

July 13, 1954

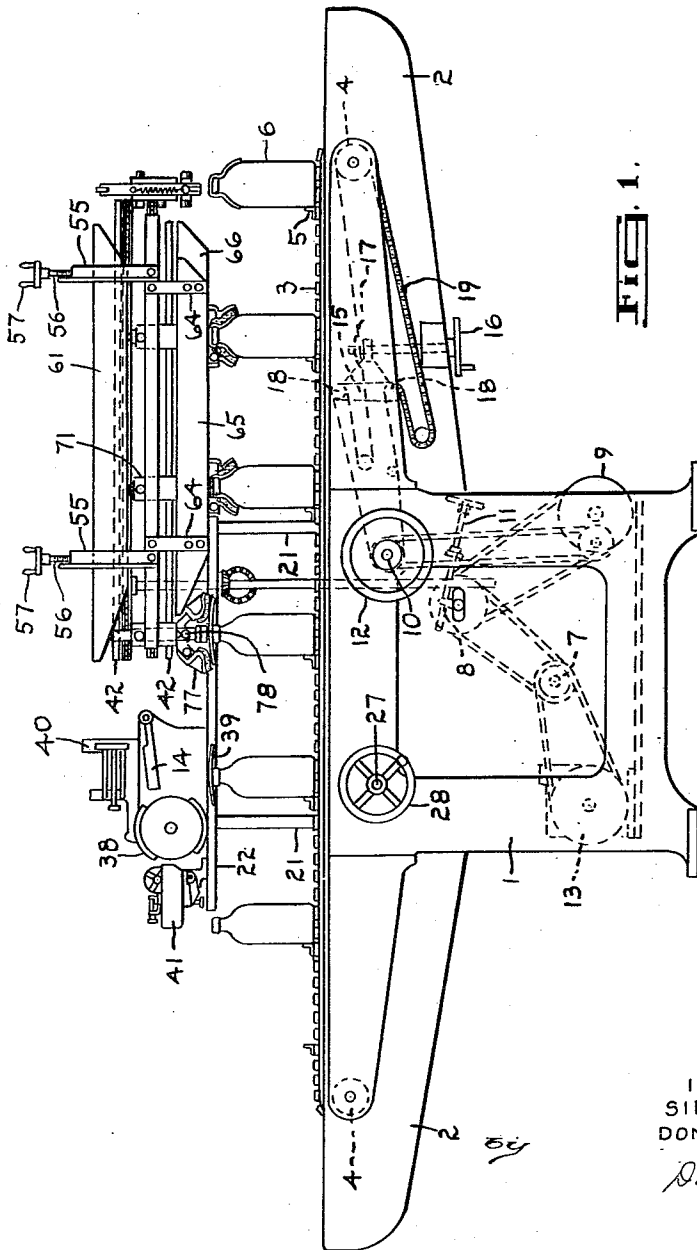
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2,683,549

