April 22, 1969 A. E. WHITECAR 3,440,116

METHOD AND DEVICE FOR SECURING AN ARTICLE TO A CONTAINER

Filed May 8, 1964 Sheet 1 of 10

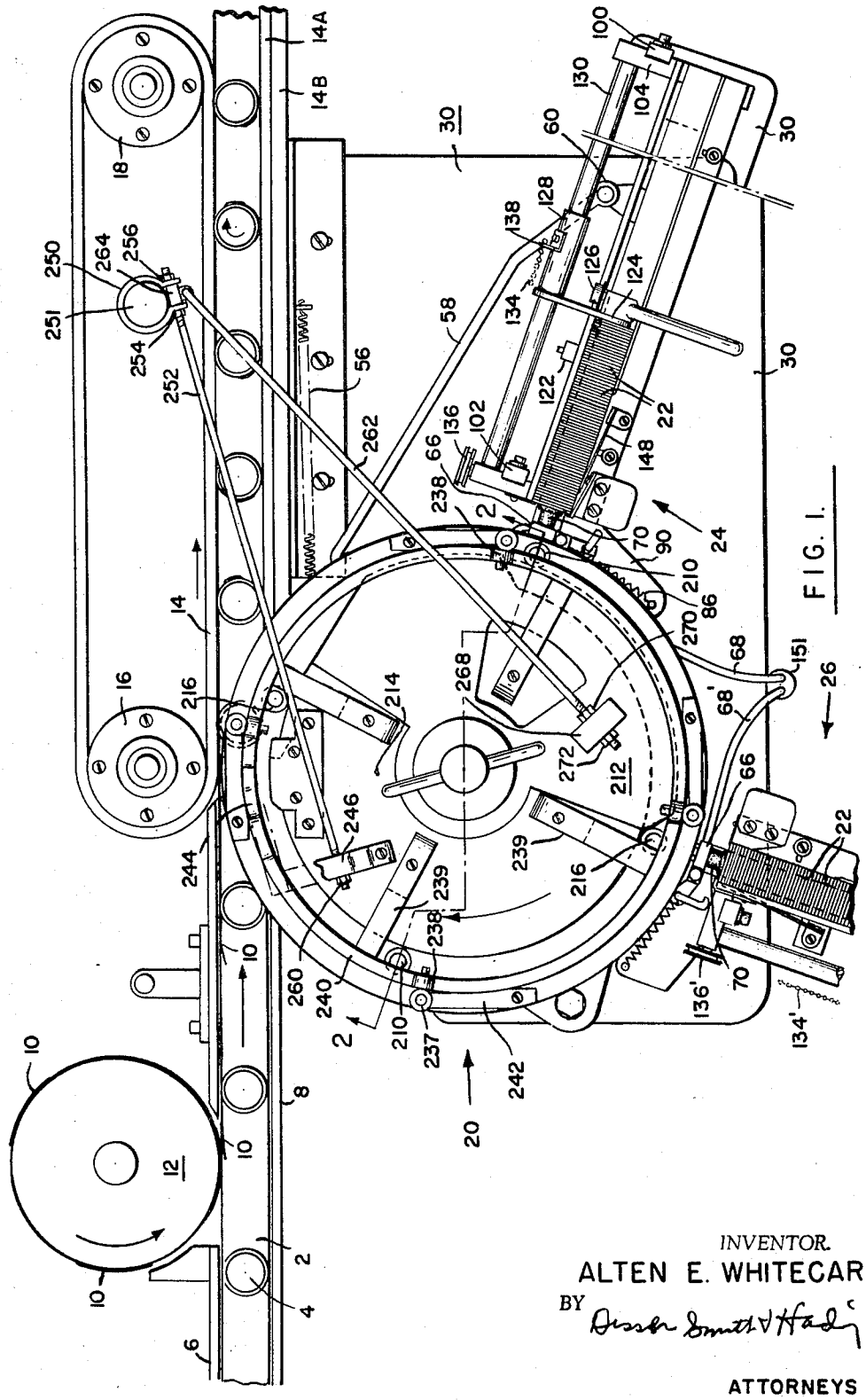

FIG. 1.

INVENTOR.
ALTEN E. WHITECAR
BY Dressler Smith & Hady
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April 22, 1969 A. E. WHITECAR 3,440,116

METHOD AND DEVICE FOR SECURING AN ARTICLE TO A CONTAINER

Filed May 8, 1964 Sheet 2 of 10

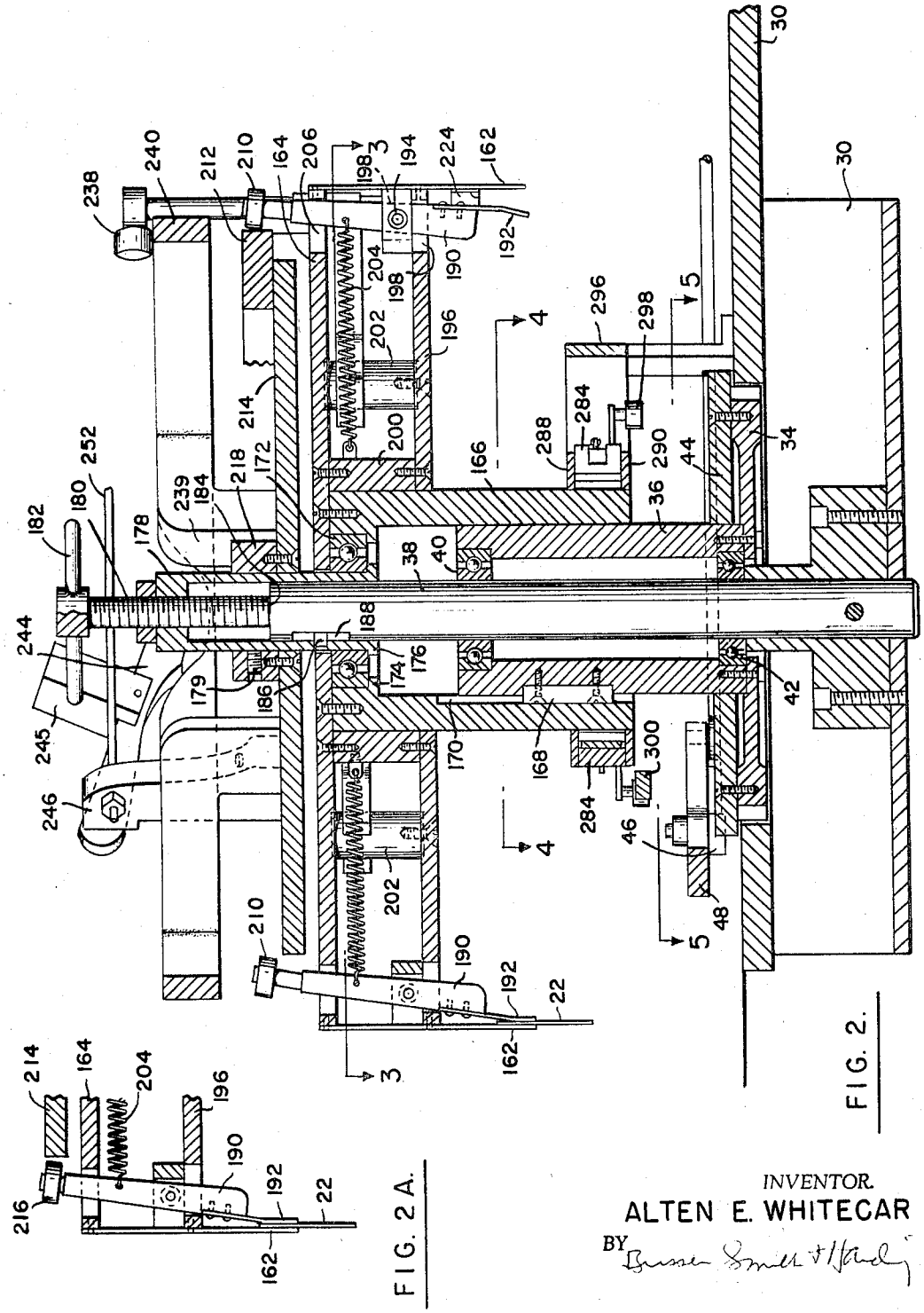

FIG. 2.

