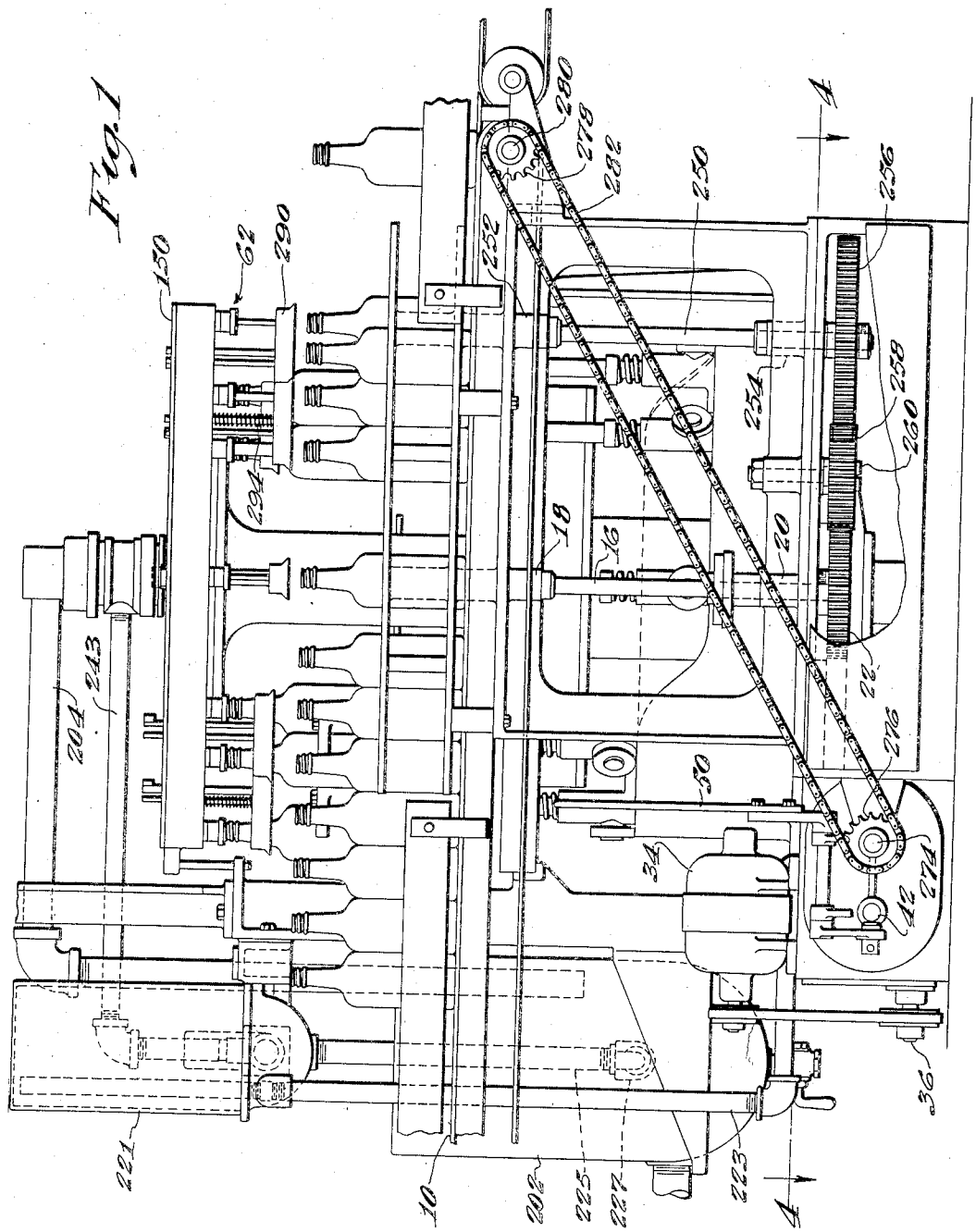
Feb. 8, 1938. A. C. EVERETT 2,107,474

RECEPTACLE CLEANING AND FILLING MACHINE

Filed April 13, 1935 7 Sheets-Sheet 1

Fig. 1



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RECEPTACLE CLEANING AND FILLING MACHINE

