Aug. 12, 1969 SEIJI NAGASHIMA 3,461,018

DEVICE FOR PRINTING AND APPLYING LABELS ONTO ARTICLES

Filed Feb. 25, 1966 4 Sheets-Sheet 1

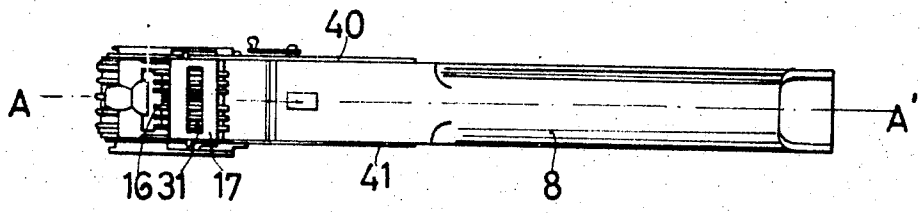

Fig. 1.

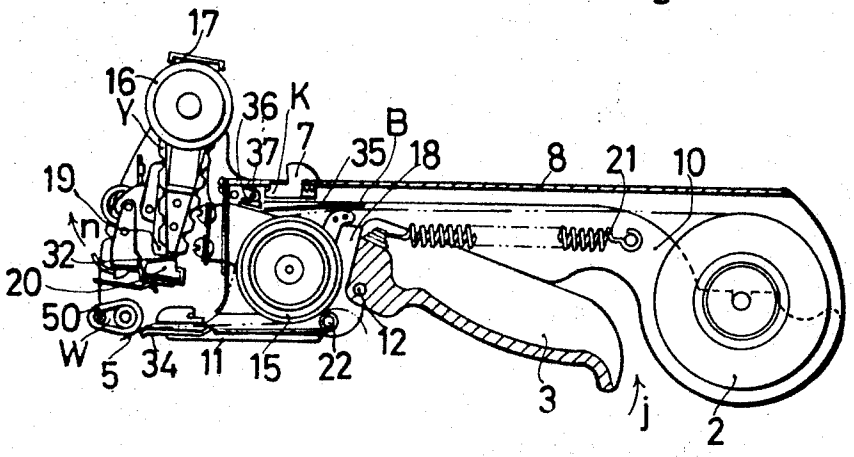

Fig. 2.

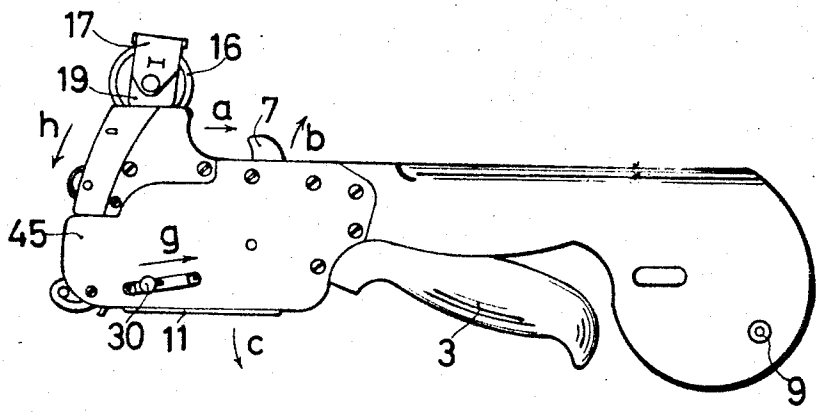

Fig. 3.

DEVICE FOR PRINTING AND APPLYING LABELS ONTO ARTICLES

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Fig. 4.

