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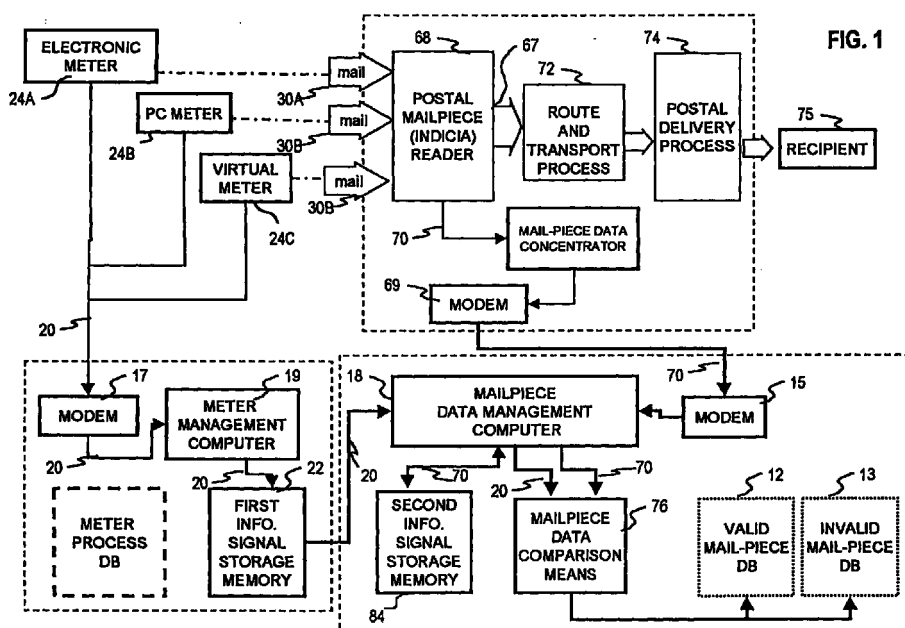
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(54) **Method and apparatus for detecting misuse of postal indicia**

(57) A method for detecting misuse of postal indicia, and an apparatus for executing the method. The method includes the steps of storing a first information signal indicative of a postal indicia on a mail piece to be posted, sensing a postal indicia on a received mail piece for providing a second information signal indica-

tive of the sensed postal indicia, retrieving the first information signal, and comparing the first information signal with the second information signal for providing a misuse signal if the first information signal is not the same as the second information signal.



Description

[0001] Reference is made to commonly assigned co-pending European patent application Docket No. E-852 filed herewith entitled "A System for Capturing Information From A Postal Indicia Producing Device So As To Produce A Report Covering The Payment Of Value Added Taxes And Fees" in the names of Robert A. Law, Jr. and Ronald P. Sansone.

[0002] The present invention relates to a method and apparatus for detecting mail fraud. More specifically, the present invention concerns a method and apparatus for detecting misuse of postal indicia.

[0003] Postage meters are commonly used to apply postal indicia to mail pieces in lieu of using postage stamps. To apply a postal indicia to a mail piece using a postage meter, a mail piece to be mailed is inserted into the postage meter, which imprints a mark (also called a postal indicia) on the mail piece indicating that a certain amount of postage has been paid. The postage meter deducts the amount of postage applied to the mail piece from an amount available, which is stored in the postage meter. Periodically, the amount available is increased, and the sender is billed for the increase. The process of increasing the amount available is referred to as "refilling" or "recharging" the postage meter. Usually, an organization other than the post office is responsible for monitoring and refilling such postage meters, billing and collecting fees from senders, as well as remitting to the post office a sum of money corresponding to the postage applied by such postage meters.

[0004] It is known in the prior art to analyze the usage of postage meters with respect to the recharge history of postage meter for the purpose of detecting fraudulent or improper usage of the postage meters. An example of such a prior art system is described in U.S. Patent No. 5,280,531. Such prior art systems include an optical character recognition system which scans mail pieces in a stream of mail pieces to recognize postage amounts and postage meter serial numbers imprinted on the mail pieces. In addition, such prior art systems include inputs for input of data representing the recharge history for postage meters which correspond to authorized serial numbers as well as thresholds, i.e., parameters against which expenditures and the refill history of a particular postage meter will be tested. In the prior art systems, a data processing system compares cumulative amounts of postage expended by a particular postage meter to determine if the difference between totals expended and total recharges exceeds the thresholds, indicating the possibility of fraudulent or improper use of that postage meter.

