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(54) **Label printing apparatus**

Etikettendruckvorrichtung

Dispositif pour imprimer des étiquettes

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(56) References cited:
EP-A- 0 267 890

• **PATENT ABSTRACTS OF JAPAN vol. 10, no. 378**
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371 (PENTEL K.K.) 2 August 1986

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EP 0 573 188 B1

Description

The present invention relates to label printing apparatus.

Thermal printing devices for producing labels are known. They operate with a supply of tape arranged to receive an image and a means for transferring an image onto the tape. In one known device, a tape holding case holds a supply of image receiving tape and a supply of an image transfer ribbon, the image receiving tape and transfer ribbon being passed in overlap through a printing zone of the printing device. At the print zone, a thermal print head cooperates with a platen to transfer an image from the transfer ribbon to the tape. A printing device operating with a tape holding case of this type is described for example in EP-A-0267890 (Varitronics, Inc.).

In this printing device the image receiving tape comprises an upper layer for receiving an image which is secured to a releaseable backing layer by a layer of adhesive.

With this arrangement the width of the image receiving tape is substantially the same as the width of the image transfer ribbon so that they can be aligned and passed in overlap through the print zone. Thus, the width of the image receiving tape depends on the width of the image transfer ribbon. This width is typically of the order of 16mm. If a much wider image receiving tape was to be used with the above described arrangement the print head would have to be wider, which raises problems in relation to cost and power dissipation. The use of a tape width of about 30mm is desirable to produce six line address labels.

The present invention seeks to provide a printing apparatus capable of printing on wider image receiving tapes in a simple and cost effective manner.

According to the present invention there is provided printing apparatus comprising;

means for receiving a supply of image receiving tape;

means for receiving a supply of image transfer ribbon;

means for driving the image transfer ribbon and the image receiving tape in overlap through a print zone;

printing means at the print zone movable between an operative position in which an image is transferred from the image transfer ribbon to the image receiving tape and an inoperative position; and

means for moving the printing means between a first position aligned with a lower portion of the image receiving tape and a second position aligned with an upper portion of the image receiving tape.

By arranging for the printing means to be movable between the first and second positions the printing means itself need only have a width corresponding to half of the width of the image receiving tape. Thus, print-

ing can be accomplished on a lower portion of the tape with the printing means in a first position and then on the upper portion of the tape with the printing means in a second position. Preferably the driving means is operable to drive the image receiving tape in a forwards direction for printing on a lower portion thereof and then to drive the image receiving tape rearwardly so that the upper portion of the tape can be printed in alignment with the lower portion.

Preferably the printing means comprises a thermal print head cooperable with a platen. The length of the platen can correspond to the width of the image receiving tape and can remain stationary while the print head can be approximately half of the width of the image receiving tape since it is movable between the first and second positions.

In one embodiment, the means for receiving a supply of image transfer ribbon is a ribbon holding case which is mounted with the print head and movable therewith. This means that the width of the image transfer ribbon can correspond to the width of the print head and be approximately half the width of the image receiving tape.

For a better understanding of the present 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:-

Figure 1 is a plan view of a printing device with two cassettes inserted therein; and

Figure 2 is a side view showing the arrangement for moving the print head.

Referring firstly to Figure 1 there is shown a first cassette 2 which houses a reel 1 of image receiving tape 4. The image receiving tape has an upper layer for receiving an image on its upper surface and, on its lower surface a layer of adhesive to which a releaseable backing layer is secured. The tape is arranged so that the image receiving layer faces downwards in Figure 1. There is a second cassette 3 which houses a supply of an image transfer ribbon 7 which extends from a supply spool 30 to a take-up spool 32 via a print zone 5 of the device. The image transfer ribbon 7 has a width of 18mm in the described embodiment and extends through the print zone 5 in overlap with the image receiving tape 4. The printing device is provided with first and second feed rollers 6,8 which guide the image source tape 7 and the image receiving tape 4 in overlap one with another. The feed rollers 6,8 drive image receiving tape out of the cassette 20 and through the print zone 5 to an outlet 10 of the printing device. They can also be driven to drive tape 4 back into the cassette over a predetermined distance for the purposed described hereinafter. The cassette 2 can accommodate image receiving tape being fed back into the cassette 2 through the provision of deflectors 34 which define a tape receiving part.