FIG. 2A.

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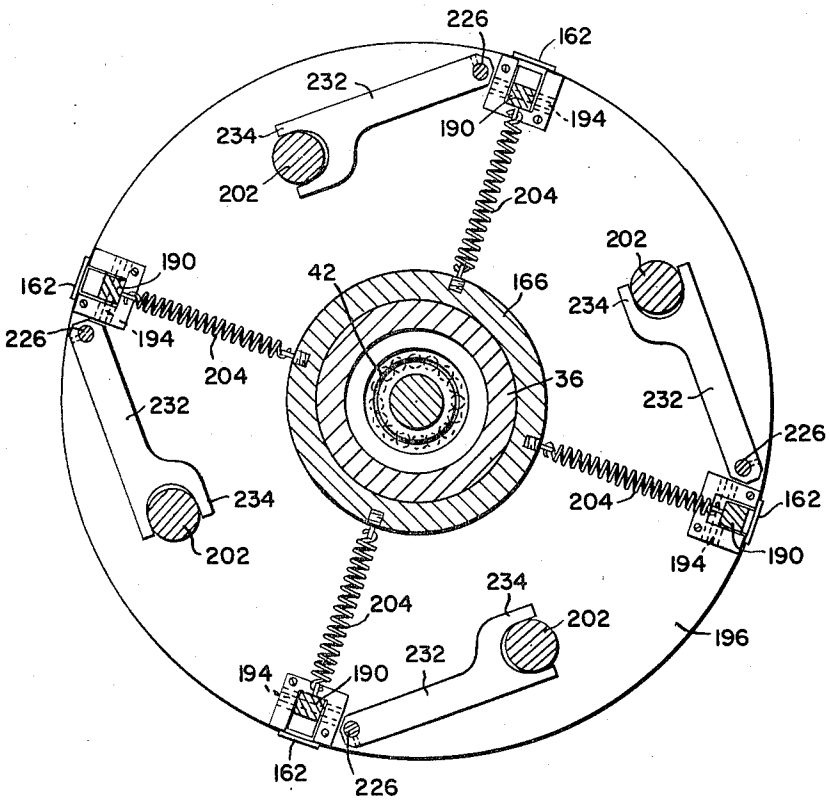

FIG. 3.

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METHOD AND DEVICE FOR SECURING AN ARTICLE TO A CONTAINER

Filed May 8, 1964 Sheet 4 of 10

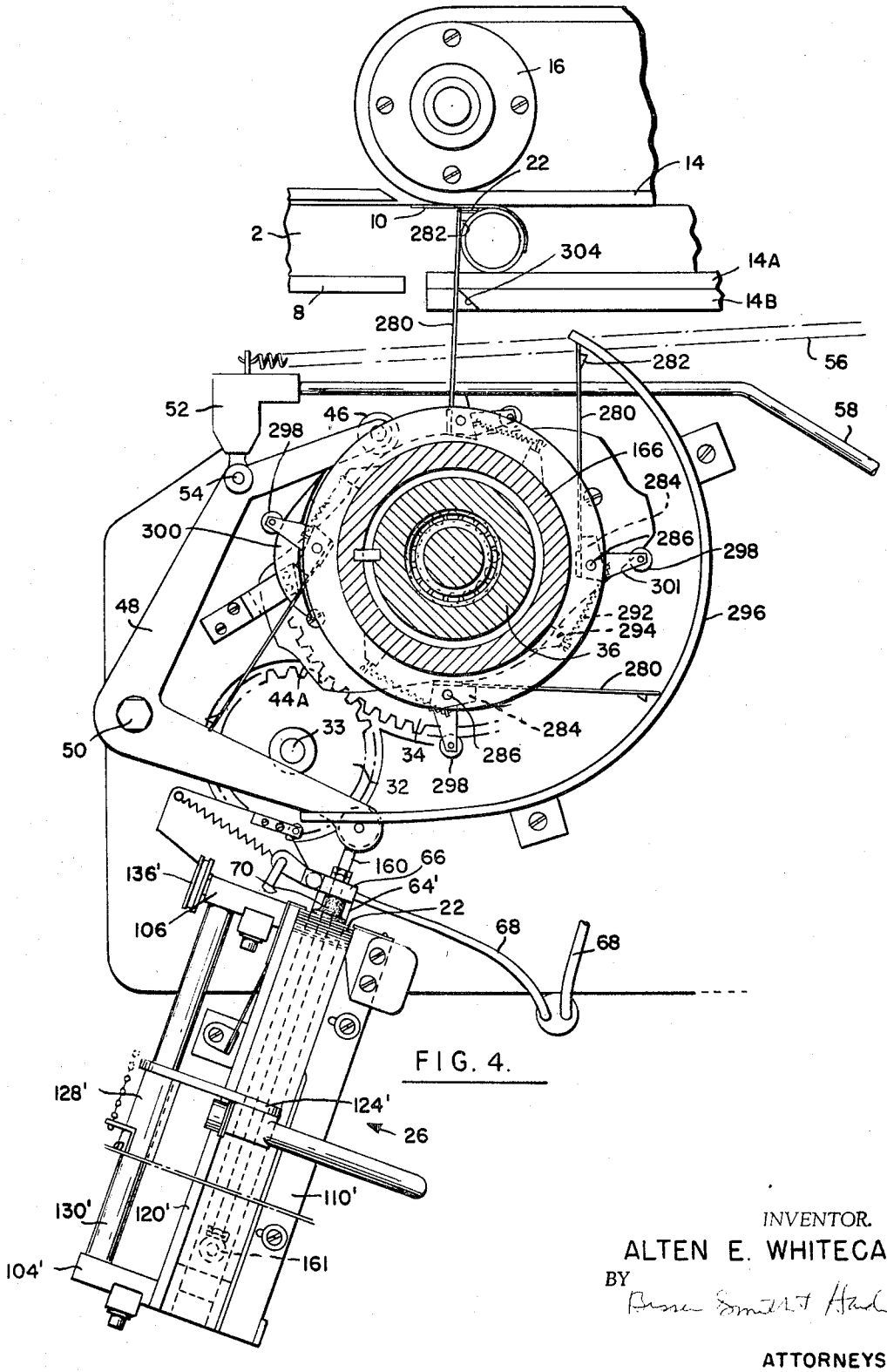

FIG. 4.

