July 18, 1939. E. L. KNOEDLER ET AL 2,166,497

LABELING MACHINE

Filed May 15, 1937 3 Sheets-Sheet 1

Fig. 1

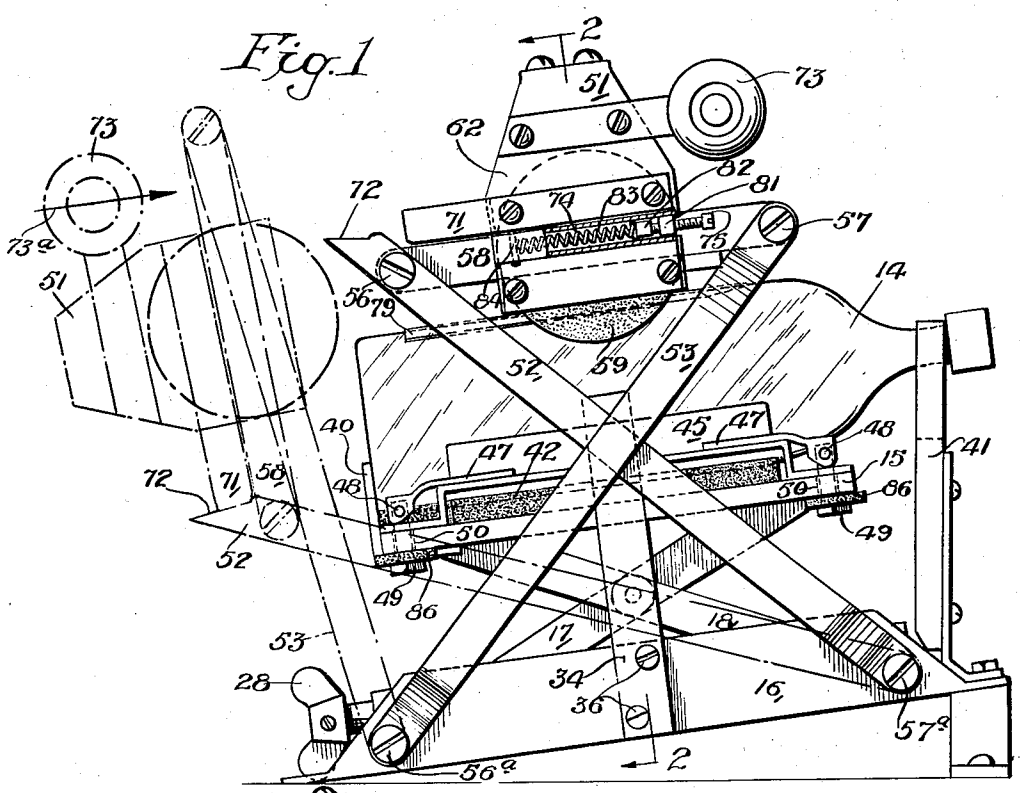


Fig. 3.

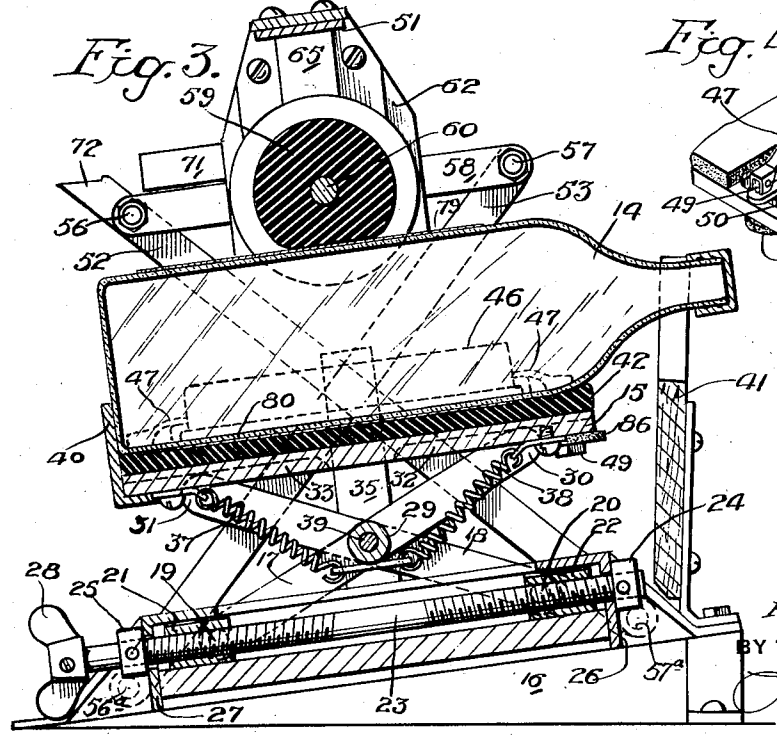
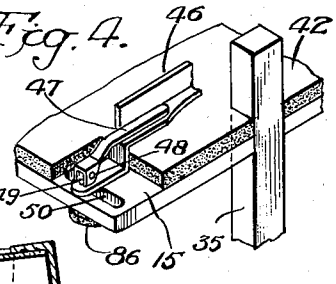


Fig. 4.