STAMPING OR LABELING MACHINE

Filed Oct. 31, 1951

4 Sheets-Sheet 1



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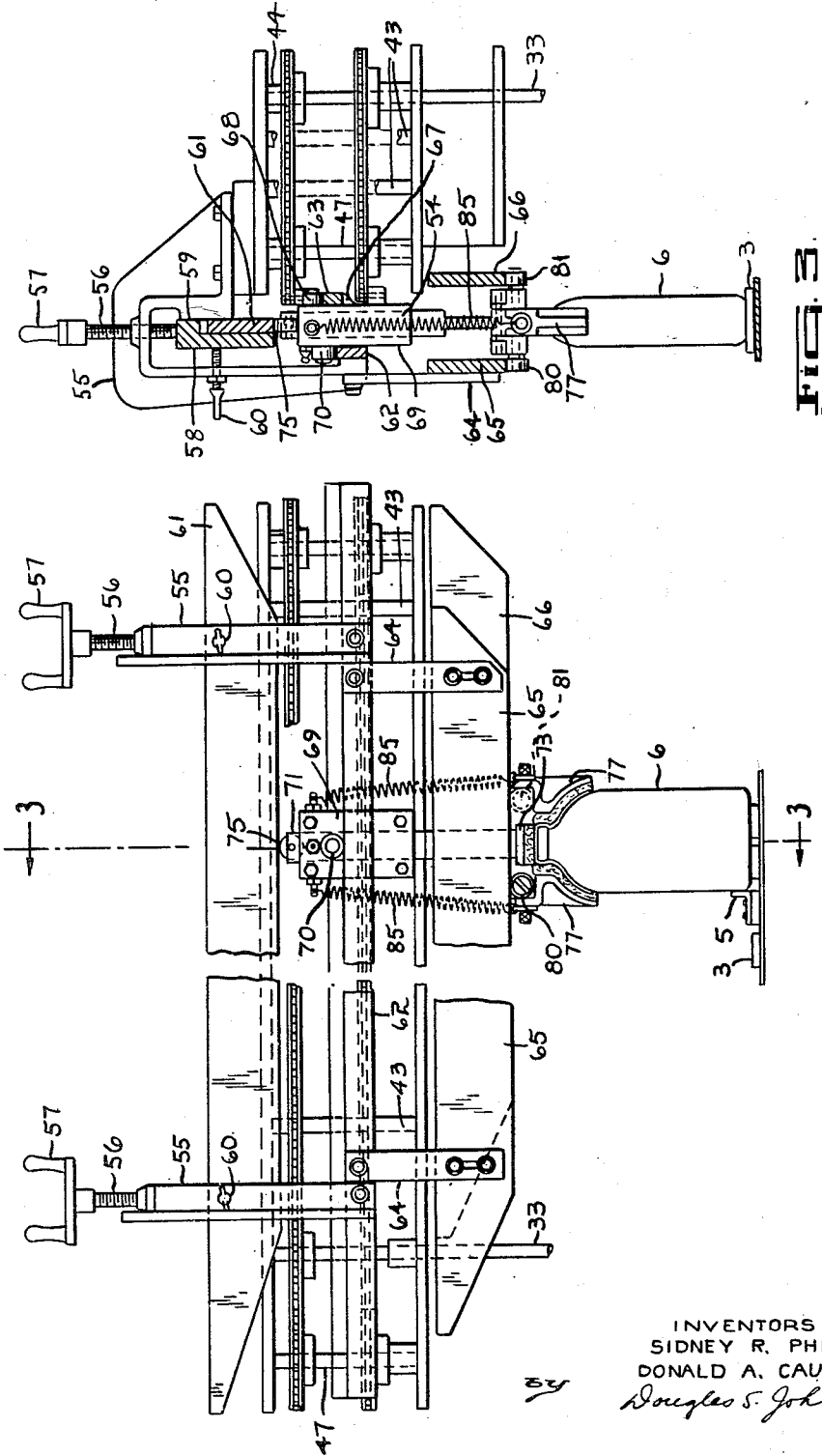
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4 Sheets-Sheet 2



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4 Sheets-Sheet 3

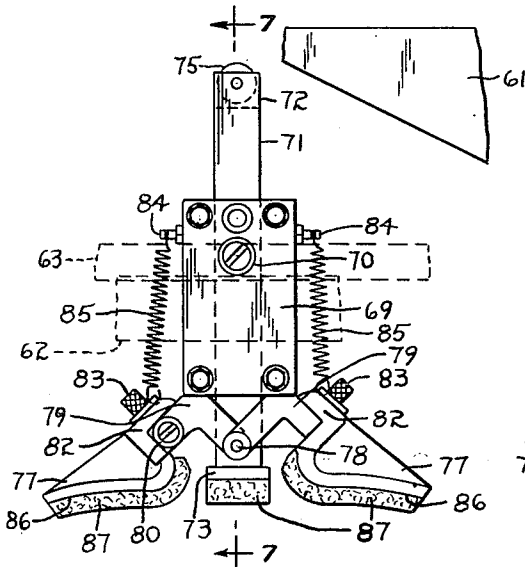


FIG. 4.

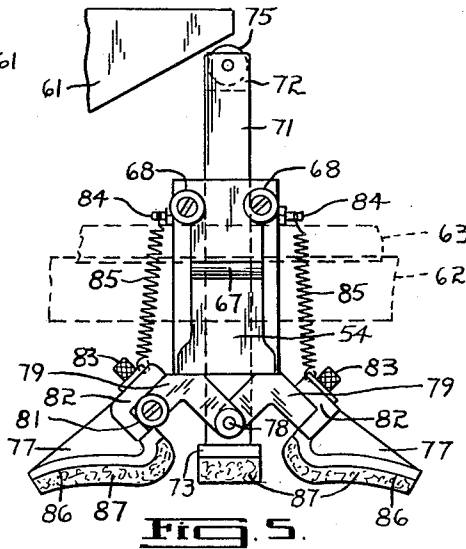


FIG. 5.

