

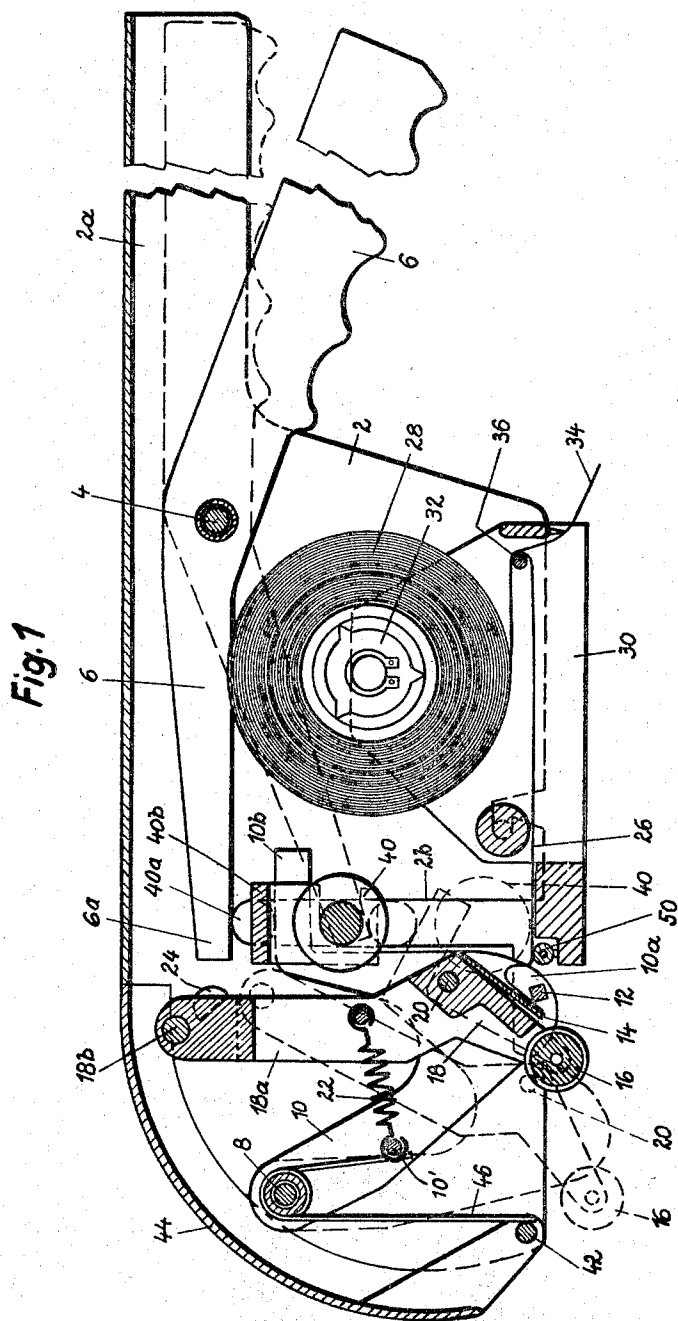
Sept. 19, 1967

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LABEL DISPENSER

3,342,662

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4 Sheets-Sheet 1



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Fig.2

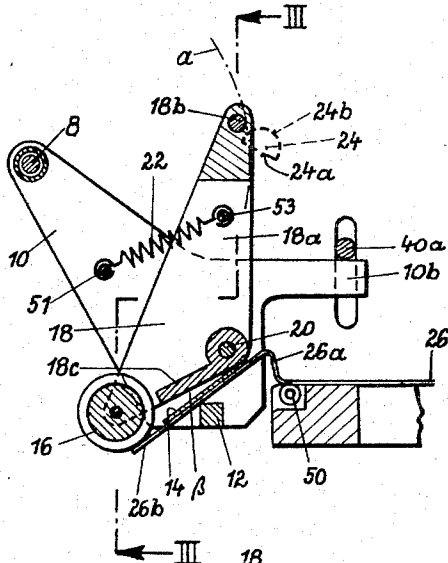


Fig.3

