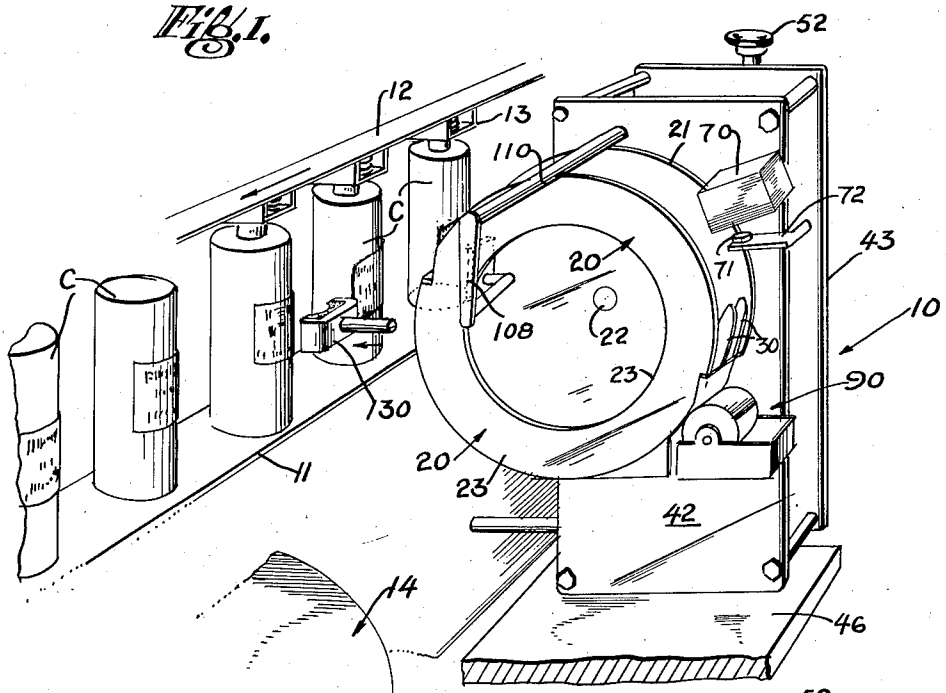
April 15, 1958 H. D. MANAS 2,830,724

UNIVERSAL LABEL APPLYING DEVICE

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Fig. 1.



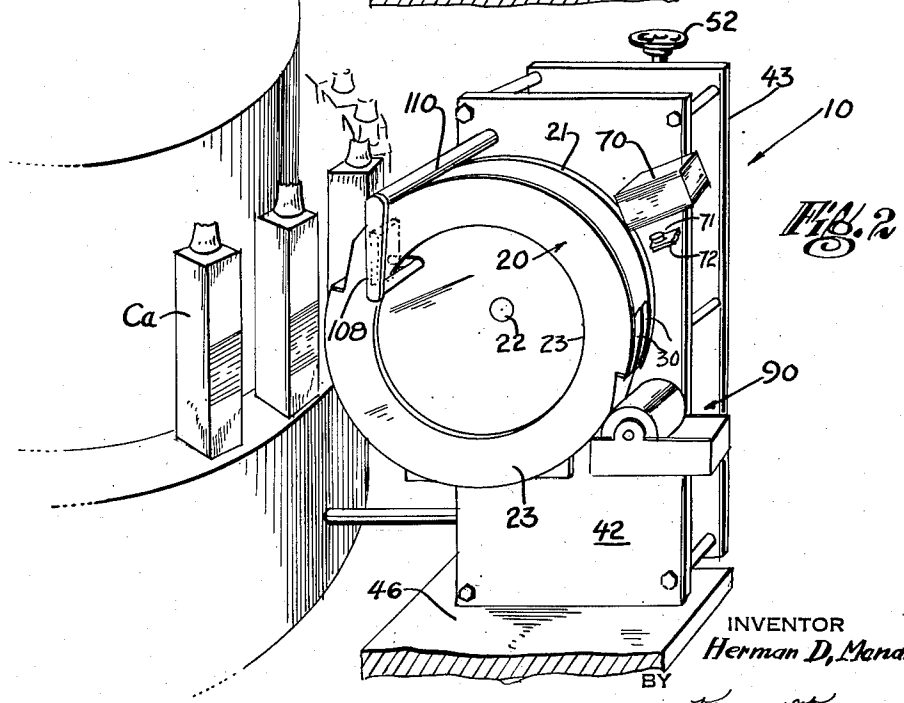


Fig. 2.

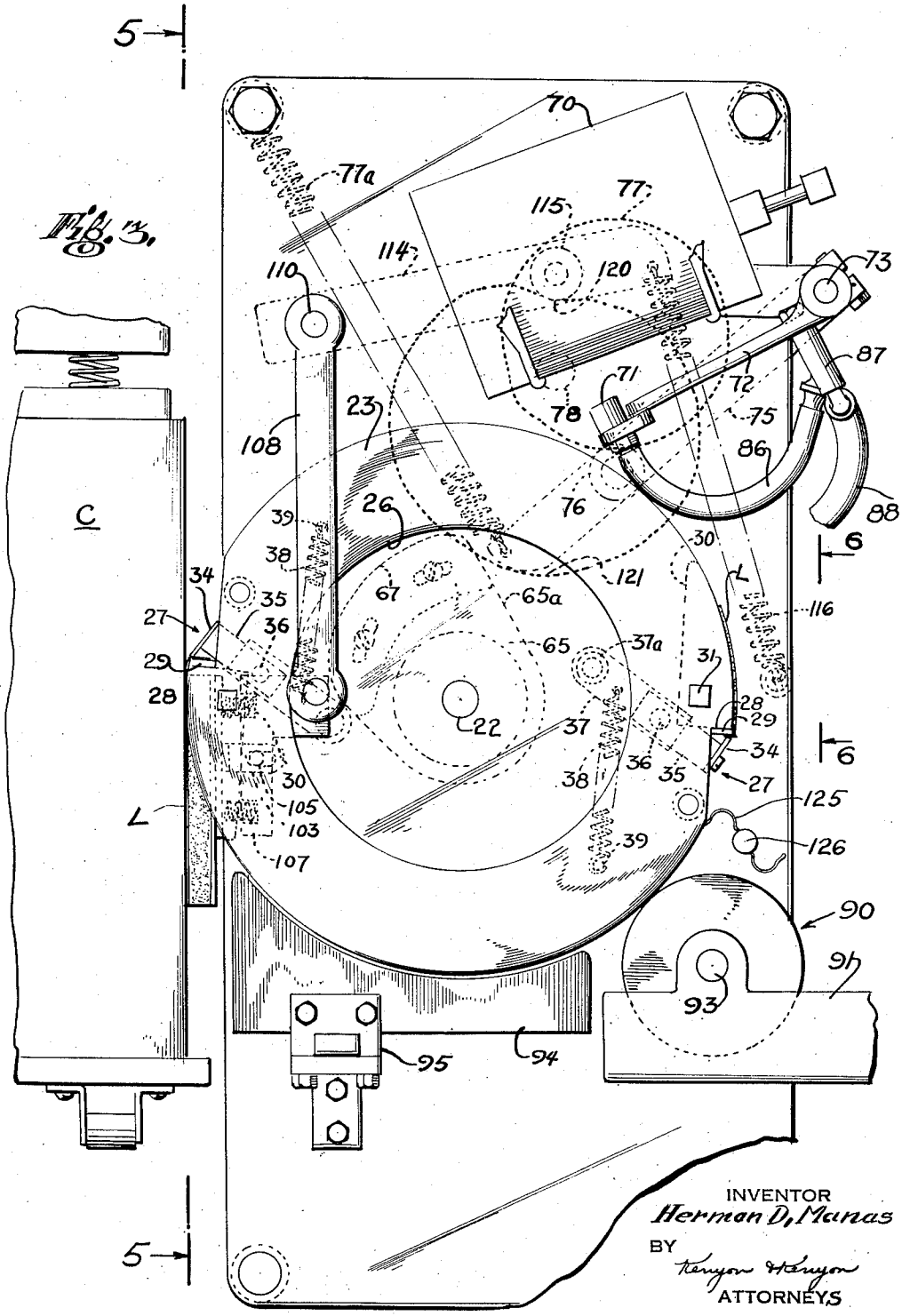
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Herman D. Manas
BY
Kenyon & Kenyon
ATTORNEYS