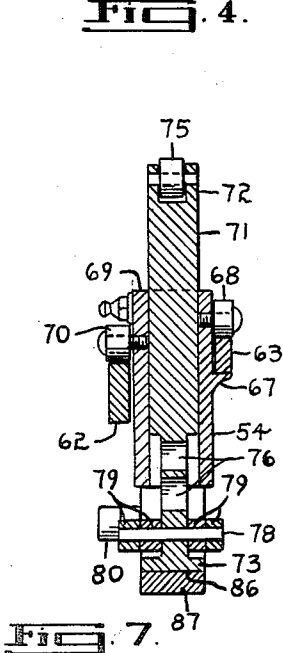


FIG. 7.

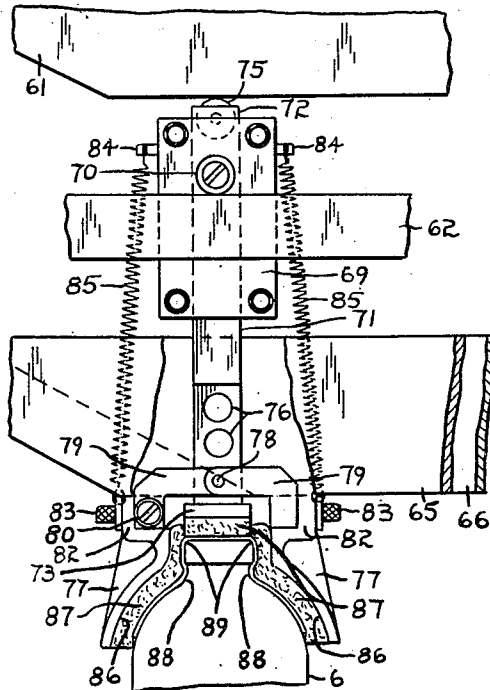


FIG. 6.

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4 Sheets-Sheet 4

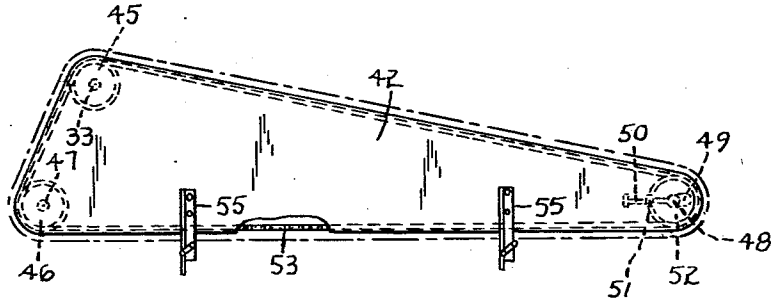


FIG. 8.

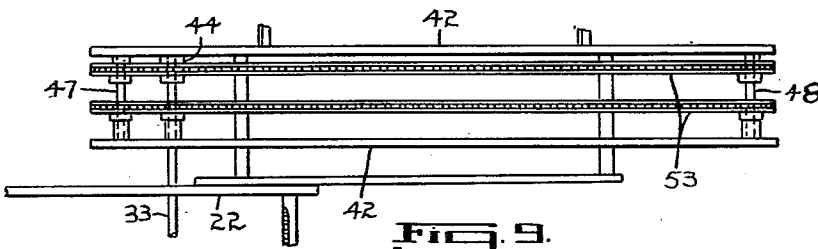


FIG. 9.