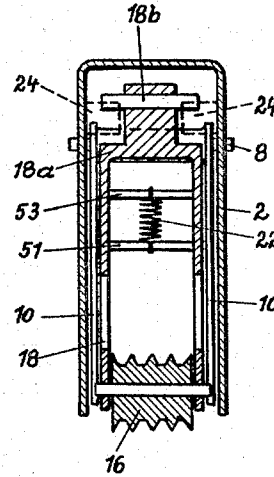


Fig.4

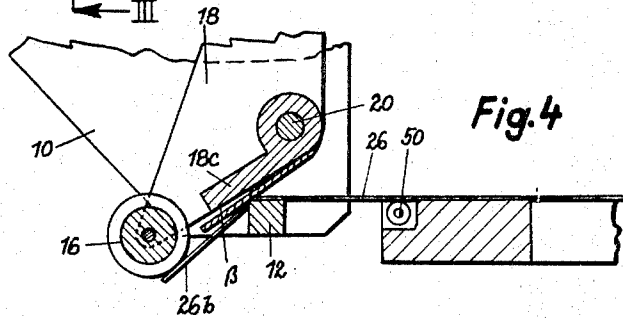
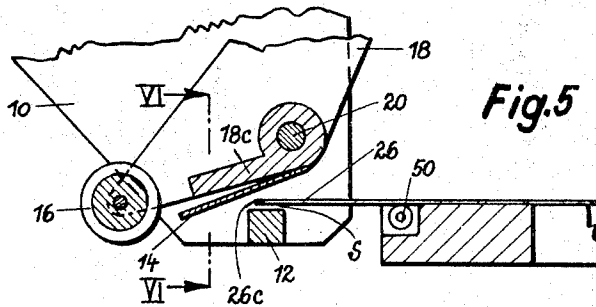


Fig.5



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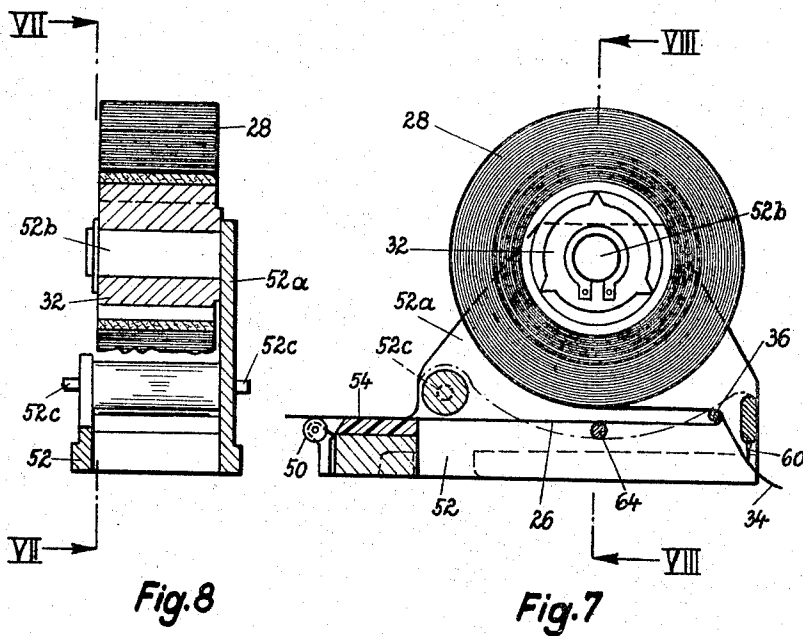
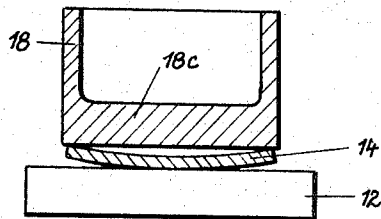
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Fig.6