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Fig. 2.

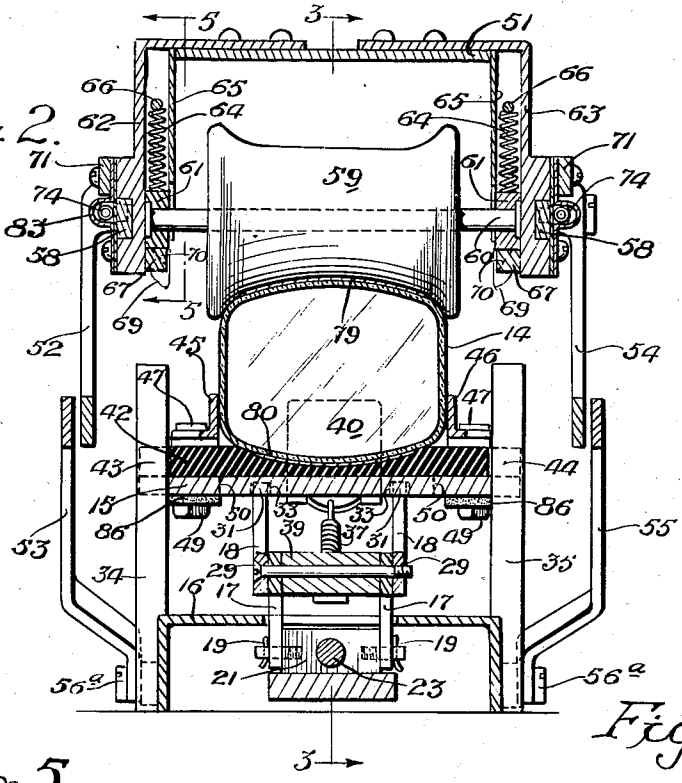


Fig. 6.

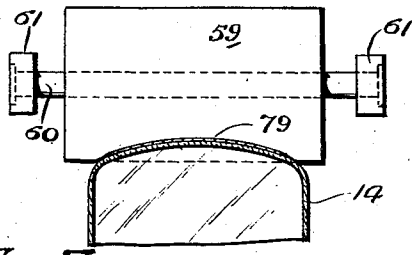


Fig. 5.

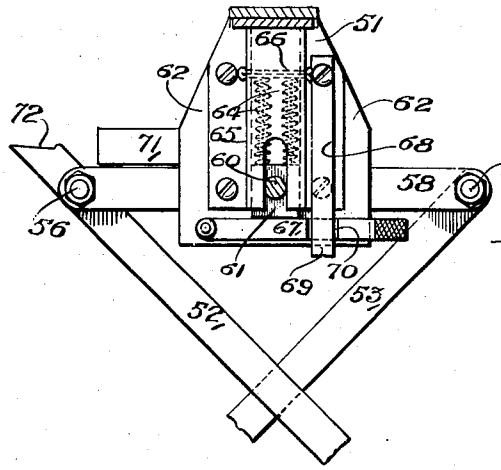
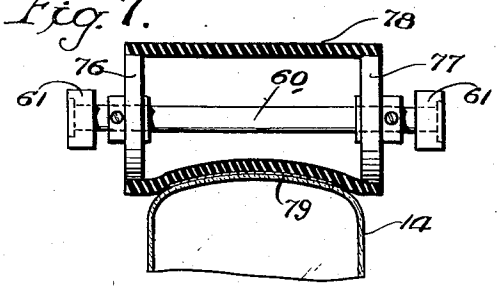


Fig. 7.



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LABELING MACHINE

Filed May 15, 1937 3 Sheets-Sheet 3

Fig. 8.

