Jan. 10, 1961 H. D. MANAS ET AL 2,967,636

LABELING MACHINE

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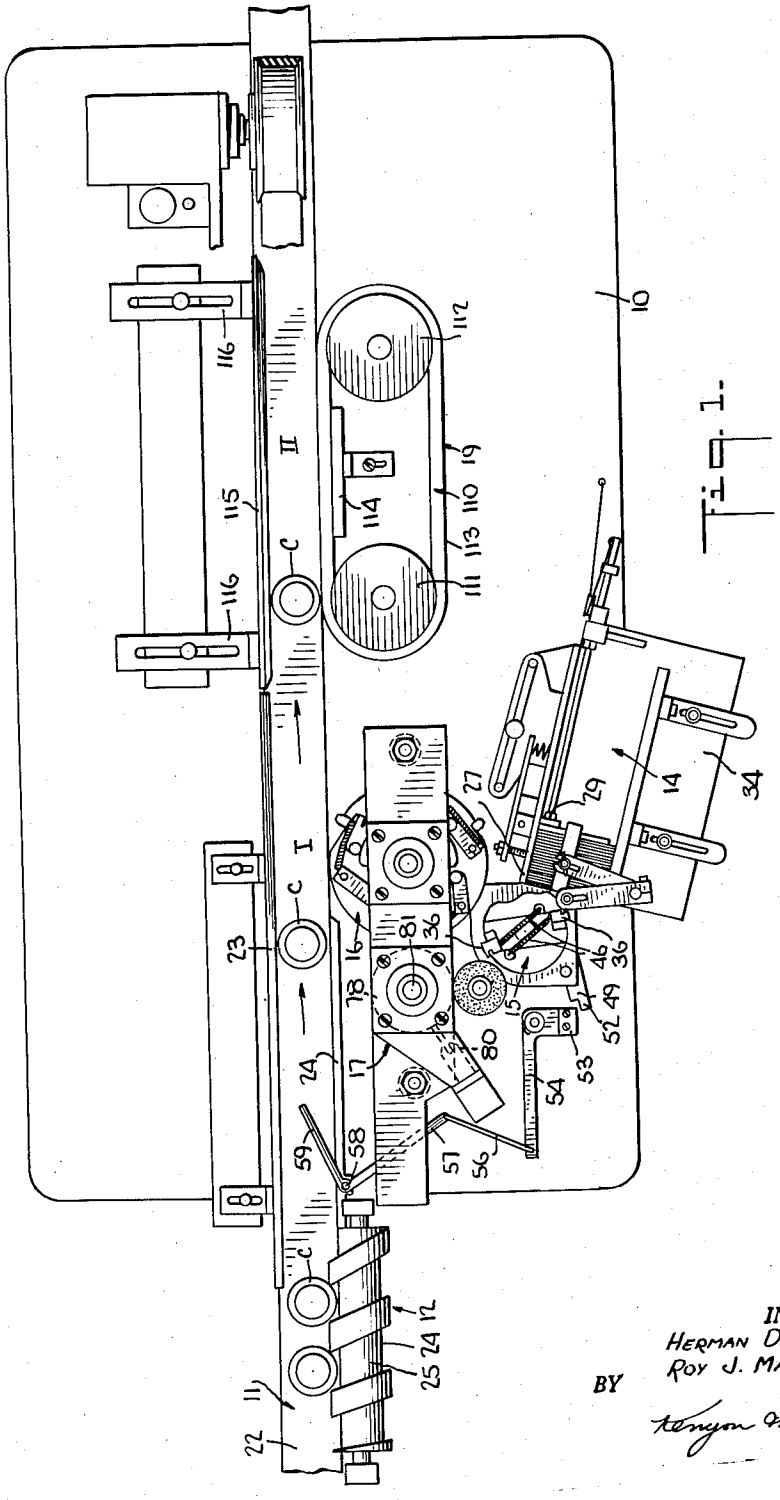


Fig. 1.

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LABELING MACHINE

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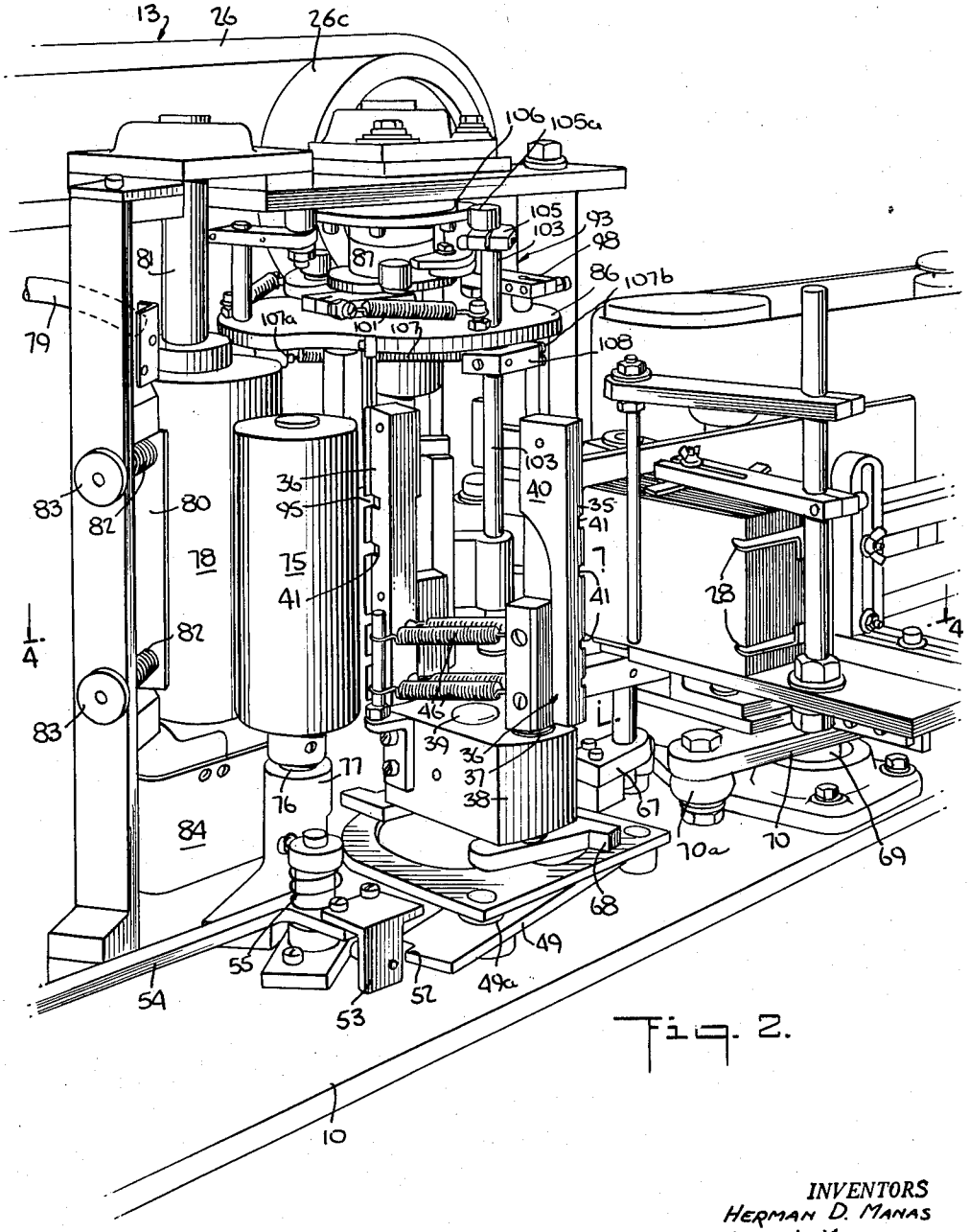


Fig. 2.

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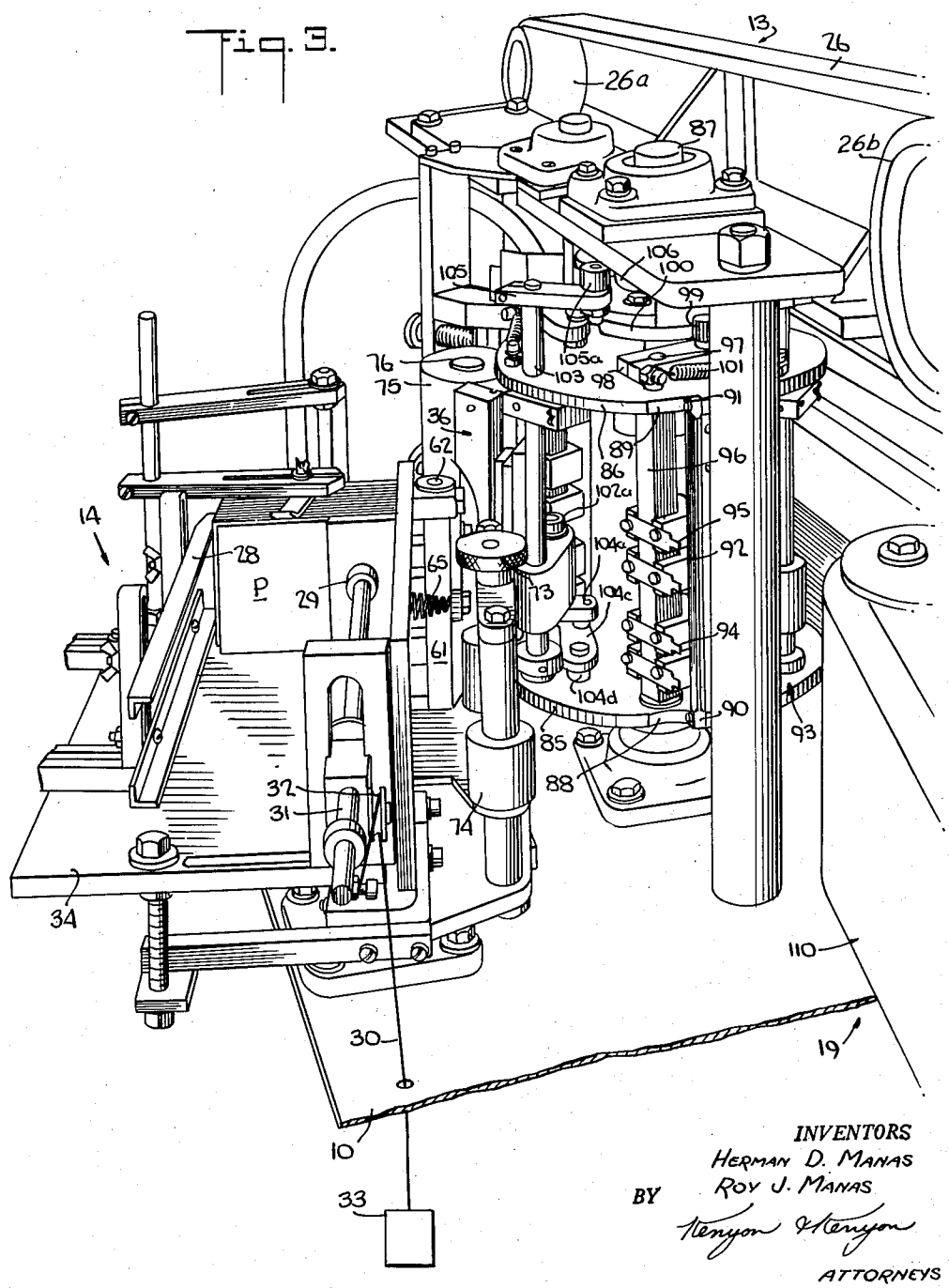
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LABELING MACHINE

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Fig. 3.



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LABELING MACHINE

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Fig. 4.