[0005] One of the disadvantages of the prior art systems is that if a postage meter is refilled but the total amount available for authorized mailings is not immediately used, it is possible for unauthorized mailing (i.e., mailing mail pieces having fraudulently applied postal indicia) to occur without detection. For example, if a par-

ticular postage meter is refilled with \$1,000 available for postage, it may take the user several months to use up the \$1,000 and require another refill. During those months, mail with fraudulently applied postal indicia could be sent without detection, provided that the amount of authorized postage plus the amount of fraudulent postage did not exceed \$1,000.

[0006] An additional disadvantage of the prior art systems results from the inability of such systems to track when postal indicia have been applied to mail pieces. Several days may lapse between the time a postal indicia is applied to a mail piece and the time the mail piece is processed at the post office. The prior art systems may not detect that a mail piece was marked with a postal indicia during a first period of time corresponding to an initial refill, if that mail piece was marked shortly before a second period of time corresponding to a subsequent refill, i.e., the prior art systems are not able to detect which refill period the postal indicia corresponds to. Therefore, the time frame during which mail pieces having undetected fraudulently applied postal indicia may be longer than one refill period.

[0007] Finally, in addition to untimely detection of fraudulently applied postal indicia, the prior art systems may also not timely detect so-called "recycled" mail pieces having authorized postal indicia. "Recycling" occurs when a mail piece is sent through the optical character recognition system more than once. In such a situation, as long as the amount of authorized postage plus the amount of postage corresponding to recycled mail pieces does not exceed the amount available, the "recycling" would not be detected by prior art systems. Undetected recycling results in a difference between the amount of money the post office expects to receive for handling indicia marked mail pieces, and the amount of money that the organization which monitors and refills the postage meters expects to pay to the post office.

[0008] Accordingly, it is an object of the present invention to provide a method for detecting fraudulently applied postal indicia.

[0009] In addition, it is an object of the present invention to provide a method for detecting when a mail piece having the same postal indicia has been posted through the postal service optical character readers multiple times, i.e., when mail pieces have been recycled.

[0010] The foregoing objectives are realized by the present invention, which includes a method for detecting misuse of postal indicia. The method begins by storing a first information signal in a memory. The first information signal is indicative of a postal indicia applied at a sender location on at least one mail piece to be sent. The indicia is indicative of a characteristic of an applying device which is applied the postal indicia to the mail piece to be sent, and is also indicative of a characteristic of the mail piece to be. In a next step of the method, a postal indicia on at least one received mail

piece is sensed at a post office, and a second information signal, indicative of the sensed indicia, is provided. The sensed indicia is indicative of a characteristic of an applying device which applied the sensed indicia, and is also indicative of a characteristic of the received mail piece. Next, the stored first information signal is retrieved and provided in response to a retrieve command signal. Then, the first information signal retrieved from the memory is compared with the second information signal, and if the first information signal is not the same as the second information signal, a misuse signal is provided.

FIG. 1 is a block diagram illustrating an apparatus according to the present invention;

FIG. 2 is a flow chart showing the steps of the method according to the present invention;

FIG. 3 illustrates a mail piece having a postal indicia produced by an electronic postage meter; and

FIG. 4 illustrates a mail piece having a postal indicia, referred to herein as an Information Based Indicia, produced by a printer that was coupled to a postal security device and a computer, or, alternatively, produced by a printer that was coupled to a personal computer that was coupled to a data center.

[0011] Figures 1 and 2 illustrate an apparatus and the method steps respectively, in accordance with the present invention. As shown, the method begins by a storing step 100 wherein a first information signal 20 is stored in a storage memory 22, and this is followed by a reading step 102 wherein the postal indicia 28A, 28B on the mailed piece 30A, 30B are read at a post office 66 and a second information signal 70 is provided to comparison means 76; a retrieving step 104 wherein the first information signal 20 is retrieved from the storage memory 22, and the retrieved signal is provided to comparison means 76; and, finally, a comparing step 106 wherein the first 20 and second 70 information signals are compared and a misuse signal 82 is provided if a miscomparison occurs.