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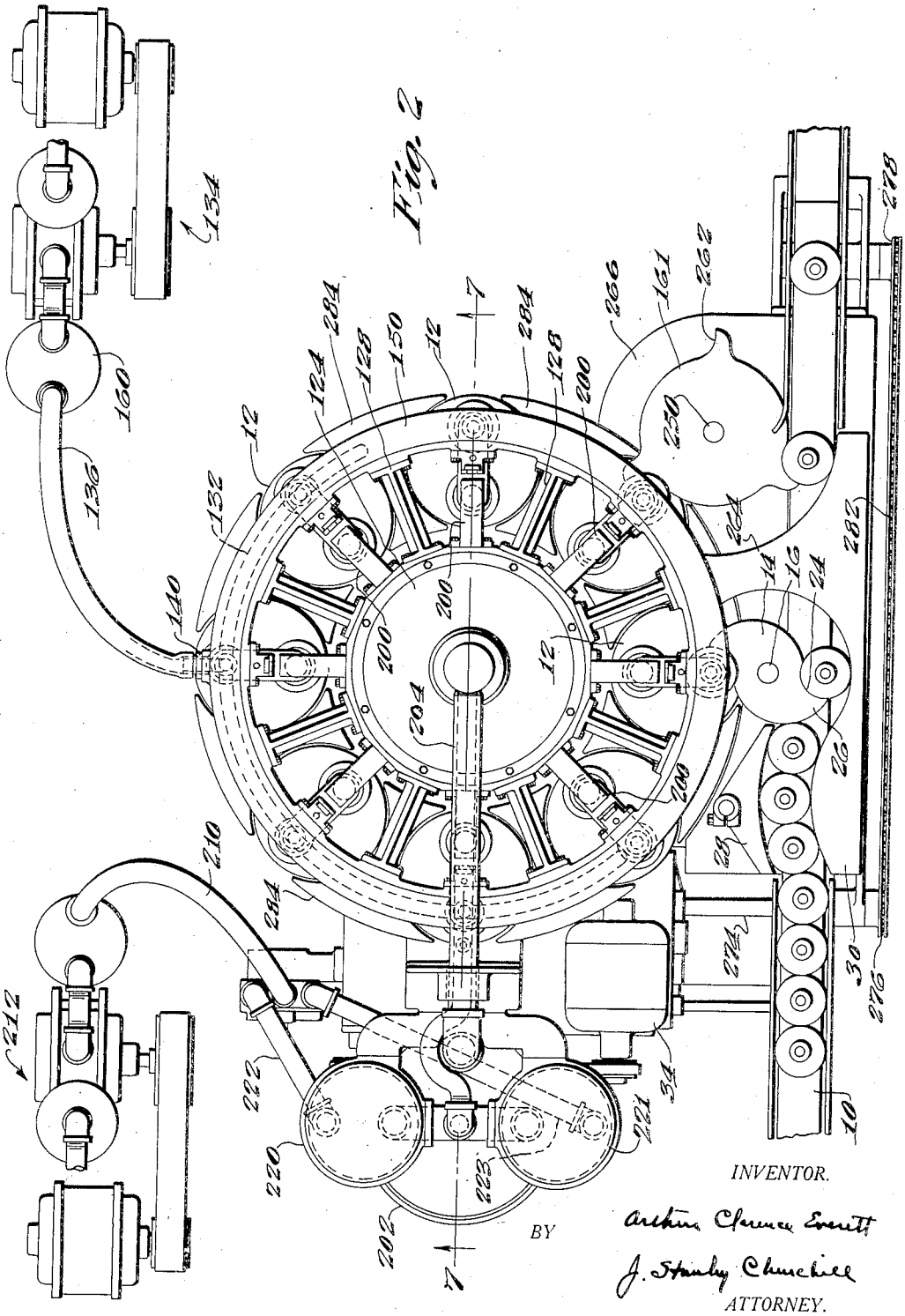
Fig. 2



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RECEPTACLE CLEANING AND FILLING MACHINE

