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## [54] CENTRAL CHECK CLEARING SYSTEM

[75] Inventors: **John L. Barnhard, Jr.**, Worthington; **Thomas K. Bowen**, Westerville; **Terry L. Geer**, Baltimore; **John W. Liebersbach**, Gahanna, all of Ohio

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

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### Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 203,489, Jun. 7, 1988, abandoned.

[51] Int. Cl.<sup>5</sup> ..... **G06F 15/20; G06G 7/52**

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

[58] Field of Search ..... **364/406, 408; 902/24, 902/39, 40; 235/379**

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Primary Examiner—Roy N. Envall, Jr.

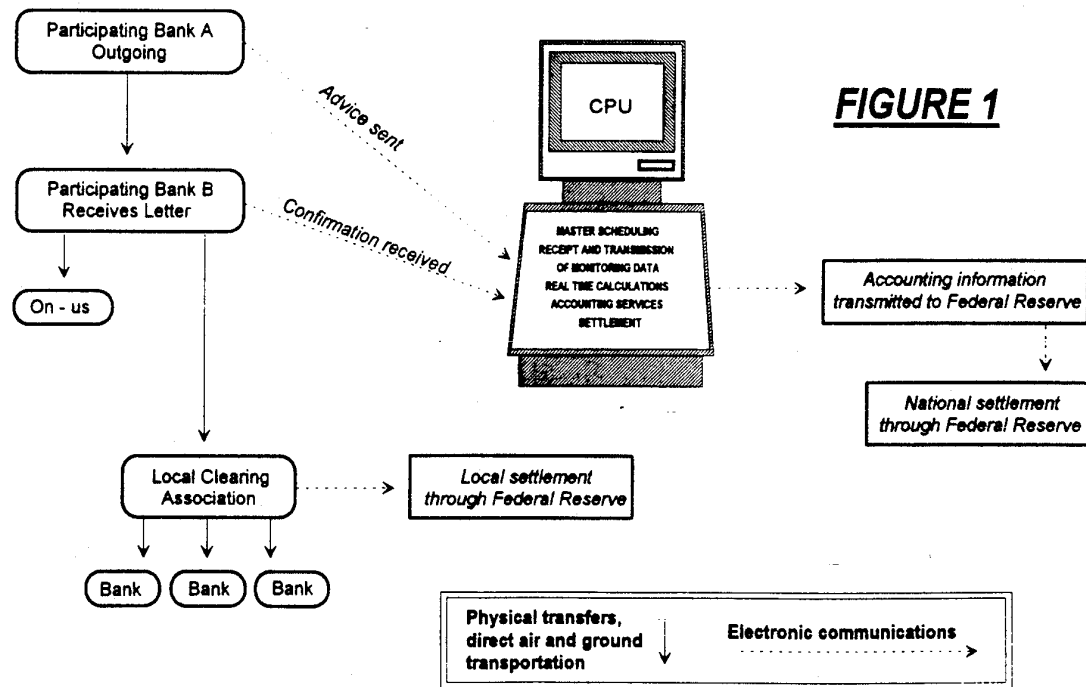
Assistant Examiner—Laura Brutman

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

### [57] ABSTRACT

A central check clearing association by which different member banks and financial institutions can each settle debit and credit balances with respect to other member institutions on a predetermined periodic basis and methods and systems by which the association is operable. The system and method is independent of conventional central bank district geographic and institutional boundaries and time zones.

