Sept. 26, 1950 L. OSKOW 2,523,389

LABEL APPLYING MACHINE

Filed May 16, 1946 2 Sheets-Sheet 1

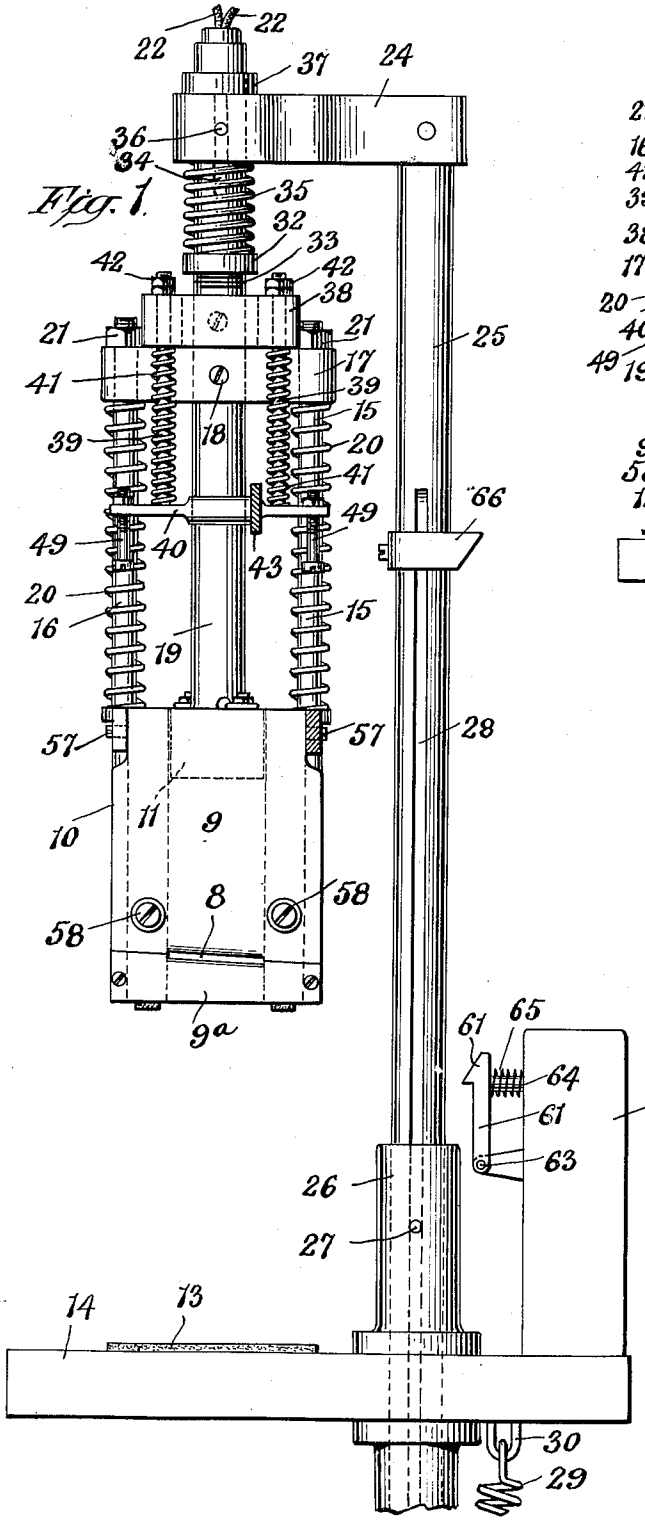


Fig. 1.