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Fig. 9

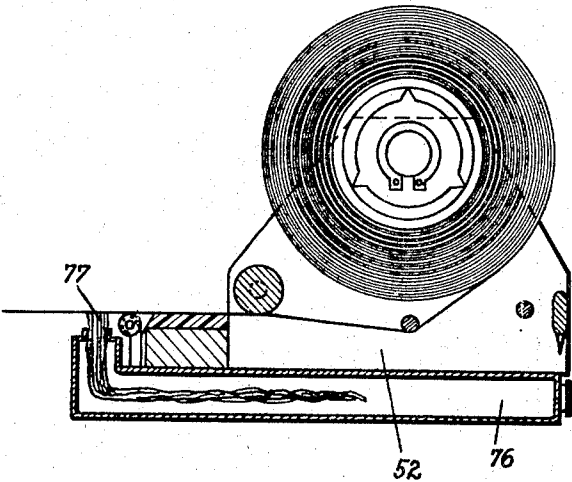
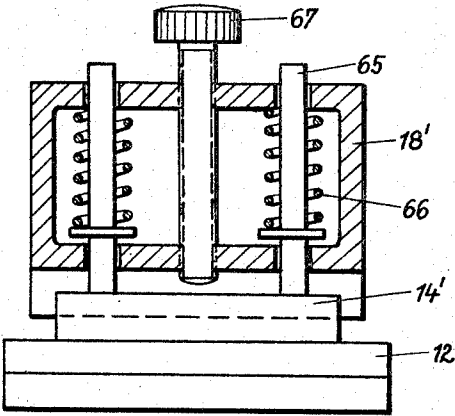


Fig. 10

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A 8,503/63

10 Claims. (Cl. 156—384)

This invention relates to apparatus for applying labels and particularly price labels to articles, such as goods offered for sale in large quantities in self-service or department stores.

The present apparatus is of the kind comprising a dispenser, which is movable in the apparatus housing by actuating means to withdraw and sever label-forming tape portions of predetermined length from a label-tape supply, particularly a supply of self-adhesive tape, and which feeds the tape portions to pressure applying means, by which the label can be applied to the article.

It is an object of the invention to simplify the design of known label-applying apparatus in such manner that the apparatus is suitable for use with label tapes of any kind, e.g. for self-adhesive tape with or without a cover or masking band and gummed or ungummed tape. It is another aspect of the invention to provide means whereby the withdrawal of the label tape, in contrast to the present systems involving withdrawal of the tape through the nip of a driven pair of rollers, and the severing of the label from the label tape are simplified.

Hence, it is an important object of the invention to simplify and reduce the number of those parts in the known apparatus of the kind mentioned initially hereinbefore which cooperate in a more or less complicated manner and involve disadvantages in manufacture, assembly and function.

In an apparatus of the kind mentioned hereinbefore, the invention accomplishes these objects essentially in that the dispenser comprises gripping jaws and for this purpose permits of engagement with the end portion of the label tape between a knife edge and a backing so that the actuating means can be operated to move the dispenser to draw the gripped end portion for a predetermined distance from the supply toward the pressure-applying means; this movement of the dispenser involves a change in the relative position of the knife edge and the backing such that the pressure between the knife edge and backing is increased to the extent that the tape end portion, constituting the label, is severed from the label tape and the label adhering to the dispenser is advanced further, whereas the return movement of the dispenser to its rest position causes the knife edge to be lifted from the backing. The stationary end portion of the label tape is received between the knife edge and the backing and is clamped between these parts during the completion of the return movement. The relative movement between the knife edge and the backing is suitably a rotation of one of these parts with respect to the other and this rotation may be derived from a cam mounted at a fixed point in the housing of the apparatus; one of the jaws consisting of the knife edge and the backing cooperates with the cam during the dispensing movement. In a preferred embodiment of the invention the apparatus is so designed that one of the jaws, preferably the knife edge, is carried by a first lever rotatably mounted in the housing, whereas the other part is carried by a second lever which is pivotally connected to the first lever; the free end of the first lever is shifted by the actuating means, which may consist of a hand lever or a thumb-operated push member. The pressure-applying means, which may be a smoothing roller, and the backing may form a common part.

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To enable a better understanding of what has been stated hereinbefore, reference may be made to the accompanying diagrammatic drawing, which shows by way of example an embodiment of the invention. In the drawing:

FIG. 1 is a longitudinal sectional view of an apparatus according to the invention with the movable parts being shown in solid lines in that rest position and in broken lines in their extreme position.

FIG. 2 is a somewhat simplified showing of the gripping jaws consisting of a knife edge and a backing together with the levers carrying these parts in the position thereby at the beginning of the withdrawal of the self-adhesive tape from its supply.

FIG. 3 is a transverse sectional view taken on line III—III of FIG. 2.

FIGS. 4 and 5 show other significant positions of the parts apparent from FIGS. 2 and 3 on a slightly larger scale.

FIG. 6 is a transverse sectional view taken on line VI—VI of FIG. 5 and shows a detail of a somewhat modified jaw device.