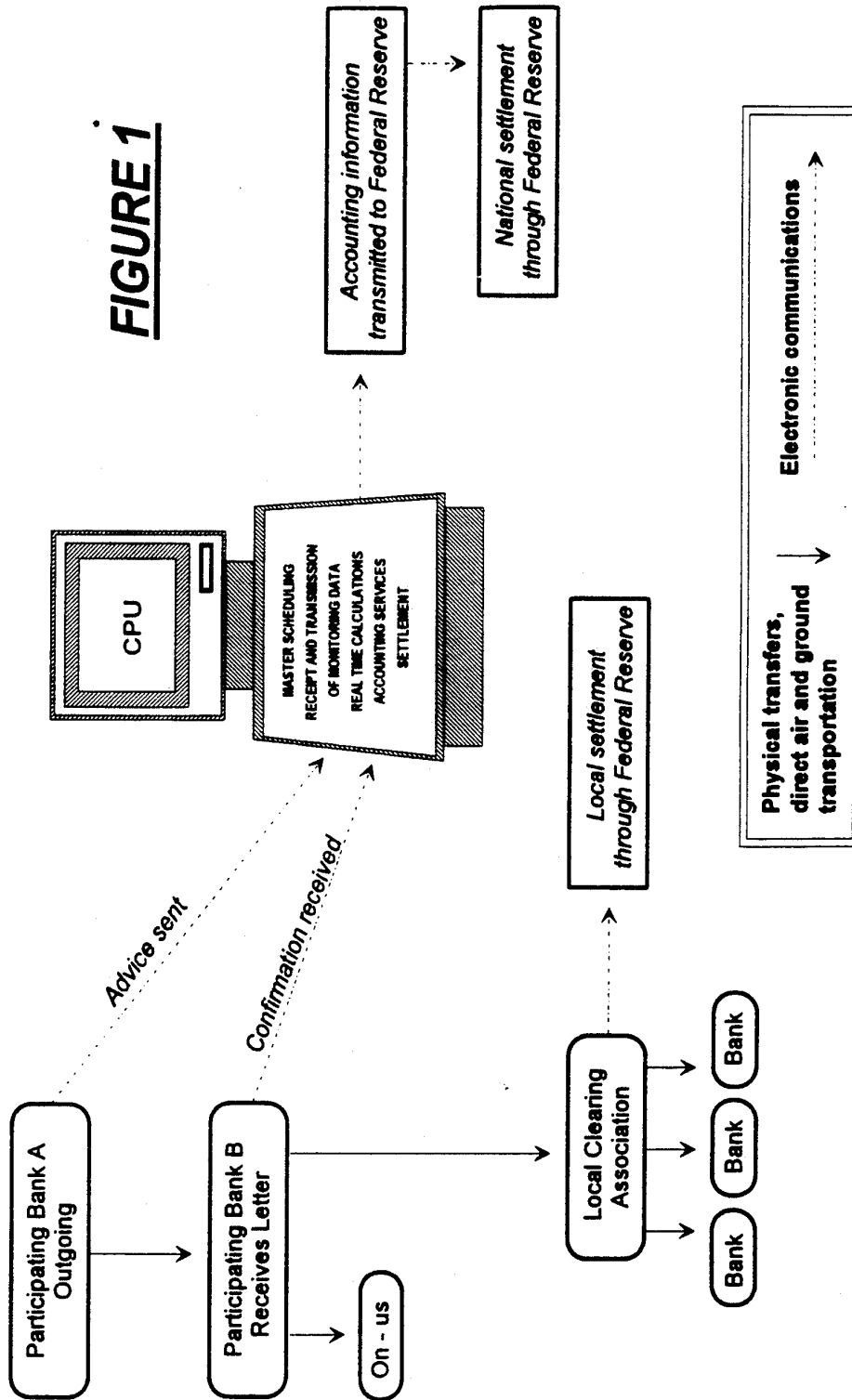
6 Claims, 1 Drawing Sheet



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**CENTRAL CHECK CLEARING SYSTEM**

**RELATED APPLICATION**

This is a continuation-in-part of our copending application Ser. No. 07/203,489 filed on Jun. 7, 1988, now abandoned.

**FIELD OF THE INVENTION**

This invention relates to an exchange and settlement system to be used by banks for financial instrument clearings. More particularly, the invention comprises a central check clearing association and a control system therefor by which different member banks and financial institutions can each settle by debit and credit entries for checks drawn on other member institutions and certain non-member institutions on a predetermined periodic basis and means by which the association and the control system for the association is operable. The system and method is independent of conventional central bank district geographic and institutional boundaries, and time zones. In the system, checks can also be sent to members for clearing on behalf of non-member correspondent banks. As used herein, "checks" includes standard banking checks and other "cash items" as that latter term is conventionally used in the banking industry.