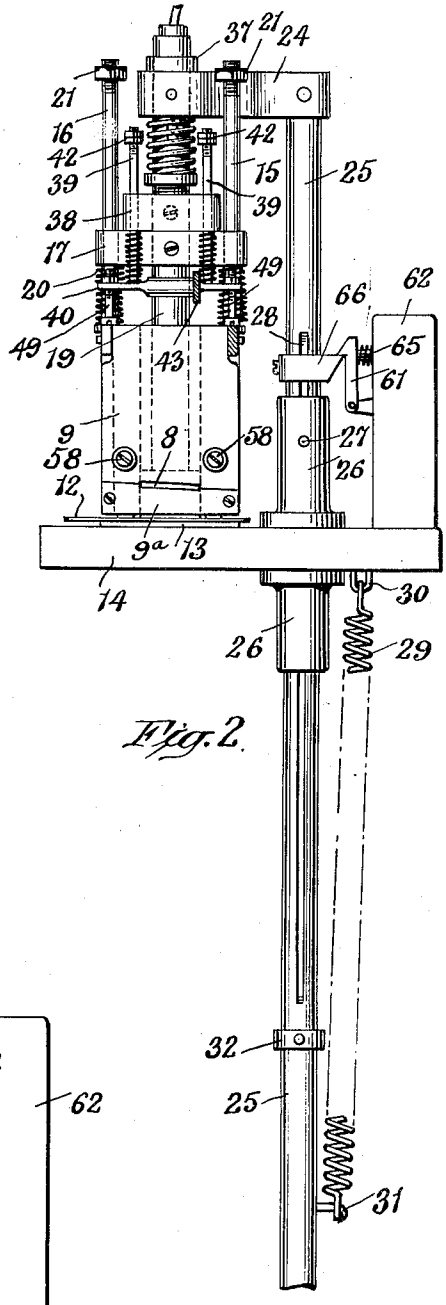


Fig. 2.

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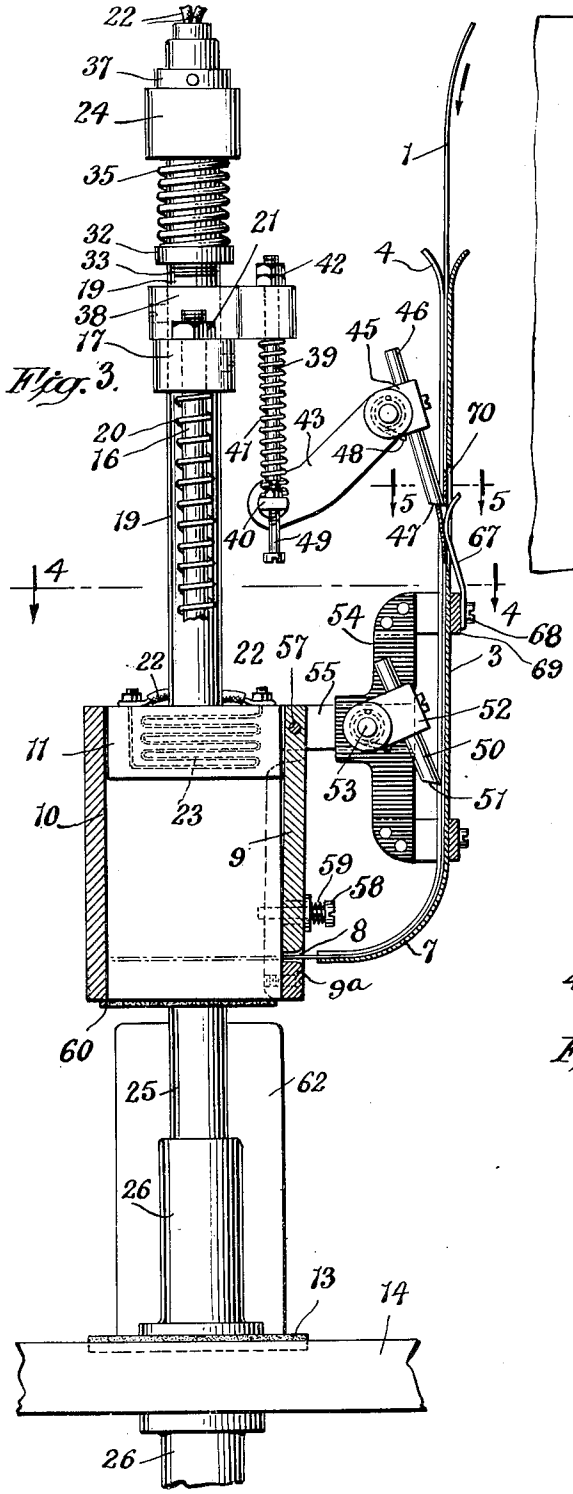


Fig. 3.