April 15, 1958 H. D. MANAS 2,830,724

UNIVERSAL LABEL APPLYING DEVICE

Filed April 14, 1955 5 Sheets-Sheet 2

Fig. 3.

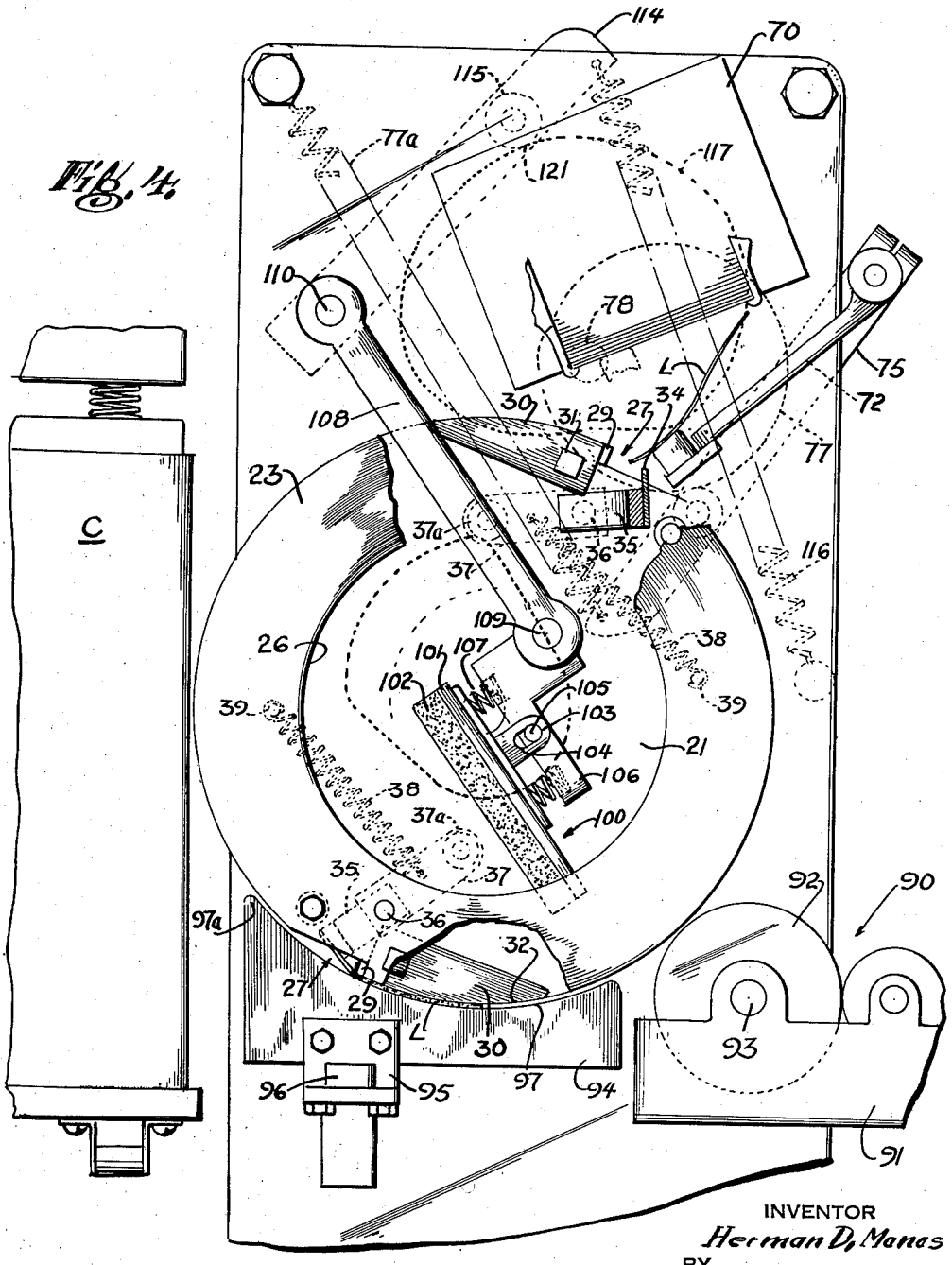


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UNIVERSAL LABEL APPLYING DEVICE

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Fig. 4.



