

May 11, 1965

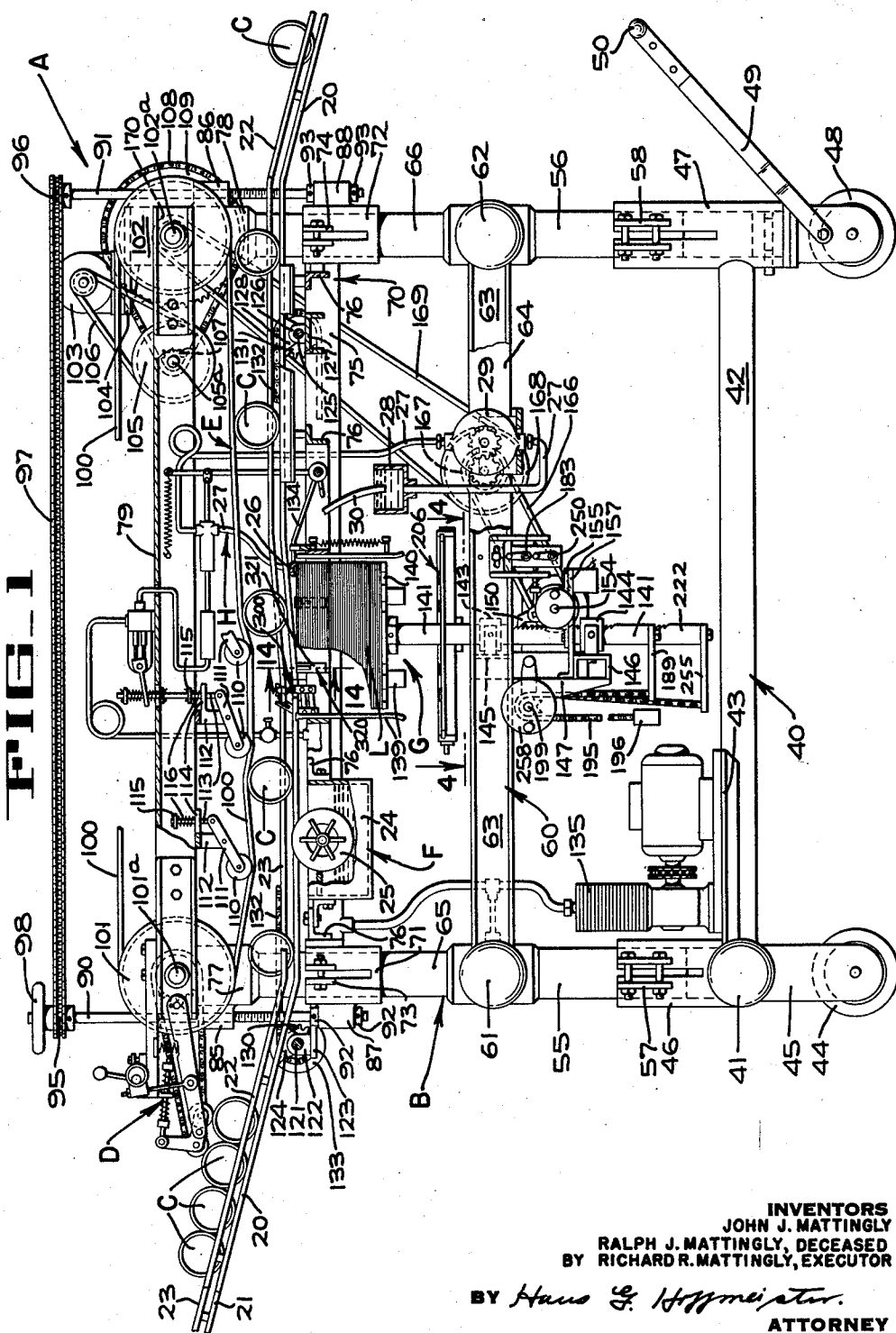
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3,183,138

LABELING MACHINE

Filed June 22, 1959

5 Sheets-Sheet 1



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FIG 4

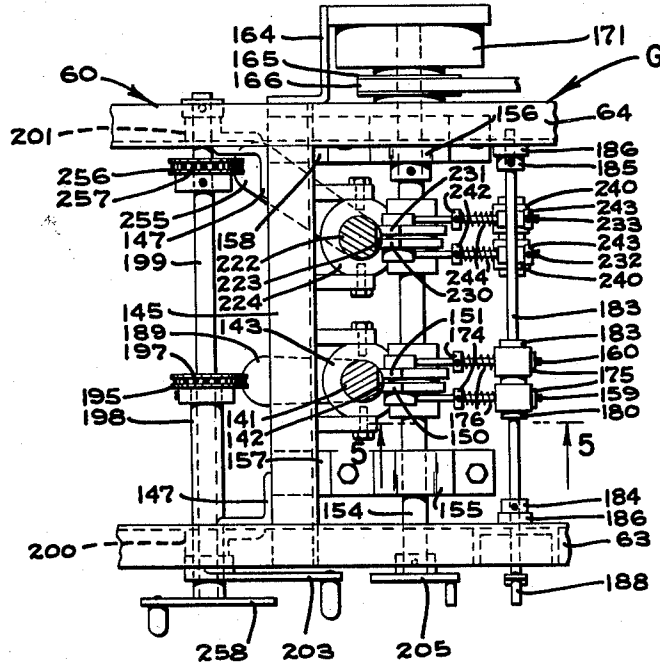


FIG 6

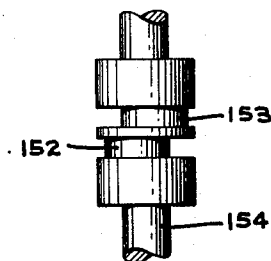
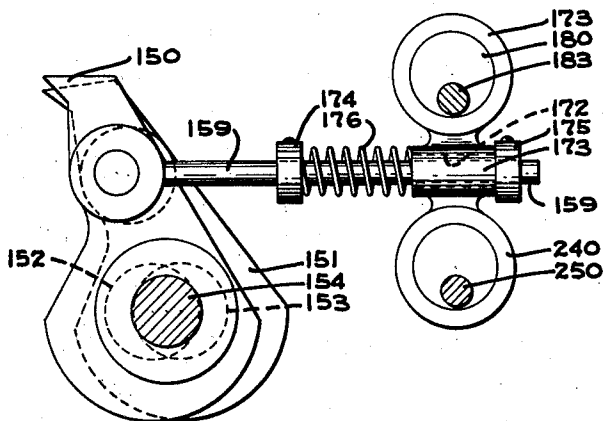