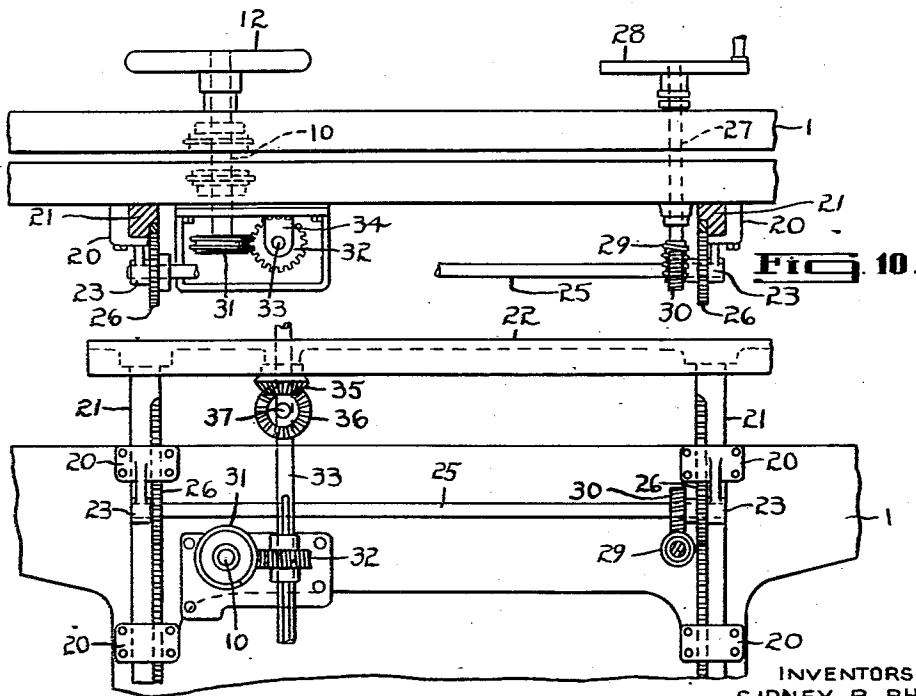


FIG. 11

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STAMPING OR LABELING MACHINE

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Application October 31, 1951, Serial No. 254,167

9 Claims. (Cl. 216—57)

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This invention relates to improvements in automatic labelling or stamping machines and more particularly to an improved mechanism for conforming a label, excise stamp or the like to the surface of an article or container being labelled to urge the label or stamp into intimate contact throughout its entire area with the container surface and to maintain such intimate contact for a period sufficient for complete adhesion to be effected.

In co-pending application Serial Number 147,916 there is disclosed an automatic labeller comprising a mechanism for applying a label to a container and a mechanism for applying pressure on the applied label during an interval sufficient to ensure adhesion of the label.

Such pressure applying mechanism is adapted to conform the label to a convex, plane or angular surface but is unable to conform the label throughout its entire area to some surfaces having a concavity or a curvature in which there is a point of inflexion as the surface changes curvature.

For example, in the applying of an excise stamp across the top down the neck and over the shoulders of a bottle, abrupt changes and reversals of curvature are encountered and there is at present no provision for conforming the stamp intimately to such a surface formation in an automatic labelling machine.

Again where a surface presents a concave or concavo-convex surface the same problem is encountered and without the intimate contact being obtained a proper adherence of the label or stamp is not effected.

The principal object of the present invention is to provide a mechanism which will overcome the limitations of the present labellers and conform an excise stamp to the top, neck and shoulders of a bottle or a label to a concaved surface so that the stamp or label is pressed into intimate contact with the surface throughout its entire area.

A further object is to enable such surfaces to be labelled with an automatic labeller of the type disclosed in said application Serial No. 147,916 in which the labels are deposited on the containers and then pressed to intimate contact therewith while the containers move with continuous uninterrupted motion through the machine.

The principal feature of the invention resides in dividing each of the label-pressing surfaces of the presser mechanism into a series of independently movable segments contoured to conform to

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the shape of the segment of the container surface to which a label or stamp is to be applied, mounting the presser segments for movement in unison to a container co-operating position from which they can individually be closed on the container while moving substantially normal to the container segment they are adapted to conform to, and providing means for first moving the segments in unison to container co-operating position and then independently to close on the container and press a stamp or label against the container without sliding over or pulling of the label.

More particularly the presser mechanism comprises an endless series of presser elements mounted to move above and at the same surface speed as a carrier on which the containers being stamped or labelled are being conveyed. Each of these presser elements includes a vertically reciprocal plunger carrying the container pressing segments supported therefrom and a series of cams are arranged first, to vertically operate the plungers into engagement with the containers while moving at the speed of the containers and to then operate the presser segments to close on the container surface segments opposite thereto while moving substantially normal to the opposing container surface portions.

A further feature consists in making the presser surfaces of a resilient cushioning media.

Another feature resides in mounting the presser segments for ready interchangeability to enable the presser to be quickly modified to fit different types of containers.

Still a further feature resides in mounting the presser segments for selective relative adjustment, and again another feature resides in mounting the entire presser mechanism for vertical adjustment for different sizes of containers.

