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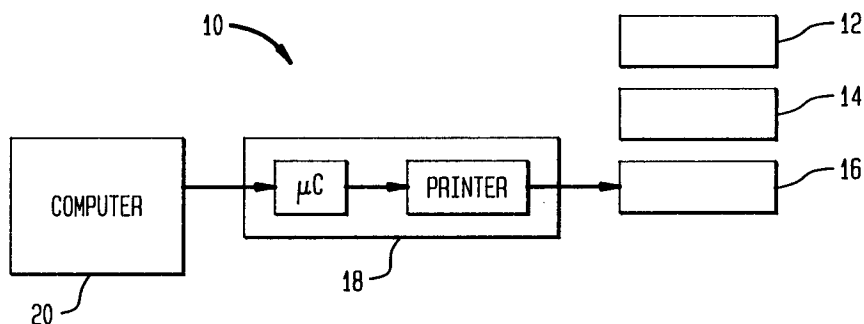
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D-81925 München (DE)(54) **Postage meter system having bit-mapped indicia including fraud protection.**

(57) The method for verifying mailpieces comprises the creation of predetermined bit-mapped indicia which are printed on a mailpiece (12, 14, 16) and are changed in accordance with a predetermined pattern on each successive printing. The pattern will allow an animated sequence to occur as the mailpieces of

a batch are flipped through. The animated sequence may be associated with a particular mailer. The animation during the flipping will allow postal officials to swiftly check to assure against some modes of fraudulent copying of postal indicia.

FIG. 1**EP 0 647 923 A2**

The invention relates to methods of printing indicia to enable verification of mailpieces, methods of producing a batch of mailpieces, and methods for verifying authenticity of a batch of mailpieces.

The invention is applicable to postage metering systems and especially to postage metering systems which include bit-mapped printing of the meter indicia.

Digital printing technology has made it possible to implement digital, i.e., bit map addressable, printing for the purpose of evidencing payment of postage by a postage-meter-like device. In order to distinguish such postage-meter-like devices from the typical postage meter which uses mechanical printing techniques, such devices will be named herein Postage Evidencing Devices or PED's. The computer driven printer can print the postal indicia in a desired location on the face of a mail piece. As used herein the postal indicia includes a Postal Revenue Block or PRB. The PRB typically contains data such as the postage value, a unique PED identification number, the date and in some applications the name of the place where the mail is originating.

From the Post Office's point of view, it will be appreciated that the digital printing makes it fairly easy to counterfeit an indicia with the PRB since any suitable computer may be used to generate multiple images.

It is known to prevent such counterfeiting by including certain information in the block in both plain text and cipher text. For example the postage amount, date and sequential piece count can be encrypted using either a secret or public key encryption algorithm and printed along with the plain text counterpart in the PRB. The value of the franking used in the encryption can be determined from the encryption to learn whether the value as printed on the mailpiece is correct. See, for example, U.S. Patent Nos. 4,757,537 and 4,775,246 to Edelmann et al. as well as U.S. Patent No. 4,649,266 to Eckert. It is also known to authenticate a mailpiece by including the address as a further part of the encryption as described in U.S. Patent No. 4,725,718 to Sansone et al. and U.S. Patent No. 4,743,747 to Fougere et al. The encrypted messages may be included in graphic form as disclosed in U.S. Patent Nos. 4,835,713 and 4,949,381 to Pastor.

U.S. Patent No. 5,075,862 to Doeberl et al. discloses a metering system which includes changes in the indicia based on time of day of the printing. The Postal Authorities can riffle through a batch of mail to determine whether the time is changing appropriately during the printing of a batch of mail. Tell locations may also be included such that the presence or absence of a marker at a particular location will authenticate the mailpiece.

U.S. Patent Nos. 4,637,051, to Clark; 4,641,346 to Clark et al.; 4,829,568 to Clark et al.; and 4,660,221 to Dlugos teach the printing of indicia in human readable format wherein the dots forming the indicia are displaced in accordance with a coded message which may be read with an overlay. The coded message may also be printed in barcode.

U.S. Patent No. 5,186,498 to Dietrich discloses the forming of a characteristic identification pattern to be printed which includes an encrypted number representative of the machine and the fee amount and date of printing.