**BACKGROUND OF THE PRIOR ART**

Check clearing systems are well known in the banking industry and generally operate locally or through the Federal Reserve Bank settlement system. On a predetermined periodic basis, checks and other financial instruments drawn against a payer bank are submitted for payment and collection. Where, in a system, there are multiple institutions on which checks are drawn and which checks are in the possession of multiple members, clearinghouse systems are known in which the debit/credit balances of members with respect to the others are reconciled on a daily basis and payments to reconcile a net zero balance are made.

**OBJECTS OF THE INVENTION**

It is an object of this invention to provide means whereby an association composed of participating banks in major cities is formed, and a national clearinghouse system is maintained. At least one institutional participant in each city would have access to the local clearinghouse. Participating member banks would each agree to receive items drawn on the individual participant and on other members of its local clearinghouse in that city. The members of the local clearinghouse need not be members of the national clearinghouse, and items cleared by the national association include items drawn on local clearinghouse members who do not belong to the national association. As used herein, reference to "national clearinghouse" may also include a system having participants in different nations joined in a single association according to the system described herein. A "national" association, however, because of currency uniformity in a single nation is most feasible.

In its function, the association would provide a central accounting means such as a conventional programmable computer or other central processing unit for the computation of the settlements among participating banks. Physical delivery of items would be accomplished through air and ground transportation, and real time electronic tracking of cash letters transmitted

through the transportation system is permitted. Advice of the sending of cash letters would be received electronically by the association's central accounting means from the participating institutions sending such cash letters, and confirmations of receipt would also be electronically transmitted by participants receiving such cash letters. Preferably, the electronic information transmitted through the system would be encrypted.

The detailed accounting entries required to accomplish a net settlement among participants on a periodic basis (typically daily) would be prepared by the central accounting means of the association. In the United States banking system, national settlement would be completed by debit and credit of the participant's accounts, or wire advice to the participant's accounts through the Federal Reserve settlement system.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 shows an overall flow chart of operations in a national clearing association in the United States which includes: (1) the centralized monitoring and control means necessary for the association operations; and (2) the linkages of the various elements of the system by physical transfer and electronic communications.

**DESCRIPTION OF THE PREFERRED EMBODIMENT**

In its preferred embodiment applicable to the United States banking system, this invention comprises a centralized clearinghouse system including an association of selected member financial institutions. A clearing system is maintained by a central control means in which debits and credits owing from one member to another are calculated on a predetermined periodic basis without regard to Federal Reserve System district settlements, in which the participants report the value and transit status of items to be cleared to the central control means; and in which the central control means monitors on a real time basis the actual sending and receipt of, and the dollar amount of items being cleared, as reported by the participants, and records the sending and receipt of the aggregate amount of the actual financial instruments transported, as reported by the participants, (subject to timely reporting of adjustments, returns and the like) and thereafter calculates the net settlements among the participants and initiates the corresponding debits and credits necessary to effect settlement among members in the Federal Reserve settlement systems. In the system, before the calculation of the net settlement, the receiving bank records and enters into the central control means any adjustments and any return items after transmission of the items which may affect the net settlement.

In the system of the invention, physical transport of financial instruments between and among the members is controlled by a predetermined time schedule, and the national settlement of the individual members of the association is achieved at a time not later than local settlements by members of the national association are completed.