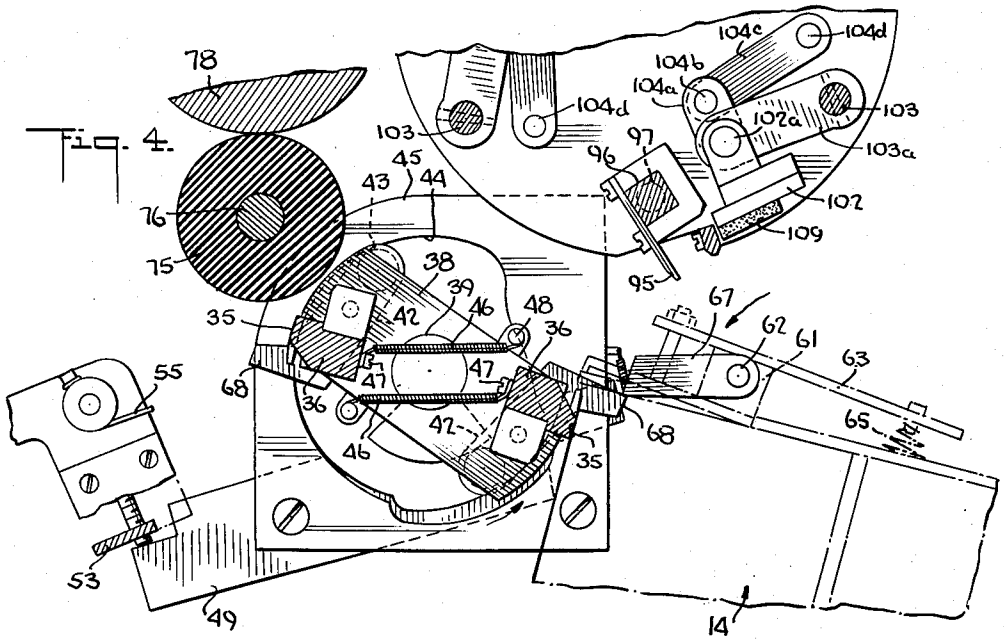


Fig. 14.

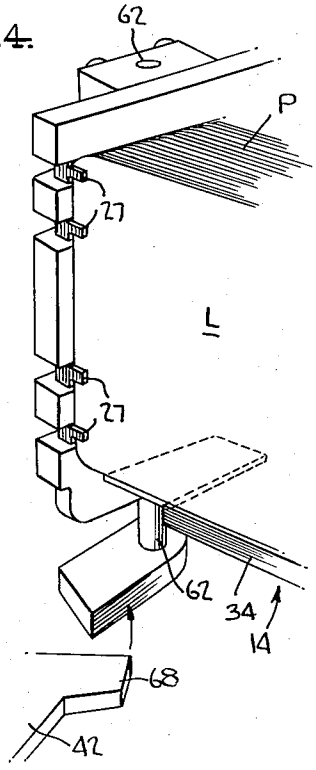
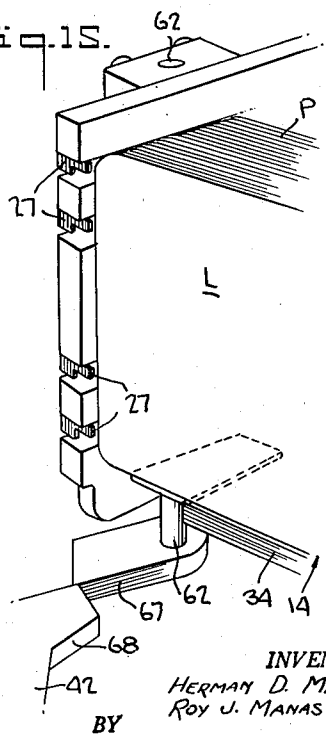


Fig. 15.



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LABELING MACHINE

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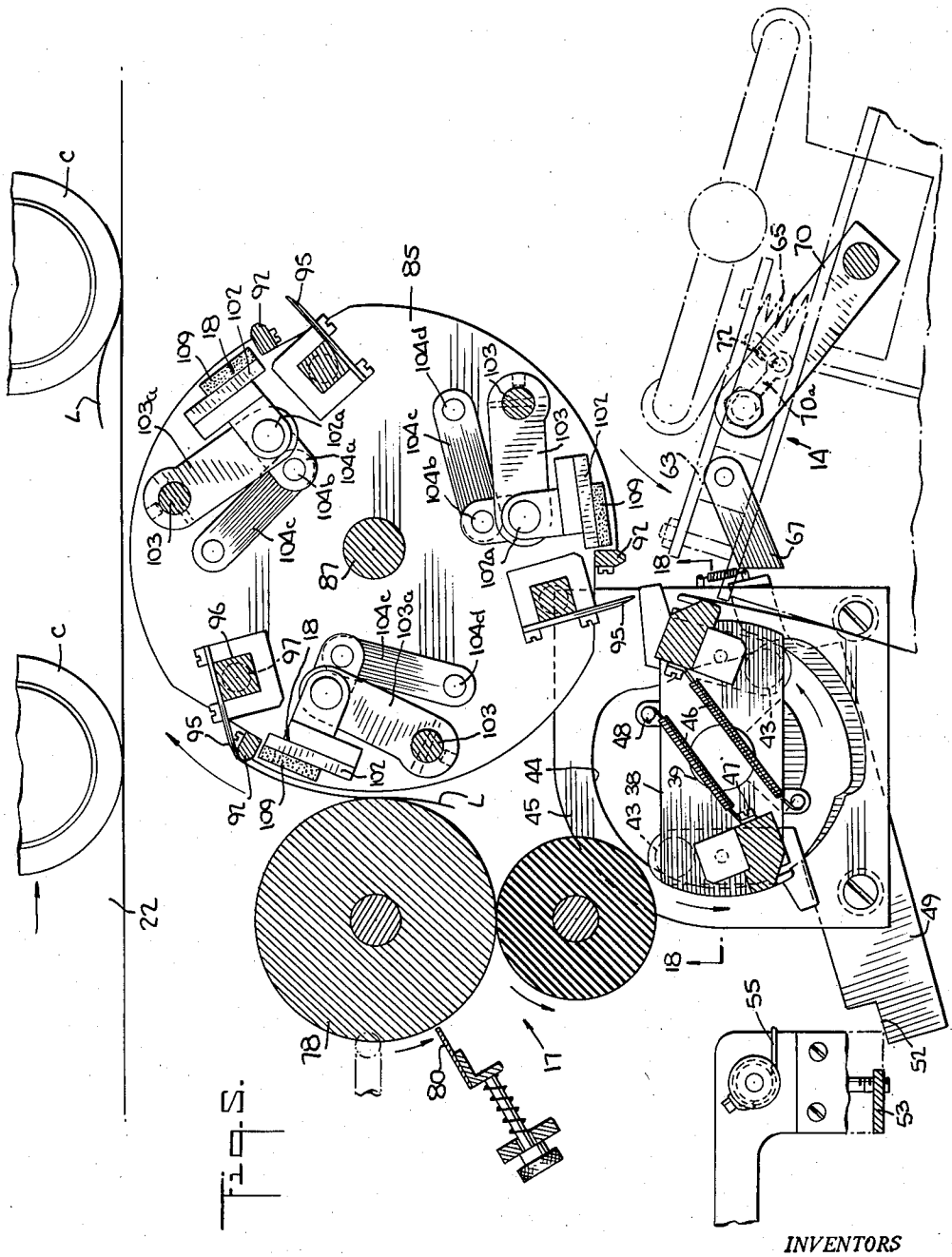


Fig. 5

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Jan. 10, 1961 H. D. MANAS ET AL 2,967,636

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Fig. 6.

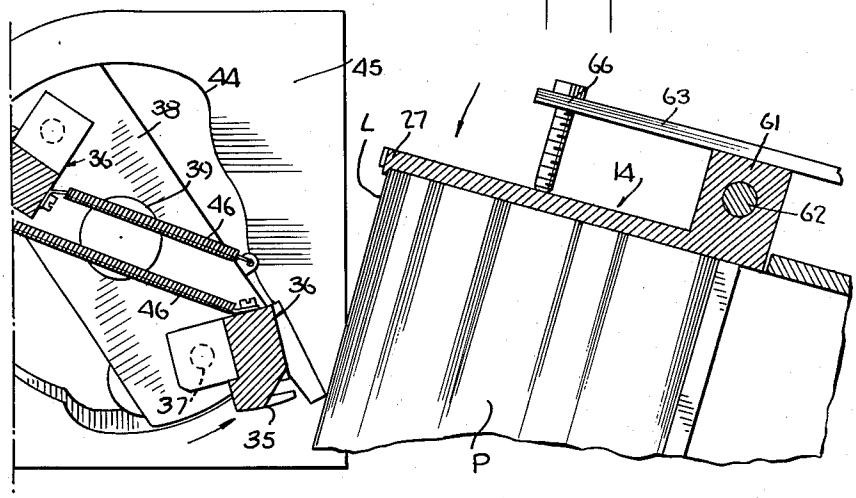


Fig. 7.

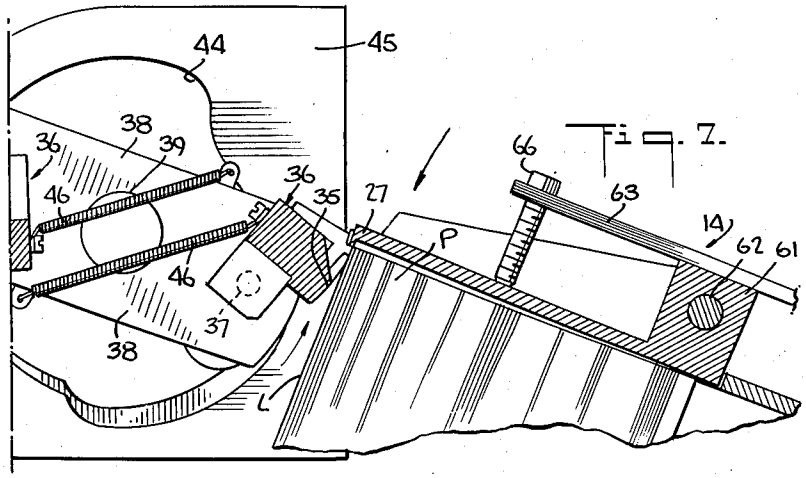


Fig. 8.

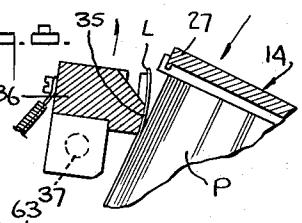
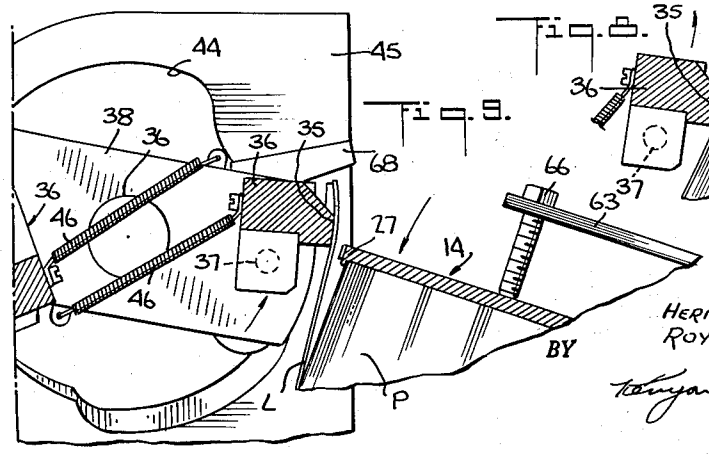


Fig. 9.



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LABELING MACHINE

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Fig. 10.