[0012] The first information signal 20 is indicative of a postal indicia 28A, 28B applied on one or more mail pieces 30A, 30B to be sent at a sender location. The postal indicia 28A, 28B is indicative of a characteristic of a device, such as an electronic meter 24A, a PC meter 24B and a virtual meter 24C, which applies the postal indicia to the mail piece 30A, 30B to be sent. The first information signal 20 may be provided via modem 17 and a meter management computer 19 to the first information signal storage memory 22 to be stored therein. The electronic meter 24A, which applies postage to mail piece 30A, includes an electronic postage meter and an electronic interface unit. The PC meter 24B, which applies postage to mail piece 30B, includes a user computer coupled with a printer and a postal security device. The postal security device includes a memory

for storing an authorized amount, and deducts an amount equal to postage to be applied by the printer which has been instructed by software running on the user computer to apply the postage to a mail piece 30B. Additional funds may be added to the electronic meter 24A and the PC meter 24B during a refill. The virtual meter 24C, which are also capable of applying postage to mail piece 30B, includes a user computer coupled with a printer and an authorization center.

[0013] When a sender desires to apply postage to a mail piece 30B using a virtual meter 24C, the sender enters a command in the user computer, which establishes a communication link to the meter management computer 19. The meter management computer 19 determines whether the request for postage should be granted, and, if granted, a signal is sent back to the user computer permitting the user computer to instruct the printer to print the postal indicia 28B on the mail piece 30B. Confirmation of printing the postal indicia is sent from the virtual meter 24C to the management computer 19 which, in turn, sends a first information signal 20 including information regarding the printed postal indicia in the first information signal storage memory 22. Similar procedures are carried out regarding the use of the digital meter 24A and the PC meter 24B.

[0014] Figures 3 and 4 depict, respectively, mail pieces 30A and 30B, each having thereon a respective postal indicia 28A and 28B. Figure 3 depicts a postal indicia 28A that is affixed by a digital meter 24A on mail piece 30A. The postal indicia 28A may contain a dollar amount 38A for sending the mail piece, the date 40A that the postal indicia is affixed, the place 42A where the postal indicia was affixed, the postage meter serial number 44A, a stylized eagle 46, a piece count 52A, the type of mail piece, the type of the mail piece 55A, and a security code (9). The security code is a unique number that may be derived from the address field 54A and information contained in the digital meter 24A. The manner in which the security code 16 may be obtained is disclosed in United States Patent No. 4,831,555, entitled "Unsecured Postage Applying System". In addition to the information described above, the postal indicia 28A may contain in the areas indicated by reference numerals 56A, 57A and 58A the time that the postal indicia 28A was set to be affixed to the mail piece 30A. Area 56A may represent hours in military time (e.g., the number 14 equals 2:00 PM). Area 57A may represent minutes (e.g., 23 minutes) after the hour, and area 58A may represent seconds and fractions thereof. The postal indicia 28A contains a unique series of numbers, or a so-called specifying number. The specifying number may include the postage meter serial number 44A, date 40A, time that the postal indicia was set to be affixed, piece count 52A, dollar amount 38A and type of mail piece 15. The specifying number for the mail piece 30A shown in Fig. 3 may be written, for example, as PB445411 02 18 1997 1423060 0045 00.320 102.