FIG 5



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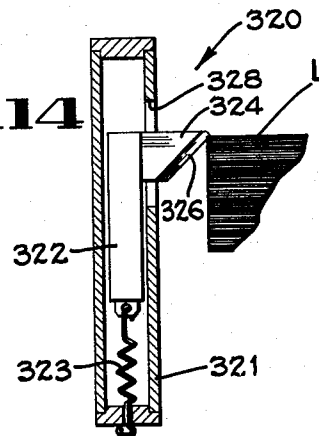
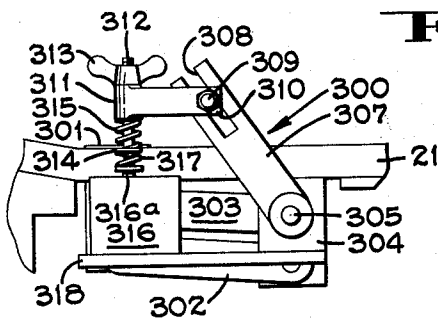
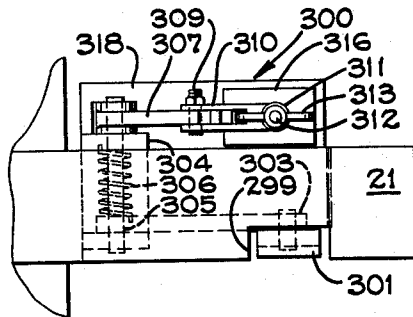
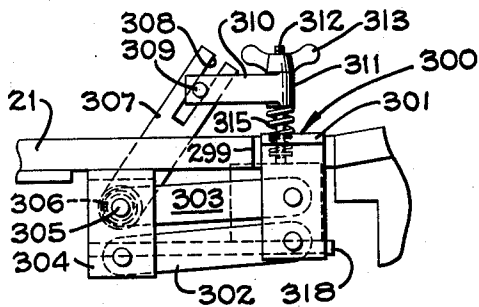
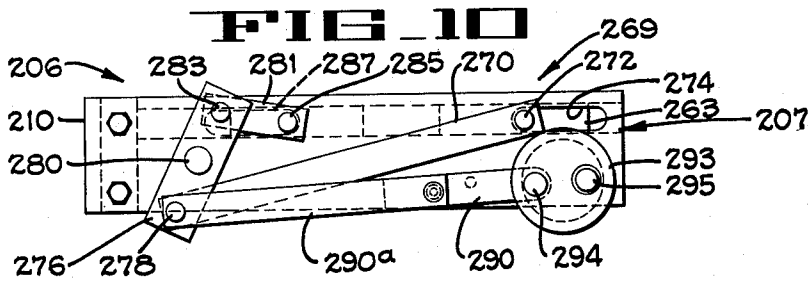
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3,183,138

LABELING MACHINE

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5 Claims. (Cl. 156—364)

The present invention appertains to labeling machines and more particularly to a mechanism for feeding labels in a labeling machine.

An object of the present invention is to provide an improved can labeling machine.

Another object of the present invention is to provide an improved label feeding mechanism.

A further object is to provide a can labeling machine wherein the labels are automatically elevated as the supply of labels is reduced.

Another object is to provide a can labeling machine wherein the labels are fed continuously.

Another object is to provide an improved method for continuously supplying labels in a label feeding mechanism.

Another object of the present invention is to provide an improved label guiding and releasing device.

A further object is to provide a can labeling machine wherein the release of labels from a stack of labels is controlled so that only one label at a time can be removed by an advancing can.

Other objects and advantages of the present invention will become apparent from the following description and drawings, in which:

FIG. 1 is a side elevation of the can labeling machine of the present invention.

FIG. 2 is an isometric view of the frame support structure of the can labeling machine of FIG. 1.

FIG. 3 is an enlarged fragmentary side elevation of the label feeding mechanism of the can labeling machine of FIG. 1.

FIG. 4 is an enlarged horizontal section taken along line 4—4 of FIG. 1 to illustrate further the label feeding mechanism.

FIG. 5 is an enlarged vertical section taken along line 5—5 of FIG. 4.

FIG. 6 is an enlarged fragmentary plan of a shaft with adjacent eccentric portions for the label feeding mechanism.

FIG. 7 is a plan view of the label feeding mechanism taken along line 7—7 of FIG. 3 to illustrate an auxiliary label support for the label feeding mechanism with the movable frame members outwardly disposed.

FIG. 8 is a plan view of the label feeding mechanism similar to FIG. 7 excepting that the movable frame members of the auxiliary label support are inwardly disposed.

FIG. 9 is an enlarged side elevation of the label supports for the label feeding mechanism with the auxiliary label support in an elevated position.

FIG. 10 is an enlarged fragmentary end elevation of the auxiliary label support taken along line 10—10 of FIG. 8.

FIG. 11 is an enlarged fragmentary right side elevation of a label feed control device for the label feeding mechanism as viewed in the direction of travel of the cans advancing through the can labeling machine.

FIG. 12 is an enlarged fragmentary plan of the label feed control device.

FIG. 13 is an enlarged fragmentary left side elevation of the label feed control device as viewed in the direction of travel of the cans advancing through the can labeling machine.

FIG. 14 is an enlarged vertical section of the label re-

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leasing device of the label feeding mechanism taken along line 14—14 of FIG. 1.

Illustrated in FIG. 1 is the can label machine A of the present invention that comprises a frame support structure B on which is mounted transversely spaced tracks 20 and 21, that are provided with guide rails 22 and 23, respectively. Cylindrical cans C enter the can labeling machine A in succession with their axes disposed transversely to their direction of travel and advance through the machine along the tracks 20 and 21. The tracks 20 and 21 are spaced apart so that the end edges or beads of the cans C are in contact therewith. The cans C are evenly spaced in their forward movement in the labeling machine A by a can spacing device D (FIG. 1), which is mounted on the frame support structure B. The construction and operation of the can spacing device D are described in detail in Patent No. 2,868,403, issued on January 13, 1959, to R. J. Mattingly et al. for Can Labeler.

After the cans C pass the spacing device D, they are contacted by a belt assembly E, which moves the cans forwardly along the tracks 20 and 21. As the cans C are advanced along the tracks 20 and 21 by the belt assembly E, they pass over a glue applicator mechanism F. The glue applicator mechanism F is supported by the frame support structure B and comprises a glue pot 24 in which is positioned a glue applicator in the form of glue wheels 25. The glue wheels 25 are positioned in spaced apart relation and apply a plurality of spaced apart spots of glue to the outer cylindrical surfaces of the cans C passing thereover. The construction and operation of the glue applicator mechanism F are also described in detail in the aforementioned patent.

Subsequent to the application of the glue spots on the outer cylindrical surfaces of the successively advancing cans, the cans C pass over a label feeding mechanism G, which will be described in detail hereinafter. The label feeding mechanism G supports a stack of labels L that extends upwardly between the tracks 20 and 21 with the uppermost label of the stack in a position to be contacted by a can passing over it. The glue spots on a can C contact the uppermost label of the stack of labels L and cause the uppermost label to adhere to the can. Continued forward movement of the can serves to wrap the uppermost label around the outer cylindrical surface thereof.