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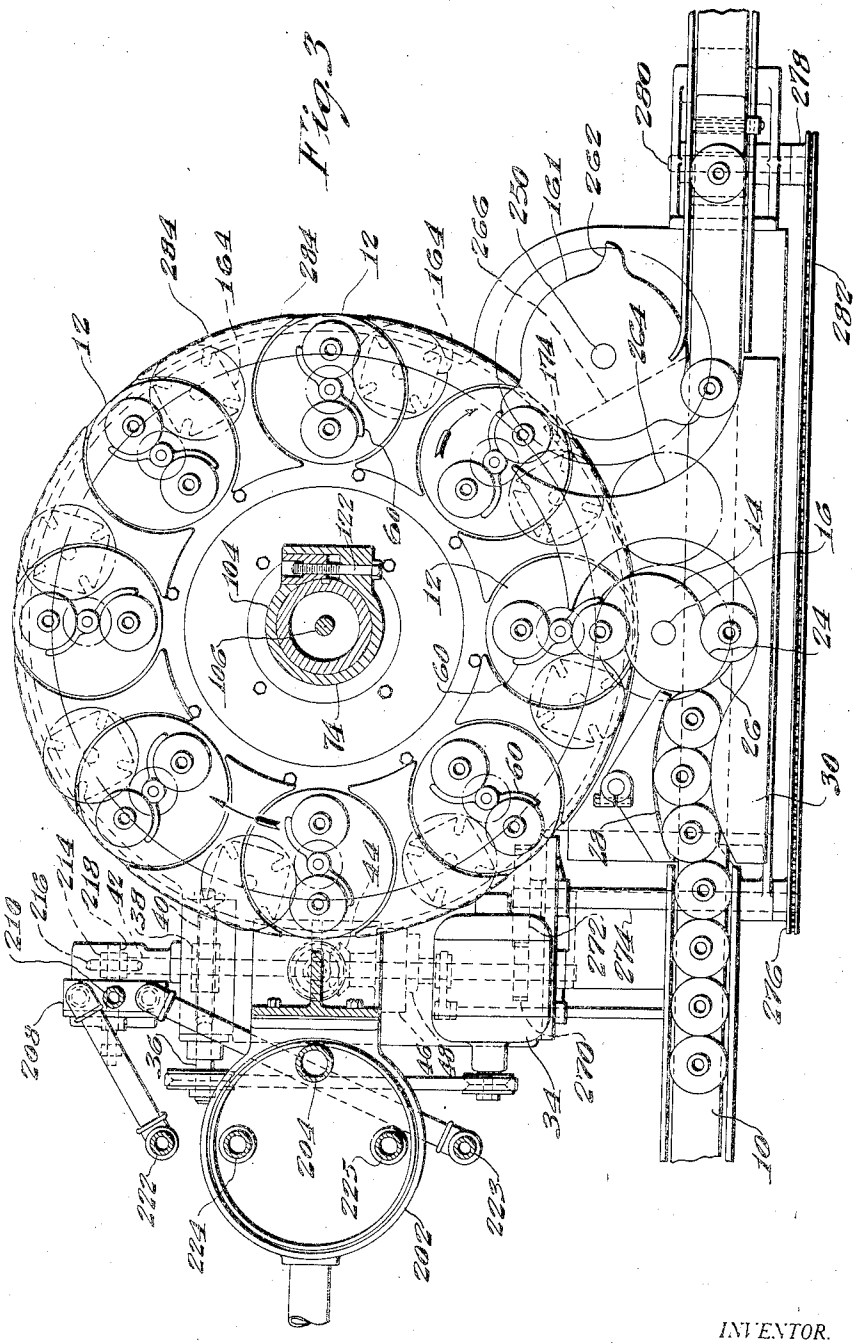
Fig. 3



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RECEPTACLE CLEANING AND FILLING MACHINE

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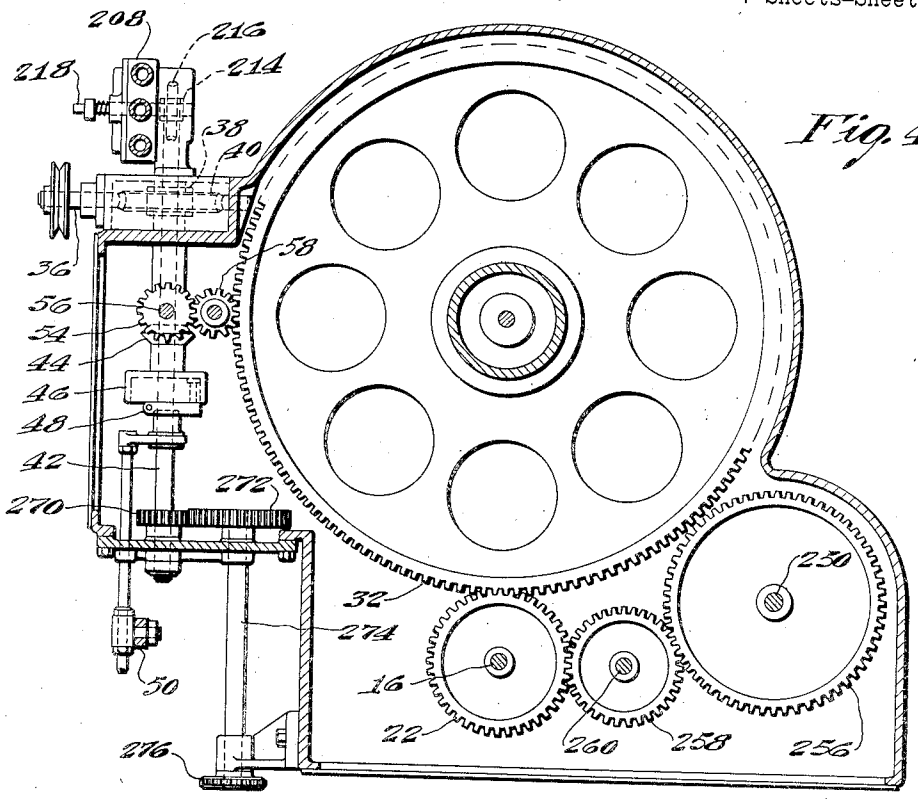