These and other objects and features will become apparent with reference to the accompanying description taken in conjunction with the drawings in which Figure 1 is an elevational view of a labelling or stamping machine to which the improved presser mechanism has been applied.

Figure 2 is an enlarged elevational view partly broken away showing one of the presser devices conforming a label to a bottle.

Figure 3 is a vertical section on the line 3—3 of Figure 2.

Figure 4 is an enlarged front elevation of one of the presser devices with the presser segments in open position.

Figure 5 is an elevational view of the device of Figure 4 taken from the opposite side.

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Figure 6 is an elevational view of the device of Figures 4 and 5 showing the presser segments operated in closed position conforming a label to a bottle.

Figure 7 is a vertical section on line 7-7 of Figure 4.

Figure 8 is a plan view of the presser mechanism, frame assembly and endless carrier with the presser devices omitted.

Figure 9 is an elevational view of the assembly of Figure 8.

Figure 10 is an enclosed fragmentary plan and horizontal section of the main frame of the machine showing the mechanism for elevating the frame carrying the presser mechanism, and the drive to the presser mechanism.

Figure 11 is a rear elevation of a portion of the machine shown in Figure 10.

With reference to the drawings, the presser mechanism is shown applied to an automatic labelling or stamping machine of the type disclosed in the above application and as the details of the construction of the machine, the drive therefor, the label-applying mechanism and the timing mechanism form no part of the present invention the details of the construction thereof are omitted.

Basically the machine consists of side frames 1 having arms 2 extending from the ends thereof. Between these side frames 1 operates an endless conveyor 3 operating over sprockets 4 at each end of the machine. The conveyor is provided with a series of lugs 5 to engage and advance a bottle or container 6 longitudinally of the machine.

The drive for the conveyor is obtained from a suitable motor 7 which drives a variable drive mechanism 8 which in turn drives a reduction gear 9 from which is driven the main drive shaft 10, Figures 1 and 10.

The variable drive mechanism 8 is operated through a control shaft 11 to alter the speed of the main drive shaft 10 and a hand wheel 12 permits the main drive shaft to be manually rotated.

13 is a vacuum pump for applying vacuum to the label-withdrawing arm 14.

The drive from the main drive shaft 10 to the sprocket 4 is controlled by a timing mechanism 15 operated by the hand wheel 16. This hand wheel operates a crank 17 which alters the positions of the sprockets 18 around which drive chain 19 pass to advance or retard the position of the lugs 5 so that they can be timed to register a bottle or container with the presser mechanism hereinafter described.

Slidably mounted in brackets 20 on the rear side frame 1, Figures 10 and 11, are vertical rack bars 21 which carry a platform 22. Journalled between lugs 23 is a shaft 25 extending longitudinally of the machine and carrying pinions 26 engaging the rack bars 21.

Extending transversely through the machine is a shaft 27 operated by hand wheel 28, Figure 1, which carries a worm 29, Figures 10 and 11, which meshes with a worm wheel 30 carried by the shaft 25 to elevate the rack bars and platform 22.

The mechanisms carried by the platform 22 are driven from the main drive shaft 10 by the worm 31 carried thereby and engaging a worm wheel 32 splined on a vertical shaft 33, the worm wheel being held in position by a bracket 34 while permitting vertical movement of the shaft 33 as the platform is elevated and lowered.

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Mounted on the vertical shaft 33 adjacent the platform is a bevelled gear 35 meshing with a bevel gear 36 carried by a stud shaft 37 from which the drive for the label-applying mechanism is obtained. This drive is not shown nor are details of the label-applying mechanism, which comprises a drum 38 adapted to pick up a label 39 from the magazine 40 following withdrawal by the sucker arm 14, and one surface of this label is coated by glue from the gluepot assembly 41 and then deposited on the container 6.

As the drive for the mechanisms on the platform is obtained from the vertical shaft 33, which in turn is driven by the main drive shaft 10, the drives of the mechanisms on the platform will be maintained at all times in synchronism with the conveyor 3.

Mounted on the platform 22 are a pair of vertically spaced horizontal plates 42 of triangular formation separated by spacers 43. These plates and spacers constitute the frame of the presser mechanism and the vertical shaft 33 carrying the drive from the main drive shaft 10 to the mechanisms of the platform extends through the plates 42 adjacent one apex thereof terminating in the fitting 44.