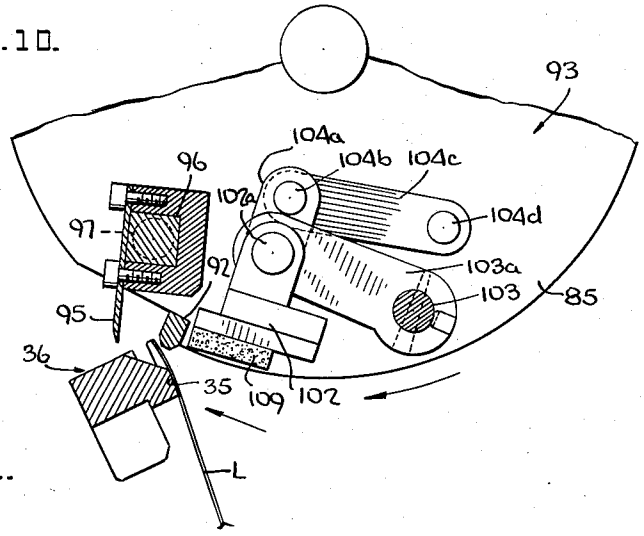


Fig. 11.

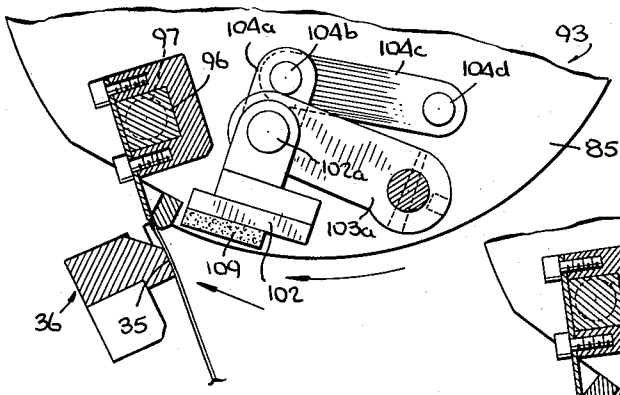


Fig. 12.

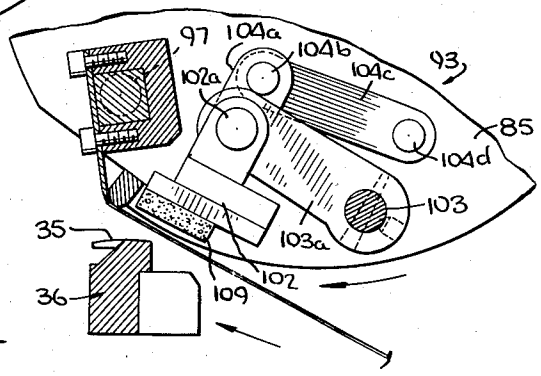
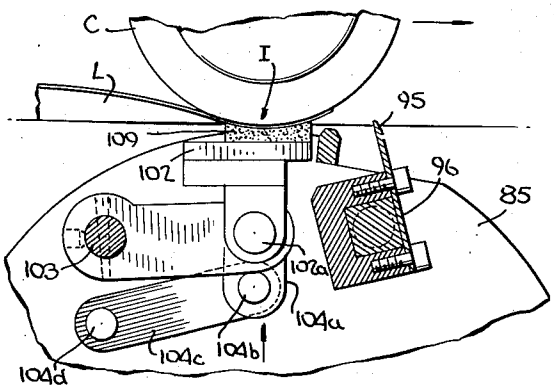


Fig. 13.



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LABELING MACHINE

Filed April 7, 1959 11 Sheets-Sheet 8

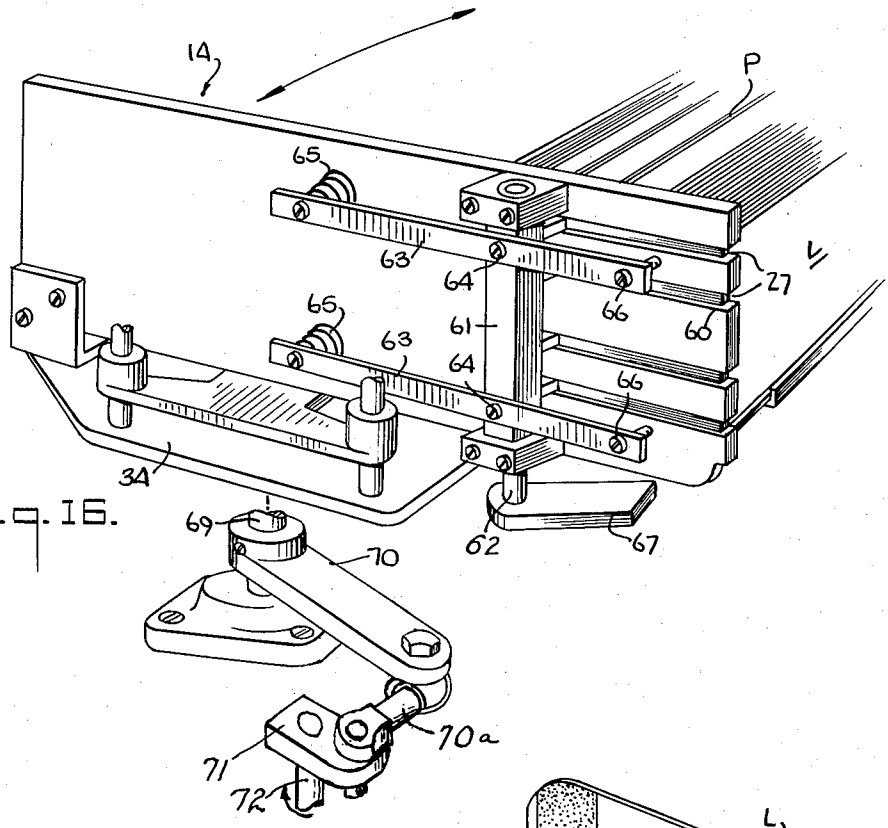
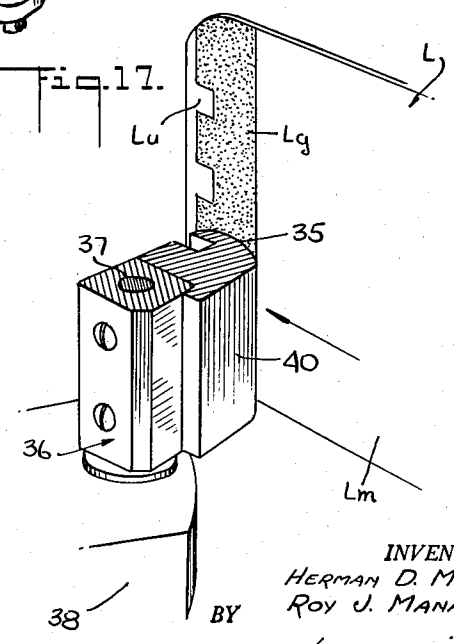


Fig. 16.

Fig. 17.



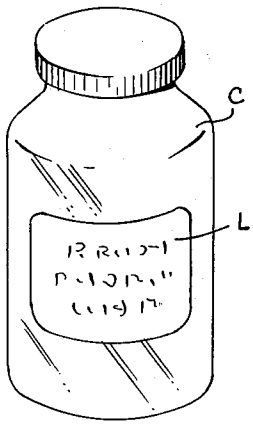


Fig. 25.

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LABELING MACHINE

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Fig. 18.

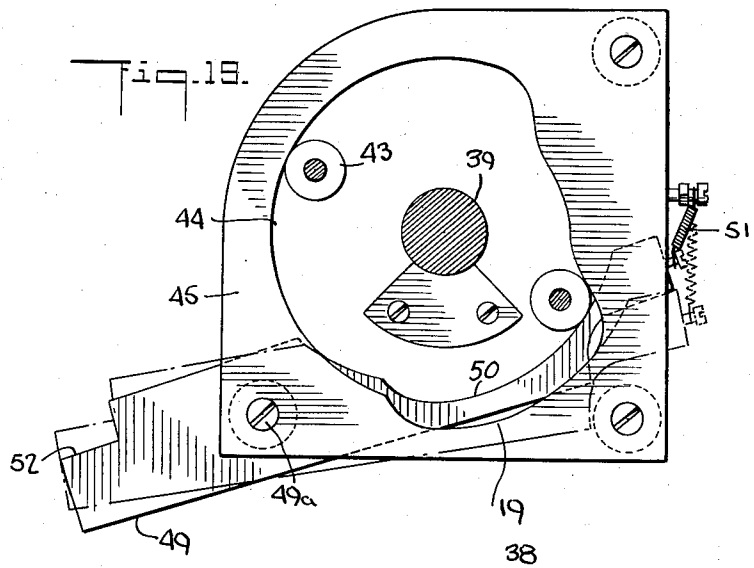
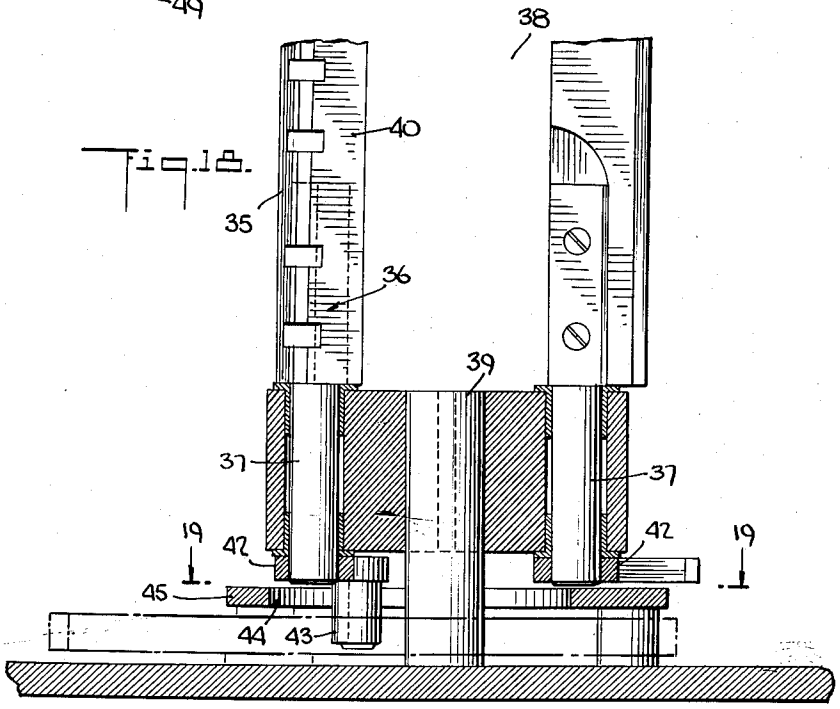


Fig. 18.



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Jan. 10, 1961 H. D. MANAS ET AL 2,967,636

LABELING MACHINE

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Fig. 11.