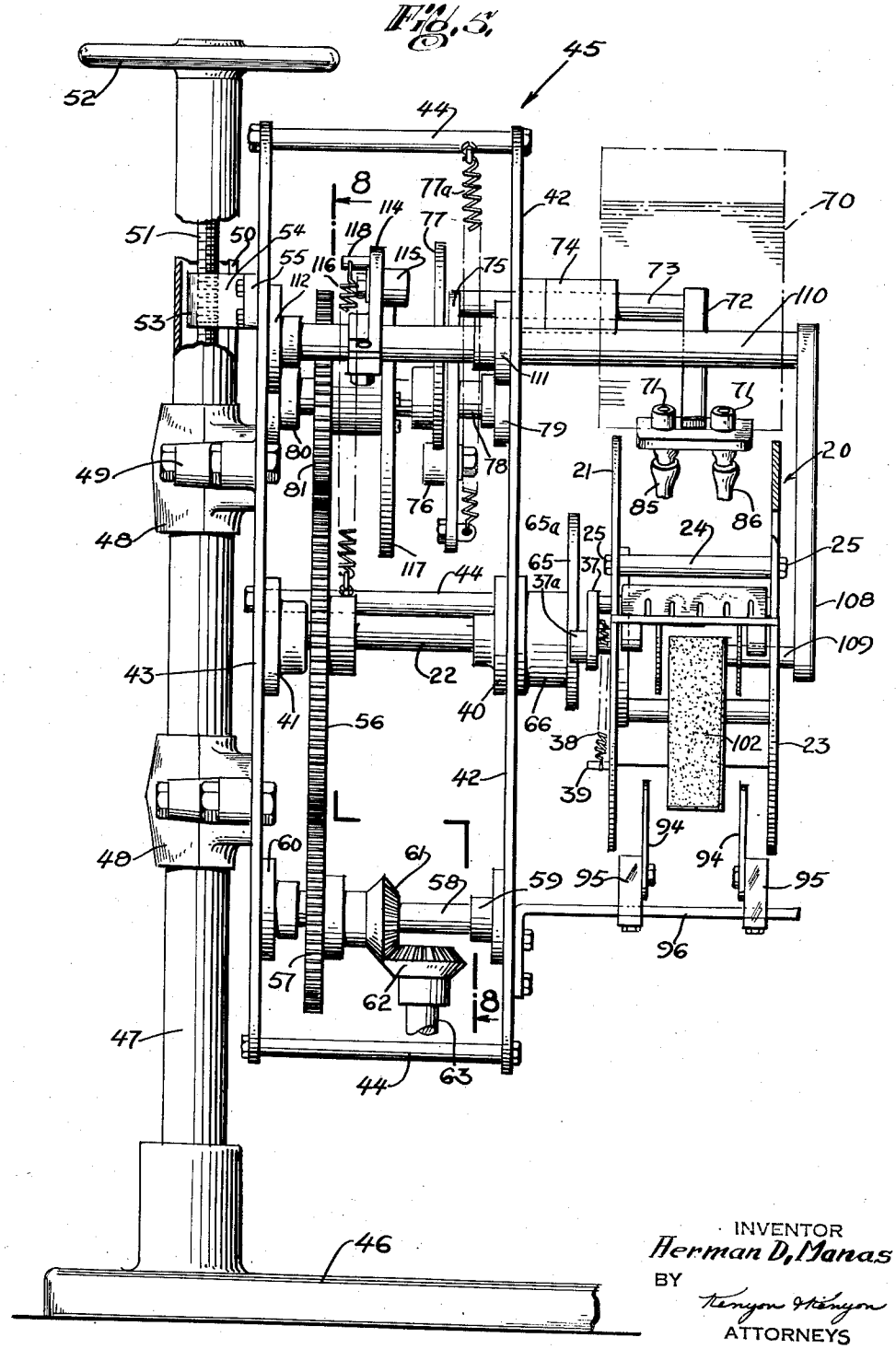
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Fig. 3.



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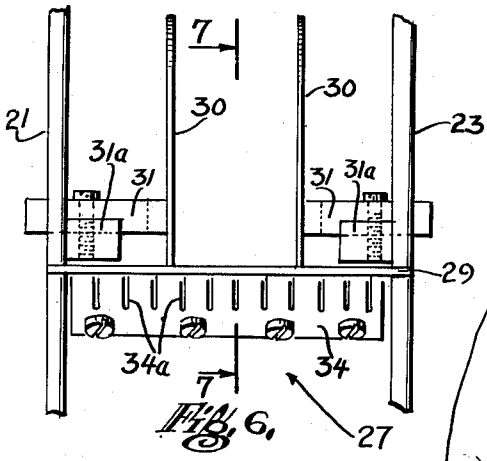


Fig. 6.

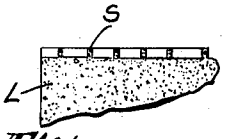


Fig. 9.

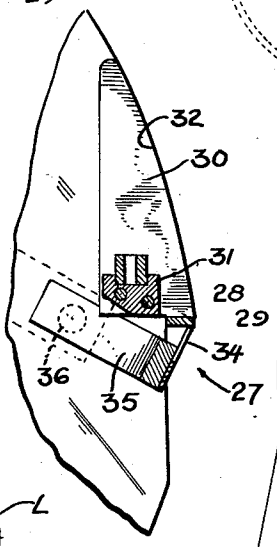


Fig. 7.

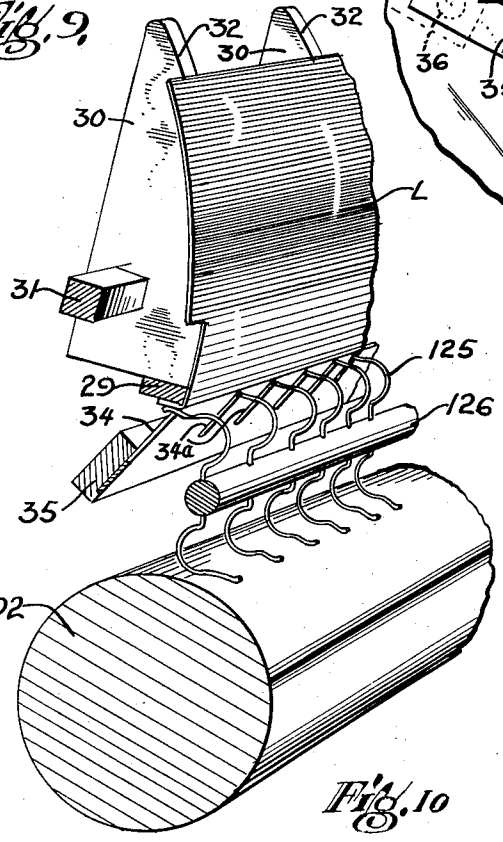


Fig. 10.

