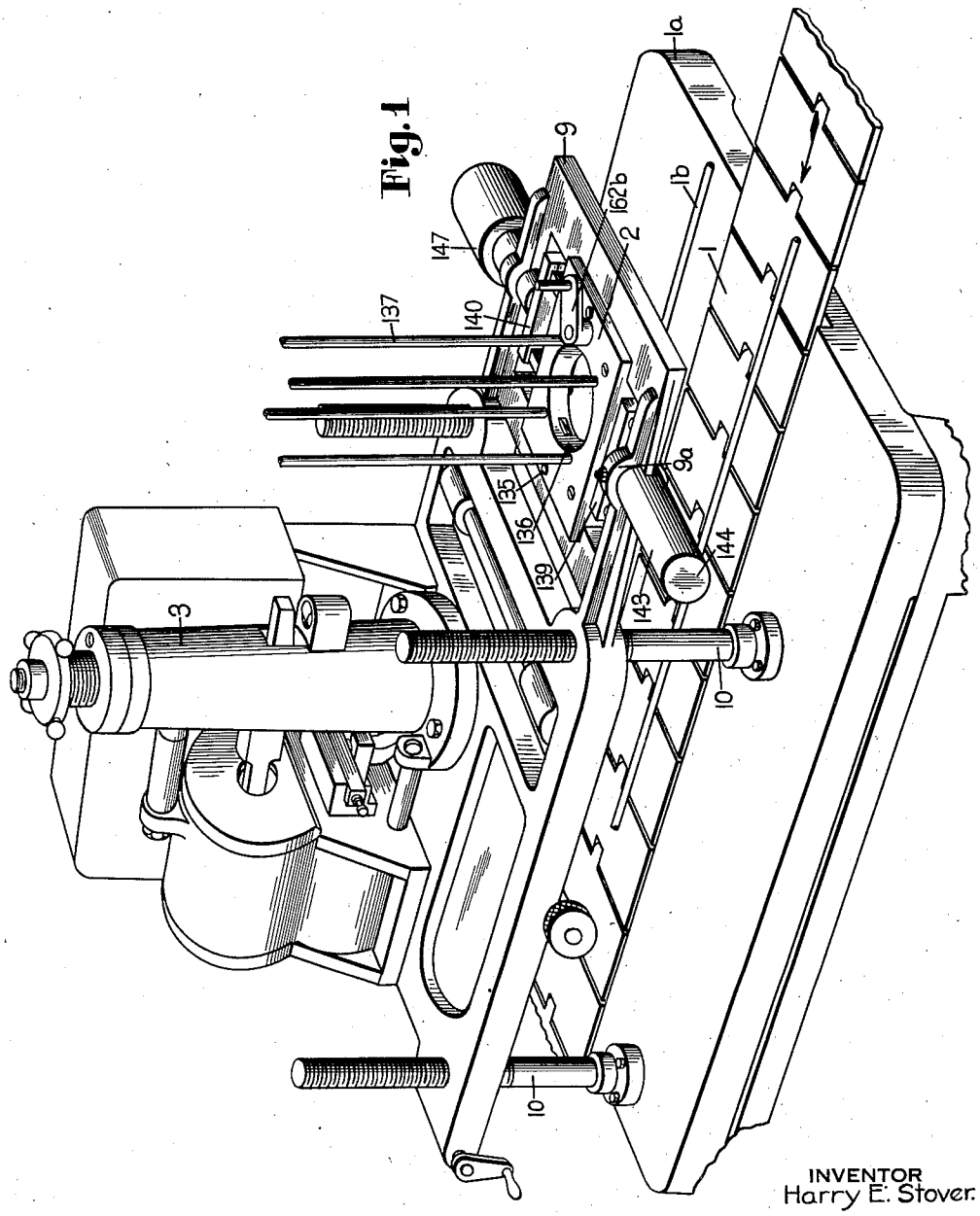
Aug. 8, 1944. H. E. STOVER 2,355,479

CAP-FEEDING APPARATUS

Filed Jan. 23, 1942 5 Sheets-Sheet 1

Fig. 1



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CAP-FEEDING APPARATUS