[0015] Fig. 4 shows a mail piece 30B containing a

postal indicia 28B, commonly referred to as an Information-Based Indicia ("IBI"). An IBI may be affixed by a PC meter 24B or a virtual meter 24C. As shown in Fig. 4, the postal indicia 28B has a dollar amount 38B, the date 40B that the postal indicia 28B was set to be affixed to the mail piece 30B, the place 42B where the postal indicia 28B was affixed, the piece count 48B, the class 50B, the postage meter serial number 44B, a two-dimensional encrypted bar code 62, a Facing Identification Mark ("FIM") 64. Mail piece 30 has an address field 54B and may have a security code that is contained within the encrypted bar code 62. The manner in which the security code may be obtained is disclosed in aforementioned, United States Patent No. 4,831,555, entitled "Unsecured Postage Applying System". In addition to the information described above, the postal indicia 28B may contain in the area indicated by reference numeral 56B the time that the indicia 28B was set to be affixed to the mail piece 30B. The information described above may be incorporated within the two-dimensional encrypted bar code 62. The postal indicia 28B contains a unique series of numbers, or a so-called specifying number. The specifying number may include the serial number 44B of the PC meter 24B or the virtual meter 24C, as the case may be, date 40B, time 56B that the postal indicia 28B was set to be affixed, piece count 48B, dollar amount 38B and type of mail piece 50B, i.e., first class, which may be code 102. The specifying number for the mail piece 30B shown in Fig. 4 may be written, for example, as PB13456 67 89 0 12041997 21 09 42 44 00.320 1 02.

[0016] Once marked with a postal indicia 28A, 28B, mail piece 30A, 30B is delivered to a post office 66. Upon being received at the post office 66, the received mail piece is one of many received mail pieces, each bearing a postal indicia to be read, which is similar to the postal indicia 28A, 28B. At the post office 66, an indicia reader 68, which may be an optical character reader, reads the postal indicia on at least one of the received mail pieces 30A, 30B and provides a second information signal 70 indicative of the read postal indicia 28A, 28B. Each read postal indicia 28A, 28B is indicative of a characteristic of the meter 24A, 24B, 24C, which applies the read postal indicia, and is also indicative of a characteristic of the mail piece 30A, 30B. Once the indicia reader 68 has read the postal indicia 28A, 28B, the received mail piece 30A, 30B is subsequently routed and transported 72 and then delivered 74 to a recipient 75.

[0017] The second information signal 70 is then sent, via mail piece data concentrator modems 69 and 15, and mail piece data management computer 18, to a mail piece data comparison means 76. Concurrently, the first information signal 20 stored in the first information signal storage memory 22 is retrieved and sent to the mail piece data comparison means 76 via the mail piece data management computer 18.

[0018] Then the mail piece data comparison means

76 compares the first information signal 20 which contains the specifying number for the mail piece 30A, 30B, indicative of the postal indicia 28A, 28B, with the second informal signal 20. If the first and second information signals are not the same, the misused signal 82 is provided and the specifying number is stored in invalid mail piece database 13. If the first and second information signals are the same, the specifying number is stored in the valid mail piece database 12.

[0019] As an example of the comparison (step 106) carried out according to the present invention, assume that the first information signal 20 and the second information signal 70 are indicative of the following characteristics: identification number corresponding to the serial number of the applying device, date and time of applying the postal indicia, the type of mail service requested, the postage amount due, the weight, a piece count, and an encrypted code determined from one or more of the foregoing characteristics. Once the second information signal 70 is received by the comparison means 76 and a retrieve command signal 78 is given to the first information signal storage memory 22, the comparison means 76 requests retrieval from the first information signal storage memory 22 of all first information signals 20 corresponding to the identification number indicated by the second information signal 70. If the identification number indicated by the second information signal 70 is not found among the first information signals 20 stored in the first information signal storage memory 22, a miscomparison is declared by the comparison means 76, and the misuse signal 82 is provided. If a first information signal 20 having an identification number corresponding to the identification number indicated by the second information signal 70 is found, that first information signal 20 is retrieved (step 104) and the comparison means 76 compares (step 106) the date and time indicated by the second information signal 70 with the date and time corresponding to the retrieved first information signal 20. If no match of date and time is found, another first information signal 20 having the identification number indicated by the second information signal 70 is retrieved (step 104), and again the corresponding dates and times are compared. This process of comparing (step 106) a retrieved first information signal 20 to the second information signal 70 is repeated until a match is found, or until there are no further first information signals 20 having the identification number indicated by the second information signal 70 to be retrieved. If no match between identification number, date and time is found, the misuse signal 82 is provided.

[0020] However, if a match between identification number, date and time is found, then the comparison means 76 compares the remaining characteristics (i.e., mail service requested, postage amount due, weight, piece count, and encryption code) corresponding to that retrieved first information signal 20 with the corresponding characteristics of the second information signal 70.

If any of these comparisons result in a miscomparison, then the misuse signal 82 is provided.

