

PATENT SPECIFICATION

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- (21) Application No. 30587/77 (22) Filed 21 Jul. 1977 (19)
(31) Convention Application No. 51/142079U (32) Filed 22 Oct. 1976 in
(33) Japan (JP)
(44) Complete Specification Published 17 Dec. 1980
(51) INT. CL.³ B65C 9/18 11/00 11/02
(52) Index at Acceptance
B8M 4B A2



(54) LABEL STRIP DISPENSING DEVICE

(71) We, KABUSHIKI KAISHA SATO KENKYUSHO, a Japanese Company of 21-23, 3-Chome, Kamikitazawa, Setagaya-ku, Tokyo, Japan do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

The present invention relates to label dispensing devices for label printing machines.

In a label dispensing device of a label printing machine of the conventional art in which a series of label pieces are printed and let out of the machine by squeezing and releasing operations of a hand grip, and a hand lever and the printed label pieces are then applied on the surface of desired articles by pressing the label pieces against the surface, a label strip is inserted or set into the machine by forming a large space to pass the label strip between a label guide member, and a platen and a feed wheel. In the operation for attaining the above, a label guide member in contact with both the platen and feed wheel having feed projections for label transferring are separated from the platen and the feed wheel by opening a bottom cover and lowering the interlocked platen.

With the above described mechanism, the insertion of a label strip has been made easy by the provision of the above mentioned space; however, when the free end of the label strip is erroneously bent or folded, the label strip is often passed to the front portion of the machine body (to the printing head) or to the rear portion thereof (the rear side of the feed wheel) and reliable label insertion cannot be expected.

According to this invention there is provided a label dispensing device for use with a label printing machine in which a feed wheel pivotally secured to machine frames

transfers a label strip comprising a label material and a backing strip put in layers which backing strip in use is peeled from said label strip leaving printed label pieces for applying on articles, and folded backward, the label dispensing device comprising a platen supported for motion between an inoperative position and an operative position; said platen having a surface over which a label strip is fed, a label guide member having a surface portion generally opposed to said platen; said guide member being supported for motion between an inoperative position and an operative position, such that a widened space between said guide member and said platen is created upon movement of said guide member and said platen to their respective inoperative positions, and an operating member connected to said platen and to said guide member, such that said operating member transmits the motion of said platen to said guide member, so that said platen and said guide member move simultaneously to their respective operative and inoperative positions.

The invention may be performed in various ways and one specific embodiment will now be described by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a vertical sectional view of a label printing machine which is provided with a label dispensing device according to the present invention in a closed position;

Figure 2 is a vertical sectional view of the same in an open position for label inserting operation;

Figure 3 is an exploded perspective view of the main parts of the label dispensing device;

Figure 4 is a plan view of a label strip used for the device, in which the upper layer is partly peeled off; and

Figure 5 is a schematic illustration in side

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elevation for showing the state of engagement between the label strip and feed wheel.

As shown in Figures 1 and 2, a portable label printing machine having a labeling dispensing device according to the invention is integrally provided with a hollow hand grip 1 in the rear portion thereof and a hand lever 2 pivotally secured to shaft 3. A return spring 6 is stretched between two spring holding members 4 and 5, the former of which members is integrally formed on the front part of the hand lever 2 and the latter, on the rear part of the hand grip 1. Accordingly, when the hand lever 2 is released in a squeezing operation, it is returned to the stationary position by the force of the return spring 6.

The extended portions of the hand lever 2 in front of the shaft 3 constitute operation levers 2A which form a print section 2a and a drive section 2b. The print section 2a is positioned at the forefront of the hand lever 2 and is equipped with a printing head 7 comprising a plurality of printing wheels which have types 8 of figures, symbols and other indicia standing out from the surfaces. The drive section 2b is provided with driving members for intermittently rotating a feed wheel 11 which will be further described below.

The feed wheel 11 is rotatably secured to a main shaft 10 that is held by a pair of machine frames 9 (only one shown) and it is driven by the drive section 2b on the operation levers 2A to feed a label strip L.

As particularly shown in Figure 3, the label dispensing device 20 comprises a platen 21, a label guide member 22, an operating member 23 for directing the label strip L and label guide pieces 16 and 17 which are formed near the holder 15 of the label strip L.

The platen 21 is integrally provided with a short arm 25a and a long arm 25b on the rear side thereof and shaft holes 26 are respectively formed in both the arms 25a and 25b. By inserting the main shaft 10 of the above-mentioned feed wheel 11 into the shaft holes 26, the platen 21 is movably supported. At the tip end of the long arm 25b is formed a pin 27 which is fitted into a slot 31 of the operating member 23.

The operating member 23 has perpendicular side walls 30 which form a pair of forward-elongated arms 32. The operating member 23 as further provided with a pair of pins 28 on the above side walls 30 and is pivotally secured to the machine frames 9 with the pins 28. When the operating member 23 is turned about the pins 28 in operation thereof, the rectangular frame of a label guide surface 29 serves as a guiding surface for the label strip L. As described above, a slot 31 is formed in one of the side

walls 30 of the rectangular frame so as to receive the pin 27 of the platen 21. On the inner end portions of the pair of arms 32, pins 33 are formed which are inserted into slits 35 of the label guide member 22 that is pivoted to the machine frames. Thus, the operating member 23 is turned about the pins 28 with the movement of the other pins 33.