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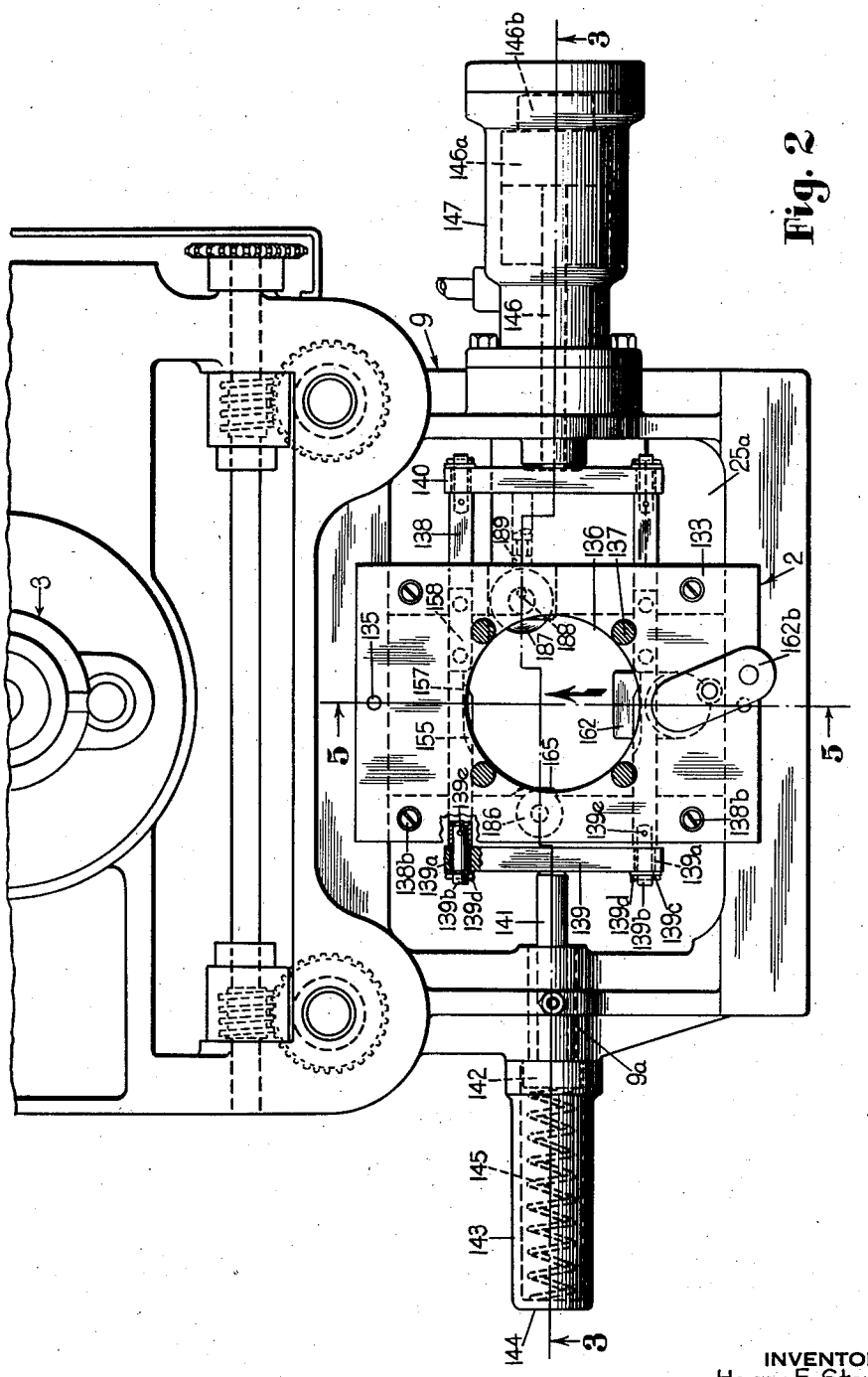


Fig. 2

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CAP-FEEDING APPARATUS

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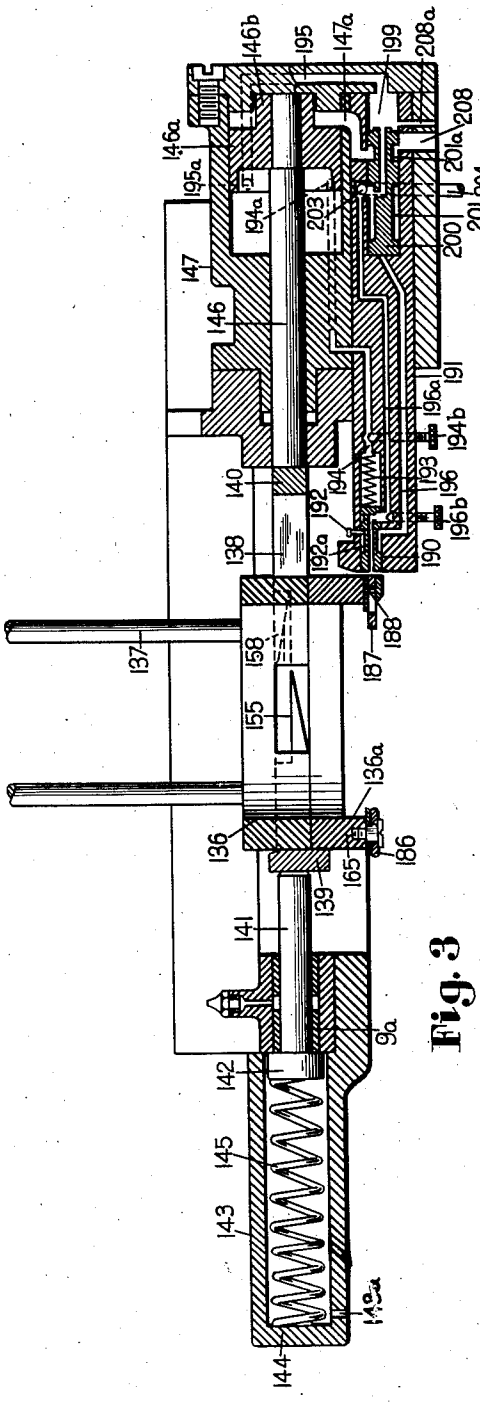


Fig. 3

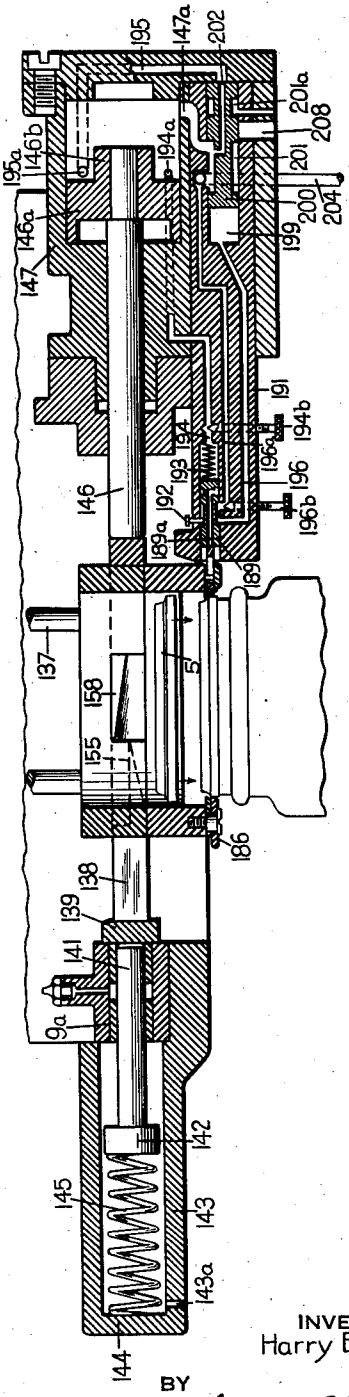


Fig. 4

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CAP-FEEDING APPARATUS

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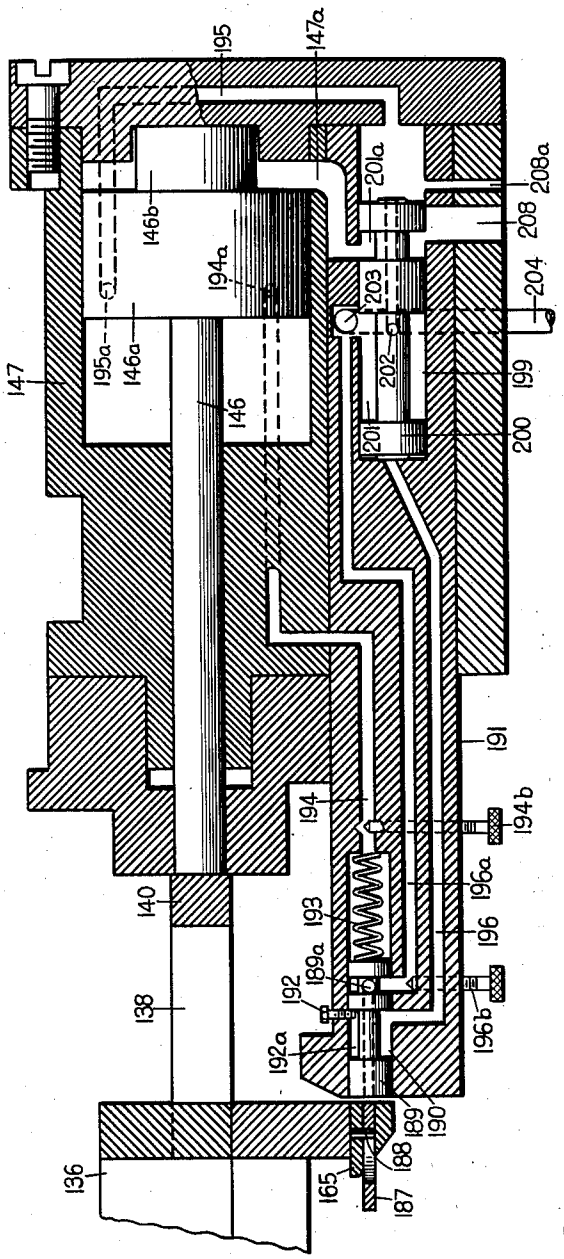


Fig. 3a

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CAP-FEEDING APPARATUS

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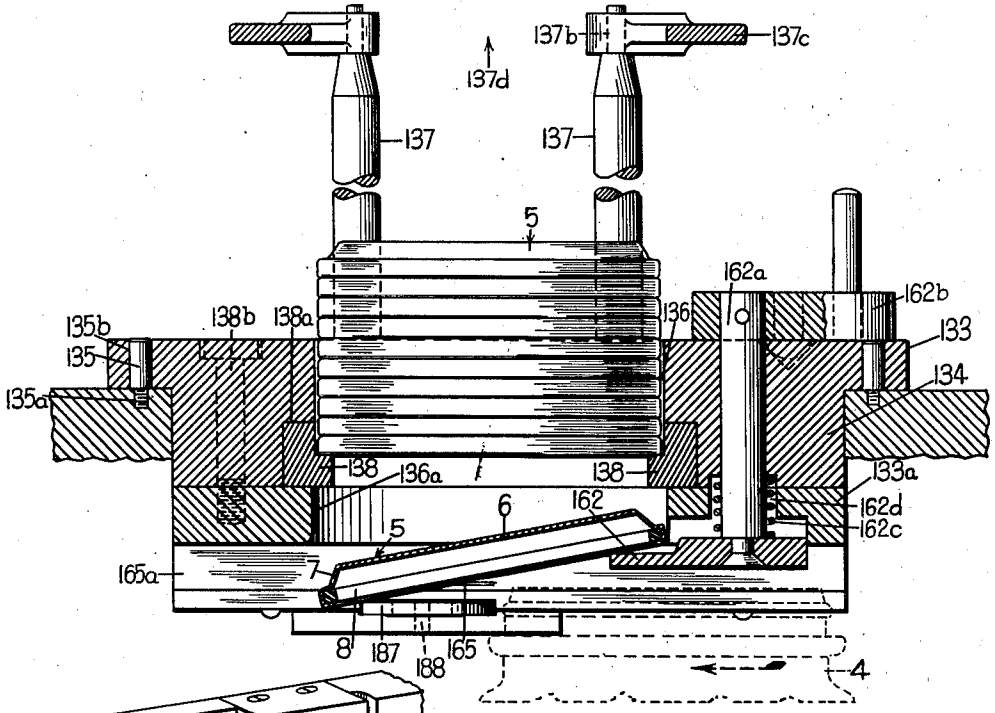


Fig. 5

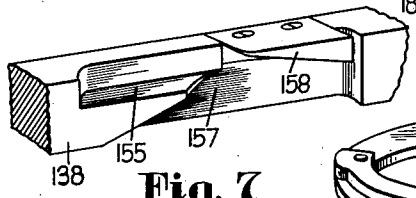


Fig. 7

Fig. 6

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Patented Aug. 8, 1944

2,355,479

UNITED STATES PATENT OFFICE

2,355,479

CAP-FEEDING APPARATUS

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Application January 23, 1942, Serial No. 427,966

14 Claims. (Cl. 226—88.1)

My invention relates to cap-feeding apparatus. It has to do, more particularly, with apparatus for feeding caps from a source of supply and applying them to containers, such as food containers and including jars, bottles, cans, et cetera, preparatory to sealing them on said containers.

One of the objects of my invention is to provide a simple and effective apparatus for feeding caps from a source of supply into position to be engaged by the upper ends of containers to be sealed thereby which are moved along by a conveyer.

Another object of my invention is to provide apparatus which will automatically release caps from a cap magazine and feed them into position to be engaged by the top of the containers without any manual intervention by the operator.

Another object of my invention is to provide a cap-feeding and applying unit of such a nature that the cap can be withdrawn therefrom by a container on a moving conveyer without danger of upsetting the container.

Another object of my invention is to provide a cap-feeding apparatus of such a nature that the cap which is fed into position to be engaged by a container will not drop from the cap-feeding mechanism until it is positively withdrawn by the passing container.

Another object of my invention is to provide a cap-feeding unit having a magazine for a vertically disposed stack of caps and which is of such a nature that the lowermost cap will be separated from the stack while the stack is supported in position.

Another object of my invention is to provide a cap-feeding apparatus including a magazine and cap-feeding unit which can be removed and replaced readily when different size caps are to be used.

Another object of my invention is to provide a cap-feeding unit wherein the cap-feeding parts are so mounted that they are self-aligning and there will be no danger of binding of such parts.

Another object of my invention is to provide a cap-feeding unit having a magazine for a vertically disposed stack of caps which is of such a nature that the caps will be maintained in proper nested relationship and which is of such a nature that a stack of nested caps can be inserted readily into the magazine.

Another object of my invention is to provide a cap-feeding apparatus which has an operating trigger engaged by a container moved into association therewith and which is provided with means for keeping the trigger and associated parts clean.

Another object of my invention is to provide a cap-feeding apparatus which is provided with fluid-actuated control and operating mechanism that is more positive and more efficient.

Another object of my invention is to provide a cap-feeding unit of the type indicated which is readily adjustable for use with containers of varying heights.

This application is a continuation-in-part of my copending application Serial No. 397,761, filed June 12, 1941.

In its preferred form, my invention contemplates the provision of a simple apparatus for feeding caps from a source of supply and applying them to containers such as jars, bottles, cans, et cetera. The apparatus is preferably employed with a continuously moving conveyer upon which the filled containers are placed indiscriminately. Means is preferably provided in association with the conveyer for centering and maintaining containers centered on said conveyer. The containers are first moved by the conveyer to my cap-feeding and applying unit where caps or other closures are loosely positioned on the upper ends of the containers. The containers may then be moved to a sealing unit such as described in my co-pending application, Serial No. 418,401, filed November 8, 1941. However, it is to be understood that my cap-feeding apparatus may be used in conjunction with any suitable sealing unit.

My cap-feeding and applying unit consists of a magazine for receiving a stack of nested caps. This magazine is of such a nature that the stack of caps may be readily inserted thereinto and they will be held in proper nested relationship. Suitable wedge bars are disposed at the bottom of the magazine for supporting the lowermost cap. When these wedge bars are reciprocated, they separate the lowermost cap from the remainder of the stack of caps and allow it to fall downwardly while still supporting the stack of caps. A support is provided below the magazine for receiving the separated caps and supporting them in position to be engaged and withdrawn by a container moved beneath the cap-feeding and applying unit. For controlling the movement of the wedge bars, I provide a steam controlled cylinder and piston unit. This cylinder and piston unit is actuated by a control trigger adapted to be engaged by a container moved beneath the cap-feeding and applying unit. This trigger has a steam jet associated therewith for keeping it clean of food products or other products which might spill thereon from the containers. The steam control and operating mechanism is very simple, positive and efficient.

The preferred embodiment of my invention is illustrated in the accompanying drawings wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a perspective view of my cap-feeding and applying apparatus showing it associated with a sealing machine.

Figure 2 is a plan view of my cap-feeding and

applying apparatus and its actuating mechanism.

Figure 3 is a vertical sectional view taken substantially along line 3—3 of Figure 2, showing the actuating mechanism in inoperative condition.

Figure 3a is an enlarged vertical sectional view of the valve structure shown in Figure 3.

Figure 4 is a sectional view similar to Figure 3 but showing the actuating mechanism in an operative condition.