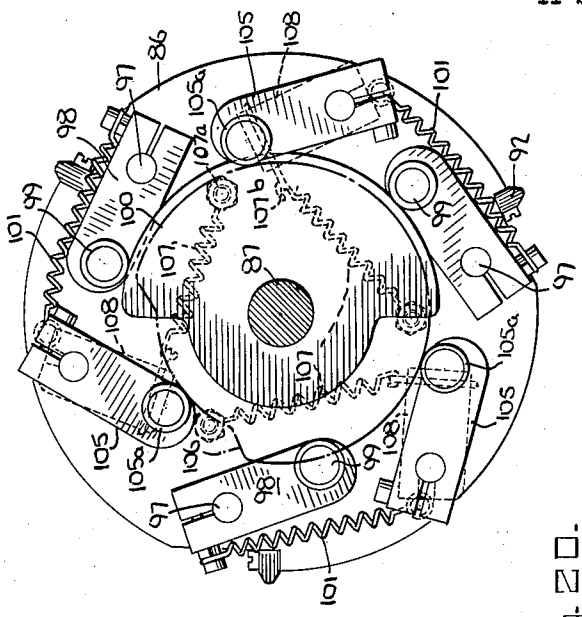
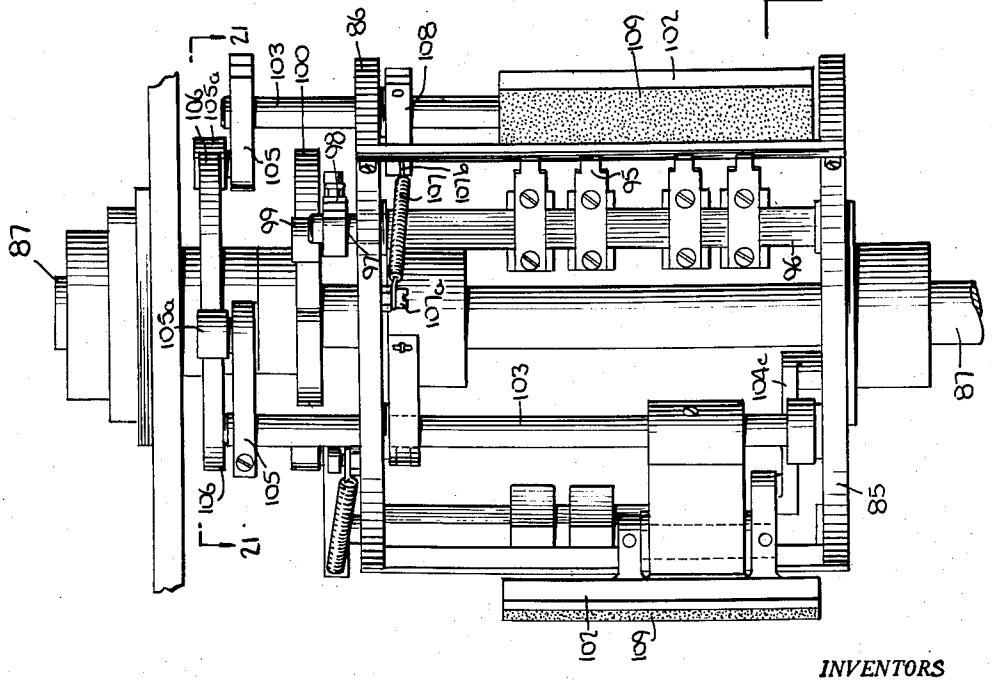


Fig. 10.



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Jan. 10, 1961 H. D. MANAS ET AL 2,967,636

LABELING MACHINE

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Fig. 23.

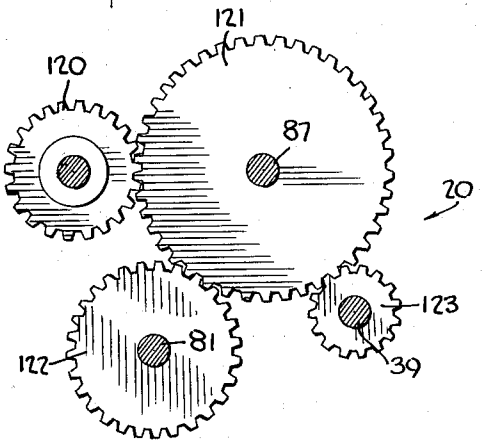


Fig. 22.

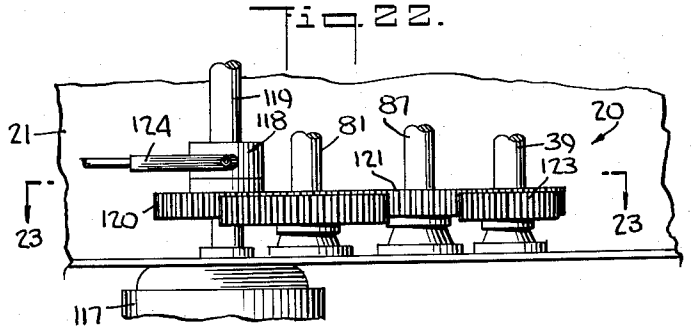
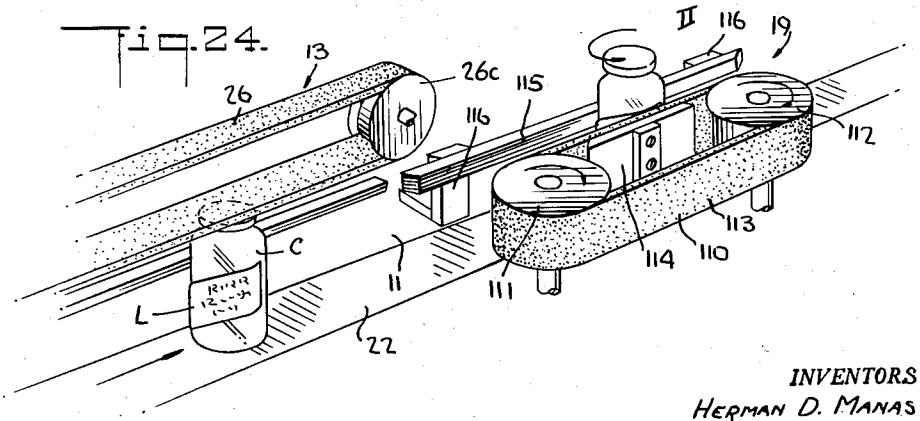


Fig. 24.



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United States Patent Office 2,967,636 Patented Jan. 10, 1961

2,967,636

LABELING MACHINE

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Filed Apr. 7, 1959, Ser. No. 804,800

21 Claims. (Cl. 216—54)

This invention relates to labeling machines and more particularly to mechanisms for applying labels to containers in succession with substantially complete adhesion of an entire label to the container to which it is applied.

It is conventional in labeling machines to transfer labels individually from a label magazine through intermediate positions for application to a container at a label applying station. In such machines, an individual label is withdrawn from the magazine generally by suction means. On its withdrawal by such suction means, it is seized by pick-off and transfer mechanism and carried to the label applying station, being gummed in transit. The pick-off and transfer mechanism grips the label along a narrow border portion or strip and carries the gripped label past an adhesive applying roller, and then to the label applying station whereat the label is applied to a container arriving simultaneously at the station. The narrow strip of label engaged by gripping jaws of the pick-off and transfer mechanism, however, is covered by them and does not receive adhesive as the label is swept past the adhesive applying roller. In consequence, this narrow strip will not adhere to the container, and may cause difficulty in later packaging or under other circumstances.

It is important that practically all portions of the labels be adhered firmly to the container to eliminate packaging difficulties, particularly when the labeled containers are transferred to high speed packaging machines. One solution for this problem is presented in Herman D. Manas, U.S. Patent 2,873,040, dated February 10, 1959. The solution therein provided is the application by special mechanism of a stripe of glue to each container in advance of its arrival at the label-applying station. The glue stripe is applied to a position on the container corresponding to that portion on which the non-adhesive bearing narrow strip or border of the otherwise gummed label will lie when the label is applied to the container. Thus, when the label is pressed against the container, there will be adhesive present in all corresponding areas either of the label or of the container to insure complete adhesion of the entire label to the container.

Principal objects and features of the present invention are the provision of different mechanism than that provided in the said patent for effecting adhesion of substantially the entire area of each label to the container to which it is applied, and very rapid labeling of containers.

In practising the present invention, each label to be applied to a container is removed from a label magazine by temporary adhesion to a previously-gummed surface of a novel label remover means which moves relative to the delivery or outlet end of the label magazine. The said adhesive-bearing surface is pressed firmly against the leading label at the outlet or delivery end of the label magazine while counter pressure is maintained on the pile of labels in the magazine as by a counter weight. The firm pressure of the adhesive-bearing surface against the surface of the leading label causes transference of adhesive from one to the other and also adhesion of a

temporary nature between the two. Immediately after such adhesion has been effected, the leading label is released from the magazine as the label remover means is moved away from said magazine. This causes the leading label now adhered temporarily to said adhesive-bearing surface to be readily withdrawn past the retaining fingers (then in a release position) of the label magazine and clear of said magazine.

The particularly removed label now temporarily adhered to the surface of the label remover means is carried away from the label magazine and brought to a seizure point or position where it may be stripped from said means by a pick-off and transfer mechanism.

The pick-off and transfer mechanism is in the form of a rotary turret. It includes a movable jaw having teeth of small dimensions that may move through appropriately provided slots or notches in the surface of the label remover means at said pick-off seizure point to clamp small ungummed areas of the label adhered to said surface against a fixed jaw on the turret. This serves to clamp the label to turret parts and on continued motion of the turret to strip the label from said surface of said label remover means. The portions of the stripped label which have been in contact with the latter surface retain adhesive transferred thereto by the said surface. Thus, the stripped label is now partially gummed. However, the small areas of the label which were aligned with the said slots or notches in said surface remain ungummed. These small ungummed areas are the ones engaged by the teeth of the movable jaw when clamping is effected by the latter. These areas are negligible in size as compared to the entire area of the label.

When clamping of a label by the turret parts has been effected at the seizure point, the clamped label is moved by the rotating turret from the seizure point to a partial label applying station. In such movement the clamped label is first carried past a main adhesive applying roller. In the sweep of the label past the main adhesive applying roller, the latter applies gum or adhesive to previously ungummed surfaces of the label and also to some portions of the area already containing adhesive by previous transference from the gummed surface of the label remover means. The ungummed areas covered by the teeth of the movable jaws, however, remain ungummed. Thus, when the label arrives at the partial label-applying station, adhesive has been spread on the entire surface of the label except for the small and negligible ungummed areas covered by the teeth of the movable jaws.

The label is unclamped from the turret at said station by opening movement of its movable jaw, and wide band portions of its gummed or adhesive bearing surfaces are pressed against and adhered to the surface of the container arriving at said station by cooperating presser mechanism within the turret. Then the container bearing the label partially adhered thereon is moved beyond the initial partial label applying station to a further position at which position the label is completely pressed against the container by appropriate mechanism.

As adhesive has been applied to the major areas of the label as described and only the minor small areas covered by the teeth of the movable jaws have remained ungummed, substantially complete adhesion of the entire label to the container occurs. As a matter of fact, the pressure applied between the label and the container at said further position in completing the adhesion between the two also may cause some oozing spread of adhesive into the small ungummed areas so that even these thereby become adhered to the container.

Other objects and features of the invention are the provision of novel means for removing labels successively from a label magazine by adhesion, with partial gumming of a selected area of each label as it is re-

moved by said means in advance of seizure of the label by pick-off and transferring mechanism and gumming of the remainder of the label.

Other objects and features of the invention are the provision of means for operating the label remover means relative to the label magazine and of means for oscillating the latter during operation.

Additional objects and features of the invention are the provision of controlled means to exert pressure on the pile of labels in the label magazine toward the delivery end of the label magazine which is sufficient to provide a reasonably firm abutment for the leading label at the moment the adhesive bearing surface of the label removed means arrives for engagement with and adhesion to such leading label in the magazine, thus insuring full contact between adhesive bearing surface and adhesive receiving area of the label and temporary adhesion between the two.

Other objects and features of the invention are to provide novel means for applying adhesive to the label removing means.

Other objects and features of the invention are the provision of simple mechanisms for operating the various components of the machine in a coordinated manner and to provide for high speed labeling of containers.