Mounted on the shaft 33 between the plates 42 are a pair of sprockets 45 while at the adjacent apex a pair of idler sprockets 46 are journalled on a shaft 47. At the remaining apex an idler shaft 48 is rotatably supported between the plates and is arranged to slide in slots 49 in accordance with the setting of the set screws 50 carried by the plates and locked by check nuts 51.

Mounted on this latter shaft 48 are sprockets 52. Driven by the sprockets 45 and meshing with idler sprockets 46 and 52 are a pair of chains 53 carrying at intervals slide brackets or blocks 54 supported therebetween in vertical orientation.

Mounted on the upper of the plates 42 are a pair of C-shaped brackets 55 which project over the conveyor 3. Threading through these brackets 55 are spindles 56 operated by the hand controls 57. Carried at the lower end of the spindles is a longitudinal cam bar 58 adapted to be clamped against the inner faces 59 of the brackets 55 by the wing screws 60 and carrying the longitudinal camming bar 61.

Carried on the lower end of the clamps 55 is a longitudinal guide bar 62, while a similar guide bar 63 is mounted on the spacers 43 and spaced inwardly of the bar 62.

Depending from the bar 62 on hangers 64 is a longitudinal cam bar 65 and opposite thereto and inwardly thereof is a corresponding cam bar 66 supported from the lower of the plates 42 and offset longitudinally with respect to the cam bar 65.

Each of the brackets or blocks 54 carried by the chains 53 carries on the rearward face a ledge 67 engaging under the guide bar 63 and rollers 68 rolling on the latter guide bar. The forward face of the block or slide is closed by a plate 69 carrying a roller 70 operating on the guide bar 62. The rollers 68 and 70 and ledge 67 co-operating with the respective guide bars serve to support the blocks for supported and guided horizontal movement with the block moving above the conveyor 3. Not only are the blocks in vertical register with the conveyor but the speed of the conveyor and the speed of the endless carrier formed by the chains 53, being derived from the same main drive shaft 10, are

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regulated to operate at the same surface speed so that the blocks and conveyor move at the same surface speed while in vertical register.

Mounted in each of the slides or blocks 54 is a plunger 71 having a forked upper end 72 and a lower end formed into a platen 73. Journalled in the upper end is a roller 75 adapted to roll on the cam surface of the camming bar 61 to depress the plunger during the major portion of the period that its block or slide is moving above the conveyor 3.

Above the platen the plunger is provided with a series of holes 76 and a pair of presser segments 77 are pivoted on a pin 78 selectively received in one of the holes 76. Each of the presser segments has a slotted shank 79, the ends of which are secured to the pin 78. The shank of the left-hand segment 77 carries a roller 80 projecting forwardly to engage the cam bar 65, while the right-hand shank of the opposing presser segment carries a roller 81 projecting to the rear to engage the cam bar 66.

Each of the presser segments has a slotted lip 82 overlying the shank 79 and removably secured to the shank by the bolt 83 so that each presser segment is readily removable and replaceable upon loosening of its bolt 83.

Secured between the posts 84 carried by the slide brackets 54 and the presser segments 77 are springs 85 which act to urge the presser segments or elements to the "open" position of Figure 4. At the same time these springs function to urge the plungers 71 upwardly to the positions of Figures 4 and 5.

In the particular application for which the machine illustrated is intended the presser elements 77 are adapted to conform an excise stamp or label to the top, neck and shoulders of a bottle. The presser segments are thus formed with the particular presser surfaces 86 and these surfaces, together with the surfaces of the platens 73 are provided with a resilient covering, preferably of sponge rubber, 87, which is a medium deformable and conformable about the bottle surface yet permitting the application of an effective pressure against the label and bottle.

In operation, the bottles to be stamped or labelled are moved longitudinally of the machine on the endless conveyor 3. The labels 14 with a suitable adhesive coating applied by the gluepot assembly 41 are deposited on the tops of the bottles as they pass therebeneath. There will be sufficient adherence between the contacting label and bottle areas to temporarily hold the labels in position until they arrive beneath the presser mechanism.

The timing of the conveyor 3 and the endless carrier formed by the chains 53 is, as explained, such as to bring the slide brackets or blocks 54 and their plungers 71 into vertical registration with the container. The timing mechanism 15 permits this accurate registration to be obtained.