Organization of the system requires strict maintenance of predetermined association parameters. The clearinghouse is independent of conventional geographical and institutional boundaries such as Federal Reserve districts, as well as time zones. In the association, all participants must be members of the national clearinghouse association, and all member banks must agree

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to accept and process items drawn on themselves and on banks within the local clearinghouse of which they are also a member. The local clearinghouse rules, means of exchange and procedures are entirely separate from that of the system. All member banks of the national association must agree to use the central settlement system, and all settlements would be either same day settlements or based on some other acceptable periodic or predetermined time schedule. In the United States Federal Reserve System, settlements accomplished by the national association described herein would preferably occur after the daily scheduled local clearinghouse settlements are accomplished. Strict adherence to a time schedule prescribed by the association for providing debit and credit advice and the physical exchange of items is required.

A high dollar return notification (i.e., \$2,500.00) is mandatory, as is high dollar adjustment notification. All cash letters received must be confirmed by the receiving bank through the association's accounting system. Members typically should be able to guarantee minimum dollar amounts and transaction volumes to be able to participate in the association's clearinghouse system. Selection criteria for members may consider geographic locations, time zones, commercial standing and membership in other banking associations, as well as other criteria appropriate for a coordinated clearinghouse system.

In a central accounting means, all national settlements among participants in the national associations will be posted from the association's accounting system to the accounts of the participants at the Federal Reserve System (or a pass-through bank). The net of the day's activity for each institution will reflect the bank's position in the system with respect to other members. By means of the central accounting system, each member will be able electronically to inquire into the accounting system throughout the day, on a real time basis, to manage and reconcile funds in anticipation of settlement. In accordance with a strictly defined time schedule, all activity must be confirmed by the receiving bank prior to final settlement. If a member or members cannot settle, an unwinding mechanism is provided by a control means in the accounting system; and the system would recompute the settlement without the inclusion of the items sent to the non-settling member or members. The national clearinghouse association does not itself effect settlement among the members; member settlement occurs through the Federal Reserve System based on computations made by the control means which are transmitted to one of the Federal Reserve Banks. That one Federal Reserve Bank, in turn, will send entries to other Federal Reserve Banks to effect "nationwide" settlements in other districts.

A principal object of and advantage achieved by the proposed clearinghouse association is to expedite the forward collection of items and the return of items. When forward collection is expedited, float is reduced, the speed of availability of funds is increased and costs are reduced.

Another advantage is the overall adoption of a uniform set of standards among members to cover all legal and operational aspects of the system. By agreeing to be governed by the association's bylaws, many existing agreements between clearing banks can be standardized and greater operational efficiencies achieved as a result. Further, the proposed clearinghouse association will reduce overall risks in the payment system by reducing

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the risks associated with daylight overdrafts and by minimizing the disruption to the overall system which would result if a member cannot settle.

The status of participant's accounts in the national clearinghouse association is recorded and displayed instantaneously as soon as information is received by the central control means. Account reconciliation occurs at a predetermined time each day when the net settlement is calculated after each member completes its reports. However, with reference to the sequence depicted in FIG. 1 in the United States system, the critical timing element of the system is that national settlement through the Federal Reserve System occurs not later than the settlements of local clearinghouses.

FIG. 1 shows an illustrative linkage of participants in the clearinghouse as presentation and payment functions are connected by physical transfer by air or ground transportation of the actual checks or drafts that are to be cleared and by electronic communications between the participants, concerning information about the value and status of transport of the items sent by member banks. In the example of FIG. 1, the relative position of participating banks A and B with respect to each other are monitored by the central control means of the National Clearing Association. Bank B may participate in a local clearing association that includes a number of banks that are not members of the National Clearing Association. The "On us" reference in FIG. 1 denotes items drawn on Bank B and payable by Bank B that are not exchanged in the local clearinghouse. After local settlement by Bank B and the physical transfer of items in the local clearing association, the National Clearing Association will calculate the respective debit/credit balances of Bank A and Bank B (not only to each other but to all other participating banks) and transmit the same information to the Federal Reserve for the national banking system settlement. Settlement in the National Clearing Association is wholly independent of settlement or liability of settlement in the local clearinghouses.

In the preferred embodiment, sorting of checks between member and non-member local clearinghouse banks is done by the receiving bank. This permits the sending bank to assemble checks for sending without sorting, except for a first sort by member locality, and permits the receiving bank thereafter to sort its local checks when its sort machines would otherwise not be in peak use. Presentation of checks for payment is thereby expedited.