Fig. 4

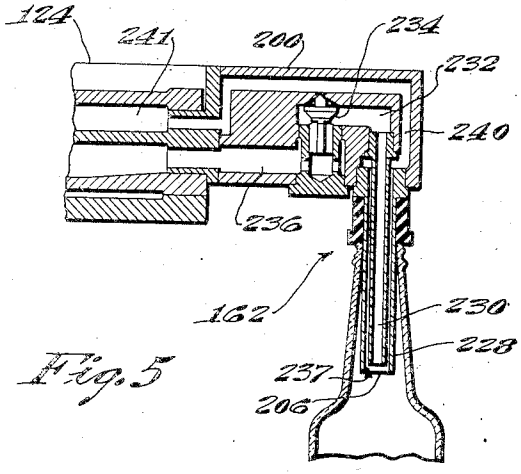

Fig. 5

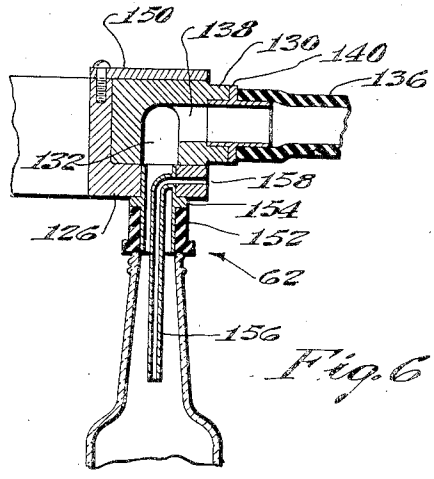

Fig. 6

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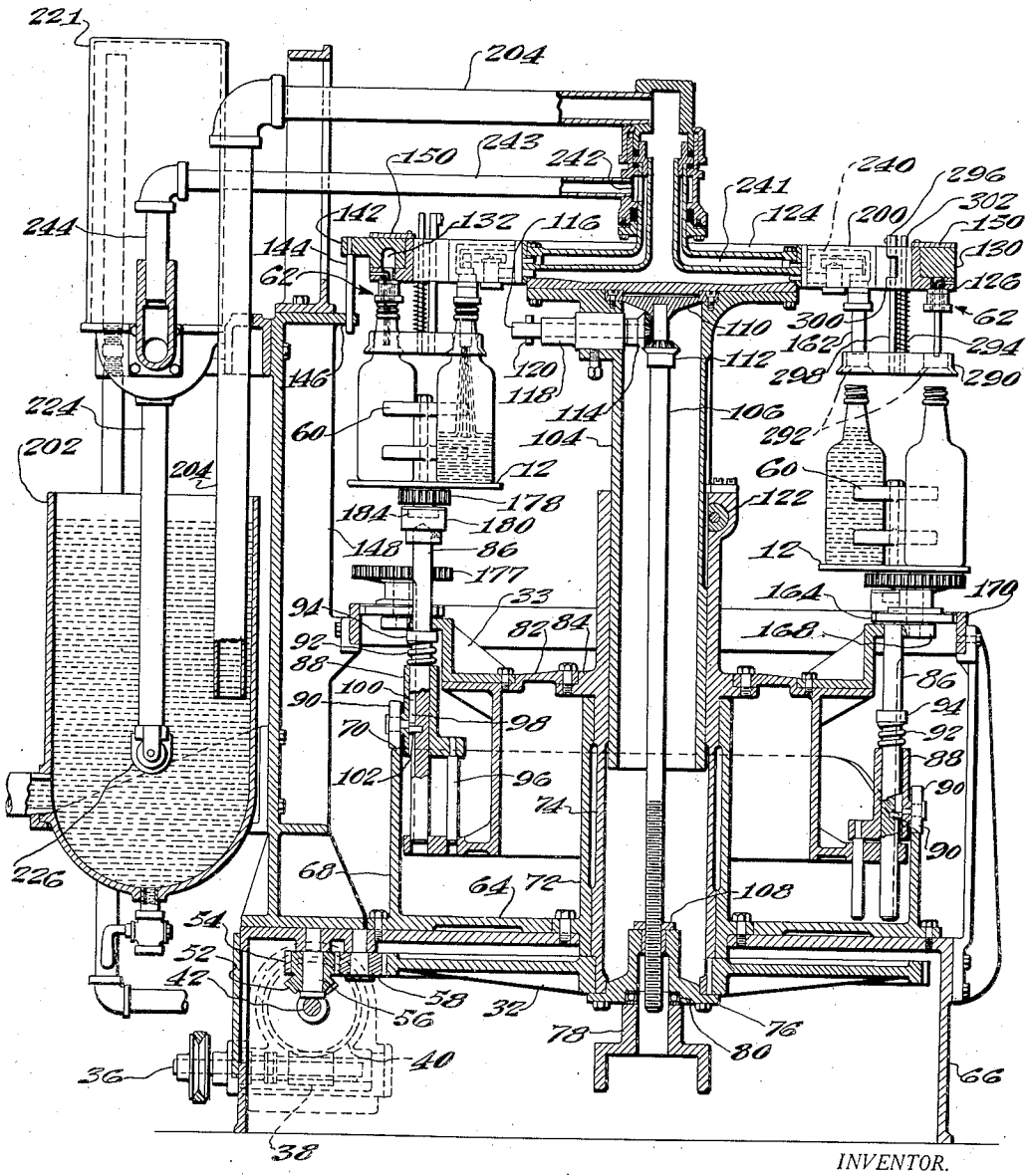