To authenticate a mailpiece using the foregoing encryption techniques, the verifying Authority must again generate the encryption from the plain text using the identical key used by the purported mailer. If the printed cipher text matches that generated by the verifying authority or if the graphical pattern matches an overlay, the mailpiece is verified. If there is no match then appropriate action may be initiated.

When large numbers of mailpieces must be verified, it is apparent that significant delays may be encountered in trying to monitor such batches of mail.

SUMMARY OF THE INVENTION

It has been found that a swift verification of a batch of mail produced by a particular mailer to guard against some fraudulent practices can be provided without delaying the mail stream by utilizing a novel method and apparatus for implementing the printing of "changes" in the indicia such that sequentially franked indicia are artistically different from each other in a pattern which is readily detectable by Postal Authorities.

It is therefore an object of the invention to provide a novel method for verification of the printing of a Postal Revenue Block on a mailpiece and apparatus for producing such verifiable Revenue Blocks which will interfere only minimally, if at all, with the mail processing stream.

These and other objects of the invention are realized in a method for verifying mailpieces comprising the steps of creating a predetermined first indicia image, printing the first indicia image on a mailpiece, changing the first indicia image in a predetermined manner after the printing thereof, and thereafter sequentially printing and changing successive indicia on respective successive mailpieces franked by the system in accordance with a predetermined pattern of changes.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

Fig. 1. is a schematic view of a system which may be used in accordance with the invention.

Figs. 2a, 2b and 2c illustrate typical successive indicia which may be printed by a postage evidencing device (PED) operated in accordance with the invention; and

Fig. 3 is a flow chart of the operation of the printing of sequential bit-maps for verification in accordance with one embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In Fig. 1, there is shown generally at 10 a system in accordance with the invention. Mailpieces 12, 14, and 16, which are representative of those to be sequentially printed during a batch run by a particular mailer are shown being fed to printer 18 for printing of a postal indicia by the printer which is suitably connected to computer 20 in known manner as described for example in U.S. Patent No. 4,757,537 to Edelmann et al or U.S. Patent No. 4,831,555 to Sansone et al, specifically incorporated by reference herein.

Fig. 2a shows a first bit-mapped print 50 on a mailpiece 52 illustrative of a predetermined indicia for a particular machine assigned to a given mailer. As seen in Fig. 2b, the indicia print 54 on mailpiece 56 has been changed only slightly so as to be artistically different from the previously printed indicia 50. Fig. 2c shows indicia 58 on the next mailpiece in the printing sequence shown at 60. It in turn has been modified slightly from both the previously illustrated indicia. It will be appreciated that the variations in successive printed indicia may form a pattern such that when a sequentially printed batch of the mailpieces are riffled, an animated sequence occurs. It will be understood that the visibly animated pattern created by riffling through the batch may form such noticeable changes as, for example, an eagle of the indicia flapping its wings, or it may be made more subtle in order to be harder for the attempted fraudulent printer to find. It will also be appreciated that a particular predetermined pattern may be associated with a corresponding mailer or group of mailers.

Fig. 3 is a flow chart of the operation of the postage metering device in accordance with the invention. The data for the bit map may be chosen to be the image of a standard indicia or one associated with a particular user. In any event the chosen bit map data is stored, block 100, in memory of computer 20 for printing in conventional manner when commanded in association with the known postage meter accounting routines described for example in the previously cited U.S. Patents incorporated by reference. The image is

printed, block 102, and the image is changed, block 104, in accordance with a predetermined change program. The program checks to determine if any more mailpieces are to be franked, decision block 106, and if there are the program loops back to printing block 102 in order to assure that the next printed indicia in the sequence will be different in some way from the indicia just printed previously. If there are no more mailpieces in the particular batch, the program returns to its idling sequence, not further described herein.

It will be appreciated that entirely new bit map data may be selected from a library of bit maps to form the new image. Alternatively the change may be to selected portions of the image via a library or via an algorithm for changing the bit map. The program and/or bit map library is preferably selected to provide a pattern that will produce an easily-viewed animated sequence for the selected changes of the indicia. That is, the animated pattern will become apparent simply by flipping through a batch of mailpieces where the indicia changes may be as apparent as the flapping of the wings of the typical eagle of the indicia or the changing of the number of stars or the like in accordance with the predetermined pattern. It will be understood that in the event the mailpieces are not in proper order a random pattern of changes will result which will in itself provide an indication that simple copies have not been made.

It will be apparent that the use of such a pattern will allow the postal authorities to make a swift visual check to preclude the fraudulent use of a simple copy of the postal indicia for franking a quantity of mailpieces by a user and to identify a particular device.

Claims

1. A method of printing indicia to enable verifying of mailpieces comprising the steps of creating a predetermined first indicia image, printing the first indicia image on a mailpiece, changing the first indicia image in a predetermined manner after the printing thereof, and thereafter sequentially printing and changing successive indicia on respective successive mailpieces franked by the system in accordance with a predetermined pattern.
2. A method according to claim 1 wherein said indicia images are bit-mapped.
3. The method according to claim 2 wherein the step of creating the indicia image utilizes a bit map library and the changes are made by selecting new images from the library.

4. A method according to any preceding claim wherein the step of creating the mailpiece image utilizes an algorithm for providing changes in the indicia. 5
5. A method according to any preceding claim wherein the indicia are changed in a predetermined manner to produce a pattern such that a sequence of mailpieces in a batch will produce animation whenever the batch is flipped through. 10
6. A method according to any preceding claim wherein each one of a plurality of predetermined patterns is associated with a respective selected user of a plurality of users. 15
7. A method of producing a batch of mailpieces to enable verification of authenticity comprising the steps of creating for a user a predetermined bit-mapped first indicia image, printing the first indicia image on a mailpiece, changing the bit-mapped first indicia image in a predetermined manner after the printing thereof in accordance with a pattern provided to the user, and thereafter sequentially printing and changing successive indicia on respective successive mailpieces franked by the user in accordance with the predetermined pattern. 20 25 30
8. A method of verifying authenticity of a batch of mailpieces produced according to claim 7 in which, upon receipt at a postal facility, the step of rapidly flipping through the batch of mailpieces in the sequentially printed order is performed to ensure that the corresponding pattern has been reproduced in the batch received from the user. 35 40 45 50 55

FIG. 1

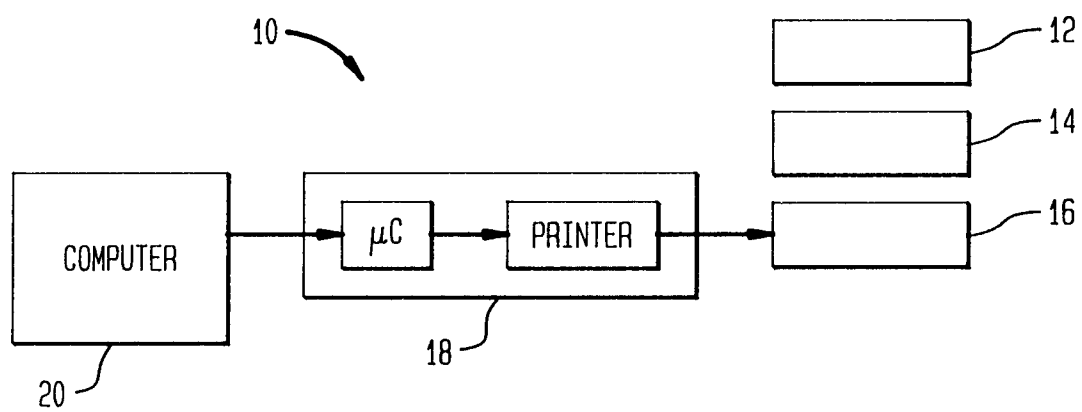


FIG. 2A

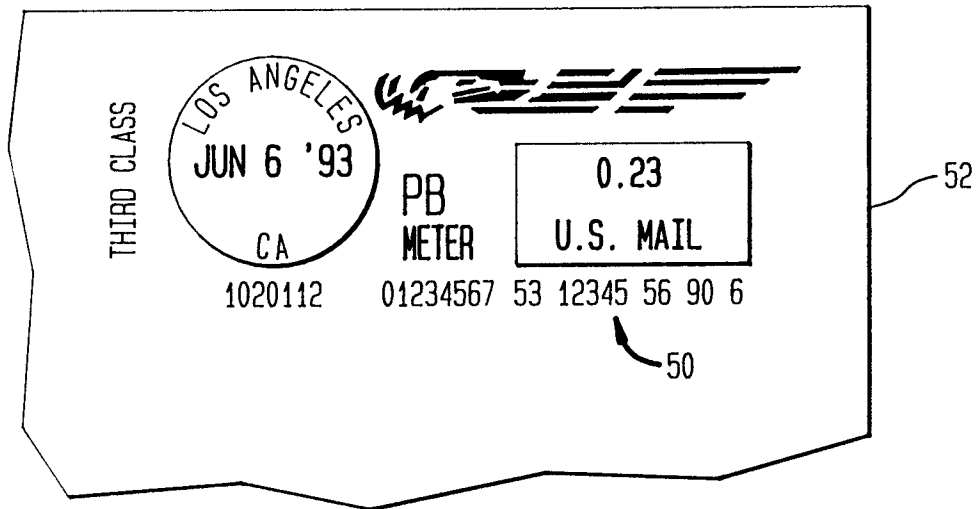


FIG. 2B

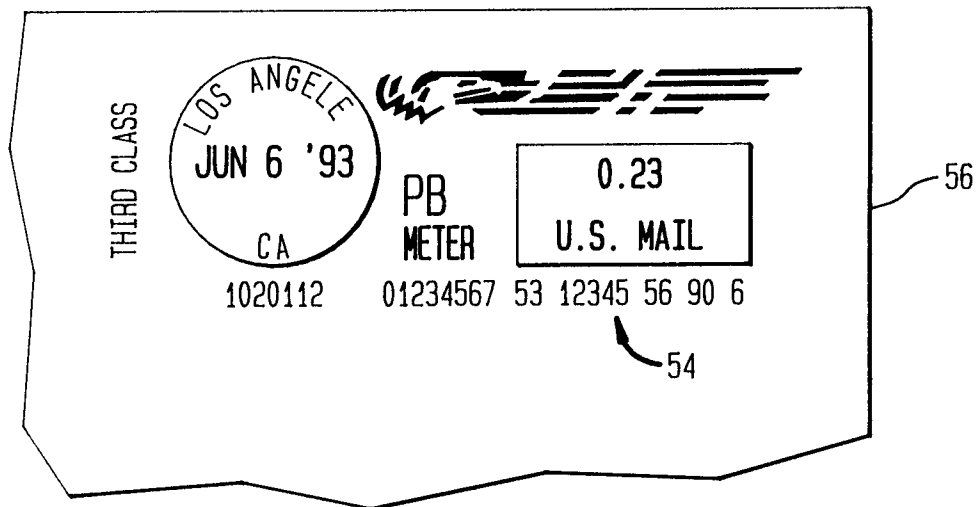


FIG. 2C

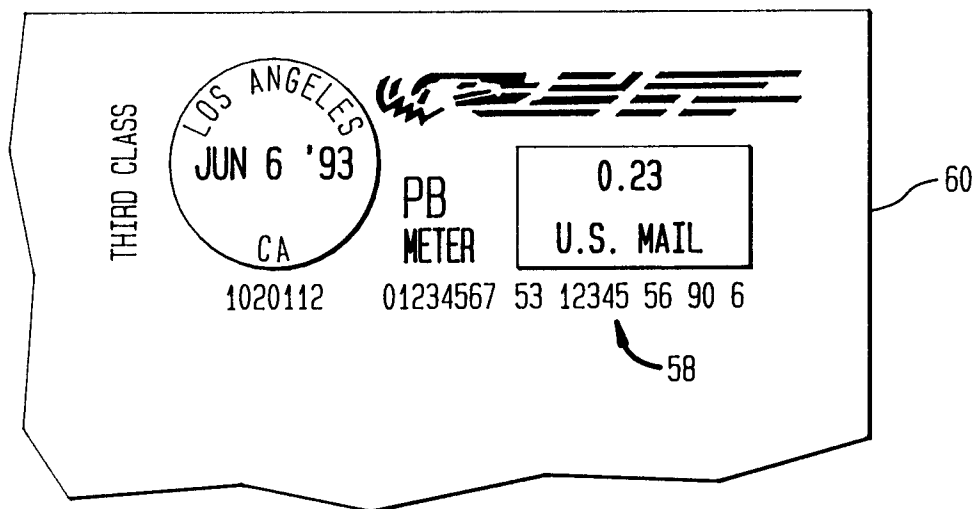


FIG. 3

