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23 November 2005

By First Class Mail

DataTreasury Corporation
175 Pinelawn Road
Suite 200
Melville, NY 11747

Re: Reexamination of U.S. Patent Nos. 5,910,988

Dear Sir/Madam:

Please find enclosed a copy of a Request for Ex Parte Reexamination, including exhibits, and a Prior Art Citation and Form 1449 Form, for the above-captioned reexamination proceeding that we filed today in the U.S. Patent and Trademark Office.

Yours sincerely,

Jeffrey P. Kushan

JPK:RHT
Enclosure

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of:	)	
	)	
Claudio R. Ballard	)	
	)	
Patent No. 5,910,988	)	**Assignee:** DataTreasury Corporation
	)	
Issued: June 8, 1999	)	
	)	
For: REMOTE IMAGE CAPTURE WITH CENTRALIZED PROCESSING AND STORAGE	)	

INFORMATION DISCLOSURE STATEMENTS UNDER 37 CFR § 1.501

Mail Stop *Ex Parte* Reexamination
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached Form PTO/SB/1449 lists references that are being submitted in connection with the Request for *Ex Parte* Reexamination of U.S. Patent No. 5,910,988. Copies of the references are enclosed.

Respectfully submitted,

SIDLEY AUSTIN BROWN & WOOD LLP

Dated: 11/23/05

By: _____
Jeffrey P. Kushan
Registration No. 43,401

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LIST OF PATENTS AND OTHER ITEMS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT	**Patent No.** 5,910,988
	Inventor: Claudio R. BALLARD
	Issue Date: June 8, 1999

U.S. PATENT DOCUMENTS

Examiner Initial		DOCUMENT NUMBER	Date	Name	Class	SUBCLASS	FILING DATE
	AA	4,264,808	Apr. 28, 1981	Owens et al.			
	AB	5,373,550	Dec. 13, 1994	Campbell et al.			
	AC	5,930,778	Jul. 27, 1999	Geer			

FOREIGN PATENT DOCUMENTS

		DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	

OTHER DOCUMENTS (*Including Author, Title, Date, Pertinent Pages, Etc.)*

	AD	"Imaging in Corporate Environments: Technology and Communication," Daniel Minoli, McGraw Hill, 1994
	AE	"ANSI/ABA X9.46-1995, Draft version 0.13, American National Standard For Financial Image Interchange: Architecture, Overview and System Design Specification."
	AF	"ANSI/ABA X9.46-1997, American National Standard For Financial Image Interchange, Architecture, Overview and System Design Specification." Copyright 1996.

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

PTO/SB/57 (04-05)
Approved for use through 04/30/2007. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also referred to as FORM PTO-1465)

REQUEST FOR *EX PARTE* REEXAMINATION TRANSMITTAL FORM

Address to:
Mail Stop *Ex Parte* Reexam
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attorney Docket No.:

Date: 23 November 2005

1. [X] This is a request for *ex parte* reexamination pursuant to 37 CFR 1.510 of patent number 5,910,988 issued June 8, 1999. The request is made by:

   [ ] patent owner. [X] third party requester.

2. [X] The name and address of the person requesting reexamination is:

   First Data Corporation

   6200 S. Quebec Street

   Greenwood Village, CO 80111

3. [ ] a. A check in the amount of $_____ is enclosed to cover the reexamination fee, 37 CFR 1.20(c)(1);

   [X] b. The Director is hereby authorized to charge the fee as set forth in 37 CFR 1.20(c)(1) to Deposit Account No. 18-1260 (submit duplicative copy for fee processing); or

   [ ] c. Payment by credit card. Form PTO-2038 is attached.

4. [X] Any refund should be made by [ ] check or [X] credit to Deposit Account No. 18-1260. 37 CFR 1.26(c). If payment is made by credit card, refund must be to credit card account.

5. [X] A copy of the patent to be reexamined having a double column format on one side of a separate paper is enclosed. 37 CFR 1.510(b)(4)

6. [ ] CD-ROM or CD-R in duplicate, Computer Program (Appendix) or large table
   [ ] Landscape Table on CD

7. [ ] Nucleotide and/or Amino Acid Sequence Submission
   If applicable, items a. – c. are required.

   a. [ ] Computer Readable Form (CRF)
   b. Specification Sequence Listing on:

      i. [ ] CD-ROM (2 copies) or CD-R (2 copies); **or**
      ii. [ ] paper

   c. [ ] Statements verifying identity of above copies

8. [ ] A copy of any disclaimer, certificate of correction or reexamination certificate issued in the patent is included.

9. [X] Reexamination of claim(s) 1-50 is requested.

10. [X] A copy of every patent or printed publication relied upon is submitted herewith including a listing thereof on Form PTO/SB/08, PTO-1449, or equivalent.

11. [ ] An English language translation of all necessary and pertinent non-English language patents and/or printed publications is included.

12. ☐ The attached detailed request includes at least the following items:

a. A statement identifying each substantial new question of patentability based on prior patents and printed publications. 37 CFR 1.510(b)(1)
b. An identification of every claim for which reexamination is requested, and a detailed explanation of the pertinency and manner of applying the cited art to every claim for which reexamination is requested. 37 CFR 1.510(b)(2)

13. ☐ A proposed amendment is included (only where the patent owner is the requester). 37 CFR 1.510(e)

14. ☒ a. It is certified that a copy of this request (if filed by other than the patent owner) has been served in its entirety on the patent owner as provided in 37 CFR 1.33(c).
The name and address of the party served and the date of service are:

DataTreasury Corporation
175 Pinelawn Road, Suite 200
Melville, NY 11747

Date of Service: 23 November 2005; or

☐ b. A duplicate copy is enclosed since service on patent owner was not possible.

15. Correspondence Address: Direct all communication about the reexamination to:

☒ The address associated with Customer Number: 33694

OR

☐ Firm or Individual Name

Address

City	State	Zip
Country		
Telephone	Email	

16. ☐ The patent is currently the subject of the following concurrent proceeding(s):
☐ a. Copending reissue Application No. _____.
☐ b. Copending reexamination Control No. _____.
☐ c. Copending Interference No. _____.
☐ d. Copending litigation styled:

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

Authorized Signature — Date

Jeffrey P. Kushan — Typed/Printed Name

43,401 — Registration No.

☐ For Patent Owner Requester
☐ For Third Party Requester

APPENDIX

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.:	**5,910,988**
Filed:	August 27, 1997
Patent Owner:	DataTreasury Corporation
Applicant:	Claudio R. BALLARD
For:	Remote Image Capture with Centralized Processing and Storage

Mail Stop **Ex Parte Reexam**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR REEXAMINATION UNDER 35 U.S.C. § 302

Sir:

Reexamination of claims 1-50 of United States Patent Nos. 5,910,988 ("the '988 patent") under 35 U.S.C. §§ 302-307 and 37 C.F.R. § 1.510 is requested. A copy of the '988 patent, issued on June 9, 1999, is attached as Appendix A.

The request for reexamination is which based on substantial new questions of patentability raised by prior art patents and printed publications cited in the accompanying Citation of Prior Art.[1] Copies of the references identified in the Citation are attached as exhibits to this request. None of the primary references serving as anticipatory references or ones which render the claims obvious was cited, made of record or considered during the prosecution of the '988 patent. Moreover, none of those references is cumulative to prior art that was considered by the examiner during prosecution of the '988 patent.

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[1] U.S. Patent No. 6,032,137 (the '137 patent), filed on February 29, 2000, is a continuation-in-part claiming priority to the '988 patent. The undersigned is also submitting concurrently a request for an *ex parte* reexamination of the '137 patent.

This patent has not expired due to non-payment of maintenance fees and is assigned to DataTreasury Corporation ("DataTreasury"). In accordance with 37 C.F.R. §§ 1.33(c) and 1.510(b)(5), this request is being served in its entirety on the assignee DataTreasury.

I. Statement Pointing Out Substantial New Questions Of Patentability

To obtain a patent, an inventor must have a novel and nonobvious invention. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 780, 227 USPQ 773, 777 (Fed. Cir. 1985) That is, a person shall be entitled to a patent unless –

> "the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent" 35 U.S.C. § 102(a);
>
> "the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for a patent in the United States" 35 U.S.C. §102(b); or
>
> "the invention was described in a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent" 35 U.S.C. § 102(e). Moreover, one may not obtain a patent on an invention if the differences between the invention and the prior art are such that the invention as a whole would have been obvious to the person of ordinary skill in the pertinent art. 35 U.S.C. § 103(a).

The '988 patent to Claudio R. Ballard was filed on August 27, 1997. The patent claims systems, methods, and networks for capturing and transmitting images of documents and receipts from a remote location to a central processing location.

U.S. Patent No. 5,373,550 to Campbell, *et al.* ("Campbell," ***Exhibit A***) was issued on December 13, 1994. Campbell describes a method and a system for check image processing such as that claimed in the '998 patent. Campbell teaches the transmission of images: (1) within a remote location; (2) from a remote location to an intermediate location; (3) within the intermediate location; (4) from the intermediate location to a central location; and (5) within the central location, in a tiered or layered configuration, as contemplated by claims 46-50 of the '988 patent.

Many prior art references not considered during the prosecution of the '988 patent disclose imaging other types of financial documents that are "receipts" or their equivalents, such

as U.S. Patent No. 5,930,778 to Geer (***Exhibit H***), ANSI X9.46 -1997 and ANSI X9.46-1995 (***Exhibits J*** and ***I***, respectively), and Minoli (***Exhibit N***). Although Campbell does not require that an image of receipts be captured in addition to the checks, it would have been obvious to one skilled in the art at the time the application was filed to apply the same system of Campbell to remotely capture and transmit within a tiered architecture any financial (or other paper) document, including receipts as disclosed by Geer, ANSI or Minoli, because, as with checks, this would reduce or eliminate the need to physically transfer and store those documents. Thus, the foregoing prior art, which were not considered during prosecution of the '988 patent raise a substantial new question of patentability of claims 46-50 of the '988 patent under 35 U.S.C. § 103.

Moreover, Campbell describes a communication network as set forth in claims 42-45 of the '988 patent. That is, Campbell teaches the existence of three subsystems that each expressly or inherently have a local area network, and a wide area network for transmitting images between the three subsystems in a tiered architecture. To the extent Campbell does not expressly describe specific components of the system, those components are nevertheless inherent in the description of the system and its use set forth in Campbell. Again, although Campbell does not expressly teach that an image of receipts be captured in addition to the checks, it would have been obvious to one skilled in the art at the time of the invention to apply the same system of Campbell to remotely capture images of both documents and receipts. Thus, Campbell raises a substantial new question of patentability of claims 42-45 of the '988 patent under 35 U.S.C. § 103.

Campbell also describes the system and method set forth in claims 1, 2, 16, 18, 26, 27, and 29 of the '988 patent. In particular, Campbell describes a method of (1) capturing images of paper documents at one or more banks; (2) managing the capturing and sending of the images with the multiworkstation equipment; (3) collecting, processing, sending and storing the transaction data at a central location; (4) managing the collecting, processing, sending and storing of the transaction data; (5) encrypting the information transmitted, which includes both the images and information about the identity of the sending institution; and (6) transmitting the images and accompanying information within and between the remote location and the central location by virtue of a communication network. That method uses the system claimed in claim 1. To the extent Campbell does not expressly describe specific components of the system or

method, those components are nevertheless inherent in the description of the system and its use set forth in Campbell Once again, although Campbell does not expressly teach that an image of receipts be captured in addition to the checks, it would have been obvious to one skilled in the art at the time of the invention to apply the same system of Campbell to remotely capture images of both documents and receipts. Thus, Campbell raises a substantial new question of patentability of claims 1, 2, 16, 18, 26 , 27, and 29 of the '988 patent under 35 U.S.C. § 103.

Moreover, Campbell, taken in view of Minoli, "Imaging in Corporate Environments: Technology and Communication" ("Minoli"), U.S. Patent 4,264,808 to Owens et al.[2] ("Owens," ***Exhibit P***), and prior art admitted by the applicant, raises a substantial new question of patentability of claims 3-15, 17, 19-25, 28, 30-41 under 35 U.S.C. §103. These additional references and admissions describe additional claim elements which, for the reasons explained in detail below, it would have been obvious to employ in combination with the systems and methods described by Campbell.

The Geer patent ("Geer"), which was filed prior to the '988 patent, describes a system and method exactly as set forth in claims 46-50. Thus, Geer raises a substantial new question of patentability of claims 46-50 of the '988 patent under 35 U.S.C. § 102(e).

Minoli, which is a textbook that was published more than one year before the '988 patent was filed, describes a system exactly as set forth in claims 42-45. Thus, Minoli raises a substantial new question of patentability of claims 42-45 of the '988 patent under 35 U.S.C. § 102(b).

ANSI X9.46-1995 ("ANSI-1995"), which was a document accessible and distributed to a working group of financial institutions dedicated to developing an electronic data interchange standard for the exchange of check images and financial data across a computing network more than one year before the '988 patent was filed[3], describes the systems, methods and networks exactly as set forth in claims 1-41. Thus, ANSI X9.46-1995 raises a substantial new question of patentability of claims 1-41 of the '988 patent under 35 U.S.C. § 102(b).

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[2] Owens was cited and considered by the Examiner during prosecution of the '988 patent.

[3] This document was also available to members of the financial industry upon request or reasonable diligence.

ANSI X9.46-1997 ("ANSI-1997") was the standard that resulted from the working groups efforts on ANSI X9.46-1995, and was published in 1996 by the American Bankers Association and was approved by the American National Standards Institute, Inc. on January 21, 1997. Like ANSI X9.46-1995, ANSI X9.46-1997 describes the systems, methods and networks exactly as set forth in claims 1-41. Thus, ANSI X9.46-1997 raises a substantial new question of patentability of claims 1-41 of the '988 patent under 35 U.S.C. § 102(a).

II. Overview of the Claimed Subject Matter of the '988 Patent

The '988 patent describes a system for scanning documents and receipts to create images, and for transmitting, storing and processing the images. Independent claims 1 and 26 are directed to remote capture and transmission of encrypted images, while independent claims 42 and 46 are directed to transmission of transaction data between and within three (3) subsystems [or locations]. But as will be made clear from the analyses of the newly cited art, remote capture and transmission of encrypted images and the transmission of data within a tiered architecture were well-known concepts at least within the banking industry and at least since the early 1990s.

Claims 1-41 of the '988 patent are drawn to a system (claim 1) or method (claim 26) wherein images are captured remotely and transmitted to a central subsystem (claim 1) or central location (claim 26) over a communication network. Also transmitted from the remote system/location to the central system/location is "subsystem identification information." This term is not defined by the specification of the '988 patent ("the Specification").[4] According to claim 1, the remote data access subsystem "provide[s] encrypted subsystem identification information and encrypted paper transaction data to the data processing subsystem."[5] Analogously, the method of claim 26 includes a step of "encrypting subsystem identification information and transaction data."

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[4] The Specification does disclose that a controller may tag the image with "an identification number to identify the merchant originating the scan." '988 patent, col. 8, lns 14-23.

[5] The Specification discloses that a controller may execute "an encryption algorithm which is well known to an artisan of ordinary skill in the field to encrypt the CBI [compressed bitmap image] in step 318 [of Fig. 3A]. Encryption protects against unauthorized access during the subsequent transmission of the data." Col. 8, lns 3-5. Further disclosure of methods of encryption, algorithms, and the exact data that is encrypted is lacking in the Specification.

Claims 42-50 of the '988 patent are drawn to a communication network forming a tiered architecture (independent claim 42) and a method for transmitting data[6] in a tiered manner (independent claim 46) among three (3) subsystems (claim 42) or three (3) locations (claim 46): remote, intermediate, and central.

The dependent claims of the '988 patent, claims 2-25 and 27-41 and 43-45 and 47-50, do not contain any additional features which would impart patentable subject matter to the independent claims. The European Patent Office ("EPO") has recently examined and rejected analogous claims in a counterpart application. The EPO examiner characterized the limitations of the dependent claims as "refer[ring] to minor implementation details or other generally known features which would be used by the skilled person as a matter of normal design procedure."[7]

III. Explanation of Pertinency and Manner of Applying Cited Prior Art to Every Claim for which Reexamination Is Requested

The prior art relied upon in this request renders the claims of the '988 patent unpatentable.

In the discussion below, the prior art will be applied to the '988 patent claims in the order of increasing breadth of the four independent claims, namely, claims 46, 42, 1, and 26. Thus, claims 46-50 will be analyzed first, including a discussion of Campbell and Geer. Next, claims 42-45 will be analyzed versus each of Campbell and Minoli. Independent claims 1 and 26 and their dependent claims will then be analyzed versus each of Campbell and the ANSI/ABA-X9.46 documents. Finally, the additional cited art will be briefly discussed.

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[6] While claims 42-50 do not expressly recite that the data is encrypted during transmission, the patentee made clear statements of disavowal of claim scope during the prosecution of the '988 patent claims in response to a rejection of claims 42-50 (among others) as filed, thereby requiring the reading of encryption into these claims. Thus, the following analyses of claims 42-50, following the plain language of the claims, should not be read as assuming that encryption is not required. In any event, the references applied to these claims in fact teach the encryption of data limitation. Specifically, Campbell teaches encryption of the data at col. 5, lns 55-60; and Geer teaches encryption at col. 14, lns 32-39.

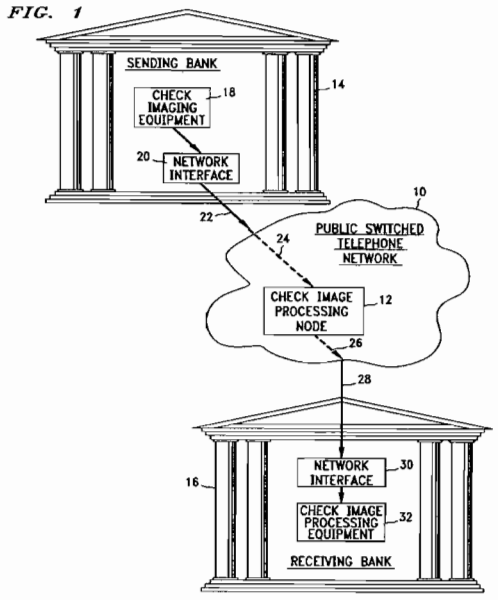
[7] Page 3 of the October 24, 2005 EPO Office Action rejecting all claims to European Application 98/942251.4-1238, under Campbell, et al. In Ballard's corresponding International Application, PCT/US/98/17662, the European Searching Authority cited Campbell, et al. as an "X reference" (particularly relevant if taken alone). The EPO Office Action and Search Report are attached as Exhibit B.

A. Claims 46-50 Are Obvious or Anticipated in View of the Prior Art

1. Campbell Renders Claims 46-50 Obvious under 35 U.S.C. § 103(a)

Campbell describes a public switched telephone network including a check clearing services node 12, which receives check images from a sending institution 14, processes the image data, and transmits the check images to a receiving institution 16. Campbell, col. 2, lns 25-33. Campbell was not cited in the original prosecution of the '988 patent.

As illustrated in FIG. 1 of the Campbell patent, reproduced below, checks are scanned at a first bank, the check images are transmitted from the first bank to a check processing node 12, such as a clearinghouse, and images are further transmitted to a second bank.



Campbell expressly teaches every element of claims 46-50, except for the requirement that an image of receipts be captured in addition to documents (i.e. "capturing an image of documents and receipts . . . "). However, these claims are rendered obvious under Campbell in view of Geer, and/or ANSI/ABA X9.46-1995, or any number of other document/receipt imaging disclosures. An element by element comparison of claims 46-50 of the '988 patent to Campbell is provided in Exhibit C.

Claim 46

Claim 46 requires that data is transmitted between and among three locations: remote, intermediate and central. Although the preamble of claim 46 broadly contemplates the use of more than one of each subsystem/location (i.e., the phrase "at least one" is used to introduce each of the three subsystem/locations), the claim clearly covers a configuration where there is only one of each location. That is, "at least one" meets the limitations of the claims. Accordingly, claim 46 covers any architecture in which ***a*** remote location (bank 14) communicates with ***an*** intermediate location (processing node 12), which communicates with ***a*** central location (bank 16), as is described in Campbell.

Campbell teaches that image data may be transmitted between and among a remote, intermediate and central location. Each of the sending bank 14 (remote location) and receiving bank 16 (central location) has imaging equipment such as large multiworkstation systems available from companies such as IBM, UNISYS, or NCR. Campbell, col. 3, ln. 10-12; 46-48. "The images produced by the equipment 18 [at the sending bank 14] are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, col. 3, ln 17-20.

Furthermore, Campbell, teaches "extracting data" from the captured check images through character recognition capability at the sending institution 14. Campbell, col. 3, ln 61 - col. 4, ln 5. Specifically, data such as a desired destination for routing the check image is extracted from the check image at the sending bank 14: "[t]he destination identifying data ... may also be entered by character recognition equipment or the like in response to the image produced by equipment 18." col. 3, ln. 66 - col. 4, ln. 2. Thus, Campbell teaches the claimed elements of capturing an image of a check, extracting data (e.g., destination identifying data) from the image at a sending bank 14, and "transmitting data within the remote location" (sending bank 14).

Campbell teaches the transmission of images: (1) within a remote location; (2) from a remote location to an intermediate location; (3) within the intermediate location; (4) from the intermediate location to a central location; and (5) within the central location, in a tiered or layered configuration, as contemplated by claim 46.

Campbell does not specifically disclose the capturing of other documents and receipts. However, many prior art references, including references cited herein, disclose imaging other types of financial documents that are receipts or equivalent, such as Geer (payment stubs, FIG. 1, reference numeral 2); and ANSI X9.46 (other financial documents) and Minoli (documents in general). It would have been obvious to one skilled in the art at the time of the invention to apply the same system of Campbell to remotely capture and transmit within a tiered architecture any financial (or other paper) document, including receipts, as broadly disclosed by Geer, ANSI or Minoli, because, as with checks, this would desirably reduce or eliminate the need to physically transfer and store those documents.

Claims 47-50

Claims 47-50, dependent on independent claim 46, are also rendered obvious in view of Campbell. An element by element comparison of claims 47-50 of the '988 patent to Campbell is provided in Exhibit C. Claims 47-50 describe transmitting steps that are typically part of a communication among a three (3) tiered network. These claims add limitations, which are expressly taught by Campbell and include: Claim 47: connecting the remote to the intermediate location (Campbell, col. 3, lns 17- 31); Claim 48: connecting the intermediate to an external communication network (Campbell, col. 3, lns 17- 31) and connecting the central location to the communication network (Campbell, col. 4, ln 30-34); Claim 49: packaging the transaction data into frames (Campbell, col. 4, lns 18-23) and transmitting the frames through the external communication network (Campbell, col. 4, lns 18-23); and Claim 50: the data transmitted is paper transactions from documents (Campbell, col. 2, lns. 26-32).

2. Geer Anticipates Claims 46-50 Under §102(e)

Geer describes a system and method wherein item capture may occur at a payee's facility "for effecting the efficient submission of check and other financial instruments into the payment system for collection of funds." Col. 4, lns 47-49. Geer was not cited during the prosecution of the '988 patent. "The financial instruments are received by a payee at a capture location remote from the payee's collecting and clearing depository bank… ." Col. 4, lns 49-51. Geer further describes that "electronic scanning means at a first location established by the payee receives the financial instruments, scans and extracts necessary data therefrom including the data of the magnetic ink character recognition (MICR) line of the instrument, adds necessary data such as

the amount and a document identification number to the electronic information associated with each check, and sends this electronic information to the payee's depository bank for further electronic sorting and processing both with regard to the introduction of the checks into the payment system and the crediting of funds represented by the checks to the payee's account at the bank." Geer, col. 4, lns 54-65.

As seen in FIG. 1 of the reference, the 3 tiers of Geer corresponding to the 3 claimed tiers are: (1) a first location 2 with electronic scanning means ("remote location at which the step of "capturing an image of documents and receipts and extracting data therefrom" occurs); (2) the payee's depository bank 10 ("intermediate location"); and (3) the payment system 12 ("central location"). As shown in the element by element analysis of claims 46-50 attached hereto as Exhibit D, Geer discloses data being transmitted between and within all of these tiers. Specifically, the following passages teach the data transmitted from the remote to intermediate locations: "Information pertaining to the checks and/or the cash letters in anticipation of a deposit in the payee's account corresponding to a cash letter (or cash letters) is transmitted from the payee to the collecting and clearing depository bank." Col 5, lns 25-31. "[T]his image of the check may also be transmitted electronically to thc bank along with the other information extracted from the check." [Col 9, lns 1-10.] Geer also discloses that the data is transmitted from the intermediate to central locations: "The electronic check information ... is sent via an appropriate communication link 15 into the payment system 12." Col 9, lns 27-30. Finally, given the numerous components disclosed at each location that deal with data, data transmission within each location it is inherently disclosed.

B. Claims 42-45 are Obvious or Anticipated in View of the Prior Art

1. Campbell Renders Claims 42-45 Obvious under 35 U.S.C. § 103(a)

Claims 42-45 of the '988 patent describe a communication network forming a tiered architecture among three subsystems: remote, intermediate, and central. Claim 42 literally requires nothing more than three LANs (one which includes an imaging subsystem) interconnected by a WAN in a tiered architecture, an architecture that has existed since the early 1990s.

An element-by-element comparison of claims 42-45 of the '988 patent to the disclosure of Campbell is provided in Exhibit E. Campbell teaches the existence of three subsystems, one at each of the sending bank 14, the node 12, and the receiving bank 16, each expressly or inherently having local area network, and a wide area network (telephone network 10) for transmitting images between the 3 subsystems in a tiered architecture (See, Fig. 1 directional arrows of the communications lines 22, 24, 26, and 28, as well as Fig. 2 directional arrows). The local area network ("LAN") connecting the subsystems of the node 12 is expressly taught. Campbell col. 4, lns 56-58. The LANs at each of the sending and receiving banks are inherent to the nature of the equipment at each bank.

Campbell further teaches that the check imaging equipment 18 ("an imaging subsystem for capturing images of documents and receipts") and/or 32 may be "large multiworkstation systems available from companies such as IBM, UNISYS, or NCR." Campbell, col. 3, ln. 10-12; 46-48. One skilled in the art would understand that the term "large multiworkstation systems" means that the equipment 18 includes multiple components interconnected by a local area network.[8] LANs were commonplace at banking institutions by the early 1990's, as is evidenced by the express teaching of the LAN at the check processing node 12. Thus, Campbell alone teaches all of the hardware components of claims 42-45.

As noted above, Campbell does not expressly teach capturing images of "receipts." As discussed above with respect to claims 46-50, it would have been obvious to apply the teaching of Campbell to process any financial (or other paper) document, including receipts, as broadly disclosed by Geer, ANSI or Minoli, because doing so would desirably eliminate the need to handle such documents in paper form. Accordingly, claims 42-45 are unpatentable under 35 U.S.C. § 103(a).

2. Minoli Anticipates Claims 42-45 under 35 U.S.C. § 102(b)

Minoli, as its title ("Imaging in Corporate Environments: Technology and Communication") indicates, provides an overview of the state of imaging communication

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[8] See the attached definition of "workstation" which states that the term "workstation" "refers to any computer connected to a local-area-network," at Exhibit F. The concept of networked workstations is further supported by Campbell, et al.'s use of the term "large multiworkstation systems".

technologies as of 1994. As stated in the preface, "[t]he word Communication in the subtitle emphasizes aspects of remote delivery of stored image information, whether across a local area network (LAN) in a building or campus, or a wide area network (WAN) covering a region, a state, or the nation." Minoli, p. xi. Minoli teaches that a typical remote image capture application in the banking industry "involves (1) scanning of documents at branch offices for transmission to a host computer at the main office of the central site." Minoli, p. 20. Minoli also describes several local area network (LAN) and wide area network (WAN) based architectures for transmission of images between and within three (3) tiers.

The hardware of FIG. 2.6 of Minoli may be used with wide area communication networks. Minoli states that Chapter 2 "provides an initial overview of system configurations that are typical of what corporate managers ...have already put in place as of the early 1900s." Minoli, p. 26. Chapter 2 is used to show "various subcomponents of the imaging system." *Id.* Minoli continues, "Chapters 8 and 9 will focus more specifically on technical aspects of these and communication technologies." *Id.*

At least claims 42-45 of the '988 patent are anticipated by Minoli. A claim-by-claim analysis of claims 42-45 of the '988 patent with respect to the reference is set forth in Exhibit O, which illustrates the three LANs of FIG. 2.6, one corresponding to the Scan segment, the Utilities segment, and the Access segment. Each of the 3 LANs has a LAN wiring hub, which is a common connection point for devices in a network. The LANs are illustrated as connected by a LAN bridge, which is a device that connects two or more LANs. However, Minoli contemplates that these 3 LANs could also be connected by a WAN, "WAN communication services [] can be employed in support of distributed imaging in general and LAN interconnection in particular." Minoli, p. 39.

The 3 LANs of FIG. 2.6 teach a tiered workflow of images. The Scan segment provides an imaging subsystem (scanner) that captures images of documents. These images may be routed in electronic form through the Utilities segment to make use of the fax server or mainframe, to the Access segment for viewing and storage. As is clear from the diagram attached in Exhibit O, in order for images to be transmitted to the Access Segment, they must be routed through the Utilities segment. Thus, as illustrated in FIG. 2.6, Minoli teaches the

transmission of images from a first LAN to a second LAN, and then from that second LAN to the third LAN, in a tiered or layered configuration.

The top-left-hand corner of FIG. 2.6 demonstrates several scanners connected by a LAN as a "scan segment" in a 3-tier architecture. Minoli, p. 31. FIG. 2.6 also shows a "LAN hub" which connects a "capture workstation" having a "scanner" to other components such as a mainframe, a print server, and a display workstation. Minoli, p. 30. These descriptions in Minoli easily meet the first LAN limitation of claim 42, wherein a remote subsystem includes an imaging subsystem for capturing images of documents and receipts.

The bottom-left-hand corner of FIG. 2.6 demonstrates a "fax server" and a mainframe connected via a "LAN wiring hub" in a portion of the 3-tiered-architecture shown as the "Utilities segment." Minoli, p. 31.

FIG. 2.6 shows an "Access segment" in the bottom corner of the 3-tiered architecture including a file server, a printer, and viewing workstations connected through a "LAN wiring hub." This LAN is connected to the Utilities segment LAN via a "LAN bridge." Minoli, p. 31.

Claims 43-45 are also anticipated by or obvious over Minoli. These claims add further structure to the three tiers of transmission described in Claim 42. Claims 43-45 require hardware that is typically part of a communication network and that is explicitly taught by Minoli. These claims add limitations of a modem (Minoli, p. 263); a bank of modems (Minoli, p. 263); routers (Minoli, p. 269); a carrier cloud using frame relay (Minoli, p. 268); a network switch (Minoli, p. 268); and transmission of images from documents (Minoli, p. 20).

C. Claims 1-41 are Anticipated or Obvious in View of the Prior Art

1. Campbell Renders Independent Claims 1 and 26 Obvious under 35 U.S.C. § 103(a)

Claim 1

Campbell teaches the remote data access subsystem of claim 1 as sending bank 14. Campbell, col. 3, ln. 10-12. Campbell describes that both paper transaction data, i.e., images of documents, such as checks, and subsystem identification information, i.e., accompanying identifiers, are transmitted from a remote data access subsystem. "The controller 42 may read some data accompanying check images, for example, it may identify that TCP/IP protocol

information accompanying those images. That information may instruct the node 12 about the identity of the sending institution and the intended receiving institution." Campbell, col. 5, ln 23-28 (emphasis added). Furthermore, the processing node 12 "may read certain overhead information accompanying the images, including frame relay flags, identifiers, address bits, indicators, and other overhead information." Campbell, col. 5, ln 2-5.

Campbell teaches the central data processing subsystem of claim 1. Specifically, "the processing node 12 receives check images and performs certain processing procedures on those images, including at least temporary storage of the received check images." Campbell, col. 3, lns. 43-58. The processing node 12 "transmits frames of digital information representing check images to the network 38 after those images have been processed by the node 12. A node controller and router 42 control the routing of check images to their intended destinations, both in the controller and to their ultimate destinations outside the network 38." Campbell, col. 3, lns. 30 – 39.

Campbell also teaches the communication network of claim 1. Images are exchanged via a public switched telephone network. Campbell, col. 2, lns. 20-22. "The public switched telephone network 10 may be ....electrically or optically based or ... may be digital or analog. Two examples of suitable digital networks are a packet network and a frame relay network, such as the existing packet and frame relay networks now provided by carriers such as AT&T." Campbell, col. 2, lns. 50-63.

Campbell also teaches the encryption limitations of claim 1. "The controller 42 may also be configured to handle information encrypted by sending institutions to provide security for the images transported by the network 38. The controller 42 may have its own encryption and decryption equipment to provide a secure environment in the node 12." Campbell, col. 5, lns. 55-60. Thus, the sending bank 14 is capable of sending encrypted "information." This information includes check images and also information "about the identity of the sending institution." Campbell, col. 5, lns. 26-27. Thus, encrypted information includes encrypted images and encrypted subsystem identification information.

Independent claim 1 recites that the remote data access subsystem comprises "an imaging subsystem for capturing the document and receipts." As noted above, Campbell does not expressly teach the capturing of "receipts." However, as discussed above with respect to claims

46-50, it would have been obvious to apply the teaching of Campbell to process any financial (or other paper) document, including receipts, as broadly disclosed by Geer, ANSI or Minoli, because doing so would desirably eliminate the need to handle such documents in paper form. Accordingly, claim 1 is unpatentable under 35 U.S.C. § 103(a).

Claim 26

Each and every step of claim 26 of the '988 patent is taught by Campbell. As explained, Campbell describes a method of (1) capturing images of paper documents at one or more banks; (2) managing the capturing and sending of the images with the multiworkstation equipment; (3) collecting, processing, sending and storing the transaction data at a central location (check processing node 12); (4) managing the collecting, processing, sending and storing of the transaction data at the check processing node 12; (5) encrypting the information transmitted to the check processing node 12 which includes both the images and information about the identity of the sending institution; and (6) transmitting the images and accompanying information within and between the remote location and the central location by virtue of a communication network. An element by element comparison of claim 26 to Campbell is provided in Exhibit G.

The preamble of claim 26 recites, "A method for [the processing] of remotely captured paper transactions from documents and receipts." Campbell does not expressly teach capturing from "receipts." However, as discussed above with respect to claims 46-50, it would have been obvious to apply the teaching of Campbell to process any financial (or other paper) document, including receipts, as broadly disclosed by Geer, ANSI or Minoli, because doing so would desirably eliminate the need to handle such documents in paper form. Thus, claim 26 is unpatentable under 35 U.S.C. § 103(a).

2. Campbell, Alone or in Combination with Other References, Teaches the Limitations of All of the Claims Dependent upon Claims 1 and 26.

Campbell provides a strong motivation to combine its teachings with other check imaging systems, methods, and networks. First, Campbell teaches that the imaging equipment at any of the banks may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR. Campbell, col. 3, lns. 10-12. Second, Campbell describes that the network 10 may incorporate any network technology, such as electrical or optical, digital or analog, local or long-distance, and the like. Campbell, col. 2, lns 50-63. The check processing node 12

provides for storage, retrieval, access, receiving, sending, processing, and verifying check images. Campbell, FIG. 2. Finally, Campbell describes the use and transmission of check images in any "network based check clearing service which handles the routing, sorting, delivery, and storage of interbank check images to effectuate a check clearing procedure." Campbell, col. 8, lns 1-4. Thus, Campbell provides the motivation to combine its systems and methods with more detailed teachings of the remote subsystem, the communication network, the central processing subsystem, and any general hardware or transmission mechanisms.

Minoli teaches that a typical remote image capture application in the banking industry "involves (1) scanning of documents at branch offices for transmission to a host computer at the main office of the central site." Minoli, p. 20. Thus, for one looking to add hardware components, such as routers, modems, and storage devices and also networking architectures in a check imaging application, one skilled in the art is highly motivated to refer to the Minoli textbook. There exists a strong motivation to combine the teachings of Minoli with other references that discuss check imaging applications, such as the ANSI standard, Owens, Campbell, etc.

Because of these motivations, it would have been obvious to combine the teachings of Campbell and/or Minoli with the prior art discussed below to arrive at the inventions of the noted dependent claims of the '988 patent.

a. Claims 2, 16, 18, 27, and 29 are anticipated by Campbell

Campbell teaches each and every one of the limitations of the noted dependent claims, including the scanner of claim 2 (Campbell, col. 2, ln. 64 – col. 3, ln 12); the data collecting subsystem of claim 18 (Campbell, FIG. 2; col. 2, lns 46-49); the tagged, encrypted, compressed bitmap image of claim 27 (Campbell, col. 7, lns. 15 – 27); and the plurality of remote and central locations of claim 29 (Campbell, col. 2, lns. 27-49).

Claim 16, dependent on claim 1, adds further architecture to the communication network of claim 1, such as a first and second LANs corresponding to the remote and central subsystems, and a WAN for transmitting data between the remote and the central subsystems. A first LAN inherently connects the components of the sending bank 14 (Campbell, col. 3, ln. 10-31); while a second LAN 56 connects the components at the check processing node (12) (Campbell, col. 4, lns. 56-58), while the network 10 may be a WAN (Campbell, col. 2, ln 61).

The limitations of claim 1 of the '988 patent are also anticipated by FIG. 2 of Campbell, which is a more detailed illustration of the teaching of FIG. 1. A bank of first deposit 36 (type of bank 14) and a payor bank 34 (type of bank 16) interchange images through the check processing node 12. For example, check images may be transmitted in a "forward flow path from a bank of first deposit [through the check processing node 12] to a payor bank." Campbell, col. 7, lns. 65-68. The bank of first deposit may have check processing equipment for generating images of the checks. Campbell, col. 4, lns 18-21; col. 3, lns 46-48. Thus, the bank of first deposit 36 may be considered a remote data access subsystem that transmits images to the check processing node 12 (a central data access subsystem), for the forward presented of check images.

Claim 18 requires an intermediate data collecting subsystem in between the remote and central subsystems. This limitation is taught by the embodiment of Campbell described above, wherein a bank of first deposit 36 may transmit images to the check processing node 12. This transmission may be through an intermediary bank 14, which forwards received images and is located in between the bank of first deposit 36 and the check processing node 12, "[o]ne or both institutions 14 and 16 may also be any intermediary institution in the forward and reverse check clearance flows between a bank of first deposit and a payor bank." Campbell, col. 2, lns 46-49. Thus, the workflow of images is: (1) images are captured at the bank of first deposit 36; (2) the images are transmitted from the bank of first deposit 36 to an intermediate bank 14; the images are transmitted from the intermediate bank 14 to the check processing node 12, thus meeting the limitations of claim 18.

Claim 29 (plurality of remote locations, plurality of central locations), depends on claim 26 (the method embodiment of claim 1). Both claims 26 and 29 are anticipated by Campbell

b. Claims 3-8 and 28 are obvious over Campbell in view of admitted prior art

As acknowledged by the applicant in the '988 patent, "[a]s is known to persons of ordinary skill in the art, the DATs 200 could also include additional devices for capturing other biometric data for additional security. These devices include facial scans, fingerprints, voice

prints, iris scans, retina scans and hand geometry." The '988 patent, col. 6, lns 46-60.[9] This statement of the knowledge of the art qualifies as an admission of prior art. See MPEP §§ 706.02(c); 2129; 2133.03(c). Additionally, as is noted in Section III(4), *infra*, Owens et al. describes that electronic transaction card and biometric peripherals may be used in connection with a system of capture and storage.

Claim 3 and its dependent claims 4-8 and further claim 28 of the '988 patent relate to capturing additional information such as transactional data, biometric data, and signature data. Such teaching is clearly taught by the patentee as being obvious additional limitations to the remote capture system.

Campbell teaches the compressed tagged image of claim 4 (Campbell, col. 7, lns. 15–27). Campbell teaches the digital storage of claim 5 (Campbell, col. 6, lns. 57-60.). Claims 6-8 and 28 contain further limitations which are admitted "well known to those in the art." *See* '988 at col. 5, ln 58 - col. 6, ln 6.[10]

c. Claims 9, 11-15, 19, 30-32 are obvious over Campbell in view of Owens and Minoli

Claim 9 details further elements of the data management subsystem of the central data processing subsystem, such as a "polling server" (Minoli, p. 33; 350; Owens, col. 12, lns 12-16); a database (Owens, col. 12, lns 18-27); a report generator (Owens, col. 14, lns 12-18); a CPU (Owens, col. 12, lns 27-36); a domain name services program (Owens, col. 21, lns 1-17; Minoli, p. 248-49); and a memory hierarchy (Owens, col. 12, lns 23-27). Claim 19 parallels claim 9. Claim 19 depends on claim 18, which describes a collecting subsystem in between the remote

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[9] This admission is referred to in the attached claim charts as "admission."

[10] "In addition to scanning images and text, the DAT scanner 202 also scans DataGlyph™ elements, available form Xerox Corporation. As is known to persons of ordinary skill in the art, the Xerox DataGlyph™ Technology represents digital information with machine readable data which is encoded into many, tiny, individual glyph elements. Each glyph element consists of a 45 degree diagonal line which could bc as short as 1/100th of an inch depending on the resolution of the scanning and printing devices. Each glyph element represents a binary 0 or 1 depending on whether it slopes downward to the left or the right respectively. Accordingly, DataGlyph™ elements can represent character strings as ASCII or EBCIDIC binary representations. Further, encryption methods, as known to persons of ordinary skill in the art encrypt the data represented by the DataGlyph™ Technology." *Id.*

and central subsystems. Claim 19 specifies that the data management subsystem (controller or CPU) of the collecting (intermediate) subsystem of claim 18 comprises a server; a database; a CPU; and a domain name services program; and a memory hierarchy. Each of these limitations is expressly taught by either Owens or Minoli.

The limitation of claim 11, wherein the memory hierarchy comprises at least one primary memory for storage and at least one secondary memory for storage, is specifically taught by Owens, col. 12, lns 23-27.

Claim 12, dependent on claim 11 and thus claim 9, describes the memory hierarchy of claim 9 as comprising a WORM jukebox and an optical storage jukebox. Both types of storage may be used to store check images, as discussed in Minoli, pp. 30-31 and Chapter 7.

Claim 13, dependent on claim 12, specifies that the optical storage jukebox comprises read only memory technology including compact disc read only memory. CD-ROM optical storage is described as being faster (150 kbps) than video servers. Minoli, p. 33.

Claim 14 is drawn to the database of claim 9 comprising at least one predefined template for portioning the stored transaction data into panels. Owens discusses ways of storing the data into predefined fields, "machine pattern recognition units" which include "a conventional character recognition reader which read the decompressed image of a document 18 and ascertains the monetary amount thereon." Owens, col. 23, lns 44-47.

Claim 15 depends from claim 14 and adds that "a data entry gateway for correcting errors in the panels of stored transaction data." Owens describes this limitation wherein transaction data is sent to a workstation wherein an operator may correct any errors through viewing the image, "[w]hen data is missing, the associated image is routed to one of the processors 396, 398 for display on one of the CRTS 150 where an operator keys in the appropriate data on an associated keyboard 152." Owens, col. 23, lns 47-52.

Claim 30 parallels claim 9. Claims 31-32, parallel to claims 14-15, are dependent on claim 30. Thus, each of these limitations is taught by Minoli and Owens

As admitted by the patentee of the '988 patent, "[a]s is known to persons of ordinary skill in the art, the DAT 200 could also be custom designed around a general purpose network computer running other operating systems as long as the chosen operating system provides

support for multiprocessing, memory management and dynamic linking required by the DataTreasury™ System 100." The '988 Patent, col. 6, lns 46-60. Thus, the Specification of the '988 patent itself acknowledges that an operating system that provided memory management, multiprocessing, and dynamic linking, elements found in claim 9 were known to those of ordinary skill for use in the kinds of systems described in the prior art. This admission at the very least provides evidence that one in the art would know to combine the well known teachings of Owens with other check imaging systems and methods, such as the check interchange system of Campbell.

d. Claims 17, 22-25 and 37 are obvious over Campbell in view of Minoli

Claim 17, dependent on claim 16, describes modems for connecting the first LAN to the WAN and a bank of modems for connecting the second LAN to the WAN. Using a dial-up or modem connection to a WAN was well known in the art and is specifically described in Minoli. Minoli, p. 263.

Claim 22 depends on claim 18, which describes a collection subsystem in between the remote and central subsystems. Claim 22 adds further architecture to the communication network of claims 1 and 18, such as a first, second, and third LANs corresponding to the remote subsystem, the collection subsystem, and the central subsystems, and a WAN for transmitting data between the remote and the central subsystems. Minoli teaches that several LANs may be interconnected through a WAN, such as in a banking or check processing environment. Minoli, p. 31; 269-271.

Claims 23-25, dependent on claim 22, describe hardware that is typically part of a communication network and that is expressly taught by Minoli. These claims add limitations of a modem (Minoli, p. 263); a bank of modems (Minoli, p. 263); routers (Minoli, p. 269); a carrier cloud using frame relay (Minoli, p. 268); and a network switch (Minoli, p. 268).

Claim 37, dependent on claim 36 and thus 29 (both anticipated by Campbell) adds limitations relating to: polling (Campbell, col. 3, lns 30 – 39); storing (Campbell, col. 3, lns. 43-58); and dynamically assigning (Campbell, col. 3, lns 30 – 39; Minoli, p. 248-49).

e. Claims 10 and 33 are obvious over Campbell in view of admitted prior art

Claim 10, dependent on claim 9 (obvious under Campbell in view of Owens and Minoli), incorporates the biometric and signature data limitations as admitted by patentee to be well known additions to a remote capture system.

