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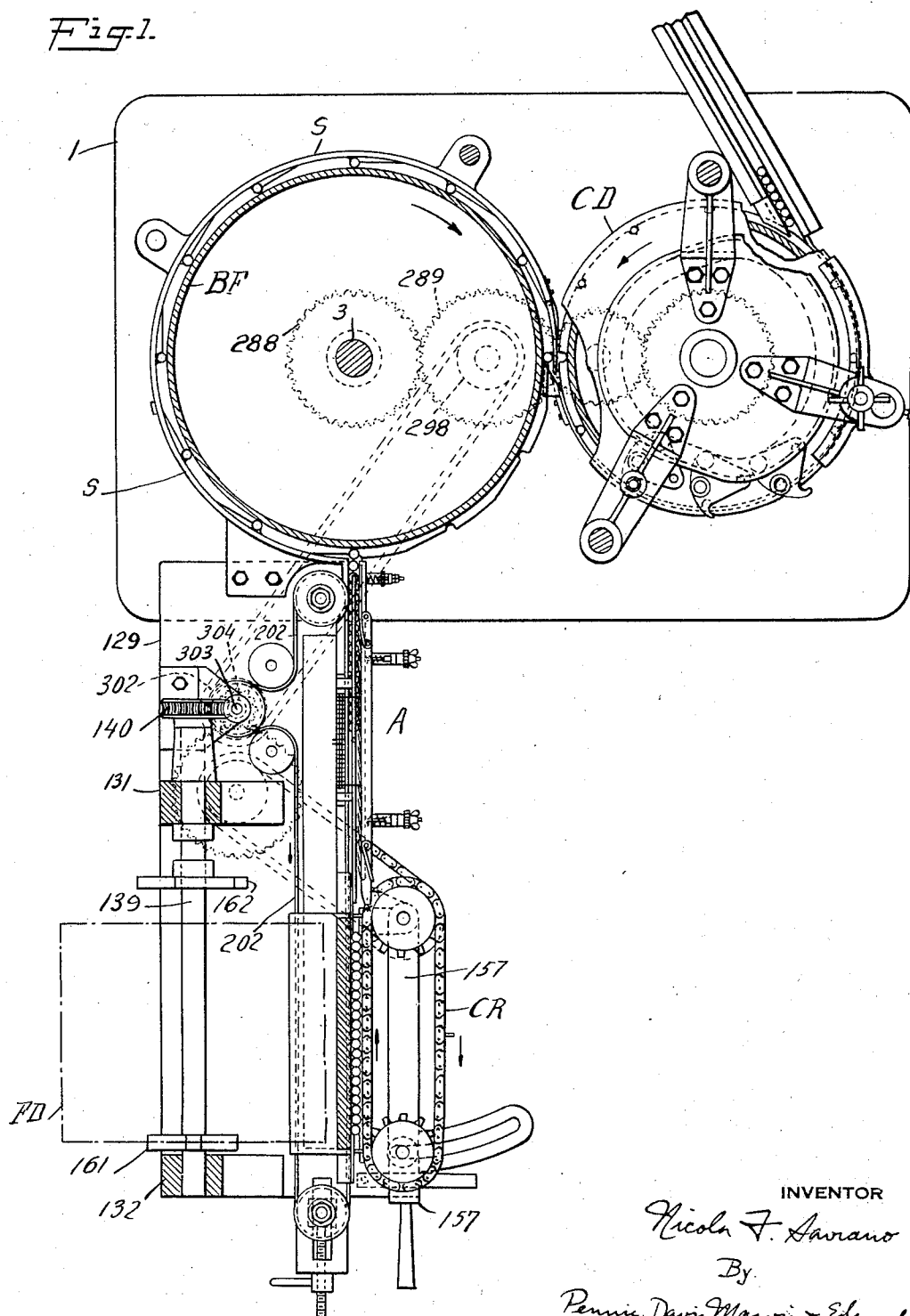
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BOTTLE FEEDING MECHANISM

Filed July 12, 1928

3 Sheets-Sheet 1

Fig. 1.