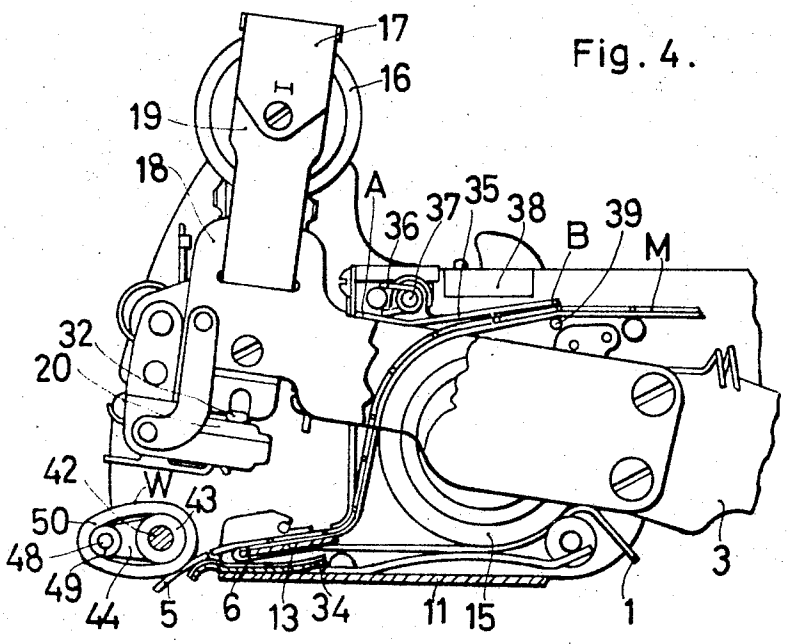


Fig. 5.

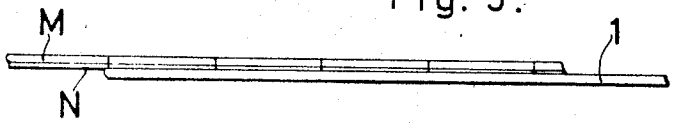
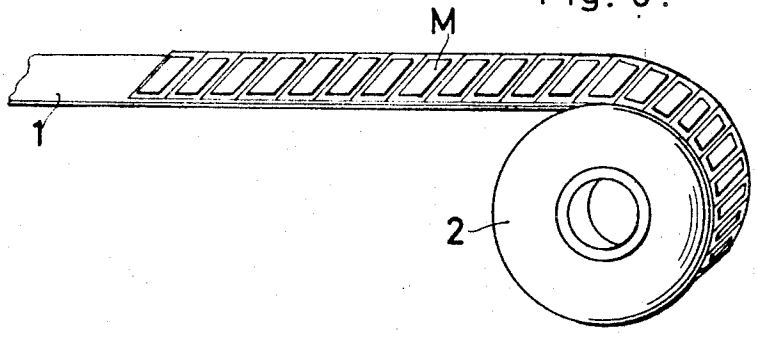


Fig. 6.



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DEVICE FOR PRINTING AND APPLYING LABELS ONTO ARTICLES

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Fig. 7.

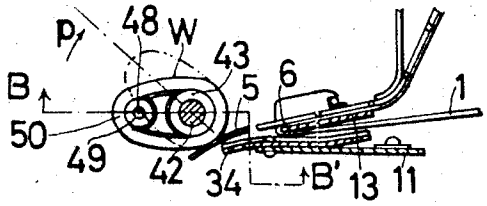


Fig. 11.

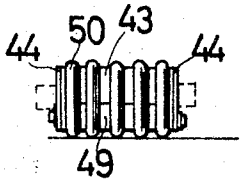


Fig. 8.

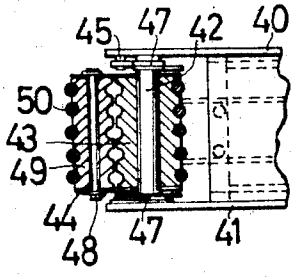


Fig. 12.

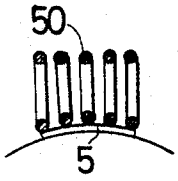


Fig. 9.

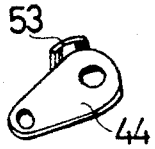


Fig. 10.

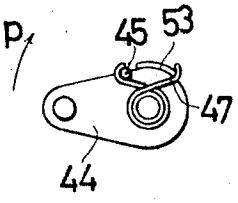
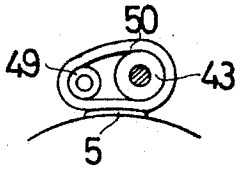


Fig. 13.



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DEVICE FOR PRINTING AND APPLYING LABELS ONTO ARTICLES

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Fig. 14.

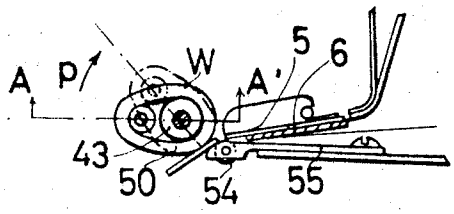


Fig. 15.