Similarly, claim 33, dependent on claim 32 (obvious under Campbell in view of Owens and Minoli), incorporates the biometric and signature data limitations as admitted by patentee to be well known additions to a remote capture system. '988 patent, col. 6, lns 46-60.

f. Claims 34-35 are obvious over Campbell in view of Owens and Minoli

Claims 34-35 are dependent on claim 32, but add limitations that are taught by Campbell These limitations include: transmitting within the remote subsystem (Campbell, FIG 1); transmitting between the remote and central subsystems (Campbell, col. 2, lns. 26-32); transmitting within the central subsystem (Campbell, col. 3, ln 41-52); connecting the remote to the central subsystem (Campbell, col. 3, lns. 20-43); and connecting the central subsystem to the remote subsystem (Campbell, col. 3, ln 32-52).

g. Claims 20-21 are obvious over Campbell in view of Minoli

Claims 20-21, dependent on claim 19, are drawn to the memory hierarchy of claim 19. Claim 20 adds limitations of a primary memory for collecting transaction data and a secondary memory for backup storage of the transaction data. Campbell, describes temporary and long-term archiving of the images at the check processing node 12. Campbell, col. 7, lns 6-8. Claim 21 describes a type of magnetic tape storage device. Minoli describes several image storage systems including: CD-ROMs, WORMs, recordable CD, and magnetooptic (MO) storage. Minoli, Chapter 7, p. 219.

h. Claims 36 and 38-41 are obvious over Campbell

Claims 36 and 38-41 are each dependent on claim 29, which is anticipated by Campbell Claim 36 (the method embodiment of claim 18) describes a collecting step at an intermediate location, such as at the intermediary bank 14. Campbell, col. 2, lns 46-49. Claim 36 also requires a transmitting of the transaction data within the intermediate location and between the

intermediate locations and the central locations. As described above with respect to claim 18, Campbell teaches that such a collection may occur at an intermediary bank 14 (intermediary) that transmits check images between the bank of first deposit and the processing node 12. Campbell, col. 2, lns 46-49.

Claims 38-41, add further steps, relating to connecting and transmitting among the three locations. Campbell teaches these connections and transmissions among 3 tiers, specifically as to the bank 14, the node 12, and the bank 16. However, these connecting and transmitting steps are directly applicable to the connecting and transmitting among the bank 36, the bank 14, and the processing node 12 (specifically described as in claims 18 and 36). These include: transmitting between the remote and intermediate (Campbell, col. 2, lns 25-33); transmitting between the intermediate and central (Campbell, col. 2, lns 25-33); connecting the remote to the intermediate location (Campbell, col. 3, lns 30-39); connecting the intermediate to the central location (Campbell, col. 2, lns 25-33; col. 3, lns 30-39); connecting the intermediate to an external network (Campbell, col. 2, lns 25-33; col. 2, lns 50-63; col. 3, lns 30-39); connecting the central location to the communication network (Campbell, col. 2, lns 25-33; col. 2, lns 50-63; col. 3, lns 30-39); packaging the transaction data into frames (Campbell, col. 3, lns 30 - 39); and transmitting the frames through the external communication network (Campbell, col. 3, lns 30 - 39).

3. The ANSI/ABS X9.46-1995, version 0.13 Standard for Financial Image Interchange Anticipates Claims 1 and 26

a. The ANSI Standard and the Drafts that Preceded It Are Printed Publications under 35 U.S.C. § 102

In the 1990s, the financial industry developed an electronic data interchange standard for the exchange of check images and financial data across a computing network. The Accredited Standards Committee X9 Financial Services voted on and approved the standard. The Working Group X9B9 on Image Interchange (the "Working Group"), which reported to Subcommittee X9B, developed this standard. These facts are set forth in the Declaration of R. Jesmajian, attached hereto as Exhibit K, which is provided to substantiate that the ANSI documents are in fact printed publications within the meaning of the statute. *See* Jesmajian Decl. at ¶ 2.

From approximately 1993 to 1996, several versions of a draft document covering a proposed standard for the interchange of images among financial institutions (the "draft documents") were created by the Working Group leading up to the publication of the ANSI X9.46 Standard. *Id.*, ¶ 5. The document entitled, "ANSI/ABA X9.46-1995, Draft version 0.13, American National Standard For Financial Image Interchange: Architecture, Overview and System Design Specification," (the "ANSI/ABA X9.46-1995 document"), was one of the draft documents distributed to and used by the Working Group in 1995 in order to develop the ANSI X9.46 Standard. *Id.*, ¶ 7. The ANSI/ABA X9.46-1995 document is attached hereto as Exh. I.

The ANSI/ABA X9.46-1995 document is a printed publication and is therefore appropriately considered by the Office for purposes of reexamination. To constitute "publication," a document must be accessible to the public. *Garrett Corp. v. United States*, 422 F.2d 874, 877 (Ct.Cl. 1970). The public necessarily includes only "that class of persons concerned with the art to which the document relates and thus most likely to avail themselves of its contents." *Id.* at 878. In *Garrett Corp.,* the court determined that a report written by a government agency that detailed equipment and procedures for boarding large inflatable rafts that was distributed to 6 commercial companies with no restriction on use qualified as a publication. *Id.* at 877. Furthermore, reports composed by a joint venture of several member companies and distributed to each participating member constituted a publication since "those with access to the documents were … a *significant portion* of the interested public" and because the papers were not treated as confidential by those participants even though there was a confidentiality label on a single page of the entire report, and because "any other interested persons exercising reasonable diligence could have sought information … from [the joint venture]" as the information "was available without restriction." *Cooper Cameron Corp. v. Kvaerner Oilfield Products, Inc.*, 291 F.3d 1317, 1323-1324 (Fed. Cir. 2002).[11]

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[11] *See also*, *Crane Co. v. Goodyear Tire & Rubber Co.*, 577 F.Supp. 186, 197 (D.Ohio. 1983) (plaintiff attempted to market its system to its three major customers by distributing individualized technical proposals and detailed circuit diagrams to those three customers, such distribution to an interested segment of the public was sufficient to constitute publication, and the documents qualified as printed publications because plaintiff "intended and actually did distribute the documents to its major commercial customers who comprised the interested population in the United States" despite the fact that some of the documents had a confidentiality label affixed thereto); *Construction Technology v. Lockformer Co.*, 1990 U.S. Dist. LEXIS 20000 (D.N.Y., 1990) ("distribution to commercial companies or

The ANSI/ABA X9.46-1995 document qualifies as a "printed publication" because it was not only accessible to the relevant public, but it was distributed to the same. The members of the Working Group who developed the image interchange standard included about 40 individual members from: (1) the Federal Reserve Bank; (2) financial institutions such as Bank of America, Wells Fargo Bank, Chase Manhattan Bank, Mellon Bank, Banc One, Wachovia, and the New York Clearing House; and (3) vendors of document and check imaging products and services, such as AT&T (including NCR), IBM, and Unisys, servicing the financial industry. (Jesmajian Decl., ¶ 3). These members of the Working Group represented a substantial cross-section of the financial industry that was interested in check imaging projects during this time period. *Id.*, ¶ 4. Membership to X9B was generally granted to a member of this industry upon request. *Id.* Thus, the Working Group represented entities that would have been interested in the contents of the document and would have used its teachings to implement check interchange imaging systems.

The ANSI/ABA X9.46-1995 document was one of the draft documents distributed to the individual members of the Working Group. *Id.*, ¶ 7. This draft document was disseminated to the members of the Working Group in order to elicit feedback on the technical aspects of the proposed standard. *Id.*, ¶ 6. The individual members of the Working Group were free to collect feedback from their respective organizations using these draft documents. *Id.* Thus, a significant portion, if not all of the major financial institutions and vendors servicing financial institutions in this time period would have had a copy of the ANSI X9.46-1995 document in their possession. There was no confidentiality or restriction of use label on the ANSI X9.46-1995 document.

In addition to the Working Group members having copies of the ANSI/ABA X9.46-1995 document, this same document was distributed to the 75 members of the Subcommittee X9B for

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potential customers without restrictions on use constitutes publication"); *Friction Div. Products, Inc. v. E. I. Du Pont de Nemours & Co.*, 658 F. Supp. 998, 1008 (D. Del., 1987) (using the availability to commercial companies as a fact establishing publication of a document); *Vetco Offshore Industries, Inc. v. Rucker Co.*, 448 F.Supp. 1203 (D.Cal. 1978) (holding that drawings distributed directly or indirectly to some 30 companies constituted publication because "it appears beyond question that the companies represented the major part of the public interested in the particular art involved" even if "the record does not disclose how many companies other than those specified ... were interested in [the invention]"); *Maurice A. Garbell, Inc. v. Boeing Co.*, 385 F.Supp. 1 (D.Cal. 1973) (ruling that the fact that the author distributed his manuscript to many people in public and private agencies showed his intent to disseminate the contents of the document).

voting.[12] Furthermore, the draft documents, including the ANSI/ABA X9.46-1995 document would have been available to members of the financial industry upon request or reasonable diligence. *Id.*, ¶ 4, 10.[13] Members of the financial industry knew that a standard relating to the interchange of images was being developed at this time. *Id.*, ¶ 9. The Working Group did not keep its activities confidential or restrict its membership. *Id.* Industry-wide participation in the development was encouraged. *Id.* Thus, the ANSI/ABA X9.46-1995 document is a "printed publication" having a publication date of 1995.

This standard was published by the ABA and became known as the "X9.46 American National Standard For Financial Image Interchange." (Jesmajian Decl., ¶ 2). The ANSI X9.46 Standard was approved by the American National Standards Institute, Inc. on January 21, 1997 and was published by the American Bankers Association with a copyright notice of 1996, thus qualifying as a printed publication under 35 U.S.C. § 102(a). A copy of the ANSI X9.46 Standard as approved on January 21, 1997 is also attached as Exh. J and will be referred to as "ANSI X9.46-1997."

b. The ANSI standard, as described in ANSI-1995 and ANSI-1997, anticipates independent claims 1 and 26

An element-by-element comparison of claims 1-41 of the '988 patent to the teachings of the ANSI/ABA X9.46-1995 document is provided in Exhibit L. At least each and every element

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[12] It was a duty of the Working Group to develop a standard to present to the Subcommittee X9B on Check Processing ("Subcommittee X9B") for voting and approval. The Subcommittee X9B consisted of about 75 individual members. Similar to the Working Group, the members of the Subcommittee X9B included members from: (1) the Federal Reserve Bank; (2) financial institutions such as Bank of America, Wells Fargo Bank, Chase Manhattan Bank, Mellon Bank, Banc One, Wachovia, and the New York Clearing House; and (3) vendors of document and check imaging products and services, such as AT&T (including NCR), IBM, and Unisys, servicing the financial industry. The ANSI/ABA X9.46-1995 document was distributed to the 75 members of the Subcommittee X9B for voting. (Jesmajian Declar., ¶ 8).

[13] Such availability of working draft documents is further evidenced in the Financial Services Technology Consortium ("FSTC") Publication No. WO 97/22060 and U.S. Application Serial No. 08/571,099 (filed December 12, 1995), which incorporates the ANSI standard by reference, "[d]etails of the X9.46 proposed standard are set forth in the ANSI X9.46 Data Structure Reference, available from the X9B working group within ANSI and incorporated by reference." p. 13, lns 14-17 (emphasis added) (attached as Exhibit M).

of claim 1 and 26 of the '988 patent is taught by the ANSI X9.46 standard protocol as described in this document and thus should be rejected under 35 U.S.C. § 102(b).

Independently, claims 1 and 26 are anticipated under 102(a) by the ANSI X9.46-1997 document. The citations to "ANSI" will thus refer to two documents: (1) the document entitled "ANSI/ABA X9.46-1995, Draft version 0.13, American National Standard For Financial Image Interchange: Architecture, Overview and System Design Specification" and (2) the ANSI X9.46-1997 document. Each document substantively contains the same elements for purposes of claim comparison. Thus, for each of the passages relied upon, there will be citations to each of the 1995 and 1997 documents.

The ANSI/ABA X9.46 standard describes an electronic data interchange protocol for the exchange of electronic digitized images of financial documents among different financial institutions involved in a payment transaction. The exchange occurs across diverse computing platforms. "Packaged interchange content is delivered from the originating imaging application's financial image interchange translator to the receiving imaging application's financial image interchange translator . . . through a computer network by transmitting the . . . data electronically." §5.1.5 Transfer Mechanism; ANSI-1995, p. 15-16; ANSI-1997, p. 16. Thus, the original imaging application captures images of paper transaction data, *i.e.*, checks. ANSI-1995, p. 9; ANSI-1997, p. 9. The originating financial institution is "remote data access subsystem for capturing and sending paper transaction data."

Functional groups are packaged and interchanged between financial institutions. ANSI-1995, p. 14; ANSI-1997, p. 14-15. One type of functional group is "item views". ANSI-1995, p. 14; ANSI-1997, p. 14. "Item Views" include imaged items, such as checks or other financial documents. ANSI-1995, p. 14; ANSI-1997, p. 14. In addition to images, a data element known as "creation computer" which "conveys the system name of the originator's host computer that was used to create and digitize the imaging data" may be transmitted. ANSI-1995, p. 105; ANSI-1997, p. 105. Thus, both paper transaction data, i.e., images of documents such as checks, and subsystem identification information, i.e., the creation computer data element, are transmitted from a remote data access subsystem.

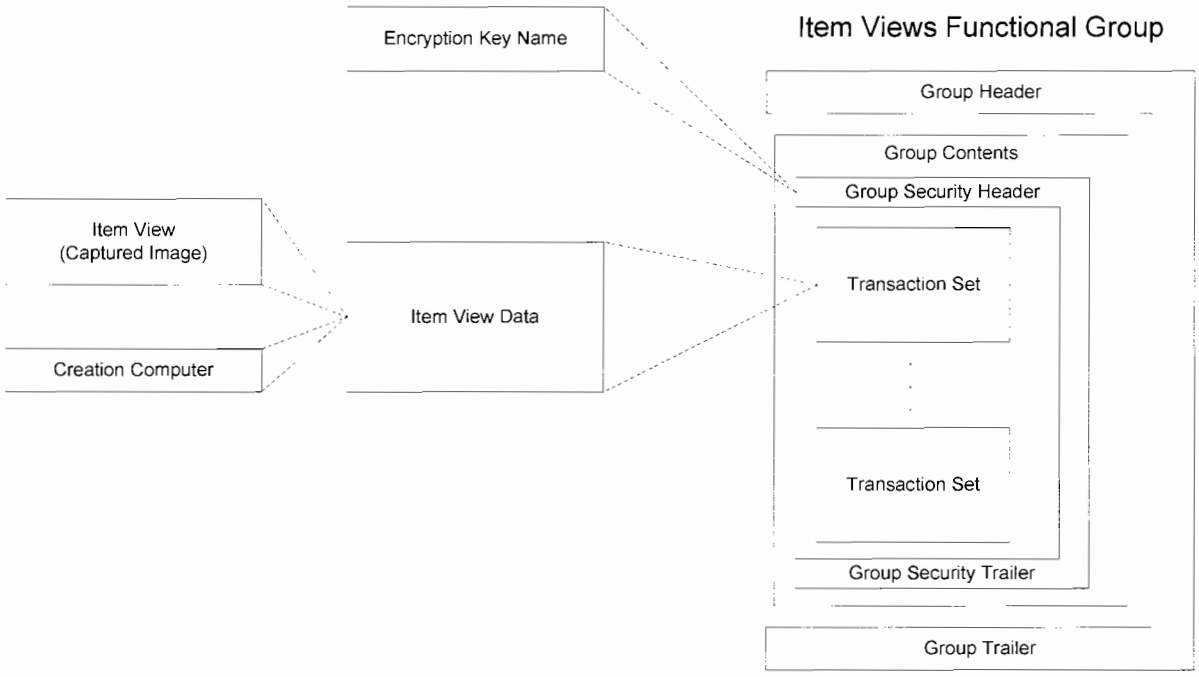
Both the originating (remote) and receiving (central) financial institution have a translator. ANSI-1995, p. 12; ANSI-1997, p. 12. "The data to be interchanged from the

originating imaging application are packaged by the FII-translator." ANSI-1995, p. 12; ANSI-1997, p. 12. The translator "(FII-translator) function of the originating application produces an interchange object (i.e., a complex data structure) by translating the output of the local imaging handling, data processing, or data storage application into a standardized interchangeable 'edi' structure." ANSI-1995, p. 14; 202-203; ANSI-1997, p. 14. At the central subsystem or receiving institution, "upon receipt of the interchanged data, the FII-translator will parse the incoming data for the receiving imaging application." ANSI-1995, p. 12, lines 406-409; ANSI-1997, p. 12. Then, the receiving imaging application may generate acknowledgements or replies to query requests, and become the originating imaging application for a new image interchange." ANSI-1995, p. 12; ANSI-1997, p. 12. Thus, the central data processing subsystem or the receiving financial institutions processes, sends, verifies, and stores the paper transaction data and subsystem identification information.

The ANSI X9.46 standard describes the communication network of claim 1. "[P]ackaged interchange content is delivered from the originating imaging application's financial image interchange translator to the receiving imaging application's financial image interchange translator is through a computer network by transmitting the packaged interchange data electronically." ANSI-1995, p. 15-16; 199; ANSI-1997, p. 16. Examples of communication methods include "teleprocessing methods: links, network end point addresses, speed, data transfer protocols, etc." ANSI-1995, p. 172; 199; ANSI-1997, p. 173. Thus, transaction data may be transmitted within and between the financial institutions.

Encryption and various security methods are expressly described. ANSI-1995, p. 55-61; ANSI-1997, p. 55-61. The standard describes specific data elements that are encrypted prior to transmission, "[e]ncryption key name… conveys the name of the key used to encipher the contents of this functional group. The name is mutually known to the security originator and the security recipient, is unique for this relationship, and allows a particular key to be specified." ANSI-1995, p. 57; ANSI-1997, p. 57. Thus, data elements are encrypted (enciphered) at the functional group level. This is further supported by the initialization vector showing the length of the data element to be encrypted. ANSI-1995, p. 55-57; ANSI-1997, p. 55-57. As explained, one (1) type of functional group is known as "item views." The check images are item views. The "creation computer" which identifies the computer that creates the image is also an item view data element. ANSI-1995, p. 93-94; 105; ANSI-1997, p. 93-94. Thus, the originating

institution (remote subsystem) provides encryption to both the images and the subsystem identification information. The illustration below combines the relevant portions of Fig. 3 on p. 14 (with the addition of the encryption key name), which shows the relationship between a functional group and its components and a transaction set and its components, with relevant portions of Fig. 9 on p. 33, which illustrates the contents of the item views functional group.



D. Other cited art

A. Owens, U.S. Patent No. 4,264,808

In the original examination, the Examiner cited U.S. Patent No. 4,264,808 to Owens, which describes a Point of Acceptance ("POA") which "captures (in image form) all information from documents (Checks, deposits, etc.) presented thereat and prepares and transmits this

information to the associated Image Processing Center (IPC) 14." Owens, col. 8, lns 41-44. Encryption techniques were well known in the financial industry at the time of the '988 patent.[14]

IV. The Patent Owner Has Represented that the Claims of the '988 Patent are Broad

A significant segment of the financial industry been sued by DataTreasury Corporation ("DataTreasury", the '988 patent assignee). Currently,[15] DataTreasury is aggressively asserting the '988 patent against several defendant financial institutions and vendors, including Bank of America Corporation, Citigroup, Inc., Wachovia Corp., Wells Fargo & Co., First Data Corporation and related entities, SVP Company (part of the Clearing House Payments Company), MagTek, NCR Corporation, EDS, and Viewpointe Archive Services.

DataTreasury purports that its claims validly cover a wide array of check imaging applications used by this assortment of the financial industry, including internal use of check images within a bank, check interchange among banks, point-of-sale check imaging applications, and the use of check images in the payment/clearing system. These allegations have been reiterated by DataTreasury in various press releases, wherein it broadly states that the patents are "for image capture, centralized processing and electronic storage of document and check information."[16] Another characterization of the patents is that "Ballard's technology enables a bank to scan the check, send it and store it securely and even mine the data on the check."[17]

Moreover, DataTreasury has alleged that "[t]hese patents describe a technology process capable of implementing the federally enacted Check Clearing for the 21st Century Act,

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[14] The Examiner in the original prosecution rejected the '988 claims under § 103 over Owens et al. in combination with a number of encryption references (Lee, et al. (USP 4,912,762), Elander, et al. (USP 4,500,750), and Zeidler (USP 4,578,530)). See also, e.g., U.S. Patent No. 4,536,647 to Atalla et al., filed on July 15, 1983, wherein a banking terminal encrypts a PIN and entity and terminal codes to produce a personal verification number and subsequently transmits a random number generated from the personal verification number.

[15] In addition to the current litigations, the patentee had enforced the '988 patent against defendants J.P. Morgan Chase, Banc One, Zions National Bank, NetDeposit, RDM, ACS, and Ingenico.

[16] <www.finextra.com/fullpr.asp?pf=y&id=4989>. "JPMorgan Chase and DataTreasury settle Patent dispute," DataTreasury Corporation Company Announcement, July 6, 2005 (included in Exhibit Q).

[17] "Melville, N.Y. – Based DataTreasury Fights J.P. Morgan Chase over Patent," Newsday, Tania Padgett, October 22, 2003 (included in Exhibit Q).

popularly known as 'Check 21.'"[18] As these statements demonstrate, DataTreasury will continue to bring lawsuits under the '988 patent unless and until its claims are properly held unpatentable in a reexamination proceeding. As its CEO stated recently, "DataTreasury's business is built on an invention that we believe has been copied by others, and we have been forced to take this matter to court. In each and every one of these suits, there are two possible outcomes: settlement and licensing or a trial."[19] There is a third option that the CEO forgot about – a holding in reexamination that the '988 patent claims are unpatentable.

V. Conclusion

The newly cited references, alone, or in combination with each other or with art previously made of record, raises substantial new questions of patentability and render the claims of the '988 patent unpatentable. Accordingly, these submitted references serve as a basis for a reexamination of the '988 patent.

Respectfully submitted,

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[18] *Id.* Check 21 is the federal legislation passed at the end of 2004 designed to enable banks to handle check images in presentment and settlement processes. See www.federalreserve.gov paymentsystems truncation faqs.htm .

[19] "Check Technology Case Stays In Texas," IP Law Bulletin, October 13, 2005.

CERTIFICATE OF SERVICE

I hereby certify that on this 23rd day of November, 2005, a copy of the foregoing Request for Reexamination Under 35 U.S.C. § 302 and Information Disclosure Statement Under 37 C.F.R. § 1.510, including exhibits, was served upon the following via First Class Mail:

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US005910988A

United States Patent [19]

Ballard

[11] Patent Number: 5,910,988

[45] Date of Patent: Jun. 8, 1999

[54] REMOTE IMAGE CAPTURE WITH CENTRALIZED PROCESSING AND STORAGE

[75] Inventor: **Claudio R. Ballard**, Lloyd Harbor, N.Y.

[73] Assignee: **CSP Holdings, Inc.**, Lloyd Harbor, N.Y.

[21] Appl. No.: **08/917,761**

[22] Filed: **Aug. 27, 1997**

[51] **Int. Cl.**[6] **H04L 9/00**

[52] **U.S. Cl.** **380/24**

[58] **Field of Search** 380/25, 24

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(List continued on next page.)

Primary Examiner—Salvatore Cangialosi

Attorney, Agent, or Firm—McGuire, Woods, Battle & Boothe LLP

[57] **ABSTRACT**

A system for remote data acquisition and centralized processing and storage is disclosed called the DataTreasury™ System. The DataTreasury™ System provides comprehensive support for the processing of documents and electronic data associated with different applications including sale, business, banking and general consumer transactions. The system retrieves transaction data at one or more remote Locations, encrypts the data, transmits the encrypted data to a central location, transforms the data to a usable form, performs identification verification using signature data and biometric data, generates informative reports from the data and transmits the informative reports to the remote location (s). The DataTreasury™ System has many advantageous features which work together to provide high performance, security, reliability, fault tolerance and low cost. First, the network architecture facilitates secure communication between the remote location(s) and the central processing facility. A dynamic address assignment algorithm performs load balancing among the system's servers for faster performance and higher utilization. Finally, a partitioning scheme improves the error correction process.

50 Claims, 10 Drawing Sheets

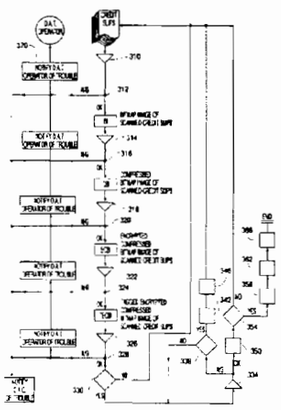

EXHIBIT
A

US005373550A

United States Patent [19]

Campbell et al.

[11] Patent Number: 5,373,550

[45] Date of Patent: Dec. 13, 1994

[54] TRANSMISSION OF CHECK IMAGES BY WAY OF A PUBLIC SWITCHED TELEPHONE NETWORK

[75] Inventors: Walter G. Campbell, Flemington; Charles J. Garland, Randolph; David A. Hollowell, Morristown; Robert Orleanski, Pittstown; Carol A. Wegrzynowicz, Holmdel, all of N.J.

[73] Assignee: AT&T Corp., Murray Hill, N.J.

[21] Appl. No.: 959,588

[22] Filed: Oct. 13, 1992

[51] Int. Cl.[5] H04M 11/00

[52] U.S. Cl. 379/100; 364/408; 235/379

[58] Field of Search 379/100, 53, 91, 96, 379/97, 98, 93; 364/408, 401, 400; 235/379; 340/825.3, 825.35; 358/85

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5,175,682	12/1992	Higashiyama et al.	364/408

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Primary Examiner—Curtis Kuntz
Assistant Examiner—Stella L. Woo
Attorney, Agent, or Firm—Eugene S. Indyk; Stuart H. Mayer

[57] ABSTRACT

Checks used to effectuate commercial and private transactions may be cleared through the banking system by transporting images of those checks between sending institutions and receiving institutions in forward and reverse flow paths between banks of first deposit and payor banks. The check images are transported through a public switched telephone network which contains a special check imaging node which provides a network based check clearing service for customers of telephone network. The check imaging node receives images of checks from institutions which subscribe to this service and routes those images through the telephone network to intended subscriber and non-subscriber recipients. Transmission of check images through a public switched telephone network may completely replace existing check clearance procedures or may be used in conjunction with existing procedures.

16 Claims, 2 Drawing Sheets

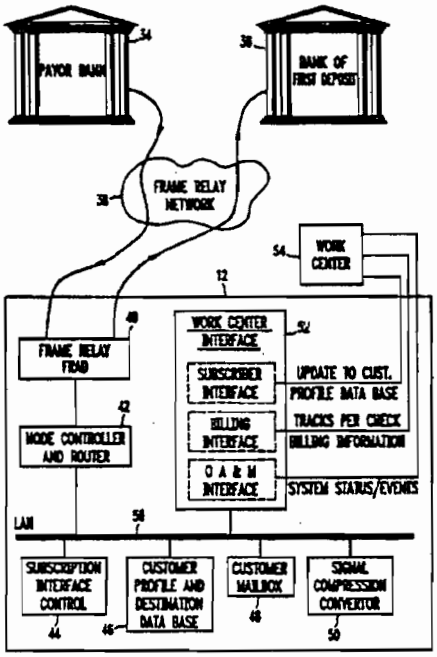


FIG. 1

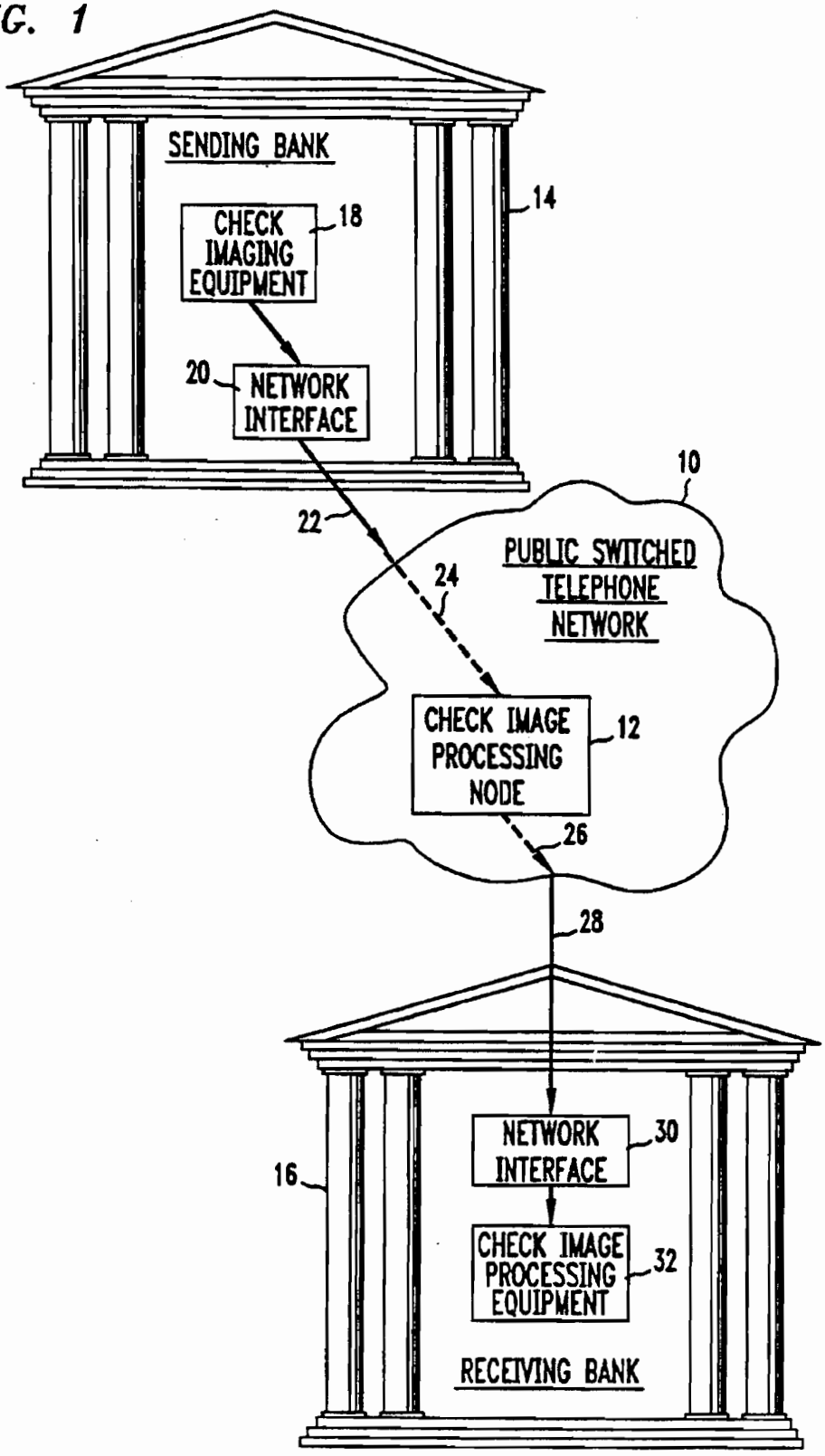
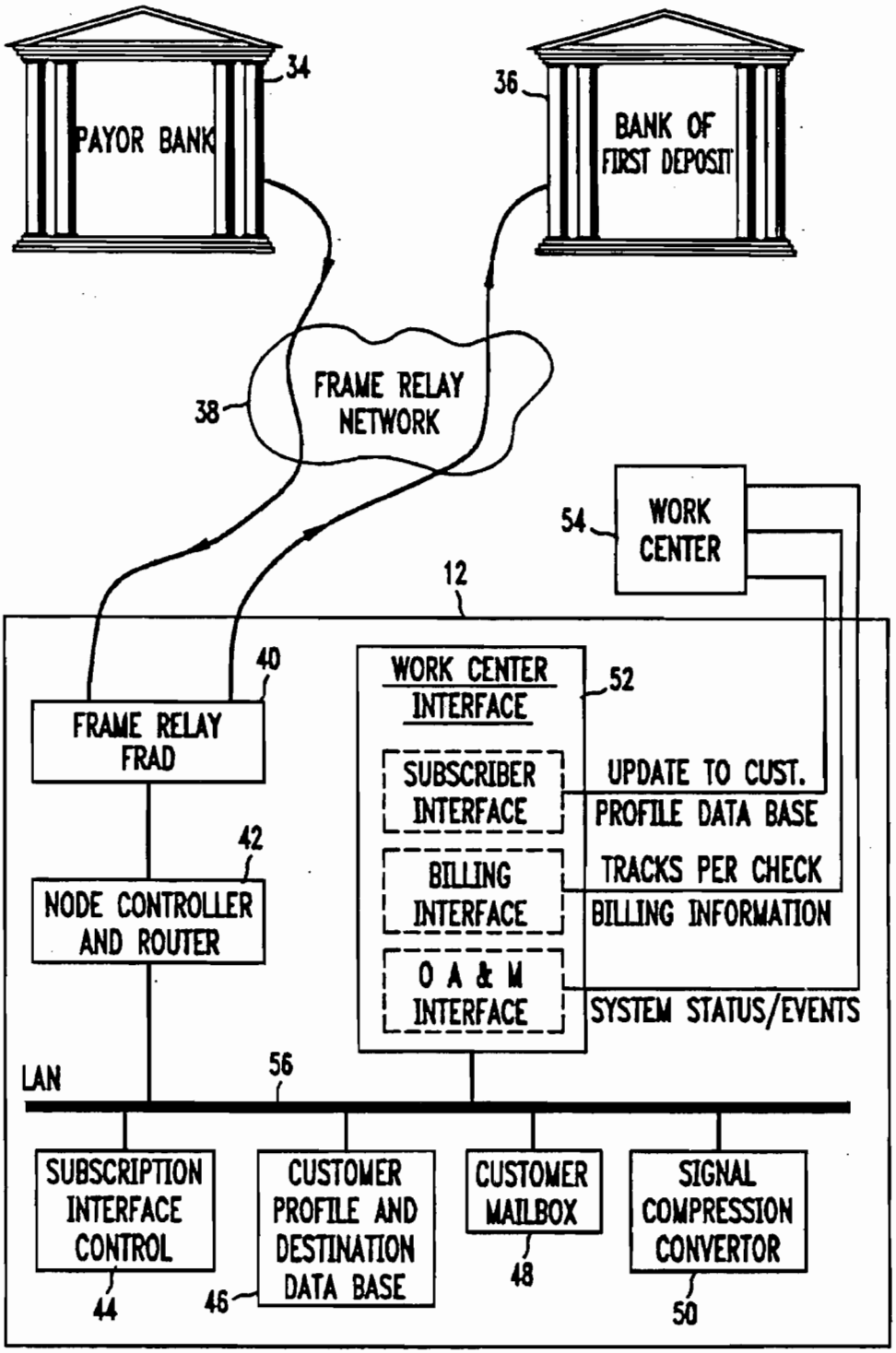

SENDING BANK
CHECK IMAGING EQUIPMENT
18
14
20
NETWORK INTERFACE
10
22
PUBLIC SWITCHED TELEPHONE NETWORK
24
CHECK IMAGE PROCESSING NODE
12
26
28
16
NETWORK INTERFACE
30
CHECK IMAGE PROCESSING EQUIPMENT
32
RECEIVING BANK

FIG. 2


PAYOR BANK
34
BANK OF FIRST DEPOSIT
36
FRAME RELAY NETWORK
38
WORK CENTER
54
12
40
FRAME RELAY FRAD
WORK CENTER INTERFACE
52
SUBSCRIBER INTERFACE
UPDATE TO CUST. PROFILE DATA BASE
BILLING INTERFACE
TRACKS PER CHECK BILLING INFORMATION
O A & M INTERFACE
SYSTEM STATUS/EVENTS
42
NODE CONTROLLER AND ROUTER
LAN
56
SUBSCRIPTION INTERFACE CONTROL
44
CUSTOMER PROFILE AND DESTINATION DATA BASE
46
CUSTOMER MAILBOX
48
SIGNAL COMPRESSION CONVERTOR
50

signal may represent the intensity or color of light reflected from a small region on the front or back surface of a check. The check imaging equipment may be any device which can create suitable graphic image signals. For example, the imaging equipment may comprise systems which scan the front face, the back face or both the front and back faces of a check, as required, to create a series of intensity or color signals for each picture element making up the scanned surfaces of the check. The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR. Alternatively, in smaller check clearing operations, the imaging equipment 18 may be personal computer based systems involving relatively simple video cameras and circuitry to digitize the signals from the camera.

The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10. The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10. For example, the network access lines 22 may comprise one or more digital transmission lines operating at speeds of about 2400 bits per second to about 1.544 megabits per second or more. Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line.

The signals received by the network on line 22 may be transmitted through the network 10 via one or more trunks and one or more central offices to the check image processing node 12 as represented schematically by a dotted line 24. The check image processing node 12 then routes the received check image via one or more trunks and one or more central offices, as represented schematically by a dotted line 26, to a network access line 28 of suitable capacity which may be the same as or different from the network access line 22. Check images are received in a network interface 30 in the receiving institution 16. The interface 30 transforms the signals from the network 10 into a form suitable for use by check image processing equipment 32 located in the receiving institution 16. The check image processing equipment 32 may be similar to the imaging equipment 18 located in the sending institution 14. The equipment 32 may also be facsimile equipment, character recognition equipment, e-mail systems, or any other image processing equipment by which the images received may be displayed or used by the receiving institution.

As described in more detail below in connection with the description of a specific example of the invention shown in FIG. 2, the processing node 12 receives check images and performs certain processing procedures on those images, including at least temporary storage of the received check images. One of the procedures performed on check images is to route them to a desired destination. The appropriate destination may be determined by the node 12 in a variety of ways. One example involves the sending institution 14 including destination identifying data along with the image. That data then can be read by the node 12 to appropriately route the check image to its destination. The destination identifying data may be manually entered by an operator at the time the image is generated in institution 14. The data may also be entered by character recognition equipment or the like in response to the image produced by equipment 18. One alternative to the sending institution producing data relating to the destination of the check image is to install character recognition equipment in the check image processing node 12. The character recognition in the node 12 then can read the check image and determine its destination from certain characteristics of the image such as the endorsements on the check.

FIG. 2 illustrates a detailed example of a check image processing node 12 like the one shown in FIG. 1. FIG. 2 also shows a specific public switched telephone network in which the node 12 is located. FIG. 2 is an example of the invention involving a situation where a payor bank 34, which is a subscriber to the services provided by the check image processing node 12, has dishonored a check sent to it directly or indirectly by a bank of first deposit 36. An image of the front and back faces of the dishonored check is generated by the payor bank 34 and sent to a public switched telephone network in the form of a frame relay network 38. The frame relay network 38 may be the frame relay network in the AT&T switched network. The image of the dishonored check is sent through an appropriate path in the network 38 to the check image processing node 12. The node 12 accepts the images transmitted over the frame relay network 38 and uses specific subscriber data to process check images and retransmit those images through the network 38 to their final destination.

The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38. The assembler/disassembler 40 also transmits frames of digital information representing check images to the network 38 after those images have been processed by the node 12. A node controller and router 42 controls the routing of check images to their intended destinations, both in the controller and to their ultimate destinations outside the network 38. The node 12 also contains a subscription interface control 44 which controls a network customer's access to the facilities in the node 12. A customer profile and destination database 46 contains information about subscribers to the services provided by the node 12 and information about all potential recipients of images handled by the node 12. A storage device 48, which may be an electronic mailbox as shown in FIG. 2, stores at least temporarily some or all of check images received by the node 12. A signal converter 50 contains information used by the node 12 to convert images in a format used by the sending institutions into a format understandable by the receiving institution. A work center interface 52 is connected to a work center 54. The interface 52 is involved with updating customer profiles, handling billing information, and accomplishing operations, administration, and maintenance functions. A local area network 56 connects the subsystems of the node 12 described above.

The frame relay assembler/disassembler 40 controls incoming and outgoing frames of digital information representing the images of the checks received in the node 12. When a check arrives at the node 12, the assembler/disassembler 40 will assemble the frames making up the image of the check. For example, there may be approximately 391 frames per check image, depending on the size and information content of the check. In addition to assembly of the frames making up check images, error detection and recovery operations may

also be performed. The image of the check will then be passed to the node controller and router 42. The assembler/disassembler 40 may read certain overhead information accompanying the images, including frame relay flags, identifiers, address bits, indicators, and other overhead information. When check images leave the node 12 to go to their final destinations, the assembler/disassembler builds the frames making up each check image for transmission through appropriate portions of the frame relay network 38. The assembler/disassembler 40 may set flags, identifiers, indicators, and address bits under the control of the node controller and router 42.

The node controller and router 42 provides interfaces to systems external to the node 12. It is connected to all the other subsystems in the node 12 by way of the local area network 56. The controller 42 provides access to the database 46 and directs check images to appropriate subsystems in the node 12 connected to the local area network 56. The controller 42 also routes the check images from the node 12 to their ultimate destinations by way of the assembler/disassembler 40 and the frame relay network 38. The controller 42 may read some data accompanying check images, for example, it may identify that TCP/IP protocol information accompanying those images. That information may instruct the node 12 about the identity of the sending institution and the intended receiving institution. That information may also identify the disposition of the check, for example, it may indicate that the check is a return check dishonored by a payor bank. The controller 42 may signal the subscription interface controller 44 to extract data from the customer profile and destination database 46 which controls the processing performed on the check by the node 12. The controller 42 may receive instructions from the work center 54 through the interface 52 to control changes made to the information in the database 46. These changes may include the addition or changes to personal identification numbers or bank related data. The controller 42 may monitor, filter, and collect various alarms and signals from the subsystems connected to the local area network 56 to notify the work center 54 about various conditions in the node 12. High reliability may be achieved by the provision of various fault tolerant features in the node 12, for example, by the provision of appropriate backup equipment used when equipment in the node fails. The controller 42 accumulates certain statistics needed to prepare bills for telephone network users. For example, the controller 42 may count checks, keep track of functions performed by the node 12 (i.e., numbers of conversions, storage amounts, etc.) and the origins and destinations of the check images for billing purposes. This information is transmitted to a billing interface shown in the work center interface 52. The controller 42 may also be configured to handle information encrypted by sending institutions to provide security for the images transported by the network 38. The controller 42 may have its own encryption and decryption equipment to provide a secure environment in the node 12.

The subscription interface control 44 links the node 12 to a subscriber of the services provided by node 12. In addition to controlling a subscriber's access to the node 12, it controls the sending of information from the database 46 about the customer and the disposition and process requirements for each check to the controller 42. The control 44 may receive a login personal identification number and other security identifiers deemed necessary. It will check these against a customer profile and allow access to the node when they are correct. The control 44 checks a profile of a destination bank stored in the database 46 to determine how the check should be processed and stored. This information is transmitted to the node controller and router 42. The interface controller 44 controls all additions, deletions, and changes to the customer data in the database 46.

The database 46 contains two types of data, data relating to subscribers to the services of node 12 and data relating to banks and other potential destinations which do not subscribe to the services of the node 12. Examples of data which will be stored for each subscriber may include:

1. A personal identification number (PIN);
2. A subscriber's destination address which may be similar to those used in electronic funds transfer;
3. Information relating to protocols used by the equipment of the subscriber which creates the check images and information relating to any compression algorithms used by that equipment for transmitting images over the network;
4. Requirements of the subscriber regarding the storage of check images in the node;
5. Information about the times at which check images should be transmitted to the subscriber;
6. Default destinations to be used in the event that equipment on the subscribers premises should fail; and
7. Levels of subscriber service.

Data for nonsubscribers, for example, nonsubscription destination banks, are required because subscribers may wish to route check images to such non-subscribers. Data requirements for such entities may differ from those of subscribers. For example, non-subscribers may not have frame relay customer premises equipment, equipment to reconstruct the check images, or encryption devices to properly accept encrypted data. Check images may have to travel to such entities over normal switched access lines or a hard copy must be created to be physically sent to such entities. Data for non-subscribers may include:

1. A destination address similar to those used in electronic funds transfer;
2. A delivery code indicating the method of check delivery to be used, for example, a delivery code indicating whether frame relay or imaging equipment is available;
3. A fax number if delivery of check images is to be made by facsimile or a mailing address if delivery is to be made by post;
4. Storage requirements;
5. The time of day at which checks should be transmitted; and
6. A default destination in the event of a failure in the destination's premises equipment.

The storage device 48 may be a rewritable mass storage device which can at least temporarily store or archive compressed or uncompressed check images prior to transmission to their destinations. The storage means may be an optical disk drive or a magnetic disk drive depending on the needed file size and required access speed. A subscriber's check images will be stored in the storage device 48 if the subscriber elects this option. The customer will also specify a time-to-transmit threshold which is stored in the customer profile and destination database 46. This allows the customer to receive check images at convenient times of the day

rather than sporadically. The customer may also elect to temporarily store check images during emergencies such as during a failure of the customer's premises equipment. The customer may also elect alternate delivery methods, such as facsimile or mail, when the customer's premises equipment fails. In addition to temporary storage of check images, the storage mechanism **48** may be configured to provide long term archiving of check images if elected by the customer. In one example of the invention, check images may be stored in the storage device **48** for a period of time sufficient to allow the item to clear normally. In all cases, the treatment of the check image by node **10** may be indicated in a customer profile stored in database **46**, as described above.

Since there are no universally adopted standards regarding imaging formats and compression standards, the node **12** contains a signal converter **50** which converts signals received by the node **12** in one format used by a sender into another format usable by a recipient. The converter **50** uses information stored in the database **46** regarding the formats and compression algorithms involved. This information will be relayed from the database **46** to the signal converter **50** by the node controller **42**. The converter **50** may contain multi-vendor image format and compression processors which can uncompress and reconstruct images from one imaging system to another.