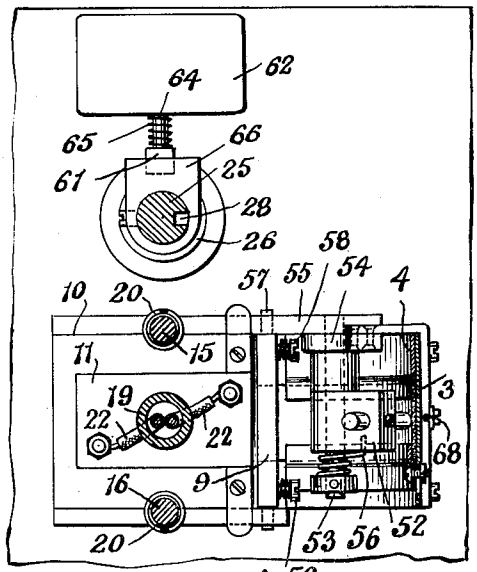


Fig. 4.

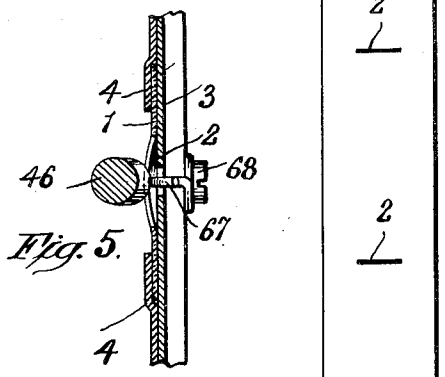


Fig. 6.

Fig. 5.

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Patented Sept. 26, 1950

2,523,389

UNITED STATES PATENT OFFICE

2,523,389

LABEL APPLYING MACHINE

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Application May 16, 1946, Serial No. 670,177

6 Claims. (Cl. 216—28)

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This invention relates to machines for applying or affixing labels to garments, stockings or other articles, and particularly labels of the character in which a thermoplastic adhesive material is used as the means for attaching the labels to the garments, stockings or other articles to which they are applied.

Labels of the above kind are obtainable in several forms. In one of the forms now generally known, the body of the label is a thin, relatively transparent, and expansible film of thermoplastic material, the printing or design of the label being printed or otherwise reproduced directly upon this film. An important advantage of this particular type of label resides in the ability of the film-like body of the label to stretch or expand with the material of the garment, stocking or other article upon which it is applied, and then contract to its normal condition co-extensively with the body of the article. Another label is one in which the body of the label is composed of textile fabric and the thermoplastic film is in the form of a layer or coating which is applied to the back of the body of the label. Both of these types of label, and possibly others in which a thermoplastic coating is applied and is used as the means for affixing the label, can be used in the label-applying mechanism or machine to be described.

An object therefore, of the present invention, is to provide an apparatus for attaching or affixing labels of the general character above described in which the labels in strip form will be positively fed to cutting means; will be successively cut from the strip and will be held against the article to which they are to be affixed and caused to become attached thereto by the action of plunger-applied heat and pressure.

Another object of the invention is to provide a simple, rapidly-working device of this kind in which a novel shearing means for severing the labels from the strip is employed; in which a positive feed means, insuring accurate and registered label feed, results; in which a pressure over the entire area of the severed and pressed label is had and in which many other advantages are secured as will be apparent to those skilled in this art.

In the accompanying drawings, wherein an illustrative embodiment of the invention is shown, Fig. 1 is a side elevation of the label-applying device constructed in accordance with the invention, parts being shown in section, and the strip-feeding means being omitted from this view; Fig. 2 is similar view, but showing the label-

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applying means in lowered position and in the act of applying the label; Fig. 3 is a vertical sectional view through the device, the view being taken at right angles to Fig. 1; Fig. 4 is a sectional view on the line 4—4 of Fig. 3, looking in the direction of the arrows; Fig. 5 is a sectional view on the line 5—5 of Fig. 3, looking in the direction of the arrows, and Fig. 6 is a face view of the label strip.

