METHOD FOR SEMI-CONTINUOUS CURRENCY PROCESSING USING SEPARATOR CARDS

VERFAHREN ZUR HALBKONTINUIERLICHEN HANDHABUNG VON GELDSCHEINEN MIT HILFE VON TRENNKARTEN

PROCÉDE SEMI-CONTINU DE TRAITEMENT DE BILLETS DE BANQUE UTILISANT DES CARTES DE SEPARATION

PATENT ABSTRACTS OF JAPAN vol. 007, no. 070 (P-185), 23 March 1983 & JP 57 212567 A
(FUJITSU KK), 27 December 1982,
Description

TECHNICAL FIELD OF THE INVENTION

[0001] The field of this invention relates to high-volume currency processing using currency processing machines.

BACKGROUND OF THE INVENTION

[0002] Automated, high-volume currency processing is a growing international industry affecting numerous aspects of the distribution, collection, and accounting of paper currency. Currency processing presents unique labor task issues that are intertwined with security considerations. Currency processing requires numerous individual tasks, for example: the collection of single notes by a cashier or bank teller, the accounting of individual commercial deposits or bank teller pay-in accounts, the assimilation and shipment of individual deposits or accounts to a central processing facility, the handling and accounting of a currency shipment after it arrives at a processing facility, and the processing of individual accounts through automated processing machines. Any step in the process that can be automated, thereby eliminating the need for a human labor task, saves both the labor requirements for processing currency and increases the security of the entire process. Security is increased when instituting automated processes by eliminating opportunities for theft, inadvertent loss, or mishandling of currency and increasing accounting accuracy.

[0003] A highly automated, high-volume processing system is essential to numerous levels of currency distribution and collection networks. Several designs of high-volume processing machines are available in the prior art and used by such varied interests as national central banks, independent currency transporting companies, currency printing facilities, and individual banks. In general, currency processing machines utilize a conveyer system which transports individual notes past a series of detectors. By way of example, a note may be passed through a series of electrical transducers designed to measure the note's width, length, and thickness. The next set of sensors could be optical sensors recording the note's color patterns. Detectors can likewise be used to detect specific magnetic or other physical characteristics of individual notes.

[0004] High volume currency processing machines typically pull individual notes from a stack of currency through a mechanical conveyer past several different detectors in order to facilitate the sorting of the individual notes and the accumulation of data regarding each note fed through the machine. For example, a currency processing machine can perform the simple tasks of processing a stack of currency in order to ensure that it is all of one denomination with proper fitness characteristics while simultaneously counting the stack to confirm a previous accounting. A slightly more complex task of separating a stack of currency into individual denominations while simultaneously counting the currency can be accomplished as well. On the more complex end of prior art currency processing machines, a stack of currency consisting of various denominations can be fed into the machine for a processing that results in the separation of each denomination, a rejection of any currency that does not meet fitness specifications, the identification of counterfeit bills, and the tracking of individual notes by serial number.

[0005] Prior art high-volume currency processing machines are loaded with one single stack of currency, identified to a single set of accounting parameters, before executing the sort process. For example, a stack of currency associated with a specific commercial deposit at a bank may be loaded at the beginning of the currency processing cycle. The currency is then fed into the currency processing machine and sorted based on the needs of the customer. Data obtained from the sort process, for example the number of each denomination note that was detected during the procedure and the total deposit amount, is then compared to the same data identified to the stack of currency prior to the processing cycle. However, a need exists for a currency processing method that reduces the labor involved in loading the currency processing machine and improves the security involved in this step. Specifically, a need exists for a method which can process numerous stacks of currency identified to individual accounting parameters one after another without having to wait to reload or stop the machine in order to review data collected on each individual account. It is this need which is addressed by the present invention.

[0006] US 4 025 420 A discloses a method of processing banknotes in which a bundle of notes is made up of stacks of notes, each stack originating from an individual cashier. The stacks are separated and identified by sorting cards, each provided with a magnetic strip. The object is to be able to trace any problems with the notes back to the bank employee from whom they came, while still handling the notes in a large bundle from a plurality of origins. The sorting card of US 420 can be detected, even if it is sandwiched between two banknotes, because its width is greater than that of the banknotes. US 420 deals with misfeeds by another technique, which relies on measuring the thickness of two or more superposed notes.