The work center interface **52** provides external interfaces to the work center **54**. The contents of the database **46** may be changed or updated through a subscriber interface in the interface **52**. Service orders may be placed to accomplish this process. Certain aspects of a billing record may be produced by the node **12**. For example, information about the number of checks processed, converted, stored, and transmitted will be maintained by the node controller **42**. A billing interface in the interface **52** will periodically poll the node controller **42** for this information and will transmit this information to an appropriate downstream billing center. An operations, administration, and maintenance interface in the interface **52** will send all alarms, status checks, and reports of certain events to the work center **54**.

In the example of the invention shown in FIG. **2**, the payor bank **34** creates an image of each check it has dishonored. The image comprises a plurality of frames of digital information. The frames are sent to the node **12** in the frame relay network **38** and are assembled in the assembler/disassembler **40**. The node controller and router **42** then may send the image to the storage device **48** and afterward read the image out of the storage device **48** and route it through the assembler/disassembler **40** and portions of the network **38** to a bank of first deposit **36** to notify that bank that the check has been dishonored. The behavior of the controller **42** in directing the check image to the storage device **48** and routing the image to its destination may be controlled by data accompanying the check image, data derived from the image, or data about the subscriber and the intended destination stored in the database **46**. Although FIG. **2** has been described as a situation involving the return of dishonored check images from a payor bank to a bank of first deposit, the principles embodied in the circuitry shown in FIG. **2** may readily be applied to any situation requiring a transfer of a check image from one institution to another institution in the course of carrying out a check clearance procedure, including transferring check images in a forward flow path from a bank of first deposit to a payor bank.

In summary, this application describes a network based check clearing service which handles the routing, sorting, delivery, and storage of interbank check images to effectuate a check clearing procedure. The described method of clearing a check utilizing a public switched telephone network and images of checks may completely replace conventional check clearance procedures involving the physical transfer of checks between institutions. The described method may also be used in conjunction with actual physical transfer of checks to act as speedy notification of the flow of actual checks through the clearance system. Use of the described apparatus and method of clearing checks will have significant benefits for users. The entire notification process will be speeded up. The information available to payor banks, banks of first deposit, and intermediaries will be improved. The risks to the institutions will be reduced and the costs of processing checks will be lowered. Banks of first deposit will be able to improve customer service by the increased timeliness with which it notifies its deposition of dishonored checks.

We claim:

1. A public switched telephone network, comprising:

at least one check clearance services node which receives an image of a check from a check clearance service subscriber connected to the network and routes that image to a recipient connected to the network;

a storage device for storing a plurality of check images received by the node;

a database containing information relating to each of the subscribers to the services provided by the node and information about potential recipients of check images from the node; and

a node controller which is responsive to information contained in the database for storing check images in the storage device and routing check images to recipients through the public switched telephone network.

2. The apparatus of claim **1**, in which the public switched telephone network comprises a public switched telephone network provided by a local exchange carrier.

3. The apparatus of claim **1**, in which the public switched telephone network comprises a long distance public switched telephone network.

4. The apparatus of claim **1**, in which the public switched telephone network comprises a long distance public switched telephone network accessed by way of a public switched telephone network provided by a local exchange carrier.

5. The apparatus of claim **1**, in which the public switched telephone network is a packet network.

6. The apparatus of claim **1**, in which the public switched network is a frame relay network.

7. The apparatus of claim **1**, in which the public switched network is a circuit switched network.

8. The apparatus of claim **1**, in which the subscriber is connected to the public switched telephone network by way of a dial up connection.

9. The apparatus of claim **1**, in which the subscriber is connected to the public switched telephone network by a dedicated private connection.

10. The apparatus of claims **1**, in which the subscriber is connected to the public switched telephone network by way of a digital connection operating at a bit rate of 2400 bits per second to about 1.544 megabits per second.

11. The apparatus of claim 1, in which the node comprises:

a means for storing information relating to customer profiles and destinations of check images.

12. The apparatus of claim 11, in which the node further comprises:

a means for storing images of checks for predetermined time periods.

13. The apparatus of claim 12, in which the node further comprises:

a means for controlling access to information in the storing means.

14. The apparatus of claim 1, in which the node comprises:

a means for convening signals produced by the subscriber in a first format to signals for the recipient in a second format.

15. The apparatus of claim 14, in which the convening means comprises:

a means for convening signals produced by the subscriber in accordance with a first encryption algorithm to signals encrypted in accordance with a second encryption algorithm for the recipient.

16. The apparatus of claim 1, in which the node comprises a node controller for controlling the operation of the node and for routing received check images to intended destinations in the node and in the public switched telephone network.

* * * * *

EXHIBIT
B

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Application No.	Ref.	Date
98 942 251.4 - 1238	DCM/P10420EP	24.10.2005
Applicant: Data Treasury Corporation		

Communication pursuant to Article 96(2) EPC

The examination of the above-identified application has revealed that it does not meet the requirements of the European Patent Convention for the reasons enclosed herewith. If the deficiencies indicated are not rectified the application may be refused pursuant to Article 97(1) EPC.

You are invited to file your observations and insofar as the deficiencies are such as to be rectifiable, to correct the indicated deficiencies within a period

of 4 months

from the notification of this communication, this period being computed in accordance with Rules 78(2) and 83(2) and (4) EPC.

One set of amendments to the description, claims and drawings is to be filed within the said period on separate sheets (Rule 36(1) EPC).

Failure to comply with this invitation in due time will result in the application being deemed to be withdrawn (Article 96(3) EPC).

Bohner, M
Primary Examiner
for the Examining Division

Enclosure(s): 5 page/s reasons (Form 2906)

Registered Letter
EPO Form 2001 07.02CSX

The examination is being carried out on the **following application documents**:

Description, Pages

1-40 as originally filed

Claims, Numbers

1-36 received on 21.09.1999

Drawings, Sheets

1/11-11/11 as originally filed

The following documents (D1-D5) may be referred to during any communication in subsequent examination; the notation below will be adhered to:

D1: EP-A-0 593 209 (AMERICAN TELEPHONE AND TELEGRAPH COMPANY; AT&T CORP) 20 April 1994 (1994-04-20)
D2: WO 90/04837 A (EMPIRE BLUE CROSS/BLUE SHIELD; SIGMA COMPUTER RESEARCH ASSOCIATES, INC) 3 May 1990 (1990-05-03)
D3: US-A-5 602 936 (GREEN ET AL) 11 February 1997 (1997-02-11)
D4: WO 91/06058 A (UNISYS CORPORATION) 2 May 1991 (1991-05-02)
D5: US-A-5 457 747 (DREXLER ET AL) 10 October 1995 (1995-10-10)

1.) Conciseness and clarity

1.1 The application does not meet the requirements of Article 84 EPC because the claim set is not concise regarding claims 13 and 29.

Claims 13 and 29 have been drafted as separate independent claims. Under Article 84 in combination with Rule 29(2) EPC an application may contain more than one independent claim in a particular category only if the subject matter claimed falls within one or more of the exceptional situations set out in paragraphs (a), (b) or (c) of Rule 29(2) EPC. This is not the case in the present application because the above-mentioned claims do not relate to a plurality of inter-related products nor represent alternative solutions to a particular problem, but they refer to the same method differing from each other only with regard to the definition of the subject-matter for which protection is sought and in respect of the terminology used for the features of that subject-matter.

1.2 Claim 4 is not supported by the description as required by Article 84 EPC. It relates to the additional feature that the data access subsystems comprise a printer for printing the paper transactions initiated by the card interface which includes data glyphs. The person skilled in the art would realise that this feature is in no way covered by the disclosure of the description and figures.

2.) Patentability

Furthermore, the above-mentioned objection notwithstanding, the present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of claims 1-36 does not involve an inventive step in the sense of Article 56 EPC.

2.1 Document D1, which is considered the closest prior art, discloses a system for central management, storage (see e. g. col. 4, l. 22-25) and report generation (see col. 8, l. 51-54) of remotely captured paper transactions from cheques (see col. 3, l. 18-20) comprising

- remote data access subsystems for capturing and sending paper transaction data (see e. g. col. 3, l. 18-55) and subsystem identification information (see col. 6, l. 18-20) comprising an imaging subsystem and a data access controller;
- a central data processing subsystem for processing, sending, verifying and storing the paper transaction data and the subsystem identification information

comprising a management subsystem (see e. g. col. 5, l. 9-55); and
- a communication network for the transmission of the transaction data between the subsystems (see col. 2, l. 37-42) with the data access subsystems providing encrypted data to the data processing subsystem (see col. 6, l. 48-51).

D1 does not mention the processing of other documents such as receipts. This is, however, a matter of design choice for the skilled person since the use of systems as disclosed in D1 for other financial documents is generally known in the field (see e. g. D2-D4).

As a consequence, claim 1 is not allowable for lack of inventive step of its subject-matter.

2.2 Dependent claims 2-12 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the EPC with respect to inventive step. They refer to minor implementation details or other generally known features which would be used by the skilled person as a matter of normal design procedure.

2.3 In this respect, capturing electronic transactions from cards and the use of electronic signature data or biometric data as user identification means were generally known features in the field of banking systems at the date of priority of the present application (claim 2 of application, see e. g. D5). The skilled person would regard it as a normal design option to include these features in a system as disclosed in D1.

The additional features of transforming the paper transaction data to an image which is compressed and encrypted are disclosed in D1 (claim 3 of application, see e. g. col. 7, l. 23-27 and col. 6, l. 48-51 in D1). It is implicit that the image is a bitmap image and that the data access subsystems comprise digital storage for storing the images. Tagging of the image with information relating to image capture is a standard implementational choice (see e. g. TIFF standard) which does not involve an inventive step.

The subject-matter of claim 4 is not supported by the description as pointed out under

1.2 above. Insofar as it appears to relate to the provision of a printer for printing the transactions and the known use of DataGlyph elements (see p. 9 of descriptions) it does not appear to add anything of inventive significance to the subject-matter of the application.

2.4 Claims 5 and 7-11 address the components used in the data access subsystems, the regional data collection systems, the central data processing system, the connecting networks and their interaction. It appears that standard components of a distributed transaction processing system at the time of priority of the application are used such as servers, databases, a report generator, jukeboxes, a bank of modems, routers and a frame relay network. It would therefore be a matter of normal design procedure for the skilled person to use and combine these components when implementing a system as disclosed in D1. This also applies to load balancing by dynamic assignment of IP addresses and the design option for transmitting the transaction data via intermediate locations (see also col. 3, l. 56 - col. 4, l. 2 in D1). The subject-matter of claims 5 and 7-11 can therefore not be regarded as involving an inventive step.

2.5 Claims 6 and 12 refer to generally known features of identification verification and cheque processing. In this respect, it is common to compare biometric and signature data with samples stored at a central database and to use templates for partitioning scanned data into panels, identifying locations of the panels and correcting errors in the panels (claim 6 of application, see e. g. D5, col. 7, l. 35-39 and D2, p. 6, l. 5-22). The use of typical cheque data fields and remote verification cannot be considered inventive either (claim 12 of application, see e. g. D2, p. 6, l. 33-36).

2.6 Claims 13-22 and 29-36 relate to methods and claims 23-28 to a communication network with features corresponding to those in system claims 1-12. The objections raised in respect of these claims also apply to claims 13-36.

3.) Amendments

3.1 It is not at present apparent which part of the application could serve as a basis

for a new, allowable claim. Should the applicant nevertheless regard some particular matter as patentable, an independent claim should be filed taking account of Rule 29(1) EPC. The applicant should also indicate in the letter of reply the difference of the subject-matter of the new claim vis-à-vis the state of the art and the significance thereof.

3.2 The attention of the applicant is drawn to the fact that the application may not be amended in such a way that it contains subject-matter which extends beyond the content of the application as filed (Article 123(2) EPC).

3.3 Any information the applicant may wish to submit concerning the subject-matter of the invention, for example further details of its advantages or of the problem it solves, and for which there is no basis in the application as filed, should be confined to the letter of reply and not be incorporated into the application (Article 123(2) EPC and the Guidelines, C-VI, 5.3.4 et seq.).

3.4 In order to facilitate the examination of the conformity of the amended application with the requirements of Article 123(2) EPC, the applicant is requested to clearly identify the amendments carried out, irrespective of whether they concern amendments by addition, replacement or deletion, and to indicate the passages of the application as filed on which these amendments are based.
If the applicant regards it as appropriate these indications could be submitted in handwritten form on a copy of the relevant parts of the application as filed.

3.5 When filing amended claims the applicant should at the same time bring the description into conformity with the amended claims. Care should be taken during revision, especially of the introductory portion and any statements of problem or advantage, not to add subject-matter which extends beyond the content of the application as originally filed (Article 123(2) EPC).

EXHIBIT
C

Element by element comparison of claims 46-50 of the '988 Patent to Campbell, et al. (USP 5,373,550).

'988 Patent	'550 to Campbell, et al.
46. A method for transmitting data within and between one or more remote subsystems, at least one intermediate subsystem and at least one central subsystem in a tiered manner wherein each of the central subsystems communicate with at least one intermediate subsystem and each of the intermediate subsystems communicate with at least one remote subsystems comprising the steps of:	"The system of FIG. 1 comprises a public switched telephone network 10. The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2, ln 25-33.
46a. capturing an image of documents and receipts and extracting data therefrom;	The sending institution 14 possesses check impanging equipment 18 which produces electrical or optical signals representing the image of a check. Campbell, et al., Col. 2, lns 64-66. "The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR." Campbell, et al., Col. 3, ln. 10-12. "The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al., Col. 3, ln 17-20. Extracting: "The destination identifying data may be manually entered by an operator at the time the image is generated in institution 14. The data may also be entered by character recognition equipment or the like in response to the image produced by the equipment 18. One alternative to the sending institution producing data relating to the destination of the check image is to install character recognition equipment in the check image processing node 12. The character recognition in the node 12 then can read the check image and determine its destination from certain characteristics of the image such as the endorsements on the check" Campbell, et al., Col. 3, ln 65 – Col. 4, ln 9.
46b. transmitting data within the remote locations;	"The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR." Campbell, et al., Col. 3, ln. 10-12. "The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al., Col. 3, ln 17-20.
46c. transmitting data from each remote location to corresponding intermediate location;	"The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10." Campbell, et al., Col. 2, lns. 26-32.
46d. transmitting data within the intermediate locations;	"A local area network 56 connects the subsystems of the node 12 described above." Campbell, et al., Col. 4, lns. 56-58. "The node controller and router 42 provides interfaces to systems external to the node 12. It is connected to all the other subsystems in the node 12 by way of the local area network 56. The controller 42 provides access to the database 46 and directs check images to appropriate subsystems in the node 12 connected to the local area network 56." Campbell, et al., Col. 5, lns. 14-26.

'988 Patent	'550 to Campbell, et al.
46e. transmitting data from each intermediate location to corresponding central locations; and	"The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2, lns. 26-32.
46f. transmitting data within the central locations.	"Check images are received in a network interface 30 in the receiving institution 16. The interface 30 transforms the signals from the network 10 into a form suitable for use by check image processing equipment 32 located in the receiving institution 16. The check image processing equipment 32 may be similar to the imaging equipment 18 located in the sending institution 14. The equipment 32 may also be facsimile equipment, character recognition equipment, e-mail systems, or any other image processing equipment by which the images received may be displayed or used by the receiving institution." Campbell, et al., Col. 3, ln 41-52.
47. A method as in claim 46 wherein said transmitting data from each remote location to corresponding intermediate locations step comprises the steps of:	See claim 46
47a. connecting each remote location to a corresponding intermediate location; and	"The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10. The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10. For example, the network access lines 22 may comprise one or more digital transmission lines operating at speeds of about 2400 bits per second to about 1.544 megabits per second or more. Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line." Campbell, et al., Col. 3, lns 17- 31.
47b. connecting the intermediate locations to corresponding remote locations.	"The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38." Campbell, et al., Col. 4, ln 30-34.
48. A method as in claim 47 wherein said transmitting data from each intermediate location to corresponding central locations comprises the steps of:	See Claim 47
48a. connecting each intermediate location to an external communication network; and	"The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10. The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. The network access lines 22 may comprise any form of transmission line suitable for carrying the

'988 Patent	'550 to Campbell, et al.
	expected volume of check image traffic between the sending institution 14 and the telephone network 10. For example, the network access lines 22 may comprise one or more digital transmission lines operating at speeds of about 2400 bits per second to about 1.544 megabits per second or more. Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line." Campbell, et al., Col. 3, lns 17- 31.
48b. connecting the corresponding central locations to the external communication network.	"The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38." Campbell, et al., Col. 4, ln 30-34.
49. A method as in claim 48 wherein said transmitting data from each intermediate location to, corresponding central locations step further comprises the steps of:	See Claim 48
49a. packaging the transaction data into frames; and	"An image of the front and back faces of the dishonored check is generated by the payor bank 34 and sent to a public switched telephone network in the form of a frame relay network 38. The frame relay network 38 may be the frame relay network in the AT&T switched network. The image of the dishonored check is sent through an appropriate path in the network 38 to the check image processing node 12." Campbell, et al., Col. 4, lns 18-25.
49b. transmitting the frames through the external communication network.	"The node 12 accepts the images transmitted over the frame relay network 38 and uses specific subscriber data to process check images and retransmit those images through the network 38 to their final destination. The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38. The assembler/disassembler 40 also transmits frames of digital information representing check images to the network 38 after those images have been processed by the node 12." Campbell, et al., Col. 4, lns 18-36.
50. A method as in claim 46 wherein said data is obtained from (a) electronic transactions from credit cards, smart cards and debit cards, signature data or biometric data, or (b) paper transactions from documents and receipts.	"The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2, lns. 26-32.

Element by element comparison of claims 46-50 of the '988 Patent to Campbell, et al. (USP 5,373,550).

'988 Patent	'550 to Campbell, et al.
46. A method for transmitting data within and between one or more remote subsystems, at least one intermediate subsystem and at least one central subsystem in a tiered manner wherein each of the central subsystems communicate with at least one intermediate subsystem and each of the intermediate subsystems communicate with at least one remote subsystems comprising the steps of:	"The system of FIG. 1 comprises a public switched telephone network 10. The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2, ln 25-33.
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46c. transmitting data from each remote location to corresponding intermediate location;	"The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10." Campbell, et al., Col. 2, lns. 26-32.
46d. transmitting data within the intermediate locations;	"A local area network 56 connects the subsystems of the node 12 described above." Campbell, et al., Col. 4, lns. 56-58. "The node controller and router 42 provides interfaces to systems external to the node 12. It is connected to all the other subsystems in the node 12 by way of the local area network 56. The controller 42 provides access to the database 46 and directs check images to appropriate subsystems in the node 12 connected to the local area network 56." Campbell, et al., Col. 5, lns. 14-26.

'988 Patent	'550 to Campbell, et al.
46e. transmitting data from each intermediate location to corresponding central locations; and	"The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2, lns. 26-32.
46f. transmitting data within the central locations.	"Check images are received in a network interface 30 in the receiving institution 16. The interface 30 transforms the signals from the network 10 into a form suitable for use by check image processing equipment 32 located in the receiving institution 16. The check image processing equipment 32 may be similar to the imaging equipment 18 located in the sending institution 14. The equipment 32 may also be facsimile equipment, character recognition equipment, e-mail systems, or any other image processing equipment by which the images received may be displayed or used by the receiving institution." Campbell, et al., Col. 3, ln 41-52.
47. A method as in claim 46 wherein said transmitting data from each remote location to corresponding intermediate locations step comprises the steps of:	See claim 46
47a. connecting each remote location to a corresponding intermediate location; and	"The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10. The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10. For example, the network access lines 22 may comprise one or more digital transmission lines operating at speeds of about 2400 bits per second to about 1.544 megabits per second or more. Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line." Campbell, et al., Col. 3, lns 17- 31.
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48a. connecting each intermediate location to an external communication network; and	"The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10. The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. The network access lines 22 may comprise any form of transmission line suitable for carrying the

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48b. connecting the corresponding central locations to the external communication network.	"The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38." Campbell, et al., Col. 4, ln 30-34.
49. A method as in claim 48 wherein said transmitting data from each intermediate location to, corresponding central locations step further comprises the steps of:	See Claim 48
49a. packaging the transaction data into frames; and	"An image of the front and back faces of the dishonored check is generated by the payor bank 34 and sent to a public switched telephone network in the form of a frame relay network 38. The frame relay network 38 may be the frame relay network in the AT&T switched network. The image of the dishonored check is sent through an appropriate path in the network 38 to the check image processing node 12." Campbell, et al., Col. 4, lns 18-25.
49b. transmitting the frames through the external communication network.	"The node 12 accepts the images transmitted over the frame relay network 38 and uses specific subscriber data to process check images and retransmit those images through the network 38 to their final destination. The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38. The assembler/disassembler 40 also transmits frames of digital information representing check images to the network 38 after those images have been processed by the node 12." Campbell, et al., Col. 4, lns 18-36.
50. A method as in claim 46 wherein said data is obtained from (a) electronic transactions from credit cards, smart cards and debit cards, signature data or biometric data, or (b) paper transactions from documents and receipts.	"The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2, lns. 26-32.

EXHIBIT
D

Element by element comparison of claims 46-50 of the '988 Patent to Geer (USP 5,930,788).

'988 Patent	'788 to Geer
46. A method for transmitting data within and between one or more remote subsystems, at least one intermediate subsystem and at least one central subsystem in a tiered manner wherein each of the central subsystems communicate with at least one intermediate subsystem and each of the intermediate subsystems communicate with at least one remote subsystems comprising the steps of:	"The present invention comprises an integrated system beginning at a payee's item capture facility for effecting the efficient submission of checks and other financial instruments into the payment system for collection of funds. The financial instruments are received by a payee at a capture location remote from the payee's collecting and clearing depository bank and are presented for payment through the check payment system to the multiple institutions on which the instruments are drawn. In one embodiment, electronic scanning means at a first location established by the payee receives the financial instruments, scans and extracts necessary data therefrom including the data of the magnetic ink character recognition (MICR) line of the instrument, adds necessary data such as the amount and a document identification number to the electronic information associated with each check, and sends this electronic information to the payee's depository bank for further electronic sorting and processing both with regard to the introduction of the checks into the payment system and the crediting of funds represented by the checks to the payee's account at the bank, as the payee processes the check in its own record of account with the check payor. In this first embodiment, the paper financial instruments are typically imaged (electronically, digitally, optically, on microfilm or disk, or otherwise) for archival storage at the payee's location remote from the payee's depository bank, substantially contemporaneous with the capture of the financial or other information on the instrument." Col 4, lns 46-67. **remote subsystem** = payee 2 **intermediate subsystem** = depository bank 10 **central subsystem** = payment system 12
46a. capturing an image of documents and receipts and extracting data therefrom;	"The financial instruments are received by a payee at a capture location **remote** from the payee's collecting and clearing depository bank." Col 4, lines 49-51. "[F]or retail establishments such as grocery chains and the like that receive large numbers of point of sale checks, the present invention is applicable with the item capture location of the payee being the point of sale check receiving establishment. Point of sale capture may, but need not necessarily, include imaging of the check." Col. 8, lns 48-54. "An image of the physical check is **created**." "The image may be an optical or electronic gray-scale or color image of the check maintained in archival storage in pixel-by-pixel digital, optical, magnetic, electronic, fully optical or other storage technology from which information can be derived." Col 8, lns 12-19. "The electronic scanning for **extraction of the data** from the MICR line, etc., may be combined with the imaging of the check." Col 8, lns 61-64.
46b. transmitting data within the remote locations;	The internal communication **network** at the **remote capture location** is inherently disclosed. Referring to the FIGs., it is clear that electronic data is transmitted within the remote location among the functional components including the electronic sorter, the imaging unit, the archive, etc. "Following receipt and item capture by the payee, the check will advance to scanning and processing

'988 Patent	'788 to Geer
	in the electronic scanning block 6 of FIG. 1. In this step, the check is scanned by a suitable reader." Check images are created. "The data thus collected will typically include the MICR (Magnetic Ink Character Recognition) data from the MICR lines of the checks. The amount of the check and a date will also be collected (optionally verified by a human operator) and included with the electronic record to be associated with each check." [Col 7, lns 38-58] Ultimately, the check images and the information extracted from the check must be organized and transmitted to the bank of first deposit. Therefore, the electronic data is inherently transmitted within the remote location. "The embodiment of FIG. 1 uses electronic transmission of information related to electronically sorted information about checks received and electronic cash letters related to the particular groups of sorted checks. Therefore, sorting, reconciliation, etc., is effected by electronic means without the need for mechanical processing or delivery of physical paper checks." Col. 7, Lines 31-37. "The information flow within the check payee's organization from item capture 4 to the check payee accounting function 5 is a matter of payee preference." Col. 8, Lines 6-9
46c. transmitting data from each remote location to corresponding intermediate location;	"A **communication link** is established between the **payee's location** and the **depository bank**. Information pertaining to the checks and/or the cash letters in anticipation of a deposit in the payee's account corresponding to a cash letter (or cash letters) is **transmitted** from the payee to the collecting and clearing depository bank." [Col 5, lns 25-31]. "[T]his **image of the check may also be transmitted electronically** to the bank along with the other information extracted from the check." [Col 9, lns 1-10].
46d. transmitting data within the intermediate locations;	While the specification does not explicitly disclose the communication network internally at the bank of first deposit, it does disclose the flow of the electronic check information and check images through several functional blocks of the bank of first deposit.[1] Therefore, the electronic data is inherently transmitted within the bank of first deposit.
46e. transmitting data from each intermediate location to corresponding central locations; and	"The electronic check information ... is sent via an appropriate communication link 15 into the payment system 12." [Col 9, lns 27-30]
46f. transmitting data within the central	"The payment system 12 includes clearing institutions such as the Federal Reserve Banks,

[1] "The electronic check information ... is sent via an appropriate communication link 15 into the payment system 12." [Col 9, lns 27-30] "The image 7 is transferred via a communication link 11 from payee 2 to depository bank 10 for financial information processing and archival storage." [Col 10, lns 1-3] "At the depository bank, the appropriate adjustments of the payee's account balances by the depository bank are carried out 13." [Col 9, lns 11-25] "The payee's account is credited with the appropriate amounts as such are compiled by the payee and the information thereof is received electronically from the payee. The electronic check information is sorted and routed via 14, with appropriate electronic information added thereto to insure proper routing through the payment and clearing system to the appropriate payor bank." [Col 9, lns 14-16]

'988 Patent	'788 to Geer
locations.	correspondent banks, The National Clearinghouse Association (described in United States Letters Pat. No. 5,265,007), the electronic check clearing house organization (described in Stephens et al., supra), and like mechanisms. Having a direct relationship to the check payment system, the collecting and clearing depository bank 10 is considered a part of the check payment system." [Col 9, lns 30-37] "The payment system 12 receives checks from depository bank 10 and other banks of first and subsequent deposit (not depicted on FIG. 1) intended for various payor banks, B.sub.1, B.sub.2, B.sub.3 . . . B.sub.n, collectively denoted as 16 in FIG. 1. The check information from the payment system 12 reaches the appropriate payor banks 16 for proper debiting of the accounts of check writers 1 thus completing the payment cycle. In the event of dishonor of a check by a payor bank, the process reverses as to the collection of the dishonored check, and this **information may be transmitted electronically back through payment system 12** (or by more direct means of reversal) to depository bank 10 for unwinding the transaction and for debiting of the payee's account as to the dishonored check. " [Col 9, lns 38-51]
47. A method as in claim 46 wherein said transmitting data from each remote location to corresponding intermediate locations step comprises the steps of:	See claim 46
47a. connecting each remote location to a corresponding intermediate location; and	"A **communication link** is established between the **payee's location** and the **depository bank**." Col. 5 ln 25-27.
47b. connecting the intermediate locations to corresponding remote locations.	"A **communication link** is established between the **payee's location** and the **depository bank**." Col. 5 ln 25-27.
48. A method as in claim 47 wherein said transmitting data from each intermediate location to corresponding central locations comprises the steps of:	See Claim 47
48a. connecting each intermediate location to an external communication network; and	"The electronic check information as sorted, grouped and annotated by the depository bank [10] is sent via an appropriate communication link 15 into the payment system 12." [Col 9, lns 27-30]. Inherently, a connection between the depository bank 10 (the intermediate location) and the payment system 12, which includes a variety of independent "clearing institutions, such as the Federal Reserve Banks, correspondent banks, The National Clearinghouse Association . . . " (col. 9, ln. 25-34), requires first connecting the depository bank with an external network . . .
48b. connecting the corresponding central locations to the external communication	which, in turn, connects with the payment system 10.

'988 Patent	'788 to Geer
network.	
49. A method as in claim 48 wherein said transmitting data from each intermediate location to, corresponding central locations step further comprises the steps of:	See Claim 48.
49a. packaging the transaction data into frames; and	The transmission using frames is not expressly disclosed in the Geer patent. However, frame relay transmission was well-known at the time of the earliest Ballard patent filing and thus it would be a matter of obvious design choice to implement this specific method of transmitting data in the Geer system. See for example, the X.25 and X.31 protocols
49b. transmitting the frames through the external communication network.	See above.
50. A method as in claim 46 wherein said data is obtained from (a) electronic transactions from credit cards, smart cards and debit cards, signature data or biometric data, or (b) paper transactions from documents and receipts.	The data that is transmitted throughout the system is capture and extracted from check. See Claim 46(a) analysis above. Thus, the data of the claim elements, is obtained from paper transactions from documents and reciepts.

EXHIBIT
E

Element by element comparison of claims 42-45 of the '988 Patent to Campbell, et al. (U.S. Patent No. 5,373,550).

'988 Patent	'550 to Campbell, et al.
42. A communication network for the transmission of data within and between one or more remote data processing subsystems, at least one intermediate data collecting subsystem and at least one central subsystem forming a tiered architecture wherein each of said at least one central data processing subsystem communicate with a corresponding some of said at least one data collecting subsystem and each of said at least one data collecting subsystem communicate with a corresponding some of said one or more data processing subsystems,	"The system of FIG. 1 comprises a public switched telephone network 10. The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2, ln 25-33.
said data processing subsystem including an imaging subsystem for capturing images of documents and receipts, comprising:	"The sending institution 14 possesses check imaging equipment 18 which produces electrical or optical signals representing the image of a check. The image may comprise a sequence of signals each representing some characteristic of a picture element, for example, each signal may represent the intensity or color of light reflected from a small region on the front or back surface of a check. The check imaging equipment may be any device which can create suitable graphic image signals. For example, the imaging equipment may comprise systems which scan the front face, the back face or both the front and back faces of a check, as required, to create a series of intensity or color signals for each picture element making up the scanned surfaces of the check. The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR. Campbell, et al., Col. 2, ln. 64 – Col. 3, ln. 12.
42a. at least one first local area network for transmitting data within a corresponding one of said one or more remote subsystems;	"The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR." Campbell, et al., Col. 3, ln. 10-12. "The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al., Col. 3, ln 17-20. "The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10. For example, the network access lines 22 may comprise one or more digital transmission lines operating at speeds of about 2400 bits per second to about 1.544 megabits per second or more. Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line." Campbell, et al., Col. 3, ln 20-31.

'988 Patent	'550 to Campbell, et al.
one of said at least one second local area network through said at least one wide area network;	dedicated 24 h per day, but must be brought on line when needed (via a process called call setup) and then taken down when no longer needed. Minoli, p. 263.
at least one bank of modems for connecting said at least one second local area network of said at least one intermediate subsystem to a corresponding some of said at least one first local area network of said one or more remote subsystems through said at least one wide area network;	Dial-up link between LAN routers. This approach involves the use of modems connected to the LAN server (bridge or router), to utilize the analog public telephone network. Circuit switching implies that the communications channel is not dedicated 24 h per day, but must be brought on line when needed (via a process called call setup) and then taken down when no longer needed. Minoli, p. 263.
at least one first wide area network router for connecting a corresponding one of said at least one second local area network of said at least one intermediate subsystem to said at least one wide area network; and	Minoli Fig. 9.7 (pg. 269) First router connecting two or more LANs over a WAN. The public switched telephone network 10 may be a frame relay network, a WAN. Campbell, et al., Col. 2, ln 61.
at least one second wide area network router for connecting a corresponding one of said at least one third local area network of said at least one central subsystem to said at least one wide area network.	Minoli Fig. 9.7 (pg. 269) Second router connecting two or more LANs over a WAN. The public switched telephone network 10 may be a frame relay network, a WAN. Campbell, et al., Col. 2, ln 61.
44. A system as in claim 43 wherein said at least one first wide area network and said at least one second wide area network comprises a carrier cloud which utilizes a frame relay method for transmitting the transaction data.	Campbell et al. in view of Minoli "Frame relay service provides interconnection among n sites by requiring only that each site be connected to the "network cloud" via an access line. ... The cloud consists of switching nodes interconnected by trunks used to carry traffic aggregated from many users (see Fig. 9.7). In a public frame relay network the switches and the trunks are put in place by a carrier for use by many corporations. Carrier networks based on frame relay provide communications at up to 1.544 Mbps (in the United States), shared bandwidth on demand, and multiple user sessions over a single access line. The throughput is much higher than that available for packet switching, making the service attractive for imaging applications. In a private frame relay network, the switches and trunks are put in place (typically) by the corporate communications department of the company in question." Minoli, p. 268 The public switched telephone network 10 may be a frame relay network, a WAN. Campbell, et al., Col. 2, ln 61.

'988 Patent	'550 to Campbell, et al.
45. A system as in claim 44 wherein said at least one second local area network and said at least one third local area network further comprises a corresponding one of at least one network switch for routing transaction data within said at least one second local area network and said at least one third local area network; and further wherein said data comprises (a) electronic transactions from credit cards, smart cards and debit cards, signature data or biometric data, or (b) paper transactions from documents and receipts.	"Frame relay service provides interconnection among n sites by requiring only that each site be connected to the "network cloud" via an access line. ... The cloud consists of switching nodes interconnected by trunks used to carry traffic aggregated from many users (see Fig. 9.7). In a public frame relay network the switches and the trunks are put in place by a carrier for use by many corporations. Carrier networks based on frame relay provide communications at up to 1.544 Mbps (in the United States), shared bandwidth on demand, and multiple user sessions over a single access line. The throughput is much higher than that available for packet switching, making the service attractive for imaging applications. In a private frame relay network, the switches and trunks are put in place (typically) by the corporate communications department of the company in question." Minoli, p. 268. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2, ln 25-33.

EXHIBIT
F

Merriam-Webster's Collegiate® Dictionary

TENTH EDITION

Merriam-Webster, Incorporated
Springfield, Massachusetts, U.S.A.

A GENUINE MERRIAM-WEBSTER

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[1]work-ing *n* (14c) 1 : the manner of functioning or operating : OPERATION — usu. used in pl. 2 : an excavation or group of excavations made in mining, quarrying, or tunneling — usu. used in pl.
[2]working *adj* (1613) 1 : engaged in work ⟨a ~ journalist⟩ 2 : adequate to permit work to be done ⟨a ~ majority⟩ 3 : assumed or adopted to permit or facilitate further work or activity ⟨~ draft⟩ 4 : spent at work ⟨~ life⟩ 5 : being in use or operation ⟨a ~ farm⟩
working asset *n* (ca. 1914) : an asset other than a capital asset
working capital *n* (ca. 1901) : capital actively turned over in or available for use in the course of business activity: a : the excess of current assets over current liabilities b : all capital of a business except that invested in capital assets
working–class *adj* (1839) : of, relating to, deriving from, or suitable to the class of wage earners ⟨~ virtues⟩ ⟨~ family⟩
working class *n* (1789) : the class of people who work for wages usu. at manual labor
working day *n* (15c) : WORKDAY
working dog *n* (1891) : a dog fitted by size, breeding, or training for useful work (as draft or herding) esp. as distinguished from one fitted primarily for pet, show, or sporting use
working fluid *n* (1903) : a fluid working substance
work-ing-man \'wər-kiŋ-ˌman\ *n* (1638) : one who works for wages usu. at manual labor
working papers *n pl* (1928) : official documents legalizing the employment of a minor
working substance *n* (1897) : a usu. fluid substance that through changes of temperature, volume, and pressure is the means of carrying out thermodynamic processes or cycles (as in a heat engine)
work-ing-wom-an \'wər-kiŋ-ˌwu-mən\ *n* (1853) : WORKWOMAN
work-less \'wər-kləs\ *adj* (15c) : being without work : UNEMPLOYED — **work-less-ness** *n*
work-load \'wərk-ˌlōd\ *n* (1943) 1 : the amount of work or of working time expected or assigned 2 : the amount of work performed or capable of being performed (as by a mechanical device) usu. within a specific period
work-man \'wərk-mən\ *n* (bef. 12c) 1 : WORKINGMAN 2 : ARTISAN
work-man-like \-ˌlīk\ *adj* (1739) : characterized by the skill and efficiency typical of a good workman
work-man-ly \-lē\ *adj* (1545) : WORKMANLIKE
work-man-ship \-ˌship\ *n* (1523) 1 : something effected, made, or produced : WORK 2 : the art or skill of a workman : CRAFTSMANSHIP; *also* : the quality imparted to a thing in the process of making ⟨a vase of exquisite ~⟩
work-mate \'wərk-ˌmāt\ *n* (1851) *chiefly Brit* : a fellow worker
workmen's compensation insurance *n* (ca. 1917) : WORKERS' COMPENSATION
work of art (1834) 1 : a product of one of the fine arts; *esp* : a painting or sculpture of high artistic quality 2 : something giving high aesthetic satisfaction to the viewer or listener
work off *vt* (1678) : to dispose of or get rid of by work or activity
work-out \'wərk-ˌau̇t\ *n* (ca. 1894) 1 : a practice or exercise to test or improve one's fitness for athletic competition, ability, or performance 2 : a test of one's ability, capacity, stamina, or suitability
work out *vt* (1534) 1 a : to bring about by labor and exertion ⟨*work out* your own salvation —Phil 2:12 (AV)⟩ b : to solve (as a problem) by a process of reasoning or calculation c : to devise, arrange, or achieve by resolving difficulties ⟨after many years of wrangling, *worked out* a definite agreement —A. A. Butkus⟩ d : DEVELOP ⟨the final situation is not *worked out* with psychological profundity —Leslie Rees⟩ 2 : to discharge (as a debt) by labor 3 : to exhaust (as a mine) by working ~ *vi* 1 a : to prove effective, practicable, or suitable ⟨how this will actually *work out* I don't know —Milton Kotler⟩ b : to amount to a total or calculated figure — used with *at* or *to* 2 : to engage in a workout ⟨*works out* in gymnasiums . . . to keep in shape —*Current Biog.*⟩
work over *vt* (1874) 1 : to do over : REWORK ⟨saved the play by *working* the first act *over*⟩ 2 : to subject to thorough examination, study, or treatment ⟨shelf stock *worked over* by shoppers⟩ 3 : to beat up or manhandle with thoroughness ⟨the gang *worked* me *over*⟩
work-peo-ple \'wərk-ˌpē-pəl\ *n pl* (1708) *chiefly Brit* : WORKERS, EMPLOYEES
work-piece \-ˌpēs\ *n* (1926) : a piece of work in process of manufacture
work-place \-ˌplās\ *n* (ca. 1828) : a place (as a shop or factory) where work is done
work print *n* (1937) : a completely edited motion-picture print used as a guide in cutting the original negative from which the final production prints will be made
work-room \'wərk-ˌrüm, -ˌru̇m\ *n* (1828) : a room used for work
work-shop \-ˌshäp\ *n* (1562) 1 : a small establishment where manufacturing or handicrafts are carried on 2 : WORKROOM 3 : a usu. brief intensive educational program for a relatively small group of people that focuses esp. on techniques and skills in a particular field
work song *n* (1911) : a song sung in rhythm with work
work-sta-tion \-ˌstā-shən\ *n* (1931) 1 : an area with equipment for the performance of a specialized task usu. by a single individual 2 a : an intelligent terminal or personal computer usu. connected to a computer network b : a powerful microcomputer used esp. for scientific or engineering work
work stoppage *n* (1945) : concerted cessation of work by a group of employees usu. more spontaneous and less serious than a strike
work–study program *n* (1946) : a program planned to give high school or college students work experience
work-ta-ble \'wərk-ˌtā-bəl\ *n* (1790) : a table for holding working materials and implements; *esp* : a small table with drawers and other conveniences for needlework
work–to–rule *n* (1950) : the practice of working to the strictest interpretation of the rules as a job action
work-up \'wərk-ˌəp\ *n* (1939) : an intensive diagnostic study
work–up \'wərk-ˌəp\ *n* (1903) : an unintended mark on a printed sheet caused by the rising of spacing material
work up *vt* (15c) 1 : to stir up : ROUSE 2 : to produce by mental or physical work ⟨*worked up* a comedy act⟩ ⟨*worked up* a sweat in the gymnasium⟩ ~ *vi* : to rise gradually in intensity or emotional tone
work-week \'wərk-ˌwēk\ *n* (1921) : the hours or days of work in a calendar week ⟨40-hour ~⟩ ⟨a 5-day ~⟩ ⟨a shortened ~⟩
work-wom-an \-ˌwu-mən\ *n* (ca. 1530) : a woman who works
[1]world \'wərld\ *n* [ME, fr. OE *weorold* human existence, this world, age (akin to OHG *weralt* age, world); akin to OE *wer* man, *eald* old — more at VIRILE, OLD] (bef. 12c) 1 a : the earthly state of human existence b : life after death — used with a qualifier ⟨the next ~⟩ 2 : the earth with its inhabitants and all things upon it 3 : individual course of life : CAREER 4 : the inhabitants of the earth : the human race 5 a : the concerns of the earth and its affairs as distinguished from heaven and the life to come b : secular affairs 6 : the system of created things : UNIVERSE 7 a : a division or generation of the inhabitants of the earth distinguished by living together at the same place or at the same time ⟨the medieval ~⟩ b : a distinctive class of persons or their sphere of interest ⟨the academic ~⟩ ⟨the sports ~⟩ 8 : human society ⟨withdraw from the ~⟩ 9 : a part or section of the earth that is a separate independent unit 10 : the sphere or scene of one's life and action ⟨living in your own little ~⟩ 11 : an indefinite multitude or a great quantity or distance ⟨makes a ~ of difference⟩ ⟨a ~ away⟩ 12 : the whole body of living persons : PUBLIC ⟨announced their discovery to the ~⟩ 13 : KINGDOM 5 ⟨the animal ~⟩ 14 : a celestial body (as a planet) — **for all the world** : in every way : EXACTLY ⟨copies which look *for all the world* like the original⟩ — **in the world** : among innumerable possibilities : EVER — used as an intensive ⟨what *in the world* is it⟩ — **out of this world** : of extraordinary excellence : SUPERB
[2]world *adj* (13c) 1 : of or relating to the world ⟨a ~ championship⟩ 2 a : extending or found throughout the world : WORLDWIDE ⟨brought about ~ peace⟩ b : involving or applying to part of or the whole world ⟨a ~ tour⟩ ⟨a ~ state⟩
world–beat-er \'wərld(-ə)-ˌbē-tər\ *n* (ca. 1888) : one that excels all others of its kind : CHAMPION
world–class *adj* (1950) : being of the highest caliber in the world ⟨a ~ polo player⟩
world federalism *n* (1950) 1 : federalism on a worldwide basis 2 *cap W&F* a : the principles and policies of the World Federalists b : the body or movement composed of World Federalists
world federalist *n* (1951) 1 : an adherent or advocate of world federalism 2 *cap W&F* : a member of a movement arising after World War II advocating the formation of a federal union of the nations of the world with limited but positive governmental powers
world-ling \'wərl(-ə)ld-liŋ, 'wərl-liŋ\ *n* (1549) : a person engrossed in the concerns of this present world
world-ly \'wər(-ə)ld-lē, 'wərl-lē\ *adj* (bef. 12c) 1 : of, relating to, or devoted to this world and its pursuits rather than to religion or spiritual affairs 2 : WORLDLY-WISE *syn* see EARTHLY — **world-li-ness** *n*
world-ly–mind-ed \ˌwərl(d)-lē-'mīn-dəd\ *adj* (1601) : devoted to or engrossed in worldly interests — **world-ly–mind-ed-ness** *n*
world-ly–wise \'wərl(d)-lē-ˌwīz\ *adj* (15c) : possessing a practical and often shrewd understanding of human affairs *syn* see SOPHISTICATED
world power *n* (1860) : a political unit (as a nation or state) powerful enough to affect the entire world by its influence or actions
world premiere *n* (1925) : the first regular performance (as of a theatrical production) anywhere in the world
World Series *n* [fr. *World Series*, annual championship of U.S. major league baseball] (1951) : a contest or event that is the most important or prestigious of its kind ⟨the *World Series* of the equestrian world⟩
world's fair *n* (1850) : an international exposition featuring exhibits and participants from all over the world
world–shak-ing \'wərl(d)-ˌshā-kiŋ\ *adj* (1598) : EARTHSHAKING
world soul *n* (1848) : an animating spirit or creative principle related to the world as the soul is to the individual being
world-view \-ˌvyü\ *n* (1858) : WELTANSCHAUUNG
world war *n* (1909) : a war engaged in by all or most of the principal nations of the world; esp, *cap both Ws* : either of two such wars of the first half of the 20th century
world–wea-ry \'wərld-ˌwir-ē\ *adj* (1768) : feeling or showing fatigue from or boredom with the life of the world and esp. material pleasures — **world–wea-ri-ness** *n*
[1]world-wide \-'wid\ *adj* (1632) : extended throughout or involving the entire world
[2]worldwide *adv* (1892) : throughout the world
[1]worm \'wərm\ *n, often attrib* [ME, fr. OE *wyrm* serpent, worm; akin to OHG *wurm* serpent, worm, L *vermis* worm] (bef. 12c) 1 a : EARTHWORM; *broadly* : an annelid worm b : any of numerous relatively small elongated usu. naked and soft-bodied animals: as (1) : an insect larva; *esp* : one that is a destructive grub, caterpillar, or maggot (2) : SHIPWORM (3) : BLINDWORM 2 a : a human being who is an object of contempt, loathing, or pity : WRETCH b : something that torments or devours from within 3 *archaic* : SNAKE, SERPENT 4 : HELMINTHIASIS — usu. used in pl. 5 : something (as a mechanical device) spiral or vermiculate in form or appearance: as a : the thread of a screw b : a short revolving screw whose threads gear with the teeth of a worm wheel or a rack c : a spiral condensing tube used in distilling d : ARCHIMEDES' SCREW; *also* : a conveyor working on the principle of such a screw 6 : a usu. small self-contained computer program that invades computers on a network and usu. performs a malicious action — **worm-like** \-ˌlīk\ *adj*
[2]worm *vi* (1610) : to move or proceed sinuously or insidiously ~ *vt* 1 a : to proceed or make (one's way) insidiously or deviously ⟨~ their way into positions of power —Bill Franzen⟩ b : to insinuate or introduce (oneself) by devious or subtle means c : to cause to move or proceed in or as if in the manner of a worm 2 : to wind rope or yarn spirally round and between the strands of (a cable or rope) before serving 3 : to obtain or extract by artful or insidious questioning or by pleading, asking, or persuading — usu. used with *out of* 4 : to treat (an animal) with a drug to destroy or expel parasitic worms
worm–eat-en \'wərm-ˌē-tᵊn\ *adj* (14c) 1 a : eaten or burrowed by worms ⟨~ timber⟩ b : PITTED 2 : WORN-OUT, ANTIQUATED
worm-er \'wər-mər\ *n* (ca. 1934) : a drug used in veterinary medicine to worm an animal
worm fence *n* (1652) : a zigzag fence consisting of interlocking rails supported by crossed poles — called also *snake fence, Virginia fence*

EXHIBIT
G

Element by element comparison of claims 1-41 of the '988 Patent to Campbell, et al. (U.S. Patent No. 5,373,550).