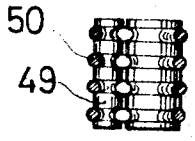
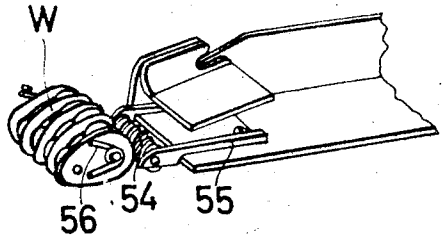


Fig. 16.



United States Patent Office 3,461,018
Patented Aug. 12, 1969

3,461,018

DEVICE FOR PRINTING AND APPLYING LABELS ONTO ARTICLES

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Filed Feb. 25, 1966, Ser. No. 530,203
Claims priority, application Japan, Sept. 16, 1965, 40/75,465; Nov. 17, 1965, 40/93,141, 40/93,142
Int. Cl. B41k 3/12; B41m 1/16; B32b 31/20
U.S. Cl. 156—384 7 Claims

ABSTRACT OF THE DISCLOSURE

A hand operated apparatus for delivering and applying labels to an article is provided with a device for intermittently feeding a strip of labels to a printing mechanism where the leading label of the strip is imprinted and fed to a pressing device which applies the imprinted labels onto the surface of the article. The pressing device is constituted as a pivotal frame carrying a pair of rotatable rollers on which endless belts are mounted.

The present invention relates to a device designed to print characters upon labels, and is constructed in such a manner as to perform the operation of imprinting said labels and pasting said labels upon the surfaces of articles.

The labels to be used are cut to a certain size and are provided with adhesive material on the rear side thereof and pasted continuously upon a strip-shaped paper base; this continuous paper base is installed in the device after being spirally wound.

In accordance with the invention there is provided a hand operated device for delivering and applying labels which comprises means for intermittently feeding the strip of labels to printing means which is operative to imprint the leading lable of the strip, and means for pressing the imprinted label on an article, the pressing means comprising a pivotally mounted frame including a pair of rotatable rollers on which are supported flexible endless belts adapted to press the labels against the article.

The invention will next be described in greater detail, with reference to the embodiments of a device thereof, illustrated in the accompanying drawing, wherein:

FIG. 1 is a plan view of the device,

FIG. 2 is a cross section taken on the line A—A in FIG. 1,

FIG. 3 is a side view of the device,

FIG. 4 is a side view of the device with a cover of the printing and delivery mechanisms removed,

FIG. 5 illustrates the structure of the labels,

FIG. 6 shows the continuous form of the labels,

FIG. 7 is an enlarged cross section of the delivery and separation device for the labels and the label applying device,

FIG. 8 is a sectional plan view taken on the line B—B' in FIG. 7,

FIG. 9 is a perspective view of a frame forming the label applying device,

FIG. 10 is a side view illustrating the combination of the shock absorber forming the label applying device,

FIG. 11 is a front view in which a label is being pasted on a flat surface,

FIG. 12 is the front view illustrating the adhering contact at the front of the label applying device when the label is applied onto a curved surface,

FIG. 13 is the side view illustrating the label being pasted onto the curved surface,

FIG. 14 is a vertical sectional side view of the label applying device when an auxiliary roller is used,

FIG. 15 is a cross section taken on the line A—A in FIG. 14, and

FIG. 16 is a perspective view of the label applying device when an auxiliary roller is used.

Following is a detailed explanation given with reference to the drawing.

A spirally wound body **2** of the labels (hereinafter referred to as the body of the labels) has been cut to a certain measurement and adhesive N has been applied to the rear side thereof and pasted continuously onto a strip-shaped paper base **1**. The body **2** is loaded in the device as shown in FIG. 2. When a grip **3** fixed in the lower center of the device, is clamped into closed position, rubber printing stamp **32** imprints the label **5** with necessary figures, and when the grip **3** is released, the label **5** thus imprinted is separated completely from the paper base **1** and is delivered to the region of delivery guide **34** and the label applying device W.

Since, adhesive N has been applied to the rear side of the label M—the surface in contact with the paper base **1**—when the rear side of the label **5** delivered to the region of the delivery guide **34** and the label applying device W is pressed against the surface of an article, the label is pressed into adhesive contact with the surface of the article. The repetition of this operation makes it possible to carry out imprinting of the labels with figures such as prices, marks or characters continuously, separating the labels **5** from the strip-shaped paper base **1** and pressing the separated labels **5** onto the surface of an article immediately and efficiently.

In operating this device, to expose the place in which the body **2** of the label is to be loaded, a button **7** is pulled in the direction of arrow *a* (FIG. 3), to separate the tip end *k* from the connecting part of the device whereupon the cover **8** can be turned in the direction of arrow *b* about a fulcrum **9**.

Then, the body **2** of the labels is loaded in the frame **10**, one end of the body **2** of the label is pulled out and set as shown in chain lines in FIG. 2. When the button **30** is moved in the direction of arrow *g* at this time, the lower lid **11** is opened in the direction of arrow *c* by pivoting about axle **12** to make it easy to thread the end of the body **2**.

As shown in FIG. 1 and FIG. 2, when a dial **16** with a combination of suitable numbers is turned, a loop Y of the rubber stamp belt engaged with a rubber roller fixed to the dial **16** rotates to change the combination of the array of the rubber stamps.

In more detail, the loop Y of the rubber stamp belt carries rubber stamps **32** for printing figures, and indexing members **31** arranged symmetrically so that when the stamps **32** are in bottom-most printing position, the corresponding indexing members will appear at the top-most position.

Furthermore, the surfaces of the members **31** are located at a height so that they can not touch the stamp pad **20**. The positioning of the rubber stamp **32** for imprinting figures can be realized by arranging the indexing members **31** below a window **17** by turning the dial **16** while looking through the window **17**. The frame **19** for the loop of the rubber stamp belt is fixed at one end of the grip **3** through frame **18**, and when the grip **3** is closed and rotates in the direction arrow *j*, the frame **19** for the rubber stamp belt turns in the direction of arrow *h* about axle **12**. Consequently, the closing of the grip **3** turns the loop Y of the rubber stamp in the direction of arrow *h* and the rubber stamps **32** come into contact with the surface of the label to perform a printing operation thereon.

When the frame **19** for the loop of the rubber stamp belt starts turning as a result of the closing of the grip **3**, the rubber stamp pad **20** moves in the direction of arrow *n* so that it will not interfere with the movement of the loop Y for the rubber stamp belt. When the grip **3** is released, the grip **3** returns to its original position by the action of a tension spring **21**, at which time the frame **19** of the loop for the rubber stamp belt moves in a direction opposite arrow *h* to return to its original position.

Furthermore, the stamp pad **20** also returns to its original position below the loop for the rubber stamp belt to apply ink to the rubber stamps **32** for printing. Further when the frame **18**, assembled with the grip **3**, turns in the direction of arrow *h* as a result of closing said grip **3**, a force which was applied to the part A of the label stopper **35** is eliminated and said label stopper **35** turns in counter-clockwise direction around axle **37** by the action of the coil spring **36** until it is stopped by the part B of the label stopper **35** which comes in contact with the lower end of claw case **38**, and the resulting release of the part B of the label stopper **35** from the frame strut **39** sets the label N free.

When the grip **3** is clamped, imprinting is performed, and when the grip **3** is released, the label **5** is advanced by the action of the one direction clutch fixed in the delivery roller **15**. At this time, since the part B of the label stopper **35** and the frame strut **39** are apart from each other, the label M is advanced smoothly. When the delivery of one label, label M for instance, is completed, the frame **18** comes into contact with the part A of the label stopper **35** and, at the same time, the part B of the label stopper **35** presses the label M on the frame strut **39**. The holding of the grip **3** until it comes to a stop in the direction of an arrow *h* performs the imprinting of the label with figures such as prices and marks or characters, and when the grip **3** is released after the completion of the imprinting operation, the grip **3** returns to its original position by the action of the tension spring **21**. At this time, the delivery roller **15** revolves by the action of the one-direction clutch fixed in the delivery roller **15** to advance, outside the device, the strip-shaped paper base **1** held by pressure between the delivery roller **15** and an auxiliary roller **22**. The length of the strip-shaped paper base **1** advanced outside the device for the applicaton of one label is equal to the number of rotations of the perimeter of the delivery roller **15** which is also equal to the length of one label. As shown in FIG. 2, the body of the labels is loaded inside the device, and when the grip **3** returns to its original position, the paper base **1** is bent at the tip end of the rubber stamp carrier **13** and drawn outside the device. At this time, the label **5** and part of the subsequent label **6** (FIG. 4) are separated from the paper base **1**, and the label **5**, as shown in FIG. 7, is delivered between the label applying device W and the delivery guide **34**. The delivery guide **34** is mounted on the lower cover **11** and has the shape of a channel for receiving the label **5**.

Since the label **5** is delivered in this manner, the label **5**, when pasted onto an article by the label applying device W, receives merely the force to be pasted onto the article applied by the label applying device W. However, in the conventional device for the same purpose, when the label is intended to be pasted onto an article, the rear end of the label is still adhered to the paper base even if the tip end of the label had been delivered to the lower side of the adhesive roller, and thus the rear end of the label had been required to withstand a force to be separated from the paper base.

From this, the force thus applied by the label to be separated to the paper base pulls the ground paper in the direction of the force on the label, resulting in erroneously moving the position of the following labels. As a result, when the grip was clamped to imprint the label imprinting was unable to be performed at the desired place on the label, resulting in non-uniform imprinting of the labels.

According to the present invention, the label **5** to be immediately pasted and part of the following label **6** are separated completely from the paper base **1**, which makes the pasting of the label **5** onto an article easy and at the same time does not cause the erroneous printing on the following label **6** as no pulling force is applied to said following label **6**.

The label applying device W facilitates the pasting of the label **5** delivered between the delivery guide **34** and the label applying device W onto an article.

The label applying device W is mounted between side plates **40** and **41**, in a manner to be explained as follows with reference to FIG. 7 and FIG. 8. An axle **42** extends between the side plates **40** and **41** and rotatably supports a wheel **43** which possesses several grooves around its perimeter. At both ends of the grooved wheel **43**, as shown in FIG. 8 and FIG. 9 are mounted two frames **44** possessing arc-shaped projections **53**. Springs **47** are fixed between the outside of the frames **44** and the side plates **40** and **41**. One end of each spring **47** is connected with a pin **45** fixed to the respective side plate and the other end is connected with the arc-shaped projection **53** of the frame **44** to urge the frame **44** in the counter-clockwise direction at all times. An axle **48** is fixed at the tip end of the frame **44** so that it may swing together with said frame **44** around the axle **42**. A wheel **49** is rotatably mounted on axle **48** and possesses several grooves along its perimeter which are symmetrical with the grooves in wheel **43**.

Flexible belts **50** are fixed in the grooves of the two grooved wheels **43** and **49**. When the tip ends of the flexible belts **50** of the label applying device W come into contact with an article, the label applying device W rotates in the direction of arrow *p*, against the forces of the spring **47**, about axle **42** as a fulcrum. As a result, when the label applying device W comes into contact with an article, any impact is eased by the force of the spring **47** and any possible damage of the device can be prevented. When the label applying device W is removed from the article, it returns to its original position by the action of the spring **47**.

The belts **50** are placed in the grooves of the two grooved wheels **43** and **49**, and since these two grooved wheels **43** and **49** are close to each other, the belts **50** produce a comparatively large force to resist the bending force. As a result, the belts are curved outwardly. After the label **5** is imprinted, it is delivered between the label applying device W and the delivery guide **34** and pasted onto an article by the label applying device W.

When the label **5** is pasted onto the article by the label applying device W, label **5** is pressed and pasted onto the article through the belt **50** in the region of the grooved wheel **43**.

In pressing and pasting the label **5**, the label applying device W operates as follows.

The label **5** is brought into contact with the article and pasted at the point at which an arc, formed by the belt **50** bending along with the grooves of the grooved wheel **43**, and the label **5** come into contact with each other. If the distance in which the label **5** is delivered by the roller **15** is too long, the point at which the arc formed by the belt **50** and the label **5** come in contact moves backward, and, as a result, the pressing force produced by the arc of the belt **50** is applied merely to the latter half of the label.

However, the grooved wheel **49** supporting flexible belts **50** is also fixed to the tip end of the label applying device W, and the belts **50** press against any part of the label remaining unpasted.

Consequently, the entire surface of the label **5** can be completely pressed down even if the distance in which

the label 5 is delivered varies as a function of the delivery roller 15.