Each participant in the proposed association will be better able to monitor its net settlement position throughout the banking day. On a daily basis, local clearinghouse settlements will occur before settlement by the national clearing association. In addition, reliance upon large wire transfers through the Federal Reserve Bank wire network, which is created by the present environment in which many reciprocal clearing arrangements exist, will be reduced. Wire transfer fees between banks are significantly reduced or eliminated. The need for reciprocal private correspondent balances with other financial institutions for the purpose of check clearing will also be eliminated for members of the system with respect to other members.

The association will also establish a procedure in the event that a participant is unable to settle. In this event, the non-settling member's payments will be excluded; the accounting system of the association will revise the settlement entries to include only the deposits of the

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settling members of the association and will exclude items drawn on non-settling members.

In the event there is more than one member bank in a large city, means can be included in the system to allocate volume to equalize the flow of checks among the members. This may reflect pro-rata or other equitable distribution of a work load among system members.

#### EXAMPLE I

In the continental United States, there are 12 Federal Reserve Districts and 4 time zones that presently constitute obstacles to inter-district and inter-time zone settlements. Inter-city settlements by association member participant banks situated in different time zones and Federal Reserve Districts are conveniently effected by the control means and the system of the invention.

In any particular locality, the participating member would first effect local settlement. All non-local checks would be sorted according to the locality of the bank on which the checks were drawn and the aggregate value of such checks would be determined. In any event, non-local checks that are not submissible to the local clearinghouse are segregated from local checks, typically by a rough sort of checks according to MICR coding.

At a predetermined time, typically after the close of the banking day, each participating member: (1) will prepare and send for presentment to each other participating member all checks drawn on that other participating member; and (2) will send for collection all checks to be presented for payment which are drawn on non-participant banks in the other participating member's local clearing-house district. "Collection" and "presentment" are known technical terms in the banking industry. Thus, if membership in a check clearing association controlled by the means of the invention included 40 participants, each participant would usually send out in accordance with a fixed and predetermined processing time schedule, checks and accompanying cash letters to up to potentially 39 other participants. Each participant in turn would receive such items from up to potentially 39 other participants. The items presented would be drawn directly on participant and on non-participant banks located in the participant's local clearing system.

#### A.

A simplified two city settlement involving Los Angeles and New York as example localities is described. At a 12:00 midnight cut-off in Los Angeles, the Los Angeles bank should have completed its sorting and dispatched by air to New York the sorted New York checks. The Los Angeles bank may have determined that it had been presented with \$1,000,000.00 of checks drawn in the New York area, including (1) a first quantity of checks valued at \$800,000.00 drawn directly on the New York participant and (2) a second quantity of checks valued at \$200,000.00 drawn on banks in the local New York clearinghouse district of which the New York participant is a member.

Physical transport of the checks may be by any means provided that scheduling requirements of the system are maintained. When the checks are dispatched to New York, the fact of transmittal, information about the transmittal of the checks and the total value transmitted are entered into the master association "switch". The two categories of checks represent the Los Angeles side of an anticipated settlement credited to the Los Angeles

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participant arising from (1) checks drawn on the New York participant and (2) checks sent for collection to be presented to other New York banks. Thus, all checks received in New York are potential credits to the Los Angeles participant. The checks drawn on the New York participant are debits of the New York participant. All the New York non-participant checks submitted will be recorded as credits to the Los Angeles participant. The "switch" is the central control means in which information about the Los Angeles transmittal is immediately entered. The switch may be an appropriately programmed digital computer having means for receipt and transmission of data as well as further arithmetic or algorithmic means, to reconcile or calculate debits and credits anticipated in an essentially "real time" basis among the participating members. Net settlement occurs at a single predetermined time each day when final debits and credits among the members are calculated and effected through Federal Reserve accounts. Software adapted to the system described herein may be devised by persons of skill in the financial programming computer arts. Communications to and from the switch may occur through conventional telephone links by modem connections and the like.