FIGS. 7 and 8 show the tape-roll magazine, FIG. 7 being a sectional view taken on line VII—VII of FIG. 8 and the latter a sectional view taken on line VIII—VIII of FIG. 7.

FIG. 9 shows another embodiment of the part shown in FIG. 6.

FIG. 10 shows a tape-roll magazine as illustrated in FIG. 7 and suitable for other than self-adhesive label tapes.

In FIG. 1, the apparatus housing 2 is shown to consist in known manner substantially of a piece of sheet metal, which has been bent into a U-shape and in which the actuating means is mounted on a shaft 4. The actuating means comprises a hand lever 6, which is receivable in and can be pivotally moved into a handle extension 2a of the housing. A lever 10 is pivoted on a pin 8 in the front portion of the apparatus and has in its lower portion 10a a knife edge 12. The end 10b of the lever extends into the path of the pivotal movement of the end 6a of the hand lever 6. The knife edge 12 cooperates with a resiliently yieldable backing 14, which is carried together with the pressure-applying member 16 by another lever 18, rotatably mounted on the lever 10 by a pin 20. A spring 22 connects the two levers 10 and 18 and tends to maintain them normally in a position in which the knife edge 12 contacts the backing 14 under a moderate pressure, which is insufficient for cutting. The lever 18 has an extension 18a, which moves in contact with a stationary cam 24 mounted in the housing 2.

The label band 26, which in this example is a self-adhesive tape, is mounted as a supply roll 28 in a magazine 30, which has a pin 32, which fits into the core of the roller. This core is hollow, as is usual. In the example shown, a self-adhesive tape is used in conjunction with a cover or masking strip 34. When the cover tape 34 has been separated from the self-adhesive tape in known manner by a deflector 36, the cover tape 34 moves outwardly whereas the self-adhesive tape 26 moves over a small roller 50 into the nip between the knife edge 12 and the backing 14 and is held there by the above-mentioned moderate pressure between the knife edge 12 and the backing 14.

A printing unit 40 is adjustably mounted in a vertical slot 2b of the housing 2 and operable by means which will be described hereinafter. The front end of the housing 2 is closed by a cover 44, which is hinged on a pin 42.

The lever 10 is held in the position shown in solid lines by a torsion spring 46, which surrounds the pivot pin 8 and acts on an abutment 10' carried by the lever 10 and on the pin 42 or another abutment provided at substantially the same location. In this (solid-line) position

of the lever 10, the shaft 40a of the printing unit 40 engages the upper end of the slot 2b provided for guiding said shaft.

To enable upward and downward sliding movements of the printing unit 40 in the slot 2b without a rotation of the printing unit about its shaft, the latter is provided with an elongated slide block 40b, which is slidable in the groove 2b. The slide block may also be formed by an extension of the housing of the printing unit. When the lever arm 6a is operated it is from downwardly above against the shaft 40a and the end 10b of the lever 10 is yieldably held against this shaft from below by the action of the spring 46. A separate restoring spring for the lever 6 is not required because this lever is held in its rest position shown in solid lines in FIG. 1, by the spring 46.

The mode of operation of the apparatus described thus far is as follows:

The knife edge 12 and the backing 14 form jaws for gripping the self-adhesive tape 26. Displacement of the actuating lever 6 by hand towards the housing part 2a causes, via the shaft 40a and the lever end 10b, a rotation of these jaws in the clockwise sense so that a corresponding length of self-adhesive tape is withdrawn from the spool 28. The gripping and withdrawal of the self-adhesive tape depend on the contact pressure between the knife edge 12 and the backing 14. This pressure is less than that required for severing the tape but sufficient to ensure a firm grip. The spring 22 is designed to cause initially only a gripping action and no cutting action to be exerted on the tape 26. When a predetermined length of self-adhesive tape has thus been withdrawn from the spool 28, the gripping pressure must be increased to a cutting pressure sufficient for severing the tape. For this purpose the lever 18 is rotated in the counterclockwise sense relative to the lever 10. This is achieved by the cooperation of the follower 18b, carried at the end of the lever 18, with the cam 24. The portion contacted by the follower 18b is so shaped that the lever 18 is slightly rotated in the counterclockwise sense about its pin 20. This rotation results in an increase of the pressure acting on the self-adhesive tape between the knife edge 12 and its resilient backing 14. When this pressure exceeds a predetermined value, the self-adhesive tape will be severed. The adhesive layer of the severed portion of label adheres still to the knife edge 12.