In the conventional devices of this sort, a pressing roller formed by only a single roller had been in use, and this pressing roller was able to apply pressing force merely to the area of the label behind the point of contact with the perimeter of said roller. Consequently, the front end of the label remained unpressed and unpasted. The label applying device W of this invention removes this drawback and has made pressure pasting of the label throughout its entire area possible as described hereinbefore.

Moreover, since the label applying device W rotates about the axle 42 as a fulcrum, the label 5 can be pasted upon an article completely even if the device and the article come into contact in an angle of broad range when pasting the label 5 to the article.

In the conventional device of this sort, however, the device had to be put into contact with the article at a fixed angle in pasting the label to the article since the position of the pressing roller had been fixed. The frame 44 mounted on the stable axle 42 in the label applying device W is capable of rotating around the axle 42 and since this frame 44 is fixed in such a manner as it may swing together with the axle 48 of the grooved wheel 49, the label 5 can be pasted completely and easily on a flat surface as indicated in FIG. 11. Further in the label applying device W, as the belts 50 are placed in the grooves of wheels 43 and 49 which are close to each other, the belts 50 produce a relatively large force resisting bending. For this reason, the belts 50 are fixed in an outwardly curved state between the grooved wheels 43 and 49, and thus, as illustrated in FIG. 12, these belts 50 change their form in accordance with the shape of the article even if it has a curved surface, making it possible to paste the label 5 onto the curved surface as shown in FIG. 12. The belts 50 also change their shape to accommodate the curved surface illustrated in FIG. 13 for the same reason, and thus it is possible to paste the label 5 onto such a surface.

In the conventional device of this sort, when an attempt was made to paste the label onto an article possessing such a curved surface as illustrated in FIG. 12 and FIG. 13, the edge of the label remained unpasted since the pressing roller was fixed and was capable of little change in its shape.

However, according the the preferred from of the present invention, these drawbacks have been completely removed, making it possible to apply the entire label onto a curved surface.

In another form of the present invention, as illustrated in FIG. 14 and FIG. 16, an auxiliary roller 54 may be fixed to a receiving frame 55 behind the label applying device W, and this auxiliary roll 54 prevents the label from falling off and at the same time makes it easy for the label 5 free from the paper base to be separated from the following label 6.

Element 56 in the drawing is a shock absorbing spring. As delineated hereinbefore, the label applying device absorbs the shock that occurs at the time of pasting the label to prevent any possible damage of the machine by the shock absorbing action at the tip end of the supporting axle of the device. Consequently, the article to which the label is pasted will not be damaged or deformed, which is of importance when the article is fragile.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. Hand operated apparatus for delivering and applying labels to an article comprising means for supporting a continuous strip of labels, printing means for printing indicia on the labels, means for intermittently feeding the strip of labels to said printing means, means for operating the printing means to imprint the leading label of the strip, means for pressing the imprinted label onto an article to be labelled, means for feeding the imprinted label to the pressing means, said pressing means comprising a pivotally mounted frame including a pair of rotatable rollers and flexible endless belts mounted on said rollers to press the labels onto the article.

2. Apparatus according to claim 1 wherein said rollers have peripheral grooves in which the endless belts are received.

3. Apparatus according to claim 1 comprising an auxiliary roller at the infeed side of the said frame for guiding the labels to said pressing means.

4. Apparatus according to claim 1 wherein said strip of labels includes a base on which a plurality of labels are removably attached in succession, said means for feeding the imprinted label to the pressing means comprising delivery guide means for separating each imprinted label from the base before such label is fed to the pressing means.

5. Apparatus according to claim 1 wherein said printing means comprises a stamp belt in the form of a loop with printing characters and corresponding indexing characters arranged on said stamp belt such that with a particular character is printing position, the corresponding indexing character is in a visible indexing position.

6. Apparatus according to claim 1 wherein said means for operating the printing means comprises a pivotable clamp member coupled to both the means for feeding the strip and the means for feeding the imprinted label to cause the labels to be printed when the clamp member is clamped to a closed position, whereafter release of the clamp member produces feed of the strip and imprinted label.

7. Apparatus according to claim 1 comprising spring means acting on said frame to urge the same in a direction tending to cause the belts to contact the surface of the article on which the labels are to be applied.

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DOUGLAS J. DRUMMOND, Primary Examiner

U.S. Cl. X.R.

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