[0007] According to one aspect of this invention there is provided a method of semi-continuous processing of currency, said currency having at least one denomination and authenticating attributes, using a currency processing machine, comprising the steps of:

(a) separating at least one currency stack with at least one separator card, said separator card having a magnetic strip wherein said separator card is encoded with account information:
(b) identifying said currency stack with information encoded on said separator card;
(c) feeding said currency stack and separator card into said currency processing machine, and
(d) processing the separator card and currency notes using processing steps common to both, the method comprising a further step, effected during step (d) if a mis-feed occurs at step (c) resulting in at least one note masking the separator card during the subsequent processing of the separator card and currency notes, the further step including detecting the magnetic strip on the separator card by reading the magnetic field through the masking currency.

[0008] Preferably the method includes the additional step of reading the individual serial number on a note masking a concurrently stacked separator card.

[0009] The method may further comprise the steps of:

(e) verifying the authenticity of each currency note within said currency stack;
(f) separating non-authentic currency; and,
(g) associating said non-authentic currency with an initial currency stack and separator card.

[0010] Preferably step (f) is accomplished by stacking non-authentic currency with a corresponding separator card as a last processing step.

[0011] Alternatively step (f) is accomplished by identifying the non-authentic currency to the account information encoded at step (a).

[0012] The method may further comprise:

(h) sorting said currency by denomination into a plurality of slots in said machine;
(i) sorting an accounting of said currency in a memory of said machine; and,
(j) comparing said accounting of step (i) with the account information encoded at step (a).

[0013] In one embodiment step (a) comprises separating at least one currency stack with a separator card imprinted with a bar code series.

[0014] Step (a) may further comprise encoding accounting information including an initial count of the value of said currency stack and a source for said currency stack.

[0015] The method may further comprise:

(i) comparing the initial count with a post-processing count.

[0016] Preferably step (a) further comprises placing said separator card as a header card.

[0017] Alternatively step (a) further comprises placing said separator card as a trailer card.

[0018] In a further method of the invention step (a) further comprises placing one of said card as a header card and placing one of said cards as a trailer card.

[0019] The invention also provides a method of identifying a separator card used to delineate and track a stack of currency in a currency batch fed into a currency processing machine, which card has a magnetic strip thereon, said method comprising the steps of:

(a) identifying account data for said currency stack to said separator card prior to processing said currency stack;
(b) passing the separator card through at least one detector which detects at least one card characteristic; and
(c) distinguishing between said separator card and said currency based on the detected characteristics, wherein step (c) comprises distinguishing between said separator card and said currency when said separator card is masked by a currency note due to a misfeed by detecting the magnetic strip on the separator card by reading the magnetic field through the masking currency.

[0020] Step (b) may comprise passing the separator card through a detector which detects magnetic card characteristics.

[0021] Alternatively step (b) additionally comprises passing the separator card through a detector which detects optical pattern card characteristics.

[0022] In another embodiment step (b) additionally comprises passing the separator card through a detector which detects physical dimension card characteristics.

[0023] In yet another embodiment step (b) additionally comprises passing the separator card through a detector which detects colour card characteristics.

[0024] The preferred embodiment of this invention provides a method of semi-continuous processing of currency using uniquely designed separator cards defining individual accounting subsets of currency within a larger volume batch feed of currency. This invention thus seeks to provide an improved method of processing currency with high-speed and high-volume currency processing machines such as those presently manufactured and marketed by Currency Systems International of Irving, Texas. The present state of the art utilises such currency processing machines in batch process feeds of currency. A single stack of currency, identified to a particular set of accounting parameters, is placed into the currency processing machine manually and then processed and sorted by the currency processing machine. For example, one stack of currency may represent a commercial deposit of a single day's cash collection for a single retail store that was deposited to the retail store's local bank. The single stack could also be identified to an individual teller's shift pay-in collections from a single bank after this teller's collections are shipped to a central bank for processing. Data obtained from the currency processing machine sort of a single stack of currency is then retrieved from the machine and
Another particularly difficult quality control problem in-
two accounts would be fatal to the accuracy of the
another, the co-mingling of the currency between the
ator card as a break between one currency stack and
If a currency processing machine fails to identify a sep-
ning distinct separations between individual accounts as
arator cards and currency. This is important to maintain-
should easily and consistently distinguish between sep-
cards which a currency processing machine can both
easily distinguish from currency and readily identify as