The labels applied by the apparatus to be hereafter described, are preferably those which consist of a thin film of a thermoplastic adhesive rendered adhesive or sticky by the application of heat, and thus caused to become adherent to the surface against which they are applied. Labels of such construction may consist of a thin film of thermoplastic and substantially transparent material upon which the printing or design of the label may be directly reproduced, or such labels may be composed of textile fabric bearing the printing or design and having the thermoplastic coating applied to the back. In either event, the label to be applied is one which is applied by the action of heat and pressure and is waterproof so that when once applied to the article, it will remain adherent thereto through repeated launderings.

The labels fed to the means which applied the same to garments, stockings or other articles, are in continuous strip form, fed from a substantially large roll, such a strip being indicated at 1 in Fig. 6. If the label is in the form of a thin film of the thermoplastic material, the film, in strip form, may be backed by a paper covering which is freed as the label severed from the strip is pressed down on the article and heat is simultaneously applied.

The strip of labels shown at 1 and composed of the thermoplastic material and paper backing is provided at uniformly spaced intervals with slits 2 extending only part way across the strip, these slits constituting points on which the strip is severed into the separate labels and also constituting elements by which the strip is engaged by feeding means to feed the successive labels into position to be cut from the strip and applied to the articles intended to carry them.

In Fig. 3, the label strip 1 is shown as being fed between guides 3 and 4 to position to enable the labels to be rapidly and successively severed from the strip and pressed down on the articles to which the labels are to be applied. The lower ends of the guides 3 and 5 are curved as shown at 7 (Fig. #3) to thereby direct the label strip through an angularly disposed slot 8 (Fig. 1)

formed in the side wall composed of the hinged part 9 and pivotal part 9a of the plunger box 10. Mounted for reciprocating movement inside of the plunger box is the cutting and pressing plunger 11 which shears successive labels from the strip 1 and presses them down on the articles 12 placed over a compressible pad 13, such as felt or the like, set into a recess in the face of a base or table 14.

Rising from the top of the plunger box 10 is a pair of rods 15, 16 which extend through a head 17, secured by a screw 18 to the vertically disposed plunger shaft 19. The head 17 can move on the rods 15 and 16, and each of the rods 15 and 16 carries a coil spring 20 interposed between the top of the plunger box 10 and head 17. When the plunger box is in its raised position, the plunger box 10 and the head 17 are held in the separated relationship shown in Fig. 1, the nuts 21 on the ends of the rods 15 and 16 being then located against the top of the head 17.

The plunger shaft 19 is secured to the top of the cutting and pressing plunger 11 and said shaft is tubular and permits of the passage through it of the wires 22 carrying electric current to a heating coil 23 contained within the plunger and heating the same to a degree controlled by a thermostatic switch of conventional construction contained either within the plunger or remotely thereof. The plunger shaft 19 is mounted for a limited sliding movement through an arm 24 secured at the upper end of a shaft 25, said shaft 25 being slidable through a guide boss 26 secured to and extending through the table or base 14. The shaft 25 is prevented from rotating about its vertical axis by means of a pin 27 extending through the wall of the boss 26 and entering a longitudinally-extending groove 28 formed in the shaft 25. In lowering the plunger box 10 to a position where the plunger 11 will cut off and press a label down on the article to which it is to be applied, a foot lever, not shown, is used, the same acting to move the shaft 25 sliding through the boss 26 on its descent. A coil spring 29, has one end connected at 30 to the table 14, and its other end attached at 31 to shaft 25, said spring being expanded when the shaft 25 descends and tending to elevate the shaft 25 and thus lift the plunger box and plunger thereafter and at the proper time as will be hereinafter described. A collar 32 secured to the shaft 25 restricts the upward movement or ascent of the shaft.