Intermediate the leading and trailing edges of the stack of labels, the tracks 20 and 21 are inclined upwardly so as to raise the successively advancing cans C above the rear portion of the stack of labels L to cause the cans to pass over a glue bar 26 of a lap end glue applicator H. The glue bar 26 rests on the rear edge of the uppermost label of the stack of labels L and applies a transverse band of adhesive to the rear edge of each label. An adhesive is continuously circulated through the glue bar 26 by means of a tube 27, which communicates with a reservoir 28 and a pump 29. The adhesive is returned to the reservoir 28 from the bar 26 through a tube 30. The band of adhesive formed by the glue bar 26 serves to connect the leading and trailing edges of the labels, the labels being of a length such that upon being wrapped around the cans their leading and trailing edges will overlap sufficiently to form a glue seam connection between the rear and front edges of respective labels.

In addition to applying glue to the rear edge of the labels, the glue bar 26 acts to hold each label in a taut condition as it is being wrapped around the can. The label will be pulled from beneath the glue bar 26 as the forward movement of the can continues, thereby permitting the glue bar 26 to contact and apply adhesive to the next adjacent label. The construction and operation of

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the lap end glue applicator H is described in detail in the above-mentioned patent.

The frame support structure B of the can labeling machine A includes a T-shaped base 40 (FIG. 2) that has a tubular transverse member 41. Fixed to the transverse member 41 midway between the ends thereof is one end of a tubular longitudinal member 42 of the base 40. Rigid with the transverse member 41 and the longitudinal member 42 is a platform 43. At each end of the transverse member 41 is disposed a wheel 44 that is mounted for rotation by a depending bracket 45, the bracket 45 being rigid with the transverse member 41. Supported by the transverse member 41 midway between the wheels 44 is an upright sleeve 46. The other end of the longitudinal member 42 is secured to an upright sleeve 47 and mounted at the lower end of the sleeve 47 is a caster 48. A rod 49 is pivotally attached at its bifurcated end to the upright bracket of the caster 48. Rigid with the rod 49 is a suitable handle 50 that is gripped by an operator for moving the labeling machine A to different locations. The wheels 44 and 48 provide an arrangement that permits the can labeling machine A to be firmly supported even on an irregular floor.

Vertical posts 55 and 56 are supported by the sleeves 46 and 47, respectively. Each post is slidably received within its associated sleeve for adjusting the height thereof. For retaining the posts 55 and 56 in adjusted positions within the sleeves 46 and 47, respectively, the sleeves 46 and 47 have vertical slits formed at the upper ends thereof and clamping means 57 and 58 are mounted on the sleeves 46 and 47, respectively, with the slits disposed intermediate the tightening members of the clamping means. Mounted on the posts 55 and 56 is a rectangular frame or bed 60, which includes cylindrical end members 61 and 62 interconnected by outwardly facing, channel-shaped side members 63 and 64. The members 61 and 62 of the frame 60 are secured midway between their respective ends to the posts 55 and 56, respectively. Adjustment of the height of the posts 55 and 56 permits the can labeling machine A to accommodate the tracks 20 and 21 or any other means used for feeding the cans C onto the can labeling machine A.

Rigid with the end members 61 and 62 adjacent the side member 64 and projecting upwardly from end members 61 and 62 are vertical posts 65 and 66, respectively, which support an upper frame structure 70. The upper frame structure 70 includes sleeves 71 and 72 that are adjustably positioned on the posts 65 and 66, respectively. For retaining the sleeves 71 and 72 in adjusted positions along the posts 65 and 66, respectively, the sleeves 71 and 72 have vertical slits at the upper ends thereof and clamping means 73 and 74 are mounted on the sleeves 71 and 72, respectively, with the slits disposed intermediate the tightening members of the clamping means. A longitudinal member 75 interconnects the sleeves 71 and 72. Projecting horizontally from the longitudinal member 75 in the general direction of the side members 63 are angle support bars 76. At the upper ends of the posts 65 and 66 are fixed support members 77 and 78, respectively, that mount thereon a longitudinally extending frame bar 79 (FIG. 1). The can labeling machine A is well balanced and centrally disposed relative to the base 40, and the location of the posts 65 and 66 at the rear of the machine makes the devices mounted on the support structure B readily accessible to an operator standing at the front of the machine.

For adjusting the height of the upper frame structure 70, the sleeves 71 and 72 (FIGS. 1 and 2) are adjustably positioned along the posts 65 and 66, respectively. Toward this end, the fixed support members 77 and 78 have internally threaded, outwardly projecting apertured bosses 85 and 86, respectively. Disposed below the boss 85 in vertical alignment therewith is an outwardly projecting apertured boss 87 of the sleeve 71, while disposed below the boss 86 in vertical alignment

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therewith is an apertured boss 88 of the sleeve 72. A vertical rod 90 (FIG. 1) has a threaded portion intermediate its ends that is received in threaded engagement with the boss 85 of the fixed support member 77 and, at its lower end, the rod 90 is journaled in the unthreaded aperture of the boss 87 of the sleeve 71. In a like manner, a vertical rod 91 (FIG. 1) has a threaded portion intermediate its ends that is received in threaded engagement by the boss 86 of the fixed support member 78 and at its lower end, the rod 91 is journaled in the unthreaded aperture in the boss 88 of the sleeve 72. A collar 92 is fixed to the rod 90 at each end of the boss 87, whereby movement of the rod 90 in a vertical direction, as it is rotated in boss 85, imparts a corresponding movement to the sleeve 71, when the clamping means 73 are loosened. Likewise, a collar 93 is fixed to the rod 91 at each end of the boss 88, whereby movement of the rod 91 in a vertical direction imparts a corresponding movement to the sleeve 72, when the clamping means 74 are loosened.

At the upper ends of the rods 90 and 91 are secured the hubs of sprockets 95 and 96, respectively, which have a chain 97 trained therearound. Fixed to the rod 90 above the chain 97 is a hand wheel 98. Thus, an operator rotates the hand wheel 98 to turn the rod 90 for raising or lowering the rod 90 within the threaded boss 85. The rotation of the rod 90 causes a like rotation of the rod 91 through the chain 97 and the sprockets 95 and 96 for correspondingly raising or lowering the rod 91 within the threaded boss 86. As a result thereof, a simultaneous movement is imparted to the sleeves 71 and 72 to vary the height of the upper frame structure 70.

The tracks 20 and 21 (FIG. 1) are mounted on the support bars 76 of the upper frame structure 70 by means of suitable spacer members, while the can spacing device D is mounted on the frame bar 79 adjacent the post 65. As the cans C pass the can spacing device D, they are contacted by the belt assembly E and are advanced along the tracks 20 and 21. The belt assembly E includes a belt 100 that has its lower run in engagement with the cans C. The belt 100 is trained around sheaves 101 and 102, which are mounted on shafts 101a and 102a on the frame bar 79. Suitable drive means is provided for the sheave 102, said drive means including a motor 103 supported by a base plate 104 that is fixed to the support member 78. The motor continuously drives a pulley 105 through a drive belt 106. A sprocket 107 is mounted on the drive shaft 105a of the pulley 105 for rotation therewith and has a driven chain 108 trained therearound, which is also trained around a sprocket 109. The sprocket 109 is fixed to the shaft carrying sheave 102 for imparting rotary movement thereto.