[0021] It should be apparent to those skilled in the art that many different applying devices 24A, 24B, 24C can be connected to the first information signal storage memory 22. Furthermore, many different post offices 66 can be connected to the comparison means 76. In addition, the comparison means 76 shown in Fig. 1 is located at a checkpoint location 80, which may be an office of the organization which is responsible for monitoring and refilling the postage meters.

[0022] It should be apparent to those skilled in the art that a second information signal storage memory 84 (shown in Fig. 1) could be used and would operate in a manner similar to the first information signal storage memory 22. As such, the second information signal 70 is provided to and stored in a second information signal storage memory 84, such as a memory of a metered mail data management computer. Upon receiving the retrieve command signal 78, the second information signal storage memory 84 would provide second information signals 70 to the comparison means 76. Furthermore, it should be apparent to those skilled in the art that the second information signal storage memory 84 can be located *inter alia* at a data center 86, as shown in Fig. 1, at the post office 66, or at the checkpoint location 80.

[0023] It will be recognized by those skilled in the art that the method and apparatus of the present invention provides a means for detecting misused or fraudulently applied postal indicia, and provides a means for detecting when mail has been sent through the postal service optical character readers multiple times, i.e., when mail has been recycled.

[0024] Although the present invention has been described with respect to one or more particular embodiments of the invention, it will be understood that other embodiments of the present invention may be made without departing from the spirit and scope of the present invention. Hence, the present invention is deemed limited only by the appended claims and the reasonable interpretation thereof.

Claims

1. A method for detecting misuse of a postal indicia, comprising the steps of:

storing in a memory a first information signal indicative of a postal indicia applied at a sender location on at least one mail piece to be posted, wherein the postal indicia is indicative of a characteristic of a device which applied the postal indicia to the mail piece to be sent, and wherein the applied postal indicia is also indicative of a characteristic of the mail piece to be posted;
reading, at a post office a postal indicia on at

least one received mail piece for providing a second information signal indicative of the read postal indicia, wherein the read postal indicia is indicative of a characteristic of a device which applied the read postal indicia, and wherein the read postal indicia is also indicative of a characteristic of the received mail piece;

retrieving the stored first information signal from the memory, for providing said first information signal; and

comparing said first information signal retrieved from said memory with the second information signal for providing a misuse signal when said first information signal is not the same as said second information signal.

2. The method of claim 1 wherein the characteristic of the device which applied the postal indicia to the mail piece to be posted includes a serial number of the device which applied the postal indicia to the mail piece to be posted.
3. The method of claim 1 wherein the characteristic of the mail piece to be sent includes a postage amount due for mailing the mail piece to be posted.
4. The method of claim 1 wherein the characteristic of the mail piece to be sent includes a date on which the postal indicia was applied to the mail piece to be posted.
5. The method of claim 1 wherein the characteristic of the mail piece to be posted includes a time at which the postal indicia was applied to the mail piece to be posted.
6. The method of claim 1 wherein the characteristic of the mail piece to be posted includes a type of mail service requested for the mail piece to be posted.
7. The method of claim 1 wherein the characteristic of the mail piece to be posted includes a piece count of the mail piece to be posted.
8. The method of claim 1 wherein the characteristic of the device which applied the postal indicia is encrypted in the postal indicia.
9. The method of claim 1 wherein the characteristic of the mail piece to be posted is encrypted in the postal indicia.
10. The method of claim 1 wherein the device which applied the postal indicia to the mail piece to be posted is a postage meter.
11. The method of claim 1 wherein the device which applied the postal indicia includes a computer and a

printer.

12. The method of claim 11 wherein the device which applied the postal indicia further includes a postal security device.

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13. An apparatus for detecting misuse of a postal indicia, comprising:

means for storing in a memory a first information signal indicative of a postal indicia applied at a sender location on at least one mail piece to be posted, wherein the applied postal indicia is indicative of a characteristic of a device which applied the postal indicia to the mail piece, and wherein the applied postal indicia is also indicative of a characteristic of the mail piece to be posted;

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means for reading, at a post office, a postal indicia on at least one received mail piece for providing a second information signal indicative of the read postal indicia, wherein the read postal indicia is indicative of a characteristic of a device which applied the read postal indicia, and wherein the read postal indicia is also indicative of a characteristic of the received mail piece;

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means for retrieving the stored first information signal, for providing said first information signal; and

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means for comparing said first information signal retrieved from said memory with the second information signal for providing a misuse signal when said first information signal is not the same as said second information signal.