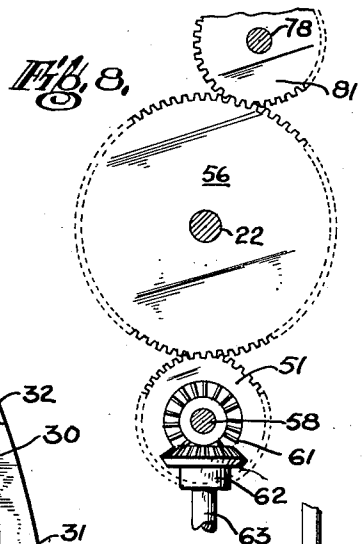


Fig. 8.

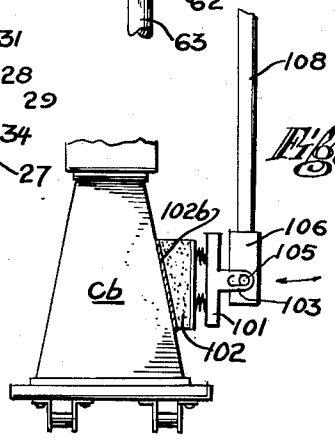


Fig. 11.

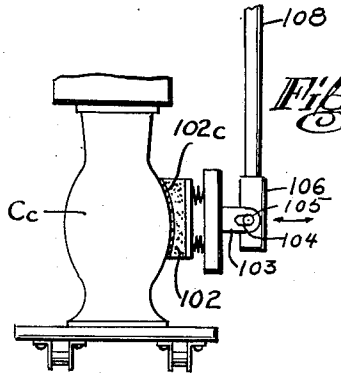


Fig. 12.

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United States Patent Office

2,830,724

Patented Apr. 15, 1958

2,830,724

UNIVERSAL LABEL APPLYING DEVICE

Herman D. Manas, Brooklyn, N. Y., assignor to M. R. M. Machinery Co., Inc., Brooklyn, N. Y., a corporation of New York

Application April 14, 1955, Serial No. 501,277

9 Claims. (Cl. 216—55)

This invention relates to labeling machines and more particularly to a universal label applying device that may be utilized for transferring labels from a label magazine to a container which is being moved past the device.

The device is intended to apply labels successively to containers by transferring the labels individually from a label magazine to a label applying position. The transfer is effected in such a way that the label arrives at the labeling position synchronously with the arrival there of the container to which the label is to be applied. Speedy labeling with some known transfer mechanisms has proved difficult because of the fact that the mechanisms were not capable of keeping pace with the speed of the containers requiring labeling.

Moreover, in the past it has been necessary to design the label applying devices or transfer mechanisms for use specifically with the particular package or container feeding machinery involved. Thus, for example, if the package conveying machinery were of a linear intermittent or of a continuous motion type, it became necessary specially to design the transfer mechanism intended to operate therewith. Further, if, for example, the conveyor mechanism were of the intermittent or continuous rotary feed type, similar special design questions occurred.

In addition to these factors, existing transfer mechanisms are not readily adaptable for use with containers of varying dimensions and shapes. For example, known transfer mechanisms designed for applying labels to regular cylindrical containers of specific dimensions are found to require material readjustment, often of complex character, merely to adapt the transfer mechanism for use with regular cylindrical containers of smaller or larger dimensions. In addition, if the containers have oddly or irregularly shaped profiles, such existing transfer mechanisms cannot be used therewith without extensive and often expensive remodification.

Principal objects and features of this invention are the provision of a universal label applying device capable of use without any material modification for labeling of all types of containers irrespective of their shapes and dimensions, and capable of use with all types of container feeding machinery.

Other objects and features of the invention are the provision of an effective universal label applying device that will serve to transfer individual labels from a label magazine to a label applying position at high speed.

Further objects and features of the invention are the provision of a label applying device of this character in which simplicity of mechanical detail is a major factor.

Still other objects and features of the invention are the provision of a device of this character which is capable of being rapidly and simply adjusted for the labeling of containers of any shape or dimension with labels of any size or shape in any type of container conveying machinery.

Further objects and features of the invention will become apparent from the following specification and the accompanying drawings, wherein:

Figure 1 is a perspective and partially diagrammatic view of the universal label applying device of this invention arranged for operation with linear container moving machinery;

Fig. 2 is a similar view of the universal label applying device of this invention arranged with respect to a rotary type of container moving machinery;

Fig. 3 is a side elevation of the label applying device of this invention;

Fig. 4 is a similar side elevation of the device of Fig. 3, with parts shown in a different operating position from their positions as shown in Fig. 3, the figure being partially broken away to illustrate certain structural details;

Fig. 5 is an end elevational view, as seen from the plane taken along line 5—5 of Fig. 3, and viewed in the direction of the arrows;

Fig. 6 is a fragmentary end elevational view, as seen from the plane taken along line 6—6 of Fig. 3, and viewed in the direction of the arrows;

Fig. 7 is a fragmentary sectional view taken along line 7—7 of Fig. 6 and viewed in the direction of the arrows;

Fig. 8 is a partially diagrammatic view taken along line 8—8 of Fig. 5 illustrating details of the gear train that is utilized for driving the device of this invention;

Fig. 9 is a fragmentary plan view of a label viewed from its under side to which adhesive has been applied during its transfer in the device of this invention;

Fig. 10 is a fragmentary perspective view of an arrangement for use in connection with this invention in order to apply adhesive stripes to those label areas that normally are covered by label grippers and which cannot be brought into contact with the usual adhesive applying rollers; and

Figs. 11 and 12 diagrammatically illustrate the versatility of the device of this invention for use in the application of labels to containers whose contours are other than that of ordinary regular cylinders, Fig. 11 showing use of the device in connection with label application to a frustro-conical container, and Fig. 12 showing a similar use in connection with a container of bulging contour.

Referring to the drawings and first to Figures 1 and 2 the reference character 10 generally denotes the universal label applying device embodying the invention. In Figure 1 the device 10 is shown located at a labeling station in front of containers C which are being moved along a linear path in a clamped condition between a pair of conveyors 11 and 12. The uppermost conveyor 12 is provided with conventional spring actuated clamping members 13. These clamping members serve to maintain the containers in a clamped and rigid condition between the conveyors 11 and 12, particularly during the period beginning just prior to the arrival of the containers at the label applying station and ending at a point beyond the labeling station when label application has been completed as will be hereinafter described.

In the embodiment shown in Figure 1, the linear movement of the conveyors 11 and 12 may be either continuous or intermittent.