Figure 5 is a vertical sectional view taken substantially along line 5—5 of Figure 2.

Figure 6 is a perspective view, partly broken away, of my cap-feeding unit.

Figure 7 is a perspective view of one of the wedge bars used in my cap-feeding unit.

With reference to the drawings, I have illustrated a sealing machine of the type disclosed in my co-pending application, Serial No. 418,401. This machine comprises generally a table 1a supporting a horizontal conveyer unit 1 on its upper end, as shown in Figure 1. Above this conveyer in properly spaced relationship, a cap-feeding and applying unit 2 and a sealing head unit 3 are supported. The conveyer unit 1 may be of any suitable type and is driven continuously. As described in said application, the containers 4 are placed indiscriminately on the conveyer 1 and are moved in the direction of the arrows (Figures 1 and 5) by the conveyer.

My invention is not limited to any particular type of container and cooperating cap but for illustrative purposes I have shown in Figure 5 a jar 4 having its upper end shaped to receive a cap of the type indicated by the numeral 5. This cap preferably embodies a substantially disk-like portion 6 which has a depending annular skirt 7 which carries an annular gasket 8 therewithin. When a cap is forced downwardly onto the upper end of the container, the frictional contact of the gasket with the upper end of the container will aid in maintaining the cap in position and will seal the cap on the container.

In order to center the containers transversely of the conveyer and to maintain them centered, a pair of longitudinally extending guide rails 1b may be provided. These guide rails may be suitably mounted for adjustment towards and away from each other. These rails will center the containers on the conveyer so that they will be properly positioned as they pass beneath my cap-feeding and applying unit 2. This unit will apply a cap loosely to the upper end of each container which moves therebeneath. After the container passes the unit 2, it is carried to the sealing unit 3 and is sealed in the manner described in my application, Serial No. 418,401.

My cap-feeding and applying unit 2 is preferably disposed directly adjacent the sealing unit 3. They are both supported by a horizontally disposed plate 9. The plate 9 is supported at a point spaced above the conveyer 1 by means of a plurality of vertically disposed posts 10. As described in my application, Serial No. 418,401, the plate 9 may be adjusted vertically on the posts 10 to vary the height of the units 2 and 3 above the conveyer 1 for different heights of containers.

My cap-feeding and applying unit comprises a plate 133 which is suitably mounted on the plate 9 over a large opening 25a (Figure 2) in the plate 9. This plate 133 has a portion 134 (Figure 5) which extends down into the opening 25a. The plate 133 is held in position on plate 9 by means of dowel pins 135 threaded into openings 135a formed in plate 9. Pins 135 fit into sockets 135b in plate 133 so that plate 133 may be removed readily from plate 9. The plate 133 is provided with a centrally disposed opening 136 which is of the proper size to permit the caps, to be applied to the containers, to drop freely therethrough. The plate 133 carries four upstanding posts 137 which are spaced circumferentially around the opening 136. These posts 137 are adapted to receive a stack of the nested caps.

The lower ends of the posts 137 are provided with reduced portions 137a (Figure 6) which removably fit into sockets formed in the plate 133. The upper ends of these posts 137 are also provided with reduced portions 137b which fit into sockets formed in a partial ring 137c. The ring The ring 137c has a segment 137d omitted therefrom. The ring 137c serves to keep the upper ends of the posts 137 in proper spaced relationship. This ring prevents springing of the upper ends of the posts away from each other. Thus, the posts 137 will serve to keep the nested caps in proper nested relationship and in accurate alignment with each other. The segment of the ring 137c is omitted from 137d in order to facilitate insertion of a stack of nested caps in the magazine formed by the post 137. Such a stack of caps can be gripped by the operator with the fingers on one hand supporting the bottom of the stack and with the fingers of the other hand gripping the top of the stack and can be then inserted readily into the magazine, the segmental space at 137d permitting free movement of the fingers downwardly as the stack is being inserted into the magazine.

For controlling the feed of the caps downwardly through the opening 136, I provide the following structure. This structure embodies a pair of cap-separating wedge members 138. These wedge members 138 are disposed tangentially to the opening 136, as indicated best in Figure 2. They are mounted for longitudinal movement in recesses 138a formed in the lower surface of the plate 133. The recesses 138a (Figure 5) extend substantially tangential to opening 136 and are in communication therewith at their inner edges. The lower wall of these recesses is formed by a plate 138b which is bolted by means of bolts 133b to the lower surface of plate 133 and which has a central opening 136a in alignment with opening 136. The members 138 are connected together at one end by a bar 139 (Figure 2). This bar has openings 139a for receiving the outer end of pins 139b which are held in openings in the ends of wedge bars 138 by small pins 139e. The openings 139a are larger than the cooperating portions of pins 139b. To maintain the bar 139 on pins 139b collars 139c held in place by cotter pins 139d are provided. Thus, the wedge bars 138 are loosely connected to bar 139 in order to permit slight movement of the wedge bars relative to bar 139 so that they will properly align and position themselves in recesses 138a. The other ends of wedge bars 138 are connected together in a similar manner by a bar 140.

The bar 139 is engaged by the outer end of a pin 141 (Figures 2 and 6) which is mounted for axial movement in a bearing member 9a disposed on plate 9 (Figure 3). The outer end of the pin 141 is provided with a head 142 disposed within housing 143. This cylindrical housing 143 is in alignment with bearing member 9a and has a closed outer end 144. Within this housing a compression spring 145 is provided. This spring has one end bearing against the closed end 144 of the housing and its other end bearing against the head 142

on pin 141. Thus, the spring 145 normally forces the pin 141 to the right (Figure 2). As shown best in Figures 3 and 4, the housing 143 is provided adjacent its closed outer end with an opening 143a which serves both as a drain for steam condensate within housing 143 and as a vent to prevent air pressure from being built up within housing 143. The spring 145 will normally keep the wedge bars 138 towards the right.

The spring 145 also serves to keep the bar 140 in contact with the outer end of a piston rod 146. This piston rod 146 (Figures 2, 3, 4 and 6) is carried by a piston 146a disposed in a cylinder 147 carried by the plate 9. The piston 146a is provided with a projection 146b on its outer end which engages the closed end of cylinder 147 to keep the piston spaced therefrom. The piston 146a is held normally in the position indicated in Figure 3. It will be apparent that when the piston is reciprocated, the members 138 will be reciprocated also.

The wedge members 138 are of the shape shown best in Figures 2, 3, 4 and 7. Each of the members 138 is notched intermediate its ends to provide a recess flat vertical surface 157. This surface has a cap supporting shelf 155 formed adjacent one end thereof and a cap separating wedge portion 158 adjacent the opposite end thereof. The members 138 are normally in such a position that the lowermost cap will be supported by the projecting portions 155 of the members 138 which will project into openings 136. However, when the members 138 are moved to the left (Figure 2) by outward movement of the piston 146a, this causes the portions 155 thereof to be withdrawn from the opening 136, permitting the lowermost cap to drop through the opening. At the same time that the portions 155 are withdrawn from beneath the stack of caps, the portions 158 are projected between the lowermost cap and the cap next above so that the stack of caps will be supported. The shape and operation of these wedge members 138 are described more in detail in my co-pending application, Serial No. 397,761.

It will be apparent that the entire cap feeding unit consisting of plate 133, posts 137, carried by such plate, and members 138, mounted for longitudinal movement in guides in said plate, together with bars 139 and 140, can be removed readily and be replaced with a similar unit for different sized caps. The removal of this unit is facilitated because pin 141 is not connected to bar 139 and piston rod 146 is not connected to bar 140. The wedge members 138 may be removed quickly and easily for cleaning or replacement from the plate 133 by disconnecting the bars 139 and 140 from the ends thereof.

The cap released from the stack will drop downwardly onto a tongue member 162. This member 162 extends beneath the opening 136a in plate 133a. It is fastened on the lower end of a vertical pin 162a which is mounted for rotation in aligning openings formed in members 133 and 133a. The upper end of the pin 162a has a handle member 162b pinned thereon. A spring 162c surrounds the lower end of pin 162a and bears against the upper surface of member 162. The upper end of this spring is disposed in a socket 162d formed in members 133 and 133a. The spring member 162c normally causes the handle 162b to frictionally engage the upper surface of plate 133 and to prevent rotation of tongue 162 about the axis of pin 162a. However, movement of the handle 162b will produce swinging movement of tongue 162 from beneath the opening 136a. The spring 162c will serve to maintain the tongue 162 in any position into which it is moved. When the tongue 162 is in normal position, as shown in Figure 5, the rear edge of the dropped cap is supported thereby. The forward edge of the cap is supported at diametrically opposed points by lugs 165. As shown in Figure 5, the cap will be supported in downwardly tilted position. The plate 133a is so formed that guide portions 165a are provided at each side thereof which will prevent lateral movement of the cap as it is withdrawn from the supporting members 162 and 165 by a container being moved along by the conveyer 1. Although the members 165 are spaced a distance such that the cap will rest thereon, they are so spaced laterally that the upper end of the container will pass therebetween, it being understood that the cap is slightly greater in diameter than the upper end of the container. Furthermore, the members 165 are so placed longitudinally and vertically, that the resulting angle of the tilt of the dropped cap is such that the upper end of the container will pass under the rear edge of said cap, and it will engage with the inner side of its forward edge, and since said cap is merely guided but not restrained in any way, it is easily removed by the container without danger of upsetting said container.

As previously explained, the entire cap-feeding unit is carried by plate 133 and can be removed readily and be replaced with a unit for feeding caps of a different size. Furthermore, at any time, the tongue 162 may be swung away from aligning openings 136 and 136a to facilitate removal of dropped caps, particularly if a second cap drops on top of a cap already in place and both caps jam in the forward tilted position.

When the conveyer moves a container beneath the cap-feeding unit 2, the upper end of the container will engage the skirt of the inclined cap disposed in the position indicated in Figure 5. This will withdraw the cap from its supports and position it on the upper end of the container. The cap and container will be moved along until they pass into association with the sealing unit 3 which will seal the cap on the container in a manner described in my co-pending application, Serial No. 418,401.

In order to supply steam to the cylinder 147 to actuate the cap-feeding unit, I provide means which is actuated by movement of the container by the conveyer into a position below the cap-feeding and applying unit. As illustrated best in Figures 2, 3, 3a, and 4, this means comprises a small roller 186 which is held in a fixed position on the lower edge of one of the guide portions 165a of plate 133a. This member 186 is located directly below the aligning openings 136 and 136a slightly forwardly of pin 141 as shown best in Figure 2. At a point almost laterally opposed but spaced forwardly slightly, the washer member 187 is disposed on the other guide portion 165a of plate 133a. A pin structure 188 (Figures 3 and 3a) prevents the removal of washer 187 but it is free to move laterally to a considerable extent. A plunger 189 normally has its outer end spaced slightly from the washer 187 when the washer is in its innermost position. The plunger 189, as shown best in Figures 3, 3a and 4, is disposed in a bore 190 formed in a valve housing 191 suitably mounted in cylinder 147. The plunger 189 is normally held in its outermost position by means of a compression spring 193 disposed in the bore 190, see par-

ticularly Figure 3a. The outer end of the plunger 189 is normally prevented from contacting the washer 187 by means of a pin 192 cooperating with an annular space 192a formed in the plunger 189. The bore 190 communicates with a passageway 194 which leads into the cylinder 147 at the point 194a which is normally covered by the piston 146a. An exhaust passageway 195 leads from an outlet 195a in cylinder 147 which is also normally covered by piston 146a. This passageway 195 communicates with chamber 199. A second passageway 196 leads from bore 190 and is normally in communication with space 192a of the plunger 189. This passageway 196 communicates with one end of the chamber 199. A third passageway 196a leads from bore 190 and is normally in communication with a passageway 189a extending through the plunger 189. A piston valve 200 is disposed for reciprocation in the chamber 199. This piston valve is normally in the position indicated in Figure 3 so that the end of passageway 196 is covered while the end of passageway 195 is uncovered. This piston 200 is provided with an annular chamber 201 and an annular chamber 201a. The annular chamber 201 is always in communication with the right-hand end of chamber 199 by means of a bore 202 provided in the piston 200. The chamber 201 is also always in communication with a steam inlet 203 which is connected to a steam conduit 204. The end of passage 196a also communicates with inlet 203. The annular chamber 201a is normally in communication with the right-hand end of cylinder 147 by means of a passage 147a. It is also normally in communication with an exhaust outlet 208. A second smaller exhaust outlet 208a is in communication with the right-hand end of chamber 199.

With the parts in the position illustrated in Figure 3, steam will flow from the line 204 through annular chamber 201, through passage 202 and through exhaust outlet 208a. Steam will also flow from inlet 203 through passage 196a, through passage 189a in plunger 189 and outwardly around the trigger washer 187. The steam escaping from passage 189a will keep the washer 187 clean and spaced slightly from plunger 189 as shown in Figures 3 and 3a. The amount of steam flowing from passage 189a may be controlled by means of a needle valve 196b associated with passage 196a. Passages 189a and 208a are so small that a small amount of steam only will normally escape and this will serve to keep the steam alive. Under these conditions, the piston 146a will be kept in the position indicated in Figure 3 by spring 145, it being understood that the steam previously in the right-hand end of cylinder 147 has exhausted through outlet 147a, chamber 201a and opening 208.

As soon as a container is brought by the conveyer beneath the cap-feeding and applying unit 2, the upper end of it will engage the roller 186 and the washer 187. This will happen substantially at the same instant that the forward edge of the container engages the inclined cap and tends to withdraw it from its inclined position on the tongue 162. Engagement of the upper end of the container with the washer 187 will force it away from the center of the container, it being understood that the inner edge of the washer and the inner edge of the roller 186 are normally spaced apart a distance slightly less than the diameter of the upper end of the container.

Such movement of washer 187 will bring it in contact with the end of plunger 189 and will close the outer end of passage 189a. It will also move the plunger 189 to the right as shown in Figure 4. This will connect passage 196a to passage 196 through the medium of the annular space 192a in plunger 189. This will allow steam under pressure to flow through passage 196 into the left-hand end of chamber 199 forcing piston valve 200 to the right. Movement of piston valve 200 to the right causes the annular chamber 201 formed therein to communicate with the opening 147a leading into the right-hand end of cylinder 147. Thus, steam under pressure will flow into the right-hand end of cylinder 147 and will force the piston 146a to the left. This will move the wedge bars 138 against the resistance of the spring 145 and will actuate the cap feed. Movement of piston 146a to the left will eventually expose openings 194a and 195a. Exposing the opening 194a will allow steam under pressure to flow through passage 194 and will aid the spring 193 in returning plunger 189 to the position indicated in Figure 3. The amount of steam acting to return the plunger to its original position may be adjusted by means of a needle valve 194b associated with passage 194. At the same time, opening 194a is exposed, opening 195a is also exposed and steam under pressure will pass through passage 195 into the right-hand end of chamber 199. Since passage 195 is of much greater cross-sectional area than the passage 202 in piston valve 200, the piston valve will be returned to its original position. With plunger 189 and valve 200 in their original positions indicated in Figure 3, the spring 145 will return the wedge bars and the piston 146a to the positions indicated in Figure 3. As the piston 146a is returned to its original position, the steam will exhaust from the right-hand end of cylinder 147 through opening 147a, annular chamber 201a in valve 200 and through outlet 208a. This cycle of operations will be repeated each time a container moves beneath the cap-feed. Thus, each time a container moves beneath the cap-feeding unit and withdraws a cap, it will actuate the cap feed to drop another cap into position to be engaged by the next succeeding container.

It will be apparent from the above description that I have provided a cap-feeding and applying unit having many advantages. The unit will serve to feed caps from a source of supply into position to be engaged by the upper end of containers to be sealed thereby and which are moved along by a conveyer. The cap-feeding operation is entirely automatic. The caps can be withdrawn from the unit by a container on a moving conveyer without danger of upsetting the container. However, the cap must be positively withdrawn by the container. The cap-feeding unit can be replaced readily with units for different sized caps and it may be adjusted vertically for different sized containers. The cap-feeding parts of the unit are self-aligning and there is no danger of such parts binding. The cap-containing magazine is of such a nature that a stack of nested caps will be accurately held in proper relationship. The operating trigger for the cap-feeding unit will always be kept clean by the steam jet associated therewith. The steam-operated control mechanism of the cap-feeding unit is very positive and efficient.

Various other advantages will be apparent from the preceding description, the drawings and the following claims.

Having thus described my invention, what I claim is:

1. In combination a conveyer, a cap-feeding unit associated with the conveyer, said cap-feeding unit comprising a source of supply of caps, movable means for feeding said caps from said source of supply, a fluid-actuated unit for controlling operation of said movable means, a trigger for actuating said unit located at one side of and projecting into the path of movement of containers carried by said conveyer and adapted to be engaged by a container being moved by the conveyer into association with said unit, and means located at the same side of said path and adjacent the trigger for directing a jet of fluid on said trigger to keep it clean of contents of the container which might spill thereon.

2. In combination a conveyer, a cap-feeding unit associated with the conveyer, said cap-feeding unit comprising a source of supply of caps, movable means for feeding said caps from said source of supply, a steam-actuated cylinder and piston unit for controlling operation of said movable means, a movably mounted trigger located at one side of and having a portion normally projecting into the path of movement of containers carried by said conveyer for actuating said unit and adapted to be engaged by a container being moved by the conveyer into association with said unit, and means positioned at the same side of said path for directing a jet of steam on said trigger to keep it clean of contents of the container which might spill thereon.

3. In combination a support for a container, a cap-feeding unit associated with the support, said cap-feeding unit comprising a source of supply of caps, movable means for feeding said caps from said source of supply, a fluid-actuated unit for controlling operation of said movable means, a trigger for actuating said unit and adapted to be engaged by a container positioned on said support, and means associated with and located in substantially the same plane as the trigger for directing a jet of fluid on said trigger to keep it clean of contents of the container which might spill thereon.

4. In a cap-feeding apparatus, a source of supply of caps, movable means for feeding said caps from said source of supply, a fluid-actuated unit for controlling operation of said movable means, means for controlling operation of said unit, said means comprising a main control valve for controlling the supply of fluid to said unit, a pilot valve for controlling the supply of fluid to said control valve, and a trigger for operating said pilot valve, said pilot valve having a jet orifice associated therewith adapted to direct fluid on said trigger in order to keep it clean.

5. In combination a conveyer, a cap-feeding unit associated with the conveyer, said cap-feeding unit comprising a source of supply of caps, movable means for feeding said caps from said source of supply, a steam-actuated cylinder and piston unit for controlling operation of said movable means, means for controlling the operation of said unit, said means comprising a main control valve for controlling the supply of steam to said unit, a pilot valve for controlling the supply of steam to said control valve, and a trigger for operating said pilot valve and disposed in position to be engaged by a container moved into association with the cap-feeding unit by the conveyer, said pilot valve having a jet orifice associated therewith adapted to direct steam on said trigger in order to keep it clean.

6. A cap-feeding unit comprising a magazine for supporting a stack of caps, means for controlling the feed of caps from said magazine, said means comprising a reciprocable cap-feeding unit, means for operating said unit, said means comprising a spring-pressed plunger unit which engages said cap-feeding unit and normally forces it in one direction and a cylinder and piston unit opposing said plunger unit and adapted to be actuated to move said cap-feeding unit in the opposite direction.

7. A structure according to claim 6 wherein the plunger unit includes a pin engaging the cap-feeding unit and the spring thereof is a compression spring acting on the pin for causing such engagement.

8. A cap-feeding unit according to claim 6 wherein the plunger unit and cylinder and piston unit loosely engage said cap-feeding unit.

9. A structure according to claim 6 wherein the plunger unit includes a housing, a pin extending from said housing and mounted for reciprocation relative to said housing and engaging the cap-feeding unit, and wherein the spring is a compression spring disposed in said housing and which acts on the inner end of the pin to cause its outer end to engage said cap-feeding unit, said housing having an opening therein in the end where the spring is disposed.

10. A cap-feeding unit comprising a vertical magazine for supporting a stack of caps which are in flat superimposed relationship, said magazine having an opening at the bottom thereof through which the caps are adapted to drop, means for controlling the feed of caps through said opening, a tongue member supported adjacent said opening and having a portion normally projecting horizontally beneath said opening, and means including a vertically disposed rotatable pin for mounting said tongue member whereby to permit it to be swung in substantially a horizontal plane away from said opening.

11. A structure according to claim 10 wherein the tongue member is keyed to said rotatable pin and has a handle for rotating the pin, and wherein a spring is associated with said pin for causing the handle to frictionally engage a supporting surface associated therewith.

12. A structure according to claim 10 wherein said tongue member provides means for supporting a released cap temporarily in tilted position.

13. In a cap-feeding apparatus, a source of supply of caps, movable means for feeding caps from said source of supply, a fluid-actuated unit for controlling operation of said movable means, means comprising a source of supply of fluid under pressure for controlling the operation of said unit, a main control valve for controlling the supply of fluid to said unit, a pilot valve for controlling the supply of fluid to said control valve, and a trigger disposed in position to be engaged by a container coming into cooperative relationship with the cap-feeding unit for operating said pilot valve.

14. Structure according to claim 4 wherein adjustable valve means is associated with the jet orifice for regulating the amount of fluid flowing from said orifice.

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