The present invention seeks to eliminate the
need for individual batch feedings of stacks of currency.
With the preferred embodiment of the present invention,
individual batch runs of currency can be consolidated
into a much larger batch with accounting subsets, such
as the single currency stack examples given above, de-
lineated by separator cards with special features. As a
result, currency relating to individual accounts can be
stacked, without the need for bundling, to make up a
much larger batch of currency to be processed. This
step can be performed before the currency is even
shipped to a central processing location. For example,
individual tellers’ shift collections for a single branch
bank can be stacked into one single batch of currency
with each teller’s shift account separated by separator
cards. Each separator card can be encoded with de-
tailed account information about the stack of currency
with which it is associated, or bar code information from
the separator card can be identified to the account in-
formation of the accompanying stack of currency. The
entire batch can now be transported to a central banking
location or processing facility. When the currency, now
in a large batch, arrives at the processing facility, the
currency processing machine operator can load the en-
tire batch into the currency processing machine in one
step, rather than loading each teller’s account individu-
ally. Data assimilated regarding each accounting subset
can also be obtained continuously and compared with
the detailed account information encoded on or identi-
fied to the separator cards without stopping the machine
between each currency batch feed. As a result, the pre-
ferred embodiment of the present invention greatly in-
creases both security and labour savings for high-vol-
ume currency sorting operations by eliminating steps in
the currency processing system.

This invention includes the use of separator
cards which a currency processing machine can both
easily distinguish from currency and readily identify as
a specific separator card associated with a specific
stack of currency. The currency processing machine
should easily and consistently distinguish between sep-
ator cards and currency. This is important to maintain-
ning distinct separations between individual accounts as
they are fed through the currency processing machine.
If a currency processing machine fails to identify a sep-
arator card as a break between one currency stack and
another, the co-mingling of the currency between the
two accounts would be fatal to the accuracy of the
processing cycle. Difficult accounting problems could
likewise surface if a currency processing machine mis-
takenly identifies a currency note as a separator card.
Another particularly difficult quality control problem in-
volves the misfeed of one or more currency notes simul-
taneously with a separator card, resulting in the curren-
cy and separator card entering the machine while
stacked together. The notes in this misfed stack could
mask the separator card from many of the detectors that
would otherwise distinguish the card from currency.
Therefore, in order to accomplish the goal of consistent
distinction between a separator card and currency, the
separator card of the invention is designed with unique
characteristics which allow for the detection of the sepa-
ator card even when misfed with currency notes.

A feature of this invention, that of being able to
identify specific account information to each separator
card, is a requirement of the semi-continuous process-
ing method described above. When individual account
information for a single currency stack can be identified
to an individual separator card, either by encoding the
separator card with this information or by identifying the
information to a unique identifier for each card (such as
a unique bar code sequence), individual currency stacks
in the batch feed of the currency processing machine
can be tracked without the necessity of attempting to
identify data accumulated on each stack to the position
of the stack in the larger batch feed.

The present invention utilises separator cards
with several unique characteristics. The two most
important of these characteristics are magnetic strips and
a means for identifying individual currency stacks to in-
dividual separator cards. This identification means may
include encoded magnetic strips or bar codes. Other
identifying means could include a specific optical pattern
sequence, a sequence of holes or slots cut in the card
like computer key punch cards, identifying slots or
grooves cut into the side of each card, or one of any
other number of means for identifying a specific card by
a unique sequence of identifiable characteristics.

Magnetic strips, aside from their use for encod-
ing account information, allow for the currency process-
ing machine to identify a separator card even when the
separator card is masked by a misfed note of currency.
This is because the magnetic signature of the strips can
be read through notes masking all of the other physical
characteristics of the card. The magnetic strips can ad-
ditionally be encoded with account information or a spe-
cific magnetic signature can be recorded prior to the cur-
rency processing cycle and identified to accounting data
for the accompanying currency stack. Likewise, this lat-
ter function of the magnetic strip can be accomplished
by the use of bar codes or one of the other means of
identifying individual currency stacks to specific separa-
tor cards. For example, the accounting data accumulat-
ed on a single stack of currency can be identified to a
unique bar code number for a specific separator card.
This specific separator card can then be placed with that
currency stack prior to placing this single accounting
subset into the larger batch of currency for processing
by a currency processing machine. The separator card
can be placed either above the stack of currency as a
header card, or below the stack of currency as a trailer card, or both. Once the currency processing cycle has been completed, the currency processing machine can, in turn, identify specific accounting information to the unique bar code number of a specific separator card. This information can be compared to the account information associated with that bar code number prior to the currency processing cycle.

[0030] Additional unique characteristics of the separator cards used in the preferred embodiment of the present invention can include separator cards designed with a unique size or dimension, a given thickness and unique colours or optical patterns. These additional card characteristics provide for redundant confirmation of separator card features versus currency. Once a currency processing machine is configured to detect the several unique characteristics of unique separator cards, the machine can easily distinguish between separator cards and any type of currency. In addition, the currency processing machine can track each individual piece of currency through the detection, imaging, and sorting processing and provide a report on each individual piece of currency correlated to accounting and other data which has been identified to a single separator card.

[0031] The preferred embodiment of the present invention is a substantial improvement over the prior art in providing increased speed, accuracy, security and data management in high-volume currency processing.