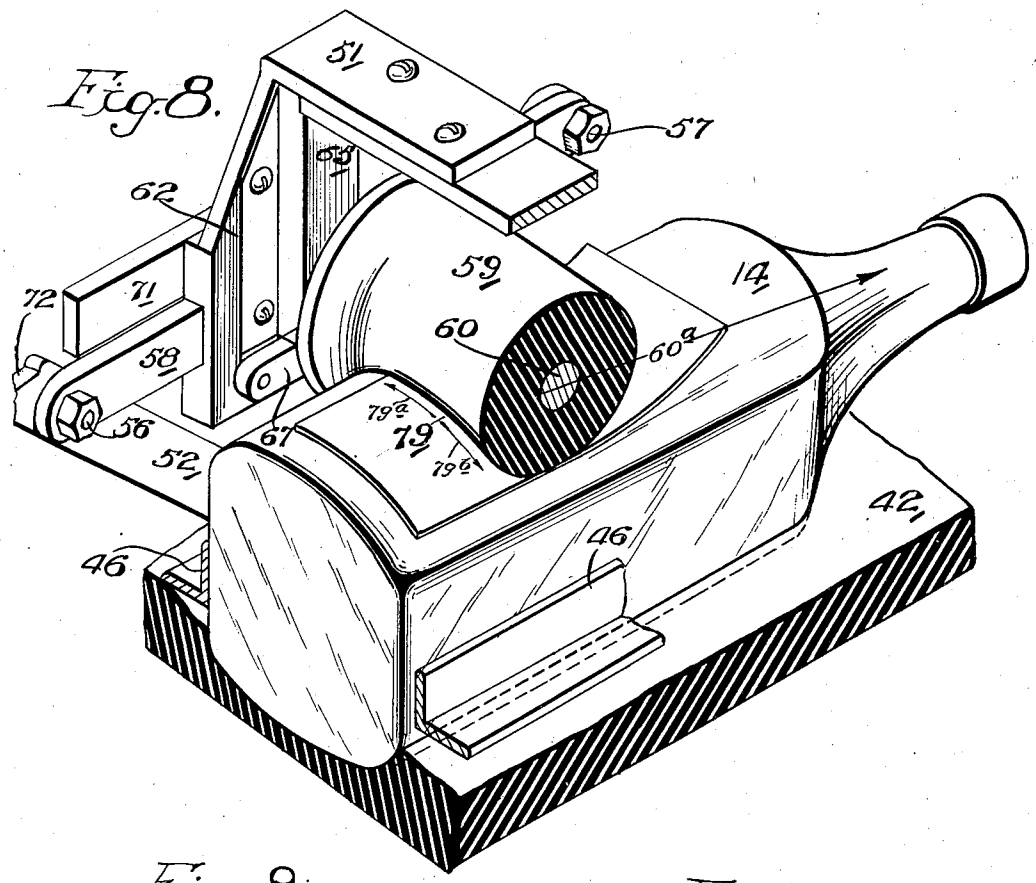


Fig. 9.

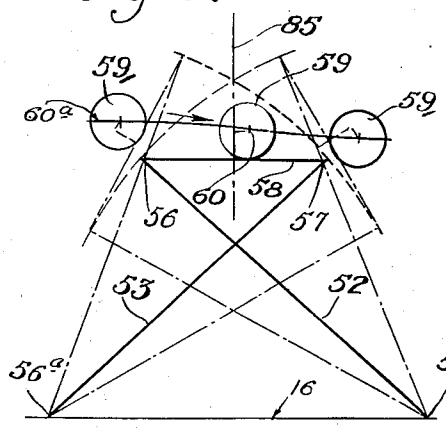
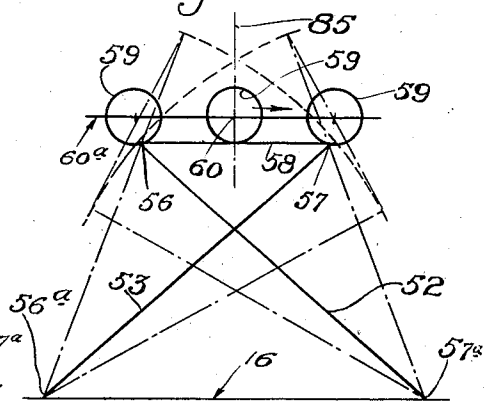


Fig. 10.



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2,166,497

LABELING MACHINE

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Application May 15, 1937, Serial No. 142,818

7 Claims. (Cl. 216—12)

The present invention relates to a certain new and useful bottle labeling machine.

One of the objects of the present invention is to provide a labeling machine which is more readily and more quickly adjustable for different sizes and styles of bottles so as to facilitate a change-over from one style or size bottle to another with a minimum loss of time and with a minimum tie-up or interruption of the filling operation which must necessarily be maintained in timed relation to the labeling operation.