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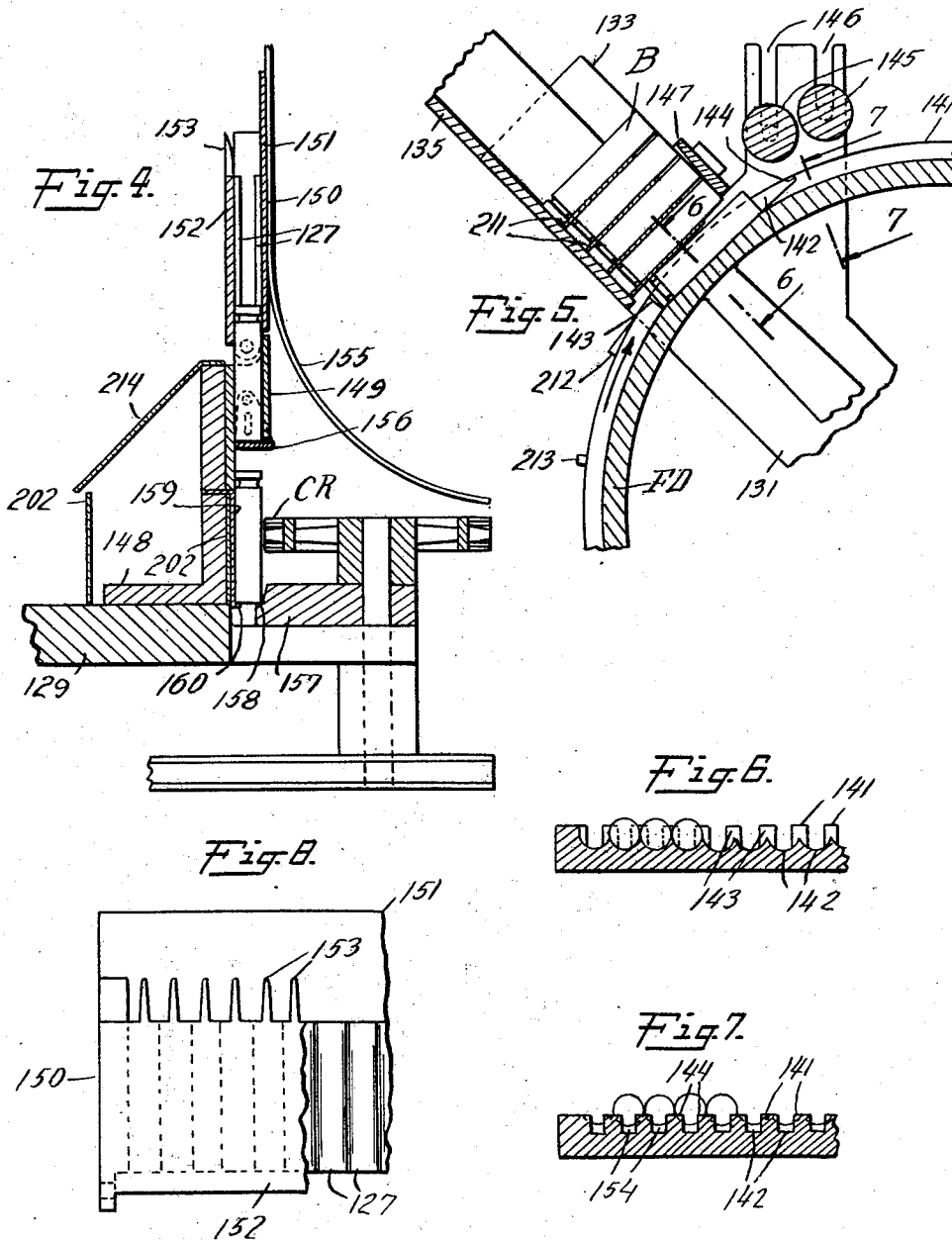
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BOTTLE-FEEDING MECHANISM

Original application filed October 19, 1926, Serial No. 142,537. Divided and this application filed July 12, 1928. Serial No. 292,259.