[0032] Further objects and advantages of the present invention will become apparent from the following detailed description which is given by way of example with reference to the accompanying drawings in which:

FIGURE 1 is a perspective view of a currency processing machine loaded with a stack of currency and separator cards,

FIGURE 2 is a perspective view of a stack of currency divided by separator cards,

FIGURE 3A is a perspective view of the front of an exemplar separator card,

FIGURE 3B is a perspective view of the back of an exemplar separator card,

FIGURE 4 is a flow chart of a method for processing currency utilizing separator cards, and

FIGURE 5 is a flow chart of a method for identifying separator cards used by currency processing machines.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0033] Figure 1 shows a currency processing machine 10 embodying the present invention and loaded with a batch feed of currency 12 prior to starting the currency processing cycle. This batch feed of currency 12 is fed into the currency processing machine one single note at a time. Single notes then travel on a conveyor past several different detectors before being deposited in one of the sort bins 14. Typically, a single sort bin is used to accumulate a single denomination of note at the end of the sort process.

[0034] Figure 2 shows a currency batch 12 having several individual currency stacks. The currency batch 12 illustrated consists of a first stack of currency 16, a second stack of currency 20, and a third stack of currency 24. Each stack of currency is accompanied with a separator card 18, 22, 26. In this embodiment, the separator cards 18, 22, 26 are shown as header cards where a first separator card 18 is stacked on top of the first stack of currency 16 and would identify the first stack of currency 16 during the currency processing cycle. Likewise, a second separator card 22 is stacked on top of a second stack of currency 20 and identifies the second stack of currency during the currency processing cycle. It is understood that the present invention contemplates that numerous currency stacks 16, 20, 24 such as the three depicted can be successively stacked to form a large batch feed 12 prior to insertion in the currency processing machine 10. It is also understood that an alternative embodiment from that depicted in Figure 2 could use separator cards 18, 22, 26 at the end of each stack of currency 16, 20, 24, called trailer cards. A third embodiment could use both header cards and trailer cards to separate the currency stacks 16, 20, 24.

[0035] Figures 3A and 3B depict an exemplar separator card 18 of the present invention. Figure 3A shows the first side 28 of the separator card 18, while Figure 3B shows the second side 30 of the separator card 18. In the embodiment shown by Figures 3A and 3B, the first side 28 is overlaid with a first magnetic strip 32 and a second magnetic strip 34. The second side 30 is imprinted with a bar code 36. As will be described in more detail below, this embodiment allows for accurate identification of a separator card 18 primarily by detection of the two magnetic strips 32, 34, while accounting data on an individual stack of currency can be identified to a specific bar code number encoded on the bar code 36 of the separator card 18.

[0036] Figure 4 shows a flow chart of a method of processing currency utilizing separator cards. Using the same exemplar batch of currency 12 shown in Figure 2, Figure 4 shows three individual currency stacks 16, 20, 24. Account data 56, 58, 60 associated with each currency stack 16, 20, 24 is first recorded for each account. This account data 56, 58, 60 might include the number of individual currency notes, the total currency value, and the identity of the currency stack to a single commercial deposit or bank teller’s shift. The account data 56, 58, 60 is then associated with a separator card 18, 22, 26, which will accompany an individual currency stack 16, 20, 24. This account data can be identified to...
a separator card by either identifying a bar code number unique to the specific separator card to the account data or by encoding the account data information directly on the separator card. The physical combination of separator cards 18, 22, 26 and the currency stacks 16, 20, 24 form what is shown as single accounting subsets 68, 70, 72. These accounting subsets 68, 70, 72 can then be stacked into a currency batch 12. This currency batch 12 is fed into a currency processing machine 10.

During the currency processing cycle individual notes from each accounting subset 68, 70, 72 are sorted into sort bins 82, 84, 86, 88, 90, 92. Typically, these sort bins are used to bundle individual denomination notes. For example, the first sort bin 82 may be designated to accumulate $1.00 notes, while the second sort bin 84 may be designated to accumulate $5.00 notes. Figure 4 shows a separate bin 94 for a rejected sort with the separator cards. This rejected sort bin 94 could be designated to hold any counterfeit currency detected during the currency sort process. By depositing the counterfeit currency with the separator cards 18, 22, 26, a quick physical check can be made to determine which single accounting subset 68, 70, 72 is associated with the counterfeit notes found to follow a specific separator card 18, 22, 26.