Other objects and features of the invention will become apparent from the following description and the accompanying drawings wherein:

Figure 1 is a plan view of a machine embodying the instant invention;

Figure 2 is a perspective elevational view of the partial adhesive-applying, label remover means in relationship to the label magazine and turret-like pick-off and transfer mechanism;

Figure 3 is a similar perspective view of the components of Figure 2 seen from behind the label magazine;

Figure 4 is a sectional view taken along the plane of line 4—4 of Figure 2;

Figure 5 is a sectional view on a horizontal plane of Figure 1 between its upper and lowermost planes illustrating the position of the label remover means in relationship to the label magazine and with respect to the roller means for gumming a surface of the label remover means as well as the label pick-off and transfer means and main label gumming means, and various structural details of these components;

Figure 6 is a diagrammatic fragmentary view illustrating the position of parts of the label remover means at an approach position of its gummed surface to the leading label in the label magazine;

Figure 7 is a similar diagrammatic view illustrating a position of parts of the label remover means as its adhesive bearing surface moves into engagement with the leading label in the magazine;

Figure 8 is a diagrammatic view illustrating the position of parts of the label remover means as its gummed bearing surface begins to remove the adhered leading label from the label magazine;

Figure 9 is a diagrammatic view illustrating a further position of the label remover means as it withdraws the leading label by adhesion from the label magazine and before such label has been seized by pick-off and transfer mechanism;

Figure 10 is a diagrammatic view illustrating the position of parts immediately prior to stripping of the adhered label from the label remover means by the pick-off and transfer mechanism;

Figure 11 is a similar diagrammatic view showing completion of jaw closing of the stripping or pick-off and transfer mechanism just prior to stripping of the adhered label from the label-remover means;

Figure 12 is a similar view illustrating the position of the parts immediately after stripping of the label from the label-removing means has occurred;

Figure 13 is a diagrammatic view illustrating the positioning of the label by the turret-like pick-off and transfer mechanism for application to a container at the initial partial label-applying station;

Figure 14 (Sheet 4) is a fragmentary perspective view illustrating the finger means by which labels are retained as a pile within the label magazine;

Figure 15 is a similar perspective view illustrating the release position of the retaining finger means of the label magazine when the leading label thereof is to be removed;

Figure 16 (Sheet 8) is a perspective view of the label magazine and its associated mechanisms;

Figure 17 is a fragmentary, partially broken away perspective view illustrating the nature of the area of the leading edge of the label to which adhesive is applied by the label-remover means as its adhesive bearing surface removes a leading label from the label magazine;

Figure 18 is a fragmentary, partially broken away elevational view of the label remover means;

Figure 19 is a sectional view taken along the plane of line 19—19 of Figure 18;

Figure 20 is an elevational view of the pick-off and transfer mechanism;

Figure 21 is a sectional view taken along the plane of line 21—21 of Fig. 20;

Figure 22 is a fragmentary elevational view of the driving mechanism for operating the various components with a common motor;

Figure 23 is a sectional view taken along the plane of line 23—23 of Figure 22;

Figure 24 is a fragmentary perspective view illustrating the station of the machine at which completion of pressing of labels to containers is effected; and

Figure 25 (Sheet 8) is a perspective view of a container to which a label has been applied by the machine of this invention.

Referring to the drawings and first to Figures 1 to 5 and 24, the various mechanisms of the machine in assembly are arranged with reference to a table **10**. These mechanisms include, generally, conveyor means **11** for containers, means **12** for spacing the containers on the conveyor means, means **13** (Figure 24) for clamping the containers on a conveyor means in spaced condition, a label magazine **14**, label remover means **15** for withdrawing labels individually from the label magazine by adhesion, pick-off and transfer means **16** for seizing labels adhered to the label remover means and for transferring them to a label-applying station I, means **17** for applying adhesive to non-adhesive bearing portions of the label during such transfer, means **18** (Figure 5) for partially applying a portion of the adhesive-bearing labels successively to containers arriving at the label-applying station I and means **19** at a completion station II beyond the label-applying station for completing the adhesion of the labels partially applied at station I to the respective containers.

All of these means are appropriately positioned relative to each other and with reference to the surface of the table **10**. Driven portions of these means are operated by appropriate driving means **20** (Figures 22 and 23), preferably located below the surface of the table **10** and enclosed, for example, by a protective apron or casing **21**.

The conveyor means **11** is conventional and comprises an endless band **22** including horizontal upper flight. The upper horizontal flight of the band **22** provides a substantially horizontal surface on which the containers C to be labeled are moved. The band **22** is driven preferably in a continuous manner by any conventional driving mechanism (not shown) so that the upper flight of conveyor band **22** moves continuously, for example, in the direction of the arrows shown in Fig. 1.

A pair of guide rails **23** and **24** as positioned at opposite sides of the upper flight of the conveyor band **22** extend parallelly with its direction of movement. One

of the guide rails 23 is adjustable transversely relative to the other rail 24 in order to accommodate differently dimensioned containers C to which it may be desired to apply labels. The selected containers C to be labelled are placed either manually or mechanically on the upper flight of the conveyor band 22 at, for example, its extreme left with their bottoms resting on the band. Friction causes these containers C to move forwardly with the conveyor band 22 to the spacer means 12, for example, of the conventional worm type.

This spacer mechanism comprises, for example, a worm groove 24 on a shaft 25. The shaft 25 is driven by any suitable mechanical means (not shown). On rotation of spacer shaft 25, its worm groove 24 engages the container C arriving at its starting end and in its rotation acts to separate successive containers C uniform distances apart on the conveyor band as they emerge successively from the groove 24.

The uniformly spaced-apart condition of the containers C as they leave groove 24 is maintained by the positive clamping means 13. This clamping means 13 in the embodiment shown (Figures 2 and 3) is provided by the vertically adjustable endless band 26 which is trained around the guide pulleys 26*a*, 26*b* and 26*c*. These pulleys are carried on a horizontal vertically movable frame part (not shown). Vertical adjustment of said frame and band 26 is effected in conventional manner to accommodate containers of different heights.

At least the outer surface of clamping band 26 is of cushion-like material such as rubber or the like so that it will press resiliently against the upper ends of the containers C as they pass under the lower flight of said band 26 just as they leave the worm groove 24 of the spacer mechanism 12. The pressure of the lower flight of band 26 on the containers C provides a resilient clamping action which maintains the containers C in a clamped regularly-spaced condition on conveyor band 22 until the containers C move out from under the lower flight of said band 26 at a later stage as will be described. The band 26 is freely rotatable around its pulleys 26*a*, 26*b* and 26*c* and moves at the same speed as conveyor band 22 when containers C are clamped between the two.

While the containers C are maintained in this clamped condition, each, as it moves past an initial partial label-applying station I, has a label L partially applied thereto as seen in Figures 13 and 24. After such partial application of a label L to each succeeding container C at station I, the containers are moved beyond said station I to a further label application completion station II which lies beyond the label-applying station I and at said station II the partially-adhered labels L are completely pressed against and adhered to their respective containers.

The labels L which are intended to be partially adhered to the containers at the label-applying station I are transferred individually and successively to said station from a pile in a horizontally oscillatable label magazine 14 (Figures 1, 2 and 3). This label magazine 14 has sets of retaining fingers 27 and 28 at opposite sides of its outlet end past which each label must be drawn for removal from the pile in the magazine. The fingers 27 at the innermost side of the magazine may be moved to release or clearing positions temporarily, as will be described (see Figures 14 and 15). A ram or pusher 29 serves to urge the labels in the pile against the fingers 27 and 28. Pressure is maintained on the ram as by a cord 30 secured at one end to the pusher guide rod 31 and after passing over a pulley 32, at its other end to a counterweight 33. The pressure of the ram 29 on the pile P of labels in the magazine acts to provide an abutment for the label pile for purposes presently to be described. Means are provided, as will be described, for momentary release movements of the fingers 27 which, when it occurs, permits the leading label in the pile to be withdrawn from the magazine. The horizontal table 34 which carries the label magazine 14 is oscillated in synchronism with movements of other parts as will be described.

The successive leading labels L of the pile within the magazine 14 are withdrawn individually from said magazine by adhesion to an adhesive-bearing surface 35 on a head 36 of the movable label-remover means 15. In the embodiment shown, two diametrically-disposed heads 36 are provided on the label remover means 15. Each of the heads 36 performs a double function. Its surface 35 engages a leading label in the pile on the magazine and withdraws it. Also each surface 35 applies adhesive by transference to a partial area L*g* (Figure 17) of the surface of each label L that it withdraws from the pile in the label magazine. The temporary adherence of a label L to each surface 35 acts, when its head 36 is moved away from the label magazine, to withdraw an adhered label from said magazine. The movement of such surfaces 35 of the label remover means 15 away from the label magazine 14 carries the respective labels L adhered to them successively to a position for seizure therefrom by the rotary label pick-off and transfer mechanism 16.

Label remover means

In the embodiment shown, the label remover means 15 includes two vertically supported, diametrically located heads 36 (Figures 1, 2, 3, 4 and 17). Each head 36 is secured to a vertical shaft 37 which is rotatably carried in a block 38. Block 38 is secured to a driven vertical shaft 39. A removable member 40 which includes an adhesive-bearing surface 35 is secured to each head 36. Spaced-apart notches or recesses 41 (Figure 2) are provided along one longitudinal edge of each member 40 and its surface 35 for purposes to be presently described. Each surface 35 is intended to have adhesive spread thereon cyclically as the heads 36 are moved in a circular orbit during rotation of block 38. Each time adhesive has been so spread on a surface 35, the latter is moved thereafter during the orbital movement of the head 36 into pressing surface contact with a small area L*g* of the leading label then in the magazine M. Oscillation of the head supporting shafts 37 occurs during periods of the orbital motion to position the surfaces 35 properly both to receive adhesive and for face to face engagement with the label surface or to prevent such engagement. The engagement causes temporary adherence of a leading label in the magazine to said surface 35 and also a transference of adhesive therefrom to the contacted area L*g* of the label from the surface 35.

The rotatable shafts 37 which carry the heads 36 extend through the block 38. Cranks 42 are secured to the shafts 37 below block 38 and are equipped with cam followers 43 which track a cam surface 44 in a horizontally disposed cam plate 45 (Figures 4–8 incl.) mounted on the table 10. Biasing springs 46 are secured respectively at 47 to the heads 36 and to pins 48 attached to the block 38. These springs function to bias the cam followers 43 toward cam surface 44 so that, during orbital movement of the heads 36 about the axis of the block-carrying shaft 39, oscillatory swiveling motion may be imparted to the respective heads 36 on the respective axes of their support shafts 37. The effect of this swiveling oscillation of the heads is to effect lateral motions of the surfaces 35 during their orbital travel so that said surfaces may have adhesive applied effectively thereto by the adhesive-applying mechanism 17 as will be de-described in one position of their orbital travels and also in another position be swung for effecting a firm pressing engagement of such an adhesive bearing surface with the leading label in the magazine to cause temporary adhesion of such label thereto, and immediately thereafter be swung or oscillated reversely to initiate withdrawal of the adhered label from the label magazine.

A crank 49 is positioned on the under side of cam plate 45 and pivoted at 49*a*. This crank has an edge surface 50 (Figure 19) which is biased by action of a

biasing spring 51 toward a cam path altering position for the cam followers 43. The crank 49 is provided at another portion with a trip nose 52 which is normally engaged by a pivoted latch 53 (Figure 1). This latch 53 in turn is provided on a pivoted bell crank 54. The crank 54 is biased by a spring 55 (Figure 5) to normally maintain the latch 53 in engagement with nose 52. A link 56 (Figure 1) connects the crank 54 with an arm 57 of another pivoted bell crank 58 whose other arm 59 as a feeler normally is positioned by the biasing action of spring 55 to lie in the path of travel of successive containers C on conveyor band 22 after they have left the worm groove 24 of spacer 12. This engagement displaces feeler arm 59 and causes latch 53 to free trip nose 52, thus freeing crank 49 and permitting the cam follower 43 of a head 36 to shift crank 49 against the action of spring 55 and to ride on the portion of cam surface 44 which is otherwise masked by the surface 50 of crank 49 in the described untripped condition of the latter. The said portion of cam surface 44 is so shaped that it permits the head 36 of the particular cam follower 43 to swivel in response to the action of springs 46 and of said portion of said cam surface. Thus, surface 35 of the swivelled head 36 will lie in a position to engage the leading label in the magazine. If no container, however, should appear on the conveyor to effect the described tripping of feeler arm 59, the locked condition of crank 49 will prevent the cam follower 43 from following the said portion of cam surface 44 because surface 50 of crank 49 will mask surface 44 and the particular head 36 will not at this time be swivelled to bring its surface 35 into a position to contact with the leading label in the label magazine, thus providing a safety device and waste preventer by preventing withdrawal of a label from the magazine when there will be no container present at the label-applying station I to which it can be applied.