While the actuating lever 6 is still held in the handle 2a, the label can be applied to the article by the pressure-applying means, which comprises the roller 16; the latter consists of a more or less soft material and is mounted on the lever 18. These operations will now be explained once more with reference to FIGS. 2 to 4, in which the levers 10 and 18 have a simplified form. The configuration illustrated in FIG. 1 has been selected to reduce the weight.

FIG. 2 shows the position of the levers 10, 18 at the beginning of the tape withdrawing movement. For reasons which will be described hereinafter, the self-adhesive tape forms a loop 26a. The resilient backing 14 tends to move away from the portion 18c of the lever 18 to which it is screw-connected (the screws are not shown) so that the angle β is increased. This movement is opposed by the spring 22, which is connected to the cross-pins 51, 53. As a result of operations which will be described hereinafter, the end portion 26b of the self-adhesive tape is in the nip between the knife edge and the backing. If the lever 10 is rotated as a result of the downward movement of the shaft 40a of the printing unit (not shown in FIG. 2), the periphery of the follower pin 18b would describe a circle *a* in the absence of the cam 24 so that there would be no relative movement between the levers 10 and 18 and the pressure in the nip would not vary. Because of the face 24a of the cam 24 moves the follower pin 18b in such a direction that it tends to close the jaws 12, 14, the gripping pressure is increased to the extent that the self-adhesive tape is severed, see FIG. 4.

The kinematic relations are such that this occurs whenever tape portions having a predetermined, uniform length have been withdrawn. The increase of the cutting pressure involves a reduction of the angle β and an increase in the stress of the spring formed by the backing 14. As soon as the follower 18b has left the cam face, the resiliently yielding backing 14 can relax so that β increases and the lever 18 is moved to a position in which the forces of the spring 22 and of the resilient backing 14 again balance each other. This position is shown in dotted lines in FIG. 1.

When the label has been applied with the aid of the roller 16 to the article to be labeled and the lever 6 in FIG. 1 is released, the lever 10 will rotate in the counterclockwise sense under the influence of the spring 46 because the lever end 10b is no longer subjected to an opposing force. As a result, the follower 18b of the lever 18a moves in contact with the rear face 24b of the cam 24. This causes the jaws 12, 14 to open while the spring 22 is being strained. As soon as the follower 18b has reached the upper end of the face 24b of the cam 24, the spring 22 is free to relax and rotate the lever 18a in the counterclockwise sense to its initial position, in which the jaws 12, 14 are closed.

As soon as the lever moves in contact with the rear face 24b of the cam 24, there is a gap S, FIG. 5, between the knife edge 12 and the backing 14. Hence, this gap is present while the system comprising the levers 10 and 18 returns to its initial position. As the gap S is disposed on the level of the end 26c of the self-adhesive tape, which was left when the preceding label was cut off, this free end will now enter this gap. As soon as the follower 18b moves in contact with the upper portion of the cam 24 so that the members 12, 14 assume a closed position, the end of the self-adhesive tape will follow the movement of the jaws to their initial position, shown in FIG. 1. The loop 26a shown in FIG. 2 is formed because the tape adheres to the surface of the roller 50.

It is thus apparent that the cam 24 and the follower 18b cooperate to form a control device which determines the condition of the gap between the jaws comprising the knife edge 12 and the backing 14. This condition may result in a normal pressure in a state of equilibrium of the actions of the spring 22 and the resilient backing 14, or in a state of increased pressure as is required for separating the tape, or in a state of pressure relief, when the jaws define a gap for the introduction of the self-adhesive tape. In other words, the parts 10 and 18 form gripping tongs, the jaws of which are formed by the parts 12 and 14 and the arms of which are pivotally movable about the joint 20. These tongs form a withdrawing and severing device for the tape and the arms of the tongs are controlled by the cam 24 cooperating with the follower 18b.

The small roller 50 forms a part of the tape magazine, which will now be described with reference to FIGS. 7 and 8.