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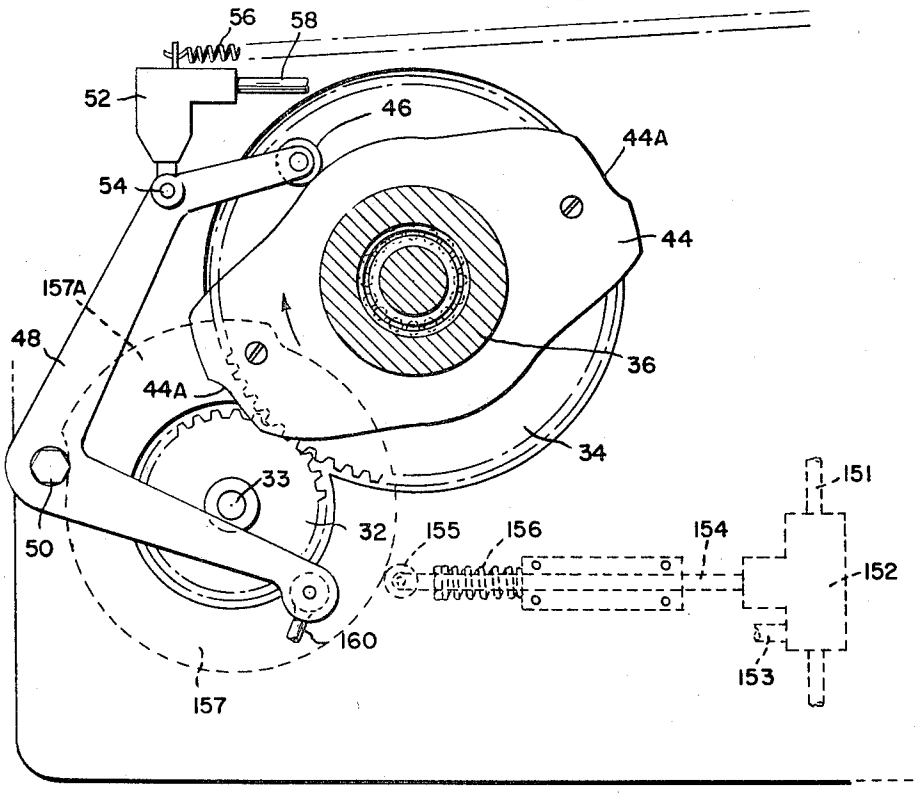

FIG. 5.

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April 22, 1969 A. E. WHITECAR 3,440,116

METHOD AND DEVICE FOR SECURING AN ARTICLE TO A CONTAINER

Filed May 8, 1964 Sheet 6 of 10

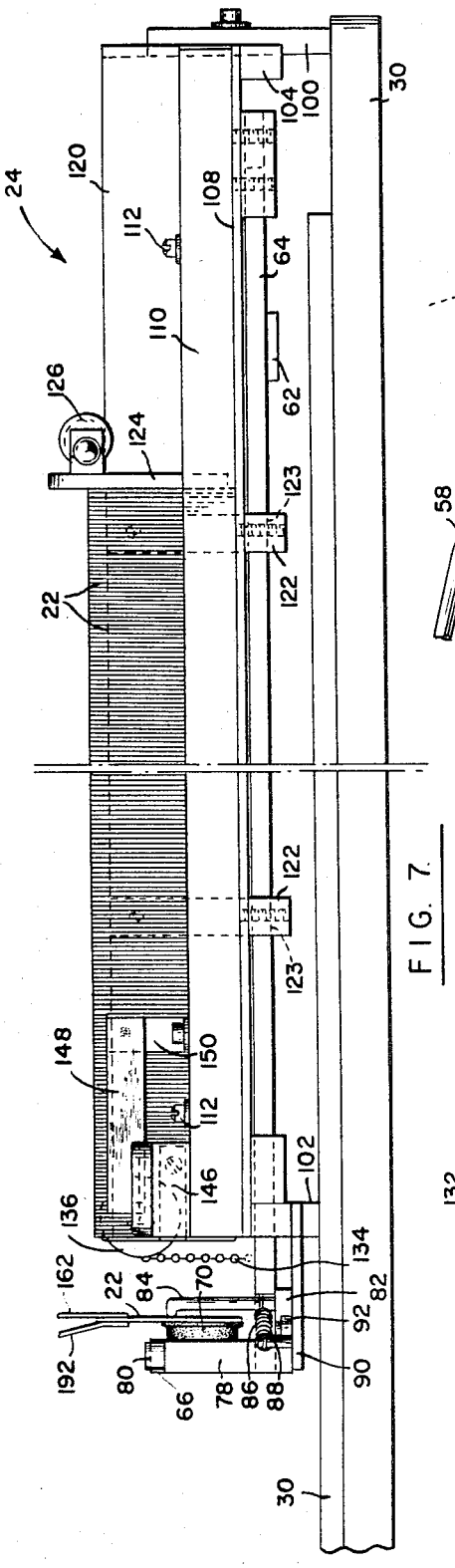

FIG. 7.

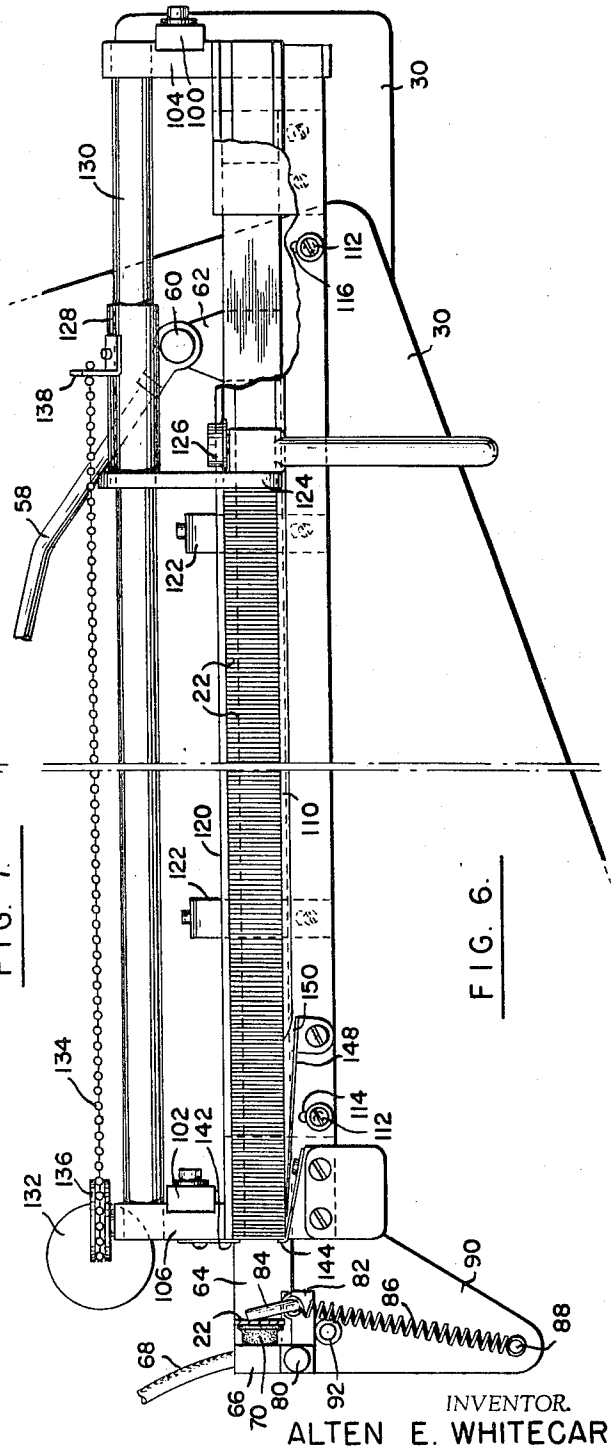

FIG. 6.