The same universal label applying device 10 is shown in Figure 2 in operating relationship at a labeling station with respect to a rotary type of conveyor mechanism for containers C_a. The containers C_a in the embodiment shown merely for illustrative purposes are of a different shape from the containers C of Figure 1. It is to be understood, however, that the shape and dimensions of the containers in either Figure 1 or Figure 2 are immaterial insofar as the adaptability of the label applying device 10 for use therewith is concerned. The rotary type container conveyor 14 shown in Figure 2 is intended to be a diagrammatic representation of any continuous

or intermittent rotary type container conveyor machinery. It is understood that such machinery usually includes some type of conventional clamping means (not herein shown) for maintaining the containers in a rigid immovable condition during their passage past the label applying station.

Universal label applying device

The universal label applying device 10 which is illustrated in detail in Figures 3 to 8, inclusive, includes a rotary skeleton-like turret member 20. This turret 20 is adapted to be rotated about a preferably horizontally disposed axis. The turret 20 includes a substantially circular plate 21 which is supported for rotation with a horizontally disposed shaft 22. A ring 23 of substantially the same diameter as the plate 21 is supported in spaced apart concentric relationship from the plate 21, for example, by cross or tie bars 24. These tie bars 24 are secured, respectively, at their opposite ends to the plate 21 and the ring 23 by the securing bolts 25. A sufficient number of tie bars 24 is provided to maintain a rigid support of the ring 23 from the plate 21. The inner diameter of the ring 23 is relatively large as compared with the width of ring 23 to provide a large center clearance hole 26 whose purposes will presently appear.

The outer peripheries of the plate 21 and of the ring 23 are both provided with a pair of diametrically disposed recesses or notches 27. These notches 27 have radially directed portions 28. Transverse members 29 span the space between the plate 21 and the ring 23 and are secured to the radially directed portions 28 of the recesses 27. A pair of segmentally shaped label guides 30 are located adjacent each transverse member 29. These guides 30 are each carried on a polygonally shaped cross bar 31 extending into the space between the plate 21 and the ring 23 (see Figs. 4, 6 and 7). The guides 30 are adjustably movable toward and away from each other and may be clamped in adjusted positions through the agency of adjustment clamps 31*a* or by any other conventional clamping means. The curved edges 32 of the guides 30 have substantially the same radius of curvature as that of the outer peripheries of the plate 21 and ring 23. The guides 30 are normally supported by the transverse members 31 so that their curved surfaces 32 lie in the envelope defined by the outer peripheries of plate 21 and ring 23. The guides 30 are adjustable relative to each other on the transverse members 29 so that labels of different widths may be conveniently and easily accommodated simply by a relative shift of the two guides 30 toward or away from each other.

Gripping means including finger-like grippers 34 are provided. These fingers 34 are movable toward and away from the transverse members 29 which are secured to the radial portions 28 of the recesses 27. These fingers are supported at an extremity of a rock lever 35. Each rock lever 35 is supported on a transverse shaft 36 which is supported rotatably by the ring 23 and the plate 21. A lever 37 is carried by each shaft 36 and is provided with a cam follower 37*a* for purposes presently to be described. A biasing spring 38 is connected to each lever 37 and to, for example, a pin 39 (Fig. 5) extending from and secured, for example, to the plate 21. Each spring 38 is under tension and is intended to bias its lever 37 in a rotary direction which tends to urge fingers 34 toward the transverse bar 29 of a particular recess 27 for label gripping purposes.

The shaft 22 which carries the turret 20 is supported for rotation as by the bearings 40 and 41 (Fig. 5) which are respectively carried by the frame plates 42 and 43. These frame plates 42 and 43 are maintained in spaced-apart parallel relationship by the cross rods or bars 44. The frame 45 which is defined by plates 42, 43 and the cross rods or bars 44 is supported for vertical adjustment in any conventional manner. For example, as shown in Figure 5, a base 46 is provided with a vertically upstanding hollow post 47. Guides 48 are adjustably carried on the post 47 and are secured to the frame plate 43 so that the entire frame 45 may be moved vertically in guided manner on the post 47 as well as being angularly adjustable relative to the vertical axis of said post. Clamping means such as setting bolts 49 associated with the guides 48 serve to lock the frame 45 in any adjusted position on the post 47.

To facilitate accurate vertical adjustment of the frame 45 on the post 47, the latter is provided with a longitudinally extending slot 50. A threaded member or adjusting bolt 51 extending axially and internally of the post 47 from its upper end is provided. This bolt 51 has a hand wheel 52 at its outer end for convenient manipulation. A nut-like member 53 is threadedly engaged with the bolt 51 internally of the post 47. A flange 54 extends from the nut-like member 53 outwardly through the slot 50 and is secured at 55 to the frame plate 43. With this arrangement the vertical disposition of the frame part 45 may be adjusted conveniently and accurately by manipulation of the bolt hand wheel 52 after the set bolts 49 have been loosened. Upon completion of the adjustment the bolts 49 are, of course, preferably retightened.

The turret 20 is adapted to be rotated by the rotation of shaft 22. To this end a gear 56 is secured to the shaft 22 (Figs. 5 and 8). This gear, in turn, meshes with a gear 57 which is carried on a shaft 58. The shaft 58 is rotatably supported, for example, by the axially alined bearings 59 and 60. These bearings, respectively, are secured to the frame plates 42 and 43. The conical spur gear 61 is also secured to the shaft 58. This gear 61, in turn, meshes with a conical driving spur gear 62. This gear 62 is secured to a drive shaft 63. The drive shaft 63 is adapted to be driven in any conventional way, as by coupling, to a motor (not shown) or in any other conventional manner. Rotary drive of the shaft 63 thus imparts rotary motion to the turret 20 through the agency of the herein-described gear train.

The levers 35 which support the gripper fingers 34 are adapted to be swung automatically in opposite direction to the biasing actions of the springs 38 during desired periods of their rotation along with the turret 20. To this end a cam 65 is secured to an extension 66 of the bearing 40 so that the peripheral surface 65*a* of the cam 65 will lie in the path of travel of the cam followers 37*a*. As can be seen from Figure 3, the cam 65 has a generally wedged shape contour whose maximum angular width is substantially less than 90°. The highest or most remotely positioned arc portion 67 of cam 65 is less than 1¼ radians in length. This arc portion 67 is so disposed with respect to the axis of shaft 22 that in the major portion of each revolution of the turret 20, the cam followers 37*a* are entirely clear of any portion of the peripheral surface 65*a* of cam 65. Once during each revolution of turret 20 each of the cam followers 37*a* rides on to the arc portion 67 of said cam 65. In doing so each cam follower 37*a* rotates the shaft 36 with which it is associated against the biasing action of its associated spring 38 and in consequence moves the associated gripper fingers 34 out of clamping action with the radially directed surface 28 of the associated recess 27. As soon as a cam follower 37*a* rides off the high portion 67 of the cam 65, its associated spring 38 acts to restore the associated grippers 34 to their clamping position.

