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(54) Printing of franking and the like on mail items.

(57) A franking machine system is disclosed in which mail items (24) such as envelopes or labels are treated with heat sensitive material and the franking machine 910,11) is provided with a thermal print head (18) to apply selectively heat to the sensitive material to produce a change in colour of the material and thereby print a franking impression (26) on the mail item (24). The thermal print head (18) may also print a destination address (23). The entire face or only predetermined areas (25) of the mail item (24) may be treated with sensitive material and if desired different areas (25a,25b) of the mail item (24) may be treated with material which is changed to different colours by the application of heat in order to produce images of different colours.

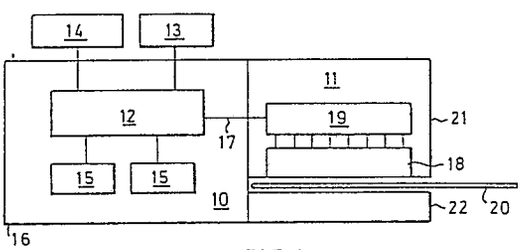

FIG.1.

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Description

PRINTING OF FRANKING AND THE LIKE ON MAIL ITEMS

This invention relates to the printing of a franking impression and other matter on mail items such as envelopes and labels.

Franking machines are used for franking mail items by the printing of a franking impression on the mail item to indicate that a postal value has been charged for the transmission of that item. In the case of small mail items in which an envelope contains the material being sent, the franking impression is usually applied directly to the envelope. However with larger items such as parcels and packets too large to pass through the franking machine, the franking impression is usually applied to a label which is subsequently adhered to the item.

Franking machines include a printer to print the franking impression and other material such as an advertising slogan on the envelope or label by means of type characters which engage an inked roller and then the surface of the mail item or alternatively press an inked ribbon against the surface of the mail item. The franking includes the value of postage and the date of franking and may include further data such as an identifier for the franking machine and coded data for checking the validity of the franking. Commonly the printer has a printing drum which is rotated to bring type carried by it into printing engagement with an inked roller and mail item. The drum may carry fixed type to print invariable data such as an officially authorised pattern of franking impression together with type characters which can be selected for the printing of the variable data such as the date and value of postage charged. The type characters for printing variable data are usually carried on rotatable type wheels which can be turned to bring selected characters into an operative printing position. Such printers require complex mechanisms for setting the type wheels and also electro- mechanical transducers for generating electrical signals indicative of the setting of the type wheels for use by electronic circuits for carrying out accounting functions related to the use of the franking machine.

It has also been proposed to use other forms of printer such as a thermal dot matrix printer using a thermal transfer process for the transfer of ink from a transfer ribbon to the surface of the mail item. In such printers a print head has a plurality of selectively heatable print elements which bear against a rear face of the transfer ribbon. The front face of the ribbon carries a layer of inked material which is melted by the heated elements in the vicinity of those elements and thereby transfer the ink to the surface of a mail item which is fed in contact with the front face of the ribbon. Such printers have the advantage over the earlier mechanical printers in that they are electrically operated and hence do not require the provision of complex mechanisms for setting values to be printed.

However both forms of printer require the provision of an inked roller or inked ribbon. As the rollers are used, ink is removed and after a number of passes of the type past the printing position the ink remaining in the roller is reduced to a level at which the printing would be too feint to be acceptable. In the case of thermal transfer ribbons, the entire thickness of ink is removed by the heated printing elements and hence the ribbon is not able to be re-used. Accordingly at intervals during the use of a franking machine it becomes necessary to interrupt use of the machine in order to replace the used ink roller ribbon with a correspondingly fully charged roller or ribbon. Such interruptions are inconvenient to the user of the machine.

According to one aspect of the invention a franking system comprises the combination of a mail item such as an envelope or label having an area on a face thereof treated with sensitive material and a franking machine including a printing device selectively operable to print a franking impression on said face of the mail item by changing the visual state of selected portions of said area of sensitive material.