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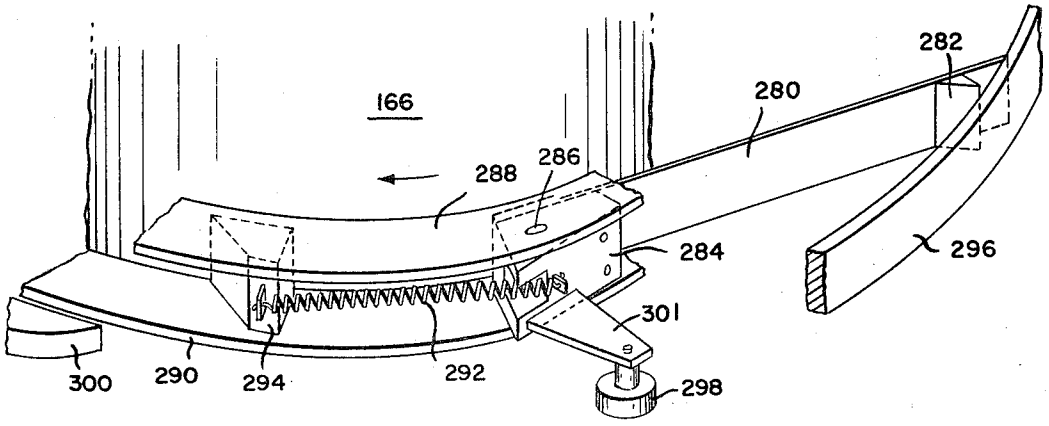

FIG. 8.

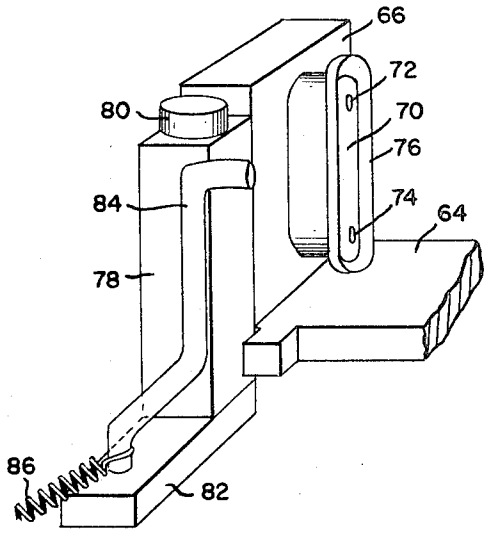

FIG. 9.

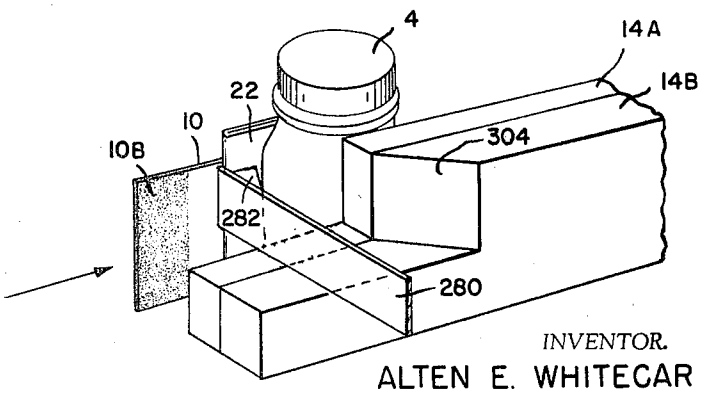

FIG. 10.

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April 22, 1969 A. E. WHITECAR 3,440,116

METHOD AND DEVICE FOR SECURING AN ARTICLE TO A CONTAINER

Filed May 8, 1964 Sheet 8 of 10

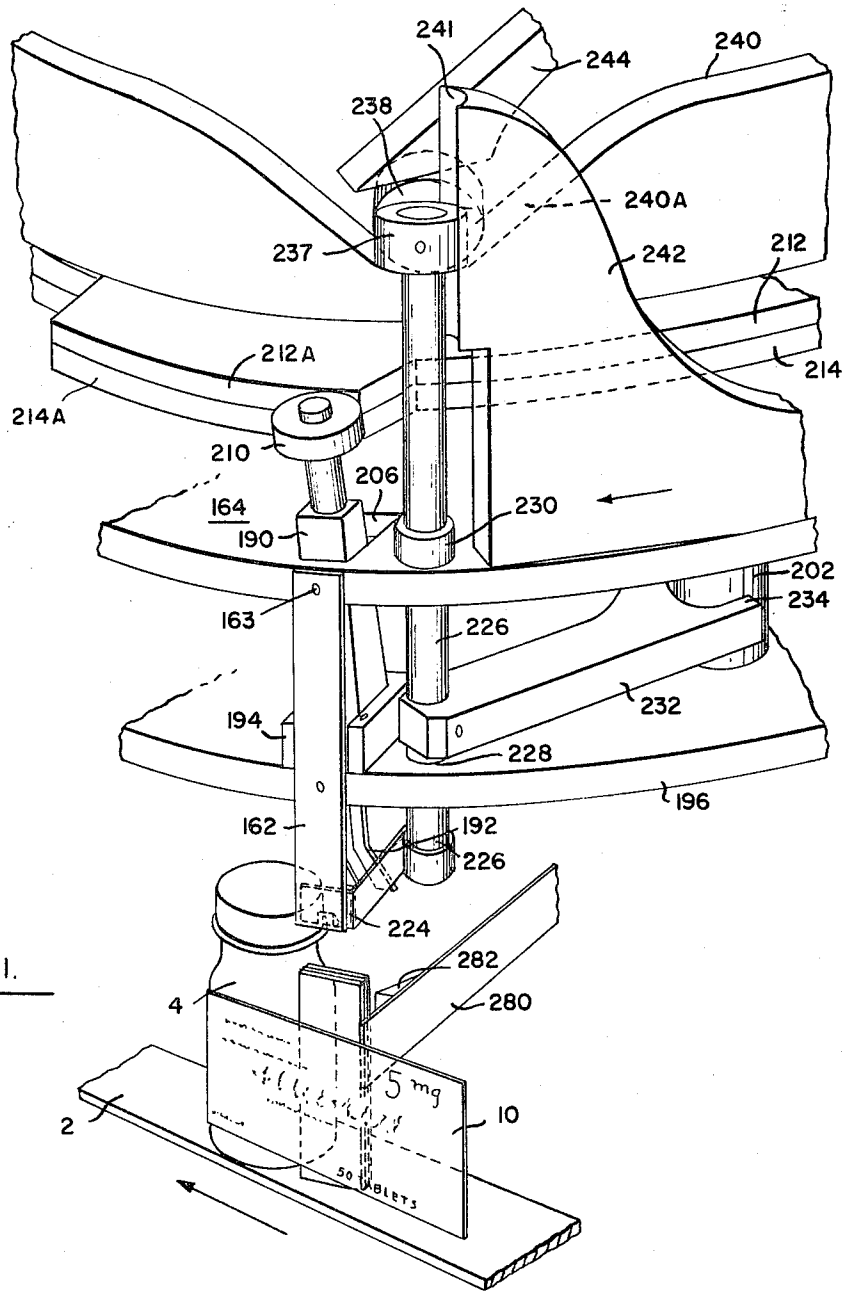

FIG. 11.

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April 22, 1969 A. E. WHITECAR 3,440,116

METHOD AND DEVICE FOR SECURING AN ARTICLE TO A CONTAINER

Filed May 8, 1964 - Sheet 9 of 10

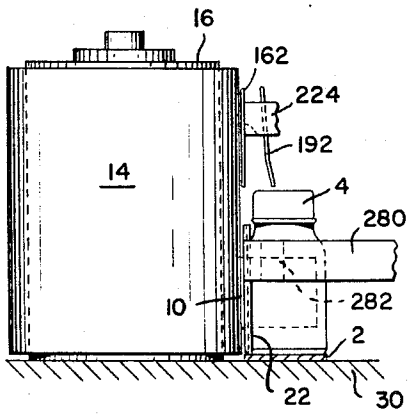

FIG. 16.

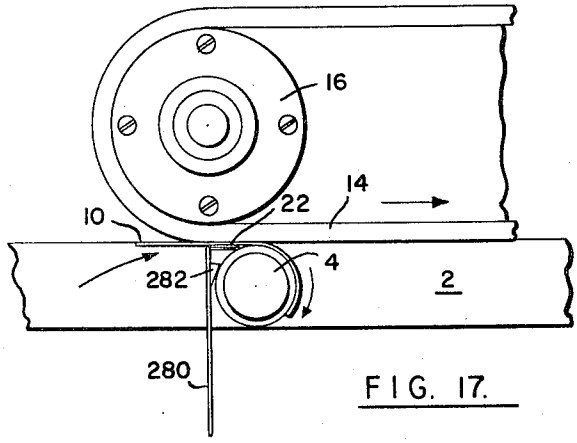

FIG. 17.

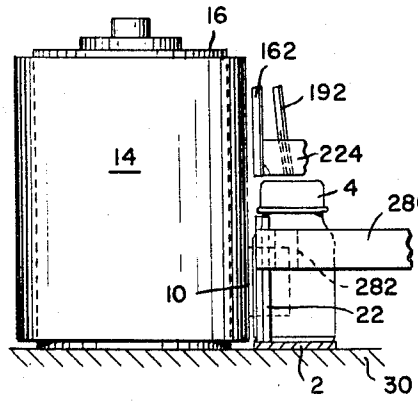

FIG. 14.

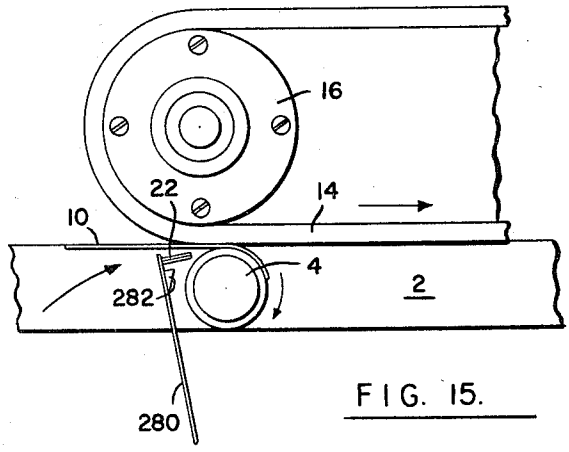

FIG. 15.

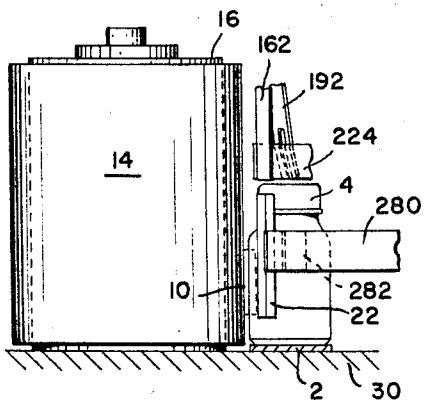

FIG. 12.

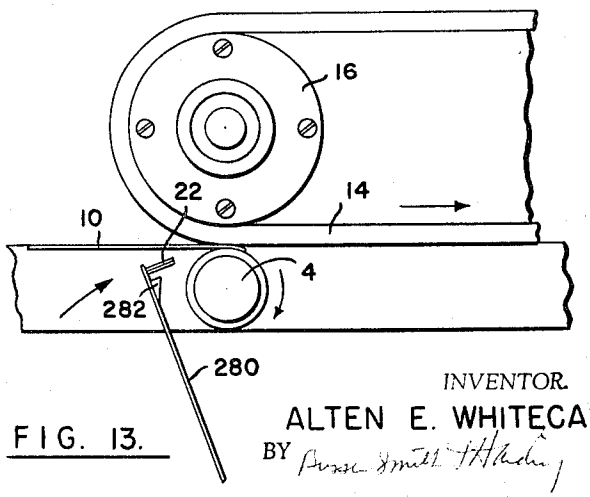

FIG. 13.

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BY Arnold Smith & Hadad

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METHOD AND DEVICE FOR SECURING AN ARTICLE TO A CONTAINER

Filed May 8, 1964 Sheet 10 of 10

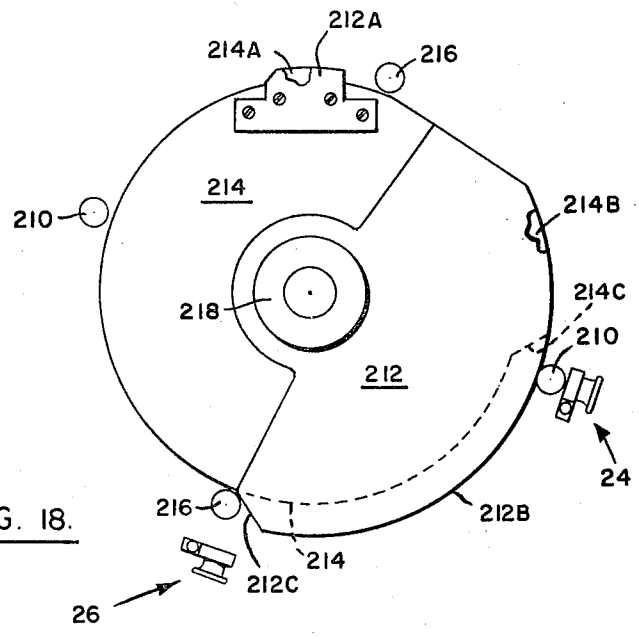

FIG. 18.

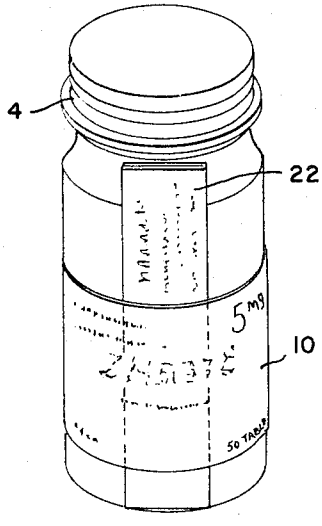

FIG. 19.

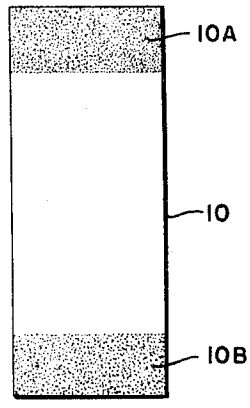

FIG. 20

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United States Patent Office 3,440,116 Patented Apr. 22, 1969

3,440,116

METHOD AND DEVICE FOR SECURING AN ARTICLE TO A CONTAINER

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Filed May 8, 1964, Ser. No. 366,066
Int. Cl. B65c 9/04; B29c 17/04
U.S. Cl. 156—70 14 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure relates to a method and device for securing an article to a container and more particularly relates to a device providing means for inserting an article between a container and a label for retention therebetween.

It is frequently desired to supply an article along with a container which is accessible without the necessity for opening the container. Typical examples are instruction sheets, premiums, tokens, product samples and money. For purposes of illustration, the invention will be described as it relates to a bottle containing medicinal tablets with which it is desired to supply informative literature to be read by the dispensing pharmacist and not by the ultimate purchaser of the tablets. In accordance with this invention, an article such as a piece of literature can be removably secured to a container between the container and a label.

It is therefore the primary object of this invention to provide for securing an article to a container between the container and a label applied to the container.

This and other objects of the invention will be made apparent on reading the following description in conjunction with the drawings, in which:

FIGURE 1 is a plan view of apparatus in accordance with the invention;

FIGURE 2 is a vertical section taken on the plane indicated by the line 2—2 in FIGURE 1;

FIGURE 2A is a fragmentary section corresponding to FIGURE 2 showing the relationship of one of the lower finger cam followers and its associated cam;

FIGURE 3 is a horizontal section of the apparatus of FIGURE 1 taken on the plane indicated by the line 3—3 in FIGURE 2;

FIGURE 4 is a horizontal section of the apparatus of FIGURE 1 taken on the plane indicated by the line 4—4 in FIGURE 2;

FIGURE 5 is a horizontal section of the apparatus of FIGURE 1 taken on the plane indicated by the line 5—5 in FIGURE 2;

FIGURE 6 is a plan view of one of the magazines of the apparatus of FIGURE 1;

FIGURE 7 is a side elevation of the magazine of FIGURE 6;

FIGURE 8 is a fragmentary perspective view showing details of the backup finger of the apparatus of FIGURE 1;

FIGURE 9 is a fragmentary perspective view showing details of the mechanism of the apparatus of FIGURE 1 for separating a circular from the other circulars in the magazine;

FIGURE 10 is a fragmentary perspective view showing details of a portion of the stationary back up pad in the apparatus of FIGURE 1;

FIGURE 11 is a perspective view partially broken away showing the positioning of a circular just as the circular contacts the conveyor carrying the bottle;

FIGURE 12 is a vertical section transverse the conveyor of the apparatus of FIGURE 1 showing a circular moving into position between a label and a container;

FIGURE 13 is a plan view of the mechanism shown in FIGURE 12;

FIGURE 14 is a vertical section taken transverse the conveyor of the apparatus of FIGURE 1 showing the circular just as it reaches the conveyor;

FIGURE 15 is a plan view of the mechanism of FIGURE 14;

FIGURE 16 is a vertical section taken transverse the conveyor of the apparatus of FIGURE 1 showing the circular engaged between the label and the container;

FIGURE 17 is a plan view of the mechanism of FIGURE 16;

FIGURE 18 is a plan view of the cam controlling the article pickup fingers;

FIGURE 19 is a perspective view showing a bottle with a label applied thereto and a folded piece of literature retained between the label and the container; and

FIGURE 20 is a bottom plan view of a typical label used with the apparatus of the invention.

It is well known to the art to apply a label to a container, for example, by conveying the container past a rotating pneumatic drum holding the label with its adhesive side toward the container so as to permit the container to pick up the label at one end thereof and then rotate the container by means of a moving belt lying in a vertical plane adjacent the container to wrap the label about the bottle. Such apparatus is shown in FIGURE 1 where a conveyor 2 conveys spaced bottles 4 guided by side barriers 6 and 8. Labels 10 having adhesive on their outer sides are carried by the conventional pneumatic transfer drum 12 which projects through an opening in side barrier 6 to permit the transfer of a label 10 to each passing bottle 4. At the terminal end of side barrier 6 there is provided a rubber side belt 14 carried by pulleys 16 and 18, pulley being driven so as to move at a linear rate in excess of the linear rate of conveyor 2 by drive apparatus (not shown). Opposite belt 14 is a rubber back up pad 14A secured to a plate 14B. As discussed above, such apparatus is well known to the art.

As seen in FIGURE 1, a turrent apparatus 20 is provided to introduce folded circulars 22 which are stored in magazines 24 and 26 between each bottle 4 and its associated label 10 so as to secure a piece of literature to each bottle 4. Turret apparatus 20 is mounted on a frame 30.

Referring now to FIGURE 4, a gear 32 is driven by a shaft 33 which in turn is driven by the mechanism which also drives conveyor 2 so as to provide for a timed relationship between conveyor 2 and the turret apparatus 20. Gear 32 drives a gear 34 which is secured to a sleeve 36 (FIGURE 2) mounted on bearings 40 and 42 on fixed shaft 38 for rotational movement with respect to shaft 38. The speed ratio of gear 32 to gear 34 is 2 to 1.

As best seen in FIGURE 5, a cam 44 fixedly secured to gear 34 is engaged by a cam follower 46 on a bell crank lever 48 pivotally mounted as indicated at 50. A bracket 52 is pivotally secured at 54 to bell crank lever 48 and has secured thereto an extension spring 56 which urges cam follower 46 into contact with cam 44. A rod 58 is fixedly secured to bracket 52 and in turn is pivotally secured at 60 (FIGURE 6) to a bracket 62 secured to a slide 64 mounted on magazine 24. Slide 64 supports a manifold element 66 which is connected to a source of vacuum (not shown) by a line 68 and is provided with a suction cup 70 which is connected to the interior of the manifold by openings 72 and 74 and has a conventional rubber edge 76 (FIGURE 9). As shown in FIGURE 9, a bracket 78 carries a pin 80 which pivotally supports a lever 82 carrying a fixed finger member 84.

An extension coil spring **86** biases lever **82** into the position shown in FIGURE 9. As best seen in FIGURE 6, extension spring **86** is connected to a pin **88** on a supporting plate **90** which carries a camming roller **92** adjacent lever **82**.

As seen in FIGURES 6 and 7, standards **100** and **102** mounted on frame **30** respectively support cross-bars **104** and **106** which in turn support a plate **108** which carries circulars **22**. A side frame bar **110** is secured to plate **108** by means of machine screws **112** which pass through slots **114** and **116** in bar **110**. A side plate **120** is secured to plate **108** by means of L-shaped brackets **122** having openings **123** to accommodate slide **64**. A follower **124** has a roller **126** which rides on the upper edge of side plate **120** and is connected to a tubular member **128** slidably mounted on rod **130** which is secured to cross-bars **104** and **106**. A weight **132** is connected to a chain **134** which passes over a pulley **136** and is connected to a bracket **138** secured to tubular member **128**. This structure acts to urge follower **124** against the circulars **22** in the magazine. A stop member **142** secured to cross bar **106** engages one side of the most advanced circular **22**. The other side of this circular is engaged by stop member **144** secured to a block **146** mounted on side bar **110**. A leaf spring **148** engages the edges of the circulars adjacent side bar **110** as they approach the advanced position to urge them against side plate **120** to insure perfect alignment. Leaf spring **148** is secured to a bracket **150** which in turn is secured to side bar **110**.

Magazine **26** is a mirror image of magazine **24** to facilitate the loading of the two magazines from a single station, corresponding parts being given corresponding prime numbers and not further described. One difference exists, namely slide bar **64'** is pivotally connected to rod **160** at **161** (FIGURE 4). As shown in FIGURE 5, rod **160** is pivotally secured to bell crank lever **48**. Further, the suction cup and associated apparatus for withdrawing a circular from magazine **26** is identical with that employed with magazine **24**.

The vacuum lines **68** and **68'** are connected to a vacuum line **151** (FIGURE 1) in which is placed a valve **152** (FIGURE 5) which is connected to atmosphere by a line **153**. Valve operating rod **154** has a cam follower **155** biased by a spring **156** against a cam **157** on shaft **33**.

The circulars **22** removed from magazines **24** and **26** on suction cups **70** are in turn removed from the suction cups **70** by finger structures which will now be described. Each finger structure has a finger **162** (FIGURE 11) secured at **163** to a ring **164** which in turn is secured to a sleeve **166** (FIGURE 2). A key **168** secured to sleeve **36** engages a key way **170** in sleeve **166** to provide for the rotation of sleeve **166** with sleeve **36** and yet permit relative vertical adjustment between the sleeves. Sleeve **166** engages bearing **172** which is supported on a flange **174** on sleeve **166** and flange **176** of cap member **178**. Cap member **178** is threadably engaged by threaded member **180** which has a handle **182** for its rotation. The lower end of threaded member **180** abuts the upper end of shaft **38** at **184**. A key **186** secured to cap member **178** engages a keyway **188** in shaft **38**.

Each finger **162** has associated therewith a cooperating finger **190** having a leaf lower portion **192** (FIGURES 2 and 11). Each finger **190** is pivotally connected to a yoke member **194** secured to a ring **196** and passes downwardly through an opening **198** in ring **196** (FIGURE 2). Ring **196** is secured to collar **200** which in turn is secured to ring **164**. In addition, ring **196** is secured to fixed posts **202** which in turn are secured to ring **164**. Finger **162** is also secured to ring **196**.

An extension coil spring **204**, connected to each finger **190** and collar **200**, biases the spring portion **192** of finger **190** towards the adjacent finger **162**. Each finger **190** passes upwardly through an opening **206** in ring **164**. While as thus described, the fingers **190**, which are 90° apart, are identical, adjacent fingers **190** are operated by

different cams that is to say, one set of opposed fingers (180° apart) is operated by one cam and the other set of opposed fingers (180° apart) is operated by a second set of cams in order to provide for the necessary interaction with the two magazines **24** and **26**. In the case of one pair of opposed fingers **190** which cooperates with magazine **26**, each finger **190** is secured to a cam follower **210** which engages a cam **212** which is mounted on collar **218** and rests on a cam **214**. In the other set of opposed fingers **190** which cooperate with magazine **24**, each finger **190** is secured to a cam follower **216** which engages cam **214**. Cam **214** is secured to collar **218** (FIGURE 2) which in turn is fixedly secured to cap **178** by set screws, one of which is shown at **179**.

A pusher member **224** lies between each pair of fingers **162** and **190** and is connected to a rod **226** (FIGURE 11) which passes upwardly through an opening **228** in ring **196** and a collar **230** secured in ring **164**. A yoke member **232** is fixedly secured to rod **226** between rings **196** and **164** and has the yoke end **234** in engagement with a post **202** to prevent rotation of rod **226**. A sleeve **237** secured to rod **226** carries each cam follower **238** which engages cam **240** supported by brackets **239**. Sleeve **237** is guided by a curved groove **241** in guide member **242** which is secured to ring **164**. A cam **244** carrying a weight **245** (FIGURE 2) is pivotally secured to bracket **246** mounted on cam **214** and acts to force rod **226** downwardly adjacent the low portion **240A** of cam **240** (FIGURE 11).

Referring to FIGURE 1, a clamp ring **250** engages a post **251** to which it is clamped by means of a threaded rod **252** and its associated nuts **254** and **256**. Rod **252** passes through bracket **246** and carries a nut **260** engaging bracket **246**. A rod **262** pivotally engages a sleeve **264** carried by rod **252**. Rod **262** passes through a bracket **268** which is secured to cam **212** and carries nuts **270** and **272** which engage bracket **268** on either side thereof.

Referring to FIGURE 4, four leaf spring finger members **280** each carrying a supporting block **282** are each secured to a block **284** which is pivotally secured as shown at **286** between flange members **288** and **290** fixedly secured to sleeve **166** (FIGURE 2). An extension coil spring **292** (FIGURE 8) connected to each block **284** and to a block **294** fixedly secured between flange members **288** and **290** biases each block **284** clockwise as viewed in FIGURE 4. A guide member **296** secured to frame **30** limits the outward travel of finger members **280** during a portion of their rotation. A cam follower roller **298** is connected to each block **284** by an arm **301** and the cam follower roller **298** is biased against a cam **300** by the action of spring **292**.

OPERATION

Assuming the parts to be in the positions shown in FIGURE 1, with the turret apparatus **20** being rotated clockwise as viewed in FIGURE 1 by virtue of gear **32** rotating gear **34** which in turn causes the rotation of sleeves **36** and **166** and the mechanism associated therewith.

The pairs of fingers **162** and **190** which are adjacent the manifold **66** associated with magazine **26** and the pair of fingers **162** and **190** which are between this manifold and conveyor **2** each hold a circular **22**. As the latter pair of fingers respectively come close to a bottle **4** on conveyor **2**, the interaction of cam **300**, roller **298** and spring **292** (FIGURE 4) is causing the adjacent finger member **280** and block **282** to be rotated by the rotation of block **284** into a position close to the bottle to which the circular **22** is to be delivered. When finger member **280** is closely following the fingers **162** and **190** with which it is cooperating, finger **190** is cammed away from finger **162** (FIGURE 11) by the engagement in this case of cam follower roller **210** with high point **212A** of cam **212**, FIGURES 11 and 18. This causes the circular **22** to drop as shown in FIGURES 12 and 13. Cam **300**, having previously released cam follower **298**, finger member **280**

and block **282** acts to back up folder **22** if necessary to keep it from falling away from the bottle as it travels downwardly. As shown in FIGURES 14 and 15, circular **22** has dropped onto conveyor **2** and is closely followed or being urged to a position between the trailing portion of label **10** and bottle **4**. Block **282** is desirable in the event that circular **22** should tend to fall towards the turret apparatus before it is secured between bottle **4** and label **10**. As shown in FIGURES 16 and 17, the circular **22** is now caught between label **10** and bottle **4**. During the period immediately discussed, belt **14** has been rotating bottle **4** so as to wrap label **10** about the bottle. With the label urged in the position shown in FIGURES 16 and 17, the circular **22** is caught between label **10** and bottle **4** and is wrapped by the action of the rotation of bottle **4** between label **10** and the bottle to produce the finished product shown in FIGURE 19. As shown in FIGURE 20, only the end portion of label **10** bears an adhesive indicated at **10***a* and **10***b*, for example, a pressure sensitive adhesive, so that the area of the label **10** which overlies circular **22** will not adhere thereto. The operation of the fingers **190** actuated by cam **214** and cam follower **216** is identical except for the fact that they are actuated to release the circular by the engagement of follower **216** with high point **214**A of cam **214**.

In order to insure the prompt dropping of circular **22**, and to provide for faster operation, it is desirable to employ the pusher member **224**. As soon as a pair of fingers **162** and **190** release a circular **22**, pusher member **224** is permitted to move downwardly by virtue of the low portion **240**A of cam **240** in engagement with cam follower roller **238**. The downward movement of pusher **224** is made positive by virtue of the engagement of pivoted cam **244** with cam follower roller **238** (FIGURE 11). The rotation of rod **226** is prevented by the engagement of yoke member **232** with post **202**. The action of cam **240** causes the rapid upward movement of pusher member **224** after its downward push on circular **22**.

As soon as circular **22** is positioned so as to be caught between bottle **4** and label **10**, finger member **280** engages a cam face **304** on plate **14**B (FIGURE 4) which causes the outer portion of follower member **280** to move rapidly to the left and entirely clear of the label on the bottle being worked on. Finger member **280** before it is released by cam **304** is engaged by guide member **296**.

Shortly after each set of fingers **162** and **190** passes over the bottle **4**, the associated cam follower and cam permit the associated spring **204** to again urge finger **190** against finger **162**.

As previously discussed, the two sets of fingers **162** and **190** which are most advanced in their movement towards conveyor **2**, each are carrying a circular **22**. It will now be described how these pairs of fingers picked up their respective circulars by describing this action with respect to the other two sets of fingers. Again, referring to the position of the parts shown in FIGURE 1, each suction cup **70** has advanced into engagement with the next circulars to be removed from magazines **24**, **26** respectively by virtue of the action of cam **44** and cam follower **46** which is translated through bracket **52** and rod **58** to the slide **64** carrying suction cup **70** associated with magazine **24** and through rod **160** to the slide **64'** associated with magazine **26**. As ring **196** rotates, it carries the set of fingers **162**, **190** shown adjacent the magazine **24** past this magazine and towards magazine **26** with finger **190** biased away from its associated finger **162** by the action of portion **212**B of cam **212** (FIGURE 18) on cam follower **210**. At the same time the next pair of fingers **162**, **190** are approaching the magazine **24**. On the approach of finger **190** to magazine **24**, it is moved from its associated finger **162** by the action of portion **214**B of cam **214** on cam follower **216**. Well prior to the arrival of the fingers adjacent the respective magazines **24** and **26**, cam **44** acts on cam follower **46** to cause the withdrawal of suction cups **70** from magazines **24** and **26**, respectively. On the retraction of each of these suction cups **70** to the withdrawn position, cam roller **92** is engaged by lever **82** causing the camming of lever **82** towards suction cup **70** to position member **84** against the circular **22** (FIGURE 7) held by the suction cup to assist in holding the folds of the folded circular **22** against the suction cup. Immediately before the circulars are picked up, cam follower **46** moves to portion **44**A of cam **44** to advance suction cups **70** and finger members **84** slightly to position circulars **22** close to finger **162**, the initial positioning of suction cups **70** and finger members **84** providing for good clearance for the fingers **162** with respect to circulars **22** and the secondary position providing for alignment for a straight pickup without binding.

As will be seen by reference to the layout of cams **212** and **214** as shown in FIGURE 18, as the respective sets of fingers **162** and **190** closely approach the magazines **24** and **26**, respectively, and the withdrawn circular **22** held by the suction cup **70** associated with these magazines, portion **214**C of cam **214** permits the cam follower **216** adjacent magazine **24** to move inwardly at the urging of the associated spring **204** to permit the adjacent finger **190** to move towards the circular **22** and clamp it to the associated finger **162**. Similarly, adjacent magazine **26** portion **212**C of cam **212** permits cam follower **210** to move inwardly at the urging of the associated spring **204** to cause the associated finger **190** to move towards the circular being presented at magazine **26** and to hold it against finger **162** and thereby withdraw it from the suction cup **70**. Just prior to the withdrawal of a circular **22** from a suction cup **70**, the portion **157**A of cam **157** engages cam follower **155** (FIGURE 5) and acts to connect manifold element **66** and **66'** and suction cups **70** to atmosphere.

I claim:

1. The method of securing an article to a container comprising attaching to the container one end of an adhesive backed label having a back portion intermediate the label ends free of adhesive,

placing the article between the container and the back portion of the label free of adhesive,

wrapping the unsecured part of the label about the article and the container and securing the other end of the label to the container.

2. In combination with a conveyor for containers,

label transfer means for partially securing a label on each container by placing one end of a label on each container, and

means for wrapping the label about the container and about an axis substantially normal to the conveyor to complete the securing of the label on the container,

the improvement comprising:

means to pick up an article and drop it between a container on the conveyor and a partially secured label on the container to provide for the securing of the article to the container between the label and the container.

3. In combination with a conveyor for containers,

label transfer means for partially securing a label on each container by placing one end of a label on each container, and

means for wrapping the label about the container and about an axis substantially normal to the conveyor to complete the securing of the label on the container,

the improvement comprising:

article storage means, and

transfer means to pick up an article from the storage means and drop it into a position between a container on the conveyor and a partially secured label on the container to provide for the securing of the article to the container between the label and the container.

4. The combination of claim 3 in which the storage means includes means to separate an article from the

articles in the storage means and position it for pickup by the transfer means.

5. The combination of claim 3 in which the transfer means comprises a pair of fingers mounted for movement in a path between the article storage means and the conveyor, and

means to close and separate the fingers to provide for the engagement of an article for transfer from the storage means to the conveyor and the discharge of the article to position it between the label and the container.

6. The combination of claim 5 having pusher means to urge the article downwardly on being released by the pair of fingers.

7. The combination of claim 5 having second finger means to prevent the article from falling away from the partially wrapped label and the container.

8. The combination of claim 7 having pusher means to urge the article downwardly on being released by the pair of fingers.

9. In combination with a conveyor for containers,

label transfer means partially securing a label on each container by placing one end of a label on each container, and

means for wrapping the label about the container and about an axis substantially normal to the conveyor to secure the label to the container,

the improvement comprising:

article storage means,

rotary means,

finger means carried by said rotary means, and

a cam follower secured to the finger means,

means including a cam adapted to engage said cam follower to close the finger means to pick up an article from the article storage means and to open the finger means to release an article between a container on the conveyor and a partially secured label on the container.

10. The combination of claim 9 having a second finger means to urge the article released by the first mentioned finger means into contact with the partially wrapped label and the container, and

means including a cam to control said second finger means.

11. The combination of claim 9 having pusher means mounted on the rotary means for movement parallel to the axis of the rotary means, and

means including a cam to control the pusher means to urge an article downwardly on being released by the finger means.

12. The combination of claim 9 in which the article storage means includes transfer means including a suction cup to transfer an article from the article storage means to the path of the finger means.

13. The combination of claim 12 in which the finger means comprises a fixed finger and a movable finger and having means to advance the suction cup and an article held by the suction cup towards the fixed finger when the fingers lie on either side of the article and immediately prior to the closing of the fingers to pick up the article.

14. The combination of claim 12 having means to hold an article against the suction cup.

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