This magazine comprises a base frame 52, which forms on one side the backing plate 54 for the printing unit. In order to prevent an adhesion of the self-adhesive tape to the plate 54 as a result of the printing operation, the surface of this backing plate is formed by an adhesive-repelling material, such as silicone rubber. This roller has a normal surface, e.g., of metal, and serves to ensure a planar position of the tape at the beginning of the printing operation. If the above-mentioned tongs having gripped the tape and return to their position of rest, the above-mentioned loop 26a, FIGS. 1 and 2, will be formed because the tape adheres to the periphery of the roller 50 and lies smoothly on the backing plate. On the other hand, this roller offers a certain resistance to the withdrawal of tape from the tape spool. This is important for achieving uniform tape feed lengths and label heights.

The base frame 52 has a deflecting edge in the form of a thin cross-bar 36, which effects in known manner a

separation between the self-adhesive tape 26 and the cover, a masking strip 34. There is also a serrated edge 60 for a convenient severing of the freely emerging cover tape in any desired length.

One side of the frame 52 extends upwardly to form a carrying wall 52a for a shaft 52b, which carries a support roller 32, on which the supply roll 28 is fitted. The two laterally protruding pins 52c serve for holding the spool magazine in the housing 2. For this purpose the latter has slots 2b, FIG. 1. The magazine is frictionally held in the housing. It is a great advantage of the present apparatus that it may also be used in conjunction with self-adhesive tapes which are not provided with a masking strip. In this case, the self-adhesive tape is simply moved in contact with another cross-bar 64 of the magazine. The present magazine device permits of a convenient application of the spool to the holder when the same has been removed from the apparatus, and a subsequent insertion of the loaded magazine into the apparatus. As a result, the possibility of rapidly exchanging self-adhesive tapes of different colors is of increased significance.

The present apparatus is particularly adapted for printing the labels and for this purpose comprises a printing unit of known type, which enables a setting of the desired price by selector wheels which can be set from the outside. During its descent, the printing unit moves in known manner past an ink pad, which is not shown for the sake of clarity, because it does not affect the function of the apparatus.

FIG. 6 shows a convenient detail regarding the design of the backing. It has already been pointed out that the backing may consist of a resilient leaf spring. It has been found desirable to use for this purpose a transversely curved spring, as is shown in FIG. 6, in contrast to the longitudinal curvature shown in FIGS. 2-5. As a result, the self-adhesive tape is initially gripped only in a central portion and the cutting operation caused by an increase of the pressure in the nip proceeds from the center of the tape toward the two edges as the transverse curvature of the backing is reduced by the increasing pressure between the knife edge 12 and the spring 14. The latter may comprise a plurality of leaf springs. The cutting edge 12 (FIGS. 1 and 6) may be formed by a square member having four cutting edges, which may be used in succession as the individual cutting edges are worn. For this reason, the knife edge member can easily be removed, turned, and reassembled.

It is another important feature of the present apparatus that its basic motion consists essentially of a simple oscillating motion performed by the lever 10, and all other operations are derived from this motion, the end 10a of the lever 10 performing almost a rectilinear motion at the center of the housing. For this reason the apparatus may also be designed in such a manner that the hand lever 6, which is shown in the drawing is eliminated and a thumb-operable push member is provided for actuating the apparatus. For this purpose, it will be sufficient to subject the shaft 40a, FIG. 2, to the action of a pressure rod, which is vertically guided in the housing and can be depressed with the thumb of the hand holding the apparatus whereas the rod returns automatically to its position of rest under the action of the spring 46 when the thumb pressure is released. In this case, the lever 6 is omitted and the housing is designed accordingly.

Some suitable developments of the apparatus according to the invention will now be described:

It is apparent that the follower pin 18b moves in contact with the periphery of the cam 24 so that there is a sliding friction between this pin and the cam face contacted by it. Whereas this friction may be reduced by a lubricant, it is more desirable to replace the non-circular cam 24 by a small anti-friction bearing, the inner race of which is secured to the housing wall, whereas its rotatable outer race forms the cam face. Two such anti-friction bearings may suitably be provided on the two

side walls of the housing 2 in a design which is distinguished by reduced frictional resistance and power requirement. Alternatively, the follower pin 18b may carry a roller mounted by means of an anti-friction bearing and contacting the cam 24.

Regarding the roller 50, it may be added that it serves to raise the moving self-adhesive tape a small distance away from the surface of the silicon rubber member 54 forming the backing plate for the printing unit. This rubber material has only a low abrasion resistance. The loop 26a, which has been described hereinbefore, is not essential for the function and may be avoided by a suitable design of the cam.