The label guide member 22 is pivoted to the machine frames 9 with a pair of pins 37 formed in the end portion thereof and provided with a concave surface 38 which faces the feed wheel 11 and the platen 21 leaving a slight space to pass the label strip L. The above slits 35 are formed in a pair of arms 34 in the rear portion of the label guide member 22 and the above pins 37 are formed on another pair of arms 36.

The bottom cover 24 positioned in the lower part of the machine frames 9 is pivotally secured with its front end to a shaft 13 that is attached to the machine frames 9, so that the bottom cover 24 can be opened about the shaft 13 in the clockwise direction, further, the bottom cover 24 is fastened to the machine frames 9 by a locking device 14. To the rear portion of this bottom cover 24 are attached a pair of curved guide members 39 that are fitted to lower peripheral surface of the feed wheel 11. Further, a guide member 40 having a notch 41 and side walls 42 is attached to the front portion of the bottom cover 24, in which the above notch 41 is directed toward the shaft 13 on the front side.

On the upper side of the machine body, a label holder 15 carrying a roll of the label strip L is provided. The surface of a lower label guide piece 16 is extended from the opening in the rear portion of the holder 15 toward the front side with an inclination and an upper label guide piece 17 is attached in front of the lowermost end of the former guide piece 16.

In the following, the operation of the label dispensing device will be described with reference to Figures 1 and 2. The device is operated from the closed position of Figure 1 to the open position of Figure 2. That is, the bottom cover 24 is turned clockwise about the shaft 13 by releasing the locking device 14 to open the bottom cover 24 (part omitted from Figure 2), and the platen 21 is then turned counter-clockwise about the main shaft 10. In Figure 1 the platen 21 is in a raised, operative position and the label guide member is in a lowered, operative position; in Figure 2 the platen 21 is in a lowered, inoperative position and the label guide member 22 is in a raised, inoperative position. In this operation, the pin 27 of the platen 21 slides within the slot 31 of the operating member 23 and turns counter-clockwise. Accordingly, the label

guide surface 29 of the operating member 23 is aligned with the inclined surface of the label guide piece 16 to form a continuous plane in parallel to the upper label guide piece 17, so that a label passage 18 is formed.

Further, in synchronism with the movement of this operating member 23, the pins 33 of the member 23 are moved clockwise with the sliding in the slots 35 of the label guide member 22. Thus a space 19 for passing the label strip L is formed between the peripheral surface of the feed wheel 11 and the curved surface 38 of the label guide member 22.

Next, the tip end of the rolled label strip L carried by the holder 15 is pulled rearward and it is inserted into opening 16' and slid on the lower label guide piece 16 so as to pass the label strip L in the forward direction through the passage 18 formed between the upper label guide piece 17 and the guide surface 29 of the operating member 23. The label strip L is further passed through the space 19 between the label guide member 22 and the feed wheel 11. After this operation, only the backing strip 52 of the label strip L consisting of a label material 50 and a backing strip 52 (see Figure 4), is folded back in a portion near the front end of the platen 21 and it is pulled out to the rear side of the machine body through the portion below the platen 21.

As shown in Figure 4 in a plan view, a label material 50 and a backing strip 52 are put together in layers to form a label strip L.

The label material 50 is applied on its rear side with an adhesive layer 51 and pre-cut lines 53 are formed in the label material 50 laterally at regular intervals so as to form a plurality of label pieces La. Two feed perforations 54 are formed in the middle portion of each pre-cut line 53. When the feed perforations 54 are engaged with a feed projection 12 on the feed wheel 11, the feed lips 55 between the above perforations 54 are bent up and brought into operation.

In the portions of the backing strip 52 corresponding to the above feed perforations 54, U-shaped feed perforations 56 are formed, which become feed lips 57 by being bent up in the engagement with the feed projection 12 of the feed wheel 11.

With the squeezing and releasing operation of the hand grip 1 and the hand lever 2, the feed projections 12 on the peripheral surface of the feed wheel 11 are brought into engagement with the feed perforations 56 of the backing strip 52 and other feed perforations 54 of the label material 50 of the label strip L, so that the label strip L is advanced for one pitch (the length of a label piece La) by the feed lips 55 and 57 of the label material 50 and backing strip 52 in each operation.

At the tip end of the platen 21, the backing strip 52 is folded down and led to the space below the feed wheel 11. The platen 21 in open position is turned clockwise into the closed position, while the bottom cover 24 is turned counter-clockwise and locked to the machine frame 9 with the locking device 14, the position in Figure 2 is thus changed back into the position in Figure 1.