Account data 96 for each accounting subset 68, 70, 72 is accumulated during the currency processing cycle. This account data 96 can then be compared with similar account data 56, 58, 60 which was originally collected for each individual currency stack 16, 20, 24. For example, while processing the first accounting subset 68, the currency processing machine can accumulate information on the number of each denomination of note processed and the total currency value of the notes associated with the first accounting subset 68. This account data 96 accumulated on the first accounting subset 68 can then be compared to the account data 56 associated with the first currency stack 16 prior to the consolidation of the accounting subset 68, 70, 72 into the currency batch 12.

Figure 5 shows a flow chart of a method for identifying separator cards used by currency processing machines. Figure 5 starts with the single accounting subset 68, 70, 72, that are likewise shown on Figure 4. These accounting subsets 68, 70, 72 are stacked to form a currency batch 12. This currency batch is then loaded into the currency processing machine 98. The top item off of the currency batch 12, whether it is a separator card 80 or currency 100, is then pulled into a conveyor past several detectors.

The first detector shown in Figure 5 is a magnetic field detector 102. This magnetic field detector can detect a unique magnetic strip on a separator card 80 in order to assist the currency processing machine in delineating between separator cards 80 and currency 100. This can be accomplished even in the event of a misfeed which results in a currency note 100 masking other physical features of the separator card 80, since the magnetic field of the separator card 80 can be read through the masking currency 100. The currency processing machine can be designed to read the individual serial number on the note masking what it detects to be a concurrently stacked separator card 80. The information obtained by the magnetic field detector on the separator card, as well as information obtained on the masking note throughout the following detectors, allows for a reconstruction of the misfeed and avoids co-mingling of the accounting subsets 68, 70, 72 during the currency processing cycle.

The next detector depicted in Figure 5 is a bar code reader 104. This bar code reader identifies the specific bar code number for each individual separator card 80 read. The bar code number is then identified by the currency processing machine with the currency 100 that follows the specific separator card 80. The separator card 80 or currency 100 then passes through one or more detectors designed to measure the thickness and size of the item on the conveyor, as depicted in Figure 5 by a thickness detector 106 and a size detector 108. This information can be of additional use to the currency processing machine in distinguishing between a separator card 80 and currency 100. The final detector shown on Figure 5 is an optical pattern detector 110. This optical pattern detector 110 can likewise assist in the process of delineating between a separator card 80 and currency 100, both having unique color characteristics and patterns.

It is understood that the order and type of detectors shown in Figure 5 represent only one example of a preferred embodiment for the method described. The detectors used in the present invention could be arranged in many different sequences. In addition, other types of detectors can be used to record various characteristics of currency and separator cards.

After passing through the currency processing machine, the currency 100 is deposited in the appropriate sort bin 82, 84, 86, 88, 90, 92 as a part of the currency sort process. The separator card, likewise is directed to the separator card sort bin 94.

Account data 96 collected by the currency processing machine on each accounting subset 68, 70, 72 can be compared to similar account data that was associated with the accounting subset 68, 70, 72 prior to the consolidation of these accounts into the currency batch 12. As shown in Figure 5, the account data 96 collected during the currency processing cycle is assimilated from information provided by the various detectors 102, 104, 106, 108, 110.

The preferred embodiment illustrated in Figure 5 can additionally detect sequencing errors between separator cards 80 and currency notes 100. For example, when the accounting subsets 68, 70, 72 are comprised of currency stacks separated by header cards, the first item processed through the sequence shown in Figure 5 should be a separator card 80. The next item processed should be currency 100. If a separator card
80 is detected immediately following the processing of another separator card 80, this event would be identified as a sequencing error which might be traced to improper stacking of the accounting subsets 68, 70, 72. Sequencing errors could likewise be detected when the separator card 80 is a trailer card. The most accurate detection of sequencing errors, however, occurs when the preferred embodiment utilizes both header and trailer cards with each accounting subset 68, 70, 72. The use of both header and trailer cards requires, in sequence, that the first separator card 80 processed for an accounting subset 68, 70, 72 is a header card. The next item processed should be currency 100. The next separator card 80 detected should be a trailer card. A trailer card would then be immediately followed by a header card for the next accounting subset. Any deviations from the above described sequence would, again, indicate a sequencing error that might be attributable to improper stacking of separator cards 80 and currency 100 in the accounting subsets 68, 70, 72.

[0046] It would be understood that various changes in the details, materials, and arrangements of the processes which have been described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the scope of the invention as defined in the following claims.

Claims

1. A method of semi-continuous processing of currency, said currency having at least one denomination and authenticating attributes, using a currency processing machine, comprising the steps of:

   (a) separating at least one currency stack with at least one separator card, said separator card having a magnetic strip wherein said separator card is encoded with account information;
   (b) identifying said currency stack with information encoded on said separator card;
   (c) feeding said currency stack and separator card into said currency processing machine, and
   (d) processing the separator card and currency notes using processing steps common to both, the method comprising a further step, effected during step (d) if a mis-feed occurs at step (c) resulting in at least one note masking the separator card during the subsequent processing of the separator card and currency notes, the further step including detecting the magnetic strip on the separator card by reading the magnetic field through the masking currency.