In the embodiment shown, the high point or arc portion 67 of the cam 65 is so disposed relative to the axis of the shaft 22 that the release action on the gripper fingers 34 will commence at approximately the 180° position of a clockwise rotation of turrent 20 and be maintained to approximately the 270° position in said clockwise turrent rotation for purposes presently to be described.

A conventional type of label magazine 70 is supported in any desired manner, for example, from the frame plate 42 so that the discharge end of the label magazine overlies the space between the plate 21 and ring 23 of the turret 20 (Figs. 3, 4 and 5). The support is such that successive labels may be conveniently removed individually from the discharge end of the label magazine 70 and brought into a gripping position relative to one of the gripper means 34 of the turret 20. While any appropriate removing means may be utilized, a preferable arrangement as herein disclosed comprises suction heads or nozzles 71 secured to a lever arm 72. The lever arm 72 is, in turn, secured to a rotative shaft 73. This shaft 73 is rotatably supported in bearings 74 carried by the frame plate 42 and projects through the latter.

A second lever 75 is secured to the shaft 73 inwardly of the frame plate 42. This lever 75, in turn, is provided with a cam follower 76. The cam follower 76 is biased toward the periphery of an eccentrically mounted circular cam 77 by a biasing spring 77*a*. A circular cam 77 is mounted eccentrically on a rotary shaft 78 which is mounted in the respective bearings 79 and 80 carried by the frame plates 42 and 43. This shaft 78 carries a gear 81 which meshes with the gear 56 thus being driven whenever the latter gear is driven as hereinbefore described.

Suction is applied to the heads or nozzles 71 via flexible tubes 85 and 86 connected to a common coupling 87 which, in turn, is connected by flexible hose 88 to an evacuating device of conventional kind such as a suction pump (not shown).

The lever arm 72 which carries the suction nozzles 71 is so dimensioned that oscillation of arm 72 in response to the action of the eccentric cam 77 reciprocally oscillates the nozzles 71 toward and away from the outlet end of the label magazine 70. When in closest proximity thereto the suction at the nozzles 71 is sufficient to attract the lowermost label in the label pile within the label magazine 70 and to withdraw the said label from the label magazine. The timing of the cam 77 with respect to the rotary speed of the turret 20 is such that the nozzles 71 bring one of the edges of a withdrawn label L into the space between one of the transverse members 29 of a turret recess 27 and one of the grippers 34 which is spaced from such member 29 just prior to the time that cam follower 37 of the lever 35 carrying the grippers 34 rides off or is released by cam 65. (See Fig. 4.) When the cam follower 37 rides off or is released by cam 65, the biasing spring 38 snaps the gripper means 34 against the transverse member 29 and clamps the edge of the removed label L between the grippers 34 and the transverse member 29. (See Fig. 10.) The label gripped in this manner is then carried with turret 20 in its further rotation until it is applied to a container at the label applying station.

It can be seen, therefore, that the turret member 20 serves in its rotation to transfer labels individually from a label receiving position in its rotary path which lies in proximity to a label magazine, to a label applying position in front of a labeling station to which containers are individually brought. The axis of the support shaft 22 of the turret 20 preferably is horizontally disposed. As a result, the rotation of the turret 20 is effected in planes which are perpendicular to the axis of the shaft 22. The direction of rotation of turret 20 is selected so as to cause it to carry the labels picked up individually from the label magazine, first, downwardly past an adhesive applying mechanism 90 of conventional type and thence further around with the rotational movement of the turret 20 so that the adhesive bearing label arrives at the label applying position in a suspended and substantially vertical condition.

The adhesive applying mechanism 90 includes, for example, a reservoir 91 in which an adhesive applying roller 92 is partially submerged. The roller 92 is supported for rotation on a shaft 93. This shaft 93 is disposed in parallelism with turret shaft 22 and the dimensions of roller 92 are such that the outer periphery of the latter in an unsubmerged portion thereof lies substantially tangent with curved faces 32 of guides 30 and with the envelope defined by the outer peripheries of the componets of turret 20, namely, turret plate 21 and turret ring 23. In consequence, a label L gripped by the grippers 34 of the turret 20 has adhesive applied to its required surface during the rotation of the turret 20 which carries the gripped label past the adhesive applying roller 92.

It is necessary to prevent the adhesive bearing label from curling in the portion of its traverse between the adhesive applying roll 92 and the label applying position. To this end, guides 94 are supported below the turret 20, for example, by brackets 95 which, in turn, are mounted adjustably on a support 96 that is secured to the frame plate 42. The guides 94 each have a concave arcuate surface 97 whose radius of curvature is only slightly larger than the radius of curvature of the circular turret plate 21 and the circular turret ring 23. The guides 94 are carried by the support 96 so that their arcuate surfaces 97 lie concentric with the envelope defined by the turret plate 21 and turret ring 23. In consequence, as each adhesive bearing label being carried by the turret 20 leaves the adhesive applying roller 92 it is caused to pass between the arcuate surfaces 97 and the curved surfaces 32 of guides 30. This movement prevents the moistened adhesive bearing label from curling. The length of the arcuate surfaces 97 is sufficient to prevent curling of the label from a period of time beginning at a point closely adjacent the adhesive applying roller 92 to a point closely adjacent the label applying position. The terminal ends 97*a* of the arcs 97 are sufficiently remote from the 180° position of rotation of the turret 20 to permit the lagging ends of each succeeding gripped label to clear the said ends 97*a* just prior to the arrival of the gripped label at the label applying station. Thus, the adhesive bearing label is permitted to assume a vertically suspended position just as it arrives at the label applying position.

The relationship of the gripper controlling cam 65 and the cam followers 37 is such that the latter ride respectively onto the high points 67 of the cam 65 just as an adhesive bearing label assumes the aforesaid vertically suspended position. Thus, the grippers 34 holding a suspended label L are moved to a release condition at such time. Coincident with this release label depositing means 100 is activated to press the vertically suspended adhesive bearing label into adhering contact with a particular container C or C_a arriving at the label applying position.

The label depositing means 100 in the embodiment shown (Figs. 3, 4 and 5) includes a presser plate 101. This plate 101 is provided with a resilient covering 102, for example, of sponge rubber or the like. The plate 101 is supported pivotally by brackets 103 which have slots 104 that are engaged by pins 105. The pins 105 extend laterally from opposite faces of a support member 106. Springs 107 interposed between the support member 106 and the presser plate 101 provide a pivoted spring suspension of the presser plate 101 and its cushion 102 from the support 106.