The movable label magazine fingers 27 on the inner side wall of label magazine 14 (Figure 16) are disposed parallelly in slots 60 and are secured to a pivoted yoke 61 carried by a spindle or shaft 62 so that the outermost ends of fingers 27 may be moved inwardly of the magazine side wall to engage the leading label of the pile in said magazine, or swing outwardly to a label-releasing position. Levers 63 are secured to the yoke at 64 and respectively to biasing springs 65 which normally bias the yoke 61 and fingers 27 carried thereby into label-engaging position. The adjustable stops 66 limit the biasing action of said springs. A trip lever 67 is secured to the spindle 62. This trip lever 67 has its outermost end positioned to be engaged by a nose 68 on each crank 42 in one of the positions of the latter as effected by operation of its cam follower 43 as controlled by the position of the edge surface 50 of the crank 49. When such engagement occurs, the trip lever 67 rotates spindle 62, yoke 61, and fingers 27 to a release position outwardly of the magazine, to permit withdrawal of that leading label in the magazine 14, which has become adhered to the surface 35 of the particular associated head 36. Immediately upon completion of label release, the trip lever 67 is released by nose 68 permitting fingers 27 to return to label-gripping position under action of springs 65.

The label magazine table 34 itself is preferably provided with horizontal oscillatory movement. To this end, it is supported as by a vertical shaft 69 which also has a crank 70 secured thereto. This crank is coupled to the link 70*a* and via this link is coupled to an eccentric 71 on a driven rotary shaft 72 (Figure 16) so that driven rotary motion of the latter imparts oscillatory horizontal motion to the magazine 14 about shaft 69 as a center. This oscillation, as will be described, is synchronized with movements of other parts to facilitate proximate tangency between an adhesive-bearing surface 35 of each head 36 as the said surface arrives opposite the leading label in the magazine so as to adhere to and remove such label therefrom.

In the embodiment shown, two heads 36 are carried by rotary block 38 and are located at diametrically opposite points. If desired, one head 36 only, or more than two heads 36 symmetrically disposed on block 38 may be utilized. Similarly, the heads 36 may receive required motion in relationship to the magazine 14 and to the roller 75 by other mechanisms than those specifically described. Such motion could, in fact, be reciprocal rather than rotary in nature. The embodiment presently described, however, is deemed preferable.

The various components of the label magazine 14 may be adjusted in conventional ways so that differently dimensioned labels may be introduced into the magazine 14 for application to the same or different types of containers. In addition, the elevation of said magazine 14 may be adjusted to position labels for application therefrom to containers at any selected container level. This latter adjustment may be accomplished, for example as illustrated in Figure 3, by the use of elevator screws 73 and associated frame parts 74 for raising and lowering the label magazine table 34.

Adhesive applying means

It is necessary once during each orbital trip of each head 36 to apply adhesive to its surface 35 in advance of the face to face engagement of such adhesive-bearing surface 35 and the surface Lg of a leading label in the label magazine. In the embodiment shown, adhesive is applied to each surface 35 in the required manner by causing these surfaces successively to sweep past and in engagement with an auxiliary gummed or adhesive application roller 75. This roller 75 is supported on a vertically-disposed axle or shaft 76 for free rotation as in a bearing 77. This bearing is so positioned that the periphery of auxiliary application roller 75 makes rolling contact with the surface of a main adhesive-dispensing roller 78, so that adhesive spread upon the surface of main roller 78 by delivery from a dispensing nozzle 79 and spread to substantial uniformity of depth thereon by an adjustable doctor blade 80, will be transferred to the surface of auxiliary applicator roller 75.

The main adhesive dispensing or gumming roller 78 as seen in Figures 1 and 2 is supported vertically on a driven shaft 81. The roller 79 rotates with driven shaft 81, and the adhesive dispensed by the nozzle 79 near the upper end of roller 78 moves downwardly onto the outer surface of said roller. It is spread uniformly on this surface by the doctor blade 80. The latter is biased as by springs 82 whose pressure is adjustable as by bolts 83 to regulate the thickness of the adhesive layer spread onto the surface of said roller 78. The adhesive is conveniently pumped to nozzle 79 by appropriate means from a reservoir (not shown). A sump 84 underlies main roller 78 and serves to collect adhesive dripping therefrom for recirculation.

Only main roller 78 is positively driven by driven rotation of its shaft 81. Adhesive is transferred from the surface of main roller 78 to the surface of auxiliary roller 75 by contact which also serves to turn the latter roller.

During orbital movement of the heads 36 on rotation of block 38, the circular and non-circular portions of cam surface 44 control the extent of axial swing or swivel of the head shafts 37 of respective heads 36 so that their adhesive-receiving surfaces 35 are swung on the axes of their shafts during their normal circular orbital travel first to provide tangent contact between each surface 35 and the adhesive-bearing surface of auxiliary roller 75 as each surface 35 sweeps past such roller to effect a transfer of adhesive thereto. Thereafter in the continuous orbital movement of the heads 36, the surface 35 bearing transferred adhesive is carried to a location approximately 180° beyond the transfer position without substantial shift in relative angular disposition to the orbital path for adhesive engagement with a leading label in the label magazine 14.

If a container C on conveyor 22, however, has operated

feeler lever 59 so as to release trip nose 52 of the crank 49 in this period of orbital motion of the particular head 36, the crank 49 and its surface will yield as the particular cam follower 43 arrives for engagement therewith so that an unchanged portion of cam surface 44 remains engaged by such cam follower 43 and relative swiveling disposition of adhesive bearing surface 35 remains unchanged. In consequence, as seen in Figures 6 and 7, the adhesive bearing surface 35 approaches the outer face of the leading label L in the magazine 14 which at this time is swinging in opposite direction in a circular path substantially tangent to the orbital path of said surface 35. When contact between adhesive-bearing surface 35 and the outer face of the leading label occurs as in the position depicted in Figure 7, pressure is exerted by adhesive-bearing surface 35 against said outer face. This causes temporary adhesion of the said label L to said surface and also transfer of adhesive from surface 35 to the label face in a pattern Lg (Figure 17) conforming substantially to the contour of the surface 35.

Immediately beyond the engagement position as depicted in Figure 7, continued rotation of head-carrying block 38 causes cam follower 43 which controls the particular head 36 to whose surface 35 the leading label L is adhered to move onto a changed portion of cam surface 44, which then acts to swing head 36 and its surface 35 in a direction outward of and away from the magazine 14. This camming action also at this time functions to position the nose 68 (Figure 14 and 15) of crank 42 so that it simultaneously engages trip lever 67 and thereby causes a momentary release movement of gripping fingers 27 so that the inner edge of said leading label L is freed and may be swung outwardly away from said label magazine by said head 36 as is depicted in Figure 8. Further rotation of block 38 causes the particular head 36 with a leading label L adhered to its surface 35 to draw the said label outwardly of said magazine, as is seen in Fig. 9. The gripping fingers 27 in the interim also have been restored by action of their biasing springs 65 to retaining position in advance of the next succeeding label in said magazine 14. The oppositely directed oscillating movement of label magazine 14 effected by the action of crank 71 (Figure 16) during this particular period as denoted by the arrows in Figures 6–9 incl. facilitates initial contact, adhesion, separation and withdrawal of each said leading label adhered to a surface 35 from the pile in the magazine. Oscillation of the magazine can, if desired, however, be eliminated.

Upon completion of withdrawal of a leading label from the magazine, the further continued rotation of said block 38 causes the head 36 bearing such a withdrawn label to bring the latter to a pick-off and transfer position at which appropriate pick-off and transfer mechanism 16 serves to strip the label arriving at such position from the surface 35 of head 36 bearing it for transfer to the label-applying station I. When two heads 36 are utilized as in the embodiment shown, two labels normally are withdrawn from the label magazine for each revolution of the block 38, the number withdrawn per revolution of the block being usually consonant with the number of heads 36 carried by said block, unless there is an intended failure of withdrawal caused by non-appearance of a container as has been described.

Pick-off and transfer mechanism (Figures 2–5 incl.)

The pick-off and transfer means 16 in the embodiment shown is of a rotary turret type and may be similar to that of Manas Patent 2,873,040, dated February 10, 1959, modified, however, as required for the particular purposes of this invention. As provided herein, this pick-off and transfer mechanism includes a pair of spaced-apart discs 85 and 86 secured for rotation with a driven vertically-disposed shaft 87 extending upwardly of table 10 and driven as will be hereinafter described.

The peripheries of these discs 85 and 86 are provided with equi-spaced, aligned recesses or notches 88 and 89. These notches respectively have the radially-directed portions 90 and 91. Fixed jaw members 92 span the space between discs 85 and 86 and are secured to the respective radially directed portions 90 and 91. These fixed jaws 92 and the discs 85 and 86 provide a rotary turret frame 93 which is rotated by driven shaft 87.

Movable gripping means 94 are provided on the turret frame 93. These means 94 include spaced-apart gripping fingers or teeth 95 (Figures 3, 20 and 21) which are pivotally supported on a pivoted bar 96 spanning the discs 85 and 86. These teeth or fingers 95 are movable toward and away from the fixed jaws 92. The number of teeth 95 and their spacing corresponds to the number and spacing of notches 41 (Figure 2) in the pad 40 and surface 35 of the head 36. The movable jaw teeth 95 as seen in Fig. 3 are mounted on bar 96 to whose rockable support shaft 97 one end of a rock lever or crank 98 is secured. A cam follower 99 secured to rock lever 98 rides on a stationary cam 100 positioned about turret shaft 87, said cam 100 being secured against rotation in any conventional way. A biasing spring 101 maintains contact between each cam follower 99 and said stationary cam 100 so that during rotation of the turret frame 93, the teeth 95 are oscillated or swivelled toward and away from the fixed jaw 92 so that said teeth 95 may alternately engage and disengage said fixed jaw 92.

The position and shape of cam 100 is such that the movable jaw teeth 95 are in open position relative to the fixed jaws 92 as they arrive at the pick-off point or position for removing individual labels L from successively arriving heads 36 as seen in Figure 10. At that instant the leading label L removed from magazine 14 and adhered to a surface 35 of a particular head 36 is in a position within the path of travel of a fixed jaw 92 and almost engaged by the latter. At that instant, the cam follower 99 (Figure 21) moves into a portion of cam 100 which permits the movable teeth 95 associated with the particular fixed jaw 92 to snap closed through the notches 41 in surface 35 of said head 36 against the said associated stationary jaw 92, thus clamping the portions of the label L aligned with the notches 41 between said fixed jaw 92 and the teeth 95 as seen in Figure 11. At the instant of such clamping of the label L, the linear speeds of head 36 and of the turret 93 are alike. Immediately after said clamping occurs, the particular head 36 swings on its shaft 37 as it moves out of the turret orbit and clear of the clamped jaw and teeth because of rotation of block 38 and action of cam followers 43. As a result, the clamped label as seen in Figure 12 is stripped from the surface 35 of the said head 36 by the clamped teeth 95 and jaw 92 and they carry the clamped label along during further continued rotation of turret 93.

The gripped label L (Fig. 12) at this time has an area Lg (Figure 17) which has been gummed because of transfer to it of adhesive from the surface 35. This gumming does not, however, occur on those small portions Lu of the label which were aligned with notches 41 of surface 35. Hence, when the teeth 95 clamp the label to jaw 97 they engage only ungummed small areas Lu. Thus no adhesion of labels to jaw teeth 95 will occur.