'988 Patent	'550 to Campbell, et al.
1. A system for central management, storage and report generation of remotely captured paper transactions from documents and receipts comprising:	Checks used to effectuate commercial and private transactions may be cleared through the banking system by transporting images of those checks between sending institutions and receiving institutions in forward and reverse flow paths between banks of first deposit and payor banks. The check images are transported through a public switched telephone network which contains a special check imaging node which provides a network based check clearing service for customers of telephone network. The check imaging node receives images of checks from institutions which subscribe to this service and routes those images through the telephone network to intended subscriber and non-subscriber recipients. Campbell, et al., Abstract.
1a. one or more remote data access subsystems for	Remote data access subsystem = sending institution 14. "The sending institution 14 is a subscriber to the telecommunications services provided by the node 12." "For example, the sending institution 14 may be a payor bank and the receiving institution may be a bank of first deposit which are involved in a processes of returning a check dishonored by institution 14 to the institution 16. Alternatively, the sending institution 14 may be a bank of first deposit which is in the process of forwarding checks to an institution 16 which is acting as a payor bank." Campbell, et al., Col. 2, lns. 32-45.
capturing and	"The sending institution 14 possesses check imaging equipment 18 which produces electrical or optical signals representing the image of a check." Campbell, et al., Col. 2, ln 64-66.
sending	"The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al., Col. 3, ln 17-20.
paper transaction data and Subsystem identification information comprising	"The controller 42 may read some data accompanying check images, for example, it may identify that TCP/IP protocol information accompanying those images. That information may instruct the node 12 about the identity of the sending institution and the intended receiving institution." Campbell, et al., Col. 5, ln 23-28. "The assembler/disassembler 40 [at the processing node 12] may read certain overhead information accompanying the images, including frame relay flags, identifiers, address bits, indicators, and other overhead information." Campbell, et al., Col. 5, ln 2-5.
at least one imaging subsystem for capturing the documents and receipts and	"The sending institution 14 possesses check imaging equipment 18 which produces electrical or optical signals representing the image of a check. ... The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR. Campbell, et al.,Col. 2, ln. 64 – Col. 3, ln. 12.
at least one data access controller for managing the capturing and sending of the transaction	"The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10."

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data;	Campbell, et al., Col. 3, lns. 17-20.
1b. at least one central data processing subsystem for	The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2, lns. 26-32.
processing, sending, verifying and storing	"[T]he processing node 12 receives check images and performs certain processing procedures on those images, including at least temporary storage of the received check images." Campbell, et al., Col. 3, lns. 43-58. "The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38. The assembler/disassembler 40 also transmits frames of digital information representing check images to the network 38 after those images have been processed by the node 12. A node controller and router 42 controls the routing of check images to their intended destinations, both in the controller and to their ultimate destinations outside the network 38." Campbell, et al., Col. 3, lns. 30 – 39. Verify: "The controller 42 may receive instructions from the work center 54 through the interface 52 to control changes made to the information in the database 46. These changes may include the addition or changes to personal identification numbers or bank related data." Campbell, et al., Col. 5, lns. 31 -39.
the paper transaction data and the subsystem identification information comprising	"The controller 42 may read some data accompanying check images, for example, it may identify that TCP/IP protocol information accompanying those images. That information may instruct the node 12 about the identity of the sending institution and the intended receiving institution." Col. 5, ln 23-28.
a management subsystem for managing the processing, sending and storing of the of the transaction data; and	"A node controller and router 42 controls the routing of check images to their intended destinations, both in the controller and to their ultimate destinations outside the network 38." Col. 3, ln 30 – 39. "The node controller and router 42 provides interfaces to systems external to the node 12. It is connected to all the other subsystems in the node 12 by way of the local area network 56. …The controller 42 may also be configured to handle information encrypted by sending institutions to provide security for the images transported by the network 38. The controller 42 may have its own encryption and decryption equipment to provide a secure environment in the node 12." Campbell, et al., Col 5, lns. 14-60.
1c. at least one communication network for the transmission of the transaction data	"The image of a check is created in a sending institution and sent to a receiving institution by means of the public switched telephone network." Campbell, et al., Col. 2, lns. 20-22. "The public switched telephone network 10 may be a telephone network provided by a local exchange carrier …The network may be digital or analog. Two examples of suitable digital networks are a packet network and a frame relay network, such as the existing packet and frame relay networks now provided by carriers such as AT&T." Campbell, et al., Col. 2, lns. 50-63.

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within and	"A local area network 56 connects the subsystems of the node 12 described above." Campbell, et al., Col. 4, lns. 56-58. "The images produced by the equipment 18 are directed to a network interface 10 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al., Col. 3, lns. 17-20.
between said one or more data access subsystems and said at least one data processing subsystem,	"The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10. For example, the network access lines 22 may comprise one or more digital transmission lines operating at speeds of about 2400 bits per second to about 1.544 megabits per second or more. Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line." Campbell, et al., Col. 3, lns. 20-43.
1d. with the data access subsystem providing encrypted subsystem identification information and encrypted paper transaction data to the data processing subsystem.	"The controller 42 may also be configured to handle information encrypted by sending institutions to provide security for the images transported by the network 38. The controller 42 may have its own encryption and decryption equipment to provide a secure environment in the node 12." Campbell, et al., Col. 5, lns. 55-60. This implies that the sending bank 14 is capable of sending encrypted information. This information includes check images and also information "about the identity of the sending institution." Campbell, et al., Col. 5, lns. 26-27.
2. A system as in claim 1 wherein said one or more data access subsystems further comprise at least one scanner for capturing the paper transaction data.	Campbell et al. "The sending institution 14 possesses check imaging equipment 18 which produces electrical or optical signals representing the image of a check. ... The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR." Campbell, et al., Col. 2, ln. 64 – Col. 3, ln 12.
3. A system as in claim 2 wherein said one or more data access subsystems also capture electronic transactions from credit cards, smart cards and debit cards, signature data or biometric data, further comprising:	Campbell et al. in view of prior art admission
at least one card interface for capturing the electronic transaction data;	Applicants' admission
at least one signature interface for capturing an electronic signature; and	Applicants' admission

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at least one biometric interface for capturing biometric data.	Applicants' admission
4. A system as in claim 3 wherein said at least one data access controller successively transforms the captured transaction data to a bitmap image, a compressed bitmap image, an encrypted, compressed bitmap image and an encrypted, compressed bitmap image tagged with information identifying a location and time of the transaction data capture.	Campbell et al. in view of prior art admission "Since there are no universally adopted standards regarding imaging formats and compression standards, the node 12 contains a signal converter 50 which converts signals received by the node 12 in one format used by a sender into another format usable by a recipient. The converter 50 uses information stored in the database 46 regarding the formats and compression algorithms involved. This information will be relayed from the database 46 to the signal converter 50 by the node controller 42. The converter 50 may contain multi-vendor image format and compression processors which can uncompress and reconstruct images from one imaging system to another." Campbell, et al., Col. 7, lns. 15 – 27. Thus, the sending institution 14 may compress the images before transmitting to the node 12. Bitmap compression is one known compression standard. The node is designed to handle all compression formats. "The assembler/disassembler 40 [at the processing node 12] may read certain overhead information accompanying the images, including frame relay flags, identifiers, address bits, indicators, and other overhead information." Campbell, et al., Col. 5, ln 2-5.
5. A system as in claim 4 wherein said one or more data access subsystems further comprise digital storage for storing the tagged, encrypted, compressed bitmap image.	Campbell et al. in view of prior art admission "A storage device 48, which may be an electronic mailbox as shown in FIG. 2, stores at least temporarily some or all of check images received by the node 12. A signal converter 50 contains information used by the node 12 to convert images in a format used by the sending institutions into a format understanable by the receiving institution." Campbell, et al., Col. 4, lns. 45-52. "The storage device 48 may be a rewritable mass storage device which can at least temporarily store or archive compressed or uncompressed check images prior to transmission to their destinations." Campbell, et al., Col. 6, lns 57-60.
6. A system as in claim 5 wherein said at least one card interface initiates the electronic transaction.	Campbell et al. in view of prior art admission Applicants' admission
7. A system as in claim 6 wherein said one or more data access subsystems further comprise at least one printer for printing the paper transaction initiated by said at least one card interface.	Campbell et al. in view of prior art admission Applicants' admission
8. A system as in claim 7 wherein the paper transaction printed by said at least one printer	Campbell et al. in view of prior art admission

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includes data glyphs.	Applicants' admission
9. A system as in claim 1 wherein said data management subsystem of said at least one data processing subsystem comprises:	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli
at least one server for polling said one or more remote data access subsystems for transaction data;	"As the 'images' of the documents 18 included in a transaction group or batch are received in the form of entry records 74 (FIG. 3B) by the communication means 88, they are routed to the image file means 100 via a system bus 102 which may be any conventional high-speed bit serial bus." Owens, et al., Col. 12, lns 12-16. Minoli describes several servers suitable in imaging applications. Minoli, pg. 33; 250.
a database subsystem for storing the transaction data in a useful form;	All images and data coming into or going out of the IPC 14 are controlled by the communication means 88, which performs all handshake protocol, logical addressing and communications packaging, and which directs all incoming images and data to the appropriate file means, as for example, image file means 100. The image file means 100 is processor controlled and broadly includes a primary storage 104 which represents, for example, a plurality of high-capacity magnetic discs and a back-up storage or archival file system, shown, for example, as a video disc 106. Owens, et al., Col. 12, lns 18-27.
a report generator for generating reports from the transaction data and providing data to software applications;	"The data associated with a transaction group of documents 18 is extracted from the data file means 114, and is put in the appropriate format by a conventional interface 124. From the interface 124, the data associated with the "on-us" documents 18 is presented in the desired format to the conventional application systems 126 where reports and application posting are performed." Owens, Col. 14, lns 12-18.
at least one central processing unit for managing the storing of the transaction data;	"A system manager 108 at the IPC 14 (FIG. 1) provides common support functions such as operator consoles 110 (only one being shown), line printers (not shown), program libraries, and non-volatile storage and retrieval of system information needed by other subsystems. The system manager 108 also provides the operator interface to all subsystems of the banking system 10, and conventionally provides the control of initiation, termination and re-start processes." Owens, Col. 12, lns 27-36.
a domain name services program for dynamically assigning one of said at least one server to receive portions of the transaction data for balancing the transaction data among said at least one server; and	"The communications controllers 232, 234, and 236 (FIG. 5A) act as buffers in controlling the flow of the entry records 74 to the communications nodes 246, 248 which also include memory to store portions of an entry record 74. Conventional direct link adapters 252 are used to couple the communication nodes 246, 248 to the system bus 102. When all the portions of an entry record 74 are received at one of the communication nodes 246, 248 all of these portions of an entry record are then routed to the image file means 100 (FIG. 1) under the control of an image file processor 254 (FIG. 5B) which is included in the image file means 100. When all the entry records 74 for a transaction group are received at the image file means 100, an end of documents 18 signal from the input hopper 24 shown in

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	FIG. 3A indicates this fact to the system manager 108." Owens, Col. 21, lns 1-17. "Bridges connect two or more LANs at the MAC layer. A bridge receiving packets (frames of information will pass the packets to the interconnected LAN based on some forwarding algorithm selected by the manufacturer (explicit route, dynamic address filtering, static address filtering, etc.) Minoli, p. 248-49.
a memory hierarchy.	"The image file means 100 is processor controlled and broadly includes a primary storage 104 which represents, for example, a plurality of high-capacity magnetic discs and a back-up storage or archival file system, shown, for example, as a video disc 106." Owens, Col. 12, lns 23-27.
10. A system as in claim 9 wherein said at least one server also polls for biometric and signature data, said database stores the biometric data and the signature data, and said at least one central processing unit verifies the biometric data and the signature data.	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli and prior art admission Applicants' admission "Signature cards or images 166 which are input into the system 10 via the ILU 22 in FIG. 2 are data completed as non-dollar batches by the data development means 112 and are used to derive account and control information therefrom; they are placed in the data file means 114 (FIG. 1)." Owens, et al., Col. 16, lns 20- 26. "With regard to FIG. 8, the various reports (non-image application reports) shown as 214, various reporting data 216, the associated images 218 from the image file means 100, qualified transaction data 220 from the data file means 114 and the associated signatures 222 from a signature file means located at IPC 14 are used to create image reports 224 at the associated IPC 14." Owens, et al., Col. 19, lns 3-9.
11. A system as in claim 9 wherein said memory hierarchy comprises at least one primary memory for storage of recently accessed transaction data and at least one secondary memory for storage of other transaction data.	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli "The image file means 100 is processor controlled and broadly includes a primary storage 104 which represents, for example, a plurality of high-capacity magnetic discs and a back-up storage or archival file system, shown, for example, as a video disc 106." Owens, et al., Col. 12, lns 23-27. "The image file means 100 (FIG. 1) is shown in more detail in FIG. 5B. Basically, the function of the image file means 100 is to store the raw images or entry records 74 received from the POAs 12, and consequently, any conventional storing means may be used. For example, the processor 254 may be a conventional processor such as an NCR Criterion 8570 with two megabytes of memory, with the processor 254 being used to write the entry records 74 on conventional memory units such as magnetic disc units 256, 258, and 260 (such as NCR 6550 disc units) which comprise the primary storage 104 (FIG. 1). ...The back-up storage or archival storage system shown as a video disc 106 in FIG. 1 may include an conventional system such as the video recorders 274, 276, and 278 shown in FIG. 5B."

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	Owens, et al., Col. 21, lns 17-38.
12. A system as in claim 11 wherein said at least one secondary memory comprises at least one write once read many jukebox and at least one optical storage jukebox.	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli Minoli displays each of an optical jukebox (pg. 30), a WORM jukebox (pg. 31), and a video jukebox (pg. 28). Owens, et al. describes its back-up storage as a video disc, video recorder or magnetic disc. Col. 21, lns 35-39; Col. 22, lns 33-35.
13. A system as in claim 12 wherein said at least one optical storage jukebox comprises read only memory technology including compact disc read only memory form factor metallic write once read many disc.	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli CD-ROM optical storage is described as being faster (150 kbps) than video servers. Minoli, p. 33.
14. A system as in claim 9 wherein said database subsystem comprises at least one predefined template for partitioning the stored transaction data into panels and identifying locations of the panels.	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli MPR (machine pattern recognition) units connected to processors at the IPC (FIG. 5C) "include[] a conventional character recognition reader which reads the decompressed image of a document 18 and ascertains the monetary amount thereon." Owens, et al., Col. 23, lns 44-47.
15. A system as in claim 14 wherein said data processing subsystem further comprises a data entry gateway for correcting errors in the panels of stored transaction data.	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli "After completion at the MPR unit 140, all the developed data for a document 18 is analyzed for completeness. When data is missing, the associated image is routed to one of the processors 396, 398 for display on one of the CRTS 150 where an operator keys in the appropriate data on an associated keyboard 152. The image display controllers 410 and 412 have conventional decompression units associated therewith for the purpose of permitting operator viewing of the images from the file means 100. The operators complete the data completion function 148 (FIG. 10) by keying in the appropriate data such as monetary amounts (if necessary) while using the keyboards 152." Owens, et al., Col. 23, lns 47-52.
16. A system as in claim 1 wherein said at least one communication network comprises:	Campbell et al.
at least one first local area network for transmitting data within a corresponding one of	"The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR." Campbell, et al., Col. 3, ln. 10-12. "The images produced by the equipment

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said one or more remote data access subsystems;	18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al., Col. 3, ln 17-20. "The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10. For example, the network access lines 22 may comprise one or more digital transmission lines operating at speeds of about 2400 bits per second to about 1.544 megabits per second or more. Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line." Campbell, et al., Col. 3, ln 20-31.
at least one second local area network for transmitting data within a corresponding one of said at least one data processing subsystem; and	"A local area network 56 connects the subsystems of the node 12 described above." Campbell, et al., Col. 4, lns. 56-58. "The node controller and router 42 provides interfaces to systems external to the node 12. It is connected to all the other subsystems in the node 12 by way of the local area network 56. The controller 42 provides access to the database 46 and directs check images to appropriate subsystems in the node 12 connected to the local area network 56. The controller 42 also routes the check images from the node 12 to their ultimate destinations by way of the assembler/disassembler 40 and the frame relay network 38. The controller 42 may read some data accompanying check images, for example, it may identify that TCP/IP protocol information accompanying those images." Campbell, et al., Col. 5, lns. 14-26.
at least one wide area network for transmitting data between said one or more remote data access subsystems and said at least one data processing subsystem.	The public switched telephone network 10 may be a frame relay network, a WAN. Campbell, et al., Col. 2, ln 61.
17. A system as in claim 16 wherein said at least one communication network further comprises:	Campbell et al. in view of Minoli "Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line." Campbell, et al., Col. 3, lns 29-31.
at least one modem for connecting said at least one first local area network of said one or more data access subsystems to a corresponding one of said at least one second local area network of said at least one data processing subsystem through said at least one wide area network; and	Dial-up link between LAN routers. This approach involves the use of modems connected to the LAN server (bridge or router), to utilize the analog public telephone network. Circuit switching implies that the communications channel is not dedicated 24 h per day, but must be brought on line when needed (via a process called call setup) and then taken down when no longer needed. Minoli, p. 263.
at least one bank of modems for connecting said at least one second local area network of	Dial-up link between LAN routers. This approach involves the use of modems connected to the LAN server (bridge or router), to utilize the

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said at least one data processing subsystem to a corresponding some of said at least one first local area network of said one or more data access subsystems through said at least one wide area network.	analog public telephone network. Circuit switching implies that the communications channel is not dedicated 24 h per day, but must be brought on line when needed (via a process called call setup) and then taken down when no longer needed. Minoli, p. 263.
18. A system as in claim 1 further comprising at least one data collecting subsystem for collecting and sending the electronic or paper transaction data comprising a further management subsystem for managing the collecting and sending of the transaction data.	Campbell et al. A bank of first deposit 36 (remote subsystem) may transmit images through an intermediary bank 14 (collecting subsystem), which forwards received images to the check processing node 12 (central subsystem). Check images may be transmitted in a "forward flow path from a bank of first deposit [through the check processing node 12] to a payor bank." Campbell, et al., Col. 7, lns. 65-68. The bank of first deposit may have check processing equipment for generating images of the checks. Campbell, et al., Col. 4, lns 18-21; Col. 3, lns 46-48. Thus, the bank of first deposit 36 may be considered a remote data access subsystem that transmits images to the check processing node 12 (a central data access subsystem), for the forward presented of check images. Thus, this may be considered another teaching of claim 1. Furthermore, an intermediate bank 14 may be located in between the bank of first deposit 36 and the check processing node 12, "[o]ne or both institutions 14 and 16 may also be check clearance flows between a bank of first deposit and a payor bank." Campbell, et al., Col. 2, lns 46-49. Thus, the workflow is: (1) images are captured at the bank of first deposit 36; (2) the images are transmitted from the bank of first deposit 36 to an intermediate bank 14; the images are transmitted from the intermediate bank 14 to the check processing node 12.
19. A system as in claim 18 wherein said further data management subsystem of said at least one data collecting subsystem comprises:	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli Intermediary bank 14 = data collecting subsystem
at least one server for polling said one or more remote data access subsystems for transaction data;	Hardware at a receiving bank: "Check images are received in a network interface 30 in the receiving institution 16. The interface 30 transforms the signals from the network 10 into a form suitable for use by check image processing equipment 32 located in the receiving institution 16. The check image processing equipment 32 may be similar to the imaging equipment 18 located in the sending institution 14. The equipment 32 may also be facsimile equipment, character recognition equipment, e-mail systems, or any other image processing equipment by which the images received may be displayed or used by the receiving institution." Campbell, et al., Col. 3, lns 41-52. Multiple types of servers may be used in image interchange. Minoli, 33; 250.
a database for storing the transaction data in a useful form;	"All images and data coming into or going out of the IPC 14 are controlled by the communication means 88, which performs all handshake protocol, logical addressing and communications packaging, and which directs all incoming images and data to the appropriate file means, as for example, image file means 100. The image file means 100 is processor controlled and broadly includes a primary storage

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	104 which represents, for example, a plurality of high-capacity magnetic discs and a back-up storage or archival file system, shown, for example, as a video disc 106." Owens, et al., Col. 12, lns 18-27. "The data associated with a transaction group of documents 18 is extracted from the data file means 114, and is put in the appropriate format by a conventional interface 124. From the interface 124, the data associated with the "on-us" documents 18 is presented in the desired format to the conventional application systems 126 where reports and application posting are performed." Owens, Col. 14, lns 12-18.
at least one central processing unit for managing the collecting of the transaction data;	"A system manager 108 at the IPC 14 (FIG. 1) provides common support functions such as operator consoles 110 (only one being shown), line printers (not shown), program libraries, and non-volatile storage and retrieval of system information needed by other subsystems. The system manager 108 also provides the operator interface to all subsystems of the banking system 10, and conventionally provides the control of initiation, termination and re-start processes." Owens, Col. 12, lns 27-36.
a domain name services program for dynamically assigning one of said at least one server to receive portions of the transaction data for balancing the transaction data among said at least one server; and	"The communications controllers 232, 234, and 236 (FIG. 5A) act as buffers in controlling the flow of the entry records 74 to the communications nodes 246, 248 which also include memory to store portions of an entry record 74." Owens, Col. 21, lns 1-17. "Bridges connect two or more LANs at the MAC layer. A bridge receiving packets (frames of information will pass the packets to the interconnected LAN based on some forwarding algorithm selected by the manufacturer (explicit route, dynamic address filtering, static address filtering, etc.) Minoli, p. 248-49.
a memory hierarchy.	"The image file means 100 is processor controlled and broadly includes a primary storage 104 which represents, for example, a plurality of high-capacity magnetic discs and a back-up storage or archival file system, shown, for example, as a video disc 106." Owens, Col. 12, lns 23-27.
20. A system as in claim 19 wherein said memory hierarchy comprises at least one primary memory for collecting transaction data and at least one secondary memory for backup storage of the transaction data.	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli "The image file means 100 is processor controlled and broadly includes a primary storage 104 which represents, for example, a plurality of high-capacity magnetic discs and a back-up storage or archival file system, shown, for example, as a video disc 106." Owens, et al., Col. 12, lns 23-27. "The storage device 48 may be a rewritable mass storage device which can at least temporarily store or archive compressed or uncompressed check images prior to transmission to their destinations." Campbell, et al., Col. 6, lns 57-60. "In addition to temporary storage of check images, the storage mechanism 48 may be configured to provide long term archiving of check images." Campbell, et al., Col. 7, lns 6-8.
21. A system as in claim 20 wherein said at	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli

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least one secondary memory comprises at least one DLT jukebox.	DLT = Digital Linear Tape, a type of magnetic tape storage device. "The data file means 114 is processor controlled and broadly includes a primary storage 116 which represents, for example, a plurality of high-capacity magnetic discs and magnetic tape units, and an optionally-provided back-up storage or archival file system, shown for example, as a video disc 118." Owens, et al., Col. 12, lns 23-27.
22. A system as in claim 18 wherein said at least one communication network comprises:	Campbell et al. in view of Minoli Minoli teaches that 3 LANs may be interconnected by a WAN. Minoli, p. 31; 269-270.
at least one first local area network for transmitting data within a corresponding one of said one or more remote data access subsystems;	Remote subsystem = bank of first deposit 36. "The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR." Campbell, et al., Col. 3, ln. 10-12. "The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al., Col. 3, ln 17-20. "The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10. For example, the network access lines 22 may comprise one or more digital transmission lines operating at speeds of about 2400 bits per second to about 1.544 megabits per second or more. Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line." Campbell, et al., Col. 3, ln 20-31.
at least one second local area network for transmitting data within a corresponding one of said at least one data collection subsystem;	Intermediary bank 14 = data collecting subsystem "The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR." Campbell, et al., Col. 3, ln. 10-12. "The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al., Col. 3, ln 17-20. "The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10. For example, the network access lines 22 may comprise one or more digital transmission lines operating at speeds of about 2400 bits per second to about 1.544 megabits per second or more. Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line." Campbell, et al., Col. 3, ln 20-31.
at least one third local area network for transmitting data within a corresponding one of said at least one data processing subsystem;	"A local area network 56 connects the subsystems of the node 12 described above." Campbell, et al., Col. 4, lns. 56-58. "The node controller and router 42 provides interfaces to systems external to the node 12. It is connected to all the other subsystems in the node 12 by way of the local area network 56.

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and	The controller 42 provides access to the database 46 and directs check images to appropriate subsystems in the node 12 connected to the local area network 56. The controller 42 also routes the check images from the node 12 to their ultimate destinations by way of the assembler/disassembler 40 and the frame relay network 38. The controller 42 may read some data accompanying check images, for example, it may identify that TCP/IP protocol information accompanying those images." Campbell, et al., Col. 5, lns. 14-26.
at least one wide area network for transmitting data between said one or more remote data access subsystems, said at least one data collection subsystem and said at least one data processing subsystem.	The public switched telephone network 10 may be a frame relay network, a WAN. Campbell, et al., Col. 2, ln 61.
23. A system as in claim 22 wherein said at least one communication network further comprises:	Campbell et al. in view of Minoli
at least one first modem for connecting said at least one first local area network of said one or more data access subsystems to a corresponding one of said at least one second local area network through said at least one wide area network;	Dial-up link between LAN routers. This approach involves the use of modems connected to the LAN server (bridge or router), to utilize the analog public telephone network. Circuit switching implies that the communications channel is not dedicated 24 h per day, but must be brought on line when needed (via a process called call setup) and then taken down when no longer needed. Minoli, p. 263.
at least one bank of modems for connecting said at least one second local area network of said at least one data collection subsystem to a corresponding some of said at least one first local area network of said one or more data access subsystems through said at least one wide area network;	Dial-up link between LAN routers. This approach involves the use of modems connected to the LAN server (bridge or router), to utilize the analog public telephone network. Circuit switching implies that the communications channel is not dedicated 24 h per day, but must be brought on line when needed (via a process called call setup) and then taken down when no longer needed. Minoli, p. 263.
at least one first wide area network router for connecting a corresponding one of said at least one second local area network of said at least one data collecting subsystem to said at least one wide area network; and	Minoli Fig. 9.7 (pg. 269) First router connecting two or more LANs over a WAN. The public switched telephone network 10 may be a frame relay network, a WAN. Campbell, et al., Col. 2, ln 61.
at least one second wide area network router	

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for connecting a corresponding one of said at least one third local area network of said at least one data processing subsystem to said at least one wide area network.	
24. A system as in claim 23 wherein said at least one first wide area network and said at least one second wide area network comprises a carrier cloud, said carrier cloud using a frame relay method for transmitting the transaction data.	Campbell et al. in view of Minoli "Frame relay service provides interconnection among n sites by requiring only that each site be connected to the "network cloud" via an access line. ... The cloud consists of switching nodes interconnected by trunks used to carry traffic aggregated from many users (see Fig. 9.7). In a public frame relay network the switches and the trunks are put in place by a carrier for use by many corporations. Carrier networks based on frame relay provide communications at up to 1.544 Mbps (in the United States), shared bandwidth on demand, and multiple user sessions over a single access line. The throughput is much higher than that available for packet switching, making the service attractive for imaging applications. In a private frame relay network, the switches and trunks are put in place (typically) by the corporate communications department of the company in question." Minoli, p. 268 The public switched telephone network 10 may be a frame relay network, a WAN. Campbell, et al., Col. 2, ln 61.
25. A system as in claim 22 wherein said at least one second local area network and said at least one third local area network further comprises a corresponding one of at least one network switch for routing transaction data within said at least one second local area network and said at least one third local area network.	Campbell et al. in view of Minoli "Frame relay service provides interconnection among n sites by requiring only that each site be connected to the "network cloud" via an access line. ... The cloud consists of switching nodes interconnected by trunks used to carry traffic aggregated from many users (see Fig. 9.7). In a public frame relay network the switches and the trunks are put in place by a carrier for use by many corporations. Carrier networks based on frame relay provide communications at up to 1.544 Mbps (in the United States), shared bandwidth on demand, and multiple user sessions over a single access line. The throughput is much higher than that available for packet switching, making the service attractive for imaging applications. In a private frame relay network, the switches and trunks are put in place (typically) by the corporate communications department of the company in question." Minoli, p. 268 The public switched telephone network 10 may be a frame relay network, a WAN. Campbell, et al., Col. 2, ln 61.
	Campbell et al.
26. A method for central management, storage and verification of remotely captured paper transactions from documents and receipts	Checks used to effectuate commercial and private transactions may be cleared through the banking system by transporting images of those checks between sending institutions and receiving institutions in forward and reverse flow paths between banks of first deposit and payor banks. The check images are

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comprising the steps of:	transported through a public switched telephone network which contains a special check imaging node which provides a network based check clearing service for customers of telephone network. The check imaging node receives images of checks from institutions which subscribe to this service and routes those images through the telephone network to intended subscriber and non-subscriber recipients. Campbell, et al., Abstract.
26a. capturing an image of the paper transaction data	"The sending institution 14 possesses check imaging equipment 18 which produces electrical or optical signals representing the image of a check. .... The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR. Campbell, et al., Col. 2, ln. 64 – Col. 3, ln. 12.
at one or more remote locations and	Remote location = sending institution 14.
sending a captured image of the paper transaction data;	"The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al.,Col. 3, ln 17-20. "The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. Campbell, et al., Col. 3, ln 20-31.
26b. managing the capturing and sending of the transaction data;	"The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al.,Col. 3, ln 17-20. "The imaging equipment may be large multiworkstation systems available from companies such as IBM, UNISYS, or NCR." Campbell, et al., Col. 3, ln. 10-12
26c. collecting, processing, sending and	The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2, lns. 26-32.
storing the transaction data at a central location;	"[T]he processing node 12 receives check images and performs certain processing procedures on those images, including at least temporary storage of the received check images." Campbell, et al.,Col. 3, lns. 43-58. "The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38. The assembler/disassembler 40 also transmits frames of digital information representing check images to the network 38 after those images have been processed by the node 12. A node controller and router 42 controls the routing of check images to their intended destinations, both in the controller and to their ultimate destinations outside the network 38." Campbell, et al., Col. 3, ln 30 – 39. "The controller 42 may receive instructions from the work center 54 through the interface 52 to control changes made to the information in the database 46. These changes may include the addition or changes to personal identification numbers or bank related data." "The controller 42 may read some data

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	accompanying check images, for example, it may identify that TCP/IP protocol information accompanying those images. That information may instruct the node 12 about the identity of the sending institution and the intended receiving institution." Campbell, et al., Col. 5, ln 23-28.
26d. managing the collecting, processing, sending and storing of the transaction data;	"A node controller and router 42 controls the routing of check images to their intended destinations, both in the controller and to their ultimate destinations outside the network 38." Campbell, et al., Col. 3, ln 30 – 39. "The node controller and router 42 provides interfaces to systems external to the node 12. It is connected to all the other subsystems in the node 12 by way of the local area network 56. The controller 42 provides access to the database 46 and directs check images to appropriate subsystems in the node 12 connected to the local area network 56. The controller 42 also routes the check images from the node 12 to their ultimate destinations by way of the assembler/disassembler 40 and the frame relay network 38. The controller 42 may read some data accompanying check images, for example, it may identify that TCP/IP protocol information accompanying those images. That information may instruct the node 12 about the identity of the sending institution and the intended receiving institution. ... The controller 42 may also be configured to handle information encrypted by sending institutions to provide security for the images transported by the network 38. The controller 42 may have its own encryption and decryption equipment to provide a secure environment in the node 12." Campbell, et al., Col 5, ln 14-60.
26e. encrypting subsystem identification information and the transaction data; and	"The controller 42 may also be configured to handle information encrypted by sending institutions to provide security for the images transported by the network 38. The controller 42 may have its own encryption and decryption equipment to provide a secure environment in the node 12." Campbell, et al., Col. 5, lns. 55-60. This implies that the sending bank 14 sends encrypted information. This information includes check images and also information "about the identity of the sending institution." Campbell, et al., Col. 5, ln 26-27. Thus, both the check images and the identifying information may be encrypted.
26f. transmitting the transaction data and the subsystem identification information	"The image of a check is created in a sending institution and sent to a receiving institution by means of the public switched telephone network." Campbell, et al., Col. 2, lns. 20-22. "The controller 42 may read some data accompanying check images, for example, it may identify that TCP/IP protocol information accompanying those images. That information may instruct the node 12 about the identity of the sending institution and the intended receiving institution." Campbell, et al., Col. 5, ln 23-28.
within and	Within the node 12: "A local area network 56 connects the subsystems of the node 12 described above." Campbell, et al. Col. 4, lns. 56-58. Within the sending bank 14: "The images produced by the equipment 18 are directed to a network

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	interface 10 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al., Col. 3, ln 17-20.
between the remote location(s) and the central location.	Between: "The public switched telephone network 10 may be a telephone network provided by a local exchange carrier ... Campbell, et al., Col. 2, lns. 50-63. "The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10." Campbell, et al., Col. 3, lns. 20-43.
27. The method as in claim 26 wherein said managing the capturing and sending step comprises the steps of:	Campbell et al.
successively transforming the captured transaction data to a bitmap image, a compressed bitmap image, an encrypted, compressed bitmap image and an encrypted, compressed bitmap image tagged with information identifying a location and time of the transaction data capturing; and	Campbell et al. in view of prior art admission "Since there are no universally adopted standards regarding imaging formats and compression standards, the node 12 contains a signal converter 50 which converts signals received by the node 12 in one format used by a sender into another format usable by a recipient. The converter 50 uses information stored in the database 46 regarding the formats and compression algorithms involved. This information will be relayed from the database 46 to the signal converter 50 by the node controller 42. The converter 50 may contain multi-vendor image format and compression processors which can uncompress and reconstruct images from one imaging system to another." Campbell, et al., Col. 7, lns. 15 – 27. Thus, the sending institution 14 may compress the images before transmitting to the node 12. Bitmap compression is one known compression standard. The node is designed to handle all compression formats. "The assembler/disassembler 40 [at the processing node 12] may read certain overhead information accompanying the images, including frame relay flags, identifiers, address bits, indicators, and other overhead information." Campbell, et al., Col. 5, ln 2-5.
storing the tagged, encrypted, compressed bitmap image.	"A storage device 48, which may be an electronic mailbox as shown in FIG. 2, stores at least temporarily some or all of check images received by the node 12. A signal converter 50 contains information used by the node 12 to convert images in a format used by the sending institutions into a format understanable by the receiving institution." Campbell, et al., Col. 4, lns. 45-52. "The storage device 48 may be a rewritable mass storage device which can at least temporarily store or archive comppressed or uncompressed check images prior to transmission to their destinations." Campbell, et al., Col. 6, lns 57-60.
28. The method as in claim 27 wherein said managing the capturing and sending step also captures electronic transactions from credit cards, smart cards and debit cards, signature	Campbell et al. in view of prior art admission Applicants' admission

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data or biometric data, further comprising the steps of:	
initiating an electronic transaction;	Applicants' admission
capturing signature data;	Applicants' admission
capturing biometric data; and	Applicants' admission
printing a paper transaction with data glyphs for the initiated electronic transaction.	Applicants' admission
29. A method as in claim 26 wherein:	Campbell et al.
said capturing and sending step occurs at a plurality of remote locations; and	"The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16. The sending institution 14 is a subscriber to the telecommunications services provided by the node 12. The receiving institution 16 may or may not be a subscriber to the services of node 12. The sending institution 14 and the receiving institution 16 may be banks or other entities involved in a check clearing procedure." Campbell, et al., Col. 2, lns. 27-49.
said collecting, processing, sending and storing step occurs at a plurality of central locations.	"The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 27-49.
30. A method as in claim 29 wherein said collecting, processing, sending and storing step comprises the steps of:	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli
polling the remote locations for transaction data with servers at the central locations;	"As the 'images' of the documents 18 included in a transaction group or batch are received in the form of entry records 74 (FIG. 3B) by the communication means 88, they are routed to the image file means 100 via a system bus 102 which may be any conventional high-speed bit serial bus." Owens, et al., Col. 12, lns 12-16. Minoli describes several servers suitable in imaging applications. Minoli, pg. 33; 250.
storing the transaction data at the central	At the central processing center, "[t]he image file means 100 is processor controlled and broadly

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location in a memory hierarchy, said storing maintains recently accessed transaction data in a primary memory and other transaction data in a secondary memory; and	includes a primary storage 104 which represents, for example, a plurality of high-capacity magnetic discs and a back-up storage or archival file system, shown, for example, as a video disc 106." Owens, et al., Col. 12, lns 23-27.
dynamically assigning the servers at the central location to receive portions of the transaction data for balancing the transaction data among the servers; and	"The communications controllers 232, 234, and 236 (FIG. 5A) act as buffers in controlling the flow of the entry records 74 to the communications nodes 246, 248 which also include memory to store portions of an entry record 74. Conventional direct link adapters 252 are used to couple the communication nodes 246, 248 to the system bus 102. When all the portions of an entry record 74 are received at one of the communication nodes 246, 248 all of these portions of an entry record are then routed to the image file means 100 (FIG. 1) under the control of an image file processor 254 (FIG. 5B) which is included in the image file means 100. When all the entry records 74 for a transaction group are received at the image file means 100, an end of documents 18 signal from the input hopper 24 shown in FIG. 3A indicates this fact to the system manager 108." Owens, Col. 21, lns 1-17. "Bridges connect two or more LANs at the MAC layer. A bridge receiving packets (frames of information will pass the packets to the interconnected LAN based on some forwarding algorithm selected by the manufacturer (explicit route, dynamic address filtering, static address filtering, etc.) Minoli, p. 248-49.
generating reports from the transaction data and providing data to software applications.	At the central processing center, "[t]he data associated with a transaction group of documents 18 is extracted from the data file means 114, and is put in the appropriate format by a conventional interface 124. From the interface 124, the data associated with the "on-us" documents 18 is presented in the desired format to the conventional application systems 126 where reports and application posting are performed." Owens, et al., Col. 14, lns 12-18.
31. A method as in claim 30 wherein said storing the transaction data step comprises the steps of:	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli
partitioning the stored transaction data with predefined templates into panels; and	At the central processing center, "[t]he data associated with a transaction group of documents 18 is extracted from the data file means 114, and is put in the appropriate format by a conventional interface 124. Owens, et al., Col. 14, lns 12-18. MPR (machine pattern recognition) units connected to processors at the IPC (FIG. 5C) "include[] a conventional character recognition reader which reads the decompressed image of a document 18 and ascertains the monetary amount thereon." Owens, et al., Col. 23, lns 44-47.
identifying locations of the panels.	At the central processing center, "[t]he data associated with a transaction group of documents 18 is

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	extracted from the data file means 114, and is put in the appropriate format by a conventional interface 124. Owens, et al., Col. 14, lns 12-18. MPR (machine pattern recognition) units connected to processors at the IPC (FIG. 5C) "include[] a conventional character recognition reader which reads the decompressed image of a document 18 and ascertains the monetary amount thereon." Owens, et al., Col. 23, lns 44-47.
32. A method as in claim 31 wherein said managing the collecting, processing, sending and storing of the transaction data step comprises correcting errors in the panels of stored transaction data.	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli "After completion at the MPR unit 140, all the developed data for a document 18 is analyzed for completeness. When data is missing, the associated image is routed to one of the processors 396, 398 for display on one of the CRTS 150 where an operator keys in the appropriate data on an associated keyboard 152. The image display controllers 410 and 412 have conventional decompression units associated therewith for the purpose of permitting operator viewing of the images from the file means 100. The operators complete the data completion function 148 (FIG. 10) by keying in the appropriate data such as monetary amounts (if necessary) while using the keyboards 152." Owens, et al., Col. 23, lns 47-52.
33. A method as in claim 32 further comprising the steps of:	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli and prior art admission
polling the remote locations for captured electronic data, captured signature data and captured biometric data with servers at the central locations; and	Applicants' admission "IPC 230 in FIG. 9 may be configured to handle special entries such as those associated with the use of a credit card (as for example, VISA). In this situation the images or entry records 74 (FIG. 3) could be produced at any POA within the banking system 10 and transmitted to the IPC 230 for processing thereat as already explained." Owens, et al., Col. 20, lns 31-37.
comparing the captured signature data and the captured biometric data to stored signature data and stored biometric data respectively for identification verification.	"With regard to FIG. 8, the various reports (non-image application reports) shown as 214, various reporting data 216, the associated images 218 from the image file means 100, qualified transaction data 220 from the data file means 114 and the associated signatures 222 from a signature file means located at IPC 14 are used to create image reports 224 at the associated IPC 14." Owens, et al., Col. 19, lns 3-9.
34. A method as in claim 32 wherein said transmitting the transaction data step comprises the steps of:	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli

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transmitting data within the remote locations;	Sending bank 14 includes check imaging equipment 18 and a network interface 20. Campbell, et al., FIG 1.
transmitting data from each remote location to a corresponding central location; and	The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2, lns. 26-32.
transmitting data within the central locations.	Receiving bank 16 includes check imaging processing equipment 32 and a network interface 30 on a LAN. Campbell, et al., FIG 1. "Check images are received in a network interface 30 in the receiving institution 16. The interface 30 transforms the signals from the network 10 into a form suitable for use by check image processing equipment 32 located in the receiving institution 16. The check image processing equipment 32 may be similar to the imaging equipment 18 located in the sending institution 14. The equipment 32 may also be facsimile equipment, character recognition equipment, e-mail systems, or any other image processing equipment by which the images received may be displayed or used by the receiving institution." Campbell, et al., Col. 3, ln 41-52.
35. A method as in claim 34 wherein said transmitting data from each remote location to a corresponding central location step comprises the steps of:	Campbell et al. in view of Owens, et al. (4,264,808) and Minoli
connecting each remote location to a corresponding central location; and	"The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10." Campbell, et al., Col. 3, lns. 20-43.
connecting each central location to corresponding remote locations.	"The signals received by the network on line 22 may be transmitted through the network 10 via one or more trunks and one or more central offices to the check image processing node 12 as represented schematically by a dotted line 24. The check image processing node 12 then routes the received check image via one or more trunks and one or more central offices, as represented schematically by a dotted line 26, to a network access line 28 of suitable capacity which may be the same as or different from the network access line 22. Check images are received in a network interface 30 in the receiving institution 16. The interface 30 transforms the signals from the network 10 into a form suitable for use by check image processing equipment 32 located in the receiving institution 16. The check image processing equipment 32 may be similar to the imaging equipment 18 located in the sending institution 14. The equipment 32 may also be facsimile equipment, character recognition equipment, e-mail systems, or any other image processing equipment by which the images received may be displayed or used by the receiving institution." Campbell, et al., Col. 3, ln 32-52.