The printing device also has a print head 12 and a platen 14 cooperating with the print head and between which the image receiving tape 4 and the image transfer ribbon 7 are held in overlap. The print head 12 has a width of 16mm and has a column containing 128 pixels in each column. In Figure 1 the print head 12 is shown in its operative position pressed against the platen 14 to cause an image to be transferred from the image transfer ribbon 7 to the image receiving tape 4. As will be described in more detail hereinafter the print head 12 can be moved to an inoperative position where it is spaced from the platen 14 to allow the image receiving tape 4 and the image transfer ribbon 7 to be released. After passing through the print zone the image transfer ribbon 7 is drawn back into the cassette 3 on its take-up spool while the image receiving tape 4 on which an image has been printed is passed through an outlet 10 of the device using the feed rollers 6,8.

As shown most clearly in Figure 2, the print head 12 and the image transfer ribbon cassette 3 are mounted on a chassis 16. The chassis 16 can be raised and lowered relative to a base plate 18 of the printing device via a lifting motor 20 driving a threaded rod 22. The base position of the chassis 16 is shown in a full line in Figure 2 and its raised position is shown in a dotted line.

In addition to being able to be raised and lowered, the chassis 16 can be moved reciprocally by means of rollers 24 running in a guide on the base plate 18. In this way, the print head 12 can be brought into and out of contact with the platen 14. It will be appreciated that other ways of moving the print head between its operative and inoperative positions are possible, such as moving the print head relative to its chassis 16 or by pivoting the entire chassis 16.

By way of example the image transfer ribbon is 16mm wide. When a cassette 2 housing an image receiving tape of equivalent width is inserted into the device the device operates conventionally, that is with the thermal print head being used to transfer an image to the image receiving tape. When a cassette 2 housing an image receiving tape having a width substantially twice that of the normal width, for example 30mm, is inserted the printing device is set into a wide label mode. This is either done automatically by sensing the cassette insertion or by a function key on the device which a user can depress.

In this mode, printing is accomplished as follows. A message to be printed is formulated using a display and microcontroller of the device in a conventional manner. A print instruction is given and, with the chassis 16 in its base position, the print head is moved into its operative position to bear against the platen 14 and a message is printed on the lower half of the image receiving tape, with the feed rollers 6,8 driving the image receiving tape through the print zone. Once the printing has been completed, the print head 12 is moved out of contact with the platen 14 by rolling the chassis 16 to the left in Figure 2 and the motor 20 is operated to raise the chassis 16 into its raised position shown in dotted outline in Fig-

ure 2. The image receiving tape 4 is driven backwards using the feed rollers 6,8 into the tape receiving part of the cassette 2 by a distance corresponding to the distance through which it was driven forwards for printing. The print head is then brought back into contact with the platen 14 so that now the image transfer ribbon is aligned with the upper part of the image receiving tape. Printing is then accomplished of the upper part of the image receiving tape.

In this way wide labels can be printed using normally available widths of image transfer ribbon and print heads.

Claims

1. A printing apparatus comprising:

means for receiving a supply of image receiving tape (4);

means (3) for receiving a supply of image transfer ribbon (7);

means for driving the image transfer ribbon and the image receiving tape in overlap through a print zone;

printing means (12,14) at the print zone (5) movable between an operative position in which an image is transferred from the image transfer ribbon (7) to the image receiving tape (4) and an inoperative position; characterized by

means (24) for moving the printing means between a first position aligned with a lower portion of image receiving tape (4) and a second position aligned with an upper portion of the image receiving tape (4).

2. A printing apparatus according to claim 1 wherein the driving means (6,8) is operable to drive the image receiving tape (4) in a forwards direction for printing on a lower portion thereof and then to drive the image receiving tape (4) rearwardly so that the upper portion of the tape can be printed in alignment with the lower portion.

3. A printing apparatus according to claim 1 or 2 wherein the printing means comprises a thermal print head (12) cooperable with a platen (14).

4. A printing apparatus according to claim 3 wherein the platen (14) has a length corresponding to the width of the image receiving tape (4) and is arranged to remain stationary and the print head (12) has a length approximately half of the width of the image receiving tape (4).