According to another aspect of the invention a franking machine includes a printing device comprising selectively operable elements effective upon operation to change the visual state of selected portions of an area of the face of a mail item treated with sensitive material.

According to a further aspect of the invention a mail item such as an envelope or label having an area on a face thereof treated with sensitive material.

Preferably the sensitive material is responsive to the application of heat to change its visual state.

An embodiment of the invention will now be described in more detail by way of example with reference to the drawings in which:-

Figure 1 illustrates diagrammatically the functional elements of a franking machine and

Figure 2 shows a mail item.

Referring first to Figure 1, a franking machine consists of an accounting and control unit 10 and a printing unit 11. The accounting and control unit 10 includes a microprocessor 12 for carrying out accounting and control functions and is provided with a keyboard 13 to enable a user of the machine to input data and command signals to the microprocessor. A display device 14 is provided to display data keyed in by the user and also to display machine status information to the user. Accounting data relating to usage of the machine is held in memories 15. The memories are arranged to store a plurality of copies of the accounting data in order that in the event of a fault in storage of the data an un-corrupted copy of the data can be subsequently retrieved from the memories. In order to ensure that the machine cannot be used in a fraudulent manner, the microprocessor and memories are contained within a secure housing 16 to prevent unauthorised access to the circuits. The construction and operation of such accounting and control circuits are well known in the franking machine art and therefore it is believed to be unnecessary for an understanding of the invention to describe these circuits in more

detail.

The printing unit 11 receives print control signals over lines 17 and includes a printing head 18 driven by a driver circuit 19. The printing head comprises a plurality of selectably heatable elements positioned immediately adjacent a feed path for mail items 20. The elements may be arranged in a single row extending across the feed path in which case the elements may be constituted by segments of a strip of electrically resistive material, the elements being defined by electrical connections spaced along the length of the strip. The electrical connections are connected to outputs of the driver circuit.

The feed path for the mail items 20 extends between the upper portion 21 of the printer housing in which the print head is located and a base portion 22 of the housing. Feed and co-operating pressure rollers (not shown) are provided in the upper and base portions of the printer housing to feed the mail items along the feed path, at least one of the feed rollers being powered by an electric drive motor.

Referring now to Figure 2 which shows a mail item consisting of an envelope. As is conventional, the front face of the envelope is intended to carry destination address information 23 within an area 24 disposed in the lower part of the face. An area 25, disposed along the upper part of the face, is utilised to carry a franking impression 26. The upper area may also be utilised to carry advertising material 27. In order to enable the franking impression to be applied to the envelope, the upper portion of the front face of the envelope is treated with material sensitive to heating. This material, prior to the application of heat, is substantially not visible or may be a uniform colour throughout the upper area of the face of the envelope. However when the material is subjected to heating, the material assumes a colour which contrasts with the that of the unheated material. It may be desired to print the franking in one colour and the advertising material in another colour. If this is desired the area 25 at the upper part of the face is divided into sub-areas 25a and 25b, one sub-area 25a being treated with material which assumes one colour after heating and the other sub-area 25b is treated with material which assumes the other colour after heating.

When it is desired to carry out a franking operation, the user of the machine enters, by means of the keyboard 13, the value of postal charge. The microprocessor 12 carries out a check to ensure that the credit value held in the memories 15 is sufficient for this value of postal charge and in the event that this check is satisfactory print control signals are passed to the print head driver circuit 19. The mail item 20 is fed into the feed path in the printer unit 11 with an orientation such that the upper area 25 which has been treated with heat sensitive material will pass immediately under the print head 18. The elements in the print head 18 are selectively heated by the driver circuit 19 such that the elements are heated selectively and successively, in synchronism with feeding of the mail item 20 along the feed path past the print head 18, in such a manner that the desired pattern of printing is obtained on the mail item. Means are provided to sense the feeding of the mail item past the print head firstly to ensure that a mail item is present and secondly to ensure that the print head is driven in synchronism with feeding of the mail item.