In each squeezing and releasing operation of the hand grip 1 and the hand lever 2 in the use of the labeling machine, a sheet of label piece La peeled from the backing strip 52 is moved forward through the delivery opening 43 of the machine frame 9. That is, when the grip 1 and the hand lever 2 are squeezed, the operation levers 2A are turned down, and with this movement, the inking device 44 applies ink to the types 8 of the printing head 7, then the label strip L supported on the platen 21 is printed with the inked types 8. When the hand lever 2 is released, the feed wheel 11 is turned counter-clockwise for a certain angle by the drive section of the above operation levers 2A under the action of the return spring 6 so that the label strip L is moved forward for one pitch.

As shown in Figure 5, the backing strip 52 is bent back in a narrow space at the front end of the platen 21 forming a loop in synchronism with the above-described operation. In this bending of the backing strip 52, the feed lips 57 formed by the feed perforations 56 are stood up, however, the backing strip 52 can be smoothly passed through the inner front portion of the bottom cover 24 owing to the provision of the notch 41 of the guide member 40. The backing strip 52 is further passed along the two curved guide members 39, at which the feed perforations 56 of the backing strip 52 are again brought into engagement with the feed projections 12 of the feed wheel 11. Thus the backing strip 52 is finally led out from the rear part of the machine body.

Meanwhile, the label piece La of label material 50 that is printed with predetermined characters is peeled from the backing strip 52 and moved forward, since stiffness of the label piece La prevents the label piece La from conforming the bending of the backing strip 52. The label piece La is then applied firmly on the surface of a desired article by bringing the label piece La into contact with the article and rubbing the surface of label piece La with the label applying device 45.

According to the present invention, the platen can be opened by unfastening the bottom cover so that the label guide member fitted to the feed wheel and the platen can be separated from them by means of the operating member that is interlocked with the opening action of the platen, thereby

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forming the space for passing the label strip. Further, with the movement of the above operating member, the label guide surface of the operating member is brought in line with the label guide piece that is positioned near the label strip holder to form a continuous surface. Therefore, the label strip can be inserted into the machine body quite easily, in addition, even when the free end of the label strip is of a quite irregular shape, the label strip can be accurately set to the machine body without being bent aside.

The lower label guide piece 16 is for guiding the label strip L into a label passage 18 and the upper label guide piece 17 is for guiding an inserted label strip into the space 19 between the label guide member 22 and the feed wheel 11. By the label guide pieces 16 and 17, the inserted label strip can be guided toward a desired position quite easily. Each of these label guide pieces can be positioned at a proper position enabling them to fulfil their function.

From the operative position of Figure 1, a bottom cover 24 is opened and the platen 21 is then turned. Thus, the platen 21 is moved to the inoperative position of Figure 2. By turning the platen 21, the operating member 23 is moved and the label guide surface of the operating member 23 is aligned with the inclined surface of the label guide piece 16 to form a continuous plane in parallel to the label guide piece 17, so that a label passage 18 is formed. Further, in synchronism with the movement of this operating member 23, the label guide member 22 (being engaged with the feed wheel 11) is separated from the feed wheel 11. Thus, a space 19 is formed between the feed wheel 11 and the label guide member 22.

The space 19 between the feed wheel 11 and the label guide member 22 enables the label strip to pass therethrough. On the other hand, in the operative position of Figure 1, the label strip is pressed against the feed wheel 11 by the label guide member 22 and thereby feed pins of the feed wheel 11 can be engaged with feed perforations in the label strips so that the label strip can be fed. In the operative position of Figure 1 the feed perforations 54 and 56 of the label strip are brought into engagement with the feed pins 12 of the feed wheel 11. When a hand lever 2 is released from its squeezed condition, the feed wheel 11 is turned counter-clockwise for a certain angle so that the label strip is advanced for one pitch (the length of a label piece L_a).

With using the label dispensing device the label strip having a free end of any shape, curled, bent or torn off, can be easily set to the label printing machine without fail.

The device is simple in structure but effective in working.

WHAT WE CLAIM IS:

1. A label dispensing device for use with a label printing machine in which a feed wheel pivotally secured to machine frames transfers a label strip comprising a label material and a backing strip put in layers which backing strip in use is peeled from said label strip, leaving printed label pieces for applying on articles and folded backward, the label dispensing device comprising a platen supported for motion between an inoperative and an operative position; said platen having a surface over which a label strip is fed, a label guide member having a surface portion generally opposed to said platen; said guide member being supported for motion between an inoperative position and an operative position, such that a widened space between said guide member and said platen is created upon movement of said guide member and said platen to their respective inoperative positions, and an operating member connected to said platen and to said guide member, such that said operating member transmits the motion of said platen to said guide member, so that said platen and said guide member move simultaneously to their respective operative and inoperative positions.

2. A label dispensing device substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

3. A label printing machine including a label dispensing device as claimed in any preceding claim.

Agents for the Applicants:
WILSON, GUNN & ELLIS,
Chartered Patent Agents,
41 Royal Exchange,
Manchester, M2 7DB.

Printed for Her Majesty's Stationery Office,
by Croydon Printing Company Limited, Croydon, Surrey, 1980.
Published by The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.

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