2. A method according to Claim 1 including the additional step of reading the individual serial number on a note masking a concurrently stacked separator card.

3. The method of Claim 1 or 2 further comprising the steps of:

   (e) verifying the authenticity of each currency note within said currency stack;
   (f) separating non-authentic currency; and,
   (g) associating said non-authentic currency with an initial currency stack and separator card.

4. The method of Claim 3 wherein step (f) is accomplished by stacking non-authentic currency with a corresponding separator card as a last processing step.

5. The method of Claim 3 wherein step (f) is accomplished by identifying the non-authentic currency to the account information encoded at step (a).

6. The method of any one of the preceding Claims further comprising:

   (h) sorting said current by denomination into a plurality of slots in said machine;
   (i) sorting an accounting of said currency in a memory of said machine; and,
   (j) comparing said accounting of step (i) with the account information encoded at step (a).

7. The method of any one of Claims 1 to 6 wherein step (a) comprises separating at least one currency stack with a separator card imprinted with a bar code series.

8. The method of any one of the preceding Claims wherein step (a) further comprises encoding accounting information including an initial count of the value of said currency stack and a source for said currency stack.

9. The method of Claim 8 further comprising:

   (i) comparing the initial count with a post-processing count.

10. The method of any one of the preceding Claims wherein step (a) further comprises placing said separator card as a header card.

11. The method of any one of Claims 1 to 9 wherein step (a) further comprises placing said separator card as a trailer card.

12. The method of any one of Claims 1 to 9 wherein step (a) further comprises placing one of said card as a header card and placing one of said cards as a trailer card.
13. A method of identifying a separator card used to delineate and track a stack of currency in a currency batch fed into a currency processing machine, which card has a magnetic strip thereon, said method comprising the steps of:

(a) identifying account data for said currency stack to said separator card prior to processing said currency stack;
(b) passing the separator card through at least one detector which detects at least one card characteristic; and
(c) distinguishing between said separator card and said currency based on the detected characteristics, wherein step (c) comprises distinguishing between said separator card and said currency when said separator card is masked by a currency note due to a misfeed by detecting the magnetic strip on the separator card by reading the magnetic field through the masking currency.

14. The method of Claim 13 wherein step (b) comprises passing the separator card through a detector which detects magnetic card characteristics.

15. The method of Claim 13 wherein step (b) additionally comprises passing the separator card through a detector which detects optical pattern card characteristics.

16. The method of Claim 13 wherein step (b) additionally comprises passing the separator card through a detector which detects physical dimension card characteristics.

17. The method of Claim 13 wherein step (b) additionally comprises passing the separator card through a detector which detects colour card characteristics.

Patentansprüche

1. Verfahren zum semi-kontinuierlichen Bearbeiten von Zahlungsmitteln, wobei die Zahlungsmittel mindest ein Nennwert- und Authentizitätsattribut aufweisen, wobei eine Zahlungsmittelbearbeitungsmaschine verwendet wird, das Verfahren die folgenden Schritte aufweisend:

a) Separieren wenigstens eines Zahlungsmittelstapels mit zumindest einer Separatorkarte, wobei die Separatorkarte einen Magnetstreifen aufweist und mit Kontoinformationen kodiert ist;

b) Identifizieren des Zahlungsmittelstapels mit Informationen, die auf der Separatorkarte kodiert sind;

c) Zuführen des Zahlungsmittelstapels und der Separatorkarte in die Zahlungsmittelbearbeitungsmaschine; und
d) Bearbeitung der Separatorkarte und von Zahlungsmitteln, wobei für beide gemeinsame Schritte genutzt werden und wobei das Verfahren einen weiteren Schritt umfaßt, der während des Schritts d) bewirkt wird, wenn ein Fehlzuführen im Schritt c) auftritt, und der dazu führt, daß wenigstens eine Note die Separatorkarte während der folgenden Bearbeitung der Separatorkarte und der Zahlungsmittelnoten maskiert, wobei der weitere Schritt das Erfassen des Magnetstreifens auf der Separatorkarte mit Hilfe des Lesens des Magnetfelds durch das Maskierungsgegenstand umfaßt.

2. Verfahren nach Anspruch 1, gekennzeichnet durch den weiteren Schritt zum Lesen der individuellen Seriennummer auf einer Note zum Maskieren einer gleichzeitig gestapelten Separatorkarte.