While the envelope described hereinbefore is treated only on an upper area 25, if desired the entire face of the envelope may be treated with sensitive material. Treating of the entire face would permit printing of the destination information to be printed by a printer having selectively heatable print elements. The printer for printing the destination information may if desired be incorporated in the printing unit 11 of the franking machine.

Conveniently, the envelopes may be formed of paper which has been treated in bulk with sensitive material. Alternatively, particularly where it is desired to selectively treat the envelope either such that only the upper area 25 of the envelope is treated or where it is desired to treat sub-areas 25a, 25b of the envelope with material which assumes different colours, the front faces of the envelopes may be treated after manufacture of the envelopes. While the mail items have been considered to consist of envelopes, it will be appreciated that the franking and or destination information may be applied to adhesive labels intended to be affixed to larger packets and parcels.

Sensitive materials suitable for treating the mail items are sometimes liable to deterioration over a period of time with the result that the printing may become feint or un-readable. Accordingly if desired the printer unit of the franking machine may be provided with means, operative subsequent to printing on the mail item, to desensitise or lower the sensitivity of the material with which the mail item has been treated.

Claims

1. A franking system comprising the combination of a mail item (24) such as an envelope or label and a franking machine (10,11) characterised in that the mail item (24) has an area (25) on a face thereof treated with sensitive material and in that the franking machine (10,11) includes a printing device (11) selectively operable to print a franking impression (26) on said face of the mail item (24) by changing the visual state of selected portions of said area (25) of sensitive material.

2. A franking system as claimed in claim 1 further charactersied in that said sensitive material assumes a colour after being subjected to heat contrasting to the colour of the material prior to being subjected to heat and said printing device (11) is operable to heat selected portions of the material.

3. A franking machine characterised by the provision of a printing device (11) comprising selectively operable elements (18) effective upon operation to change the visual state of selected portions of an area (25) of the face of a mail item (24) treated with sensitive material.

4. A franking machine as claimed in claim 3 further

characterised in that said elements (18) are operable to apply heat selectively to the area (25) of the face of the mail item (24).

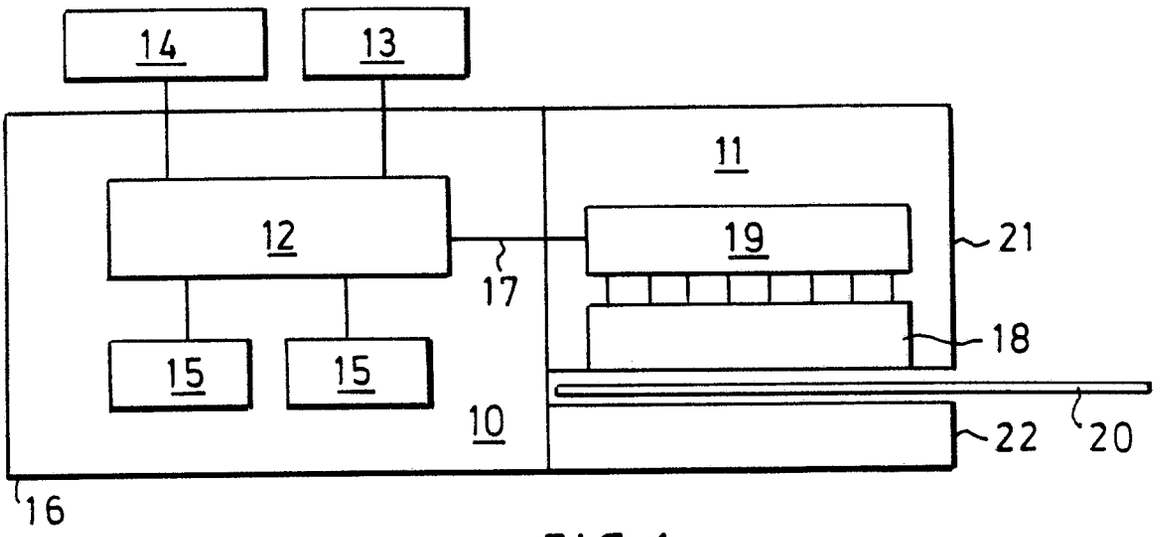
5. A mail item such as an envelope or label characterised in that an area (25) on a face thereof is treated with sensitive material.