As the endless carrier 53 and conveyor 3 are moving at the same surface speed there will be no relative motion between the plunger and bottle therebeneath as the two move longitudinally of the machine.

After the supporting slide and plunger 71 arrive above the bottle the plunger roller 75 is operated by the cam surface 58 to move downwardly to bring its platen against the top of the bottle while pressing thereagainst to anchor the label in its correct position. Then the rollers 80 and 81 of the presser segments or elements 77 engage the cam bars 65 and 66 which are offset to correspond to the displacement of the rollers to swing

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the cam segments substantially in unison about their pivot pin 78 to move the label down against the neck and shoulders of the bottle conforming it intimately to these surfaces, as shown particularly in Figure 6. This relationship is maintained for the period of the travel of the bottle beneath the presser mechanism until the ends of the cam bars 65 and 66 and the cam bar 61 are reached, at which time the springs 85 operate the presser elements from their "closed" position to release the container and bottle and move upwardly with the plunger.

By their pivotal mounting the presser segments 77, with the plunger depressed to bottle co-operating position, are adapted to swing against the respective bottle segments to which they are adapted to conform while moving substantially normal thereto. In this way there is no rolling or sliding over the label surfaces and the label will not be displaced or torn.

With the shape of a bottle there is a point of inflexion as the shoulders flare outwardly from the neck as at 88, Figure 6, and there is an abrupt change of curvature at 89 in moving from the vertical to the horizontal at the top of the bottle, and by subdividing the presser surface into independently movable segments these segments can be arranged to close and mould the label-receiving surface regardless of the contour thereof.

If a surface were used merely shaped to conform to the container label-receiving surface it would then require being frictionally forced over the label with the resulting tearing or displacement.

By having the presser elements moving at the same speed as the container or bottles the pressure on the label may be maintained for the desired interval to enable the adhesive carried by the label to set and permanently bond the label in position.

Adjustment for a range of bottle or container sizes may be made by adjusting the position of the cam bar 61 through the operation of the spindles 56, and the cam bars 65 and 66 are preferably adjustably mounted on their supporting brackets to control the movement of the presser segments 77. If a greater adjustment is required than that permitted through adjustment of the spindles 56 the entire platform can be operated through hand wheel 28 to move vertically as required.

It will be appreciated that the bottles or containers may have the labels deposited thereon by mechanisms other than those disclosed herein and in the said co-pending application, and the containers may be labelled in a separate machine and deposited on a carrier moving beneath the presser mechanism.

Additionally of course the shape of the articulated presser segments will be varied as may be their pivot mounting to conform to the particular surface shape being labelled.

Provided the plunger and container are maintained against relative movement after moving the plunger into contact with the container the presser segments, although preferably operated in unison, may be operated in sequence to label conforming position.

What we claim as our invention is:

1. In an automatic labelling or stamping machine, a main frame, an endless conveyor operating longitudinally of the frame in a straight line path, a stationary platform supported for vertical adjustment from said main frame and extending thereabove, a label magazine carried by

said platform, means carried by said platform to deliver a label from said magazine to a container on said endless conveyor, means carried by said platform to apply adhesive to a label being delivered to a container, an endless carrier mounted on said platform and moving in a straight line above said conveyor for a portion of its travel, means moving said carrier at the same surface speed as said conveyor, a series of blocks carried by said carrier, means carried by said platform guiding said blocks for horizontal movement while moving above said conveyor, a plunger reciprocally mounted in each block and having a roller on the upper end thereof and a presser foot on the lower end, support brackets carried by said platform and extending above said conveyor and blocks, a stationary cam extending longitudinally of the conveyor carried by said brackets and engaged in rolling contact by said rollers to cam said plungers, throughout a portion of the travel of their blocks above said conveyor, downwardly to bring their presser feet against a label and container on said conveyor, a pair of presser elements pivoted to each plunger and swingable on opposite sides of said plunger presser foot and adapted to co-operate therewith upon swinging to conform to a predetermined container configuration, means urging said presser elements away from container-conforming relation, and individual stationary cam means carried from said platform engaging said presser elements upon depression of said plungers to swing said presser elements independently into container-conforming relation.

2. A device as claimed in claim 1 in which said presser elements are provided with rollers, and said cam means for operating said presser elements comprise cam bars extending longitudinally of said conveyor and engaged in rolling contact by said presser element rollers.