The major area Lm of each succeeding label L seized by the pick-off and transfer turret 93 still require application of adhesive to it. This is effected during further rotation of turret 93 as they are carried around by it to the label-applying station I. This application of adhesive is effected by main adhesive applying roller 78 by movement of each gripped label L by the turret 93 past the surface of the said roller.

To assist in application of adhesive to each area Lm of successive labels, presser feet 102 (Figures 2, 5, 10, 11, 12, 20 and 21) are provided on the turret 93, one for operation in conjunction with each set of gripping teeth 95 and its associated stationary jaw 92. The presser feet 102 each respectively is secured to a pivot bar 102a which is supported rotatably in a crank 103a which is secured

to a rock shaft **103** extending respectively between discs **85** and **86**. The pivot **102***a* is also secured to a link **104***a* and the latter in turn is pivoted at **104***b* to a link **104***c*. Link **104***c* is pivoted on a fixed pivot pin **104***d* which is mounted on the lower plate **85** of the turret. A crank **105** is secured to each rock shaft **103** above upper turret disc **86** and is provided with cam follower **105***a* riding on a stationary cam **106** against which it is pressed as by a biasing spring **107**, connected at **107***a* to disc **86** and connected at **107***b* to a crank **108** which is secured to shaft **103** below disc **86**. The cam **106** is so shaped that each presser foot **102** normally lies retracted by action of spring **107** within the cylindrical envelope defined by the peripheries of discs **85** and **86** when its associated cam follower **105***a* rides on high portions of cam **106** and each presser foot **102** is swivelled radially outwardly of said envelope against the action of its associated spring **107** as its cam follower **105***a* rides onto lower portions of said cam **106**. The presser feet **102** may be covered at their outer surfaces with a resilient pad **109** of rubber or the like having desired contour.

The low portions of cam **106** are so disposed that as the turret **93** carrying a gripped label rotates from the position where a label has been picked-off from head **36** toward the main adhesive-applying roller **78**, the particular presser foot **102** directly behind the gripped label is swivelled outwardly sufficiently for its surface **109** to form a back stop for the gripped label as it is swept past the adhesive-applying roller **78**. Thus, the area L*m* of the label is pressed against said roller **78** and coated with adhesive from said roller. Parts of area L*g* of the label also are recoated by this movement past said roller **78**. Thus, all areas of the label except the small areas L*u* which still are covered by teeth **95** are now coated with adhesive. The links **104***a* and **104***c* together with crank **103***a* serve as a so-called parallel linkage which acts to maintain a substantially linear in and out radial motion of pad **109** relative to the envelope defined by the discs **85** and **86** of the turret **93** during swivelling motion of crank **103***a* under action of cam follower **105***a*.

The gripped label L bearing adhesive in its areas L*g* and L*m* is then moved beyond adhesive-applying roller **78** by the continuously rotating turret **93** and to the label-applying station I (Fig. 13) at which station a container C arrives at substantially the same time. Just after the leading edge of the gripped label sweeps slightly past the center of station I, the movable teeth **95** move away from the associated fixed jaw **92** to release the leading edge portion of the label L. Simultaneously presser foot **102** is moved outward under action of cam follower **105***a* toward container C to press a wide band-like area of the gummed label against said container C. Since only the negligibly small areas L*u* of the label are ungummed, adhesion of a wide band of the label adjacent to its leading edge L to the container C thus occurs at said station I. The surface speed of cushion or pad **109** at this time is equal substantially to speed of conveyor **22**, so that as it yields while being pressed toward the container, it effects a susbtantial wide band of adhesion between the label and the container at said station I.

As the label-bearing container C is moved by the conveyor **22** in continuous motion of the latter beyond the initial label-applying station I, it carries the partially-adhered label therewith to the label application-completing mechanism **19** at a station II (Fig. 1).

This mechanism **19**, in the embodiment shown, comprises an endless belt **110** trained about a pair of pulleys **111** and **112**. The belt **110** may be entirely of or else have an outer resilient surface **113**, for example, of sponge rubber. This belt **110** is positioned so that its inner flight lies to one side of conveyor **22** and moves in the same direction. One or both pulleys **111** and **112** may be driven to provide desired surface speed to the belt **110**. The inner flight of the belt **110** is backed preferably as by an appropriate adjustable guide plate **114**. A backing bar **115** is mounted on brackets **116** which are adjustable horizontally over the top of table **10**. Backing bar **115** extends in parallelism with the inner flight of belt **110**, and is spaced therefrom in accord with the dimensions of the containers passing between the belt and bar.

As each partially-adhered label-bearing container C is moved beyond station I toward station II by conveyor **22**, it moves between the facing flight of belt **110** and bar **115**. Resilient surface **113** of belt **110** yields and the moving belt whose speed may be somewhat in excess of the speed of conveyor **22** serves to roll the label-bearing container C on its vertical axis in counterclockwise direction the unadhered portions of the label L to be wrapped around the container and pressed into smooth adherence therewith.

If the containers are parallel faced, e.g. rectangular in section rather than cylindrical, the belt **110** at such time moving preferably at the same speed as container **22** serves to press or iron the label onto the container by action of its resilient surface **113**. The adjustability of bar **115** permits accommodation of differently-dimensioned containers merely by shifting of brackets **116**.

It is understood, of course, that the containers C become unclamped from conveyor **22** in advance of their arrival between belt **110** and surface **115** by moving out from under the lower flight of clamping band **26** as seen in Fig. 2.

Other mechanism for completing adhesion of the label to the container at station II may be utilized such as that of the afore-mentioned Manas patents or other known mechanisms.

Driving means

The driving means **20** which provides for rotation of required components is illustrated diagrammatically as seen in Figures 22 and 23. It includes an electric motor **117** which is coupled via a clutch **118** on its output shaft **119** to a drive gear **120**. This gear **120** meshes with the gear **121** which serves to rotate the turret shaft **87** and thus to rotate turret **93**. Gear **121** also meshes with a gear **122** which turns the main adhesive roller shaft **81**. In addition, gear **121** meshes with another gear **123** which drives the shaft **39** of block **38** which carries the heads **36**. Other appropriate gears (not shown) meshing either with gear **121** or gear **120** may be utilized to impart required driven rotation to the conveyor **22**, the worm spacer shaft **25**, the belt pulleys **111** or **112** and to the pump (not shown) which circulates adhesive to roller **78** via nozzle **79**.

The clutch lever **124** serves to operate clutch **118** either to couple or uncouple gear **120** to or from motor shaft **119** so that a single control manipulation will serve to initiate and halt driven movement of the entire machine and its movable parts even if power to motor **117** remains on. Other conventional means for effecting continuous drive of moving parts in appropriate synchronized relationship are possible and are contemplated.

Operation

Containers C to be labelled are positioned on conveyor **22** in advance of the spacing means **12**. Labels L are loaded into label magazine **14** so that the first leading label is maintained pressed against fingers **27** and **28** by action of weight **33** and ram **29**. Adhesive is fed to main adhesive-applying roller **78** via dispensing nozzle **79**. The motor is then started and clutch lever **124** is manipulated to connect gear **120** to drive shaft **119**. This initiates movement of conveyor **22**, the rotation of worm spacer **24**, the rotation of main glue-applying roller **78**, the rotation of turret **93**, the rotation of block **38** and consequently of heads **36** thereon in an orbital path, oscillating movement of the label magazine **14** and movement of the belt **110**.

The unlabeled containers C placed at the entrance end of the machine are advanced by the continuously moving

conveyor 22 to the spacer worm groove 24 which engages and spaces the individual contains C so that they lie at uniform distances apart after leaving said groove. The upper ends of successive spaced containers directly then pass under the lower flight of clamping band 26 which thereafter maintains the containers in clamped condition on moving conveyor 22. The clamped uniformly-spaced, unlabeled containers C are then further advanced by conveyor 22 toward the initial partial label-applying station I. As each clamped container C passes the feeler arm 58 which lies in its path of travel as seen in Figure 1, it causes the latch 53 to trip and to release trip nose 52, thus freeing crank 49 so that its surface 50 will not affect the operations of that cam follower 43 which next approaches it and the movements effected by the latter will be governed only by the shape of cam surface 44. Thus, the one of the two orbitally moving heads 36 associated with the particular cam follower 43 and to whose surface 35 glue or adhesive has been applied by contact with adhesive roller 75 in advance of the freeing of crank 49, now during continued rotation of block 38 approaches the leading label L in label magazine 14. Cam surface 44 acts on said particular follower 43 as the particular head 36 so approaches said label to swing the adhesive-bearing surface 35 into pressing engagement with the surface of said label as shown in Figure 7.

The label-retaining fingers 27 are then momentarily moved to release the said leading label by action of nose 69 on finger operating lever 67. As this occurs, the head 36 is swung to cause the leading label now temporarily adhered to it to withdraw said label and clear the fingers 27 which immediately thereafter return to label-retaining position in magazine 14 as nose 68 clears lever 67. The head 36 bearing the withdrawn label continues in its orbital path with continued rotation of block 38 as seen in Figure 9 carrying the withdrawn label to the pick-off and transfer position of Figure 10.

At the time of such arrival, the turret 93 has rotated so that one of its fixed jaws 92 and associated set of gripping teeth 95 lies at a position as shown in said Figure 9, so that the fixed jaw 42 lies directly behind the leading edge of the gripped label while teeth 95 are in a position to close which they now do as seen in Figure 11 under action of stationary cam 100 on the associated cam follower 99. The teeth 95 during closing movement pass through the notches or slots 41 in head 36 and clamp the label firmly against the associated fixed jaw 92. Continued movement in orbit of head 36 and also rotation of turret 93 move the particular head 36 out of the path of travel of the turret teeth and jaws and strip the gripped label from the surface 35 of said head as is seen in Figure 12. The gripped label is now carried by the turret 93 as seen in Figure 5 past the main glue-applying roller 78 which by contact applies adhesive to the portion L*m* of said label. The gripped adhesive bearing label is then further carried by further continued rotation of turret 93 to the initial partial label-applying station I. On arrival there the cam 100 acts on cam follower 99 of the particular gripping teeth 95 to move them to release position. Likewise the cam 106 then acts on cam follower 105*a* associated with the particular presser foot 102 directly behind the released label to shift its resilient surface 109 against said label and to press a wide band thereof against the surface of a container C which arrives at said station I at the same time. This effects partial adherence with a wide band of adhesion between the label and the particular container C.

This container C now bearing the partially-adhered label thereon moves beyond said station I toward station II and in so doing moves out from under the clamping band 26 so that the container is unclamped. As it arrives at station II, it enters the space between the fixed guide bar 115 and the inner flight of belt 110 whose surface 113 yields and frictionally engages the container with sufficient force to rotate the container and in so doing to wrap and press the unadhered portions of the adhesive-bearing label to the container. The container with a label fully adhered thereto then further is advanced by conveyor 22 beyond said station II to the delivery or exit end of the machine for hand or mechanical removal as desired.

As will be observed, all phases of the labelling procedure are effected in a continuous manner from the time of positioning of a container onto the conveyor 22 at the entrance to the machine until its delivery at the exit end thereof. All parts are in continuous motion during this time. In the embodiment shown, two labels are withdrawn with each revolution of head carrying block 38 because two heads 36 are located thereon, unless for some reason there is a container missing on conveyor 22 and feeler arm 58 is not tripped. Failure to trip such arm prevents removal by heads 36 of labels from the magazine 14 as long as no containers C are present on conveyor 22 in a position to arrive at the label-applying station I at a time synchronized with arrival there of a label for application. This avoids waste of labels.