In labeling machines, both of automatic power-driven type as well as of the manually operated type (but more particularly with the former), one of the economic factors involved in the operation of the machine is the cost of change-over from one style or size bottle to another.

Thus, where bottling operations are carried out on comparatively small runs or small quantities of any one style or size of bottle and label, the time required to change and re-adjust the machines to accommodate a new size or style of bottle and label, is so substantial as sometimes to make the use of even the best automatic labeling machine uneconomical, whereas it might be quite economical on continuous or long runs on the same size and style bottle.

To meet this condition, the present invention contemplates a quickly adjustable and easily operable machine which may be quickly adapted for short runs and which may be readily changed over from one size or style bottle to another with a minimum loss of time and a minimum tie-up of the bottling or filling machine.

Another object of the present invention is to eliminate the necessity of resorting to a hand labeling operation whenever it may become uneconomical to readjust the automatic labeling machine, by substituting therefor a readily adjustable labeling machine which will greatly increase the output rate of an operator over that available when labeling by hand.

With the above and other objects in view which will appear more fully from the following detailed description, the present invention comprises a machine including a table, a resilient platen thereon, a resilient press roll above the platen, means for guiding the roll above the platen in a predetermined path generally parallel to the platen but preferably with a slight lead, means for readily adjusting the effective distance between platen and roll, readily adjustable bottle aligning means associated with the platen, and quick-detachable journal blocks for the roll for permitting quick interchange of rolls of different shapes.

The present invention further consists of other novel features and details of construction which will appear more fully from the following detailed description.

For the purpose of illustrating the invention, there is shown in the accompanying drawings one form thereof which is at present preferred, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and that the invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

In the accompanying drawings in which like reference characters indicate like parts:

Figure 1 represents a side elevational view of a machine embodying the present invention arrested in an intermediate operative position; the dash-dotted lines indicating the initial or starting position of the label-pressing roll and associated mechanism.

Figure 2 represents a transverse sectional view taken on line 2—2 of Figure 1, looking in the direction of the arrows.

Figure 3 represents a longitudinal sectional view taken on line 3—3 of Figure 2, looking in the direction of the arrows.

Figure 4 is a fragmentary perspective view of the readily operable clamping and adjusting means disposed at the ends of the bottle guide rails.

Figure 5 represents a fragmentary sectional view taken on line 5—5 of Figure 2, looking in the direction of the arrows.

Figure 6 represents a fragmentary view of an alternative generally solid cylindrical label-pressing roll.

Figure 7 represents a fragmentary sectional view of an alternative generally hollow tubular label-pressing roll.

Figure 8 represents a fragmentary perspective view of the bottle shown in Figure 2 with a label partially applied thereto; parts of the labeling machine being shown in section.

Figure 9 represents a diagrammatic view showing how a label-pressing roll, which is off-set relative to the center of the upper connecting link, will describe a path of travel having a slope or lead relative to the base of the labeling machine; the initial and final positions of the links of the labeling machine being shown in dashed-

dotted lines, the intermediate position of these links being shown in full lines, and the path of travel described by the upper ends of these links being shown in dashed lines.

Figure 10 represents a diagrammatic view showing how a label-pressing roll, which is centered on the upper connecting link, will describe a path of travel generally parallel to the base of the labeling machine; the initial and final positions of the links of the labeling machine being shown in dashed-dotted lines, the intermediate position of these links being shown in full lines, and the path of travel described by the upper ends of these links being shown in dashed lines.

In the machine of the present invention, a table or platen 15 is preferably adjustably carried upon a base 16 by means of the similar pairs of cross links 17 and 18, the lower ends of which are pivotally secured at 19 and 20, respectively, on slidable blocks 21 and 22, respectively, which are guided within the base for rectilinear motion in line with each other. The blocks 21 and 22 are provided with aligned openings which are internally threaded in opposite directions (one a left-hand thread and one a right-hand thread) and through which an adjustment bar 23 is extended having similar oppositely threaded end portions adapted threadedly to engage the blocks. The adjustment bar 23 may be held against axial displacement by the collars 24 and 25 affixed thereto and bearing against the end walls 26 and 27, respectively, of the lower frame structure.

A wing nut or knurled nut or any other suitable handle member 28 is provided at the front end of the bar 23 whereby the same may be turned for raising or lowering the table platform 15.

The links are pivoted to each other at 29.