5. A printing apparatus according to any preceding claim wherein the means (3) for receiving a supply of image transfer ribbon (7) is a ribbon holding case

which is mounted with the print head (12) and movable therewith.

Patentansprüche

1. Druckgerät umfassend:

Mittel zum Aufnehmen eines Vorrats an Bildaufnahmeband (4);

Mittel (3) zum Aufnehmen eines Vorrats an Bildübertragungsband (7);

Mittel zum Fördern des Bildübertragungsbandes und des Bildaufnahmebandes in überlappender Weise durch eine Druckzone;

Mittel (12,14) zum Drucken in der Druckzone (5), welche zwischen einer Betriebsstellung, in der ein Bild vom Bildübertragungsband (7) auf das Bildaufnahmeband (4) übertragen wird, und einer Außerbetriebsstellung bewegbar sind; gekennzeichnet durch

Mittel (24) zum Bewegen der Mittel zum Drucken zwischen einer ersten Stellung, welche mit einem niedrigeren Teil des Bildaufnahmebandes (4) abfluchtet, und einer zweiten Stellung, welche mit einem oberen Teil des Bildaufnahmebandes (4) abfluchtet.

2. Druckgerät nach Anspruch 1, worin die Mittel zum Fördern (6,8) so betätigbar sind, daß sie das Bildaufnahmeband (4) in Vorwärtsrichtung zum Drucken auf einem unteren Teil hiervon fördern und dann das Bildaufnahmeband (4) rückwärts fördern, so daß der obere Teil des Bandes in Abfluchtung mit dem unteren Teil bedruckbar ist.

3. Druckgerät nach Anspruch 1 oder 2, worin die Mittel zum Drucken einen Thermodruckkopf (12), der mit einer Druckrolle (14) zusammenwirken kann, umfassen.

4. Druckgerät nach Anspruch 3, worin die Druckwalze (14) eine der Breite des Bildaufnahmebandes (4) entsprechende Länge aufweist und ortsfest angeordnet ist, und worin der Druckkopf (12) eine Länge von ungefähr der halben Breite des Bildaufnahmebandes (4) aufweist.

5. Druckgerät nach einem der vorhergehenden Ansprüche, worin die Mittel (3) zur Aufnahme eines Vorrats an Bildübertragungsband (7) ein Bandhalterungsgehäuse sind, welches mit dem Druckkopf (12) befestigt und zusammen mit ihm bewegbar ist.

Revendications

1. Appareil d'impression comportant :

des moyens pour recevoir une réserve de bande (4) de réception d'images ;

des moyens (3) pour recevoir une réserve de ruban (7) de transfert d'images ;

des moyens pour entraîner le ruban de transfert d'images et la bande de réception d'images en superposition à travers une zone d'impression ;

des moyens d'impression (12, 14) dans la zone d'impression (5) mobiles entre une position de travail dans laquelle une image est transférée du ruban (7) de transfert d'images sur la bande (4) de réception d'images et une position de repos ; caractérisé par

des moyens (24) pour déplacer les moyens d'impression entre une première position alignée avec une partie inférieure de la bande (4) de réception d'images et une seconde position alignée avec une partie supérieure de la bande (4) de réception d'images.

2. Appareil d'impression selon la revendication 1, dans lequel les moyens d'entraînement (6, 8) peuvent être commandés pour entraîner la bande (4) de réception d'images dans un sens vers l'avant pour une impression sur une partie inférieure de cette bande, puis pour entraîner la bande (4) de réception d'images vers l'arrière afin que la partie supérieure de la bande puisse être imprimée en alignement avec la partie inférieure.

3. Appareil d'impression selon la revendication 1 ou 2, dans lequel les moyens d'impression comprennent une tête (12) d'impression thermique pouvant coopérer avec un cylindre (14).

4. Appareil d'impression selon la revendication 3, dans lequel le cylindre (14) a une longueur correspondant à la largeur de la bande (4) de réception d'images et est agencé de façon à rester immobile, et la tête (12) d'impression a une longueur approximativement égale à la moitié de la largeur de la bande (4) de réception d'images.

5. Appareil d'impression selon l'une quelconque des revendications précédentes, dans lequel les moyens (3) destinés à recevoir une réserve de ruban (7) de transfert d'images comprennent un boîtier porte-ruban qui est monté avec la tête (12) d'impression et qui est mobile avec elle.