A machine of the character herein described is capable of labelling containers at a rate upwards of 200 per minute without waste. Moreover, since only the minute areas L*u* of negligible size actually remain ungummed during application of adhesive, substantially the entire label surface will become adhered to the container. In fact, the ironing or pressing action at station II by belt 110 probably in most cases causes sufficient oozing of adhesive from gummed areas of the label into the ungummed areas L*u* as to practically obliterate the latter and insure substantially complete adhesion between labels and containers in all areas thereof.

Although a specific embodiment of the invention has been described, variations in structure within the scope of the appended claims are possible and are contemplated. There is no intention, therefore, of limitation to the exact details shown and described.

What is claimed is:

1. In a labeling machine for substantially completely adhering a label to a container, including a label magazine, means to urge labels in said magazine toward a delivering end, means to retain the labels in said magazine, means for operating said retaining means for releasing individual leading labels successively from said magazine, remover means for withdrawing the successively released labels individually from said magazine by adhesion to a part of the area thereof upon their release, means for applying adhesive to said remover means, means for picking off each label adhered to said remover means and transferring such label individually to a label-applying position with adhesive on a part of its area as received from said remover means, and separate means for application of additional adhesive to each picked off label in residual non-adhesive bearing parts of its area during its transfer to the label-applying position.

2. The machine of claim 1 in which said remover means includes a rotary block, a plurality of independent heads swingably supported for oscillatory motion on said block, means for rotating said block to move said heads in an orbital path, and means for oscillatorily swinging said heads during such movement.

3. The machine of claim 1 in which said remover means includes a rotary block, a head swingably supported for oscillatory motion on said block, means for rotating said block to carry said head in orbital motion, and means for oscillatorily swinging said head during this orbital motion.

4. In a labeling machine having a label magazine, means for releasing leading labels successively and individually from said magazine, adhesive means for removing the successive leading labels individually from said magazine, said last-named means comprising an orbitally movable head movable toward and away from the label magazine, said head also being oscillatorily swingable and having a surface which in one position of swing of the head during

its orbital motion engages a leading label in the magazine and in a previous position during its orbital rotation has adhesive applied thereto so as to adhere labels to said surface in said first-named position and means for applying adhesive to said surface in said second-named position of rotation.

5. In a labeling machine, a label magazine, finger means for retaining the labels within the magazine, means for moving said finger means to a release position for releasing successive leading labels individually from said magazine, adhesive-bearing means adapted to be applied to the successive leading labels in the magazine for individual removal of such labels from the magazine on their release by said finger means by temporary adhesion to said adhesive-bearing means, means for picking-off the labels individually and temporarily adhered to said adhesive-bearing means after removal by the latter of each individual label from the magazine and for transferring each picked-off label to a label-applying position, and additional means for applying adhesive to non-adhesive portions of each such picked-off label during its transfer to said label-applying position.

6. In a labeling machine, a label magazine, finger means for retaining the labels within the magazine, means for urging the labels against said finger means, means for moving said finger means to a release position for releasing successive leading labels individually from said magazine, an orbitally movable adhesive bearing head adapted to be applied to the successive leading labels in the magazine for individual removal of such labels from the magazine on their release by said finger means by temporary adhesion to said adhesive-bearing head, means for applying adhesive to said head in advance of its application to successive leading labels in the magazine, means for picking-off each label individually and temporarily adhered to said adhesive-bearing means on each removal by the latter of such a label from the magazine and for transferring each such picked-off label to a label-applying position, and separate means for applying adhesive to non-adhesive bearing portions of each such picked-off label during its transfer to said label-applying position.

7. In a labeling machine, means for substantially completely adhering a label to a container comprising a label magazine, remover means for individually removing labels from said magazine by adhesion of a partial area of the surface of each succeeding leading label in the magazine to a corresponding surface of said label remover means, means for applying adhesive to said surface of said label remover means in advance of its engagement with each succeeding label, means for orbitally moving said remover means in a path toward and away from said magazine, means for retaining the labels in the magazine and for successively releasing each particular leading label individually during withdrawal movement of such label from the magazine by said remover means, means for picking-off and transferring each removal label adhered to said surface of said remover means and transferring it to a label applying position for partial application to the container and separate means for applying adhesive to non-adhesive bearing areas of each removed label during such transfer.

8. In the labeling machine of claim 7, means to prevent said remover means from withdrawing the leading label from the magazine unless a container is present in the machine that will arrive at said label applying position in time to receive such label, and means for completing the application of the label to the container at a position beyond said label-applying position.

9. In a labeling machine, means for adhering a label to a container comprising a label magazine containing a pile of labels, finger means engageable with edges of labels in the magazine for retaining the labels therein, means for moving said finger means to a release position relative to an edge of each succeeding leading label for releasing such edge and leading label individually from the magazine, an orbitally movable label remover head having a surface adapted to receive adhesive, said surface being swingable during its orbital motion to a position to engage and adhere to the leading label in the label magazine and thereafter to a position to move the released edge of the leading label clear of said magazine to permit its withdrawal therefrom by adherence to said surface, means for so moving said head and surface, means for applying adhesive to said surface prior to its engagement with said leading label, means for maintaining a back-up pressure on the pile of labels during engagement of said surface and said leading label, pick-off and transfer mechanism for seizing the label adhered to said surface after its withdrawal from the magazine and for transferring it to a label applying position and separate means for applying adhesive to non-adhesive bearing portions of the picked-off label in its transfer to said label applying position.

10. In the machine of claim 9 a plurality of said heads for acting successively as afore-said on successive leading labels.

11. In a labeling machine including a label magazine, having a pile of labels therein, an adhesive distributing roller, an auxiliary adhesive distributing roller in rolling contact with said first-named roller, an orbitally movable and swingable label remover head, means for so moving and swinging said head, said head having a surface engageable with said auxiliary adhesive distributing roller to receive adhesive therefrom during a portion of the orbital motion of said head, and in a later position during orbital motion of said head with adhesive thereon being movable into pressing contact with a leading label in said pile for adhesion thereto and for subsequent withdrawal of the said label from the label magazine by such adhesion, and means for picking-off each label adhered to said surface after its withdrawal from the magazine and for transferring it to a label-applying position for application there to a container and during such transfer moving the picked-off label past said first-named adhesive distributing roller to apply adhesive to each label in areas thereof not receiving adhesive by transference from said surface.

12. In the machine of claim 11, means to prevent said pressing contact if no container will be available at said label-applying position when a transferred label arrives at such position.

13. In a labeling machine, conveyor means for continuously moving containers to be labeled successively past a label-applying position, a label magazine, means for retaining labels within the magazine, means for moving said retaining means to a release position for releasing successive leading labels individually from said magazine, adhesive bearing means adapted to be applied to the successive leading labels in the magazine for individual sucessive removal of such labels from the magazine on their release by said retaining means by temporary adhesion to said adhesive-bearing means, means for applying adhesive to said adhesive bearing means in advance of its application to the leading label in the magazine, means for picking-off successively the individual labels temporarily adhered to said adhesive-bearing means after their removal by the latter from the label magazine and for transferring each such picked-off label to said label-applying position for application to a container simultaneously arriving at said position on said conveyor means, separate means for applying adhesive to non-adhesive bearing portions of each withdrawn label after it has been picked-off and during such transfer, and presser means for pressing each adhesive bearing label arriving at the label applying position to a container simultaneously arriving thereat with said conveyor means for effecting partial and wide band adhesion of such label and such container, and means beyond said label-applying position for completion of adhesion

of each such label to the container to which it has been partially applied at said label-applying position.

14. In the machine of claim 13, means for preventing application of said adhesive bearing means to a leading label if no container will arrive simultaneously therewith at the label-applying position.

15. A labeling machine comprising a label magazine for a pile of labels, retaining members at the outlet end of said magazine, means for applying pressure to said pile toward said retaining members, release means for operating said retaining members at predetermined times to release successive individual leading labels from the pile, label remover means for successively removing leading labels individually from said pile, means for orbitally moving said label remover means to and from the outlet end of said magazine, said remover means including a head having an adhesive receiving surface engageable with the leading label of said pile for adhesion to said leading label and for removal of the leading label by such adhesion during orbital motion of said label remover means, means for applying adhesive to said surface during an earlier portion of the orbital motion of said label remover means, said retaining members retaining said labels in said pile during orbital motion of said label remover means but moving to release the leading label after its adhesion to said surface of said label remover means to permit withdrawal of the adhered leading label from said pile, means for picking-off each label withdrawn and adhered to said surface and transferring it to a label applying position and separate means for applying adhesive to non-adhesive bearing portions of such label during such transfer.

16. In the machine of claim 15, means for oscillatorily swinging said head during its orbital movement and for oscillating said label magazine to effect optimum adhesive contact conditions between the adhesive bearing surface of said head and said leading label and clearance movement of said head relative to the magazine during withdrawal therefrom of the leading label by said head.

17. In the machine of claim 16, cam means for operating said head swinging means.

18. In a labeling machine, means for adhering a label to a container comprising a label magazine, means for retaining labels within the magazine, means for moving said retaining means to a release position for releasing successive leading labels individually from said magazine, an orbitally movable label remover head having a surface adapted to receive adhesive, said surface being movable against a leading label in said magazine for adhesion thereto and then away from said magazine to withdraw said leading label therefrom on its release by said retaining means by such adhesion, pick-off and transfer means for removing the label withdrawn from said magazine and adhered to said surface and for carrying such label to a label applying position, means for applying adhesive to said surface in advance of its engagement with said leading label, and separate means to apply additional adhesive to the label during its transfer by said pick-off and transfer means to said label-applying position.

19. In the machine of claim 18, said head and surface having clearance notches, and said pick-off and transfer mechanism including a fixed jaw and movable clamping teeth which latter may pass through said notches to clamp a non-adhesive bearing portion of a label adhered to said surface against said fixed jaw so as to strip the label from said surface during movement of said pick-off and transfer mechanism after clamping has been effected.

20. A labeling machine for adhering a label to a container comprising a label magazine for a pile of labels, finger means for retaining labels within the magazine, means for moving said finger means to a release position for releasing successive leading labels individually from the pile of labels in the magazine, remover means for withdrawing successive leading labels individually from said pile by adhesion after their release by said finger means, means for orbitally moving said remover means, means for oscillatorily swinging said remover means during its orbital motion, means for applying adhesive to a surface of said remover means in one position of its orbital motion during a period when said surface is remote from the label magazine, said surface when bearing adhesive and during its orbital motion being swingable and movable against the leading label in a pile of labels in said magazine for adhesion thereto as it is released by said finger means and then being movable away from said magazine to withdraw the leading label from the magazine by said adhesion, pick-off and transfer mechanism for then seizing the leading label adhered to said surface and withdrawn from the magazine and carrying it to a label-applying position and separate means for applying further adhesive to such seized leading label during its transit to said label-applying position.

21. The machine of claim 20 wherein said remover comprises a plurality of spaced-apart separate heads each having one of said adhesive receiving surfaces, said surfaces each having notches, and wherein said pick-off and transfer mechanism includes movable teeth that may pass through said notches to engage a non-adhesive bearing portion of a label adhered to such surface and in further movement strip it from the latter.

References Cited in the file of this patent

UNITED STATES PATENTS

2,764,408	Weiler	Sept. 25, 1956
2,830,724	Manas	Apr. 15, 1958
2,862,638	Banks	Dec. 2, 1958
2,873,040	Manas	Feb. 10, 1959

FOREIGN PATENTS

351,578	Germany	Apr. 10, 1922
156,004	Austria	Apr. 25, 1939

UNITED STATES PATENT OFFICE

CERTIFICATION OF CORRECTION

Patent No. 2,967,636 January 10, 1961

Herman David Manas et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 12, line 14, before "the", first occurrence, insert -- causing --; column 13, line 2, for "contains" read -- containers --; column 15, line 56, for "removal" read -- removed --.

Signed and sealed this 6th day of June 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents