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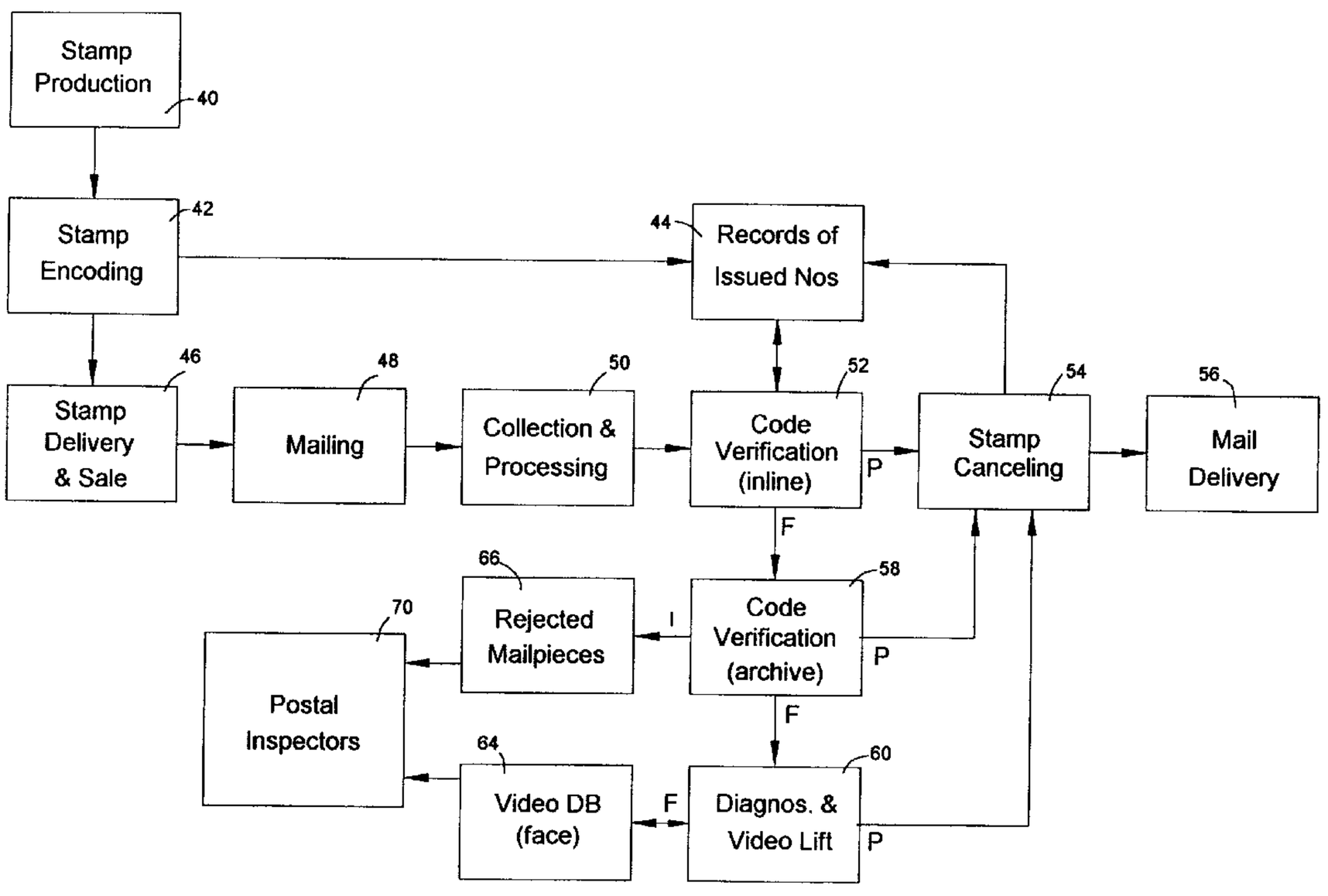
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(54) **OBLITERATION POSTALE ET METHODE DE VERIFICATION DE SA VALIDITE**

(54) **POSTAL STAMP AND METHOD OF VERIFYING THE VALIDITY THEREOF**



(57) A method of verifying the validity of a postal stamp to determine whether the stamp is produced legitimately and whether it has been canceled in a previous use. The method includes the steps of producing a special code on the stamp of interest and creating a record relating to the special code in a database. When the mailpiece collected by a post office has a stamp bearing a special code, the special code is reported to the database for verification. If the records in the database indicate that the reported special code does exist, then the stamp is considered legitimate. The mailpiece is accepted and the stamp is canceled before delivery, and a request is sent to the database to effect the alteration of the record relating to the "canceled" special code. An altered record will no longer provide a proof of validity if the database is later consulted with respect to the specific special code.

POSTAL STAMP AND METHOD OF VERIFYING THE VALIDITY THEREOF

Abstract of the Disclosure

A method of verifying the validity of a postal stamp to determine whether the stamp is produced legitimately and whether it has been canceled in a previous use. The method includes the steps of producing a special code on the stamp of interest and creating a record relating to the special code in a database. When the mailpiece collected by a post office has a stamp bearing a special code, the special code is reported to the database for verification. If the records in the database indicate that the reported special code does exist, then the stamp is considered legitimate. The mailpiece is accepted and the stamp is canceled before delivery, and a request is sent to the database to effect the alteration of the record relating to the "canceled" special code. An altered record will no longer provide a proof of validity if the database is later consulted with respect to the specific special code.

E-814

POSTAL STAMP AND METHOD OF VERIFYING THE VALIDITY THEREOF

Technical Field

The present invention relates to a postal stamp and a method of verifying the authenticity of the stamp.

Background of the Invention

Even though there is a law prohibiting the use of canceled stamps for mailing, the U.S. Postal Service is still losing a large amount of money to stamp re-use. Furthermore, there is a potential problem of counterfeiting postal stamps, especially for stamps with high denominations, by using a photocopier, a personal computer/scanner or a color printer. It is desirable to provide a process for determining whether a postal stamp on a mailpiece is legitimately produced and whether it has been previously canceled.

Summary of the Invention

It is the primary objective of the present invention to provide a method of verifying the validity of a postal stamp on a mailpiece. More specifically, the present invention provides a method of determining whether the postal stamp is legitimately produced and whether it has been canceled in a previous use.

The above objective can be achieved by producing a special code on each postal stamp of interest and establishing a database to keep records of the issued special codes. The special code is produced on the stamp before the stamp is delivered to the consumer. When a mailpiece is collected by a postal office and the stamp on the mailpiece has a special code, the postal office identifies the special code on the stamp and consults the database. If the records in the database indicate that the stamp bearing the special code has not been previously canceled, then the special code itself is a proof of validity. After receiving the proof of validity, the postal office processes the mail as usual and cancels the stamp before the mailpiece is delivered to the addressee. The postal office also reports to the database that the stamp has

now been canceled and effects the alteration of the records so that the special code associated with the canceled stamp effectively becomes a "canceled" code. A record associated with a "canceled" code will not provide a proof of validity when the database is consulted.

Preferably, the special code is overprinted on a regular postal stamp after the printing of the stamp graphics. But the special code can also be printed on the stamp stock prior to or together with the printing of the stamp graphics. The production of the special codes and the establishment of the database can be done by a third party or by the U.S. Postal Service (USPS). Preferably, the special code is machine-readable and printed as a two-dimensional barcode symbol. However, the special code imprinted on a stamp can also be a one-dimensional barcode symbol, an alphanumeric string or other machine-readable codes. The method for reading two-dimensional barcodes is well-known and has been disclosed in a number of U.S. patents, such as U.S. Patent No.5,627,358 (Roustaei) entitled "System and Method for Reading Two-Dimensional Barcodes", U.S. Patent No.5,691,528 (Wyatt et al.) entitled "Scanning System for Either Hand-held or Stationary Operation for Reading 1-D or 2-D Barcodes", and U.S. Patent No.5,637,856 (Bridgelall et al.) entitled "Scanning System and Scanning Method with Scan Pattern Control for Reading 1-D and 2-D Barcode Symbols". The method for reading a one-dimensional barcode symbol using an optical scanner and the method for reading an alphanumeric code using an optical character reader (OCR) are also well-known. Preferably, the special code is produced with invisible ink. But it can also be printed in visible ink.

Preferably, the special code is unique in that each stamp has a different code. Alternatively, the special code is only unique within a section of the country. For example, the entire United States can be divided into a number of sections or regions for this purpose so as to allow the same special code to be used on a number of stamps. However, every stamp sold within a region will have a different special code and a regional database will be used

to keep records on the special code issued for that region. It can be safely assumed that a stamp purchased in one region will be used in that region. Therefore, the canceling of a stamp in one region will not normally affect the records in the database in another region. By doing so, the required number of unique codes to be put on the stamps can be greatly reduced, and the lookup times will also be reduced accordingly. It is recognized that there is a small probability that a stamp bearing a special code purchased in one region is used in another region, and the regional database alone may not be sufficient to prove the validity of the stamp. In that case, it is also preferable to establish a national database to keep records of the issuance of special codes.

The preferred form of the special code, according to the present invention, is the two-dimensional barcode symbol. With a matrix block having a size that fits a regular postal stamp, a barcode symbol containing an equivalent of 3000 numeric characters can be easily produced. Thus, there should be more than enough unique special codes for the entire country, and it is not likely that there is a need to divide the country into regions for this purpose.

The present invention will become apparent upon reading the description of the drawings.

Brief Description of the Drawings

Fig.1 illustrates the cross section of a postal stamp having a special code produced thereon.

Fig.2 illustrates an example of a postal stamp having an alphanumeric string as its special code.

Fig.3a illustrates an example of a postal stamp having a special code imprinted in a block.

Fig.3b illustrates an example of the two-dimensional barcode symbol.

Fig.4a and Fig.4b illustrate different arrangements of a two-dimensional barcode symbol on a postal stamp.

Fig.5 illustrates the method for verifying the validity of a postal stamp.

Detailed Description

Fig.1 illustrates the cross section of a postal stamp having a special code produced thereon. As shown in Fig.1, the postal stamp **10** is printed on a substrate such a paper layer **20**. Preferably, the stamp has an adhesive layer **22** for affixing the stamp to a mailpiece. For illustrative purposes only, it is assumed that the special code is produced on top of the stamp graphics. Thus, as shown in Fig.1, the ink layer **26** for forming the special code is printed on top of the graphic ink layer **24**. Preferably, the coded ink layer **26** is transparent and colorless so that it will not noticeably affect the appearance of the stamp graphics. Preferably, the coded ink layer is invisible to the human eye in the visible wavelength region, but it will become luminescent when the stamp is illuminated by a light source in other wavelength regions to enable the reading of the code. For example, the coded ink layer can be produced with a material that fluoresces or emits phosphorescent light under the illumination of a UV source. Preferably, the ink is also water fast, fast drying, wear-resistant and low gloss or having a gloss that matches the stamp surface.

Fig.2 illustrates an example of a postal stamp having an alphanumeric string as its special code. As shown, the postal stamp **10** has a stamp graphics area **28** showing the graphic design and the stamp denomination. The stamp also has a special code **30** comprised of a string of alphanumeric characters, which is readable by a conventional OCR.

Fig.3a illustrates an example of a postal stamp having a special code imprinted in a block form. As shown, the postal stamp **10** has a stamp graphics area **28** showing the graphic design and the stamp denomination. The stamp also has an invisible special code **31** to be printed on top of the stamp graphics within an area **33** defined by the dashed lines, for example. The special code **31** shown in Fig.3a represents a two-dimensional array of symbols. For example, the block can contain an array of alphanumeric

symbols or other symbols. According to the preferred embodiment of the present invention, special code **31** is a block of two-dimensional barcode symbol which is the preferred embodiment of the present invention. The detail of a two-dimensional barcode block is shown in Fig.3b.

Fig.3b illustrates an example of the two-dimensional barcode symbol. Shown in Fig.3b is a matrix block containing the two-dimensional barcode symbol. Within the matrix block of the special code **32** are data regions which contain nominally square modules set out in a regular array. Preferably, the matrix block is produced in accordance with the International Symbology Specification developed by AIM International Inc., the worldwide trade association for manufacturers and producers of barcode products. The current address of AIM International Inc. is 11860 Sunrise Valley Drive, Suite 100, Reston, Virginia 22091 (phone: 703-391-7621; fax: 703-391-7624). In particular, the ECC 200 Data Matrix Symbols as defined in the International Symbology Specification by AIM is the preferred version of the special code, according to the present invention.

In general, the special code can be produced in the form of one, two or more matrix blocks of the two-dimensional barcode symbol, and each matrix block can be square or rectangular or in any other geometrical shape. Two examples of the arrangement of the matrix blocks are shown in Fig.4a and Fig.4b.

As shown in Fig.4a, the stamp **10** has a stamp graphic area **28** and two square matrix blocks of two-dimensional barcode symbol **34** and **36**, one positioned above the other. In Fig.4b, the two-dimensional barcode symbol is contained within a rectangular matrix block **38** below the stamp graphic area **28**.

Fig.5 illustrates a block diagram representing the process for verifying the validity of a postal stamp. In Fig.5, block **40** represents the production of the postal stamps, and each of the stamps is assigned and imprinted with a special code in step **42**. When the special code is issued for printing on a postal stamp, the issuance of that special code is reported to a database **44**

in which a record is created, specifically referenced to the issued special code. The record is a proof of validity of the postal stamp having an issued special code, and the proof is provided when the database **44** is consulted. The same record will be altered when the postal stamp having the same issued special code is canceled and that altered record will no longer provide a proof of validity. It may be desirable to store the "canceled" issued codes in a separate database or archive for other investigation procedures, such as the archive code verification step **58**.

In step **46**, it is shown that the postal stamps are delivered to local post offices to be sold to the consumers. After a consumer uses a stamp bearing a special code for mailing a mailpiece, as in step **48**, the mail is collected and processed by the accepting postal office in step **50**. As part of the mail processing procedures, the stamp is examined using an in-line code verification procedure, in step **52**, to determine whether the stamp is produced and used legitimately. In the verification process, a code reader is used to identify the special code on the stamp. It is understood that if the code is produced with an invisible ink, a special light source will be needed to make to code visible to the code reader. The identified code is reported to the database **44** and a proof of validity of the stamp is requested. If the database has a record showing the issuance of the special code and that the stamp has not been canceled, then the stamp is considered legitimate. In that case, the stamp has passed the verification process and the mail is accepted for further processing, with the stamp being canceled in step **54**. It is preferred that the cancellation mark is produced with a visible ink so that a "canceled" postal stamp is easily distinguishable from an unused one.

However, if the in-line code verification procedure fails to yield a proof of validity of the stamp, an additional code verification (archive) procedure is used in step **58** to verify the validity of the stamp. In the archive code verification procedure, the identified code is checked against an archive or database containing "canceled" codes. Again, if the archive code verification procedure proves that the stamp is produced and used legitimately, then the

stamp is canceled in step **54** before the mailpiece is delivered to the addressee in step **56**. When the stamp bearing a special code is canceled, a request is made to the database **44** so as to alter the record that is specifically related to the special code being canceled. Such an altered record will no long provide a proof of validity when the database is consulted. If it is clearly evidenced that the stamp on the mailpiece has been previously used or the stamp is not legitimately produced, the mailpiece is rejected, in step **66**, and may be subject to further investigation by the postal inspectors in step **70.**

It is realized that there may be circumstances under which an otherwise legitimate postal stamp appears to be illegitimate. For example, when the special code is partially damaged, it may cause a wrong reading of the special code by the code reader. The code as read from the stamp may or may not be in the database at all. In that case, the mailpiece is subject to further verification using a diagnostic and video lift technique in step **60**. The video lift procedure involves the consultation with a video image database **64** where the image of the entire envelope or the surface of a mailpiece, including the address of the sender and the address of the receiver, is stored. If the mailpiece again fails the verification procedure in step **60**, the image of the mailpiece with the seemingly dubious stamp will be stored in a video database **64** and the mail may be subject to the investigation by the postal inspectors.

In summary, the present invention provides a postal stamp for mailing a mailpiece. The validity of the stamp is verifiable against a database having records to prove that the stamp is legitimately produced and it has not been canceled in a previous use. The postal stamp, according to the present invention, comprises: a substrate layer, a graphic layer and a special code specifically referred to in the database. Preferably, the special code is imprinted with invisible ink as one or more blocks of two-dimensional barcode symbols.

The present invention also provides a method of verifying the validity of a postal stamp to determine whether the postal stamp is produced legitimately and whether it has been canceled in a previous use. The method includes the following steps:

1) producing a special code on the postal stamp before delivery;
2) creating in the database a record specifically related to the special code so that the record provides a proof of validity of the postal stamp when the database is consulted; and
3) altering the related record in the database when the postal stamp is canceled so as to prohibit said record from providing the proof of validity after the record has been altered.

The special code can be a two-dimensional barcode symbol, a one-dimensional barcode symbol, a string of alphanumeric characters or any machine readable code. Preferably, the code is printed with an invisible ink so that code does not noticeably affect the appearance of the stamp graphics. But the code can also be printed with a visible ink, readable by a human operator or a machine.

Although the invention has been described with respect to a preferred embodiment and version thereof, it will be understood by those skilled in the art that the foregoing and various other changes, omissions and deviations in the form and detail thereof may be made without depart from the spirit and scope of this invention.

What is claimed is:

1. A method of verifying the validity of a postal stamp by consulting a database to determine whether said postal stamp is produced legitimately and whether said postal stamp has been canceled in a previous use, said method comprising the steps of:
   a) producing a special code on said postal stamp before delivery;
   b) creating in the database a record specifically related to said special code, said record providing a proof of validity of said postal stamp when the database is consulted; and
   c) altering said record in the database when said postal stamp is canceled so as to prohibit said record from providing the proof of validity after said record has been altered.

2. The method of claim 1 wherein the special code is produced on said postal stamp before the stamp graphics is produced.

3. The method of claim 1 wherein the special code is produced on said postal stamp after the stamp graphics is produced.

4. The method of claim 1 wherein the special code is machine readable.

5. The method of claim 1 wherein the special code comprises a barcode symbol.

6. The method of claim 1 wherein the special code comprises a two-dimensional barcode symbol.

7. The method of claim 1 wherein the special code comprises a plurality of alphanumerical symbols.

8. The method of claim 1 wherein the special code is produced with a visible ink.

9. The method of claim 1 wherein the special code is produced with an invisible ink.

10. A postal stamp for mailing a mailpiece, said postal stamp being verifiable in a database having records capable of providing a proof of validity showing that said postal stamp is issued legitimately and said postal stamp has not been previously canceled, said postal stamp comprising:

a) a substrate layer;

b) a graphic layer imprinted on the substrate having a symbol indicative of the denomination of said postal stamp; and

c) a code imprinted on or near the graphic layer, said code being referred to in one of the records of the database when said postal stamp is issued so as to allow said one record to provide the proof of validity, said code being reported to the database when said postal stamp is canceled so as to prevent said one record from later providing the proof of validity of that stamp

11. The postal stamp of claim 10 further comprising an adhesive layer for affixing the stamp to a mailpiece.

12. The postal stamp of claim 10 wherein said code comprises a two-dimensional barcode symbol.

13. The postal stamp of claim 10 wherein said code comprises a plurality of alphanumeric symbols.

14. The postal stamp of claim 10 wherein said code comprises a one-dimensional barcode symbol.

15. The postal stamp of claim 10 wherein said code is machine readable.

16. The postal stamp of claim 10 wherein said code is readable by a human operator.

17. The postal stamp of claim 10 wherein said code is produced with visible ink.

18. The postal stamp of claim in claim 10 wherein said code is produced with invisible ink.

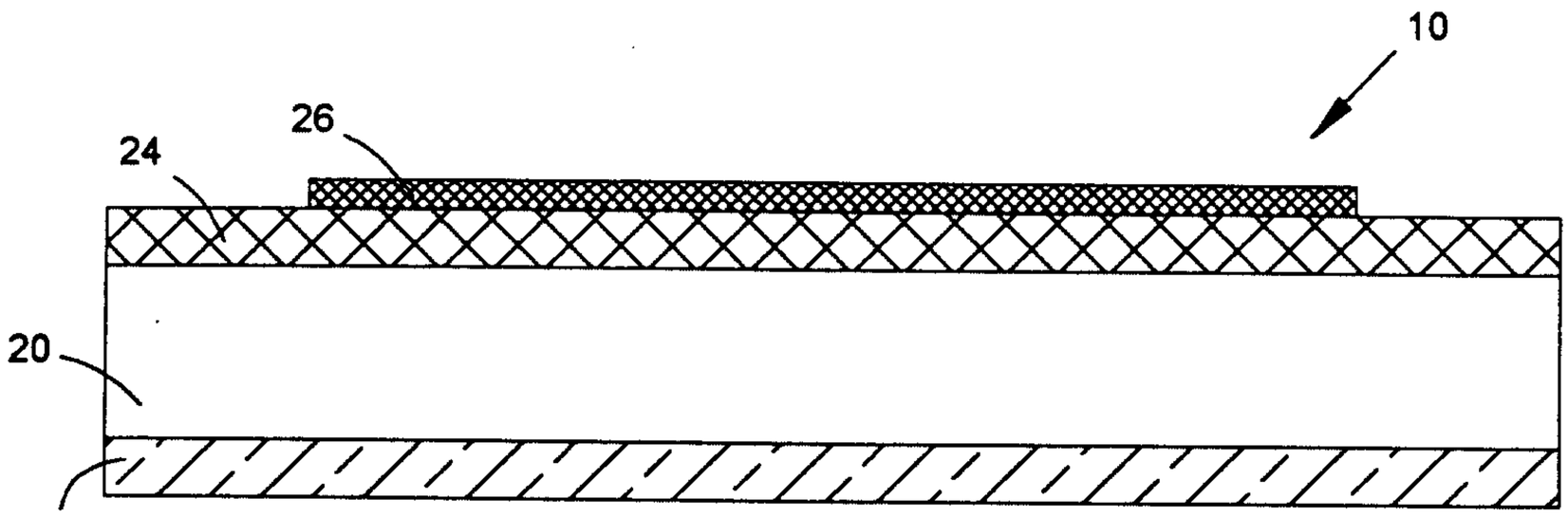


FIG. 1

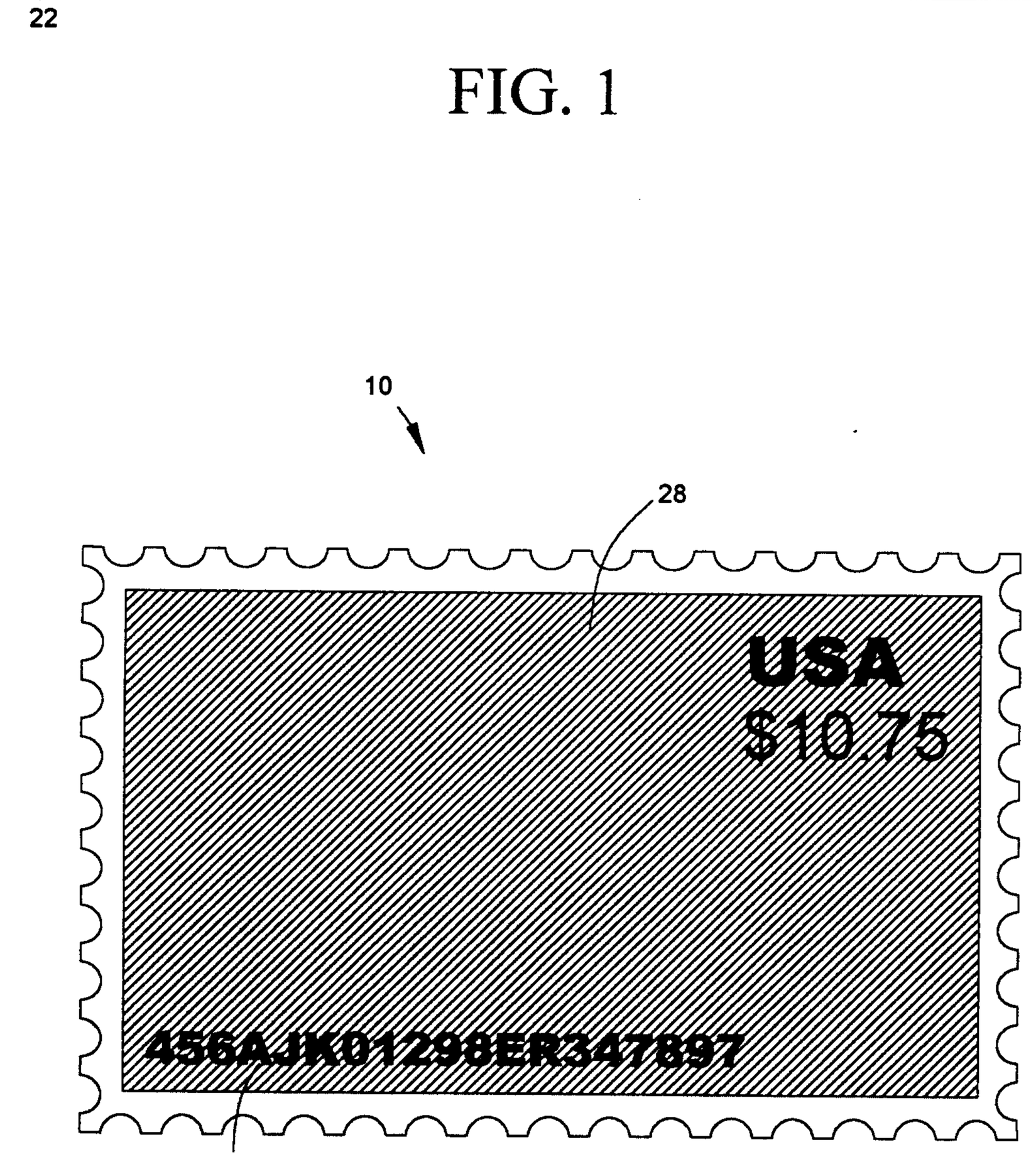


FIG. 2

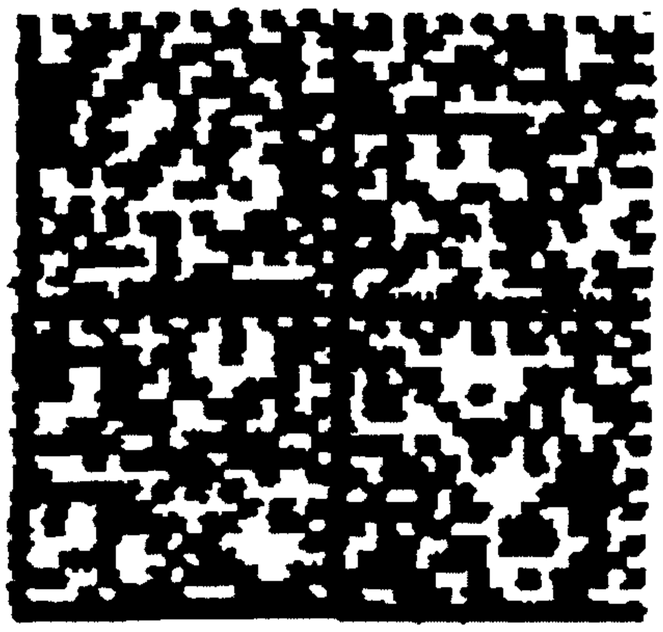


FIG. 3b

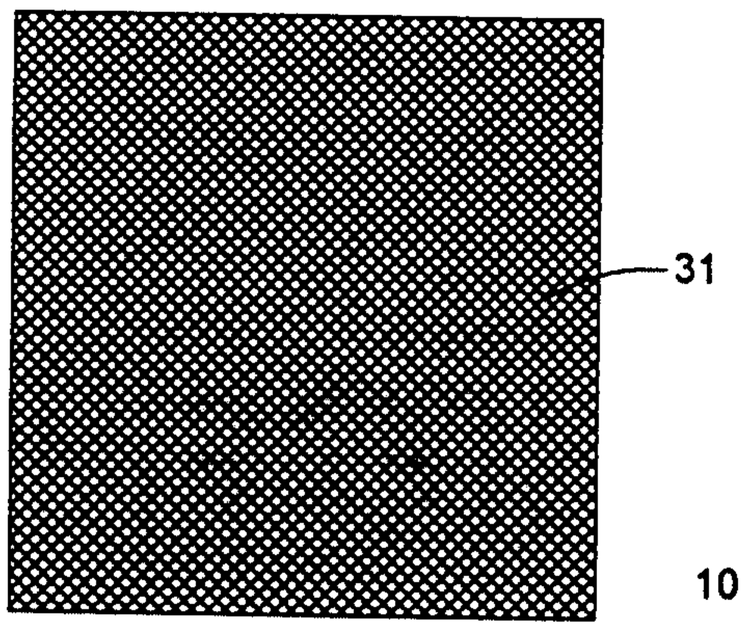
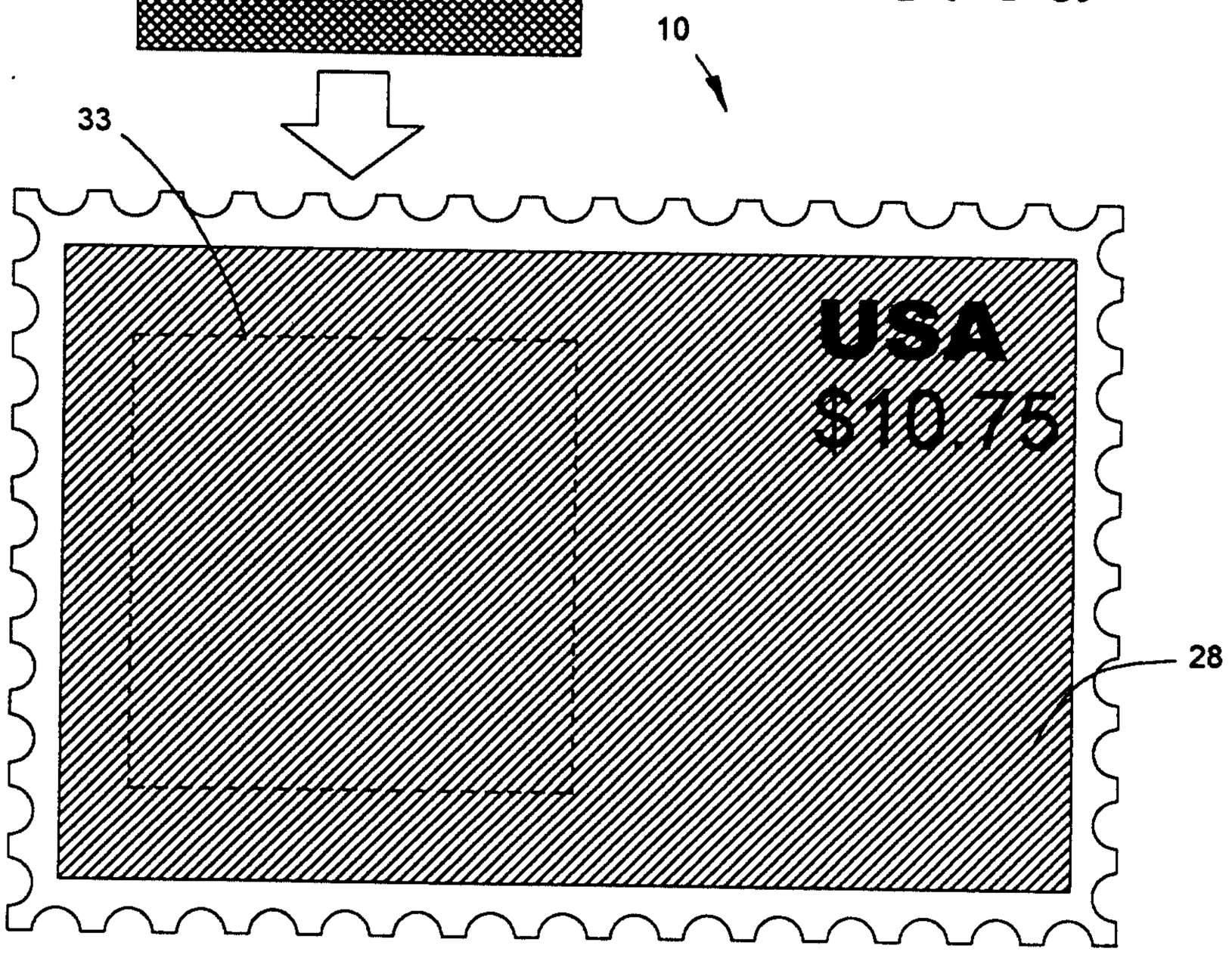