Immediately upon physical receipt of the checks, the New York participant enters information about the receipt of \$1,000,000.00 in checks into the switch. Thus, the Los Angeles bank receives potential or anticipated credits of \$1,000,000.00 in two categories: (1) checks drawn on the participant New York bank and presented for payment; and (2) checks for collection drawn on other banks in the New York area that are members of the New York participant bank's local clearinghouse. These anticipated credits are recorded in the switch. The anticipated credit of \$800,000.00 in the first category thus becomes an actual credit upon subsequent settlement. (The anticipated credit may be adjusted during the settlement process to produce the actual credit.) As promptly as possible in accordance with local New York clearinghouse rules, the New York participant presents the remaining \$200,000.00 of checks in favor of the Los Angeles participant drawn on non-participant New York banks for settlement at the local New York clearinghouse on behalf of the Los Angeles participant. Thus, the Los Angeles participant obtains same day availability for all checks drawn on the New York participant, and when non-participant checks are presented to the New York clearinghouse that same day, the Los Angeles participant also obtains same day availability of cash from the non-participants' checks drawn on New York clearinghouse banks.

The receipt of the Los Angeles checks in New York is immediately reported to the switch or control means, and the subsequent settlements of the participant and non-participant checks are calculated by the control means to determine settlement. The New York to Los Angeles reporting and settlement procedures follow the same format, as does any other locality shipment of checks to be cleared.

A number of significant advantages are achieved through the system control means by which shipment and receipt schedules are fixed and "real time" reports of shipment and receipt are made to and accessible from the control means. The control provides a means of monitoring anticipated settlements as a result of the information recorded.

A principal advantage is the considerably enhanced availability of funds, typically on a same day basis.

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Rough sorted check shipments to out-of-locality banks arrive and are fine sorted by the receiving participant when the receiving participant's sorters are not in peak use. Thus the system utilizes non-peak time and involves only marginal cost connected with expensive sorting mechanisms. In addition, a check sort can be based on many parameters. The system only requires that a sending participant rough sort (by locality) in order to send to a participant that will thereafter do a fine sort by bank within the locality for local settlement. Thus, the time within which as many checks as possible may be processed is increased, yet mechanical requirements for sorters need not be increased.

The control means monitors information about shipments and receipts from each participant. Through the means, each participant sends and receives information from the others. Each participant can address the system to determine, at any point in time, anticipated (shipped and in transit) and received checks and the accompanying "cash letter" that is included in each shipment. (A "cash letter" is a banking industry term referring to a listing, and total, of all checks within a shipment.)

Such information is of considerable importance to a participant's investment department, which requires such information to insure effective use of cash on hand and cash anticipated to be received, or to insure that sufficient cash is available to make settlements. Thus, the control means provides a real time indication of cash needs anticipated for purposes of Federal Reserve settlement.

In contrast, the Federal Reserve System typically is not as quick, and alternative correspondent systems are subject to higher fees. The present system may be devised such that no separate fees are charged among members, and association membership is a shared cost. Each participant agrees to receive all items submitted by any other participant. The system reduces risk and float time and presents added time and knowledge by which inter-bank settlements may be made and intra-bank finances may be adjusted.

What is claimed is:

1. A mechanism for physically exchanging financial instruments among a number of pre-selected financial institutions, each located at a preselected site, and for effecting the regular periodic settlement of the exchanged instruments among the institutions including:

(A) means within each of the pre-selected institutions:

- (1) for sending and receiving the instruments, said means for sending including means for physically transporting the instruments from an institution at one site to each other of the institutions at the other sites, said means for receiving including means for physically accepting the instruments transported from the other institutions;
- (2) for sending to and receiving from a central processing unit connected to each institution information reporting in real time in correspondence with the occurrence of an event (a) the value of the instruments transported; and (b) the transport status of the instruments with respect to their having been (i) sent and (ii) received; and
- (3) for receiving from the central processing unit a calculated value (a) on a real time basis and (b) on a regular periodic settlement basis, information regarding the debits and credits owing to or payable by an institution with respect to each