This invention relates to a bottle filling and corking machine, and more particularly concerns apparatus for automatically and continuously feeding bottles, vials or other containers to a mechanism in which these containers are filled and closed.

In the packing of large quantities of small articles, such as medical pills or pellets in small containers, such as bottles, it has been found economical and otherwise desirable to employ automatic packing machinery. It is essential that machinery of this type be arranged to perform the packing operations continuously and rapidly, and that the machine be capable of operating with a minimum amount of manual attention.

With the above and other considerations in mind, it is proposed in accordance with the present invention, to provide bottle feeding means for successively removing rows of bottles from their packing containers and delivering these rows of bottles to suitable bottle conveying means.

Various other specific objects, advantages and characteristic features of the present invention will become apparent as the description thereof progresses.

This application is a division of my copending application Serial No. 142,537, filed October 19, 1926, Patent No. 1,710,074, in which I have claimed the bottle filling features of the machine. In another divisional application, Serial No. 292,260 filed July 12, 1928, I have described and claimed the bottle corking mechanism, and in still another divisional application, Serial No. 292,258, filed July 12, 1928, the bottle conveying features are described and claimed.

In describing the invention in detail, reference will be made to the accompanying drawings, in which;

Figure 1 is a plan view, partly in section, of the bottle feeding, filling and corking mechanisms;

Fig. 2 is a side elevation of the bottle feeding mechanism;

Fig. 3 is a front elevation of the bottle feeding mechanism;

Fig. 4 is an enlarged sectional view of the bottle feeding mechanism;

Fig. 5 is an enlarged sectional view of a portion of the bottle feeding drum and certain associative mechanisms;

Fig. 6 is a section of a portion of the bottle feeding drum taken along the line 6—6 of Fig. 5, and viewed in the direction of the arrows;

Fig. 7 is a section of the bottle feeding drum taken along the line 7—7 of Fig. 5 and viewed in the direction of the arrows; and

Fig. 8 is a side view of the bottle catching compartment, certain portions thereof being broken away to show the interior structure thereof.

Referring to the drawings, and more particularly to Fig. 1, the machine in connection with which the bottle feeding mechanism of the present invention is disclosed includes bottle filling apparatus, generally indicated at BF, bottle corking mechanism including the device CD and a bottle conveying feature A. As these mechanisms are described in detail and claimed in my copending application as indicated above, and as they form no part of the present invention, detailed descriptions thereof will not be given herein, it being sufficient to explain that empty bottles or other containers are delivered by the feeding means of the present invention to the conveyor device A, which in turn carries the bottles to the filling mechanism BF where they are filled and transferred to the corking mechanism CD.

Referring now more particularly to the bottle feeding mechanism of the present invention, an outwardly extending feeding platform or table 129 is suitably secured to a main platform 1, the upper surface of the feeding platform being on a level with the horizontal portion 22 of the bottle feeding supporting shelf S on the bottle feeding drum BF. A pair of parallel upwardly extending brackets 131 and 132 are secured in spaced relation to the upper surface of the feeding platform 129 near its outer end as shown in Fig. 3, these brackets having angular offset portions 133 and 134 respectively. A bottle delivery chute 135 is secured between the offset portions 133 and 134 of the brackets 131 and 132, this chute being preferably formed

of sheet metal and being disposed at an angle of approximately 45 degrees to the horizontal platform 129. The upper portion 136 of the chute 135 is hinged at 137 to swing downwardly to the position shown in broken lines in Fig. 2, the springs 138 being provided to normally maintain this portion 136 in alignment with the fixed portion 135 of the chute.