FIG. 3a



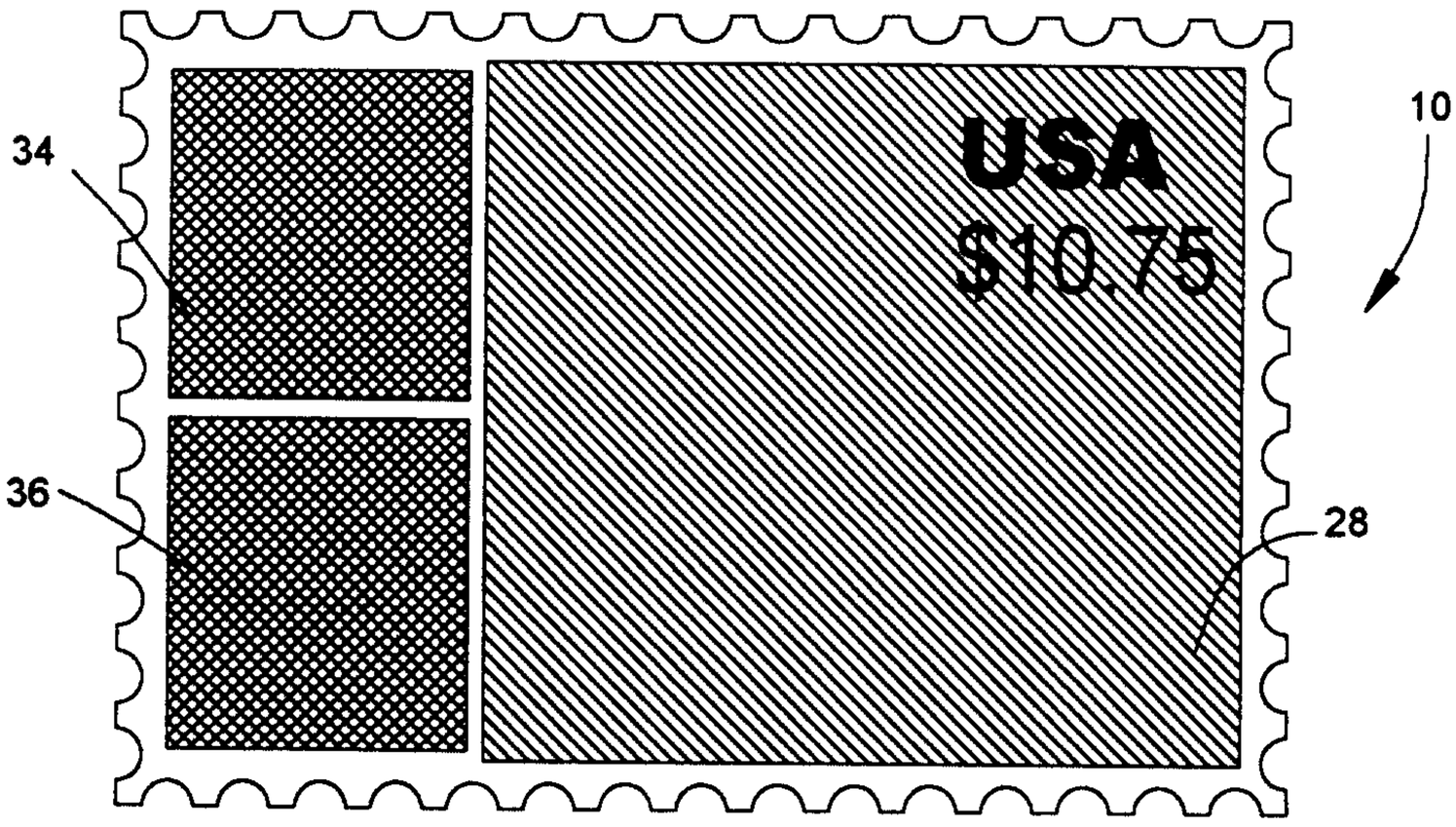


FIG. 4a

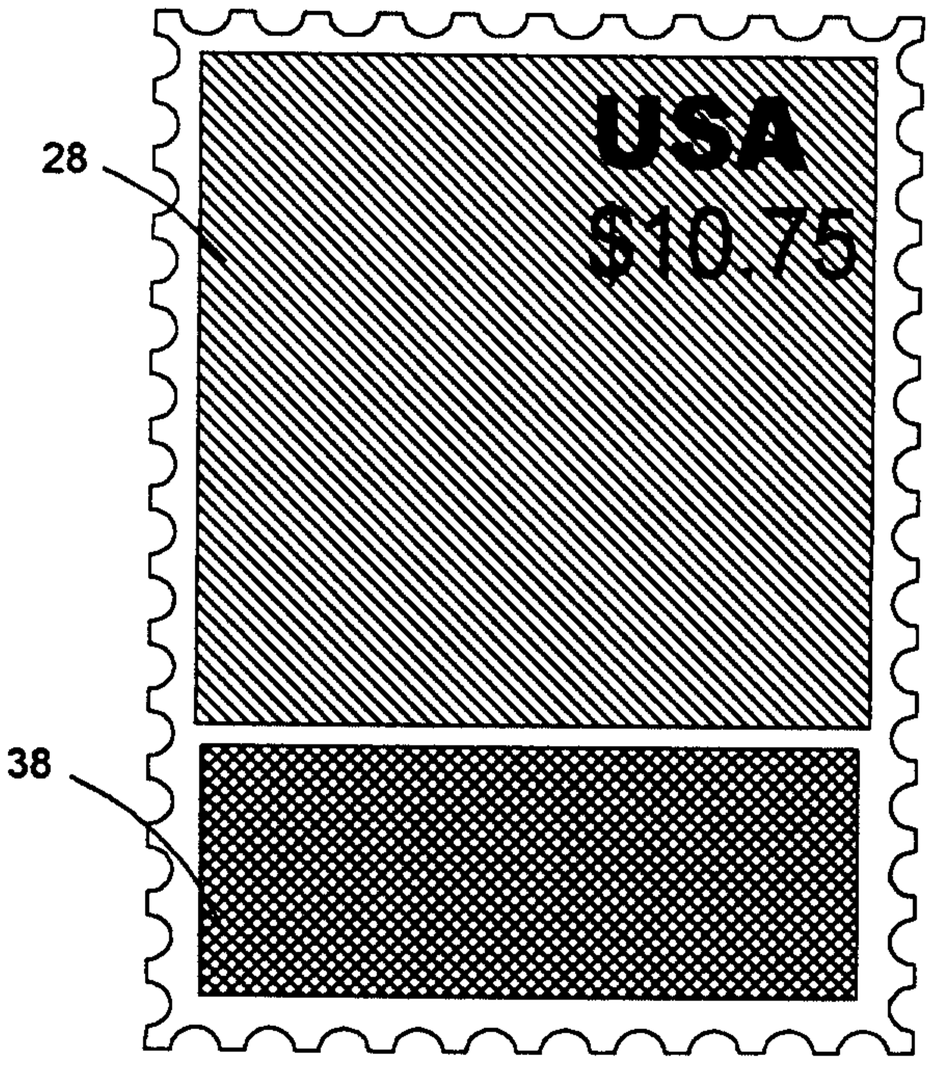


FIG. 4b

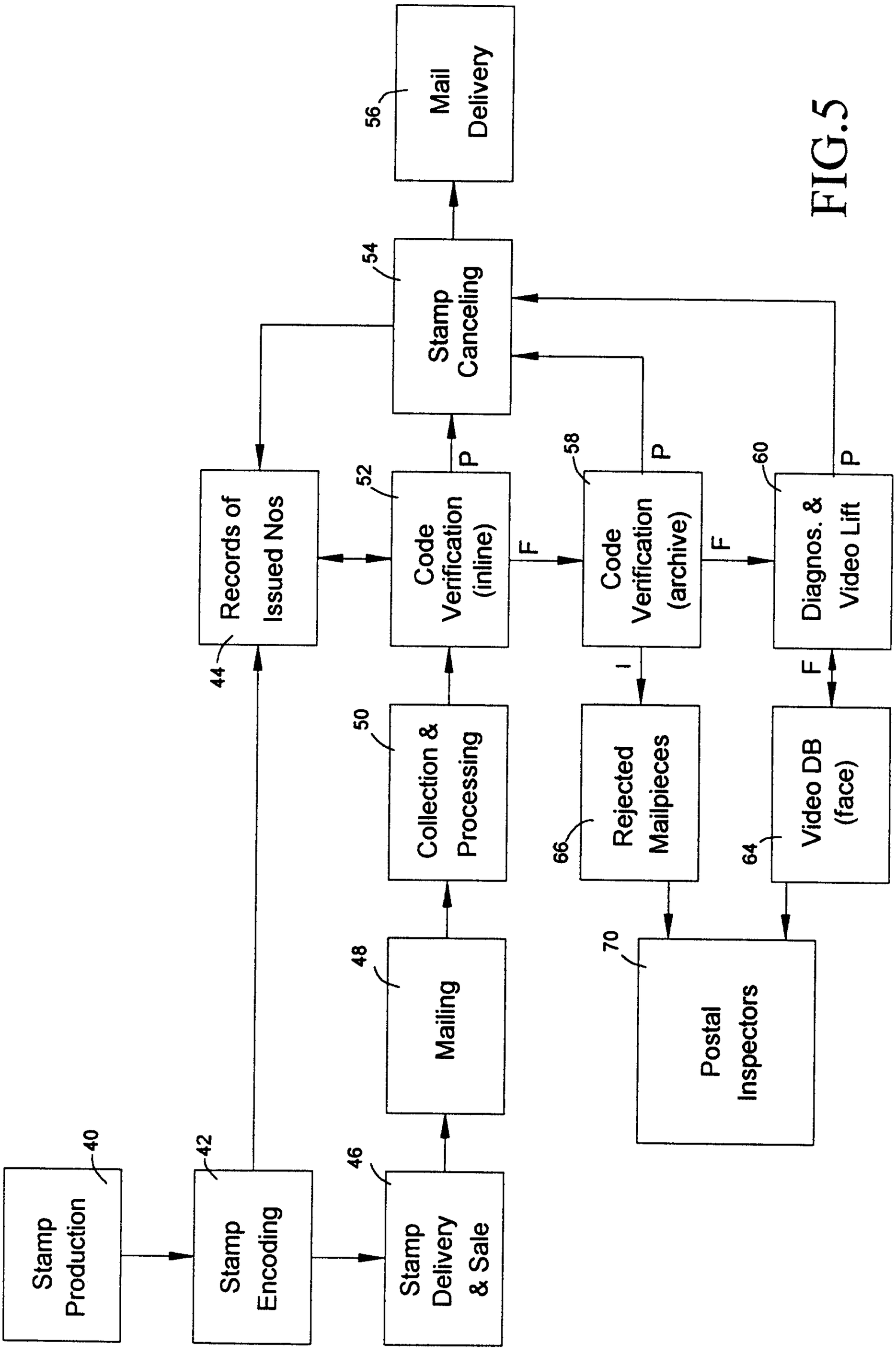
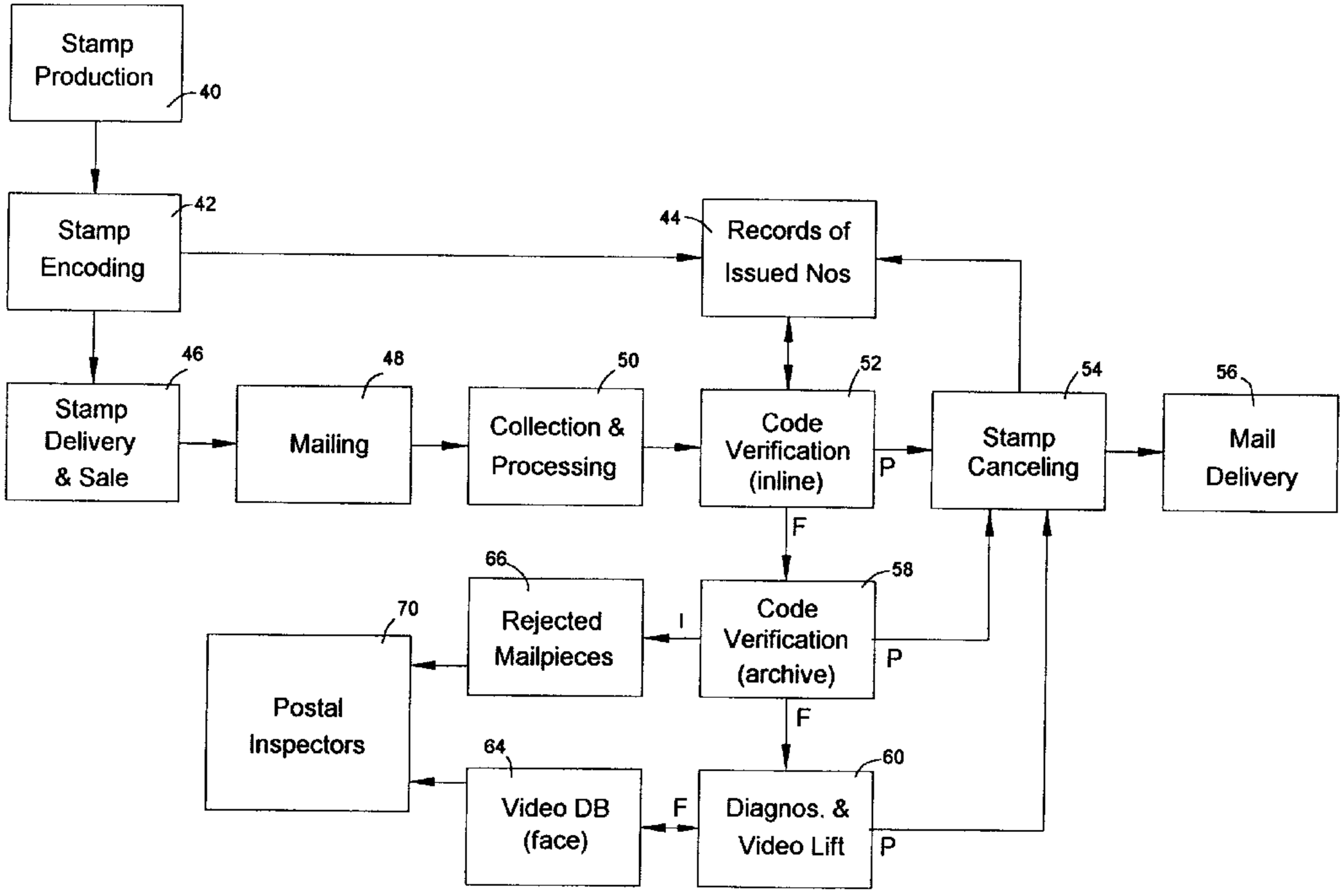

Stamp Production
40
Stamp Encoding
42
Stamp Delivery & Sale
46
Mailing
48
Collection & Processing
50
Code Verification (inline)
52
Stamp Canceling
54
Mail Delivery
56
Code Verification (archive)
58
Diagnos. & Video Lift
60
Video DB (face)
64
Rejected Mailpieces
66
Postal Inspectors
70
Records of Issued Nos
44
P
F
I

FIG.5


Stamp Production
40
Stamp Encoding
42
44
Records of Issued Nos
46
Stamp Delivery & Sale
48
Mailing
50
Collection & Processing
52
Code Verification (inline)
P
54
Stamp Canceling
56
Mail Delivery
F
66
Rejected Mailpieces
I
58
Code Verification (archive)
P
70
Postal Inspectors
F
64
Video DB (face)
F
60
Diagnos. & Video Lift
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