To maintain the lower run of the belt 100 in contact with the cans C, rollers 110 are mounted on the lower ends of arms 111, which are pivotally supported intermediate their ends by brackets 112. The brackets 112 are spaced apart and are rigid with the frame bar 79. At the other ends thereof, the arms 111 are pivotally connected to pins 113 that project through openings in ears 114 of the brackets 112. At the upper end of each pin 113 there is disposed a washer 115 which has its upward movement limited by suitable means, such as a cotter pin. Surrounding the pins 113, between the ears 114 and the washers 115, are springs 116, which tend to pivot the arms 111 in a counterclockwise direction to move and to maintain the rollers 110 in engagement with the lower run of the belt 100.

Since the upper frame support 70, which mounts the tracks 20, is movable relative to the spacing device D and the belt assembly E, said spacing device D and said belt assembly E being mounted on the frame bar 79, it will be apparent that the can labeling machine A can be adjusted to accommodate cans of different diameters. If the cans entering the can labeling machine A are of a dif-

ferent axial length, the tracks 20 and 21 may be adjusted laterally to accommodate such cans. This lateral adjustment may be obtained by means of a shaft 121 which has two oppositely threaded portions and is journaled for rotation by a pair of spaced ears 122 (one only being shown) of spaced brackets 123, which are mounted on the upper support frame 70. The oppositely threaded portions of the shaft 121 are received in oppositely threaded blocks 124 (only one shown in FIG. 1) that are respectively secured to the tracks 20 and 21. With this arrangement, rotation of shaft 121 will move the tracks 20 and 21 toward or away from each other. Near the other end of the machine, a shaft 125, having oppositely threaded portions, is journaled for rotation by spaced ears 126 (one only being shown) that project from a transverse support bar 127 which is fixed to the longitudinal frame bar 75. The oppositely threaded portions of the shaft 125 are received in oppositely threaded blocks 128 (only one shown in FIG. 1) that are respectively secured to the tracks 20 and 21. Fixed to the shafts 121 and 125 are sprockets 130 and 131, respectively, that have a chain 132 trained therearound. Attached to the shaft 121 for imparting a rotary movement thereto is a hand wheel 133. By rotating the hand wheel 133, the shafts 121 and 125 are simultaneously rotated to vary the transverse distances between the blocks 124 and the blocks 128, respectively, to adjust the lateral distance between the tracks 20 and 21.

The glue applicator mechanism F is secured to the support bars 76 of the upper frame support 70, while the label feeding mechanism G is mounted on the lower frame support structure 60. The lap end glue applicator H has its glue bar 26 and the lifting mechanism 134 therefore supported by the upper frame support structure 70, while the pump 29 is carried by the side member 63 of the support structure 60. A compressor 135 for the lifting mechanism 134 of the lap end glue applicator H is mounted on the platform 43.

As shown in FIGS. 1 and 3, the label feeding mechanism G comprises a horizontal support platform 140 on which a vertical stack of horizontal labels L is carried. Depending from the upper frame support structure 70 alongside the platform 140 are guides 139 for maintaining the labels L in position on the platform 140. The platform 140 is supported by an upright post 141, which has teeth 142 along one edge thereof, and is positioned so that the stack of labels L thereon extends upward between the tracks 20 and 21. Bearings 143 and 144, which are supported by the rectangular frame 60 by means of transverse bars 145 and 146, respectively, journal the post 141 for vertical movement. The bar 145 extends between the side members 63 and 64 of the rectangular frame 60, while the bar 146 extends between two depending brackets 147, which are rigid with the side members 63 and 64.

The post 141 is raised by means of a pair of juxtaposed dogs 150 and 151 (FIGS. 3 and 5) that are mounted at their lower ends for free rotary movement on the eccentric portions 152 and 153 (FIG. 6), respectively, of a horizontally disposed shaft 154 (FIGS. 3 to 6). The shaft 154 is supported for rotation in bearings 155 and 156, which are secured to plates 157 and 158 (FIGS. 1 and 4), respectively, that are rigid with the transverse bar 146. The upper ends or noses of the dogs 150 and 151 are adapted to alternately engage the teeth 142 of the post 141. The eccentric portions 152 and 153 of the shaft 154 are arranged so that, during each one-half revolution of the shaft 154, the eccentric portions 152 and 153 move the dogs 150 and 151 in orbital paths whereby the nose of one dog will engage a tooth on the post 141 to lift the post 141, while the other dog that is not in engagement with the teeth 142 will be moved downwardly to subsequently engage a lower tooth. One of the dogs will always be in engagement with a tooth on the post 141 to retain the post 141 in its raised position.

The shaft 154 is rotated in one-half revolution increments by an electrically operated one-half revolution

clutch 171 (FIG. 4) which is supported by the side member 64 of the rectangular frame 60 by means of an angle bracket 164. Freely mounted on the shaft 154 is a sheave 165 (FIG. 4) which has a belt 166 and is driven by a pulley 167 (FIG. 1) that is mounted on the side member 63 of the rectangular frame 60. The pulley 167 is driven continuously by a sheave 168 that has a belt 169 trained therearound, and the belt 169 is driven by a pulley 170, which is fixed to the continuously rotating shaft 102a. Each time the clutch 171 is energized, the shaft 154 is rotated through one-half of a revolution. Thus, the energization of the clutch 171 causes one of the dogs to move upwardly with its upper end in engagement with one of the teeth 142 for lifting the post 141, while the other dog is moved downwardly relative to the teeth to a position adjacent a lower tooth. Subsequent energization of the clutch 171 causes said other dog to move upwardly into engagement with one of the teeth 142 for lifting the post 141, while said one dog is lowered.

When it is desired to lower the post 141 or when it is desired to raise the post 141 independently of the dogs 150 and 151, the dogs 150 and 151 are pivoted about the axis of the shaft 154 to a position out of engagement with the teeth 142 of the post 141. Toward this end, two dog retracting arms 159 and 160 (FIGS. 4 and 5) are pivotally connected at one end to the dogs 150 and 151, respectively. Adjacent their other ends, the arms are received loosely in suitable openings 172 (one only being shown in FIG. 5) in the lower portions of a pair of eccentric mounting brackets 173 respectively. Collars 174 and 175 are fixed to each of the arms 159 and 160 and a spring 176, which surrounds each of the arms is disposed between each collar 174 and the associated bracket 173. The two eccentric mounting brackets 173 are mounted on a horizontally disposed shaft 183 that is supported for rotation by bearings 184 and 185. The bearings 184 and 185 are secured to depending brackets 186, that are attached to the side members 63 and 64, respectively, of the rectangular frame support 60.