By suitable rotation of the wing nut 28, the lower ends of the crossed links 17 and 18 are caused to either approach or withdraw from each other, causing their respective upper ends 30 and 31 to slide in grooves 32 and 33, respectively, on the underside of the platen 15. On each side of the base 16, vertical platen guides 34 and 35 are anchored by means of suitable screws 36. Corresponding slots in the platen 15 register with these vertical guide members and vertically control the motion of the adjustable platen. A pair of coiled springs 37 and 38 are attached to the underside of the platen 15 at opposite ends thereof and are joined together under a pin 39, said pin extending between, and being secured to, the spaced pairs of crossed links 17 and 18 at their fulcrum points 29. These coiled springs 37 and 38 draw the platen 15 down against the upper end of links 17 and 18. At one end of the platen 15 a vertical stop 40 is secured for limiting the position of the bottle being inserted on the platen. A flat and comparatively thick layer of sponge rubber 42 covers the upper surface of the platen 15. Notches 43 and 44 are centrally located on opposite edges of this rubber surface in order that it may clear the vertical platen guiding members 34 and 35.

Adjacent the opposite end of the platen 15, a vertically slotted bottle-neck-receiving guide member 41 is secured to the bed plate 16 and aids in guiding the bottle 14 into position on the platen surface 42. The presence of this guide member 41, however, is not essential and this member may be entirely dispensed with, in which case the bottle about to be labeled would be positioned primarily by means of the guide-rails 45 and 46.

The pair of bottle guide rails 45 and 46 are preferably adjustably secured to the platen 15, and are slightly raised above the rubber mat 42 so as not to interfere with the proper flexing action thereof. A clamping lever 47 is situated at each end of these guide rails, and as more particularly illustrated in Figure 4, this lever is pivotally secured by means of a cotter-pin 48 to a bolt 49 extending through a slot 50 in the platen 15. A resilient rubber washer 86 may be disposed between the head of the bolt 49 and the under side of the platen 15 for resiliently cushioning and improving the operation of the clamping lever 47. Raising the free end of the clamping lever 47 loosens the end of the guide rail to which the lever is attached, and thus permits the guide rail to be quickly adjusted to any desired position, at which point by merely snapping down the clamping lever 47, the guide rails may be reclamped in their newly adjusted position.

A roll bearing carriage 51 is movably guided in predetermined spaced relation above the platen 15 by means of two spaced pairs of crossed arms 52, 53 and 54, 55. These outer pairs of crossed arms 52, 53 and 54, 55 are each pivotally secured at fulcrum points 56 and 57 to a pair of spaced upper links 58, 58, and are pivotally secured at fulcrum points 56*a* and 57*a* to the base 16.

A pressing roll 59, which may be of the type indicated in Figures 2 and 8, or which may be of any other shape, as for instance, that illustrated in Figures 6 and 7, (the choice thereof depending upon the outline of the bottle upon which the label is being affixed) is rotatably supported by means of a shaft 60 and bearing blocks 61 housed within the side walls 62 and 63 of the carriage 51.

The manner in which the bearing blocks 61 are supported by the side walls of the carriage is illustrated in Figure 5.

A plurality of bearing block springs 64 are housed within a vertical channel 65 of U shaped cross section, secured to the inner side of the side wall 62, and these springs 64 may be fixed in relation thereto by means of a cotter pin 66. The rectangular bearing block 61 is adapted to slide within the channel 65 against the pressure of the coil springs 64. The bearing block 61 is adapted to be rapidly inserted into the open lower end of the channel 65, and may then be locked therein by means of a pivoted lever 67 which is swingable into a position obstructing the free lower end of the channel 65. The lever 67 is held in its bearing-block-confining position by means of a flat leaf spring 68 which is fastened to the side wall 62, and which leaf spring has a hook-shaped extremity 69 adapted to engage the under side of the free end of the lever 67.

The roll 59 may be readily and rapidly removed and another one inserted in place thereof by merely manually disengaging the hook portion 69 of the flat leaf spring 68 from contact with the under side of the free end of the lever 67. The bearing block 61 is then ejected from within the channel 65 by means of the compressed coil springs 64; the lever 67 being pushed aside by the bearing block 61 during the ejection of the block. This ejecting action is duplicated on the opposite bearing block, and the roll and associated blocks are accordingly ejected. A different roll combination may now be inserted in lieu of the ejected roll combination. Each bearing-block of this new combination may be locked

in position by merely raising the free end of the lever 67 until the hook portion 69 of the flat leaf spring 68 rides over the incline 70 on the lever 67 and snaps into position on the underside thereof.

In order that the roll and its shaft 60 may be free to deflect yieldably in a direction perpendicular to the upper link 58, the inner face of the channel member 65 is provided with a slotted portion at the lower extremity thereof as shown in Figure 5.