3. Verfahren nach Anspruch 1 oder 2, das Verfahren die weiteren Schritte aufweisend:

e) Verifizieren der Authentizität jeder Zahlungsmittelnote innerhalb des Zahlungsmittelstapels;
f) Separieren eines nicht-authentischen Zahlungsmittels; und
g) Assoziieren des nicht-authentischen Zahlungsmittels mit einem anfänglichen Zahlungsmittelstapel und der Separatorkarte.


5. Verfahren nach Anspruch 3, wobei der Schritt f) dadurch ausgeführt wird, daß das nicht-authentische Zahlungsmittel gegenüber der Kontoinformation identifiziert wird, die im Schritt a) kodiert wird.

6. Verfahren nach einem der vorangehenden Ansprüche, das Verfahren die weiteren Schritte aufweisend:

h) Sortieren des Zahlungsmittels mit Hilfe eines Nennwerts in mehrere Schlitze in der Maschine;
i) Sortieren einer Abrechnung des Zahlungsmittels in einem Speicher der Maschine; und

j) Vergleichen der Abrechnung nach Schritt i) mit der im Schritt a) kodierten Kontoinformation.

7. Verfahren nach einem der Ansprüche 1 bis 6, wobei der Schritt a) das Separieren zumindest eines Zahlungsmittelstapels mit einer Separatorkarte umfaßt, die eine Strich-Code-Folge aufweist.


9. Verfahren nach Anspruch 8, das Verfahren den weiteren Schritt aufweisend:

i) Vergleichen des anfänglichen Zähllens mit einer Zählung nach der Bearbeitung.

10. Verfahren nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß der Schritt a) ein Anordnen der Separatorkarte als eine Kopfkarte umfaßt.

11. Verfahren nach einem der Ansprüche 1 bis 9, dadurch gekennzeichnet, daß der Schritt a) ein Anordnen der Separatorkarte als eine Anhängerkarte umfaßt.

12. Verfahren nach einem der Ansprüche 1 bis 9, dadurch gekennzeichnet, daß der Schritt a) ein Anordnen einer der Karten als eine Kopfkarte und einer der Karten als eine Anhängerkarte umfaßt.

13. Verfahren zum Identifizieren einer Separatorkarte, die zum Beschreiben und zum Verfolgen eines Zahlungsmittelstapels in einem Zahlungsmittelstapel benutzt wird, der in einer Zahlungsmittelbearbeitungsmaschine eingeführt wird, wobei die Karte einen Magnetstreifen aufweist, das Verfahren die folgenden Schritte umfassend:

a) Identifizieren von Kontodaten für den Zahlungsmittelstapel an die Separatorkarte vor dem Bearbeiten des Zahlungsmittelstapels; 

b) Hindurchführen der Separatorkarte durch wenigstens einen Detektor, welcher zumindest eine Karteneigenschaft detektiert; und

c) Unterscheiden zwischen der Separatorkarte und dem Zahlungsmittel auf der Basis der detektierten Eigenschaften, wobei der Schritt c) das Unterscheiden zwischen der Separatorkarte und dem Zahlungsmittel umfaßt, wenn die Separatorkarte infolge einer Fehlzuführung mittels einer Zahlungsmittelnote mit Hilfe des Erfassens des Magnetstreifens auf der Separatorkarte durch das Lesen des Magnetstreifens durch das Maskierungsmedium geschützt werden.


15. Verfahren nach Anspruch 13, dadurch gekennzeichnet, daß der Schritt b) zusätzlich ein Hindurchführen der Separatorkarte durch einen Detektor umfaßt, der optische Mustereigenschaften der Karte erfaßt.


17. Verfahren nach Anspruch 13, dadurch gekennzeichnet, daß der Schritt b) zusätzlich ein Hindurchführen der Separatorkarte durch einen Detektor umfaßt, der Farbeigenschaften der Karte erfaßt.

Revendications

1. Procédé de traitement semi-continu de billets de banque, lesdits billets de banque ayant au moins une dénomination et des attributs d’authentification, en utilisant une machine de traitement de billets de banque, comprenant les étapes consistant à :

(a) séparer au moins une pile de billets de banque avec au moins une carte de séparation, ladite carte de séparation ayant une bande magnétique dans laquelle ladite carte de séparation est codée avec des informations de compte ;

(b) identifier ladite pile de billets de banque avec les informations codées sur ladite carte de séparation ;

(c) avancer ladite pile de billets de banque et la carte de séparation dans la machine de traitement de billets de banque, et

(d) traiter la carte de séparation et les billets de banque en utilisant les étapes de traitement communes aux deux, le procédé comprenant une étape supplémentaire, effectuée pendant...
l'étape (d) si un défaut d'avancée se produit à l'étape (c) résultant en ce qu'au moins un billet de banque masque la carte de séparation pendant le traitement ultérieur de la carte de séparation des billets de banque, l'étape supplémentaire incluant la détection de la bande magnétique sur la carte de séparation en lisant le champ magnétique à travers le billet de banque masquant.