Keyed to the shaft 183 are a pair of eccentric discs 180, one of which is shown in FIG. 5. Each eccentric disc is disposed in a cylindrical opening in one of the brackets 173 to cause the brackets 173 to move in a path about the axis of the shaft 183 when the shaft 183 is rotated. The movement of the brackets 173 about the axis of the shaft 183 actuates the arms 159 and 160, respectively, to move the arms toward or away from the post 141 dependent upon the direction of rotation of the shaft 183. Fixed to the shaft 183 is a handle 188 for imparting a rotary movement thereto. When an operator actuates the handle 188 to rotate the shaft 183 in a clockwise direction (as viewed in FIG. 3), the brackets 173 engage the collars 175, respectively, to move the arms 159 and 160 away from the post 141, thereby moving the dogs 150 and 151 out of engagement with the teeth 142 of the post 141. To return the dogs 150 and 151 into engagement with the teeth 142 of the post 141, an operator actuates the handle 188 to rotate the shaft 183 in a counterclockwise direction (as viewed in FIG. 3) to cause the brackets 173 to move the arms 159 and 160 toward the post 141 through the action of the collars 174, and through the action of the springs 176.

While the dogs 150 and 151 are out of engagement with the teeth 142 of the post 141, the post 141 may be raised or lowered manually. For this purpose, a plate 189 (FIG. 3) is bolted to the lower end of the post 141 and is secured to one end of a chain 195. The other end of the chain 195 carries a suitable counterweight 196. The chain 195 is trained around a sprocket 197, which is fixed to a tubular shaft 198 (FIG. 4). A horizontally disposed shaft 199 passes through the tubular shaft 198 and supports the same for rotation relative thereto. Bearings 200 and 201, which are mounted on the depending plates 147, support the shaft 199 for rotation. A crank handle 203 is keyed to the tubular

shaft 198 for rotating the tubular shaft 198. An operator actuating the handle 203 to rotate the tubular shaft 198 in a counterclockwise direction (as viewed in FIG. 3) causes the sprocket 197 to decrease the length of the run of the chain 195 (FIG. 3) to which the plate 189 is secured. As a result thereof, the plate 189 lifts the post 141 to raise the platform 140. By rotating the tubular shaft 198 in a clockwise direction, the sprocket 197 increases the length of the run of the chain 195 to which the plate 189 is secured, thereby lowering the post 141 to lower the platform 140.

When the stack of labels on the platform 140 has been elevated to a desired position by the manual operation of the crank handle 203, the crank 188 is actuated to cause the dogs 150 and 151 to engage the teeth 142 of the post 141. Thereupon, a fine adjustment of the height of the platform 140 may be made by actuating a hand wheel 205, which is keyed to the shaft 154.

In FIGS. 3, 7 and 8 is illustrated an auxiliary label support 206 of the label feeding mechanism G which comprises a label support frame 207. The label support frame 207 includes end frame members 210 and 211, which are interconnected at one side only by a side frame member 212. The auxiliary label support frame 207 is supported by an upright post 222, which is rigid with the underside of the side frame member 212 and has teeth 223 (FIG. 4) along one edge thereof. Bearings 224 (only one shown), similar to bearings 143 and 144 for the post 141, journal the post 222 for vertical movement. The bearings 224 are mounted on the transverse bars 145 and 146. To guide the frame 207 in its vertical movement with the post 222, rollers 225 (FIG. 7) are mounted on the side frame member 212 by means of bolts 226 and are arranged to engage the outer surfaces of the guide members 139.

For lifting the post 222, a pair of juxtaposed dogs 230 and 231 (FIG. 4) are mounted at their lower ends for free movement on eccentric portions of the shaft 154. These eccentric portions for mounting the dogs 230 and 231 are similar to the aforementioned eccentric portions 152 and 153 of the shaft 154 and, accordingly, rotation of shaft 154 will cause the dogs 230 and 231 to be alternately moved into lifting engagement with the post 222 to elevate the post 222 and the support frame 207. Since the dogs 230 and 231 are mounted on the shaft 154 along with the dogs 150 and 151, the energization of the clutch 171 permits the platform 140 and the auxiliary label support frame 207 to be lifted in unison.

When it is desired to lower the post 222, and when it is desired to raise the post 222 independently of the dogs 230 and 231, the dogs 230 and 231 are pivoted to a position out of engagement with the teeth 223 of the post 222 by means of dog retracting arms 232 and 233, which are pivotally connected to the dogs 230 and 231, respectively, and are each received in a suitable opening in the upper portion of an eccentric mounting bracket 240 (FIG. 5). Collars 242 and 243 are fixed to each of the arms 232 and 233 and a spring 244 surrounds each arm between the collar 242 and the bracket 240. The eccentric mounting brackets 240 are mounted on a horizontally disposed shaft 250 (FIG. 3) that is supported by suitable bearings, not shown. The bearings for mounting the shaft 250 are secured to the depending brackets 186 (only one shown in FIG. 3).

The dog retracting arms 232 and 233 are actuated by eccentric discs (not shown) that are keyed to the shaft 250 and disposed in cylindrical openings in the brackets 240 in exactly the same manner as described in connection with the dog retracting arms 159 and 160. The movement of the brackets 240 about the axis of the shaft 250 actuates the arms 232 and 233, respectively, to move the arms toward or away from the post 222 dependent upon the direction of rotation of the shaft 250. Fixed to the shaft 250 is a handle 251 (FIG. 3)

for imparting a rotary movement thereto. When an operator actuates the handle 251 to rotate the shaft 250 in a clockwise direction (as viewed in FIG. 3), the brackets 240 (FIG. 5) engage the collars 243 to move the arms 232 and 233 away from the post 222, thereby moving the dogs 230 and 231 out of engagement with the teeth 223 of the post 222. To return the dogs 230 and 231 into engagement with the teeth 223 of the post 222, an operator actuates the handle 251 to rotate the shaft 250 in a counterclockwise direction (as viewed in FIG. 3) to cause the brackets 240 to move the arms 230 and 231 toward the post 222 through the action of the collars 242 and through the action of the springs 244.

While the dogs 230 and 231 are out of engagement with the teeth 223 of the post 222, the post 222 may be raised or lowered manually. Toward this end, a plate 255 (FIG. 3) is bolted to the lower end of the post 222 and is carried by one end of a vertically disposed chain 256. The other end of the chain 256 carries a suitable counterweight, not shown. The chain 256 is trained around a sprocket 257 (FIG. 4), which is fixed to the shaft 199. A hand wheel 258 is keyed to the shaft 199 for imparting a rotary movement thereto. An operator, turning the hand wheel 258 to rotate the shaft 199 in a counterclockwise direction (as viewed in FIG. 3), causes the sprocket 257 to decrease the length of the run of the chain 256 to which the plate 255 is secured. As a result thereof, the plate 255 lifts the post 222 to raise the label support frame 207. By rotating the shaft 199 in a clockwise direction (as viewed in FIG. 3), the sprocket 257 increases the length of the run of the chain 256 (FIG. 3) to which the plate 255 is secured, thereby lowering the post 222 to lower the label support frame 207.