6. A mail item as claimed in claim 5 further characterised in that the visual state of the sensitive material is changed by the application of heat thereto.

7. A mail item as claimed in claim 5 or 6 further characterised in that one area (25a) of the face of the item is treated with a first sensitive material and a second area (22b) is treated with a second sensitive material.

8. A mail item as claimed in claim 7 further characterised in that said first material assumes a first colour and said second material assumes a second colour contrasting with said first colour in response to the application of heat thereto.

9. A franking machine as claimed in claim 3 or 4 further characterised by the provision of means operative subsequent to operation of the printer (11) to desensitise or lower the sensitivity of the area (25) treated with sensitive material.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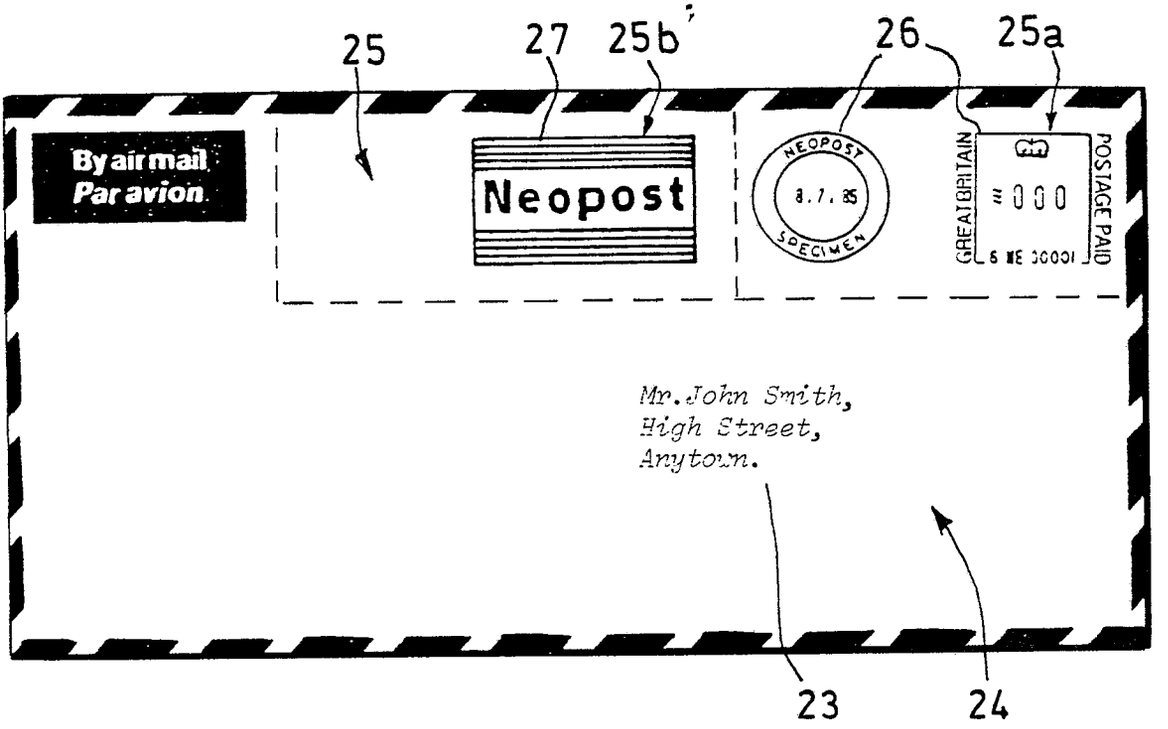
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FIG.2.