FIG.1.

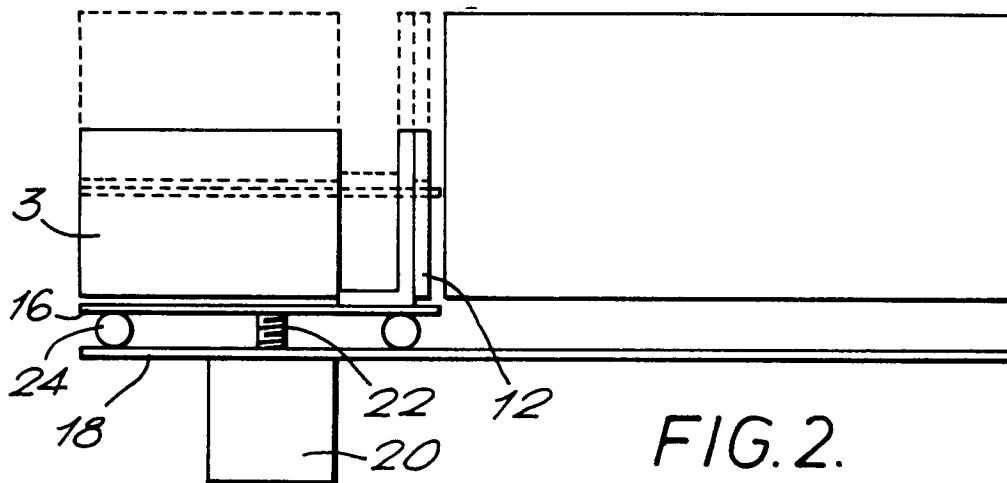
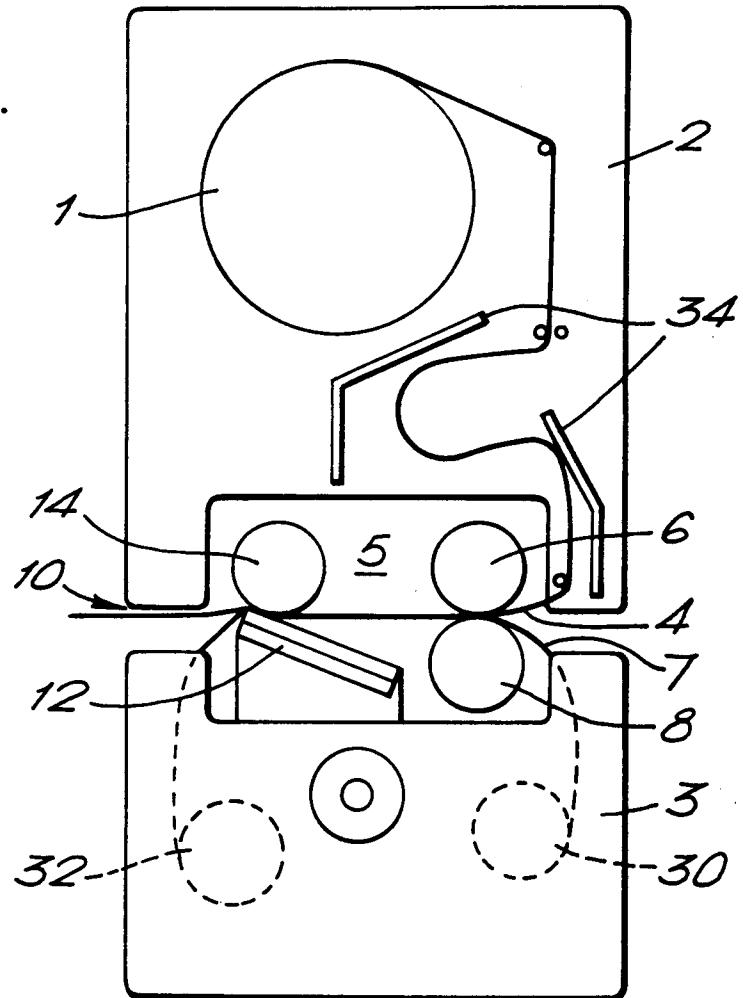


FIG.2.