The end members 210 and 211 of the label support frame 207 have transversely disposed channels 260 and 261 (FIGS. 7, 8 and 9), respectively, formed therein in which longitudinally disposed movable frame members 263 and 264 are slidably mounted. Fixed to the frame members 263 and 264 is a plurality of inwardly projecting spaced tongues 265 and 266, respectively. It is to be observed that the label support frame 207 of the auxiliary label support 206 is so constructed that, when the frame 207 and the platform 140 are in horizontal alignment, the label support platform 140 is surrounded by the label support frame 207. When the movable frame members 263 and 264 are moved toward one another within the channels 260 and 261 (FIG. 8), the tongues 265 are received by slots 267 and the tongue 266 are received by slots 268 that are formed along the side edges of the platform 140. When the movable frame members 263 and 264 are moved outwardly and away from one another (FIG. 7), the tongues 265 and 266 are withdrawn from the slots 267 and 268, respectively. When the label support frame 207 is at a height even with the support platform and the movable frame members 263 and 264 are moved toward one another so that the tongues 265 and 266 are received by the slots 267 and 268, respectively, the auxiliary label support frame 207 is adapted to engage and support a stack of labels that were initially supported by the platform 140 (FIGS. 8 and 9). The labels of the stack of labels L are substantially of the size of the platform 140 and, hence, the lowermost label would be disposed over the slots 267 and 268.

The movable frame members 263 and 264 of the auxiliary label support frame 207 are moved relative to one another by means of mechanical linkages 269 and 269a which are mounted at opposite sides of the frame 207. The linkages include arms 270 and 271 (FIGS. 7 to 10) which are connected to opposite ends of the movable frame member 263 by pins 272 and 273, respectively. The pin 272 is received in a horizontally disposed slot 274 that is formed in the end member 210 and the pin 273 is disposed in a similar slot (not shown) in end

member 211 of frame 207. At their opposite ends, the arms 270 and 271 are attached to the lower ends of pivot arms 276 and 277, respectively, by pins 278 and 279. Intermediate their ends, the pivot arms 276 and 277 are secured to a fixed shaft 280 for pivotal movement about the axis of the shaft 280. The shaft 280 is journaled for rotation by the side members 210 and 211 of the label support frame 207. Accordingly, movement of the pivot arm 276 imparts a corresponding pivot movement to the arm 277 by means of the shaft 280. At their upper ends, the pivot arms 276 and 277 are attached to arms 281 and 282, respectively, by pins 283 and 284. The arms 281 and 282 are connected to opposite ends of the movable frame member 264 by pins 285 and 286, respectively, the pin 285 being received in a horizontally disposed slot 287 formed in the end member 210, and the pin 286 being disposed in a similar slot (not shown) in end member 211 of the label support frame 207. Attached to the pivot arm 276 by means of the pin 278 is one end of a lever arm 290 which has an offset portion 290a. The opposite end of the lever arm 290 is connected to a rotatable disc 293 having a handle 294. The disc 293 is supported for rotation by a stub shaft 295, that is carried by the end member 210 of the label support frame 207, and mounts the disc 293 for eccentric rotating movement.

In FIGS. 8 and 10, the movable frame members 263 and 264 are shown disposed in an inner position with the tongues 265 and 266 received by the slots 267 and 268, respectively, of the label support platform 140. By rotating the disc 293 in a counterclockwise direction (as viewed in FIG. 10), the pivot arms 276 and 277 are pivoted in a counterclockwise direction about the axis of the shaft 280 by means of the arm 290 and the shaft 280. Upon pivoting the lever arms 276 and 277 in the counterclockwise direction, the arms 281, 282, 270 and 271 move the movable frame members 263 and 264 away from one another (FIG. 7). Subsequent rotation of the disc 293 in a clockwise direction (as viewed in FIG. 10) pivots the arms 276 and 277 in a clockwise direction, which causes the movable frames 263 and 264 to move toward one another.

Initially, the stack of labels L is placed on the central label support platform 140 (FIG. 3). The lever arm 203 is employed to elevate the platform 140 so that the uppermost label of the stack of labels is above the tracks 20 and 21 to be contacted by a can C advancing along the tracks 20 and 21. Thereupon, the dogs 150 and 151 (FIG. 5) are positioned for engagement with the teeth 142 of the post 141 to provide for automatic elevation of the platform 140. At the time the platform 140 is initially elevated or at some time prior to the depletion of the stack of labels L on the platform 140, the auxiliary label support frame 207 is elevated by rotating the hand wheel 258 (FIG. 3) until the tongues 265 and 266 of the auxiliary label support frame 207 (FIG. 7) are at an even height with the slots 267 and 268 of the label support platform 140. When the movable frame members 263 and 264 are moved inwardly by rotation of the disc 293 so that the tongues 265 and 266 are received by the slots 267 and 268 (FIG. 8), respectively, the label support frame 207 engages the under surface of the lowermost label of the stack of labels L. It is to be observed that the labels are of such a size that the lowermost label is disposed over the slots 267 and 268. Thereupon, the dogs 230 and 231 are positioned for engagement with the teeth 223 of the post 222. Rotation of the shaft 154 causes the posts 141 and 222 to raise in unison, thereby elevating the platform 140 and the auxiliary label support frame 207 in unison.

When it is desired to replenish the supply of labels, the platform 140 is lowered by first disengaging the dogs 150 and 151 (FIG. 5) from the teeth of the post 141 and thereafter by rotating the lever arm 203. As soon as the platform 140 is lowered, the stack of labels L is

supported entirely by the auxiliary support frame 207, which maintains the uppermost label of the stack of labels L in position to be contacted by cans C advancing over the label feeding mechanism G. An additional supply of labels is then positioned on the platform 140. Subsequently, the platform 140 (FIG. 9) is elevated to position the uppermost label of the new stack of labels in contact with the lowermost label of the original stack of labels. The dogs 150 and 151 (FIG. 5) are then re-engaged for automatically lifting the platform 140. An operator then rotates the disc 293 to move the movable frame members 263 and 264 away from one another until the tongues 265 and 266 are withdrawn from engagement with the labels to release the original stack of labels. Once again, the stack of labels is supported by the platform 140. With the movable frame members 263 and 264 outwardly disposed, the auxiliary label support frame 207 is lowered by first disengaging the dogs 230 and 231 and thereafter by rotating the hand wheel 258. The auxiliary label support frame 207 is lowered sufficiently for subsequent reengagement with the underside of the lowermost label supported by the platform 140.