A bottle feeding drum FD is carried in a horizontal position on a shaft 139, which shaft is journaled in the brackets 131 and 132 and is driven through a worm wheel 140 as hereinafter described. The drum FD is provided on its outer surface with a plurality of parallel peripherally disposed ridges or extensions 141 as shown in Figs. 5, 6 and 7. The ridges 141 are cut away to form transverse rows of substantially semi-circular depressions 142 at points equally spaced about the periphery of the drum FD. The depressions 142 are somewhat longer than the length of the bottles to be filled, and are formed to present bottle retaining abutments or stops 143 and 144 at the opposite ends thereof as shown in Fig. 5. A pair of rollers 145 are loosely carried in the slots 146 formed in extensions of the brackets 131 and 132, these rollers serving to retain the bottles in the depressions 142 of the drum FD as they are carried away from the delivery chute 135. A tapered metal strip 147 rests on the ends of the bottles at the lower end of the delivery chute, and maintains them in alignment as they are picked off by the drum.

An angle frame 148 is secured to the feeding platform 129 adjacent to the drum FD, which frame carries a fixed bottle delivery compartment 149 having a vertical opening therethrough and extending across the face of the drum as shown in Figs. 2 and 3. A movable bottle catching compartment 150 is pivotally supported at its ends on the delivery compartment 149 and is arranged to swing from a position in which its upper edge bears on the face of the drum FD as shown in Fig. 2, to a position in which its central opening is in vertical alignment with the central opening through the compartment 149, as shown in Fig. 4. The bottle catching compartment 150, shown in detail in Figs. 4 and 8, comprises an outer wall 151 of appreciable greater height than that of the bottles, and an inner wall 152 having a row of upwardly extending fingers 153 on the upper edge thereof. The inner faces of the walls 151 and 152 are provided with oppositely disposed aligned grooves 154 which are shaped to conform with the outer walls of the bottles, these aligned grooves being arranged in alignment with the depressions 142 on the surface of the drum FD. The fingers 153 are spaced to rest in the grooves 154 between the ridges 141 on the drum FD when the compartment 150 is in the position shown in Fig. 2. A pair of elongated curved spring fingers 155 are suitably

secured to the outer wall 151 of the bottle catching compartment 150, the upper ends of these fingers being arranged to rest in the grooves 154 on the drum FD when the compartment 150 is inclined against the drum as shown in Fig. 2. The opening at the lower end of the delivery compartment 149 is controlled by a gate 156, pivoted at the opposite ends of this compartment and adapted to be swung outwardly as shown in Fig. 2.

Directly below the opening in the compartment 149 is disposed a plate 157 extending across the face of the drum FD and having an offset extension or groove 158 thereon. Opposite and parallel to this plate 157 is a sheet metal shield 159, secured to the angle bracket 148 in any suitable manner, and having an inturned lower lip or shelf portion 160, disposed directly opposite the groove 158 in the plate 157. The groove 158 and the lip 160 are normally disposed a distance apart equal to the diameter of the bottles to be filled, so that when the bottles are dropped from the compartment 149 by the gate 156 they will drop to a position in which their bases rest between the groove 158 and the lip 160 as clearly shown in Fig. 4. The shield 159 is spaced a short distance away from the face of the angle bracket 148 for a purpose which will hereinafter appear.

The movements of the bottle catching compartment 150 and the gate 156 are controlled respectively by two cams 161 and 162 fixed to the shaft 139 and rotating with the drum FD. The cam 161 is substantially star shaped and engages a roller 163 carried by one arm of a bell crank lever 164, the other arm of which engages the inner wall 152 of the movable compartment 150, the bell crank lever 164 being pivotally mounted on an extension of the bracket 132 in any suitable manner. The compartment 150 is biased toward its angular or tilted position by means of a spring 165 connected between this compartment and a bracket 166 as shown in Fig. 2. The cam 162 is provided with a notched cam surface which engages a roller 167 on one end of a lever 168, the other end of which engages the head of a plunger 169, the lever 168 being pivotally mounted on the bracket 166. The plunger 169 is slidably mounted in the bracket 166 and its outer end bears against a lug extending from one end of the gate 156. The lever 168 is biased by the spring 170 to a position in which its roller 167 engages the surface of the cam 162, and the plunger 169 is biased by a spring 171 to a position in which its head is in constant engagement with the lower end of the lever 168, the spring 170 being stronger than the spring 171.