The plunger shaft 19 is provided near its upper end with a collar 32 threadably received on the threads 33 on shaft 19. Located between the collar and the arm 24 is a coil spring 35 surrounding the shaft 19. Shaft 19 is formed with a slot 34 through which a pin 36, extending through the arm 24 extends, said pin, as well as a collar 37 on the shaft 19 limiting the sliding movement of the plunger shaft 19 through the arm 24.

Secured on the plunger shaft 19 and carried thereby is a head 38 through which a pair of rods 39 is vertically slidable. The lower ends of the rods 39 are connected by a cross-piece and the under side of the head 38 is a coil spring 41. The rods 39 each carry nuts 42 at their upper end to limit their downward movement with respect to the head 38 through which they are slidable.

Attached to the cross-piece 40 is an arm 43 provided at its outer end with a stud-shaft 44 on which is pivoted a block 45 carrying a strip-feeding finger 46, which successively engages the

slits 2 in the strip 1 and feeds the strip, after the plunger box 10 has descended for a predetermined distance required to position a severing point in the strip in cutting position where the label will be sheared off by the plunger and pressed against the article 12. It will be noted that the end of the feeding-finger 46 is bevelled or inclined as at 47 to enable it to engage in the slits 2 and feed the strip in a direction toward and into the plunger box 10.

It is to be further noted that a torsional spring 48 disposed around the stud shaft 44, engages the block 45 and tends to hold the bevelled end of the finger 46 resiliently against the strip 1, at all times. To enable the feeding finger 46 to feed labels of different lengths, an adjustment is provided, said adjustment consisting of the stops 49, adjustably threaded through the end portions of the cross-piece 40. These stops limit the downward movement of the arm 43, carrying finger 46, in a manner to be further described.

To hold the strip 1 against retractive movement upon the upward rise of the feeding finger 46, a restraining finger 50 is provided. The same has an inclined or bevelled end 51 similar to that on the feeding finger 46, held against the strip and permitting passage of the strip 1 downwardly or in a direction toward the plunger box, but preventing movement of the strip in the opposite direction. The restraining finger 50 is held in a block 52, pivoted on a stud 53 projecting from a bracket 54 attached to an arm 55 extending from the back wall of the plunger box 10. A torsional spring 56 extending around stud 53 tends to hold the bevelled end of the finger 50 against the strip 1, which is backed by the guide 3.

Briefly, the operation of the device is as follows: The strip 1, consisting of a plurality of unitarily connected labels and a paper backing, is fed downwardly from a roll through the guides 3 and 4 and down through the curved portions 7 of these guides to enter the inclined slot 8 in one of the walls 9 of the plunger box 10. It will be observed that the upper part of said wall 9 is pivoted at its upper end by the laterally extending studs 57 entering into apertures provided in the front and back walls of the plunger box. Near its lower end, screws 58 are provided, said screws being surrounded by coil springs 59 which resiliently urge the lower portion of the plate 9 inwardly into resilient wiping contact with the adjacent portion of the plunger 11 thus facilitating the shearing action by means of which the successive labels are cut from the strip 1. The screws 58 are adjustable into the front and rear walls of the plunger and extend through apertures provided in the wall 9.

In the elevated position the parts of the device are as shown in Fig. 3. As pressure is applied to the foot pedal suitably connected to the shaft 25, shaft 25 and the parts carried by the same are brought down toward the base or table 14, until the bottom of the plunger box comes to rest upon the pad 13 on the table. Provided on the bottom of the plunger box is a soft and resilient material 60 which comes into contact with the top of the pad 13. When the plunger box 10 reaches the table as above described, its further downward movement is halted while the shaft 25 continues its descent so that the two heads 17 and 38 carried thereby are moved toward the top of the plunger box 10, the head 17 then starting to compress the coil spring 20. When the plunger box is halted by contact with the top of the table 14, the plunger 11 starts to move downwardly within

the plunger box, and since the strip-feeding finger 46 is carried by the then downwardly-moving head 38 and is in engagement with one of the slits 2 of the strip 1, the finger 45 will start to slide the strip 1 down through its guides 3 and 4 so that one of the label sections of the strip will be pushed through the slot 8 and into plunger box 10 and in the path of the descending plunger 11. A label portion of the strip so fed is shown in dot-and-dash lines in Fig. 3. The stops 49, carried by the cross-piece 40 are so adjusted that when the same reach the top of the plunger box and contact therewith to thereby halt further descent of finger 46, the finger 46 will have fed a label length of the strip 1 into the plunger box and the point at which the label is to be severed from the strip will be positioned at the inner end of the slot 8.