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36. A method as in claim 29 further comprising the steps of:	Campbell, et al.
collecting and sending the electronic or paper transaction data at intermediate locations;	A bank of first deposit 36 (remote location) may transmit images through an intermediary bank 14 (intermediate location), which forwards received images to the check processing node 12 (central location). Check images may be transmitted in a "forward flow path from a bank of first deposit [through the check processing node 12] to a payor bank." Campbell, et al., Col. 7, lns. 65-68. The bank of first deposit may have check processing equipment for generating images of the checks. Campbell, et al., Col. 4, lns 18-21; Col. 3, lns 46-48. Thus, the bank of first deposit 36 may be considered a remote data access subsystem that transmits images to the check processing node 12 (a central data access subsystem), for the forward presented of check images. Thus, this may be considered another teaching of claim 26. Furthermore, an intermediate bank 14 may be located in between the bank of first deposit 36 and the check processing node 12, "[o]ne or both institutions 14 and 16 may also be check clearance flows between a bank of first deposit and a payor bank." Campbell, et al., Col. 2, lns 46-49. Thus, the workflow is: (1) images are captured at the bank of first deposit 36; (2) the images are transmitted from the bank of first deposit 36 to an intermediate bank 14; the images are transmitted from the intermediate bank 14 to the check processing node 12.
managing the collecting and sending of the transaction data; and	Each bank, such as the intermediate bank 14 may have the equipment 18 and the associated hardware. Campbell, et al., Col. 3, lns. 46-48. "The images produced by the equipment 18 are directed to a network interface 20 which converts the signals from the equipment 18 into signals suitable for transmission on the telephone network 10." Campbell, et al., Col. 3, ln 17-20. "The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1." Campbell, et al., Col. 3, ln 20-31.
transmitting the transaction data within the intermediate location and between the intermediate locations and the remote locations and the central locations.	"A local area network 56 connects the subsystems of the node 12 described above." Campbell, et al., Col. 4, lns. 56-58. "The node 12 receives images of checks from a sending institution 14 transmitted through the network 10." Campbell, et al., Col. 2, lns 25-33. "The node controller and router 42 provides interfaces to systems external to the node 12. It is connected to all the other subsystems in the node 12 by way of the local area network 56. The controller 42 provides access to the database 46 and directs check images to appropriate subsystems in the node 12 connected to the local area network 56. Campbell, et al., Col. 5, lns. 14-26.
37. A method as in claim 36 wherein said managing the collecting and sending step comprises the steps of:	Campbell, et al. in view of Minoli "The system of FIG. 1 comprises a public switched telephone network 10. The network 10 contains at least one check image processing node 12 which provides check clearance services. The node 12 receives images of checks from a sending institution 14 transmitted through the network 10. The node 12 processes the check images and sends them to a receiving institution 16." Campbell, et al., Col. 2,

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	lns 25-33.
polling the remote locations for transaction data with servers in the intermediate locations;	"The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38. The assembler/disassembler 40 also transmits frames of digital information representing check images to the network 38 after those images have been processed by the node 12. A node controller and router 42 controls the routing of check images to their intended destinations, both in the controller and to their ultimate destinations outside the network 38." Campbell, et al., Col. 3, lns 30-39. "The controller 42 may read some data accompanying check images, for example, it may identify that TCP/IP protocol information accompanying those images. That information may instruct the node 12 about the identity of the sending institution and the intended receiving institution." Campbell, et al.; Col. 5, lns 23-28. Several severs are suitable for imaging applications. Minoli, p. 33; 250.
storing the transaction data in the intermediate locations in a useful form, said storing maintains the transaction data in a primary memory of a memory hierarchy and performs backup storage of the transaction data into a secondary memory of the memory hierarchy; and	"[T]he processing node 12 receives check images and performs certain processing procedures on those images, including at least temporary storage of the received check images." Campbell, et al., Col. 3, lns. 43-58.
dynamically assigning the servers to receive portions of the transaction data for balancing the transaction data among the servers.	"The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38. The assembler/disassembler 40 also transmits frames of digital information representing check images to the network 38 after those images have been processed by the node 12. A node controller and router 42 controls the routing of check images to their intended destinations, both in the controller and to their ultimate destinations outside the network 38." Campbell, et al., Col. 3, lns 30-39. "Bridges connect two or more LANs at the MAC layer. A bridge receiving packets (frames of information will pass the packets to the interconnected LAN based on some forwarding algorithm selected by the manufacturer (explicit route, dynamic address filtering, static address filtering, etc.) Minoli, p. 248-49.
38. The method as in claim 36 wherein said transmitting the transaction data step comprises the steps of:	Campbell, et al. Remote location = bank of first deposit 36; Intermediate location = bank 14; Central location = check processing node 12.

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	Campbell, et al., Col. 2, lns. 46-49; FIG. 2.
transmitting data within the remote locations;	The bank of first deposit may have check processing equipment for generating images of the checks. Campbell, et al., Col. 4, lns 18-21; Col. 3, lns 46-48.
transmitting data from each remote location to a corresponding intermediate location;	Intermediate bank 14 may be located in between the bank of first deposit 36 and the check processing node 12, "[o]ne or both institutions 14 and 16 may also be check clearance flows between a bank of first deposit and a payor bank." Campbell, et al., Col. 2, lns 46-49.
transmitting data within the intermediate locations;	Intermediate bank 14 includes check imaging equipment 18 and a network interface 20. Campbell, et al., FIG 1.
transmitting data from each intermediate location to corresponding central locations; and	The node 12 receives images of checks from [bank] 14 transmitted through the network 10." Campbell, et al., Col. 2, lns 25-33.
transmitting data within the central locations.	"A local area network 56 connects the subsystems of the node 12 described above." Campbell, et al., Col. 4, lns. 56-58.
39. A method as in claim 38 wherein said transmitting data from each remote location to corresponding intermediate locations step comprises the steps of:	Campbell, et al. Remote location = bank of first deposit 36; Intermediate location = bank 14; Central location = check processing node 12.
connecting each remote location to a corresponding intermediate location; and	Intermediate bank 14 may be located in between the bank of first deposit 36 and the check processing node 12, "[o]ne or both institutions 14 and 16 may also be check clearance flows between a bank of first deposit and a payor bank." Campbell, et al., Col. 2, lns 46-49. "The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10. For example, the network access lines 22 may comprise one or more digital transmission lines operating at speeds of about 2400 bits per second to about 1.544 megabits per second or more. Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line." Campbell, et al., Col. 3, ln 20-31.
connecting the intermediate locations to corresponding remote locations.	The node 12 receives images of checks from a sending institution 14 transmitted through the network 10." Campbell, et al., Col. 2, lns 25-33. "The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38." Campbell, et al., Col. 3, lns 30-39.

'988 Patent	'550 to Campbell, et al.
40. A method as in claim 38 wherein said transmitting data from each intermediate location to corresponding central locations comprises the steps of:	Campbell, et al. Remote location = bank of first deposit 36; Intermediate location = bank 14; Central location = check processing node 12.
connecting each intermediate location to an external communication network; and	The node 12 receives images of checks from a sending institution 14 transmitted through the network 10." Campbell, et al., Col. 2, lns 25-33. "The output of the network interface 20 is connected to one or more network access lines 22 in FIG. 1. The network access lines 22 may comprise any form of transmission line suitable for carrying the expected volume of check image traffic between the sending institution 14 and the telephone network 10. For example, the network access lines 22 may comprise one or more digital transmission lines operating at speeds of about 2400 bits per second to about 1.544 megabits per second or more. Connection to the network 10 may be by an ordinary dial up line or by a dedicated private line." Campbell, et al., Col. 3, ln 20-31.
connecting the corresponding central locations to the communication network.	The node 12 receives images of checks from a sending institution 14 transmitted through the network 10." Campbell, et al., Col. 2, lns 25-33. "The node 12 accepts the images transmitted over the frame relay network 38... The node 12 contains frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38." Campbell, et al., Col. 4, lns. 26-33.
41. A method as in claim 40 wherein said transmitting data from each intermediate location to corresponding central locations step further comprises the steps of:	Campbell ,et al.
packaging the transaction data into frames; and	"The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38. The assembler/disassembler 40 also transmits frames of digital information representing check images to the network 38 after those images have been processed by the node 12. A node controller and router 42 controls the routing of check images to their intended destinations, both in the controller and to their ultimate destinations outside the network 38." Campbell, et al., Col. 3, lns 30-39.
transmitting the frames through the external communication network.	"The node 12 contains a frame relay assembler/disassembler 40 which receives frames of digital information representing check images sent by service subscribers to the network 38. The assembler/disassembler 40 also transmits frames of digital information representing check images to the network 38 after those images have been processed by the node 12. A node controller and router 42

'988 Patent	'550 to Campbell, et al.
	controls the routing of check images to their intended destinations, both in the controller and to their ultimate destinations outside the network 38." Campbell, et al., Col. 3, lns 30-39.

EXHIBIT
H

US005930778A

United States Patent [19]

Geer

[11] Patent Number: 5,930,778

[45] Date of Patent: Jul. 27, 1999

[54] **SYSTEM FOR EXPEDITING THE CLEARING OF FINANCIAL INSTRUMENTS AND COORDINATING THE SAME WITH INVOICE PROCESSING AT THE POINT OF RECEIPT**

[75] Inventor: **Terry L. Geer**, Baltimore, Ohio

[73] Assignee: **Huntington Bancshares Incorporated**, Columbus, Ohio

[21] Appl. No.: **08/680,218**

[22] Filed: **Jul. 11, 1996**

Related U.S. Application Data

[63] Continuation-in-part of application No. 08/507,856, Jul. 27, 1995, Pat. No. 5,583,759, and a continuation of application No. 08/156,190, Nov. 22, 1993, abandoned.

[51] **Int. Cl.**[6] **G06F 17/60**

[52] **U.S. Cl.** **705/45**; 705/35; 235/379

[58] **Field of Search** 705/30, 33, 34, 705/35, 39, 40, 44, 45; 235/375, 379, 380, 381

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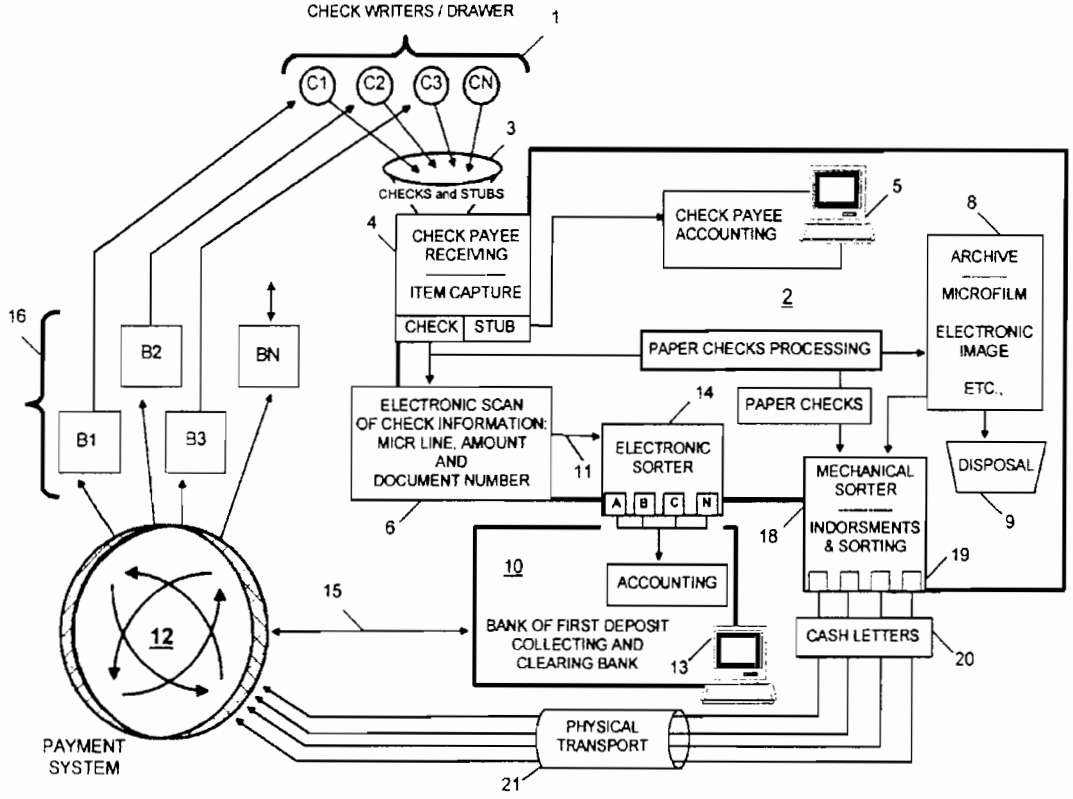
Primary Examiner—Stephen R. Tkacs

Attorney, Agent, or Firm—Porter, Wright, Morris & Arthur

[57] **ABSTRACT**

A system and process are described for effecting the expedited submission into the payment system for collection of funds represented by financial instruments that are received by a payee at an item capture facility remote from the payee's depository bank in which the submission of the instruments into the payment system is coordinated with the payee's internal accounting process and the register of the deposit of the instruments with an account at the instruments payee's bank.

18 Claims, 2 Drawing Sheets



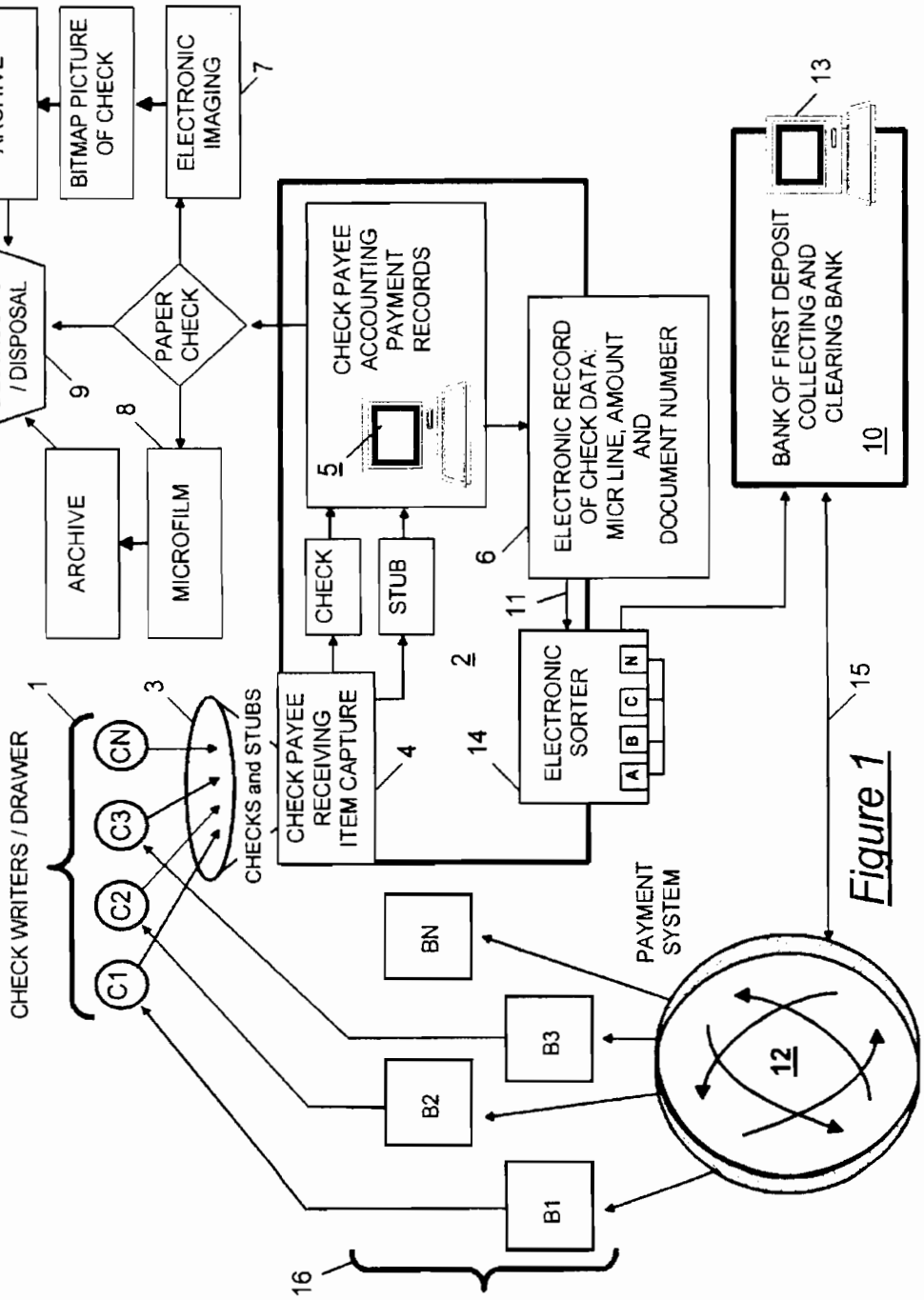
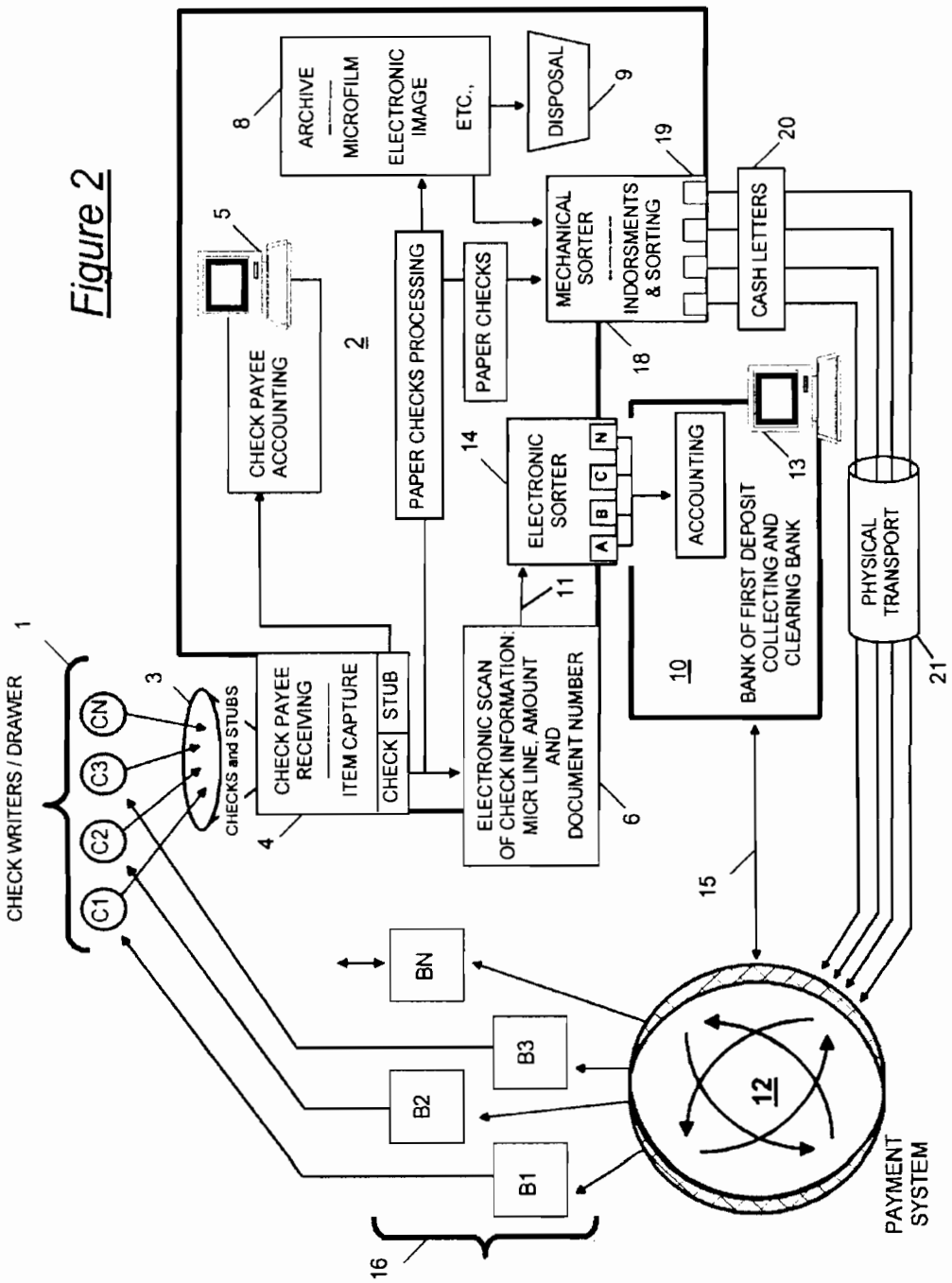

ARCHIVE
BITMAP PICTURE OF CHECK
ELECTRONIC IMAGING
7
DESTRUCTION / DISPOSAL
9
PAPER CHECK
8
ARCHIVE
MICROFILM
CHECK PAYEE ACCOUNTING PAYMENT RECORDS
5
CHECK
STUB
ELECTRONIC RECORD OF CHECK DATA: MICR LINE, AMOUNT AND DOCUMENT NUMBER
6
BANK OF FIRST DEPOSIT COLLECTING AND CLEARING BANK
10
13
11
2
CHECK WRITERS / DRAWER
1
C1
C2
C3
CN
3
CHECKS and STUBS
CHECK PAYEE RECEIVING ITEM CAPTURE
4
14
ELECTRONIC SORTER
A
B
C
N
15
PAYMENT SYSTEM
12
B1
B2
B3
BN
16

Figure 1

Figure 2


CHECK WRITERS / DRAWER
1
C1
C2
C3
CN
3
CHECKS and STUBS
4
CHECK PAYEE RECEIVING
ITEM CAPTURE
CHECK
STUB
5
CHECK PAYEE ACCOUNTING
2
8
ARCHIVE
MICROFILM
ELECTRONIC IMAGE
ETC.,
DISPOSAL
9
PAPER CHECKS PROCESSING
PAPER CHECKS
MECHANICAL SORTER
INDORSMENTS & SORTING
19
CASH LETTERS
20
18
14
ELECTRONIC SORTER
A
B
C
N
11
ELECTRONIC SCAN OF CHECK INFORMATION: MICR LINE, AMOUNT AND DOCUMENT NUMBER
6
ACCOUNTING
10
BANK OF FIRST DEPOSIT COLLECTING AND CLEARING BANK
13
PHYSICAL TRANSPORT
21
15
BN
B3
B2
B1
16
12
PAYMENT SYSTEM

SYSTEM FOR EXPEDITING THE CLEARING OF FINANCIAL INSTRUMENTS AND COORDINATING THE SAME WITH INVOICE PROCESSING AT THE POINT OF RECEIPT

RELATED APPLICATIONS

This application is a continuation-in-part of Application for United States Letters patent Ser. No. 08/507,856 filed on Jul. 27, 1995, now U.S. Pat. No. 5,583,759, and as a continuation of Application for United States Letters patent Ser. No. 08/156,190 filed on Nov. 22, 1993, now abandoned. Both applications have the same inventor and assignee as the present invention and both are incorporated herein by reference for all purposes.

FIELD OF THE INVENTION

The present invention relates to a system for expedited processing of checks and cash items received by a payee with an accompanying payment form at an item capture facility to reduce the time within which such items are paid, or returned through the check payment system and the payees bank of first deposit, by the payor bank on which such items are drawn.

BACKGROUND OF THE INVENTION

This invention expedites the processing of a deposit by the payee of an instrument or payment order into a collecting and clearing bank (referred to generally as the payee bank, bank of first deposit, or depository bank). Such instruments and payment orders are prepared, processed, and submitted into the check payment system and are typically paper checks and other cash items. The deposit and collection of the funds represented by these instruments are expedited according to the system of the present invention. Benefits of the present invention are realized by banking customers that receive as payees large numbers of paper checks to process on a continuing basis, such as utilities, bill payment companies, credit card companies, mail order processors, or other large commercial entities.

Typically in the prior art, the deposit and payment of a check tendered to a payee for an amount due is effected in accordance with traditional procedures for paper-based processing. The drawer (the check writer) establishes an account containing funds with a bank of the drawer's choice (the drawee bank or the payor bank). A check or similar financial instrument is written against the drawer's account in favor of the payee and physically delivered to the payee, usually by mail accompanied by the payor's invoice or a payment stub provided to the check writer that provides information about the check writer's account with the payee. The payee typically indorses the checks and deposits the checks in the payee's account at its depository bank or bank of first deposit for processing through the payment system. The checks are ultimately presented at the check writer's payor bank for payment of the funds represented by the instrument. Internal accounting procedures of the payor reconcile the invoice and the payment with the payor's account with the payee. The payor's account is identified by a payment stub issued by the payee that the payor returns to the payee with the payment check. Upon receipt of the check, the payor bank debits funds from the drawer's account, and may archive the check or a copy of the check, and/or return the check to the check drawer. Thus, the payment cycle is completed, typically with the paper check or financial instrument making the complete cycle from drawer to payee, to depository bank, through the check clearing system to the payor bank for archival storage and/or return to the check drawer.

In the conventional check clearing systems, the payee first indorses a check and delivers the check for deposit in the payee's account at a bank. The depository bank indorses for its own account the checks it receives, and sorts and bundles the checks. The depository bank prepares a cash letter for each bundle of checks sorted, or a cash letter that accompanies a group of check bundles. A cash letter may accompany a single bundle of checks or more than one bundle of checks. A typical cash letter contains routing information, the number and total dollar amount of the checks in a particular bundle, and optional additional information. The cash letters and check bundles are then introduced into the payment system.

The traditional multiple steps in the processing and physically handling checks, and in the preparation and transmission of cash letters, result in the float of funds represented by the check. Float is the time cost of money following deposit of the check by the payee at the depository bank until actual payment of the funds is made by the payor bank from the check drawer's account and those funds become available for use by the payee. If the check is dishonored by the payor bank, the check is returned through the clearing system in reverse direction, directly or indirectly, from payor bank to depository bank in order for the depository bank to debit the payee's account for the dishonored check. The route of the dishonored check from payor to depository bank need not precisely retrace the route of the check from depository bank to payor bank, but may be a direct return from payor bank to depository bank, or may follow an indirect route. Dishonored checks are caused by insufficient funds in the drawer's account, a stop payment order in place for the particular check, or other reasons.

There are three payment related conditions for funds deposited in a payee's account at the depository bank. The first stage is a book credit of funds, denoting checks deposited by the check payee to its account at the depository bank, as noted on the books of the depository bank, but not necessarily available for use by the payee. The second stage is available funds, credited to the account of the payee at the depository bank and available for use or withdrawal by the payee. The time between book credit and availability of funds is determined by federal regulation, bank policy, and/or negotiated terms between the bank and its customers. The third stage is collected funds in which the deposited check has been honored by the payor bank and all risk of return or dishonor is eliminated. The most certain policy with regard to funds for a depository bank is to make funds available, or withdrawable, only when they have been collected. Reducing the time between the book credit and the collection of funds is advantageous to bank customers, to the banks and to the business community in general by making funds more quickly available for productive economic uses. Faster collection is an object of the present invention.

In the usual sequence of check handling, every transferee, in the sequential chain of the check transit from the check drawer to the payee and ultimately to the payor bank, the previous party from whom the check is received is responsible for collection and payment of the check. For example, the payee is responsible to the bank of first deposit, the bank of first deposit is responsible to the next bank, and so on. The time between book credit of a check and its collection (or dishonor) is reduced by the present invention. Reduced float is advantageous to the payee because it results in the expedition of collected funds into the payee's account.

Traditional banking practices may inherently delay the ability of the payee to withdraw funds represented by the check presented by a payee for collection until the depository bank makes certain that the funds have been collected at the payor bank from the drawer's account. Since the large majority of checks presented for payment are honored by the payor bank, banking practice does not send a notice honoring a check, only notice of dishonor. To insure against risk of loss to the depository bank by a payee withdrawing funds not subsequently collected from the drawer's account at the payor bank, banking practice requires a waiting period sufficient to insure that a dishonored check would be made known to the depository bank in time to reverse the depository bank's book credit of the funds to the payee's account and to deduct the uncollected funds from the amount of the book credit. Use by the payee of subsequently uncollected funds is, at best, an interest-free loan to the payee even when a solvent payee promptly redeposits the uncollected amount in its account at the depository bank. At worst, the entire amount of a check could be lost if the check is uncollectible. Recent banking regulations, such as Federal Reserve Regulation CC, mandate a shortened time during which a payee must wait for access to its deposited and credited funds. Thus, expedited procedures for processing and collecting checks reduce the risk of loss to a depository or subsequent collecting bank through dishonored checks. Expedited procedures also benefit the payee-depositor by permitting the depository bank more promptly to release funds for payee use, offering customers more effective cash management.

The receipt of 10,000 to 1,000,000 or more checks within a predetermined period drawn on numerous different banks is not unusual for large businesses such as credit card issuers, utilities, and mail order processors. In situations where large numbers of checks are involved, the handling of individual checks and effecting their posting, deposit and clearing is a complex multiple step process, additionally complicated for the recipient payees of such checks, because a payment stub, invoice, order form or the like is usually enclosed along with each payment check. The payee must open each envelope, and record, reconcile and separate the payment stub from the check, optionally send the payment stub for archival storage (such as on microfilm or electronic media) or destruction, and send the check to the payee's bank for deposit, collection and credit to the payee's account through the check payment system. Thus there exists a need for a system whereby the conventional deposit and collection of funds represented by a check or other financial instrument may be expedited and the internal processing thereof made more efficient, particularly for businesses that regularly receive large numbers of checks and other forms of payments from their customers. The invention eliminates repetitive processing steps and begins the check clearing process at the payee's point of receipt as an adjunct to the payee's internal accounting.

Lock box or other means of collection consolidation and acceleration known in the prior art do not achieve the efficiency of the present invention. Typical lock box services, offered by cash management divisions of commercial banks or other entities, commonly entail routing customer payment checks to the payee through a designated post office box. The payments are generally collected from a post office box by the bank or cash management service at predetermined time intervals (e.g., several times a day) and removed from envelopes. The payment stubs are routed to the payee for accounting while the accompanying checks, credited to the accounts associated with particular stubs, are routed within the depository bank to begin the customary collection process. While this procedure achieves an efficiency of scale by aggregating and more rapidly depositing customer checks to the account of the payee, payment stub processing by the payee, paper check processing by a lock box manager or bank, and the physical transportation of both between lock box location, payee and depository bank and their final, physical processing in the check payment system are still conducted conventionally, slowly and repetitively.

A variation of a lock box procedure is the Payment Consolidation Service offered by NBD, N.A. of Detroit, Mich. In this procedure, invoice payments by check and electronic payments through a bill payment service are both sent directly to a depository bank, while the bank transmits certain customer accounting information electronically to the payee, the system otherwise employs conventional bank processing procedures for the physical sorting and transport of checks in the check payment system and/or the processing of electronic payments.

The present invention is directed to the bank customers (payees) who maintain customer accounting functions internally. For such bank customers, the present invention permits the payee to adapt and coordinate internal bill payment, accounting, and check processing procedures with the procedures that introduce checks into the payment system for collection.

Stephens et. al., United States Letters Pat. No. 5,237,159, describes the preparation of various electronic files that mirror paper cash letters and detail records (checks). The present invention is directed not to specific forms of electronic formatting and arrangement of the check information for rapid electronic transmission, as is Stephens et. al. Rather, the present invention is directed to an integrated system involving predetermined processing steps. Beginning at the point of receipt, this system facilitates the check payee's internal accounting for checks it receives and expedites the flow of check and cash letter information through the check payment system as a bank of first deposit monitors the check payee's account at the bank with regard to the checks received. Any suitable means for electronic file arrangement and transmission is useful in the present system.

SUMMARY AND OBJECTS OF THE INVENTION

The present invention comprises an integrated system beginning at a payee's item capture facility for effecting the efficient submission of checks and other financial instruments into the payment system for collection of funds. The financial instruments are received by a payee at a capture location remote from the payee's collecting and clearing depository bank and are presented for payment through the check payment system to the multiple institutions on which the instruments are drawn. In one embodiment, electronic scanning means at a first location established by the payee receives the financial instruments, scans and extracts necessary data therefrom including the data of the magnetic ink character recognition (MICR) line of the instrument, adds necessary data such as the amount and a document identification number to the electronic information associated with each check, and sends this electronic information to the payee's depository bank for further electronic sorting and processing both with regard to the introduction of the checks into the payment system and the crediting of funds represented by the checks to the payee's account at the bank, as the payee processes the check in its own record of account with the check payor. In this first embodiment, the paper

financial instruments are typically imaged (electronically, digitally, optically, on microfilm or disk, or otherwise) for archival storage at the payee's location remote from the payee's depository bank, substantially contemporaneous with the capture of the financial or other information on the instrument. The paper instrument itself may then be disposed of, eliminating the need for any additional mechanical sorting, indorsing or imprinting by either the payee or the payee's depository bank.

Another embodiment of the present invention sends the paper checks after processing at the point of receipt from the payee's location into the check clearing and collection system. Mechanical sorting of the paper checks is performed at a first (the payee's) location according to predetermined sort pattern categories specified by the payee's depository bank. Indorsements on behalf of the payee and the depository bank with respect to each instrument received are applied to each instrument. Other information such as the amount and/or a document identification number may also be imprinted on the instrument. In the sorting process, a mechanical sorter assembles the sorted instruments into discrete groups with respect to predetermined sort pattern categories and associates one or more cash letters with each assembled group of instruments according to categories determined by the payee's bank of first deposit. A communication link is established between the payee's location and the depository bank. Information pertaining to the checks and/or the cash letters in anticipation of a deposit in the payee's account corresponding to a cash letter (or cash letters) is transmitted from the payee to the collecting and clearing depository bank. A transport means, usually air or land, delivers the groups of sorted instruments and the one or more cash letters from the payee's location into the check payment system on behalf of the payee's depository bank.

A central processing unit and communication link determines the timing of check transport and information transmissions according to criteria specified by the depository bank, consistent with schedules appropriate to the check payment system, and monitors the transit of the sorted checks. The processing unit also coordinates information about the deposit of funds represented by the checks in the payee's account at the depository bank in a sequence coordinated with the timing of settlement in the check payment system according to a schedule determined by the depository bank.

It is an object of the present invention to provide an expedited funds deposit and collection mechanism for checks and other financial instruments received by a payee.

A further object of the present invention is to reduce costs of collection and deposit of paper instruments on behalf of the payee and payee's depository bank.

Another object of this invention is to reduce the complexities and requirements for physical transport of financial instruments where paper checks and financial instruments are involved and to reduce the physical transport per se of checks in the collection process.

It is a further object of the present invention to eliminate duplicative data capture steps and multiple handling involved in the payee's and the bank of first deposit's handling of the same payment and to coordinate the payee's internal invoice accounting system with the submission of checks received by the payee in the payee's system resulting in efficiencies in account processing and in funds collection.

Other objects of this invention include the elimination of duplicative steps of physical processing of checks and financial instruments and payment stubs which accompany them, the reduction of errors, adjustments, rejects, balancing time, item handling and personnel costs.

These and further objects of the invention will be more readily understood with reference to the following description of the preferred embodiment taken in conjunction with the figures.

BRIEF DESCRIPTION OF THE FIGURES

FIG. **1** is a flow chart depicting the processing of checks, and the electronic transfer of information derived therefrom, from the payee to the depository bank and into the check payment system resulting in the ultimate collection of funds from the account of the check writer, as such activities are coordinated by processing means at locations of the check payee and the depository bank. Paper checks are not delivered into the payment system by the payee or depository bank in this embodiment.

FIG. **2** depicts an embodiment in which paper checks are delivered from the payee into the payment system.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is a system for processing checks and other financial instruments. A check payee, as an agent of the depository bank processes the checks at their point of receipt as an adjunct of the payee's internal invoice accounting system. The payee performs according to criteria and procedures mandated by the payee's depository bank, at a location remote from the bank's conventional collection and deposit processing facilities. The processes of the present invention expedite the processing of checks by the payee and the payee's depository bank; the submission of the checks for payment into the payment system; and the deposit and availability of funds represented by the checks into a depositor's account.

EXAMPLE I

Example I is an embodiment in which physical paper checks are not transported from the payee's location. Appropriate information from the checks is extracted and converted into electronic form for sorting, processing and transmission into and through the payment system. The physical checks are disposed of, typically following imaging and archival storage by electronic, optical, microfilm or other means at the payee's location (or other location remote from the depository bank). This embodiment truncates checks at the payee's point of receipt.

With reference to FIG. **1**, the check payee and bank customer **2** is a public utility such as a telephone company, or other business entity receiving a large number of periodic payments from numerous customers. In FIG. **1**, the drawers of the check or other financial instrument (the customers of the payee) are denoted by C_1, C_2, C_3, . . . C_n, collectively denoted by **1** in FIG. **1**. The check drawers (payors) are paying invoices received from the payee and the checks are usually accompanied by a payment stub, invoice containing information about the payee's account, or an order form or the like containing relevant information about the identity of the payor and the purpose of the payment. For the typical case in which the check payee (and bank customer) **2** is a utility, credit card company or other large commercial enterprise, there may be many thousands or millions of customers **1**, submitting payments to payee **2**, often periodically and typically monthly. The method of payment and delivery of payment to the payee, denoted by **3** in FIG. **1**, is

typically via the mail. In-person delivery, commercial messenger, and other forms of delivery of checks to payee **2**, are also utilized by some customers.

In the present invention, the check payee **2** typically receives these check payments and associated statements through a functional component of the receiving organization known as remittance processing in retail organizations, or deposit processing when received by a bank. Item capture **4** in FIG. **1** represents these functions. Item capture **4** will typically occur at a location convenient to the payee's accounting functions **5**. Check receiving and item capture functions may be located at strategic bill collection points within the payee's service region. Most typically, the check receiving and item capture function of the payee will compare a payment stub with the enclosed check and send the check on for further processing. The payment stub commonly received along with the check is processed further by the payee and the funds represented by the check are reconciled with the check drawer/payor's account. The stub may be stored in archival storage as paper, microfilm, etc., or otherwise used to account properly for the customer's payment. Payment stub processing and internal accounting procedures for the reporting and allocation of payments, are an adjunct of the funds collection system of the invention herein.

FIG. **1** relates to an embodiment of the present invention in which paper checks or similar instruments are not forwarded by the payee for processing through the depository bank or payment system. Because physical transport of checks is not required, mechanical sorting of the paper checks received is not necessary. The embodiment of FIG. **1** uses electronic transmission of information related to electronically sorted information about checks received and electronic cash letters related to the particular groups of sorted checks. Therefore, sorting, reconciliation, etc., is effected by electronic means without the need for mechanical processing or delivery of physical paper checks.

Following receipt and item capture by the payee, the check will advance to scanning and processing in the electronic scanning block **6** of FIG. **1** . In this step, the check is scanned by a suitable reader. (This processing step may also include verification of the data collected electronically by human operator comparison of the electronic data with the physical check and the payment stub.) The data thus collected will typically include the MICR (Magnetic Ink Character Recognition) data from the MICR lines of the checks. The amount of the check and a date will also be collected (optionally verified by a human operator) and included with the electronic record to be associated with each check. In the typical practice of the invention, electronic indorsements on behalf of the payee and the depository bank will be applied to the electronic record of the check; and a document identification number will also be generated and added to the electronic record of the check to aid in subsequent location and retrieval of the information concerning the particular check. This information typically collected from the MICR line and the check amount is referred to as bank information. The payment stub information comprises the information necessary to the payee derived from the payment stub to reconcile the payment with the check payor's account with the payee.

Because this embodiment does not forward paper checks into the payment system, there is no need for the check amount to be added to the MICR line of the physical check as is a common procedure in current check processing operations. Amount imprinting is not necessary in this embodiment of the present invention.

FIG. **1** also shows the accounting function of the check payee **5** following the electronic scanning of the data from the check **6**. Payee accounting **5** may also include the processing of payment stubs directly from the payee receiving item capture function **4** in place of, or in addition to, the processing of information from the check. The information flow within the check payee's organization from item capture **4** to the check payee accounting function **5** is a matter of payee preference.

In FIG. **1**, box **7** indicates the creation of an image of the check for archival storage **8** prior to possible disposition of the paper instrument **9**. An image of the physical check is created. This image is preserved and may be reproduced as a copy of the check for purposes of signature comparison, amount verification, etc. if needed. The image may be an optical or electronic gray-scale or color image of the check maintained in archival storage in pixel-by-pixel digital, optical, magnetic, electronic, fully optical or other storage technology from which information can be derived. Alternative storage mechanisms include microfilm, video tape, laser disc or other tape or direct image storage technology. This functional block **8** of FIG. **1** is not limited to any particular technical embodiment; a form of image of the actual physical check is stored, capable of later retrieval, from which detailed information related to the check and its visual appearance may be displayed. Following the storage of the check, disposal of the paper instrument **9** may occur.

Disposal of the physical paper check (by destruction, recycling, etc.) at the location of the payee **9** occurs in one embodiment of the present invention. Terminating the transport of the physical paper check at a point in the collection and clearing process before return to the check writer is termed truncation of the check at that point beyond which the check is not physically sent, whether the check is physically destroyed or placed into archival storage. In practice, the physical checks may not be destroyed, but may be placed in warehouse storage for a period determined by banking policies. Disposal **9** of the paper checks may involve either the physical destruction of the instrument or archival storage of the paper check in addition to imaging **7** of the check and the storage **8** of the image in a space-efficient form.

Other truncations are consistent with the present invention resulting in more effective check collecting processes for both the payee and the depository bank. Truncation at the point of sale is an embodiment in which the MICR line, and check amount (and optional additional information) is extracted from the check for electronic transmission. For retail establishments such as grocery chains and the like that receive large numbers of point of sale checks, the present invention is applicable with the item capture location of the payee being the point of sale check receiving establishment. Point of sale capture may, but need not necessarily, include imaging of the check.

Other truncation schemes are possible in which the physical paper check is sent beyond the payee to the depository bank, or to the payor bank, or elsewhere in the check collection system.

The image function **7** is depicted in FIG. I separately from the electronic scanning function **6** for clarity in graphical depiction. The electronic scanning for extraction of the data from the MICR line, etc.,may be combined with the imaging of the check to reduce check stacking, feeding, positioning and other mechanical manipulation steps for the proper items. Whether scanning **6** and imaging **7**, in FIGS. **1** and **2**, are combined in one piece of equipment, or more than one, is a matter of convenience.

In FIG. 1, the image 7 is stored at the payee's location in an archival storage facility 8. However, this image of the check may also be transmitted electronically to the bank along with the other information extracted from the check. The amount of information in the image is typically greater than the transactional information extracted from the MICR line and is added to the electronic record of the check. Thus, transmission of the image requires greater communication capacity than transmission of the transactional check data alone.

The information from the electronic scanning 6 performed at the payee's location is transmitted via a suitable communication link 11 to the depository bank 10. At the depository bank, the appropriate adjustments of the payee's account balances by the depository bank are carried out 13. The payee's account is credited with the appropriate amounts as such are compiled by the payee and the information thereof is received electronically from the payee. The electronic check information is sorted and routed via 14, with appropriate electronic information added thereto to insure proper routing through the payment and clearing system to the appropriate payor bank. Electronic information of the sorted checks transmitted for particular payor banks, the equivalent of a cash letter, is included with each electronic bundle of checks.

The electronic check information as sorted, grouped and annotated 14 by the depository bank is sent via an appropriate communication link 15 into the payment system 12. The payment system 12 includes clearing institutions such as the Federal Reserve Banks, correspondent banks, The National Clearinghouse Association (described in United States Letters Pat. No. 5,265,007), the electronic check clearing house organization (described in Stephens et al., supra), and like mechanisms. Having a direct relationship to the check payment system, the collecting and clearing depository bank 10 is considered a part of the check payment system.

The payment system 12 receives checks from depository bank 10 and other banks of first and subsequent deposit (not depicted on FIG. 1) intended for various payor banks, B_1, B_2, B_3 . . . B_n, collectively denoted as 16 in FIG. 1. The check information from the payment system 12 reaches the appropriate payor banks 16 for proper debiting of the accounts of check writers 1 thus completing the payment cycle. In the event of dishonor of a check by a payor bank, the process reverses as to the collection of the dishonored check, and this information may be transmitted electronically back through payment system 12 (or by more direct means of reversal) to depository bank 10 for unwinding the transaction and for debiting of the payee's account as to the dishonored check.

Modifications of the system of FIG. 1 are apparent to those with skill in the art. For example, electronic sorting, routing, grouping and preparation of electronic cash letters may be merged completely at the payee's location 6 with the depository bank's function 14 comprising the extracting of cash letter information as the electronic transmission passes through communication links 11 and 15. The electronic information thus extracted by the depository bank would enable the updating of the depository bank's account balances for the payee. Checks written by check writers C_1 . . . who are also customers of the depository bank 10 would be cleared and appropriate fund transfers made immediately at the depository bank. Conversely, minimal processing may be performed at the payee's location and the steps of item capture, scanning, imaging, sorting, and depositing into the payment system could be performed at a different location. The image 7 is transferred via a communication link 11 from payee 2 to depository bank 10 for financial information processing and archival storage. This embodiment may be particularly suitable when the payee is a retail establishment receiving numerous point of sale checks but lacking internal accounting facilities.

The timing of transmissions between payee 2, depository bank 10, and the payment system 12, typically occurs according to predetermined schedules established by the bank, the payee customer of the bank and/or the payment system itself. Communications between payee 2, depository bank 10, and the payment system 12 will be under the control of a central control/processor unit 17 according to criteria established by the depository bank. This control unit coordinates, synchronizes, times and avoids interference in and among the various communications involving the depository bank and the payee and insures compliance with schedules necessary for the check payment system.

FIGS. 1 and 2 show a single control unit 17 at the location of the depository bank 10. Alternatively, it may be convenient to have the control function at the payee's location 2 or to split the control function between processors located at the payee's location, the depository bank's location or elsewhere, provided, however, that the bank determines the control, coordination and transmission protocols and the submission and collection of funds over the payment system 12.

The present invention depicted in FIG. 1 is contrasted with the traditional check payment and processing procedures in which funds represented by checks received for payment of an amount are matched with the customer's invoice or account internally and the physical paper checks are indorsed and physically transported to the depository bank for deposit in the payee's account. Conventionally, the depository bank repeats the reading, sorting, indorsing and packaging the physical checks for submission into the payment system according to the depository bank's preferred sort pattern categories. Cash letters are then prepared by the depository bank, associated with the bundles of sorted checks and together they are introduced into the payment system to complete the processing. The invention depicted in FIG. 1 does not require physical sorting, bundling or indorsing of the paper checks or transportation of the physical checks from the payee to the depository bank. Only a single mechanical processing of the physical checks during the scanning operation 6 at the payee's location is required.