The support 106 is secured to one extremity of a crank 108 as by a rod 109. The rod 109 extends laterally from the said extremity of the crank 108 and is so dimensioned as to dispose the support 106 in a centralized position between the spaced apart plate 21 and ring 23 of the turret 20. The rod 109 projects laterally through the opening or center hole 26 of the ring 23. The crank 108 is positioned adjacent to the ring 23 outside of the turret 20. The other extremity of the crank 108 is secured to a shaft 110. This shaft 110 is disposed in parallelism with the shaft 22 and is supported by the bearings 111 and 112 which are respectively mounted on the frame plates 42 and 43.

A crank 114 extends laterally from the shaft 110. This crank carries a cam follower 115. The cam follower 115 is biased by the spring 116 into engagement with a surface cam 117. For convenience, the biasing spring 116 is secured at its opposite ends respectively to a pin 118 attached to the crank 114 and at its other end to one of the cross rods 44. The surface cam 117 is secured for rotation with and on the driven shaft 78 which also carries the eccentric cam 77 and which is driven by the gear 81.

The surface cam 117 is provided, as seen in Figs. 3 and 4, with the low point 120 and the high point 121, there being a gradual transition or increase in symmetrical manner between the said low point and the said high point of said cam 117. When the cam follower 115 is engaged by the high point 121 of the cam, the crank 108 occupies the position shown in Fig. 4, at which time it maintains the presser plate 101 to its most remote position relative to a container at the label applying position. In a half revolution of the shaft 73 and of cam 117 the cam follower 115 under action of the spring 116 moves gradually into the low point 120 of the cam and in consequence shifts the crank 108 from the position shown in Figure 4 to that shown in Fig. 3 at which time the pad 102 on plate 101 is pressed toward the container C arriving at the labeling position. The resilience of the pad 102 yields enough to insure sufficient pressure against the adhesive bearing label L also arriving at the label applying station with turret 20 to cause the label to adhere to the container at least with a wide band of adhesion.

The width and length of the presser plate 101 as well as of the pad 102 are limited by the space available between the turret plate 21 and turret ring 23. The said dimensions are made sufficient so that coupled with the resilience of the pad 102 the applied pressure of the label against the container is sufficient to insure an initial wide band of adhesion between the container and the adhesive bearing label. Such wide band adhesion occurs even though the surface of the container is cylindrical or otherwise curved. It is important to provide this initial wide band adhesion in order to prevent accidental displacement of a label from the container to which it has been applied, as the container is moved from the label applying position to subsequent positions by the conveyors at which latter position the adhesion of the unadhered portions of the label to the container is effected. It is found in practice that unless initial wide band adhesion is used there is considerable likelihood of label displacement during container conveyance. The result is lack of uniformity of labeling.

It is to be understood, of course, that the timing of the cam 117 relative to the rotary speed of the turret 20 is such that the presser plate 101 will be moved as above described to arrive in a label pressing position and to apply a label vertically suspended from gripper members 34 of the turret 20 to a container simultaneously arriving at the labeling station at the proper periods during each revolution of the turret 20.

It is to be noted that the gripper members 34 cover a small marginal end portion of each label L during its transfer by turret 20 from the label magazine 70 to the label applying position. This covered area of the label because of its concealment by the cross bar 29 of the turret 20 will not come into contact with the adhesive applying roller 92. While this area is small and will not have any material effect on proper adhesion to a container if the label itself is large, occasions may arise particularly when smaller dimensioned labels are used in which such uncoated area which, of course, remains unadhered to the container becomes a problem. This unadhered area may be unsightly or else interfere with subsequent packaging operations. Provision is made, as shown in Fig. 10, to obviate this problem.

As can be seen from that figure, the individual grippers 34 are already provided with slots 34*a*. These slots 34*a* may be utilized to permit access to the concealed end area of each label of individual spring finger adhesive applicators 125. These applicators 125 are disposed in radial relationship from a rotatable shaft 126. This shaft 126 has its axis extending parallel with the axis of the adhesive roller 92 and is supported so that in rotation the spring applicator fingers 125 engage the adhesive carrying surface of the roller 92 and then move into the slots 34*a*. In the latter movement they carry adhesive from the roller 92 to the concealed end area of the label applying it thereto as stripes S as in the manner indicated in Figure 9. These stripes S are sufficient to provide adhesion to the container of what normally would be an unadhered end area of the label L.

The label pressing means 100 is not confined to use with containers C or C_a of regular cylindrical or rectilinear contour. It is adaptable equally for use with containers of other contours. For example, in Figure 11 the container C_b has conical contour. In such event, the only necessary change is either to provide the outer face of the sponge rubber cushion 102 with a sloping surface 102*b* that corresponds to the slope of the container C_b. In the alternative the contour of the cushion 102 need not be changed at all. Instead the presser plate 101 may be tilted on pin 105 relative to its support 106 so that the outermost plane of the sponge rubber pad 102 is disposed in parallelism with the container C_b.

As further seen in Figure 12, if the contour of the container C_c has an ogee shape, the outer contour surface 102*c* of the sponge rubber pad 102 may be changed to have similar complementary shape, thus permitting effective application of a label to the container C_c. In the alternative, the sponge rubber pad 102 may be of sufficient thickness to yield and bring the label into surface contact with the ogee contour of the container.

Any of the contours of the applicator pad 102 provides initial wide band adhesion of the label to the container to which it is applied. This wide band adhesion is important for reasons hereinabove pointed out.

The remaining unadhered portions of each initially applied wide band adhering label are subsequently made to adhere to the container by any conventional arrangement. For example, an auxiliary mechanism such as reciprocally movable pressure pads 130 may be utilized as shown in Fig. 1. Such pressure pad or pads 130 are positioned beyond the label applying station in the path of travel of the container carrying conveyors 11 and 12. The pads 130 are reciprocated toward and away from the container by appropriate mechanism (not shown). Such pads have resilient surfaces that are complemental in shape to the contour of the container surfaces. They serve to wrap the unadhered portions of an initially adhered label to a container in well known manner. If desired, the auxiliary pressure pad mechanism may be of a reciprocatory type such as is describd in my copending application Serial No. 255,855, filed November 10, 1951, now United States Patent No. 2,725,156, granted November 29, 1955. Any other type of auxiliary pressure pad mechanism or equivalent arrangement may be utilized for completing the adhesion of the entire label to the container.