The axis of the roll 59 is adapted to move in a path generally parallel to the upper surface of the platen 15. In the extreme position of the roll 59, shown in dotted lines in Figure 1, which is the starting point in the label affixing operation the member 71, which may be a part of or secured to the upper link 58 acts as a stop by contacting the upper extremity 72 of the crossed arm 52. A handle 73 is grasped by the operator when the carriage is in the extreme initial position indicated by dotted lines in Figure 1 and moved in the direction of the arrow 73*a*. The common link 58 which was in a nearly vertical position now shifts to the approximately horizontal position indicated in full lines in Figure 1 and continues its movement until in its final position it is again in an approximately vertical position. Reversing this operation will bring the carriage back to its initial position. Throughout the foregoing motions of the carriage, the axis of the roll moves in a path generally parallel to the platen 15.

If desired, the path of the roll axis may be slightly sloped or inclined with respect to the platen 15 (and therefore with respect to a bottle carried on said platen) by slightly shortening the length of the cross arms 53 and 55. The path of the axis of this roll is most nearly parallel to the surface of the platen 15 when the crossed arms 52, 53, 54 and 55 are all of equal length.

A slight downward slope or lead to the path of the axis of the roll in the direction of forward movement thereof is sometimes desirable for effecting a label-pressing operation. Thus, a slight lead tends to increase the labeling pressure as the roll advances, and this in turn tends more firmly to propel longitudinally any air pockets, excess moisture or paste that may be present between the label and the bottle. Thus, as illustrated in Figure 8, the path of travel 60*a* of the axis of the roll bearing shaft 60 may be given a slight slope with respect to the surface of the bottle being labeled. This eliminates any tendency the label might have to wrinkle when being affixed. It is to be understood, however, that crossed arms of equal or of slightly unequal length may both be satisfactorily employed.

Moreover, maximum pressure may be applied to the center of the label, with a gradually decreasing pressure laterally on either side thereof when the label is being applied to a crowned bottle surface such as illustrated in Figure 8. The resilient label-pressing roll 59 is maximumly displaced by the crest of the bottle surface and minimumly displaced at the edges of the label, thus providing such pressure variation in a lateral direction from the center outwardly. Thus, the labeling pressure is highest at the meeting point of the two transverse arrows 79*a* and 79*b*, and gradually decreases from this point transversely in either direction. This variation in labeling pressure serves to expel any excess moisture and paste in a lateral direction, and thereby assists in eliminating wrinkles in the label.

In those instances where the surface of the bottle is not centrally crowned and does not readily lend itself to the aforementioned pressure variation, the form of the label-pressing roll 59 may be altered by providing a suitable annular protuberance or protuberances which, when rolled over the surface of the bottle, will still achieve this same lateral pressure variation.

The present invention also contemplates the application of labels to bottles, containers, cans, or even solid products themselves, wherein the surface upon which the label is to be affixed is generally not parallel to the platen 15 and the base 16, but is inclined with respect thereto; the respective planes of said surface and said platen or base forming, when extended, an acute dihedral angle. In such cases the roll-supporting carriage 51 may be readily displaced with respect to the center of its supporting link 58 by means which will be more fully described hereinafter, and such displacement tends to similarly incline or slope the path of travel of the axis of the roll 59. Thus, as is diagrammatically illustrated in Figure 10 (wherein the crossed arms 52 and 53 are of equal length), when the axis 60 of the roll 59 is aligned with the center 85 of the upper link 58, the path of travel 60*a* of the axis 60 is generally parallel to the base 16. While the precise theoretical path of travel 60*a*, shown in Figure 10, may not follow the straight line there indicated, it is to be understood that the path of travel is shown parallel to the base 16 for the purpose of distinguishing the path of travel shown in Figure 10 from that shown in Figure 9. Thus, the path of travel shown in Figure 9 assumes a distinct slope or lead relative to the base 16, whereas the path of travel shown in Figure 10 possesses no such distinct slope or lead. In this Figure 10 as well as in Figure 9, the links are shown in the intermediate operative position in full lines and these links are shown in their initial and in their final positions in dashed-dotted lines; the path of travel described by the upper ends of these links being shown in dashed lines.