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other of the institutions with regard to instruments sent and received;

(B) a central processing unit connected to each of the pre-selected institutions including

(1) means for continuous monitoring on a real time basis, as reported by each institution by the means for sending information within each institution;

(a) (i) the sending and receipt status of the instruments and (ii) the value of the instruments sent and received, as reported by each of the institutions, and

(b) the status in transit of the instruments with respect to their having been (i) sent and (ii) received, as reported by each of the institutions, according to the reporting of an institution's sending and receiving of instruments,

(2) means for calculating debits and credits, based on the value of the instruments sent and received by the institutions, as monitored on a real time basis from information reported by the institutions, of (a) the amount owing from or payable to each one of the pre-selected institutions with respect to each of the other institutions and (b) an aggregate amount owing from or payable to each one of the pre-selected institutions with respect to all of the other institutions; and

(3) means for sending to each institution the information monitored with respect to instruments sent to an institution and the value of such instruments; and

(C) a cycling means interrelated with the central processing unit (a) for controlling the physical transport of the financial instruments among the institutions and (b) for controlling the means for calculating such that a final calculation of the debits and credits owing from or payable to, with respect to each of the institutions with regard to each other of the institutions, comprising the occurrence of the regular periodic settlement among the institutions, does not occur until pre-determined local settlements by the institutions in the pre-selected sites with institutions that are not among the number of pre-selected financial institutions, are completed.

2. The mechanism of claim 1 further including a means at an institution by which instruments are sorted by the site locality of each other of the pre-selected institutions and in which the instruments sorted by site are sent by site sort category to institutions at sites within the site sort categories.

3. The mechanism of claim 2 further including a sorter at an institution which receives the instruments which sorter sorts the instruments received according to categories of:

(1) instruments drawn on the receiving institution; and

(2) instruments drawn on institutions within the site that are not among the number of pre-selected financial institutions.

4. A system for a financial clearinghouse comprised of an association of selected member financial institution participants situated in different localities including:

A. means at each of the participants (1) for sending and receiving financial instruments to be cleared and (2) for sending and receiving in real time information reporting the value and transit status of the

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financial instruments to be cleared, to a programmed central processing unit, and (3) for addressing the central processing unit by which a participant may determine in real time the information received by the processing unit with respect to that participant's relative credit and debit obligations with respect to other institutions arising from the instruments that are reported to be sent and received;

B. a programmed central processing unit including: means for calculating debits and credits owing from or payable (1) to one member to another member and (2) from or to one member to all other members, based upon the value of instruments reported by a participant as having been sent and received;

means for receiving and recording a participant's reports of the value and transit status of the instruments to be cleared as having been sent and received with respect to all participants in the system; and

means for monitoring on a real time as reported basis (1) the actual sending from and receipt by a participant of the value of instruments being cleared as reported by the participants, and (2) the sending from and receipt by a participant of the actual instruments being cleared, said means for monitoring being operatively interconnected to the means for calculating whereby debits and

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credits owing from one member to another may be determined and monitored on a continuous basis in real time as reports of the value and transit status of the instruments to be cleared are reported by the participants and received by the processing unit; and

C. a time control for determining the time of physical transport of financial instruments between and among the participants according to a predetermined time cycle, and for determining the occurrence of a final settlement by the clearinghouse participants at a pre-determined time until after a time that certain pre-determined local settlements in the localities, by the participants in the localities, are completed.

5. The system of claim 4 further including a sorter machine which separates the instruments in pre-determined sort categories according to localities to which the instruments are sent.

6. The system of claim 5 further including a sorter machine operated by a receiving participant for sorting the instruments received by the participant according to categories of:

(1) instruments drawn on that participant; and

(2) instruments drawn on different financial institutions in the locality which are not participants in the clearinghouse.

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