EXAMPLE II

In the example depicted in FIG. 2, electronic transfer and processing of payments occur and paper checks follow at some later time for confirmation, reconciliation and storage by the payor bank and/or for return to the drawer. Paper checks in this system are truncated at a point beyond the bank of first deposit, usually at the payor bank, where the checks are stored or imaged for archival storage and optionally disposed.

In the example of FIG. 2, checks or other paper financial instruments are received by payee 2 from numerous check writers 1 via the mail or other delivery means 3 as described in connection with Example I. The checks are received at item capture site 4, scanned 6, accounted for 5, and imaged 7, in a manner explained with respect to Example 1. Because the physical paper checks are preserved, imaging and/or storage of the images are not necessary unless the image is transmitted along with other bank information and used for long term archival storage.

The processing steps, and modifications thereto, are essentially unchanged in Example 2 when compared with the all-electronic processing of Example 1. Electronic information scanned from the check at **6**, is transmitted via communication link **11** to depository bank **10** for sorting, processing, and bundling **14**. This information is entered in the payee's account **13**. The bundled electronic check information and accompanying electronic cash letter information are forwarded into the payment system **12** via communication link **15** under the bank's control through processor **17**, all essentially as described in connection with Example **1**.

The embodiment of Example I, however, is one in which the physical paper check is presented through the payment system **12** for delivery to one of the payor banks **16** (or otherwise truncated at some point within the payment system beyond the check payee). The paper check follows the electronic information previously transmitted via **15** into the payment system **12**. Thus, this embodiment is a paper-to-follow system providing rapid processing of the essential financial and accounting information represented by electronic records of the checks. The physical checks follow thereafter. The paper check in this embodiment is processed by indorsing, sorting, bundling, routing, and the generation of a physical cash letter to accompany the physical bundle (or bundles) of checks through the payment system. Indorsements to checks on behalf of the payee and the bank of first deposit are applied to the check by a payee at the payee's location.

In FIG. **2**, the paper checks are shown to be sorted by sorter **18** in sort pattern categories determined by depository bank **10**. The depository bank may require sorting according to pattern categories of check volume in a predetermined geographic area, the financial institution(s) on which the checks were drawn, the geographic or commercial area of a bank that will otherwise accept a check for clearing and collection, or other sort pattern categories. The various categories into which the checks are thus sorted are denoted schematically by pockets **19** in the sorter of FIG. **2**. In this embodiment, processing **18** will typically include indorsing the checks, both for the payee and for the depository bank at the payee's location. An institutional indorsement is conventionally applied as a payment instruction and includes the identity of the indorser on the reverse side of a check.

The mechanical processing of checks at payee's location **18** will also include the generation of physical cash letters **20** to accompany the bundles of sorted checks into the payment system **12**. The bundles of checks with accompanying cash letters are physically transported into the payment system by means of any conventional, customary or useful transport means **21** for processing by the payment system **12** according to conventional procedures.

Here, the electronic processing of the funds represented by the checks precedes, and typically does not wait for, the arrival and processing of the physical paper checks. Thus, the information relating to the potential availability of drawer funds in the payor bank **16** is expeditiously made known through the payment system electronically to the depository bank **10**. The paper checks follow directly from the payee, on behalf of the depository bank, directly into the payment system, also in an expedited manner according to the present invention, since separate sorting and indorsing by the payee and the depository bank are combined into a single sorting and indorsing function **18** at the payee's item capture facility. The separate transport of paper checks to depository bank **10** is unnecessary. The timing of steps is synchronized and coordinated with respect to (a) the check payee **2** and the bank of first deposit **10** via communication link **11**, (b) the check payment system **12** with respect to the indorsing and sorting of checks **18** and **19**, (c) the transmission of check MICR information via communication link **15** and the submission of doubly indorsed checks into the payment system **12** via physical transportation **21**, and (d) the payment of funds represented by the checks (or the dishonor of a check) by payor banks **16**. Coordination under the direct control of the depository bank, according to criteria established by the bank, insures availability to the payee of deposited funds in compliance with federal regulations, depository bank policy, and/or contractual agreement between the payee and the depository bank.

In the prior art, once the check payee **2** processed and indorsed the payment checks received to reconcile its own and its customer's accounts, the payee would physically transport the indorsed checks to its depository bank **10** where the payee maintains an account and the checks would be deposited to the credit of the payee's account . The depository bank, being the bank of first deposit, would separately indorse the checks on its own behalf and submit the checks into the check payment system resulting in the ultimate payment of funds represented by the checks from the check writer's account at payor banks (or the dishonor of the check). In that process, the bank of first deposit would apply its own indorsement to the checks already indorsed by the payee and would physically sort the checks and prepare any accompanying cash letter for delivery into the check payment system where settlements with other financial institutions on which the checks were drawn would be effected. Such a settlement involves the physical transport and exchange of the checks, and a calculation of aggregate amounts owing and payable by participants in either a bi-lateral or multilateral settlement at a predetermined time. After settlement, the payor bank would physically have custody of the check and would conventionally process the check for its customer's account.

In contrast, the present system provides that the check payee **2** in its own processing of the checks, at a site distant from the location of the depository bank **10**, indorses the check for payment both on its own behalf and on behalf of the bank of first deposit where the check payee **2** maintains an account and deposits the funds represented by the check. In its processing of the checks, the payee will typically add the check amount to the MICR line and date information about the check. The indorsed checks are sorted by the check payee in accordance with predetermined sort pattern categories **19** selected by the depository bank and the payee prepares a cash letter **20** in the name of the depository bank for each group or bundle of checks within the predetermined sort category.

The particular order of operations shown in FIG. **2** is not intended to exclude other equivalent sequences. For example, the electronic scanning of the checks **6** may be performed by the same physical equipment at substantially the same time as the mechanical sorting and indorsing **18** and **19**, and the preparation of cash letters **20**. Other modifications will be obvious to those of skill in the art.

Improvements in efficiency and time, and a reduction in paper handling is achieved by the system of the present invention as compared with the repetitive instances of physical handling, multiple transportation, and duplicative sorting indorsement encountered in the prior art. Delivery of physical items to the bank of first deposit is eliminated. Two indorsements of the check are applied at the same time, instead of twice at the different locations of the payee and the bank of first deposit. The payee/customer applies the

bank endorsement on behalf of the bank. The faster collection of funds, to the benefit of the payee and the bank in the check collecting and clearing sequence is achieved.

Thus, the system accelerates the check collection process by eliminating the need for, and the time consumed by, the physical transport of checks to the depository bank and the subsequent physical transport of the checks and submission of checks into the check payment system by the depository or the collecting and clearing bank. Separate sorting and capture of information by both the payee and a bank of first deposit is eliminated. The inter-relationship of the depository bank, or the collecting and clearing bank, with the sorter and indorsement applier is effected by electronic communications and a control system of processing computers at one or each of the bank and the payee. The cash letters for the sorted checks on behalf of the collecting and clearing bank are prepared at the remote customer/payee's location. Physical items that formerly required double handling, first by the customer/depositor and then by the collecting and clearing bank are now singly handled at the point of receipt at an item capture facility where the beginning of the check clearing process also includes the introduction of the check and payment stub information into the customer/payee's own account records. Not only is the collection of funds expedited, but because the system is integrated at the payee site with the payee's own internal accounting system, added efficiencies to the overall process of bill payment and funds collection are achieved both by the payee and the bank of first deposit.

As handling is reduced, redundancy is eliminated, cost is reduced and errors caused by duplication and the transfer and handling of numerous checks are also reduced. The checks are forwarded according to predetermined sort pattern categories into the check payment system as established by the collecting and clearing bank. Hence, with reference to Example I and a local utility as an assumed payee, most of the checks received by the utility would likely be drawn on banks in the utility service area, and the clearing of the checks would be effected through the local check payment system. The collecting and clearing bank, if in a location other than that of the utility, maintains an electronic link for settlement purposes for participation in that local check payment system.

The payees in Example I and in Example II may also establish and maintain an archive on behalf of the depository bank for the received checks, as well as for itself, whereby each check received by the payee is imaged and assigned a unique document identification number for retrieval purposes.

Thus, the invention provides a system for effecting the deposit of checks and the collection of funds represented by checks that are received by a payee at a location remote from the payee's depository bank and presented for payment to multiple institutions in the check payment system.

A communication link between the payee and the depository bank enables the payee to report to the bank the information about the checks and cash letters and permits the bank, upon receipt of the information, to anticipate in the bank a deposit in the payee's account. Typically, when the bank receives confirmation that it has received credit for the cash letter through the check payment system, it makes the funds available to the payee, although other contractual arrangements between particular payees and its depository bank may be negotiated.

The timing of communications and the scheduling and confirmation of check processing activities are coordinated by a central processing unit and communication link between/among the parties involved in the check payment process. In this manner the timing of the physical transport of the instruments for submission into the check payment system is controlled by the depository bank and the delivery by the payee of the sorted checks into the check payment system is confirmed and verified to the bank by the payee and through the bank's link into the check payment system. The recording of the check deposit as withdrawable funds in the payee's account with the depository bank is thus coordinated with the timing of the issue of a credit to the bank when the checks are cleared through the check payment system and the bank's account in the payment system is credited with funds received. The transport of bundled instruments and the associated cash letters from the payee's item capture facility location to a payment system receiving point is effected by conventional ground or air delivery.

In certain circumstances, it is desirable to verify the cash letter or bank information at one or more stages. For example, the image of the check produced as **7** in FIG. **1** and FIG. **2** may be verified, electronically or manually, with the check-by-check bank information extracted electronically **6**. In another embodiment, the electronic cash letters generated at **14** or **6** are compared with the electronic bank information at more than one location, by more than one piece of equipment, and/or by more than one human operator. Verification of physical cash letters **20** against electronic bank information and/or the images of the checks themselves is also an adaptation of the present invention. When images are transmitted through the communications links **11** and **15**, it becomes easier for multiple verifications to be made comparing the bank information and cash letters with each other and with the check image itself. Although data encryption is employed as a security measure in electronic funds transfer (and presumed herein), additional data checks and verification at several points along the transmission system enhance security. Redundant parallel communications links, with a different encryption procedure for each, allow the comparison and verification of the bank information at both ends of the parallel, encrypted transmissions.

Given the foregoing disclosure, it is evident that the benefits of the system described herein may be extended to numerous types of commercial activities in which a volume of checks is received. The examples described a utility as a payee. The benefits of the present invention will be most apparent to bank customers that receive a large number of periodic check payments from numerous of their own customers. Individual banks themselves may establish a relationship with a bank using the present invention. In this case, the depository bank **10** in FIG. **1** and FIG. **2** would be a bank of second (or later) deposit, receiving electronic information, and/or checks from another bank as its customer **2**. The depository bank **10** would be an outsource processor for the other bank. There is no essential change in the present invention whether the bank customer **2** is a commercial entity or itself a depository bank for commercial entities.

Having described the invention in detail, those skilled in the art will appreciate that, given the present disclosure, modifications may be made to the invention without departing from the spirit of the inventive concept herein described. Therefore, it is not intended that the scope of the invention be limited to the specific and preferred embodiments illustrated and described. Rather it is intended that the scope of the invention be determined by the appended claims.

What is claimed is:

1. A mechanism for effecting the deposit and submission into a payment system of financial instruments for the

collection of finds represented by financial instruments, containing financial information about a payment, the financial instruments being drawn on different payor institutions and received, accompanied by a payment stub identifier, by a payee at a location convenient to a payee's item capture facility and remote from the payee's depository bank, comprising the interconnected:

a) scanner at the location for scanning each financial instrument and deriving financial information from each of said instruments and converting said information into a first information record as to each said instrument;

b) means for associating said financial information with the payee's records of accounts based upon information derived from the payment stub accompanying the instrument for further processing by the payee;

c) imager for creating a second record translatable into a visually perceptible image of each of said financial instruments;

d) an archive for storing said records;

e) first communication link between said location and said payee's depository bank for transmitting said financial information from said location to said depository bank; for transmitting process control instructions from said depository bank to said location; and for communicating verification of transmission and receipt of information and instructions between the location and the bank;

f) processor for adding document identifiers and routing information to the first information record of each instrument to create a unique record thereof;

g) sorter for separating said unique records into predetermined categories determined by the depository bank and for assembling bundles of said unique records into the categories and associating said bundles with electronic cash letter information;

h) second communication link between one or both of said location and the depository bank and the payment system for transmitting said bundled records accompanied by their respective cash letters into said payment system for ultimate payment by the payor institution for each of said instruments; and,

i) controller for controlling and coordinating transmissions between said first location, said depository bank and said payment system in accordance with predetermined criteria established by the bank.

2. The system of claim **1** including means for adding to the record of each instrument an indorsement indicia on behalf of each of payee and the bank.

3. The system of claim **2** wherein said financial information comprises the information from a MICR line on said check, the amount of said check, and a document identification number.

4. A system as in claim **1** wherein said imager at said location creates an electronic image of each of said financial instruments for transmission of said electronic image over said first communication link to said depository bank.

5. A system for effecting the submission of financial instruments into a payment system for the collection of funds represented by the instruments and for crediting the instruments payee's account at a depository bank with the funds represented by the instruments, the instruments being drawn on different institutions and received by a payee with a payment form at an item capture facility remote from the depository bank where the payee maintains an account, comprising:

a) a scanner at the item capture facility for scanning information from said instruments and converting said information into a transmittable representation thereof;

b) means for associating said information with the payee's records of accounts corresponding to the payment form;

c) means at said facility for applying to each of said instruments a separate indorsement on behalf of each of said payee and said depository bank;

d) a sorter at said facility for sorting said financial instruments according to predetermined sort pattern categories determined by the depository bank for assembling sorted instruments with endorsements thereon into bundled groups with respect to the predetermined sort pattern categories;

e) a means at said facility for preparing at least one cash letter for association with each bundled group of instruments;

f) means for assembling information scanned from the instruments into a transmittable record with respect to each instrument in a correspondence with the bundled groups and cash letters for communication to the bank;

g) transport means for delivering said bundled groups of sorted instruments with associated cash letters from the facility into said payment system;

h) a communication link among said facility, the depository bank and the payment system for transmitting information concerning said instruments, the bundled groups and cash letters;

i) a controller for coordinating the transmissions of information among the capture facility, the depository bank and the payment system and for coordinating the delivery of the instruments and cash letters into the payment system according to criteria determined by the depository bank and for crediting the payee's account at the bank with regard to said instruments.

6. The system of claim **5** wherein said financial instruments comprise checks having MICR lines.

7. The system of claim **6** wherein said information comprises information from said MICR line and the amount of said check, and a document identification number is applied to said check and the transmittable record thereof.

8. The system of claim **5** wherein a printer applies information representing the amount of the check to the MICR line of each of said checks.

9. The system of claim **5** including an imager at the facility for creating an image of each of said financial instruments, a storage archive for maintaining such images, and means for delivering the images from the facility to the archive.

10. The system of claim **5** further comprising means at said first location for preparing said at least one cash letter in an electronic form and in a printed form.

11. A process for coordinating the receipt of a multiplicity of payments by check, the check being accompanied by a payment form associated with the check and for effecting the recording of a deposit of the check at a depository bank and for submitting the check into a payment system for the collection of funds represented by the check, the check being drawn on different institutions, comprising:

a) providing an item capture facility at a first location convenient to the payee for receiving said check and payment form associated with the check;

b) scanning said received check at said first location, and extracting bank information therefrom, and converting said bank information into a transmittable record thereof;

c) associating payee identification and payment account information derived from said payment form with

information scanned from said check and processing said payment account information in the payee's internal accounting system;

d) imaging said check at said first location and creating a storable image of each of said check;

e) storing said images of said check;

f) disposing of said check;

g) electronically transmitting said bank information with regard to each check in the form of the transmittable record thereof from said capture facility to the depository bank;

h) sorting the records about each check according to predetermined criteria established by the depository bank; bundling groups of sorted records and adding electronic cash letter information to said bundled groups of records;

i) delivering the records of said bundles and cash letters into the check payment system for clearing at the payor bank on which each of said checks is drawn;

j) coordinating the delivery of the records of the bundles and cash letters into the payment system with the recording of the check as a deposit in the check payee's account at the depository bank; and

k) controlling the transmissions and delivery of information between the capture facility, the depository bank and the payment system according to a predetermine schedule established by the bank.

12. The process of claim **11** wherein the scanning of information comprises scanning the MICR line of the check and the process further includes associating the amount of the check and a document identification number with the MICR line information.

13. The process of claim **11** wherein the imaging of the checks is in one of an electronically or optically readable format.

14. The process of claim **13** further comprising transmitting said images of the checks to the depository bank.

15. A process for introducing financial instruments into a payment system for the collection of funds represented by the instruments, the instruments being drawn on different institutions and received by a payee at an item capture facility convenient to a payee and remote from said payee's depository bank, the financial instruments representing payments to the payee accompanied by a payment form associating a payment with an account of the check drawer with the check payee, comprising:

a) scanning said financial instruments at said facility and extracting MICR and payment amount information therefrom, and converting said information into a transmittable representation thereof;

b) associating payment account information from the instrument with an account of the check drawer maintained by the payee;

c) imaging said financial instruments at said facility and creating a retrievable stored image of each of said instruments;

d) disposing of said instruments;

e) transmitting the information scanned from said instruments from said facility to said depository bank;

f) adding a document identifier associating the scanned information derived from each instrument to the record thereof and adding payment system routing information to said record;

g) sorting at least one of the scanned information and payment system routing information associated with the instruments into predetermined categories; assembling the information about a group of instruments in a same category; and preparing a bundled assembly of such information into an electronic cash letter;

h) maintaining a record between the item capture facility and the depository bank of the instruments received at said facility and the information about said instruments transmitted and recording the information about said instruments with regard to the payee's account at the bank;

i) communicating the electronic cash letter and information about the bundled groups of records of instruments into the payment system for clearing each of said instruments; and,

j) coordinating transmissions among the facility, the depository bank and the payment system in accordance with a schedule determined by the bank.

16. A process for coordinating the receipt of financial instruments at a payee's item capture facility with payee's processing of the instruments and the collection of finds represented by the instruments through a payment system with the recordation of the deposit of such instruments in an account maintained by the instruments payee at the payee's bank of first deposit comprising;

a) associating the instrument received with a record of account of the drawer of the instrument with the payee;

b) extracting payment system information from the instrument and converting said information into a transmittable record thereof;

c) sorting the instruments at said facility according to predetermined sort pattern categories determined by the bank in accordance with destination points associated with the payment system and transmitting the payment system information about said records to the bank;

d) indorsing at said facility each of said instruments with separate indorsement on behalf of each of said payee and said bank;

e) sorting the instruments bearing said endorsements with respect to said predetermined sort pattern categories and assembling the sorted instruments into one or more bundles associated with each category;

f) preparing at said facility at least one cash letter associated with the one or more bundles of sorted instruments and delivering the one or more cash letters and associated one or more bundles into the payment system;

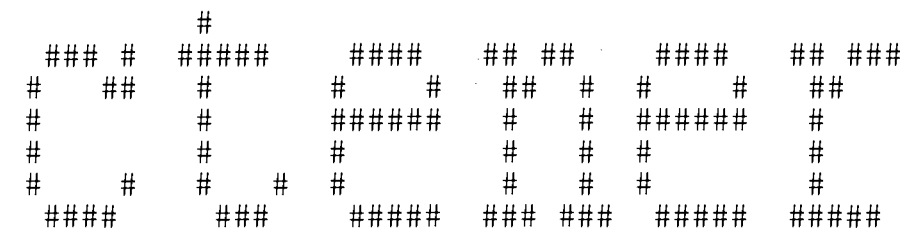
g) confirming the delivery of the at-least-one-cash letter and bundle into the payment system to the bank and reconciling said delivery into the information about said records transmitted to the bank; and,

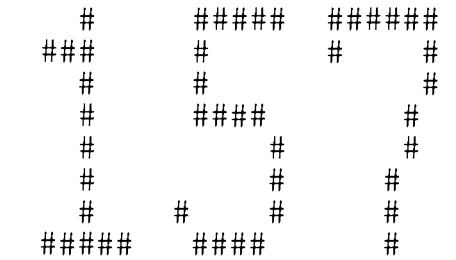
h) monitoring the clearing of said instruments in the payment system such that funds collected represented by the check are credited as received to the payee's account at the bank upon collection.

17. The process of claim **16** wherein said financial instruments comprise checks and the payment system information comprises the MICR lines on the checks and the process further includes adding the amount of the check to the MICR line of the check before the checks are delivered into the payment system.

18. The process of claim **16** in which the physical delivery of the checks in the process of clearing the check through the payment system is truncated.

* * * * *





Western Union and Sister-Company Create Business Pact with Orlandi Valuta

ENGLEWOOD, Colo., April 11 /PRNewswire/ -- Western Union Financial Services, Inc. and First Data Technologies Inc., both subsidiaries of First Data Corporation (NYSE: FDC), announced today that they have established a business relationship with the Orlandi Valuta companies ("Orlandi Valuta"), a provider of electronic money transfer services. The agreement allows Western Union branded services to be sold at Orlandi Valuta agent locations and gives Western Union the option to purchase Orlandi Valuta. Also, according to the agreement, First Data Technologies will provide data processing services to Orlandi Valuta.

Financial terms of the agreement were not disclosed.

The companies entered into a 10-year agreement that will allow Orlandi Valuta agents to sell Western Union branded products and services, including money transfers, money orders, and in-person bill payment services.

First Data Technologies entered into an agreement to provide data processing services in support of Orlandi Valuta's consumer money transfer operations.

"This agreement allows both Western Union and Orlandi Valuta to expand in what has become a fast-growing and very competitive business for money transfers to Mexico," said Charles T. Fote, executive vice president, First Data Corporation. "Western Union can benefit with additional outreach in Mexico money transfer communities. Overall, this relationship will benefit both companies and the Mexico money transfer consumer."

Founded in 1985, Los Angeles-based Orlandi Valuta provides electronic money transfers from the U.S. to Mexico through more than 2,000 retail agent locations in California, Texas, Illinois, Florida and Mexico.

Based in Englewood, Colorado, First Data Technologies serves as a data processing service bureau for other First Data Corporation business units and outside clients.

Also based in Englewood, Colorado, Western Union Financial Services, Inc. is a provider of money transfer services. The company provides rapid money transfer services through more than 30,000 agent locations in more than 130 countries worldwide. Famous for its pioneering telegraph services, the original Western Union dates back to 1851 and introduced electronic money transfer service in 1871.

Western Union and First Data Technologies are subsidiaries of First Data Corporation. Based in Hackensack, NJ, FDC and its business units provide payment systems, electronic commerce and information management services to financial institutions, merchants, insurance companies, health care providers, public utilities and consumers throughout the world.

SOURCE First Data Corporation

EXHIBIT
I

Draft **ANSI/ABA X9.46-1995**
version 0.13

American National Standard For Financial Image Interchange: Architecture, Overview, and System Design Specification

Secretariat
American Bankers Association

Approved Xxxxxxx, 1995
American National Standards Institute, Inc.

Abstract

This standard defines an open electronic data interchange (edi) protocol for use by the financial industry in the exchange of imaged items and financial data across a heterogeneous computing environment. In accordance with the user requirements and system overview specified herein, and supplemented Technical Reference Guide, this standard specifies an architecture and system design for the end-to-end exchange of digitized financial documents. The data structures, and data elements, are defined according to X12.5 and X12.6 Electronic Data Interchange principles, and syntax, for engaging in electronic financial commerce. This standard supports the ability for users to request views of an imaged item from cooperating financial institutions, as well as a means to acknowledge receipt of a Financial Image Interchange at the interchange, or component levels of the interchange. It also provides a means for digitally signing transaction sets, and their contents, as well as canceling outstanding query requests and aspects of previously sent interchanges.

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Financial Image Interchange Protocol Standard

Foreword

At the end of World War II, it became evident that practices for check processing could not adequately accommodate the growing volume of financial transactions in an expanding national economy. A method to reduce significantly the manual labor associated with the check-clearing system, that would at the same time increase the speed with which transaction could be settled, was required. Magnetic Ink Character Recognition (MICR) was the method selected to achieve these goals, and that technology, with refinements and improvements made during the intervening forty years, permitted the payment system to keep pace with the growth of transaction activity which is now over one hundred times larger than it was at mid-century.

As the end of the twentieth century approaches, we are faced with the challenge of improving the check processing and clearing process to achieve greater efficiency, to effectively manage costs, and to support new financial institution products and services.These demands exceed any foreseeable improvement in the present MICR system for handling paper-based transaction records, and once again, leading-edge technology is being called upon to provide a means to overcome this hurdle. Digital imaging is expected to be the method that will provide this next step in system improvement. Once converted to digital image form, paper checks need no longer be manually (or mechanically) handled or transported. Thus, both cost of processing and time required should improved substantially.

Because paper documents, principally checks, are the starting point, it is anticipated that financial institutions will handle both digital image and physical paper during a potentially lengthy transition period.

It is also anticipated that image systems may be called upon to generate and exchange data representing items not presently identified as "checks". For these reasons, this standard has been structured in such a way that permits the present MICR system to continue in general use, without limiting expansion of new image technology.

Comments should be sent to the following location:

Add comment location here!

The following organizations and people were involved at the time this standard was approved:

Add organizations and people here!

1. Scope and Introduction

1.1. Scope

This document defines a standard electronic data interchange (edi[1]) structure (protocol) that can be used to exchange electronic digitized images of financial documents (e.g. checks) among the different financial institutions involved in a payment transaction. This standard uses *edi* to enable the exchange across diverse computing platforms. It specifies the MICR identifier to be placed on a document that is eligible to be truncated, i.e., the physical item may be retained at the first image system institution, and its image may be transmitted to the paying institution in lieu of the actual physicaldocument. It identifies the various image parameter options (such as, compression algorithms, spatial scan densities, and levels of gray) that this standard supports, and offers the open-ended opportunity for expansion of these as development continues in this field. This standard further supports the exchange of imaged items by providing mechanisms for conveying financial data structures which are defined external to this standard. Also, it defines a query protocol that may be used to request specific imaged items, or to request groups of imaged items being held in another institution's image storage facility. Furthermore, this standard facilitates end-to-end, self contained, confirmed services by including two levels of acknowledgments: syntax checking acknowledgments, and application acceptance or rejection acknowledgments. User applications may also utilize the defined security mechanisms which are designed to provide authentication, non-repudiation, and data protection services. It is also anticipated that the standardized formats will be used beyond the limits of the standard, and will facilitate the interchange of user defined data, and non-check items.

This standard emphasizes that the commercial usage of its technology is dependent upon the establishment of formal Banking Practice Agreements between participating institutions.

For electronic check exchange, this standard uses references and examples from X9.37-1994. Other references and examples are considered be outside the scope of this standard.

NOTE - If X9.37 is not used between institutions for the exchange of Electronic Check Exchange data, then a local mapping of the standardized data elements to the non-X9.37 format for electronic check exchange should be developed by those users.

1.2. Purpose

This standard is intended to improve the payments system by supporting the interchange of digitized images of financial documents, specifically checks and similar paper-based instruments; facilitate the truncation of the paper at the earliest possible point in the clearing process; and support transmissions from a single transaction to thousands of transactions serving all banking payment processing applications.

The standard may also be used in support of deferred paper delivery, interactive interchange, or other variations as agreed upon by the exchanging parties.

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1 To accommodate X12, this standard refrains from using the term "EDI". X12 requires that if the term *EDI* is used, then all data elements, data segments, transaction sets, and functional groups are defined in X12.22 (i.e., the X12 data dictionary.) Since many of the data elements and data segment definitions specified in this standard are not duplicated in the X12 data dictionary, the term FII or "edi" is used throughout this standard.

1.3. Introduction

Image interchange among financial institutions can only take place on a wide scale with the incorporation of standards. This standard defines the structure which financial institutions shall use to interchange images. Image interchange will occur among a wide variety of financial institutions using an array of hardware and software, for a number of purposes, some of which are not yet known. The image interchange arena will continue to evolve. Although X9 anticipates that future technology will provide imaging structures which are acceptable by all image systems used for financial purposes, the current environment consists of many different technologies that are not necessarily compatible with one another when used to exchange images between financial institutions.

This standard establishes the architectural structure, protocol, and system design for image interchange in this heterogeneous environment. It does not attempt to define business practices, rules, and/or regulations. The standard does require that financial institutions, and intermediaries, entering into exchange of images will establish formal banking practices agreements that define, for their own purposes, acceptable image quality, time frames, liabilities, right of refusal, penalties, etc. Annex C is included for informational purposes to provide a framework for parties entering into image interchange, concerning areas that should be addressed by a banking practices agreement. The importance of these agreements cannot be overly emphasized. The activity of exchanging a Financial Image Interchange which conforms to this standard can be based on existing regulations, e.g., Uniform Commercial Code (UCC) and the Federal Reserve's Regulation Commercial Code.

Also assumed is every financial institution's commitment to quality images. Quality images require the use of checks designed to meet the specifications stated in ANSI X9.7-1994. When introducing image related products to their customers, financial institutions should clearly explain the requirement to use approved check designs and customer liabilities for failure to do so.

The electronic data interchange (edi) format provides a structure to carry financial data , compressed image data, and descriptive data. in the image detail. The financial data, e.g. posting-related data, may be conveyed in the interchange as binary information. The standard offers the opportunity to request one or more views of all, or a portion of one or more, imaged items in an quasi-interactive interchange. As such, the standard provides for the application to be operated according to normal transaction processing practices, be request driven, or both.

The Financial Image Interchange protocol specified in this document supports the capabilites and functions identified above. This standard is primarily intended to enable the interchange of check images among financial institutions. For the interchange of check items, the standard specifies that the imaged check should contain a "9" in the EPC field and that a banking practices agreement shall exist among trading partners. It also specifies the interchange syntax, and the image parameter options (such as compression algorithms) which are supported.

2. Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All referenced documents are subject to revision and in general, parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent edition of those documents referenced below. Members of ISO/IEC maintain registers of currently valid International Standards. In the US, ANSI is the ISO/IEC member. The ITU Secretariat maintains a list of currently valid CCITT/ITU-T Recommendations. The ANSI Secretariat maintains a list of valid ANSI Standards.

2.1 Paired ISO/IEC standards and ITU-T/CCITT recommendations.

[1] CCITT Rec. X.208(1988): *Abstract Syntax Notation - One*

ISO/IEC 8824: *Specification of Abstract Syntax Notation One (ASN.1)*

[2] CCITT Rec. X.407(1988): MHS: *Abstract Service Definition Conventions*

ISO/IEC 10021-3:1990: MOTIS: *Abstract Service Definition Conventions*

[3] CCITT Rec. T.411-T.419 (1988): *Office Document Architecture*

ISO/IEC 8613:1989: *Office Document Architecture*

[4] CCITT Rec. T.82 (1993) *Coded Representation of Picture and Audio Information - Progressive Bi-Level Image Compression*

ISO/IEC 11544, *Coded Representation of Picture and Audio Information - Progressive Bi-Level Image Compression* .

[5] CCITT Recommendation T.81 (1992), *Information Technology - Digital Compression and Coding of Continuous-Tone Still Images, Requirements and Guidelines.*

ISO/IEC 10918-1: 1993, *Information Technology - Digital Compression and Coding of Continuous-Tone Still Images, Part I: Requirements and Guidelines.*

[6] CCITT Recommendation T.83 (1994), *Information Technology - Digital Compression and Coding of Continuous-Tone Still Images - Compliance Testing.*

ISO/IEC 10918-2: 1994, [DIS] - *Information Technology - Digital Compression and Coding of Continuous-Tone Still Images, Part 2: Compliance Testing.*

[7] CCITT Draft Recommendation T.84 (1994), *Information Technology - Digital Compression and Coding of Continuous-Tone Still Images - Extensions.*

ISO/IEC 10918-3: 1994, [DIS] - *Information Technology - Digital Compression and Coding of Continuous-Tone Still Images, Part 3: Extensions.*

[8] *CCITT Recommendation X.208 (1988) Data Communications Networks - Open Systems Interconnection (OSI) - Model and Notation - Service Definition - Specification of Abstract Syntax Notation One (ASN.1)*

ISO 8824 Standard (1987, Information Processing Systems - Open Systems Interconnection - Specification of Abstract Syntax Notation One (ASN.1)

[9] *CCITT Recommendation X.402 (1988), Data Communication Networks - Message Handling Systems: Overall Architecture.*

ISO/IEC 10021-1 Standard: Information Processing Systems - Text Communication - Message Oriented Text Interchange System - Part 2: Overall Architecture

2.2 ITU-T/CCITT only standards

[10] CCITT T.6 (Group 4) - International Telecommunication Union - CCITT - The International Telegraph and Telephone Consultative Committee Blue Book - Vol. VII - Fascicle VII.3 - Terminal Equipment and Protocols for Telematic Services - Geneva 1989, pp 48-56, ISBN 92-61-03611-2.

2.3 ISO/IEC only standards

[11] ISO/IEC 7372:1986 - *Trade Data Interchange - Trade Data Dictionary*

[12] ISO/IEC 9735:1987 - *Electronic Data Interchange for Administration, Commerce, and Transport (EDIFACT) - Application Level Syntax Rules.*

[13] ISO/IEC 11166-1 - *Banking - key management by means of asymmetric algorithms - Part 1: Principles, procedures, and formats*

2.4 ANSI standards and technical guidelines

[14] ANSI X3.92(1992) *Data Encryption Algorithm*

[15] ANSI X9.7 - 1982: *Check Based Standard*

[16] ANSI X9.9 - 1982: *Financial Institution Message Authentication (Wholesale)*

[17] ANSI X9.13 - 1982: *Imaged Document Requirements*

[18] ANSI X9.17 - 1985: *Financial Institution Key Management (Wholesale)*

[19] ANSI X9.27 - 1988: *Print Specifications for Magnetic Ink Character Recognition*

[20] ANSI X9.30 - 1993: *Public key cryptography using irreversible algorithms for the Financial Services industry Part 1: The DSA Signature Algorithm*

[21] ANSI X9.31 - 1993: *Public key cryptography using reversible algorithms for the Financial Services industry Part 1: The RSA Signature Algorithm*

[22] ANSI X12S 91-690 - 1991: *Introduction to Electronic Data Interchange*

[23] ANSI X12.5 -1994*: Interchange Control Structure (release 003050)*

[24] ANSI X12.6 -1994*: Application Control Structure (release 003050)*

25] ANSI X12.58 - 1994: *Security Structures (release 003050)*

[26] ANSI X9.37 - 1994: *Specifications for Electronic Check Exchange*

[27] ABA/TG X9.15 - 1995: *Financial image interchange: Technical guidelines* [Draft]

3. Definitions, terms, and conventions

This section contains terms and definitions used throughout this Specification for the purpose of this standard and takes precedence over normal use.

3.1. General terms

The following terms used in this Standard are included in the glossary, annex J of this Specification

Adaptive Bilevel Image Compression (ABIC)	Financial data	: Partial view
	Financial institution	Pel (picture element)

Authentication
CCITT
Character repertoire
Character set
Character string
Check processing data
CIPS
Clipping
Continuous tone
Compression
Compression algorithms
Communication protocol
Confidentiality
Consumer
Copy
Cropping
Data stream
Decompression
Default
Dots per inch (DPI)
ECCHO
ECE (Electronic check exchange)
EDI (Electronic Data Interchange)
edi (non-X12 conferment EDI)
Envelope
FacsimileFII
(Financial Image Interchange)
FII-system-user
FII-translator
FIIS (Financial Image Interchange System)
FIIP (Financial Image Interchange Protocol)
Grayscale
Group 4 (T.6)
Huffman coding
IOCA
Image (digital image)
Image capture
Item views
Image raster data
Image processing
Integrity
Interchange
Interchange format
Interchange protocol
Interoperate
Item
Item views
ITU-T (International Telecommunications Union, Telecommunications Standardization Sector)
JBIG
JPEG
Local time
Lossless compression
Lossy compression
Media
Message
Object
Octet
ODA (ISO/IEC's Open document architecture standard)
Orientation
Page
Pixel (picture element or pel)
Port
Protocol
Repudiation
Resolution
Run-length encoding
Sampling resolution
Scaling
Scan line
Services
Snippet
Spatial scan density
Supplier
Text
Thresholding
TIFF (Tagged image file format)
Transaction
Transaction Set
Transcoding
Translator
Truncation

UCC (Universal commercial code)
View
View parameters
View processing data
Workflow
Zone

3.2. Protocol syntax

The following syntax conventions are applied throughout this standard:

a. The Backus Naur Form (BNF) syntax is used to specify the FII data structures, data elements, and subelement protocol components. See 6.1.5 for additional details.

- Syntactic entities, i.e., data elements, are denoted by lowercase strings enclosed in angle brackets "**<label>**" in accordance with X12.6.
- The defined construct on the left side of a statement is separated from the defining right side by two colons and an equal sign "::=". In other words, the statement on the right of "::=" defines the value of the data element named on the left side of "::=".
- A vertical bar "|" indicates an "or" condition, or alternative definition in accordance with X12.6.
- Braces "{}" enclose an item which may appear zero or more times in accordance with X12.6.
- Square brackets "[]" enclose optional items in accordance with X12.6.

- Parenthesis "( )" identify the size range. If the element is defined to have sub-elements, the size of the element includes the subelement delimiters, otherwise it does not.

  The construct "(xx/yy)" identifies the lower and upper limits of the size range. The size occurs immediately after the **<label>**

b. Data element BNF names appear in **bold** when used in in-line text.

C. For more definitive information see X12.6.

The syntax used in annex A is generally of the form:

<label> ::= <other label> | <sequence of labels> | <data type> | "value"

where ::= means "*is defined to be*" and
| means "*or*"

4 Summary of standard

This clause summarizes the functions of the standard and business considerations critical to a successful implementation of the standard.

A technical overview appears in clause 5, which introduces the detailed specification contained in clause 6, and is supported by annexes A, B and C. Annex J contains a glossary of terms used throughout this standard. A technical guideline (ANSI/ABA TG15-199x) supports implementation procedures and provides additional overview and explanation.

4.1 Summary of functions

The Financial Image Interchange standard defines the structure for sending and receiving of the following: financial data; digitized images with associated data; query requests; and acknowledgments. It also covers the retrieval of views, cross referencing of images to electronic check exchange (ECE) data, cross referencing within an interchange, and between interchanges, and compression algorithm support.

4.1.1 Financial data

This standard defines mechanisms for sending and receiving financial data, such as an entire ECE. The financial data format is specified in formats such as those defined by X9.37, ECCHO, the Federal Reserve, or the Banking Practices Agreement. For detail specification, see 6.4.1.

4.1.2 Digitized images and associated data

This standard defines mechanisms to exchange a digitized image (or images) of an item, or portions of a digitized image, with associated data. The exchanging of images and data may support forward or return processing, or the response to a request. It may comprise a single item, or a bundle of items. A bundle of items relates to an associated ECE bundle, or just a set of items sent together. A group of bundles relates to an associated ECE cash letter, or just a set of bundles sent together.

- **Items**: For each item, e.g. check, this standard defines mechanisms for sending and receiving both information about the item (*item information*) and digitized representations of the item. Item information includes such things as the amount of the item, payor bank routing number, and image key. Digitized representations of the item include such things as the item's front or back, portions of an image view, or multiples of each.

- **Bundles of Items**: For each bundle of items, the standard defines a mechanism for providing control information, such as amount of bundle, end-point, and number of items in the bundle.

- **Groups of Bundles:** For each group of bundles, the standard defines a mechanism for providing control information similar to that for bundles of items.

For detailed specification, please see 6.4.2.

4.1.3 Query requests

This standard defines mechanisms for sending and receiving query requests. The user application may request item information, views of an item, or both, for one or more imaged items. Several different Query Requests functions are supported:

- "Retrieve by specific key" requests that the receiver (i.e., a user application) return images, item information, or both, for the items identified by an image key, or list of image keys.
- "General search" requests that the receiver return images or item information, or both, for the items which meet all of a set of criteria. The selection criteria may include:
  - Business Date, or range
  - Sequence Number, or range
  - Cycle Number, or range
  - Amount, or range
  - Account Number, or range
  - Check Serial Number, or range
  - ECE Routing Number
- "Cancel" requests that the receiver cancel aspects of a previously sent interchange which contained financial data, digitized representations of items, or query request(s).
- "Restart" requests that the receiver restarts a previous query request which had been terminated because some of the specified constraints were exceeded.

For detail specification, please see 6.4.4.

4.1.4 Acknowledgments

This standard defines mechanisms for sending and receiving two classes of acknowledgments. One class of acknowledgment advises whether, or not, the syntax of the interchange, or portion of an interchange, is correct. The other class advises whether, or not, the contents of an interchange, or portion of an interchange, is correct.

For detail specification, please see 6.4.3.

4.1.5 Retrievals

This standard defines mechanisms for carrying sufficient information with an image view, or views, to support the retrieval of individual views (e.g. front only, back only), partial views or snippets (e.g. signature, endorsement), and multiple views (e.g. front and back, front, back, and signature).

4.1.6 Cross-referencing images

Cross-referencing mechanisms are provided at two levels in this standard:

- Cross-referencing an imaged item with its associated detail financial data;

The tool for this level is the image key, which accompanies an imaged item as part of the item information. For example, the image key can be constructed from the components of the financial data.

- Cross-referencing components of an interchange with other components of the same interchange, or with components of other interchanges;

  The tool for this level is a set of cross-reference data elements. For example, mechanisms are provided for cross-referencing between queries and responses, or between an entire financial data interchange and an imaged item interchange.

4.1.7 Compression algorithm support

Compression of views of items included in an interchange shall use one or more of the following algorithms, and associated parameter options, in accordance with Banking Practices Agreements. For details on supported compression algorithms, please see annex B.

Table 1 - Compression algorithms and parameter options

Compression algorithm	Spatial scan density[2]	Number of gray levels
Uncompressed	80-240 DPI	2,4,16,64,256
CCITT T.6	200-240 DPI	2
ISO JPEG Baseline (1 component)	100-200 DPI	256
JBIG Baseline, D=0 (Reserved - not released)	80-240 DPI[1]	2,16
ABIC	80-240 DPI[1]	2,16

NOTES -

1. Bi-level (2 levels) shall have a spatial scan density greater than or equal to 200 DPI.
2. "DPI" is the number of dots per inch.

4.2 Summary of business considerations

This clause includes business considerations addressing recommended procedures and practices designed to assist in implementation.

4.2.1 EPC "9" authorization

Only the payor bank shall authorize its customer to use checks printed with a "9" in the EPC field of the MICR line. The presence of the "9" in the EPC field of the MICR line designates a check as a candidate for item truncation and subsequent image interchange.

4.2.2 Banking practices agreement

Participants in financial image interchange shall establish a Banking Practices Agreement (BPA). This agreement provides a formal basis for interchange between institutions.

To assist in understanding Banking Practices Agreements, annex C covers the following:

1) Description of a suggested framework for interchange covering presentment and settlement terms, storage and availability of images, and returns, drawing on existing regulations;

2) A pro forma Banking Practices Agreement formalizing this framework; and

3) A description of other business, or technical considerations, such as communications method, media used in the interchange, acceptable compression algorithms and imaging parameter options, ASCII or EBCDIC encoding, and image requirements.

4.2.3 Imaging considerations

The following points address considerations for imaging of items:

4.2.3.1 Images and associated electronic check data

The interchange of check images shall always be predicated upon the financial data. The financial data shall precede, or accompany, the image (and its corresponding item information). The financial data could have arrived hours, days, or even years earlier.

4.2.3.2 Image capture

The institution participating in check image interchange shall capture both the full front and the full back of the item.

4.2.3.3 Image, front and back

The institution participating in check image interchange shall provide the ability to interchange the full front or the full back of the item, or both, in accordance with the Banking Practices Agreement.

4.2.3.4 Accepting images

Payor institutions should accept "usable" images provided according to prior Banking Practices Agreements (see annex C). The payor institution shall have the right to refuse an image, a group of images, or an entire image interchange, if deemed unusable, and request the physical items(s).

4.2.4 Financial data considerations

The following clauses address considerations for financial data.

4.2.4.1 Sending financial data with images

The images and financial data may be sent together, or separately. However, the financial data (i.e., electronic check exchange data) should be sent in a separate interchange from its associated images. This is recommended primarily because of the importance of the financial data. Because of the relatively large size of interchanges containing images, the processing of interchanges containing both financial data and imaged items may impact adversely the processing time for financial data.

4.2.4.2 Correlation of imaged items to financial data

Financial data shall contains sufficient information to correlate to the imaged items. If using an X9.37 format, the components of an image key can be created from elements of an ECE Bundle record , together with components of the ECE Check Detail record . This is possible only if the institution creating the image is the same as the ECE institution, and the ECE bundles are not broken anywhere prior to receipt by the payor. Therefore, this standard assumes that an intermediary never breaks an ECE bundle.

- The institution creating the image also must have the financial data available to create properly an image key. This is true even if the institution creating the image is not the same as the ECE institution.
- The institution creating the image shall use financial data to create the image key, even if it uses a different:
  - Sequence number for the image from that of the ECE Item Sequence Number; or
  - Date for the image from that of the ECE Business Date.

  In the event it uses a different sequence number, or date, it shall maintain an internal cross-reference to access the image, if needed. The payor bank remains unaffected.

If the institution creating the image uses other procedures, the correlation between the image and the financial data is subject to local views.. If the correlation between an image and its corresponding financial data is not possible, the payor may use the right of refusal to ask for the paper, or for other arrangements, as stipulated in its Banking Practices Agreement.