When the path of travel 60*a* of the axis 60 of the roll is to be given a sloping or inclined path with respect to the base 16, in order to make possible the proper affixation of a label to a similarly sloping or inclined bottle or container surface, the axis 60 may be displaced or offset from the center 85 of the common link 58. Thus, as is illustrated in Figure 9, a slight displacement of the axis 60 of the label-pressing roll tends to slope or incline the path of travel 60*a* of this axis 60 with respect to the base 16 and a correspondingly greater displacement of this axis would result in a correspondingly increased inclination or sloping of the path of travel.

In the foregoing discussion the bottle or container was at all times considered to be relatively stationary with respect to the ground and the label pressing roll 59 was moved relative to this bottle or container. If desired, the roll may be held relatively stationary with respect to the ground and the movement instead imparted to the bottle or container.

In the initial or starting position of the label-pressing roll resilient means may be provided for accommodating bottles of a diameter greater than that which could be normally accommodated were the carriage 51 rigidly secured to its supporting links 58. Thus, the side walls 62 and 63 of the carriage 51 may be slidable along, and yieldably mounted on, the upper links 58 by means of coil springs 74 housed within suitably deformed plates 83 secured to the side walls 62 and 63 of the carriage 51. These coil springs

74 may be fastened at one end through a block 82, an adjustment screw 75 and a lug 81 to the link 58, the other end thereof being fastened to the side wall 62 of the carriage 51 through the pin 84 in the plate 83.

This construction not only enables the roll bearing carriage 51 to be offset with respect to the center of the upper link 58, to accommodate bottles of sloping contour, but this construction also provides an added resilient accommodation for bottles of varying diameter.

The added resilient accommodation, afforded by the foregoing construction, is intended to enable the operator to insert bottles of slightly larger diameter than those which ordinarily could be accommodated for any particular setting of the platen 15 were the carriage 51 immovably secured to the upper links 58. The axis of the roll 59 is thus enabled (by means of the sliding action of the roll bearing carriage 51 on the link 58) yieldably to move in a direction parallel to the link 58 when the roll is approximately in the initial position shown in dash-dotted lines in Figure 1. During the intermediate travel of the carriage 51 (indicated in full lines) the axis of the roll 59 may yieldingly move in a direction generally perpendicular to the common link 56 as hereinbefore described, and in so doing the coil springs 64 are compressed. The movement of the axis of the roll 59 relative to upper connecting link 58 may thus assume a direction either perpendicular to or parallel with this link 58, or any direction therebetween. Thus, the axis of roll 59 may yieldingly move at any angle relative to the upper connecting link 58 by virtue of the combined yielding action of springs 64 and 74. This "compound" motion of roll 59 relative to the upper link 58 would ordinarily occur when roll 59 entered those phases of its travel defined by its mid-position, illustrated in full lines in Figure 1, and either of its two extreme positions relative to the container being labeled. The foregoing yielding movements of the roll 59 also enable the labeling machine to press labels onto bottle or container surfaces which may be slightly irregular or uneven.

The bed plate 16 may be provided with legs of unequal length, as indicated in the drawings, so as to impart a definite slope to the platen 15 and thus enable an operator more easily to guide a bottle into its operative position on said platen.

Two alternative rolls that might be used are indicated in Figures 6 and 7. The one shown in Figure 6 is adapted to be used with bottles having substantially flat labeling surfaces. Figure 7 illustrates a roll that very readily adjusts itself to various shaped containers by reason of its extreme flexibility. It consists of two end discs 76 and 77 permanently affixed to the ends of a short length of rubber tubing 78. These end discs 76 and 77 are keyed to the roll-bearing shaft 60.

In operation, a front label 79 and a back label 80 may be "spotted" or positioned on the respective front and back label-bearing surfaces of a bottle or container 14, and the bottle or container may then be guided into position with the back label resting upon the resilient rubber pad 43 carried by the platen 15. The bottle guide-rails 45 and 46, the vertical end stop 40 and the bottle neck guide member 41 all aid in guiding the bottle into its correct position on said pad 43. The handle 73 is then moved in the direction of the arrow 73a (Figure 1) causing the label-pressing roll 59 to be passed over the bottle or container and directly press the upper label 79 to the bottle and at the same time apply labeling pressure through the bottle 14 to the back label 80 disposed between the resilient sponge rubber surface 42 and the back of the bottle. The path of travel of the axis of the roll is normally generally parallel to the upper surface of the bottle or container, and may be regulated by the adjustment screw 75 mounted on the upper link 58.

The hereinabove described embodiment of the present invention may be used equally advantageously when affixing only a single label to a bottle or container. In such case, the sponge rubber layer 42 may be eliminated and the bottle or container supported directly upon the platen 15. This sponge rubber layer 42 may, however, be preferably retained at all times regardless of whether or not a plurality of labels are to be simultaneously applied, so that when a simultaneous application of both front and back labels is desired, time need not be spent by the operator in applying this resilient layer 42 to the platen 15.