Operation

The operation of the universal label applying device constituting the subject-matter of this invention and herein above described is in brief as follows:

Labels L to be applied to the container C are stacked within the label magazine 70. The turret 20 is rotated on its horizontally disposed shaft 22. This shaft 22 is driven through the gear train comprising the gears 62, 61, 57 and 56 as hereinbefore described. Simultaneously, the gear 81 which meshes with the gear 56 is also driven. The rotation of the gear 81 rotates the cam carrying shaft 78 and in consequence rotates the cams 77 and 117.

The rotation of the cams 77 serves to oscillate the suction grippers 71 relative to the bottom of the label magazine 70. In such oscillation the grippers 71 successively remove the lowermost label from the stack in the magazine 70. Each removed label L has its leading edge brought into position for gripping by one of the grippers 34. Movement of the grippers 34 into a clamping position is controlled by movement of the cam follower 37a relative to the cam 65 as has hereinabove been described.

Each gripped label is swept around with the rotation of the turret 20 and carried past the adhesive applying roller 92 which coats the necessary face of the label with adhesive. Further rotation of the turret 20 carries the adhesive bearing label L into a vertically suspended position directly in front of the container C, C_a or C_b arriving at the label applying station and to which the label is to be applied. At the instant of arrival of the label at the label applying station the grippers 34 actuated by the cam 65 release the label. Simultaneously, the rotary cam 117 acting on the cam follower 115 rotates the crank 108 from the position shown in Fig. 4 to that shown in Fig. 3. This rotary motion causes the pressure pad 102 to press the vertically suspended label L at the label applying position into adhesive engagement with the container in front of the label. The yielding nature of the pressure pad 102 effects an initial wide band of adhesion between the label L and the container C. The cam 117 in its continued rotation subsequently restores the crank 108 to the position of Fig. 4 so that the cycle described may be repeated with the next label brought into label applying position by the next gripper 34 of the turret 20. Each container bearing a wide band adhered initially applied label has the unadhered portions of such label adhered thereto by subsequent operations beyond the label applying station as by pads 130 or the like.

While the label source has been described herein as a magazine 70, it is to be understood that any other type of label source may be substituted, e. g., labels may be fed continuously from a roll to the grippers 34 and individually severed from the roll each time a gripper 34 passes the feed position of the label roll. Such arrangement will eliminate the necessity for the suction nozzles 71 and the mechanism herein described which operates them. Any other arrangement for feeding labels to the grippers 34 may be substituted.

While specific embodiments of the invention have been described herein, variations in structural detail within the scope of the appended claims are possible and contemplated. There is no intention, therefore, of limitation to the exact details shown and described.

What is claimed is:

1. A universal label applying device comprising skeletal turret means including a pair of spaced apart plate-like elements mounted for rotation on a substantially horizontal axis, one of said elements having a central opening, label gripping fingers carried by said turret means between said elements, a label source, means for transferring labels from said source to gripping by said gripping fingers, means for activating said gripping fingers and said label transferring means in timed relationship, pressure pad means having a resilient surface positioned between said elements within said skeletal turret means so as to be independent of the rotary motion of said turret means, said pressure pad means with its resilient surface being movable from a position between said spaced elements to a position adjacent the peripheral edges of said elements and against each gripped label caried by the gripping fingers as such label arrives at a label applying station in front of a container to press such label and effect initial wide band adhesion of such label to the container, means for applying adhesive to the gripped labels during transit on the rotating turret means to the label applying station, means for applying adhesive stripes to those portions of gripped labels covered by the gripping fingers, a crank pivoted externally of said turret means and having a portion extending through said central opening in said one of said elements and secured to said pressure pad means, and means for oscillating said crank about its pivotal support for effecting said positional movements of said pressure pad means for the application of each label to a container.

2. A device as per claim 1 wherein said pressure pad means is adjustable to permit label application to containers of varying contour.

3. A device as per claim 1 wherein said resilient surface of said pressure pad means has a contour which is complementary to that of the container surface on which label application is to be effected.

4. A device as per claim 1 wherein said label gripping fingers have slots and wherein said means for applying adhesive stripes comprise finger-like adhesive applicators movable into the respective slots while a label is gripped by the gripping fingers to apply adhesive to those portions of the gripped label which underlie the slots.

5. A universal label applying device comprising skeletal turret means including a pair of spaced apart elements mounted for rotation on a substantially horizontal axis, a transverse member spanning the space between said elements, label gripping fingers positioned between said elements and movable reciprocally relative to said transverse member for gripping labels between the fingers and transverse member during the rotation of said turret means, a label source, means for transferring labels from said source to gripping by said gripping fingers, means for activating said label transferring means and for reciprocally moving said gripping fingers in timed relationship, a presser plate positioned between said elements within said skeletal turret means so as to be independent of the rotary motion of said turret means, a resilient cushion on said presser plate, a support for said presser plate, means for mounting said presser plate on said support, a crank pivoted externally of said skeletal turret means and having a portion extending through an opening in one of said spaced apart elements to which portion said support is attached, means for oscillating said crank about its pivotal support for effecting positional movements of said presser plate and the cushion carried thereby from a position internally of the turret means between said spaced apart elements to a position adjacent the peripheral edges of said elements and successively against each gripped label carried by gripping fingers as such label arrives at a label applying station in front of a container to press such label against such container and effect adhesion of such label to the container, and means for applying adhesive to the gripped labels during their transit with the rotating turret means to the label applying station.

6. The device of claim 5 wherein said gripping fingers are slotted and wherein said means for applying adhesive to the gripped labels includes finger-like adhesive applicators movable into said slots to apply adhesive in stripes to those portions of the gripped labels which underlie the slots.

7. The device of claim 5 wherein said presser plate is adjustable to permit label application to containers of varying contour.

8. The device of claim 5 wherein said cushion has a contour which is complementary to that of the container surface on which label application is to be effected.

9. The device of claim 5 wherein said means for activating said label transferring means and for reciprocally moving said gripping fingers in timed relationship comprise a driven cam, cam follower means coupled to said label transferring means for reciprocally moving said label transferring means when said cam is driven, a fixed cam and cam follower means therefor coupled to said label gripping fingers and movable over said fixed cam during rotation of said skeletal turret means.

(References on following page)

References Cited in the file of this patent

UNITED STATES PATENTS

1,467,018	Tzibides	Sept. 4, 1923
1,467,021	Tzibides	Sept. 4, 1923
1,869,374	Jahne	Aug. 2, 1932
1,998,067	Arelt et al.	Apr. 16, 1935
2,635,765	Fauest et al.	Apr. 21, 1953
2,788,150	Rose	Apr. 9, 1957

FOREIGN PATENTS

384,631	Germany	Nov. 24, 1923
1,095,684	France	Dec. 22, 1954