4.2.5 Query request considerations

When originating a query request, users should observe the following:

- Multiple requests for the same institution may be sent in the same interchange;
- When an acknowledgment has been requested, a negative acknowledgment is used to indicate that a request failed;

4.2.6 Acknowledgment considerations

Application Acknowledgments resulting from the receiving FII-system-user's failure to accept a Functional Group or a Transaction Set shall always be sent, unless otherwise indicated. The user may expressly request that all Application Acknowledgment types not be sent.

Requested Functional Acknowledgment shall be generated before any Application Acknowledgment is generated, and Application Acknowledgment shall be generated before any response to a query request is generated.

5. Technical overview

5.1 Introduction

This overview provides a high level description of the financial image interchange process, the structure of the image and the image related data, and the use of data structure in the interchange process. This standard provides for end-to-end exchange, query, and acknowledgment of financial data and images. It does this by presenting a system model and a description of its protocol components: data, data structure, translator, and internal procedures.

This standard specifies the data groups and data structure for financial image interchange. In addition to interchanging images, this standard also supports interchanging financial data, acknowledgment, and query request services associated with images and financial data. It does this by defining expected procedures to be followed to complete an end-to-end exchange of information, so that translators achieve a common minimum level of service. The creation and use of the data by the originating and receiving imaging applications at the communicating financial institutions are outside the scope of this standard. The process of how to deposit the data into, and withdraw them from, the data structure and the method employed to deliver the data structure containing the deposited data (communication method) are outside the scope of this standard.

This standard also defines the conditions for which a financial image interchange translator is deemed compliant on origination and reception.

Clause 5 introduces the concepts for Financial Image Interchange.. Clause 6 and Annex A provide the detail specification.

5.1.1 System model overview

An analogy of a person sending a letter to another person may be used to explain how an image interchange system works. Figure 1 shows two persons involved in the letter communication process. One is the originating person, and the other is the receiving person. The originating person writes a letter, puts it into an envelope, and drops the envelope into a post office mail box. The post office takes the envelope and delivers it to the receiving person. The receiving person opens the envelope, withdraws the letter from it, and reads the letter.

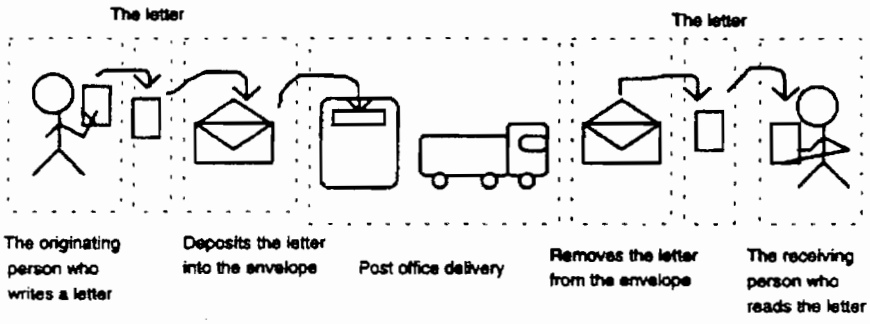

Figure 1 - An analogy of a person sending a letter to another person

An imaging interchange system is similar to the preceding analogy. As illustrated in figure 2, in an imaging interchange system, there is an originating imaging application and a receiving imaging application. The originating application produces data, deposits the data into a data structure, and sends it by some kind of communication method. The receiving imaging application withdraws the data structure to obtain and process the data. The process of depositing data into, or withdrawing data from, a data structure is accomplished by the (financial image interchange) *translator*.

This standard describes the data (the letter contents) and the interchange, consisting of the envelope and its contents (data). In this standard, the Financial Image Interchange (FII) is the instance of an electronic data interchange (edi) defined in this standard.

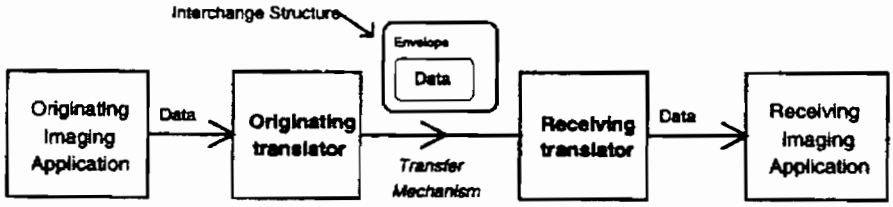

Figure 2 - An abstract representation of the FII system's model

An abstract representation of the financial image interchange system's model is shown in figure 2. This model represents the end-to-end interchange process, from the originating imaging application to the receiving imaging application. In the model, data to be interchanged may consist of any combination of the following: financial data, item groups (image view data), acknowledgments, or query requests. There may

be many FII-translators that operate on the contents of an interchange as it moves to its final destination. The data to be interchanged from the originating imaging application are packaged by the FII-translator, and sent to the receiving imaging application. Upon receipt of the interchanged data, the FII-translator will parse the incoming data for the receiving imaging application. Then, the receiving imaging application may generate acknowledgments or replies to query requests, and become the originating imaging application for a new image interchange.

The image interchange system terms corresponding to those in the analogy shown in figures 1 and 2 are listed as in table 2:

Table 2 - Relationship between FII terms

FII terms	Figure 1 terms	Figure 2 terms
FII-system-user (application)	The originating person	The originating imaging application
User data	Letter	Data
FII-translator (originator)	Deposit the letter into the envelope	Originating translator
FII structure	Addressed envelope with contents (data)	Interchange structure
Transfer mechanism	Post office mail delivery	Transfer mechanism
FII-translator (receiver)	Withdraw the letter from the envelope	Receiving translator
FII-system-user (application)	The receiving person reads the letter	The receiving imaging application uses the data

This analogy is used only as an aid in explaining the use of a standardized interchange, and is not intended to be an implementation directive.

5.1.2 Data

The originator of an interchange has the purpose of providing data, and the receiver of an interchange has the intent to do work from the data received in an interchange.

Using the analogy described in figure 1, the data to be interchanged corresponds to the contents of the envelope. Inside the envelope, there may be several letters and each letter may have several pages and paragraphs. Indeed, several letters may be sent. In the context of this standard, each letter can be viewed as a functional group, consisting of data, which is defined to perform a similar function.

The kinds of data supported in this standard are as follows:

- Financial item processing data which relate to a physical financial item;
- Digitized representations of an item, and its corresponding image processing data;
- Query request data for requesting information about stored imaged items, or for requesting the images themselves;
- Receiver acknowledgment data to signal acceptance (or rejection) of a transmission, as well as a listing of the names of imaged items found that meet a set of query selection criteria.

The functional groups which correspond to the four kinds of data mentioned above are the following:

- Financial data
- Item Views
- Functional Acknowledgment
- Application Acknowledgment
- Query Requests

More than one Functional Group may be included in an interchange. An interchange may contain a mix of functional group types.

In the current environment of paper check exchange, a cash letteranalogy can be applied to the design of the Financial Data, and Item Views functional groups:

Table 3 - Paper exchange and its FII-structure counter part

Paper exchange	FII structure counterpart
Electronic cash letters	Financial data segment
Groups of physical cash letters	Item views functional group
Physical cash letters	Item group transaction set
Physical kill bundles	Item subgroup
Physical items	Item data

5.1.3 Data structure

Figure 3 shows the general organization of interchange data structures within an X12 EDI interchange. The contents within the envelope consist of one, or more, groupings of data which are functionally related, called a functional group. A functional group contains a group header, a group trailer, and group contents. The group contents consists of sets of related transaction data, called transaction sets, and optionally, a group of security header and trailer. Transaction sets consist of related data organized in the form of segments, called data segments. Data segments are made up of a segment identifier, data elements, and delimiters.

The term *structure* is used throughout this document for simplicity to identify Functional Groups, Transaction Sets, and Data Segments.

The details of a functional group's content can be found in clause 6.

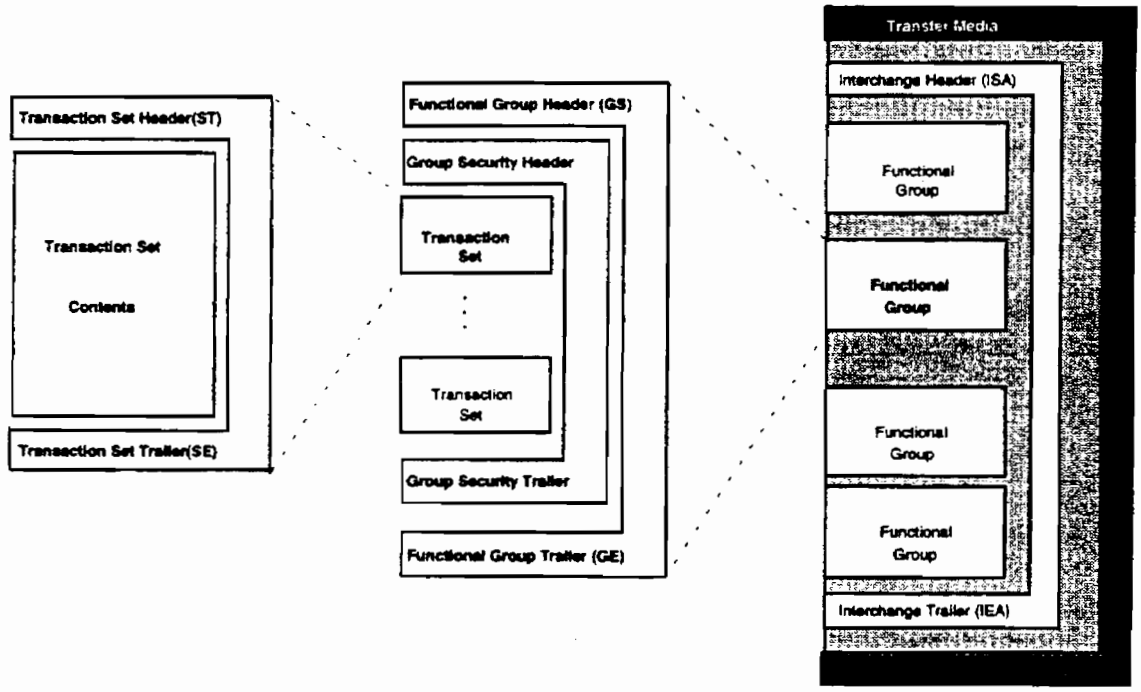

Figure 3 - Interchange data structure

The transaction set contents are different for each functional group.

For example, the structures contained in the FII's functional groups are as follows:

- For a Query Requests functional group, the transaction set contents contain query request data;
- For an Item Views functional group, the transaction set contents contain item bundles of views, item information for the views, and item view data;
- For a Financial Data functional group, the transaction set contents contain financial data;
- For an Application Acknowledgment functional group, the transaction set contents contain acknowledgment data. Security header, security trailer, and other security data are handled by mechanisms outside of, and beyond, this specification, but are accommodated by this standard;
- For a Functional Acknowledgment functional group, the transaction set contents contain syntax analysis results data. Security header, security trailer, and other security data are handled by mechanisms outside of, and beyond, this specification, but are accommodated by this standard.

5.1.4 edi translator

The edi Translator (FII-translator) function of the originating application produces an interchange object (i.e., a complex data structure) by translating the output of the local image handling, data processing, or data storage application into a standardized interchangeable "edi" structure. The peer edi Translator function of the receiving application translates the "edi" interchange into the locally understood data structures for subsequent storage or processing of the data by the receiver's application. The functions of the FII-translator are shown in figures 4 and 5.

In the examples of the originating and receiving applications in figures 4 and 5, the Functional Groups are all of one type, and could be any one of the data groups defined herein.

The FII-translator's functional model, i.e., the behavior of the translator, and the emitted (and accepted) protocol are covered in this Standard, and further elaborated in annex D of this standard. The translator is modeled as having 2 interfaces: one well specified interface which emits and receives FIIs, and a "fuzzy" interface that passes data to and from the user application. Some times this standard places requirements on actions that occur across the fuzzy interface that may be implemented by either the user application, the translator, or by some private means. However, the internal design of a FII-translator is not part of this standard.

NOTE - A FII-translator may be implemented as part of imaging applications, to enable imaging applications to deposit the data groups into, or withdraw them from, the interchange data structure.

Figure 4 and 5 show examples of a translator processing multiple functional groups of imaged items on behalf of originating (Figure 4) and receiving (Figure 5) imaging applications. The translator follows a sequential series of steps, diagrammed as a switch, which emits and accepts standardized interchange. The standardized interchange is the standard structure that is exchanged across system boundaries.

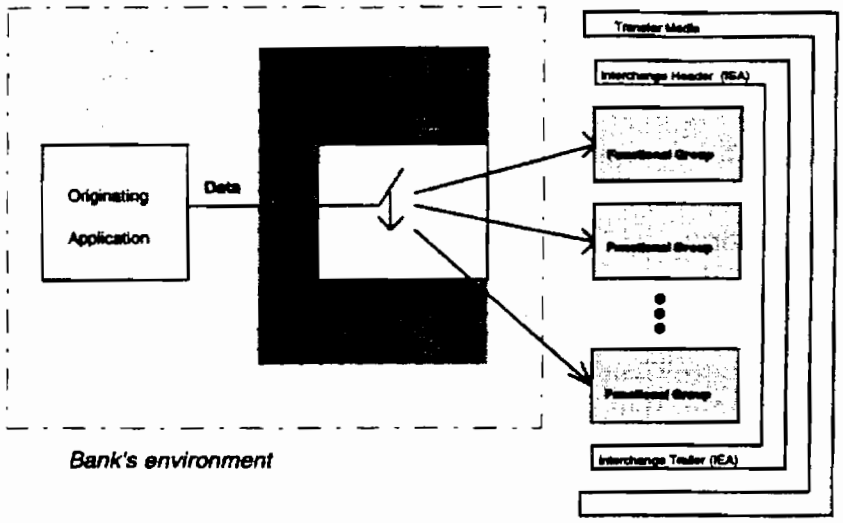

Figure 4 - Function of an EDI Translator of the originating application

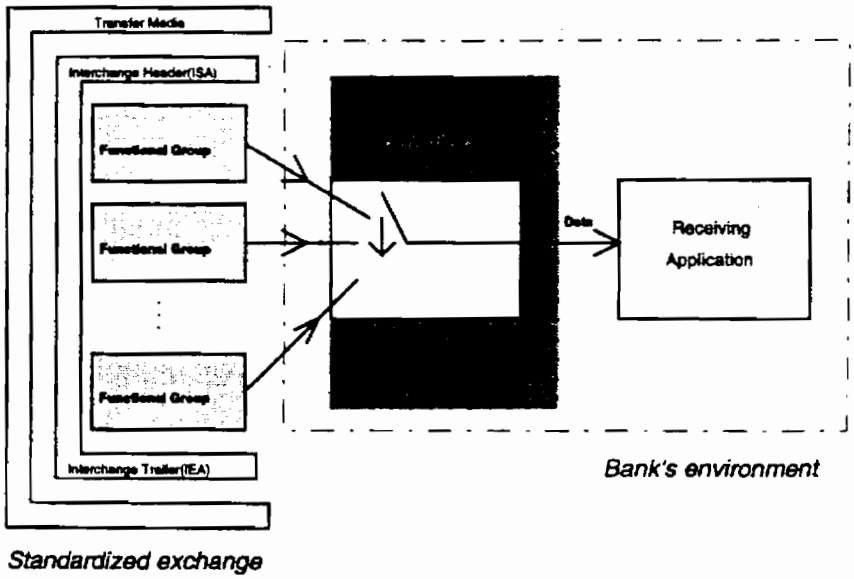

Figure 5 - Function of an EDI Translator of the receiving application

5.1.5 Communication method

A communication method specifies how packaged interchange content is delivered from the originating imaging application's FII-translator to the receiving imaging application's FII-translator. Examples of such a method are:

- Through physical delivery of a computer medium which contains the packaged interchange data.
- Through a computer network by transmitting the packaged interchange data electronically.

The specifics of the communication method are outside of this Financial Image Interchange Standard, but are within the purview of a Banking Practices Agreement.

6 FII technical specification

This clause specifies the Financial Image Interchange (FII), including data structures and protocol that are used for the conveyance of the data in accordance with the FII Model specified in annex F. The FII Model, illustrated in figure F.3 employs a hierarchical order when specifying the names, contents and definitions of the X12 ISA header, X12 IEA trailer, functional groups, transaction header sets, and data segments.

This standard is wholly based on the principles and transaction interchange formats as defined in the X12 EDI specification. However, it goes well beyond the current capabilities of the X12 EDI model by introducing query and acknowledgment translator services for FII-system-users.

6.1 Conventions, character sets, and data types

The following clauses specify the notation conventions, character sets, and data types used throughout this specification.

6.1.1 Interchange structure template

Each clause that defines a functional group, transaction set, or data segment will be specified using the following template:

- Name;
- Description including:
  - Purpose;
  - Number of occurrences;
  - Position in the interchange hierarchy.
- Protocol support;
- Business usage;
- Table of elements in structure.

Each **data element** and **sub-element** will be defined with the following (see 6.1.2 for more explanation):

- Name;
- Description including:
  - Source;
  - Examples.
- Size;
- Data type (alpha-numeric, numeric, decimal, etc.);
- Values;
- Protocol support;
- Business usage.

6.1.1.1 Values

Values for X9 defined data elements and X12 specified data elements shall be only those defined in this version of the standard. Values which are *reserved* in this standard for *private use* may be used per the Banking Practices Agreement. Any value that is not *reserved*, or defined in this standard shall not be

used, as its presence may cause rejection of the interchange by a receiving application, or may be used in future versions of this standard. Future versions of this standard may assign a different meaning to that value.

Some element values have been defined as the concatenation of values from other data elements without the use of the subelement separator. When concatenated without the subelement separator, the value of the element is populated left to right, as specified in the description for the (concatenated) element.

The term *DEFAULT* has been applied to certain data element values throughout this Specification. When used in the data element's definition, the value, identified with the key word *DEFAULT,* shall be understood and used, by the receiving FII-translator when an actual value for that data element is absent from the interchange. If an actual value is present in the interchange for a *DEFAULT*ed data element, the value that is present takes precedence over the *DEFAULT*. *DEFAULT*s provide a mechanism for reducing the size of an interchange.

NOTE – The fact that a minimum length is specified for values does not prevent Optional (or DEFAULTed) values from being entirely absent from an interchange with an actual length of zero. This descriptive convention is used to be consistent with X12 standards.

6.1.2 Element table conventions

The element tables used throughout this standard summarize the structures, data elements, and data subelements. Each table uses the following layout and conventions:

Table 4 - Element table conventions

Data Element Names	Size	Data type	Ref.[2]	Protocol support	Business usage
<structure_name> [1]					
<element_name>					
<subordinate_element_name>					
<subelement_name>					

1 - The **<element_name>** may also be a *structure* name

2 - X9.46 referenced components are shown in brackets, while X12 referenced components lack brackets.

All loops in this standard should not exceed 999999 iterations, unless otherwise specified in this standard.

A dash (–) in any column of the table indicates that column is not applicable for that specific data element. The column titles indicate the following information:

a. Data element names

This column contains the structure, data element, and data subelement names that are to be used for each entry. The names are surrounded by <> to match the BNF coding notation used in annex A. Successively lower levels are indented. A **<subordinate_element_name>** in *italics* is present to identify a parent data element which is included for information only. It has no identity in the protocol, except through its associated subelements, i.e., **<subelement_name>**.

b. Size

This column shall define the minimum and maximum number of characters (size) of the value for

a data element when present. The format is *XX/YY* where *XX* is minimum size, and *YY* is maximum size. Values outside of the range shall be considered protocol violation. If the data element is composed of subelements, the size includes the sub-element separator characters. The data element delimiter (<gs>) and structure delimiter (<tr>) are not included in the size value.

The size for subelement values does not include the subelement separator. However, subelement delimiters are included in the size of the parent data element because subelement separator(s) shall be present in a data element even though the value for the subelement may be absent. For example, when the data element consists of 3 sub-elements, the size value for *XX* and *YY* will be determined as the value, plus 2 characters for the 2 sub-element delimiters.

The size of a structure is the sum of the following components:

- 1 character for each data element delimiter, plus,
- 1 character for the structure terminator (<tr>), plus,
- 2 or 3 characters for the length of the structure identifier (e.g., "GS" = 2 characters), plus,
- size of the value for the actual data element.

c. Data type

This column shall contain values which represent the kind of data required for the entry. The values shall be date (**DT**), time (**TM**), string (**AN**), numeric (**Nn**), decimal number (**R**), binary (**B**), or identifier (**ID**). The meaning of these values is described in 6.1.4 through 6.1.9.

The ID type requires that the values be registered in X12.22.

d. Reference

This column contains the appropriate reference for any data element specified in X12.5, X12.6, X12.22, and X12.58 version 003050 and structures defined in this standard. The reference is to the X12 data dictionary number, or label. This column's value is omitted only for X9-only-defined data elements and subelements. For example, if the table defines the X12 ISA header, this reference is to the X12.5 data element definitions. A structure enclosed in brackets ([ ]) is defined by X9.46.

e. Protocol support

This column contains values indicating the support required by this standard, and X12, for these entries. Support shall be verified as part of an implementation's conformance evaluation. The values shall be one of the following:

M Mandatory:

On origination of the interchange, this data structure (functional group, transaction set, data segment), data element's value, or subelement's value, shall be present, and shall comply with its defined syntax, i.e.., size and data type as specifiedAn error shall be generated if this data structure (functional group, transaction set, data segment), data element, or subelement, is absent.

On reception of the interchange, this data structure (functional group, transaction set, data segment), data element, or subelement, shall be present, and shall comply with its defined syntax, i.e., a size and data type as specified. An error shall be generated if this data structure (functional group, transaction set, data segment), data element, or subelement, is absent.

An optional data-element may contain optional or mandatory subelements. If a subelement is mandatory it shall be present when the parent data element is present.

O Optional:
On origination, this data structure (functional group, transaction set, data segment), data element, or subelement may be supported by the translator . When supported, it shall have a size and data type as specified

On reception, FII-translator shall support this data structure (functional group, transaction set, data segment), data element, or subelement as follows:

If present, this data structure (functional group, transaction set, data segment), data element, or subelement shall be handled by the receiving FII-translator and shall be made available to the receiving FII-system-user.

- "Handle" means that the FII-translator will recognize it, correctly parse its syntax, and validate only its size and data type.

- "Make Available" means that the FII-translator will pass the data contents to the FII-system-user.

If not present, no error will be generated because of the absence of an optional data structure (functional group, transaction set, data segment), data element, or subelement.

Cx Conditional: The FII-translator's origination Support for this data structure, data element, or subelement is mandatory under certain conditions, and optional under all other conditions.

The predicates "x" are indicated with numbers (i.e. Cx) defined as follows:

C_1 shall be supported if security at the present structural level is supported.

C_2 Conditional, valid only when the value of **<trans_set_id>** in the Transaction Set header is Item Group, Financial Data, or Query Request

C_3 required when cross referencing between transaction sets.

C_4 each shall be supported, but only one shall be present in acknowledgement.

C_5 if Query Requests Functional Group is supported, it too shall be supported. However, it shall only be present in a cancel request ("0"), and no other data elements shall be included in the segment.

C_6 shall be present only if signature data **<signature_data>** is present.

C_7 either the **<subject_ts_ref_id>**, **<subject_isd_ref_id>**, **<subject_item_ref_id>**, **<subject_qrd_id>**, or **<subject_item_view_id>** shall be present. The presence of more than one of these shall be considered a protocol violation.

The term **valid** is used in the predicates C_8 - C_{23} to indicate that the applicability of a specific data element depends on the type of structure and function. It does not dictate the presents of the value in the interchange, and the data element is considered to be optional.

C_8 valid only if the **<query_request_type>** is other than a cancel request ("0")

C_9 valid only in a Financial Data Functional Group

C_{10} valid only in a Item Group Transaction Set

652 C_{11} valid only if required by or applicable to the security mechanism utilized.

653 C_{12} valid only if the **<query_request_type>** is cancel request ("0")or restart request
654 ("3").

655 C_{13} valid only if the **<query_request_type>** is search request ("2").

656 C_{14} valid only if the **<query_request_type>** is retrieve request ("1").

657 C_{15} valid only when **<view_side_requested>** is frontal view ("0") or rear view ("1").

658 C_{16} valid only if the **<query_request_type>** is restart request ("3").

659 C_{17} valid only if **<application_ack_diagnostic_code>** indicates that constraints have
660 been exceeded ("8").

661 C_{18} valid only if snippets are used.

662 C_{19} valid only if both snippet origin and offset are used.

663 C_{20} valid only if snippet origin is used.

664 C_{21} valid for any transaction set, shall be present when responding to a query request.

665 C_{22} valid only when the acknowledgement is in response to a query request other than
666 Query Cancel Request ("0").

667 Only elements designated OPTIONAL may identify a DEFAULT value. A DEFAULT shall indicate
668 that, if the value for the element is absent in an FII, a receiving FII-translator shall understand it to
669 convey the semantics of the value designated as DEFAULT in this standard. Receiving FII-
670 translators, or FII-system-users, shall not consider the absence of any Optional, or *DEFAULT*ed,
671 element of protocol to be a protocol violation. If two structures or elements may be either both be
672 present or not present, the first element (such as header) is designated as OPTIONAL and the
673 second, such as a trailer, is designated CONDITIONAL.

674 The fact that a minimum length is specified for values, does not prevent Optional (or
675 DEFAULTed) values from being entirely absent from an interchange with an actual length of zero.
676 This descriptive convention is used to be consistent with X12 standards.

677 f. Business usage
678
679 This column contains values indicating the support required of business user applications by this
680 standard. Its value expands upon the protocol support as required by the business community.
681 The values shall be one of the following:

682 **M** Mandatory: The value(s) for this data structure, data element value, or subelement value
683 shall be present upon origination of the interchange, and shall comply with its defined syntax,
684 e.g., have a size and data type as specified. Business usage is always mandatory when
685 protocol support is mandatory.

686 $\mathbf{B_x}$ Business Conditional: A value for this data element or subelement is present, or absent,
687 under certain conditions, or as defined in the Banking Practices Agreement. Specific
688 predicates are indicated with numbers (i.e. Bx) defined in the inline text. Use of a Default
689 value satisfies a Business Conditional usage requirement.

690 B_1 shall be present only if specified in Banking Practices Agreement.

691	B_2	shall be present unless explicitly omitted in the Banking Practices Agreement.
692	B_3	shall be present only to override or supplement Banking Practices Agreement.
693	B_4	shall be present if financial data is in the interchange.
694	B_5	shall be present if views of imaged items are in the interchange.
695	B_6	shall be present if a Functional Acknowledgement is conveyed in the interchange.
696	B_7	shall be present if an application acknowledgement is conveyed in the interchange.
697	B_8	shall be present if a Query Requests Functional Group is present in the interchange.
698 699	B_9	shall be present only to specify or to convey security features or security mechanism..
700	B_{10}	shall be present if the **<query_request_type>** is restart request ("3").
701	B_{11}	shall be present if the data element is required.
702 703	B_{12}	shall be present if an acknowledgement is requested, and the defaults are inappropriate.
704 705	B_{13}	shall be present when responding to query request, may be present for other transaction sets.
706 707	B_{14}	shall be present for transaction sets containing item group, financial data, or query requests.
708 709	B_{15}	shall be present only to redirect an acknowledgement to a recipient other than the sender of this functional group.
710	B_{16}	shall be present when responding to a Query Request.
711	B_{17}	shall be present only to specify a limit for a generic criterion.
712 713	B_{18}	shall be present when **<general_fii_extensions>** are conveyed in the Financial Data Functional Group.
714 715	B_{19}	shall be present when **<general_fii_extensions>** are conveyed in the Item Group Transaction Set.
716	B_{20}	shall be present only in an Item Group Tranaction Set.
717 718	B_{21}	shall be present in Item Views Functional Group unless explicitly omitted in Banking Practices Agreement.
719 720	B_{22}	shall be present to cross reference to financial data, or query requests, if appropriate.
721 722	B_{23}	shall be present when cross referencing to another X9.46 transaction set, unless explicitly omitted by the Banking Practices Agreement.

B_{24} shall be present only to supplement the routing number of the financial institution by, or through whom, the item is payable.

B_{25} shall be present if necessary to identify properly the snippet.

B_{26} shall be present when **<clipping_info>** are conveyed.

B_{27} shall be present only if **<application_ack_diagnostic_code>** indicates that contraints have been exceeded unless explicitly omitted in the Banking Practices Agreement.

B_{28} shall be present if the **<query_request_type>** is other than a cancel request ("0").

B_{29} shall be present if the **<query_request_type>** is cancel request ("0") or restart request ("3").

B_{30} . only one shall be present, either **<subject_ts_ref_id>**, **<subject_isd_ref_id>**, **<subject_item_ref_id>**, **<subject_qrd_id>**, or **<subject_item_view_id>**, **and only if specified in the BPA.**

B_{31} shall be present if the **<query_request_type>** is retrieve request ("1").

B_{32} shall be present when a snippet is requested.

B_{33} shall be present to obsolete an outstanding query request.

B_{34} shall be present to override the 300 second default.

B_{35} shall be present only to request a generic search on a specific value or range of values.

A detailed description using BNF notation specifies the structure in clauses that follow the clause summarizes this structure in a table.

6.1.3 Character set

All data element and subelement values, except those of a binary data element, shall be created using characters and symbols specified in 6.1.3.1 or 6.1.3.2. These are subsets of ASCII and EBCDIC character sets. Unless otherwise stated in the Banking Practices Agreement, all characters and symbols shall have representation in the common character 8-bit ASCII code scheme, which is based on CCITT V.3 International Alphabet 5. Optionally, characters may also be encoded in 8-bit EBCDIC rules, if permitted in the Banking Practices Agreement. ASCII and EBCDIC characters shall not be intermixed in the same interchange. ASCII encoded characters are always encoded beginning with the most significant (left-most) bit, and ending with the least significant (right-most) bit.

6.1.3.1 Basic character set

The basic character set shall be composed of the following characters:

a. Uppercase letters from A to Z
   (ASCII: 65 to 90 decimal; 41 to 5A hex, respectively)
   (EBCDIC: 193 to 201, 208 to 217, and 226 to 233 decimal C1 to C9, D1 to D9, and E2 to E9 hex, respectively)

59 b. Digits from 0 to 9
0 (ASCII: 48 to 57 decimal; 30 to 39 hex, respectively)
761 (EBCDIC: 240 to 249 decimal; F0 to F9 hex, respectively)

c. Special characters

Table 5 - Special characters

Description	Character	ASCII decimal	ASCII hex	EBCDIC decimal	EBCDIC hex
exclamation point	!	33	21	90	5A
quotation mark	"	34	22	127	7F
ampersand	&	38	26	80	50
apostrophe	'	39	27	125	7D
opening parenthesis	(	40	28	77	4D
closing parenthesis	)	41	29	93	5D
asterisk	*	42	2A	92	5C
plus sign	+	43	2B	78	4E
comma	,	44	2C	107	6D
hyphen (minus sign)	-	45	2D	96	60
period	.	46	2E	75	4B
solidus	/	47	2F	97	61
colon	:	58	3A	122	7A
semicolon	;	59	3B	94	5E
equals sign	=	61	3D	126	7E
question mark	?	63	3F	111	6F

d. Other characters

Table 6 - Other characters

Description	Character	ASCII decimal	ASCII hex	EBCDIC decimal	EBCDIC hex
space character	␣ [1]	32	20	64	40

1 – The symbol " ␣ " is used only for editorial purposes to represent a *space character* whose encoding is as indicated in the table.

6.1.3.2. Extended character set

The extended character set may be used, if not prohibited in the Banking Practices Agreement. It includes the lowercase letters and other special characters specified below:

a. Lowercase letters from *a* to *z*

(ASCII: 97 to 122 decimal; 61 to 7A hex, respectively)
(EBCDIC: 129 to 136, 145 to 153, 162 to 169 decimal; 81 to 89, 91 to 99, A1 to A9 hex, respectively)

b. Other special characters

Table 7 - Other special characters

Description	Character	ASCII decimal	ASCII hex	EBCDIC decimal	EBCDIC hex
percent sign	%	37	25	108	6C
less than sign	<	60	3C	76	4C
greater than sign	>	62	3E	110	6E
commercial at	@	64	40	124	78
opening bracket	[	91	5B	—	—
reverse solidus (back-slash)	\	92	5C	224	E0
closing bracket	]	93	5D	—	—
underscore	_	95	5F	108	6D
opening curly brace	{	123	7B	123	7B
pipe (vertical bar)	|	124	7C	173	AD
closing curly brace	}	125	7D	208	D0
tilde	~	126	7E	161	A1

c. National characters

Table 8 - National characters

Description	Character	ASCII decimal	ASCII hex	EBCDIC decimal	EBCDIC hex
number sign	#	35	23	123	7B
dollar sign	$	36	24	91	5F

6.1.4 Data type representations

The following data types are used throughout this standard to identify the character repertoire, or encoding, used in a data element (i.e., element) or subelement:

6.1.4.1 Date

The **date** identifies the syntax expressing the ISO standard date in *YYMMDD* format in which *YY* is the year within the century (00 to 99), *MM* is the month (01 to 12), and *DD* is the day (01 to 31). Representation for this data element type is DT.

This standard's specific additional requirements for a **date** syntax are as follows:

- The character repertoire is composed of the digits 0 through 9.
- Representation for this data element type is **<date>** in annex A.

6.1.4.2 Time

The **time** syntax identifies a value expressing the ISO standard time in *HHMMSSd..d* format in which *HH* is the hour for a 24 hour clock (00 to 23), *MM* is the minute (00 to 59), *SS* is the second (00 to 59), and *d..d* is the decimal second. Representation for this data element type is **TM** in the tables and **<time>** in annex A.

This standard's specific additional requirements for a **time** syntax are as follows:

- The value for time shall be expressed in terms of the originator's local time zone.
- The character repertoire is composed of the digits 0 through 9.
- Data values shall be populated left to right.
- Representation for this data element type is **<time>** in annex A.

If the size of a data element (whose data type is TM) is constrained to a length of 4, then the value is in hours and minutes (*HHMM*). If it is constrained to a length of 6, then the value is in hours, minutes, and seconds (*HHMMSS*), and so on.

A decimal point separating *SS* and *d..d* is implied, i.e., an embedded decimal point is not used in this syntax.

6.1.4.3. String

A **string** syntax identifies a value which is composed of a sequence of any characters from the basic or extended character sets. Space filled data elements apply to fixed length data values. The significant characters shall be left justified, and shall be space filled. Leading spaces, when they occur, are presumed to be significant characters. Trailing spaces should be suppressed unless they are necessary to satisfy a minimum length. The representation for this data element type is **AN**.

This standard's specific additional requirements for a **string** syntax are as follows:

- These characters are also classified as "printable" or alpha-numeric.
- The representation for this type is **<string>** in annex A.

6.1.4.4 Numeric

A numeric is represented by one or more positive digits with an optional leading sign representing the value in the normal base of 10. The value of a numeric data element includes an implied decimal point. Elements representing dollar amounts have an implied decimal of 2, i.e., they convey values in *cents*. It is used when the position of the decimal point within the data is permanently fixed, and is not transmitted with the data. The data element dictionary defines the number of implied decimal positions. The representation for this data element type is **Nn**, where "N" indicates that it is numeric and "n" indicates the number of decimal positions to the right of the implied decimal point. If "n" is 0, it need not appear in the specification; "N" is equivalent to "N0". For negative values, the leading minus sign (-) is used. Absence of the sign indicates a positive value. The plus sign (+) should not be transmitted. Leading zeros should be suppressed unless necessary to satisfy a minimum length requirement. The length of a numeric type data element does not include the optional sign.

This standard's specific additional requirements for a **numeric** syntax are as follows:

- It is composed of one or more positive digits from the set 0 through 9 and whose encoding is specified in 6.1.3.
- All values shall be positive (i.e., a minus symbol is not used).
- The representation for this type is **<numeric>** in annex A.

6.1.4.5 Decimal Number

A **decimal number** type identifies a numeric data element which contains an explicit decimal point and is used for numeric values that have a varying number of decimal positions. The representation for this data

element type is R. The decimal point always appears in the character stream, if the decimal point is at any place other than the right end. If the value is an integer (decimal point at the right end), the decimal point should be omitted. For negative values, the leading minus sign (–) is used. Absence of the sign indicates a positive value. The plus sign (+) should not be transmitted. Leading zeros should be suppressed unless necessary to satisfy a minimum length requirement. Trailing zeros after the decimal point should be suppressed, unless necessary to indicate precision. The use of a triad separator (for example, the commas in 1,000,000) is expressly prohibited. The length of a decimal type does not include the optional leading sign.

This standard's specific additional requirements for a **decimal number** syntax are as follows:

- If the value is an integer (decimal point at the right end), the decimal point shall be omitted.
- Leading zeros shall be suppressed unless, necessary to satisfy a minimum length requirement.
- There must always be at least one digit before an embedded decimal point.
- Trailing zeros after the decimal point shall be suppressed, unless necessary to indicate precision.
- The representation for this data element type is **<decimal>** in annex A.
- The length of the decimal number does not includes the optional sign or decimal point, for example the value 2.3 or .23 has a length of 2, and that 2.33, .233 or 23.3 has a length of 3.

6.1.4.6 Binary

The **binary** data element is a syntax which is composed of any sequence of bytes (8 bit encoding), each ranging in value from binary 00000000 to binary 11111111. This data element has no defined maximum length. Actual length of any binary encoded object is specified in bytes by the immediately preceding data element. The representation for this data element type is **B**, and **<binary>** in annex A. X12 uses the term *binary data* because a translator conforming to the standard has no specific understanding of this sequence of bytes . Normally, a receiving FII-translator will make its value available to the receiving FII-system-user, without regard to its integrity or correctness. This is a consequence of the value's (i.e., the encoded object) syntax and semantics being outside the scope of this standard.

6.1.4.7 Identifier

An identifier data element always contains a value from a pre-defined list of values that is maintained by the X12 Committee, or some other body recognized by the X12 Committee. Trailing spaces should be suppressed unless necessary to satisfy minimum length. The representation for this data element is **ID**.

This standard's specific additional requirements for an **identifier** syntax are as follows:

- This data element is composed of a sequence of characters from: the set of upper case letters A to Z, digits from 0 to 9, and the space character.
- The representation for this data element is **<id>** in annex A.

6.1.5 Segments, elements, subelements, and delimiters

Structures in X12 are composed of building blocks called **segments**. There are two types of segments: **control segments** and **data segments**. Control segments are used to define headers and trailers for such structures as interchanges, functional groups, transaction sets, and loops. Data segments are used to define objects such as cash letters, checks, and images which are recognizable in a business context.

Segments are composed of **elements**, which are sometimes, in turn, composed of **subelements**. A segment may be defined as a sequence of elements separated by **data element separator** characters and terminated with a **terminator** character. An element may be defined as either a single **data instance** of a type specified in section 6.1.4, or as a sequence of such data instances which are separated by **subelement separator** characters.

The separators and terminator characters are defined in table 9. Note that this standard, unlike the X12 standard, requires that the delimiters take only the value listed in table 9. Because delimiters are used to aid in disassembling the interchange, the listed values shall not be used within any data type, except within a BIN segment which is ignored when parsing the interchange structure.

Table 9 - Separators and terminator characters

Separator names: Delimiters used in this standard	Code	Notation	ASCII / EBCDIC Decimal	ASCII / EBCDIC HEX
Data element separator	<gs>	GS[1]	29	1D
Sub-element separator	<us>	US[2]	31	1F
Terminator (ends a FG/TS/DS)	<tr>	FS[3]	28	1C

1 **GS** means group separator as defined in 3.1 of X12.5
2 **US** means unit separator as defined in 3.1 of X12.5
3 **FS** means file separator as defined in 3.1 of X12.5

Within a segment, the semantics of a data instance is dependent on its position. The first data instance is always a two or three character segment identifier. This identifier names the segment which, in turn, identifies the syntax and semantics of its remaining data instances. As an example, the identifier, "ISA", represents an interchange header; its syntax and semantics are described in section 6.2.3. The length of a segment is the number of bytes from the beginning of the first element (i.e., including the segment identifier) through (and including) the terminator character.

Within an element, the meaning of a data instance dependents on its position. However, rather than including an element identifier, the syntax and semantics are defined by the position of the element within the segment. The length of an element is the number of bytes from the beginning of the first subelement through the end of the last subelement. Subelement separator are included in the length calculations.

6.1.6 X9.46 delimiters

The embedded "." character delimits variable length component values within a data element.

6.1.7 Intra-segment syntax Intra-segment syntax for the segments defined in section 6.15 is governed by the following::

a. There shall be at least one element in a segment (in addition to the segment identifier).Data elements composed of subelements whose values are defined to be Optional still must contain the subelement separator, if any subelement value is present.

b. If elements are defined as optional or defaulted, it is necessary to retain the **<gs> or <us>** delimiter as required to avoid ambiguity. For example, if a segment would normally appear as

"SEG <gs>a<gs>b<gs>c<gs>d<gs>e<tr>"

and the values **b**,**c**, and **e** are the default values for those positions, then the segment could also be comprised as

"SEG <gs>a<gs><gs><gs>d<gs><tr>"

or as

"SEG <gs>a<gs><gs><gs>d<tr>"

(note that the last **<gs>**, that is immediately followed by a **<tr>**, is optional since it is not required to prevent ambiguity).

Similarly, an element encoded as

"v<us>w<us>x<us>y<us>z"

with **w**, **x**, and **z** defaultable, can be comprised as

"v<us><us><us>y<us>"

or as

"v<us><us><us>y"

6.1.8 Bit organization for any pixel byte

For bit organization and bit padding, see annex B.

6.2 FII structure and specification of data elements

From a modeling perspective, the FII can be viewed as comprising numerous information objects. The primary object is the interchange itself. Functional decomposition reveals that it comprises lesser objects: a single ISA header; one, or more, functional groups; and a single IEA trailer. This standard specifies four (4) functional groups, and imports one acknowledgment functional group directly from X12.22 (i.e., a "Functional Acknowledgment"). When present in the interchange, functional groups appear in a specific order, as illustrated, left to right, in figure 6.

In the following figures, shadowed boxes indicate that the object may occur multiple times

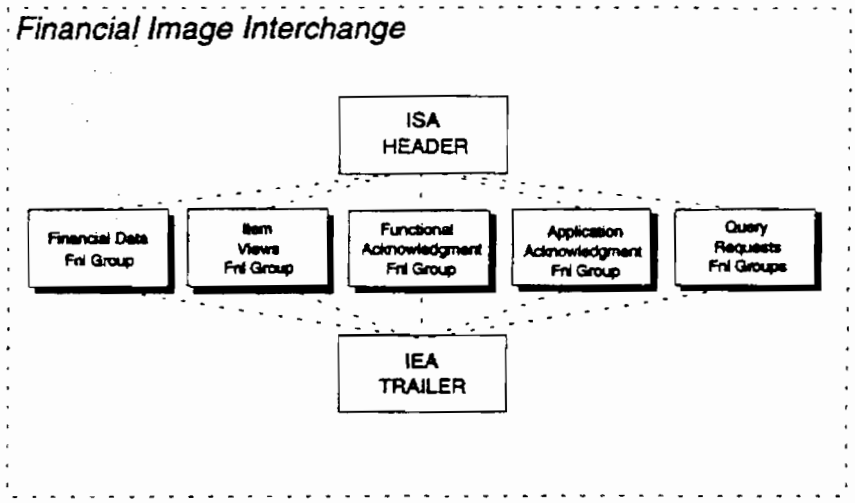

Figure 6 - FII structure

The FII structure consists of an ISA Header and an IEA trailer which surround one, or more, functional groups of digitized information. As defined in X12, an interchange is formed by sequencing components into a stream of bytes for exchange between applications. It can be illustrated as follows:

Interchange header (ISA)

Functional group 1
Functional group 2
•
•
•
Functional group n

Interchange trailer (IEA)

The functional groups comprise the primary information objects exchanged through the FII protocol. Multiple functional groups of different types may be present in the interchange. Annex A and 6.2.2 specifies their order of appearance in an interchange when multiple types of functional groups are present in a single interchange. The five types of functional groups specified in this Standard are as follows:

- Financial Data functional group (**<financial_data_fg>**);
- Item Views functional group (**<item_views_fg>**);
- Query Requests functional group (**<query_requests_fg>**);
- Functional Acknowledgment functional group (**<functional_ack_fg>**);
- Application Acknowledgment functional group (**<appl_ack_fg>**).

The FII structure (**<fii_structure>**) utilizes the X12 EDI model and protocol, i.e., the model specified in X12.5. However, this standard extends the X12 model to define synchronously interactive query services and protocols, and to specify an FII-system-user acknowledgment (at the application level) that may convey the user's acceptance (or rejection) of an interchange, and partial results to query requests. This standard also defines a data segment that extends the X12 transaction set header, and provides a mechanism for including digital signatures in the interchange. For audiences familiar with X12 publications, this standard includes an X9 data dictionary for data elements that extend the X12 data dictionary, and includes aspects of an X12 Type-II report.

6.2.1. Functional group overview

Functional decomposition of a *functional group* reveals that it is composed of lesser objects called a *functional group header, transaction sets* (TS), and a *functional group trailer.* Functional decomposition of a *transaction set* reveals that it is composed of lesser objects called Segments. This standard uses several kinds of segments: Loop Header and Trailer segments, Data segments, and Binary segments. The concept of the existence of this lesser object is defined in X12.5. The functional groups comprise the main information objects exchanged in the FII protocol. Multiple functional groups of different types may be present in the same interchange, but they shall appear in the order specified in 6.2.2.

A functional group is the collection of related information objects exchanged between financial institutions. The collection of FII functional groups, and related transaction sets, can be graphically illustrated as in figure 7.