When the stops 49 halt the downward movement of the finger 46 the plunger 11 continues further downward movement and shears the label section from the strip and presses it firmly down upon the article that has been placed below the plunger box and over the pad 13. In this connection, attention is directed to the angular position of the slot 8 through which the strip 1 is fed and it is to be pointed out that due to this angular disposition of the slot as contrasted to the horizontal position of the lower face of the plunger 11, a shearing effect is produced which cleanly severs the label section from the strip. Moreover, through this arrangement, the under surface or bottom of the plunger can be made of an area to completely cover the entire area of the label severed from the strip, so that the pressing of the severed label against the article is performed from edge to edge of the label, resulting in a perfect and complete affixment of the label to the goods.

As the label is pressed against the goods by the heated plunger, the heat of the plunger renders the thermoplastic material adhesive and the label is thus affixed to the goods. At this time, the paper backing becomes separated from the label. If the label employed is one in which the body proper of the label is wholly composed of the thermoplastic material, a mere momentary contact of the heated plunger with the label is all that is required to adherently affix the label to the goods. However, in cases where the label is of textile fabric and is provided with a backing of the thermoplastic material, it may be necessary to hold the heated plunger against the back of the label for a greater period of time, and for this purpose, a timing device is probably essential.

Such a timing device is more or less diagrammatically illustrated at 62 in Fig. 1. The same may consist of any known timing mechanism, either electrically, mechanically or pneumatically controlled, and which as shown includes a hook or latch member 61, pivoted at 63 and provided with a stem 64 normally urged to the position shown in Fig. 1 by the coil spring 65. Secured on the shaft 25 is a cam 66, which, upon the descent of the shaft 25 to its completely lowered position, engages under the latch 61, such engagement causing the stem 64 to set in operation the timing mechanism. The engagement of the cam 66 under the latch 61 causes the shaft to be held in lowered position as shown in Fig. 2 and the plunger 11 to be held against the label for a period of time determined by the timing device. At the expiration of such period of time, stem 64 is drawn inward, or toward the timer casing 62, to thereby release the latch 61 from its engagement with the cam 66. Spring 29 thereupon causes the shaft 25 to be immediately raised to the elevated position shown in Figs. 1 and 3.

As the shaft 25 starts its upward travel the plunger first rises for a distance within the plunger box 10; then arm 43 carrying the feeding finger 46 then rises and as it does so, it slides over the surface of the label strip 1, said strip being held from being carried upwardly by the contact therewith of the restraining finger 50. Finally, the plunger box proceeds upwardly and ascends until the parts are all in the raised position shown in Figs. 1 and 3. When the feeding finger 46 reaches the limit of its upward movement it comes into engagement with one of the slits 2 in the strip preparatory to shifting the strip downwardly to slide the next label section into the plunger box. This engagement of the finger 46 with the slit 2 is facilitated by means of a spring finger 67 secured at 68 to a cross member 69 of the bracket 54, said finger entering through an aperture 70 in the strip guide 3 and acting to open, dilate or spread the slit 2 positioned in front of it, to thereby enable the bevelled end 47 of the finger 46 to engage an edge of the slit substantially as shown in Figs. 3 and 6 so that the urging of the strip 1 downwardly on the next downward movement of the finger 46 will be a positive one.

The parts of the device are so arranged that a label section is fed from the strip below the plunger; the label section is sheared off by the descent of the plunger and pressed against the article to which it is to be applied and held there for a sufficient time to cause the thermoplastic material to become adhesive and adherently attach the label to the article. The device is then elevated and at the end of the elevating movement the feeding finger 46 is positioned in one of the slits in the strip to bring the next label section into position for severance upon the next descending movement of the device. The application of the labels is extremely rapid and in cases where a quick-fusing thermoplastic material is used the labels can be applied as fast as the objects to which they are to be affixed can be placed below the plunger and the plunger brought down.