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14. The apparatus of claim 13 wherein the characteristic of the device which applied the postal indicia to the mail piece to be posted includes a serial number of the device which applied the postal indicia to the mail piece to be posted.

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15. The apparatus of claim 13 wherein the characteristic of the mail piece to be posted includes a postage amount due for mailing the mail piece to be posted.

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16. The apparatus of claim 13 wherein the characteristic of the mail piece to be posted includes a date on which the postal indicia was applied to the mail piece to be posted.

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17. The apparatus of claim 13 wherein the characteristic of the mail piece to be posted includes a time at which the postal indicia was applied to the mail piece to be posted.

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18. The apparatus of claim 13 wherein the characteristic of the mail piece to be posted includes a type of

mail service requested for the mail piece to be posted.

19. The apparatus of claim 13 wherein the characteristic of the mail piece to be posted includes a piece count of the mail piece to be posted.

20. The apparatus of claim 13 wherein the characteristic of the device which applied the postal indicia is encrypted in the postal indicia.

21. The apparatus of claim 13 wherein the characteristic of the mail piece to be posted is encrypted in the postal indicia.

22. The apparatus of claim 13 wherein the means for storing in a memory includes a computer.

23. The apparatus of claim 13 wherein the means for reading includes an optical character reader.

24. The apparatus of claim 13 wherein the means for retrieving includes a computer.

25. The apparatus of claim 13 wherein the means for comparing includes a computer.

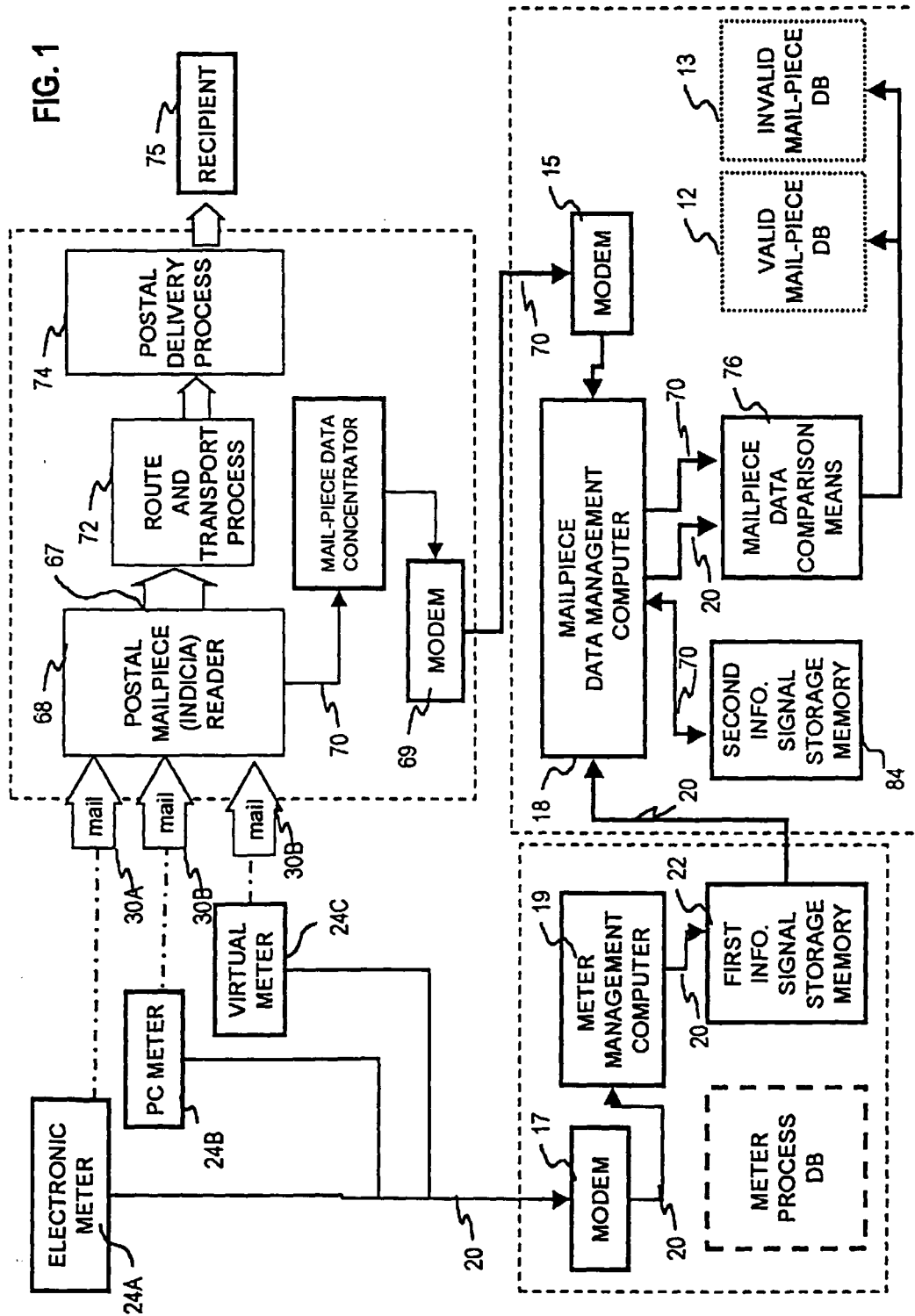


FIG. 2

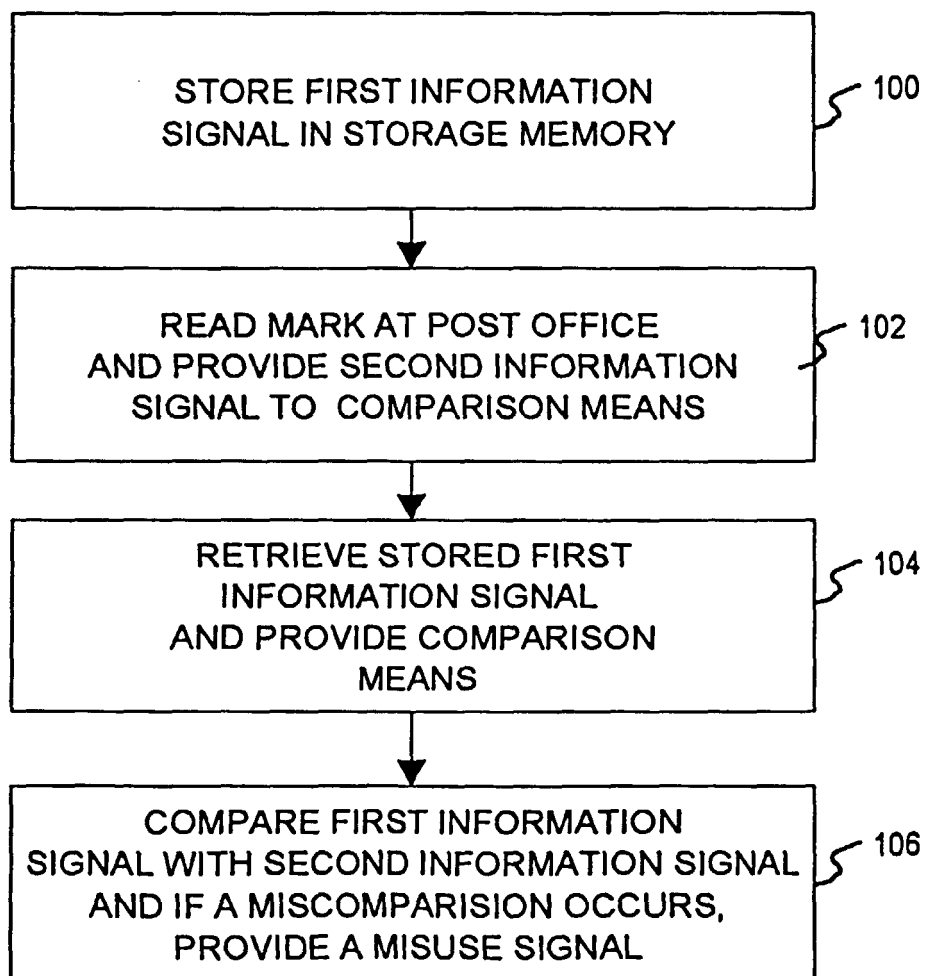


FIG. 3

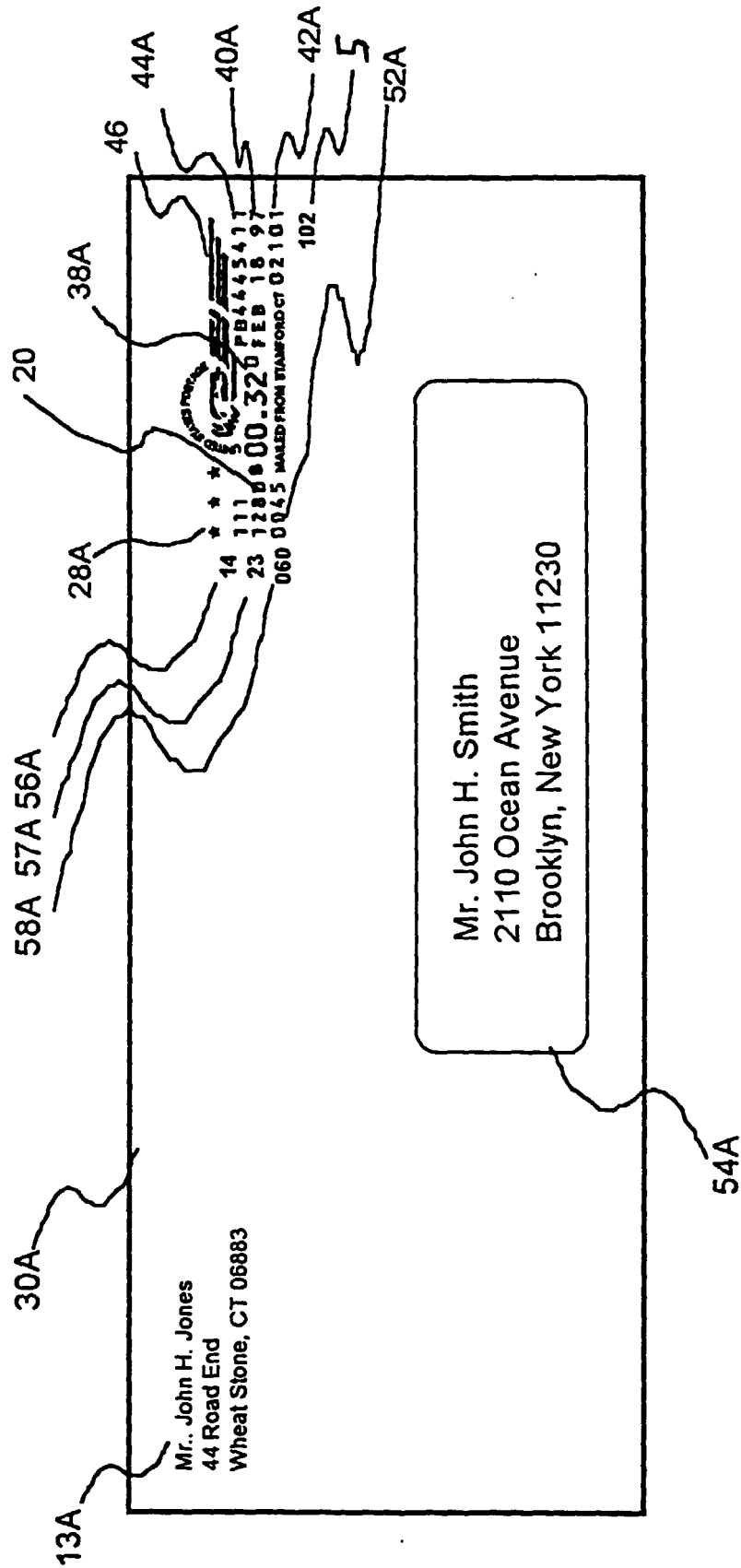


FIG. 4