The plate 157 is pivotally connected to the platform 129 and is provided with a chain conveyor generally indicated at CR for carrying the rows of bottles along the shield

159 and away from the compartment 150. An endless belt 202 passes behind the shield 159, this belt acting to engage and propel the bottles from the chain conveyor to the bottle filling mechanism. The chain and belt conveyor features are described in detail and claimed in my copending application Serial No. 292,258, filed July 12, 1928.

The shaft 3 of the bottle filling mechanism BF is driven by a suitable source of power, and a sprocket 298 is driven from this shaft through gears 288 and 289. The sprocket 298 is connected to a second sprocket 302 fixed to a vertical shaft 303. The shaft 303 drives the feed drum shaft 139 through a worm 304 and a worm gear 140, as shown in Fig. 2.

In the operation of the bottle feeding mechanism, the bottles are first placed in the upper portion 136 of the bottle feeding chute 135, this portion 136 being preferably moved to the position shown in dotted lines in Fig. 2 and a carton of empty bottles being inverted therein as shown. The portion 136 of the chute is then allowed to swing back into the position in which it is aligned with the lower portion 135 of the chute, and the box of bottles is allowed to slide down adjacent to the surface of the feeding drum FD, at which point the box or container may be removed. The bottles now lie in parallel rows, there being the same number of bottles in each row as there are bottle receiving depressions 142 across the surface of the drum FD. The tapered strip 147 aligns the rows of bottles, pushing any bottles which may be out of place into contact with the lower face of chute 135. Each row of bottles in turn is picked off by one of the rows of depressions 142 on the surface of the feeding drum FD, the rollers 145 holding the ends of the bottles from tilting out of the depressions due to the weight of the remaining bottles in the chute 135 bearing against the necks of the bottles in the depressions. The bottles are usually packed with cardboard strips 211, placed between the rows thereof, and these strips are caught between two pairs of extensions 212 and 213 fixed to the ridges 141 on the drum, these extensions being disposed between each row of depressions 142 as most clearly shown in Figs. 2 and 3.

As each row of bottles is carried around over the top of the drum FD, the bottles slide down to the leading end of the depressions 142 against the abutments 144 as shown in Fig. 2 and are finally picked off of the drum by the fingers 153 on the inner wall of the bottle catching compartment 150, which fingers pass under the edges of the bottles in the grooves 154 shown in Fig. 7. The cam 161 is designed to permit the bottle catching compartment 150 to swing against the drum as each row of bottles approaches this compartment, and the bottles slide into the inte-

rior of this compartment and are held therein by the angular relation between the compartment 150 and the bottle delivery compartment 149. At the same time that the bottles are dropped into the compartment 150, the cardboard strip 211 is picked off of the drum FD by the elongated spring fingers 155 and is allowed to drop down along these spring fingers and away from the machine at their lower ends. If it should occur that one of the cardboard strips 211 passes on under the spring fingers 155, this strip will drop against a shield 214 which is secured to the angle bracket 148 beneath the drum FD and which extends over the belt 202.

The compartment 150 is now moved to its vertical position by the cam 161, the gate 156 being simultaneously closed by the cam 162, and the row of bottles being dropped into the delivery compartment 149 and resting with their lower ends on this gate. As the mechanism continues to operate, the gate 156 is pushed outwardly by the cam 162, acting through its lever 168 and plunger 169, and the row of bottles is dropped to the level of the platform 129, the lower end of each bottle being held between the lip 160 on the shield 159 and the groove 158 on the plate 157. The rows of bottles are then carried away from the drum FD by the chain conveyor CR, and are delivered by the belt conveyor to the bottle filling drum.

The present invention has been described in connection with a single specific machine, and it should be clearly understood that the invention is not limited to the exact mechanical details or expedients shown, and that certain modifications, changes and omissions may be made in the machine without departing from the scope of the invention as defined in the appended claims.

I claim:

1. In a bottle feeding mechanism, a bottle feeding drum having a row of bottle carrying depressions on the surface thereof, a delivery chute for delivering a row of bottles to said depressions, a bottle catching compartment movable into engagement with said drum for removing said row of bottles from said drum, and means for releasing said row of bottles from said compartment.