2. Procédé selon la revendication 1, comprenant l'étape supplémentaire consistant à lire le numéro de série individuel sur un billet masquant une carte de séparation empliée simultanément.

3. Procédé selon la revendication 1 ou 2, comprenant en outre les étapes consistant à :

   (e) Vérifier l'authenticité de chaque billet de banque à l'intérieur de la pile des billets de banque ;

   (f) Séparer un billet de banque non-authentique ; et,

   (g) Associer ledit billet de banque non-authentique à une pile de billets de banque initiale et à une carte de séparation.

4. Procédé selon la revendication 3, dans lequel l'étape (f) est accomplie en empliant un billet de banque non-authentique avec une carte de séparation correspondante comme une dernière étape de traitement.

5. Procédé selon la revendication 3, dans lequel l'étape (f) est accomplie en identifiant le billet de banque non-authentique avec les informations de compte codées à l'étape (a).

6. Procédé selon l'une quelconque des revendications précédentes, comprenant, en outre :

   (h) le triage desdits billets de banque par dénomination dans une pluralité de casiers dans ladite machine ;

   (i) le triage d'un compte dudit billet de banque dans une mémoire de ladite machine ;

   (j) la comparaison dudit compte de l'étape (i) avec les informations de compte codées à l'étape (a).

7. Procédé selon l'une quelconque des revendications 1 à 6, dans lequel l'étape (a) comprend la séparation d'au moins une pile de billets de banque avec une carte de séparation imprimée avec une série de codes barres.

8. Procédé selon l'une quelconque des revendications précédentes, dans lequel l'étape (a) comprend, en outre, le codage des informations de compte incluant un compte initial de la valeur desdits billets de banque et une source pour ladite pile de billets de banque.

9. Procédé selon la revendication 8, comprenant en outre l'étape consistant à :

   (k) Comparer le compte initial à un compte après traitement.

10. Procédé selon l'une quelconque des revendications précédentes, dans lequel l'étape (a) comprend en outre le placement de ladite carte de séparation comme une carte d'en-tête.

11. Procédé selon l'une quelconque des revendications 1 à 9, dans lequel l'étape (a) comprend, en outre, le placement de ladite carte de séparation comme dernière carte.

12. Procédé selon l'une quelconque des revendications 1 à 9, dans lequel l'étape (a) comprend, en outre, le placement d'au moins une desdites cartes comme carte d'en-tête et le placement d'une desdites cartes comme dernière carte.

13. Procédé d'identification d'une carte de séparation utilisée pour délimiter et suivre une pile de billets de banque dans un lot de billets de banque avancé dans une machine de traitement de billets de banque, laquelle carte comporte sur celle-ci une bande magnétique, ledit procédé comprenant les étapes consistant à :

   (a) identifier des données de compte pour ladite pile de billets de banque sur ladite carte de séparation avant le traitement de ladite pile de billets de banque ;

   (b) passer la carte de séparation à travers au moins un détecteur qui détecte au moins une caractéristique de la carte ; et

   (c) distinguer entre ladite carte de séparation et lesdits billets de banque sur la base des caractéristiques détectées, dans lequel l'étape (c) comprend l'opération consistant à distinguer entre la carte de séparation et ledit billet de banque lorsque ladite carte de séparation est masquée par un billet de banque en raison d'un défaut d'avancée en détectant la bande magnétique sur la carte de séparation en lisant le champ magnétique à travers le billet de banque masquant.
14. Procédé selon la revendication 13, dans lequel l’étape (b) comprend l’opération consistant à passer la carte de séparation à travers un détecteur qui détecte les caractéristiques magnétiques de la carte.

15. Procédé selon la revendication 13, dans lequel l’étape (b) comprend de plus l’opération consistant à faire passer la carte de séparation à travers un détecteur qui détecte les caractéristiques de configuration optique de la carte.

16. Procédé selon la revendication 13, dans lequel l’étape (b) comprend de plus l’opération consistant à faire passer la carte de séparation à travers un détecteur qui détecte les caractéristiques de dimension physique de la carte.

17. Procédé selon la revendication 13, dans lequel l’étape (b) comprend de plus l’opération consistant à faire passer la carte de séparation à travers un détecteur qui détecte les caractéristiques de couleur de la carte.
FIG. 4