Another advantage of the present apparatus resides in that the printing unit can easily be removed from the apparatus. For this purpose it will be sufficient to move the lever 10 about its pivot pin 8 to the left in the clockwise sense to such an extent that the lever end 10b, FIG. 2, comes out of the range of the slot in which the shaft 40a of the printing unit is guided. To prevent a premature termination of the outward pivotal movement of the lever 10 by an engagement of the pressure roller 16 with the pin 42, FIG. 1, the continuous pin 42 may be replaced by short journal-forming rivets and the pin 42 forming an abutment for the spring 46 may be provided in another position.

According to FIG. 9, the flexible-elastic backing is replaced by a plate 14' which is rigid and is guided by pins 65 in the part 18'; the latter accommodates compression springs 66, which tend to urge the backing against the knife edge 12. The knife edge 12 urges the backing 14' forwardly, under a pressure insufficient for severing the tape, until the backing engages the adjusting screw 67. This device enables an adjustment of the cutting pressure and a better compensation of the wear of the cutting parts.

It is also an advantage of the present apparatus that it can easily be modified for use with gummed label tape. For this purpose the label tape must be moistened on the side provided with adhesive. A moistening means, for instance, of the wick type, may be secured to the underside of the member 52, FIG. 7, and the moist wick may extend from a liquid container into contact with the underside of the gummed tape. For this purpose, the magazine 52 carrying the supply roll is provided according to FIG. 10 with a liquid tank 76, in which a wick 77 is immersed; the wick coats the underside of the tape with the liquid. This arrangement may be used for moistening a gummed tape or apply an adhesive coating to an ungummed tape. It will be understood that the present apparatus may also be used in conjunction with entirely untreated label tape. In this case the apparatus is fed with ordinary tape and dispenses labels, which are connected in a subsequent operation to the goods to be labeled.

What is claimed is:

1. A device for the repeated dispensing of predetermined lengths of a band from a supply roll thereof, said dispenser comprising:

housing means for receiving said roll;

a pair of levers pivotally connected to one another and forming a pair of clamping tongs swingably mounted in said housing means, one of said levers being provided with a backing member and the other of said levers being provided with a blade member co-operating with said backing member for clamping a length of said band between said members to withdraw a predetermined length of said band from said roll and advance it from said housing means upon swinging movement of said tong in said housing means;

actuating means movably mounted on said housing means and co-operating with said tongs for swinging same; and

cam means in said housing means co-operating with at least one of said levers for relative angular displacement of said levers to initially clamp said band be-

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tween said members at relatively low pressure for withdrawal of said predetermined length of band from said roll and thereafter increasing the pressure applied between said members.

2. The device defined in claim 1, further comprising roller means journaled in said housing means for applying the severed predetermined lengths of band against said substrate.

3. The device defined in claim 1 wherein said housing means is provided with pivot means at a fixed location thereon for swingably supporting one of said levers and said actuating means engages said one of said levers remote from said location for swinging said tongs within said housing means, said cam means being fixedly positioned within said housing and engageable by the other of said levers.

4. The device defined in claim 3, further comprising spring means resiliently coupling said levers to urge said members together thereby applying pressure on said bands between said members.

5. The device defined in claim 3 wherein said backing member is resiliently yieldable and bears against said band at least during part of the swinging movement of said tongs.

6. The device defined in claim 3 wherein said cam means includes antifriction roller means between co-operating cam portions.

7. The device defined in claim 3 further comprising

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guide means in said housing means engaging an arm of said one of said levers, said actuating means including a manually rotatable lever acting upon said guide means for swinging said tongs.

8. The device defined in claim 7 wherein said guide means is provided with a stamping device co-operating with said band rearwardly of said members in the direction of advance of said band for imprinting same.

9. The device defined in claim 3, further comprising means forming a magazine rotatably supporting said roll and removably receivable in said housing means, said magazine being provided with deflecting means enabling the separation of a masking strip from said band prior to the feeding thereof between said members.

10. The device defined in claim 3 wherein said band is a gummed tape, further comprising means forming a magazine rotatably supporting said roll and removably receivable in said housing means, said magazine having means for wetting the gummed surface of said band.

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