The label support platform 140 and the auxiliary label support frame 207 are elevated in a step-by-step movement each time the clutch 171 (FIG. 4) is energized. The energization of the clutch 171 is controlled by a label feed control device 300 (FIGS. 1, 11, 12 and 13), which includes a depressible bar 301 that projects upwardly through a suitable opening 299 along the inward edge of the track 21. Initially, the cans C advancing along the tracks 20 and 21 are raised above the depressible bar 301 by the stack of labels L. However, the height of the labels is gradually lowered as the labels are wrapped around the advancing cans C. When the height of the labels L is sufficiently lowered, the bar 301 will be exposed for contact by a can C advancing over the label feeding mechanism G. When this occurs, a can C advancing over the label feeding mechanism G will contact the depressible bar 301. Upon a can C contacting the bar 301, the bar 301 is depressed to cause the device 300 to complete an energizing circuit for the clutch 171. The energization of the clutch 171 causes the platform 140 or the label support frame 207 to be raised to reestablish the desired position for the uppermost label of the stack of labels L so that the height of the uppermost label is above the height of the tracks 20 and 21.

The depressible bar 301 is supported for vertical movement by arms 302 and 303 (FIG. 11), which are pivotally connected thereto. At their opposite ends, the arms 302 and 303 are pivotally mounted on a depending bracket 304 that is fixed to the lower surface of the track 21. A shaft 305, which is keyed to the arm 303 for pivotal movement therewith, is journaled for rotation by the bracket 304 below the track 21. Surrounding the shaft 305 is a torsion spring 306 that has one end fixed to the arm 303 and the other end anchored in the bracket 304. The spring 306 (FIG. 12) is arranged to continuously urge the contact bar 301 in the upward direction by means of the arm 303. At the other end of the shaft 305 is keyed the hub of an arm 307 which projects upward along the outward edge of the track 21. At the free end of the arm 307 is a slot 308 that receives a bolt 309 which is mounted on the bifurcated end of an extension 310 of a sleeve 311. A rod 312 extends through the sleeve 311 and has a threaded upper portion engaged by a wing nut 313. At the lower end of the rod 312 is a stop 314 (FIG. 13). Surrounding the rod 312 between the sleeve 311 and the stop 314 is a spring 315. The lower portion of the rod 312 overlies the contacts 316a of an electrical switch 316, which is connected by suitable wiring, not shown, to the electrically operated clutch 171. A second spring 317 surrounds the rod 312 and is disposed between the stop 314 and the housing of the switch 316. The switch 316 is supported by a plate 318 that is rigid with the bracket 304.

Thus, an advancing can C engages the bar 301 and depresses it when the height of the uppermost label of the labels L on the platform 140 is insufficient to cause the advancing can to pass over and above the bar 301. The depression of the contact bar 301 rotates the shaft 305 to depress the rod 312 to close temporarily the contacts 316a of the switch 316. By closing the contacts 316a of the switch 316, the clutch 171 is energized to raise the stack of labels in increments so that the uppermost label is disposed above the tracks 20 and 21. After an engaging can passes the contact bar 301, the bar 301 is raised to its undepressed position under the action of the spring 306, which also withdraws the rod 312 from engagement with the contacts 316a of the switch 316.

In FIG. 14 is illustrated a label releasing device 320 that releasably engages the uppermost label of the stack of labels L to permit only the uppermost label to be removed by a can C advancing over the label feeding mechanism G. The label releasing device 320 comprises a hollow rectangular housing 321 that is rigid with the outward edge of the track 21 (FIG. 1) and has a portion depending therefrom. Mounted for vertical movement in the housing 321 is a rectangular bar 322 that has the lower end thereof attached to one end of a suitable spring 323. The other end of the spring 323 is anchored to the housing 321. A knife blade 324 is rigid with the bar 322 and projects outwardly through a vertical slot 328 that is formed in a side wall of the housing 321 facing a longitudinal side edge of the uppermost label of the stack of labels L. The knife 324 has a downwardly and outwardly directed tapered edge 326 that has its uppermost portion in engagement with and resting upon the longitudinal side edge of the uppermost label of the stack of labels L. A suitable opening in the track 21 is provided to permit the knife 324 to engage the longitudinal edge of the uppermost label. In the preferred embodiment, a pair of the label releasing devices 320 may be positioned at spaced intervals along each longitudinal side edge of the uppermost label of the labels L. As the uppermost label is removed from the stack of labels L to be wrapped around a can passing thereover, the knife edges 326 lower in a vertical path under the urgency of the springs 323 to releasably engage the succeeding label of the stack of labels L to hold the same in position until it is contacted by the succeeding can.

In the operation of the can labeling machine A, cylindrical cans C enter the can labeling machine A in succession with their axes disposed transversely to their direction of travel, and advance along the tracks 20 and 21. The cans C are evenly spaced in their forward movement in the labeling machine A by the can spacing device D. After the cans C pass the spacing device D, they are contacted by the lower run of the belt 100, which moves the cans forwardly along the tracks 20 and 21. As the cans are advanced along the tracks 20 and 21, they pass over the glue applicator F. The glue wheels 25 of the glue applicator F apply a plurality of spaced apart spots of glue to the outer cylindrical surfaces of the cans C passing thereover.

Subsequent to the application of the glue spots on the outer cylindrical surfaces of the successively advancing cans, the cans C pass over the label feeding mechanism G. The platform 140 of the label feeding mechanism G supports the stack of labels L between the tracks 20 and 21 with the uppermost label of the stack above the tracks 20 and 21 and in a position to be contacted by a can C passing over it. The glue spots of a can C contact the uppermost label of the stack of labels L and cause the uppermost label to adhere to the can. Continued forward movement of the can serves to wrap the uppermost label around the outer cylindrical surface thereof. The label releasing devices 320 permit only the uppermost label of the stack of labels L to be removed by the cans C advancing over the label feeding mechanism G.

Initially, the platform 140 is positioned so that the

height of the stack of labels thereon is sufficient to raise the cans C advancing thereover above the depressible bar 301 of the label feed control device 300. However, as the labels are wrapped around the advancing cans C, the height of the labels L is gradually lowered. When the height of the labels L is lowered so that an advancing can C does not advance above the bar 301 but engages the bar 301, the bar 301 is depressed. The depression of the bar 301 causes the rod 312 (FIGS. 11 and 13) to temporarily close the contacts 316a of the switch 316 to energize the clutch 171 (FIG. 5). Thereupon, the clutch 171 is engaged and the sprocket 165 drives the shaft 154 through one-half of a revolution. At this time, the dogs 150 and 151 are in engagement with the teeth 142 of the post 141. Consequently, the post 141 with the platform 140 is raised in increments to establish the desired position for the uppermost label of the stack of labels L.