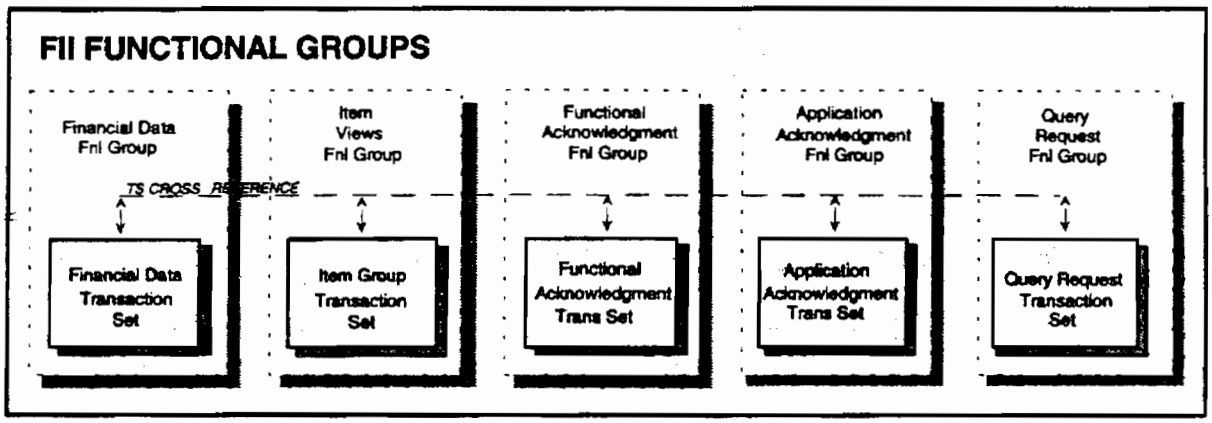

Figure 7 - FII functional group structure

The financial data regarding this transaction, and the supporting digitized image information, are conveyed as a set of sub-objects. The digitized image-related information is carried in a detail segment, deeply nested in a series of loops inside the Item Group transaction set. The loops mimic the financial industry's cash letter data structure used in cash letter processing . This design also provides a mechanism for cross-referencing between transaction sets and detail segments, and between transaction sets in the same interchange, or across interchanges. Additionally, security mechanisms are provided at all levels within a functional group for the purposes of data integrity, confidentiality, non-repudiation, and authentication. Further explanation and illustration, are provided in 6.2.1.1 through 6.2.1.4 and annex F of this Standard.

6.2.1.1. Financial data functional group

A *Financial Data functional group* is intended for conveying MICR line information and associated check processing data.. As indicated elsewhere in this standard, the syntax of the processing data is outside of the scope of this standard. However, to facilitate the exchange of this type of data, this functional group contains a *Financial Data transaction set* and optional security related features, as illustrated in figure 8. In this and the next figures, a label in a box names an X12 defined label, and a label outside of a box names an X9.46 defined label.

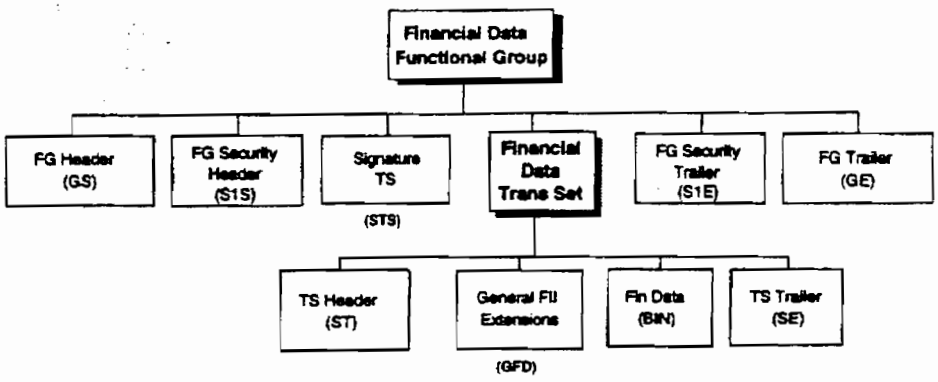

Figure 8 - Financial data functional group model

As illustrated in figure 8, the Financial Data functional group is composed as follows:

Financial Data Functional Group:
- Functional Group Header
- Functional Group Security Header
- Signature Transaction Set
- Financial Data Transaction Set(s)
- Functional Group Security Trailer
- Functional Group Trailer

Each *Financial Data* transaction set contains one General FII Extension segment and one Financial Data segment:

Financial Data Transaction Set:
- Transaction Set Header
- General FII Extensions
- Financial Data (Binary) Segment
- Transaction Set Trailer

6.2.1.2. Item views functional group

The *Item Views functional group* has more hierarchical layers than the other functional groups. It comprises transaction sets (where each contains groups of related imaged items), subgroups, item data, and item views as illustrated in figure 9. This design mimics the cash letter structure as currently used in the banking community. As such, the functional group structure can be viewed as corresponding to cash letters, bundles of items, detail items, and multiple views of each imaged item.

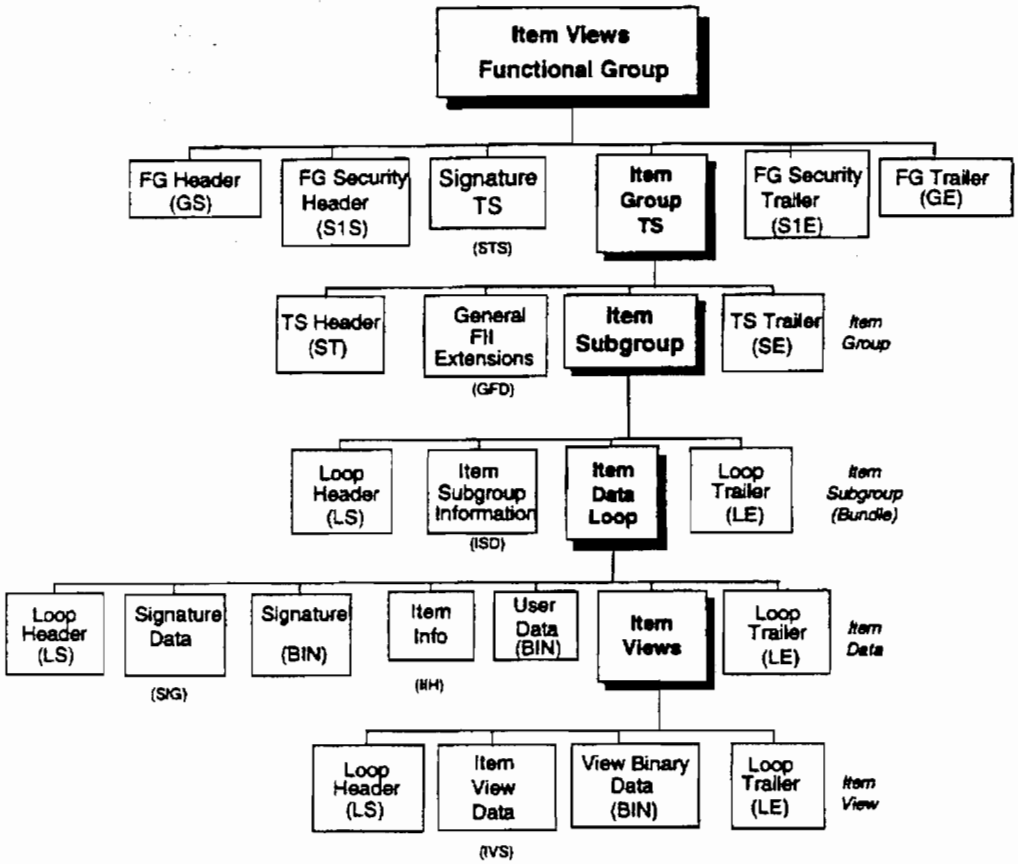

Figure 9 - Item views functional group model

An *Item Views functional group* is defined to convey information about items, user-defined data, views of imaged items, contained in one, or more, *Item Group transaction set*, and optional security-related features as illustrated in figure 9 as follows:

Item Views Functional Group:
- Functional Group Header
- Functional Group Security Header
- Signature Transaction Set
- Item Group Transaction Set(s)
- Functional Group Security Trailer
- Functional Group Trailer

An *Item Group transaction set* shall contain one *general FII extension* data segment, and one or more *item subgroup* structures which contains image items that are organized into groups of related (conceptual) *bundles* of imaged items:

Item Group Transaction Set:
- Transaction Set Header
- General FII Extensions Data Segment
- Item Subgroup Segment(s)
- Transaction Set Trailer

For each group of related bundles of imaged items, each instance of *Item Subgroup* shall contain one Item Subgroup data segment and one or more sets of *item data*:

Item Subgroup Segment:		
	Loop Header	(top level)
	Item Subgroup Information Segment	
	Item(s) Data Structure	
	Loop Trailer	(top level)

For each imaged item in a bundle of related imaged items, each instance of *item data* shall contain one *Item Information* segment and one or more *item views*:

Item Data Loop:		
	Loop Header	(middle level)
	Item Information Segment	
	Signature Data Segment	
	Signature Segment	
	User Data Segment	
	Item View(s) Structure	
	Loop Trailer	(middle level)

For each view of an imaged item, each instance of *item view* shall contain one *item view data segment* and one *view binary data*:

Item View Loop:		
	Loop Header	(bottom level)
	Item View Segment	
	View Binary Data Segment	
	Loop Trailer	(bottom level)

6.2.1.3. Functional acknowledgment functional group

A *Functional Acknowledgment functional group* is provided for conveying verification that the received FII is syntactically correct, as illustrated in figure 10.

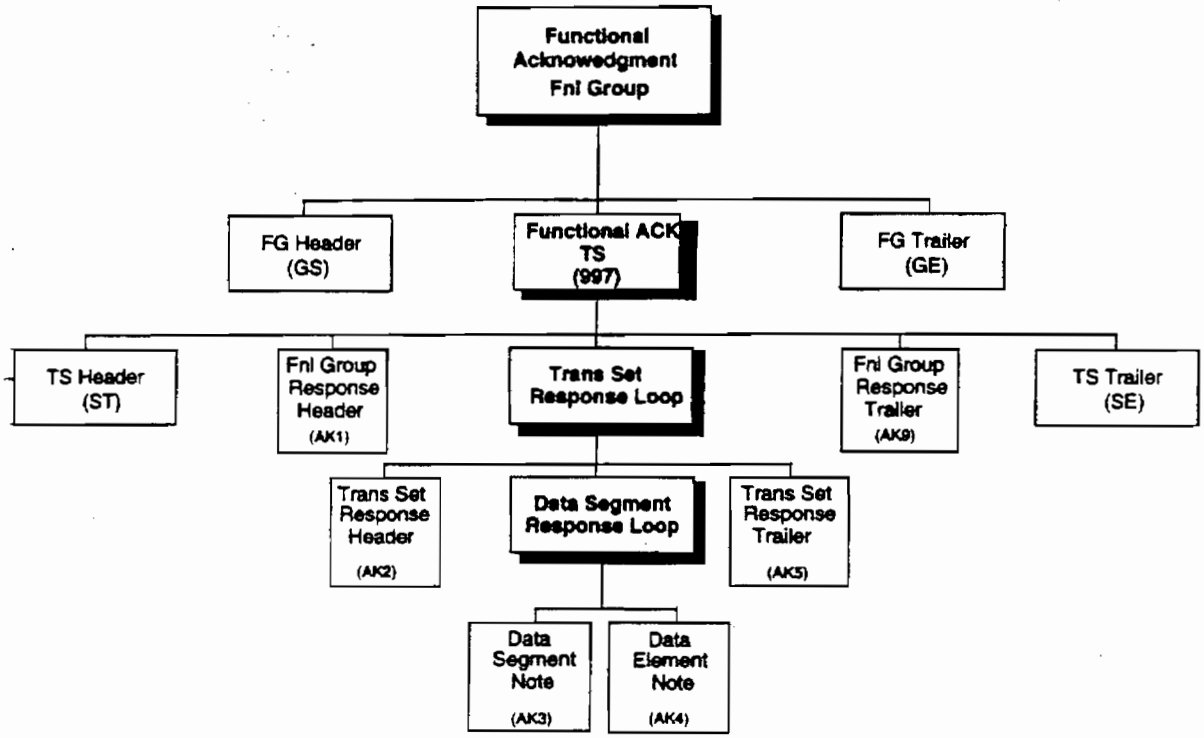

Figure 10 - Functional acknowledgment functional group model

It contains one or more *Functional Acknowledgment transaction set(s)* as follows:

Functional Acknowledgment Functional Group:
- Functional Group Header
- Functional Acknowledgment Transaction Set(s)
- Functional Group Trailer

Each *Functional Acknowledgment transaction set* (a.k.a. the X12 997 transaction set) is provided for conveying verification that the received FII is syntactically correct. It shall contain one *Transaction Set Header* and one *Transaction Set Trailer*, and one or more *Functional Acknowledgment* data segment(s):

Functional Acknowledgment Transaction Set
- Transaction Set Header
- Functional Acknowledgment Data Segment(s), i.e., X12 segment identifiers AK1-AK9
- Transaction Set Trailer

6.2.1.4. Application acknowledgment functional group

An *Application Acknowledgment functional group* is provided for conveying verification that the received FII is accepted by the receiving FII-system-user. it is illustrated in figure 11.

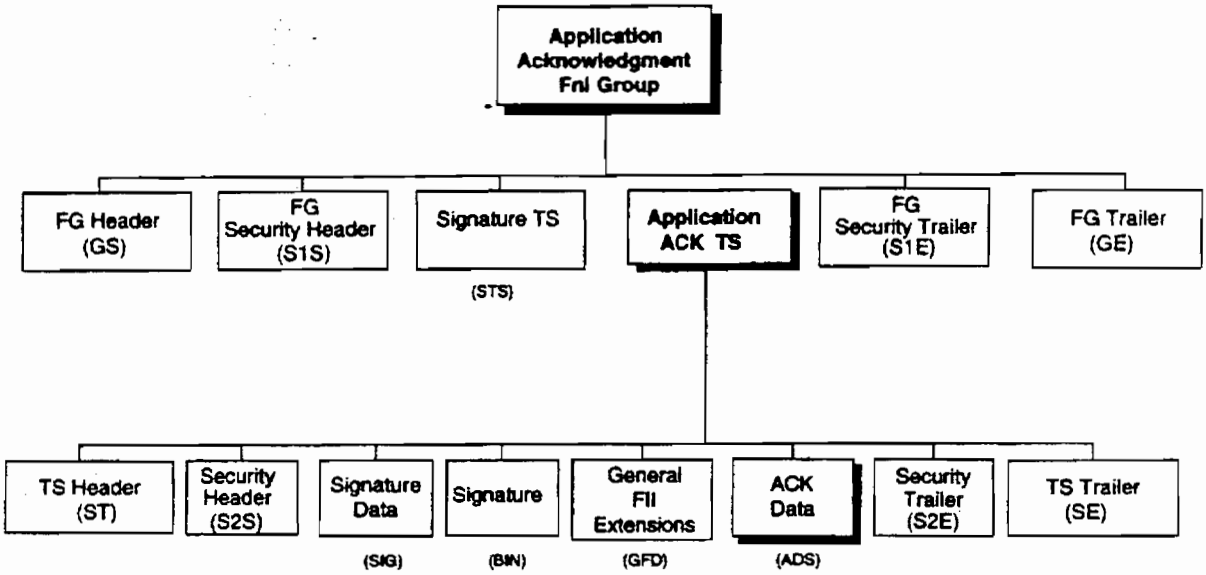

Figure 11 - Application acknowledgment functional group model

It contains one or more *Application Acknowledgment transaction sets* within the functional group as follows:

Application Acknowledgment Functional Group:
- Functional Group Header
- Functional Group Security Header
- Signature Transaction Set
- Application Acknowledgment Transaction Set(s)
- Functional Group Security Trailer
- Functional Group Trailer

Each *Application Acknowledgment transaction set* is provided for conveying verification that responsibility for the received FII is accepted (or not) by the receiving FII-system-user. Its structure is as follows:

Application Acknowledgment Transaction Set:
- Transaction Set Header
- Transaction Security Header
- Signature Data Segment
- Signature Segment
- General FII Extensions Data Segment
- Acknowledgment Data Segment(s)
- Transaction Set Security Trailer
- Transaction Set Trailer

6.2.1.5. Query requests functional group

A *Query Requests* functional group is provided for conveying requests for imaged items, corresponding item information, and optionally, privately agreed user data as illustrated in figure 12.

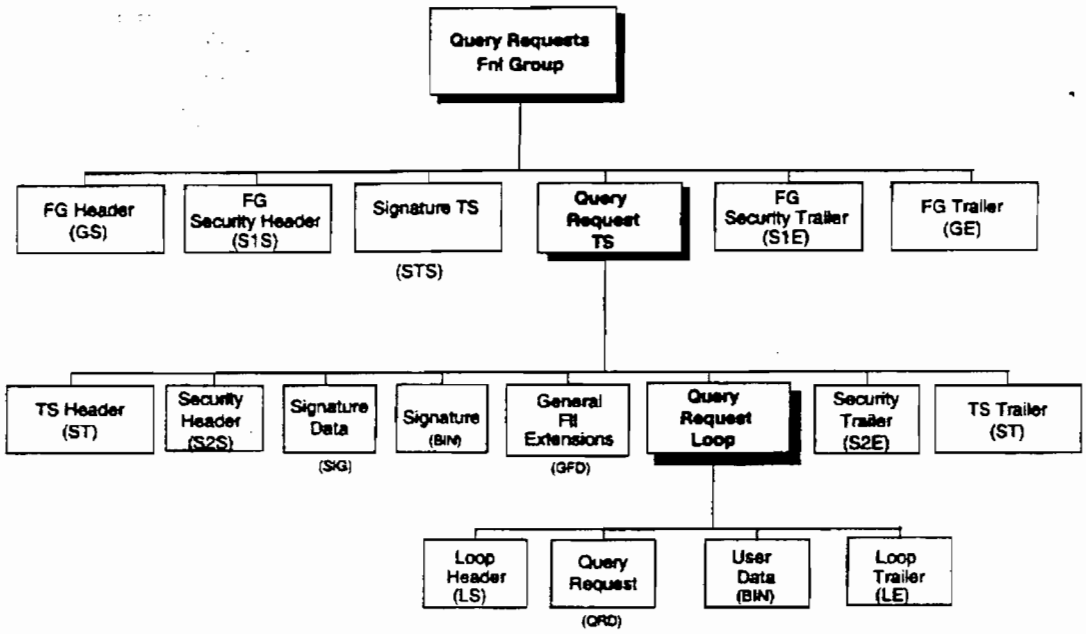

Figure 12 - Query requests functional group model

It contains one or more *Query Request Transaction Sets* within the functional group , and optional security related features as follows:

Query Requests Functional Group:
- Functional Group Header
- Functional Group Security Header
- Signature Transaction Set
- Query Request Transaction Set
- Functional Group Security Trailer
- Functional Group Trailer

Each *Query Request Transaction Set* shall have one *General FII Extension* segment, and one or more *query request* data segments:

Query Request Transaction Set:
- Transaction Set Header
- Transaction Security Header
- Signature Data
- Signature
- General FII Extensions
- Query Request data segment(s)
- User Data segment
- Transaction Security Trailer
- Transaction Set Trailer

6.2.2. Top level FII structure

Table 10 describes the top level Financial Image Interchange structure. When *different* types of functional groups are present in a single FII, they shall appear in the order indicated in table 10. Each FII conformant interchange shall contain at least one type of Functional Group defined in this standard. Functional groups of the *same* type may appear in any order.

1144 **Table 10 - Financial image interchange structure**

FII structure	Size	Data type	Ref.	Protocol support	Business usage
<fii_structure>	—	—	—	—	—
<inter_header>	—	—	ISA	M	M
<financial_data_fg>	—	—	—	O	B4
<item_views_fg>	—	—	—	O	B5
<functional_ack_fg>	—	—	—	O	B6
<application_ack_fg>	—	—	—	O	B7
<query_request_fg>	—	—	—	O	B8
<inter_trailer>	—	—	IEA	M	M

1145 The FII structure **<fii_structure>** consists of the following *edi* structures:

1146 **6.2.2.1 Interchange header**

1147 The interchange header **<inter_header>** contains information needed to manage and control the
1148 interchange. It shall be first in the interchange.

1149 Protocol support: Mandatory

1150 Business usage: Mandatory.

1151 **6.2.2.2 Financial data functional group**

1152 The Financial Data functional group **<financial_data_fg>** contains electronic check exchange data. Zero
1153 or more financial data functional groups may be present in each interchange. For example, this functional
1154 group may contain one or more transaction sets, where each transaction set may contain a financial data
1155 segment that conveys a X9.37 file. The structure shall be as illustrated in figure 8. The syntax can be
1156 found in 6.4.1.

1157 Protocol support: Optional.

1158 Business usage: Conditional, shall be present if financial data is in the interchange.

1159 **6.2.2.3 Item views functional group**

1160 The Item Views functional group **<item_views_fg>** contains views of items and processing information
1161 associated with a view, imaged item, and groupings of imaged items. The structure shall be as illustrated
1162 in figure 9. The syntax can be found in 6.4.2.

1163 In the context of a query response, its contents comprise:

1164 – One or more views of a single imaged item;

1165 – One or more views of multiple imaged items;

1166 – Item information about one or more imaged items (e.g., image keys, or compression indicators);

1167 – User data only about one or more imaged items.

1168 In the context of forward or return processing, its contents may contain:

1169 – Some, all, or none of the images associated with a cash letter;

1170 – One or multiple subgroup(s) of images, not associated with any ECE cash letter.

1171 Zero or more Item Views functional groups may be present in each interchange.

Protocol support: Optional.

Business usage: Conditional, shall be present if views of imaged items are in the interchange.

6.2.2.4 Functional acknowledgment functional group

The Functional Acknowledgment functional group **<functional_ack_fg>** contains the requested acknowledgment information for a functional group, transaction set, or data segment, as illustrated in figure 10. It shall be used by a receiving FII-translator to report the results of a syntax level check of the interchange. This standard utilizes the X12 Functional Acknowledgment (FA) to provide the requested positive, or negative, syntactic acknowledgment.

Zero or more Functional Acknowledgment functional groups may be present in each interchange.

Unlike the X12 EDI definition, this standard defines a mechanism in the *general FII extensions* for requesting X12 functional Acknowledgment. Thus, it shall only be generated in response to a request by the originator of the subject FII.

Protocol support: Optional.

Business usage: Conditional, shall be present if a Functional Acknowledgement is conveyed in the interchange.

6.2.2.5 Application acknowledgment functional group

The Application Acknowledgment functional group **<application_ack_fg>** contains the requested acknowledgment information for a functional group, transaction set, or data segment level, as illustrated in figure 11. It conveys the receiving FII-system-user application's acceptance or rejection of the interchange, or its components, after evaluating the semantics of the contents of the interchange.

Zero or more Application Acknowledgment functional groups may be present in each interchange. An Application Acknowledgment shall only be generated in response to a request by the originator of the subject FII.

Protocol support: Optional.

Business usage: Conditional, shall be present if an application acknowledgement is conveyed in the interchange

6.2.2.6 Query requests functional group

The Query Requests functional group **<query_requests_fg>** contains requests for views of imaged items, information associated with a view, imaged item, and groupings of imaged items, as well as requests to cancel outstanding queries. The structure shall be as illustrated in figure 12.

The Query Requests functional group supports the following functions:

- Retrieve based on specific key(s), or image item names,
- Retrieve based on general search criteria, and
- Cancel a "not yet completed" query request
- Cancel a previously sent Financial Data, or Item Views transmission, or portion thereof.

A FII-system-user also may specify the desired query operation results:

- Retrieve the actual images (or portions of an imaged item), item data, or privately understood data, for the imaged items found matching several ranges of selection criteria such as amount, serial numbers, etc.,
- The transport medium to be used to return the data found meeting the search and retrieve selection criteria, and
- whether the results should be secured (signed, or MAC'd)

Zero or more Query Requests functional groups may be present in each interchange. Additionally, this functional group provides a mechanism to restart a search at a specific reference point. The *restart mechanism* enables the originator to limit 1) the range of possible results, and 2) the likelihood of run-away search requests.

Protocol support: Optional.

Business usage: Conditional, shall be present if a Query Requests Functional Group is present in the interchange

6.2.2.7 Interchange trailer

The Interchange Trailer **<inter_trailer>** contains the management and control information for the interchange. It shall be last in the interchange, and is paired with an X12 ISA Header. Its syntax is specified in 6.2.4.

Protocol support: Mandatory

Business usage: Mandatory.

6.2.3 X12 ISA header

The X12 ISA Header **<inter_header>** contains the management and control information for an interchange. It always is first in an interchange. There is only one in each interchange. It is created by the originator of the interchange. All X12 ISA Header data elements shall have values, as required by X12.5 and specified in this clause and annex D of this standard.

Table 11 - X12 ISA header element names

ISA header field element names	Size	Data type	Ref	Protocol support	Business usage
<inter_header>	—	—	ISA	—	—
<authorization>	—	—	-	—	—
<authorization_qualifier>	02/02	ID	I01	M	M
<authorization_info>	10/10	AN	I02	M	M
<security>	—	—	—	—	—
<security_qualifier>	02/02	ID	I03	M	M
<security_info>	10/10	AN	I04	M	M
<sender>	—	—	—	—	—
<inter_id_qualifier>	02/02	ID	I05	M	M
<sender_id>	15/15	AN	I06	M	M
<receiver>	—	—	—	—	—
<inter_id_qualifier>	02/02	ID	I05	M	M
<receiver_id>	15/15	AN	I07	M	M
<inter_date_time>	—	—	—	—	—
<inter_date>	06/06	DT	I08	M	M
<inter_time>	04/04	TM	I09	M	M
<standard_version>	—	—	—	—	—
<standards_identifier>	01/01	ID	I10	M	M
<version_id>	05/05	ID	I11	M	M
<inter_control>	09/09	N	I12	M	M
<ack_requested>	01/01	ID	I13	M	M
<test_indicator>	01/01	ID	I14	M	M
<subelement_separator>	01/01	AN	I15	M	M

The following definitions of the elements and subelements comprising the ISA header are defined in X12.22, and are included for reference. Unlike other subelements, the ISA subelements always are separated using the **<gs>** separator character. Each element that has an X12 reference is separated with a *data element separator* (<gs>).

6.2.3.1 Authorization

This is the Authorization **<authorization>** associated with the interchange. It has two elements: **<authorization_qualifier>** and **<authorization_info>**.

<authorization> **::= <authorization_qualifier> <gs> <authorization_info>**

<authorization_qualifier> (02/02) **::= <id>** *-- data element I01 : X12.5*
<authorization_info> (10/10) **::= <string>** *-- data element I02 : X12.5*

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.1.1 Authorization qualifier

The Authorization Qualifier **<authorization_qualifier>** is a value indicating the meaning of the authorization information.

Size: 02/02

Type: ID

Values: Shall be "00" indicating that no meaningful information is in ISA header field I02, i.e., No authorization information present.

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.1.2 Authorization information

The Authorization Information **<authorization_info>** is a value which defines the authorization.

Size: 10/10

Type: AN

Values: All zeros

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.2 Security

The Security **<security>** associated with the interchange has two elements: security qualifier and security information.

<security> ::= **<security_qualifier>** **<gs>** **<security_info>**

<security_qualifier> (02/02) ::= **<id>** *-- data element I03 : X12.5*
<security_info> (10/10) ::= **<string>** *-- data element I04 : X12.5*

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.2.1 Security qualifier

The security qualifier **<security_qualifier>** is a value indicating the meaning of the security information.

Size: 02/02

Type: ID

Values: Shall be "00" indicating that no meaningful information is in ISA header field I04, i.e., No security information present.

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.2.2 Security information

The security information **<security_info>** is a value which defines the security information.

Size: 10/10

Type: AN

Values: All zeros.

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.3 Sender

The Sender **<sender>** associated with the interchange has two elements: interchange ID qualifier and sender ID.

<sender> ::= **<inter_id_qualifier> <gs> <sender_id>**

<inter_id_qualifier> (02/02) ::= **<id>** -- *data element I05 : X12.5*

<sender_id> (15/15) ::= **<string>** -- *data element I06 : X12.5*

<inter_id_qualifier> (02/02) ::= <id> -- ***data element I05 : X12.5***

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.3.1 Interchange ID qualifier

The Interchange ID Qualifier **<inter_id_qualifier>** is a value indicating the registry where the sender ID value is registered.

Size: 02/02

Type: ID

Values: X12 registered values.

<inter_id_qualifier> (02/02) ::= **<id>** -- *data element I05 : X12.5*

01 (per X12.22) indicates that the sender id value is a DUN's number (Dun and Bradstreet).
17 (per X12.22) indicates that the Sender ID value is a routing number including a Check Digit (Thomson Bank Registry).

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.3.2 Sender ID

The Sender ID **<sender_id>** is a value assigned by the registrar which defines the sender. If interchange ID qualifier is "17", then the value is the bank's routing number. Other values are defined in X12.5

Size: 15/15

Type: AN

Values: Bank routing number, or the originator's name if the value of the **<inter_id_qualifier>** is other than "17".

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.4 Receiver

The Receiver **<receiver>** associated with the interchange has two elements: Interchange ID Qualifier and Receiver ID.

<receiver> ::= **<inter_id_qualifier> <gs> <receiver_id>**

<inter_id_qualifier> (02/02) ::= **<id>** -- *data element I05 : X12.5*

<receiver_id> (15/15) ::= **<string>** -- *data element I07 : X12.5*

Protocol support: Mandatory

Business usage: Mandatory

1325 **6.2.3.4.1 Interchange ID qualifier**

1326 The Interchange ID Qualifier **<inter_id_qualifier>** is a value indicating the registry where the receiver ID
1327 value is registered. The syntax is defined in 6.2.3.3.1.

1328 Size: 02/02

1329 Type: ID

1330 Values: See 6.2.3.3.1 for values.

1331 Protocol support: Mandatory

1332 Business usage: Mandatory

1333 **6.2.3.4.2 Receiver ID**

1334 The Receiver ID **<receiver_id>** is a value assigned by the registrar which defines the receiver. If
1335 interchange ID qualifier is "17", then the value is the bank's routing number.

1336 Size: 15/15

1337 Type: AN

1338 Values: Bank routing number, or the recipient's name if the value of the **<inter_id_qualifier>** is other than
1339 "17".

1340 Protocol support: Mandatory

1341 Business usage: Mandatory

1342 **6.2.3.5 Interchange date and time**

1343 The Interchange Date and Time **<inter_date_time>** associated with the interchange represents two
1344 elements: Interchange Date and Interchange Time. For X9 purposes, the interchange date and time
1345 represent the local date and time of the originator.

1346 **<inter_date_time>** ::= **<inter_date> <gs> <inter_time>**

1347 **<inter_date>(06/06)** ::= **<date>** *-- data element I08 : X12.5*
1348 **<inter_time>(04/04)** ::= **<hour><minute>** *-- data element I09 : X12.5*

1349 Protocol support: Mandatory

1350 Business usage: Mandatory

1351 **6.2.3.5.1 Interchange date**

1352 The Interchange Date **<inter_date>** is a value indicating the originator's business date when the
1353 interchange was created.

1354 Size: 06/06

1355 Type: DT

1356 Values: *YYMMDD* where *YY* represents the year, *MM* represents the month, and *DD* represents the day:

1357 *YY* shall be 00 through 99
1358 *MM* shall be 01 through 12
1359 *DD* shall be 01 through 31

1360 Protocol support: Mandatory

1361 Business usage: Mandatory

6.2.3.5.2 Interchange time

The Interchange Time **<inter_time>** is a value which indicates the time the originator created the interchange. The value shall represent the originator's *local* time.

Size: 04/04

Type: TM

Format:

Values: *HHMM* where HH conveys the local hour, and MM conveys the local minutes:

HH shall be 00 through 23;

MM shall be 00 through 59.

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.6 Standard version

The Standard Version **<standard_version>** conveys the identity of the version of X12.5 being used in the subject FII. It has two elements: standards identifier and version ID.

<standard_version> ::= **<standards_identifier><gs><version_id>**

<standards_identifier> (01/01) ::= **<id>** *-- data element I10 : X12.5*
<version_id> (05/05) ::= **<id>** *-- value is 00305, data element I11 : X12.5*

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.6.1 Standards identifier

The Standards Identifier **<standards_identifier>** indicates the EDI community creating the interchange standard.

Size: 01/01

Type: ID

Values: Shall be "U" (US EDI Community).

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.6.2 Version ID

The Version ID **<version_id>** conveys a value which indicates the version, as specified by X12.5 and X12.22.

Size: 05/05

Type: ID

Values: Shall be "00305" to indicate the X12 *Draft Standard for Trial Use Approved for Publication* by ASN12 Procedures Review Board through December 1994.

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.7 Interchange control

The Interchange Control **<inter_control>** is an originator-determined numeric value that is unique to this interchange, across all interchanges generated by the same originating institution. It shall be the same value as in the X12 IEA Trailer.

When functional acknowledgments have been requested, the receiver of this interchange shall place this same value in the acknowledgment's appropriate segment. Together with the sender ID, it uniquely identifies the interchange contents to an acknowledgment receiver.

Size: 09/09

Type: N

<inter_control> (09/09) **::= <numeric>** *-- data element I12 : X12.5*

Values: Determined by sender.

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.8 Acknowledgment requested

The Acknowledgment Requested **<ack_requested>** provides the capability to request a receiving FII-translator to acknowledge that the interchange was received.

X9 does not use this level of acknowledgment because it is not specific enough. Instead, this standard uses a Functional Acknowledgment and Application Acknowledgment mechanism to indicate reception of an interchange.

Size: 01/01

Type: ID

<ack_requested> (01/01) **::= <id>** *-- data element I13 : X12.5*

Values: "0" shall be used. This indicates that this level of acknowledgment was NOT requested.

Protocol support: Mandatory

Business usage: Mandatory

6.2.3.9 Test Indicator

The Test Indicator **<test_indicator>** provides the capability to indicate if this is a test interchange. It has usefulness during early stages of implementation of interchanges.

Size: 01/01

Type: ID

<test_indicator> (01/01) **::= <id>** *-- data element I14 : X12.5*

Values: "P" means "production"; and
"T" means "test"

Any other value means "test".

Protocol support: Mandatory

Business usage: Mandatory.

6.2.3.10 Subelement separator

The Subelement Separator **<subelement_separator>** provides the capability to indicate a value for the subelement separator. This standard specifies it to be a certain value, as described in 6.1.5.

Size: 01/01

Type: AN

<subelement_separator> (01/01) ::= **<string>** *-- data element I15 : X12.5*

Values: See **<us>** in clause 6.1.5 for value.

Protocol support: Mandatory

Business usage: Mandatory

6.2.4. X12 IEA trailer

The X12 IEA Trailer **<inter_trailer>** structure contains management and control information for an interchange. It shall always be last in an interchange. It is created by the originator of the interchange. All X12 IEA trailer fields shall have values, as required by X12.5, and specified in this clause and annex B of this standard. The following table specifies the data elements in an X12 IEA trailer.

Table 12 - X12 IEA trailer element names

X12 IEA trailer element name	Size	Data type	Ref.	Protocol support	Business usage
<inter_trailer>	—	—	IEA	—	—
<number_groups>	01/05	N	I16	M	M
<inter_control>	09/09	N	I12	M	M

The X12 IEA trailer is defined in X12.22 and included here for reference.

6.2.4.1. Number of included functional groups

The number of included functional groups **<number_groups>** is a count of functional groups contained in this interchange. The value is set by the creator of the interchange.

Size: 01/05

Type: N

<number_groups> (01/05) ::= **<numeric>** *-- data element I16 : X12.5*

Protocol support: Mandatory

Business usage: Mandatory.

6.2.4.2. Interchange control

The Interchange Control **<inter_control>** provides control for the interchange by conveying a unique identifier that names the interchange. It shall have the same value as **<inter_control>** in the associated X12 ISA header.

The syntax and semantics are defined in 6.2.3.7.

<inter_control> (09/09) ::= **<numeric>** *-- data element I12 : X12.5*

Protocol support: Mandatory

Business usage: Mandatory.

6.3 Common data structure

Each functional group defined in this standard is a structure consisting of Common X12 Elements, General FII Extensions, and specific elements for that particular type of functional group.

6.3.1. Common X12 structures

All of the structures in this clause have the syntax specified in X12.22. If no values are specified herein, the values are as defined in X12.22. If the values herein differ from those in X12.22, the values herein take precedence.

6.3.1.1. GS functional group header

The following Functional Group Header (GS) is used throughout this standard to identify the start of a set of transactions which share a common bond. Its syntax is defined in X12.22 and included here for reference.

Table 13 - GS: Function header element names

GS -Function Header element names	Size	Data type	Ref.	Protocol support	Business usage
<fg_header>	—	—	GS	—	—
<functional_group_id>	02/02	AN	479	M	M
<app_sender_id>	02/15	AN	142	M	M
<app_receiver_id>	02/15	AN	124	M	M
<fg_date>	06/06	DT	373	M	M
<fg_time>	04/08	TM	337	M	M
<function_control_number>	01/09	N	28	M	M
<standard>	01/02	AN	455	M	M
<version>	01/12	AN	480	M	M

The function header **<fg_header>** indicates the beginning of the functional group. It contains information which applies to the entire functional group. It shall be first in the functional group.

6.3.1.1.1. Functional group ID

The Functional Group ID **<functional_group_id>** conveys a value containing the identity of the functional group.

Size: 02/02

Type: AN

<functional_group_id>(02/02) ::= **<string>** | *-- X9.46 registered values only*
<financial_data_group> | **<item_views_group>** | **<application_ack_group>** |
<query_requests_group> | **<functional_ack_group>** | **<private_types>**

<financial_data_group> ::= **"70"**
<item_views_group> ::= **"71"**
<application_ack_group> ::= **"72"**
<query_requests_group> ::= **"73"**
<functional_ack_group> ::= **"FA"** *-- Imported from X12 - 997 functional acknowledgment*
<private_types> ::= **"80" | ... | "99"**

Values:

"70" means Financial Data
"71" means Item Views
"72" means Application Acknowledgment

"*73*" means Query Requests
"80 through 99" reserved for private types
"*FA*" means Functional Acknowledgment

Protocol support: Mandatory

Business usage: Mandatory

6.3.1.1.2. Application sender ID

The Application Sender ID **<app_sender_id>** identifies the originator of the functional group's data. The value is registered by the same authority as the sender's **<inter_id_qualifier>** value defined in 6.2.3.3.1.

If the sender is a bank (i.e. the **<inter_id_qualifier>** in the ISA header is "17"), the application sender ID shall be the bank's routing number. If the value of **<inter_id_qualifier>** is other than "17", the value of this data element shall be as registered by that entity.

Size: 02/15

Type: AN

<app_sender_id> (02/15) ::= **<string>**

Values: 9 digits long.

Protocol support: Mandatory

Business usage: Mandatory

6.3.1.1.3. Application receiver ID

The Application Receiver ID **<app_receiver_id>** identifies the receiver of the functional group's data. The value is registered by the same authority as the receiver's **<inter_id_qualifier>** value defined in 6.2.3.4.1.

If the receiver is a bank (i.e. the **<inter_id_qualifier>** in the ISA header is "17"), the application receiver ID shall be the bank's routing number. If the value of **<inter_id_qualifier>** is other than 17, the value of this data element shall be as registered by that entity.

Size: 02/15

Type: AN

<app_receiver_id> (02/15) ::= **<string>**

Values: 9 digits long.

Protocol support: Mandatory

Business usage: Mandatory

6.3.1.1.4. Functional group date

The Functional Group Date **<fg_date>** specifies the creation date of this functional group.

Size: 06/06

Type: DT

<fg_date> (06/06) ::= **<date>**

Values: *YYMMDD* where *YY* represents the year, *MM* represents the month, and *DD* represents the day:
YY shall be 00 through 99;
MM shall be 01 through 12;
DD shall be 01 through 31.

Protocol support: Mandatory

Protocol support: Mandatory

6.3.1.1.5. Functional group time

The Functional Group Time **<fg_time>** specifies the creation time of this functional group. The time value represents the *local* time of the institution creating this functional group.

For the purpose of this standard, the value shall always include values for hours, minutes and seconds, i.e., contain six digits.

Size: 04/06, this standard shall use 6 digits

Type: TM

<fg_time> (04/08) ::= **<time>** -- *The originator's LOCAL time, not GMT*

Values: *HHMM[SSFF* where *HH* represents hour, *MM* represents minutes, [*SS*] represents seconds. Per X12, the inclusion of seconds is optional as indicated by the [ ] notation.

HH shall be 00 through 23
MM shall be 00 through 59
SS shall be 00 through 59
FF shall be 00 through 99

Protocol support: Mandatory

Business usage: Mandatory

6.3.1.1.6. Functional group control number

The Functional Group Control Number **<function_control_number>** conveys a unique value which is used to control the functional group. It shall be unique within this interchange, and across all interchanges originated by a sender for a specific functional group date. Its value is determined by the originator of the functional group.

The value is also used in Functional Group Trailer, see 6.3.1.2.2.

Size: 01/09

Type: N

<function_control_number> (01/09) ::= **<numeric>**

Values: Locally determined and assigned.

Protocol support: Mandatory

Business usage: Mandatory

6.3.1.1.7. Standard

The Standard **<standard>** identifies the standard to which the functional group conforms.

Size: 01/02

Type: AN

<standard> (01/02) ::= **<string>** -- *the value "X9" is used*

Values: "X9"

Protocol support: Mandatory

Business usage: Mandatory

6.3.1.1.8. Version

The Version **<version>** identifies the X12 and X9 version and release numbers, respectively, to which this functional group conforms.

Size: 01/12

Type: AN

<version> (01/12) ::= **<string>** *-- bytes 1-6: use the value "003050"*
-- bytes 7-12: use the values "001001"

Values: *Character positions 1-3*: "003" to indicate X12 (1994) version;
Character positions 4-6: "050" to indicate X12 (1994) release;
Character positions 7-9: "001" to indicate the 1995 version of the X9.46 standard,
Character positions 10-12: "001" to indicate the 1995 release of the X9.46 standard.

Protocol support: Mandatory

Business usage: Mandatory

6.3.1.2. Functional group trailer

The following Functional Group Trailer (GE) structure is used throughout this standard to identify the end of a named functional group. The **<no_included_sets>** provide a level of control to indicate the originator's perception of the number of sets of transactions included in the functional group, which is named by the value of **<function_control_number>**. Its syntax is defined in X12.22 and included here for reference.

Table 14 - GE: Function trailer element names

GE -Function Trailer element names	Size	Data type	Ref.	Protocol support	Business usage
<fg_trailer>	—	—	GE	—	—
<no_included_sets>	01/06	N	97	M	M
<function_control_number>	01/09	N	28	M	M

The function trailer **<fg_trailer>** is the trailer of the function group. It shall be last in the functional group.

6.3.1.2.1. Number of included sets

The Number Of Included Sets **<no_included_sets>** conveys a value containing the count of the number of transaction sets included in this functional group. It is provided by the application sender, and used for control purposes by the application receiver to ensure receipt of the correct number of transaction sets.

Size: 01/06

Type: N

<no_included_sets> (01/06) ::= **<numeric>**

Values: Count of number of transaction sets

Protocol support: Mandatory

Business usage: Mandatory

6.3.1.2.2. Functional group control number

The Functional Group Control Number **<function_control_number>** conveys a value which is used to control the functional group. It shall have the same value as its couterpart in the associated **<fg_header>**.

The syntax is defined in 6.3.1.1.6.

Values: Shall match the **<function_control_number>** in the associated functional group header.

Protocol support: Mandatory

Business usage: Mandatory

6.3.1.3. Transaction set header

The following Transaction Set Header (ST) structure is used throughout this standard to identify the start of a group of segments that share a common bond. Its syntax is defined in X12.22 and included here for reference.

Table 15 - ST: Transaction set header element names

ST -Transaction Set Header element names	Size	Data type	Ref.	Protocol support	Business usage
<trans_set_header>	—	—	ST	—	—
<trans_set_id>	03/03	AN	143	M	M
<trans_set_control_number>	04/09	AN	329	M	M

The Transaction Set Header is used to indicate the information common to the set of transactions. It shall be first in the transaction set.

6.3.1.3.1. Transaction set ID

The Transaction Set ID **<trans_set_id>** element conveys a value which identifies the type of this transaction set. Its type shall be selected in accordance with the X12 function header type that precedes it.

Size: 03/03

Type: AN

<trans_set_id> (03/03) ::= **<string>** / -- *Only X9.46 registered values are used*
<financial_data_set> | **<item_group_set>** | **<application_ack_set>** | **<query_requests_set>** | **<signatures_set>** | **<functional_ack_set>**

<financial_data_set> ::= **"FTS"**
<item_group_set> ::= **"ITS"**
<application_ack_set> ::= **"ATS"**
<query_requests_set> ::= **"QTS"**
<signatures_set> ::= **"STS"**
<functional_ack_set> ::= **"997"** -- *Imported from X12 - 997 functional acknowledgment*

Values: *"FTS"* means Financial Data transaction set
"ITS" means Item Group transaction set
"ATS" means Application Acknowledgment transaction set
"QTS" means Query Request transaction set
"STS" means Signature transaction set
"997" means Functional Acknowledgment transaction set

Protocol support: Mandatory

Business usage: Mandatory

6.3.1.3.2. Transaction set control number

The Transaction Set Control Number **<trans_set_control_number>** element conveys a value used to provide matching control between the transaction set header and the transaction set trailer. Its value, determined by the originator of the transaction set, is unique across all transaction sets within a specific functional group. The value assigned in the header must match the value assigned in the trailer, see 6.3.1.4.2.