3. A device as claimed in claim 1 in which said guide means for guiding said blocks in horizontal movement above said conveyor comprises rail members extending longitudinally of said conveyor and arranged on opposite sides of said blocks in moving above said conveyor, and rollers carried by said blocks and rolling on said rail members.

4. A device as claimed in claim 1 in which said support brackets are C-shaped and said cam carried by said brackets is vertically adjustable in said brackets, screw-threaded means determining the vertical adjustment of said latter cam, and clamp means locking said latter cam in adjusted position.

5. A device as claimed in claim 1 in which said presser elements comprise each a forked shank embracing said plunger and pivoted thereto, and a container-conforming body portion adjustably and removably secured to said shank, said body portion having a slotted lip extension fitting over said shank, and means securing said lip to said shank in adjusted position of said body portion on said shank.

6. In an automatic labelling or stamping machine, a conveyor, a normally stationary support structure supported for vertical adjustment above said conveyor, a label-applying mechanism mounted on said support structure above said conveyor adjacent one end thereof to deposit a label on a container in temporary adherence therewith throughout a portion of the label area, said conveyor moving in a straight line path to maintain a straight line motion of said container and label, a second endless carrier mounted on

said support structure and moving above the aforesaid carrier in linear straight line motion at the same surface speed as the aforesaid carrier, a series of presser devices mounted on said second carrier and including carriages, track means mounted on said support structure and on which said carriages run, a plunger reciprocally mounted in each of said carriages to move perpendicularly to the direction of carrier movement, a container engaging presser surface formation at the lower end of each plunger, said latter surface formation being divided into segments movable one relative the other to press against the label-receiving surface of the container while moving substantially normal thereto, stationary cam means mounted on said support structure and engaging and operating said plungers to move said presser surface formation to a position from which said segments are adapted to move into container pressing relation, and individual stationary cam means mounted on said support structure and operating said segments independently following plunger movement.

7. In an automatic stamping, labelling or like machine, a main frame, an endless carrier carried by said main frame to move containers to be labelled in a linear straight line path through the machine, a platform mounted on said frame for vertical adjustment above said carrier, means carried by said platform for depositing an adhesive-carrying label on a container being conveyed on said carrier, a second endless carrier mounted on said platform and operating at the same surface speed as the first-mentioned carrier, track means carried by said platform and extending longitudinally above said first carrier, a series of carriages guided by said track means and operated by said second endless carrier above and at the same surface speed as said first carrier, plungers reciprocally mounted in said carriages to move perpendicularly to the direction of carrier movement, a container-engaging presser surface formation at the lower end of each plunger, said latter surface formation being divided into segments movable one relative to the other, a stationary cam carried by said platform engaging and operating said plungers to move said presser surface formation to a position from which said segments are adapted to move into container pressing relation, and stationary cam means operating said segments individually following plunger movement.

8. A machine for labelling containers comprising in combination, an endless carrier to conduct a container in linear straight line motion through a machine, a support structure mounted for vertical adjustment above said carrier, label applying means mounted on said support structure and moving at the surface speed of said carrier to bring the adhesive face of a label into contact with a container deposited on said carrier, presser means mounted on said support structure and movable in a linear straight line path at the same surface speed as and above said carrier and vertically reciprocal to apply pressure to a label and container, and means to control the timing relation between said label applying means, said presser means and said endless carrier.

9. A labelling, stamping or like machine comprising, a main frame unit, an endless carrier mechanism operating longitudinally of said main frame, a platform, rack bars vertically slidable relative said main frame supporting said platform above said main frame for vertical adjustment

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an elevating shaft journaled in said main frame, pinion means operating said rack bars, a drive connection between said elevating shaft and pinion means, a label magazine mounted on said platform, a label drum mechanism rotatably mounted on said platform above said carrier for depositing a label from said magazine onto a container on said endless carrier mechanism, a drive from said main frame to said platform driving said drum at the surface speed of said carrier, an endless carrier mechanism mounted on said platform and driven by said drive from said main frame at the surface speed of and operating for a portion of its travel over the aforesaid carrier, a vertically reciprocal presser means mounted on said latter endless carrier mechanism and mov-

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able upon vertical adjustment of said platform in unison with said label drum to adjust for size of containers placed on said first-mentioned endless carrier mechanism, and means for vertically reciprocating said presser means.

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