The above-described operations are repeated to continue to raise the platform 140 in a step-by-step movement until the supply of labels L on the platform 140 is reduced, but not as yet depleted. At that time, the auxiliary label platform 207 is elevated by rotating the hand wheel 258 (FIG. 3) until the tongues 265 and 266 (FIG. 7) of the label support frame 207 are at even height with the slots 267 and 268 of the platform 140. When the movable frame members 263 and 264 are moved inwardly by rotation of the disc 293 so that the tongues 265 and 266 are received by the slots 267 and 268 (FIG. 8), respectively, the label support frame 207 engages the lowermost label of the stack of labels L. Thereupon, the dogs 230 and 231 are positioned for engagement with the teeth 223 of the post 222. Rotation of the shaft 154 causes the posts 141 and 222 to raise in unison, thereby elevating the platform 140 and the label support frame 207 in unison.

When it is desired to replenish the supply of labels, the platform 140 is lowered by first disengaging the dogs 150 and 151 (FIG. 5) from the teeth of the post 141 and thereafter by rotating the lever arm 203. As soon as the platform 140 is lowered, the stack of labels L are supported by the auxiliary support frame 207, which maintains the uppermost label of the stack of labels L in position to be contacted by cans C advancing over the label feeding mechanism G. An additional supply of labels is then positioned on the platform 140. Subsequently, the platform 140 (FIG. 9) is elevated to position the uppermost label of the new stack of labels in contact with the lowermost label of the original stack of labels. The dogs 150 and 151 are then reengaged for automatically lifting the platform 140. An operator then rotates the disc 293 to move the movable frame members 263 and 264 away from one another until the tongues 265 and 266 (FIG. 7) are withdrawn from engagement with the labels to release the original stack of labels. Once again, the stack of labels is supported by the platform 140. With the movable frame members 263 and 264 outwardly disposed, the auxiliary label support frame 207 is lowered by first disengaging the dogs 230 and 231 and thereafter by rotating the hand wheel 258. The auxiliary label support frame 207 is lowered sufficiently for subsequent reengagement with the underside of the lowermost label supported by the platform 140.

Intermediate the leading and trailing edges of the stack of labels, the tracks 20 and 21 are inclined upwardly so as to raise the successively advancing cans C above the rear portion of the stack of labels L to cause the cans to pass over the glue bar 26 of the lap end glue applicator H. The glue bar 26 rests on the rear edge of the uppermost label of the stack of labels L and applies a transverse band of adhesive to the rear edge of each label. The band of adhesive formed by the glue bar 26 serves to connect the leading and trailing edges of the labels, the labels being of such length that upon being wrapped around the cans their leading and trailing edges will overlap sufficiently to form a glue seam connection between the rear and front edges of respective labels.

It will be understood that modifications and variations of the embodiments of the invention herein disclosed may be resorted to without departing from the spirit of the invention and the scope of the appended claims.

Having thus described our invention, what we claim and desire to protect by Letters Patent is:

1. A label supporting mechanism comprising a horizontal platform adapted to support a vertical stack of horizontal labels, said platform being of one piece in construction and having a plurality of slots formed along opposite edges thereof, a label support frame arranged to surround said platform, means for supporting and for guiding said label support frame for vertical movement, means connected to said supporting and guiding means for imparting vertical movement to said label support frame to position said label support frame in horizontal alignment with said platform, said label support frame including horizontally movable label-engaging members with inwardly directed tongues adapted to be received by said slots, said movable label-engaging members being mounted adjacent said opposite edges of said platform for sliding movement in a horizontal plane with respect to said support frame, and means connected to said movable members for imparting sliding movement thereto for at times sliding said movable members toward one another to insert said tongues into said slots for engaging and supporting said stack of labels and at other times sliding said movable members away from one another while said label supporting frame and said platform are maintained in horizontal alignment to remove said tongues from said slots to withdraw said movable members from engagement with said stack of labels.

2. In an article labeling machine, means for advancing articles along a path, a horizontal platform adapted to support a vertical stack of horizontal labels with the uppermost label in position to be contacted by an advancing article, a first vertical post secured to the underside of said platform with teeth formed along a vertical side thereof, means guiding said first post for vertical movement, a first pair of juxtaposed dogs adapted to engage the teeth of said first post, a label support frame arranged to surround said platform, a second vertical post secured to the underside of said frame with teeth formed along a vertical side thereof, means guiding said second post for vertical movement, a second pair of juxtaposed dogs adapted to engage the teeth of said second post, a shaft for mounting both of said pairs of dogs, said shaft including eccentric portions arranged to cause the dogs of each of said pairs of dogs to alternately engage the teeth of its associated post for lifting its associated post, and means operatively responsive to the articles advancing along said path for rotating said shaft to actuate said pairs of dogs for lifting said posts, thereby lifting said platform and said frame.

3. In an article labeling machine, spaced tracks for advancing rollable articles along a path, means for rolling articles along said track, means for applying an adhesive to the articles, means supporting a vertical stack of horizontal labels with the uppermost label in position to be contacted and gripped by a rolling article advancing along said path, a housing supported by one of said tracks, said housing having an opening in a wall thereof facing an edge of the uppermost label of said stack, a blade pro-

jecting through the opening of said housing and having an edge adapted to rest on the uppermost label of said stack of labels for releasably engaging the uppermost label, a member disposed in said housing for vertical movement and connected to said blade, and means connected to said member for urging said blade downwardly as the uppermost label is gripped by and is wound around the rolling article and is pulled free of the horizontal stack of labels.

4. In an article labeling machine, means for advancing articles along a path, a horizontal platform adapted to support a vertical stack of horizontal labels with the uppermost label in position to be contacted by an advancing article, a vertical post secured to the underside of said platform with teeth formed along a vertical side thereof, means supporting said post for vertical movement, a pair of juxtaposed dogs adapted to engage the teeth of said post, a shaft for mounting said pair of dogs, said shaft including eccentric portions arranged to actuate said dogs to cause said dogs to alternately engage the teeth of said post and to lift said post, and means operatively responsive to the articles advancing along said path for rotating said shaft to actuate said dogs for lifting said post, thereby lifting said platform.

5. In an article labeling machine, means for advancing articles along a path, a horizontal platform adapted to support a vertical stack of horizontal labels with the uppermost label in position to be contacted by an advancing article, a vertical post secured to the underside of said platform with teeth formed along a vertical side thereof, means supporting said post for vertical movement, a pair of juxtaposed dogs adapted to engage the teeth of said post, a shaft for mounting said pair of dogs and arranged to actuate said dogs to cause said dogs to lift said post, a retractable arm for each of said dogs, each of said arms being pivotally connected to its associated dog, eccentric means mounted for engagement with said arms and arranged to actuate said arms for moving said dogs relative to said shaft to at times position said dogs for engagement with said teeth and at other times to withdraw said dogs from engagement with said teeth, and means operatively responsive to the articles advancing along said path for rotating said shaft to cause said dogs to lift said post.

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