2. In a bottle filling machine, means for feeding bottles to a filling mechanism comprising a horizontal rotary bottle feeding drum having rows of bottle carrying depressions thereon, an inclined bottle feeding chute extending radially from said drum and having its open end adjacent the surface of said drum, a movable bottle receiving platform on said chute, and a single movable member for maintaining the bottles of each row in alignment as they move from said chute to the depressions in said drum.

3. Bottle feeding mechanism comprising a bottle feeding drum, a plurality of means on

said drum for carrying rows of bottles thereon, means for feeding rows of bottles to said drum, and a bottle carrying compartment extending across the face of said drum and movable into engagement therewith for successively removing rows of bottles from said drum.

4. Bottle feeding mechanism for a bottle filling machine comprising a horizontal rotary bottle feeding drum having a plurality of rows of bottle carrying depressions thereon, means for feeding rows of bottles to said depressions as said drum rotates, a bottle catching compartment extending across the face of said drum and movable into engagement therewith for successively removing said rows of bottles from said drum, and means for moving said compartment operated by the rotation of said drum.

5. Bottle feeding mechanism for a bottle filling machine comprising a rotary bottle feeding drum having rows of depressions thereon for carrying rows of bottles, means for feeding rows of bottles to said rows of depressions, said rows of bottles having strips of packing material therebetween, means on said drum between said rows of depressions for carrying said strips, and means for separately removing said rows of bottles and said strips from said drum.

6. Bottle feeding mechanism for a bottle filling machine comprising a rotary bottle feeding drum having spaced rows of depressions on the surface thereof for carrying rows of bottles, means for feeding rows of bottles to said rows of depressions as said drum rotates, a fixed bottle delivery compartment adjacent said drum and extending across the face thereof, and a bottle catching compartment movably secured to said delivery compartment, said bottle catching compartment being adapted to be swung into engagement with said drum to remove a row of bottles therefrom and to be swung away from said drum into communication with said delivery compartment whereby rows of bottles are successively carried from said drum to said delivery compartment.

7. A bottle feeding mechanism for a bottle filling machine comprising a rotary bottle feeding drum having spaced rows of depressions on the surface thereof for carrying rows of bottles, means for feeding rows of bottles to said rows of depressions as said drum rotates, a fixed bottle delivery compartment adjacent said drum and extending across the face thereof, a bottle catching compartment hinged to said delivery compartment, and means operating synchronously with the rotation of said drum for moving said catching compartment into and out of engagement with said drum to successively deliver rows of bottles from said drum to said delivery compartment.

8. Bottle feeding mechanism for a bottle

filling machine comprising a rotary bottle feeding drum having spaced rows of depressions on the surface thereof for carrying rows of bottles, means for feeding rows of bottles to said rows of depressions as said drum rotates, a fixed bottle delivery compartment adjacent said drum and extending across the face thereof, a bottle catching compartment hinged to the upper end of said delivery compartment, a gate for controlling the lower end of said delivery compartment and means synchronized with the rotation of said drum for moving said catching compartment to successively deliver rows of bottles from said drum to said delivery compartment and for operating said gate to successively drop said rows of bottles from said delivery compartment.

9. Bottle feeding mechanism for a bottle filling machine comprising a rotary bottle feeding drum having spaced rows of depressions on the surface thereof for carrying rows of bottles, means for feeding rows of bottles to said rows of depressions as said drum rotates, a fixed bottle delivery compartment adjacent said drum and extending across the face thereof, a bottle catching compartment hinged to the upper end of said delivery compartment, a gate for controlling the lower end of said delivery compartment, a cam rotating with said drum for moving said catching compartment into and out of engagement with said drum to successively deliver rows of bottles from said drum to said delivery compartment, and a second cam rotating with said drum for operating said gate to successively drop said rows of bottles from said delivery compartment.

In testimony whereof I affix my signature,
NICOLA F. SAVIANO.