While I have described a single embodiment of the invention, it is obvious that the same is not to be restricted thereto but is broad enough to cover all structures coming within the scope of the annexed claims.

As herein stated, the slits 2 provided in the label strip, are registration elements by means of which uniformity of feed of the strip is attained. In cases where a woven label is used and the production of the slits 2 is found to be not feasible, another type of registration element can be used. For example, raised or elevated lines or ribs, or other raised projections, woven directly into the label strip, can be used and the same will be engaged by the feeding finger in the manner heretofore described. Therefore, when herein referring to the slits 2 as "slits" it is intended that this term shall comprehend raised or other registration elements capable of being employed for the purpose described.

What I claim is:

1. In an apparatus of the character described, a support for an article to be labeled, a plunger box and means guided by the support for bringing it to and from the support, a heated plunger contained in the box and means for causing it to be moved relatively to the box, the box hav-

ing an inclined slot in one of its walls through which a label strip is projected to bring a portion of said strip in the path of the plunger whereby it will be sheared off by the plunger on the descent of the plunger within the box, said slotted wall being resiliently mounted means for heating the plunger, and means for feeding the strip through the inclined slot, the latter means being operative only while the plunger box is at rest against the support.

2. In an apparatus of the character described, a plunger for affixing a label to an article by heat and pressure, a slotted plate through which a label strip is fed beneath the plunger, means for resiliently urging a portion of said plate toward the side of the plunger, the plunger having a flat, horizontally disposed lower face, the slot in the plate through which the strip is fed being at an angle to the surface of the plunger whereby the plunger will sever a label section from the strip by shearing action caused by the angularity of said slot in the plate.

3. In an apparatus provided for in claim 2, wherein the slotted plate is a part of a box in which the plunger is reciprocated, and wherein the plate is pivoted near its upper end and has its lower end portion resiliently held against the side of the plunger.

4. In an apparatus of the character described, a supporting base, a vertical shaft guided vertically through the base and means for axially raising and lowering the same, a heated plunger carried by the shaft, a plunger box carried by the shaft and mounted thereon to have movement relative to the shaft, strip-guiding means carried by the plunger box, strip-feeding means carried by the shaft, stops on said strip-feeding means for limiting the feeding movement of said means, said feeding means including an element for engaging slits in the strip and feeding said strip into the plunger box, means for dilating the slits in the strip to permit engagement of the same by said element, the plunger box having an inclined slot through which the strip is fed by the feeding means, the plunger acting to shear label sections from the strip and apply heat and pressure to said severed sections over the entire area of each of said sections.

5. In an apparatus of the character described, a support on which an article to be labelled is rested, a plunger box located above the support, a plunger movable within the plunger box, a vertically slidable post carrying the plunger box to and from the support, guide means mounted on the support for vertically guiding said post, means for feeding a label strip into the box and in the path of the plunger whereby the plunger will shear successive labels from the strip, means for lowering the post to bring the plunger box carried thereby to rest against the support, means for causing relative movement of the plunger in respect to the plunger box after the plunger box comes to rest upon the support, whereby a label severed by the plunger and in the plunger box will be pushed out of the box and pressed against an article resting upon the support.

6. In an apparatus of the character described, a plunger box having a plunger movably mounted within it, one of the walls of the box consisting of a plate pivoted near its upper end and provided with an inclined slot near its lower end, resilient means for urging said slotted lower end of the plate toward the plunger, means for feeding a label strip through the inclined slot in said plate, the plunger having a flat under face disposed angularly to the slot and operating against the pivoted plate and shearing a label from the strip as said label projects through the inclined slot, a support for receiving an article to which the label is to be applied, means guided by said support for carrying the plunger box on movements to and from the support, and means for moving the plunger to cause it to press the severed label against the article held on the support and to affix it thereto by heat and pressure.

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