The machine forming the subject matter of the present invention may also be power driven instead of manually operated; the power in this case being under suitable control of the operator.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiments be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having thus described the invention, what is hereby claimed as new and desired to be secured by Letters Patent, is:

1. A label-pressing machine for simultaneously permanently affixing labels preliminarily applied to opposite exterior surfaces of a container including a generally stationary platen, a resilient container-supporting pad disposed on said stationary platen and fixedly related thereto, a transversely-movable label-pressing roll spaced from said pad and having the longitudinal axis thereof disposed generally parallel to the surface of said pad, and yieldable means for guiding said roll along a path extending generally perpendicular to the longitudinal roll axis and spaced from said pad, whereby said roll may be operatively rolled over the surface of one of said labels, thereby permanently to affix said label to said container and simultaneously to affix the oppositely disposed label to said container through the intimate engagement therewith of said stationary resilient pad.

2. A label-pressing machine for simultaneously permanently affixing labels preliminarily applied to opposite exterior surfaces of a container including a generally stationary platen, a resilient container-supporting pad disposed on said stationary platen and fixedly related thereto, a transversely-movable label-pressing roll spaced from said pad and having the longitudinal axis thereof disposed generally parallel to the surface of said pad, and yieldable means for guiding said roll along a path extending generally perpendicular to the longitudinal roll axis and spaced from said pad, and forming a generally acute angle with the surface thereof, whereby said roll may be operatively rolled over the surface of one of said labels with a gradually increased pressure, thereby permanently to affix said label to said container and simultaneously to affix the oppositely disposed label through the intimate en-

gagement therewith of said stationary resilient pad.

3. A label-pressing machine for simultaneously permanently affixing labels preliminarily applied to opposite exterior surfaces of a container including a generally stationary platen, a resilient container-supporting pad disposed on said stationary platen and fixedly related thereto, a transversely-movable label-pressing roll spaced from said pad and having the longitudinal axis thereof disposed generally parallel to the surface of said pad, and yieldable means for guiding said roll along a path generally parallel to said pad and extending generally perpendicular to the longitudinal roll axis, whereby said roll may be operatively rolled over the surface of one of said labels, thereby permanently to affix said label to said container and simultaneously to affix the oppositely disposed label through the intimate engagement therewith of said stationary resilient pad.

4. A label-pressing machine for simultaneously permanently affixing labels preliminarily applied to opposite exterior surfaces of a container including a generally stationary platen, a resilient container-supporting pad disposed on said stationary platen and fixedly related thereto, a transversely-movable label-pressing roll spaced from said pad and having the longitudinal axis thereof disposed generally parallel to the surface of said pad, and yieldable means for guiding said roll along a path spaced from said pad, said yieldable means being arranged to constantly urge said roll towards said resilient supporting pad at all points along said path, whereby said roll may be operatively rolled over the surface of one of said labels thereby permanently to affix said label to said container and simultaneously to affix the oppositely disposed label through the intimate engagement therewith of said stationary resilient pad.

5. A labeling machine having means for guiding into operative position an article on opposite sides of which labels have been preliminarily applied, a roll adapted to press against and roll over one of said labels from one end thereof to the other, means for varying the pressure exerted by the roll upon said label from a minimum at one end of the label to a maximum at the other end thereof, and resilient means for simultaneously affixing the remaining preliminarily applied label to the opposite side of said article.

6. A labeling machine for simultaneously and permanently affixing labels preliminarily applied to opposite sides of a container including a generally stationary resilient container-supporting pad, a transversely-movable label-pressing roll spaced from said pad and having the longitudinal axis thereof disposed generally parallel to the surface of said pad, and means for operatively supporting and guiding said roll along a path spaced from said pad and determined by the contour of the container being labeled, whereby said labels may be affixed permanently and simultaneously to opposite sides of said container.

7. A readily-adjustable labeling machine having an adjustable platen for operatively supporting an article to be labeled, a resilient label-pressing pad disposed on the upper surface of said adjustable platen, readily adjustable guide rails adapted to guide said article into a predetermined position on said resilient pad, a resilient transversely-movable label-pressing roll spaced from said pad and having the longitudinal axis thereof disposed generally parallel to the surface of said pad, and means for operatively supporting and guiding said roll along a path of travel extending generally perpendicular to said longitudinal roll axis and spaced from said platen, said means including yieldable means constantly urging said roll towards said pad.

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