Fig. 7

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RECEPTACLE CLEANING AND FILLING MACHINE

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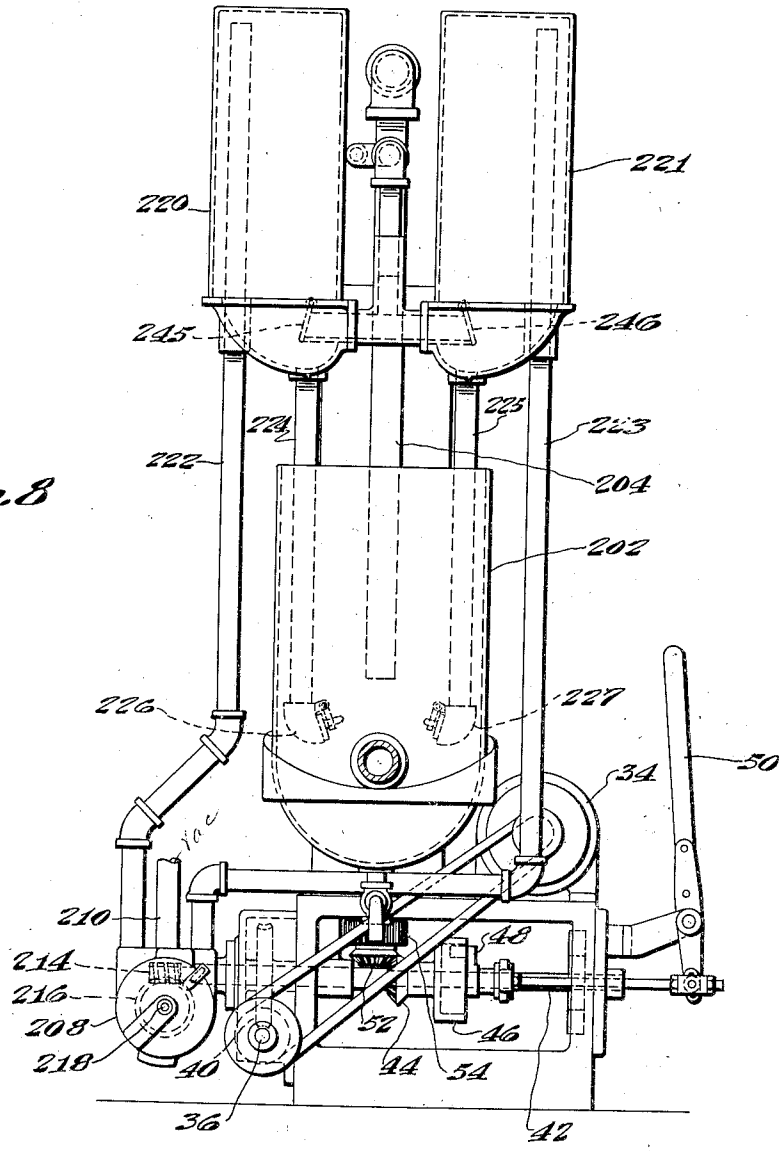
Fig. 8



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RECEPTACLE CLEANING AND FILLING MACHINE

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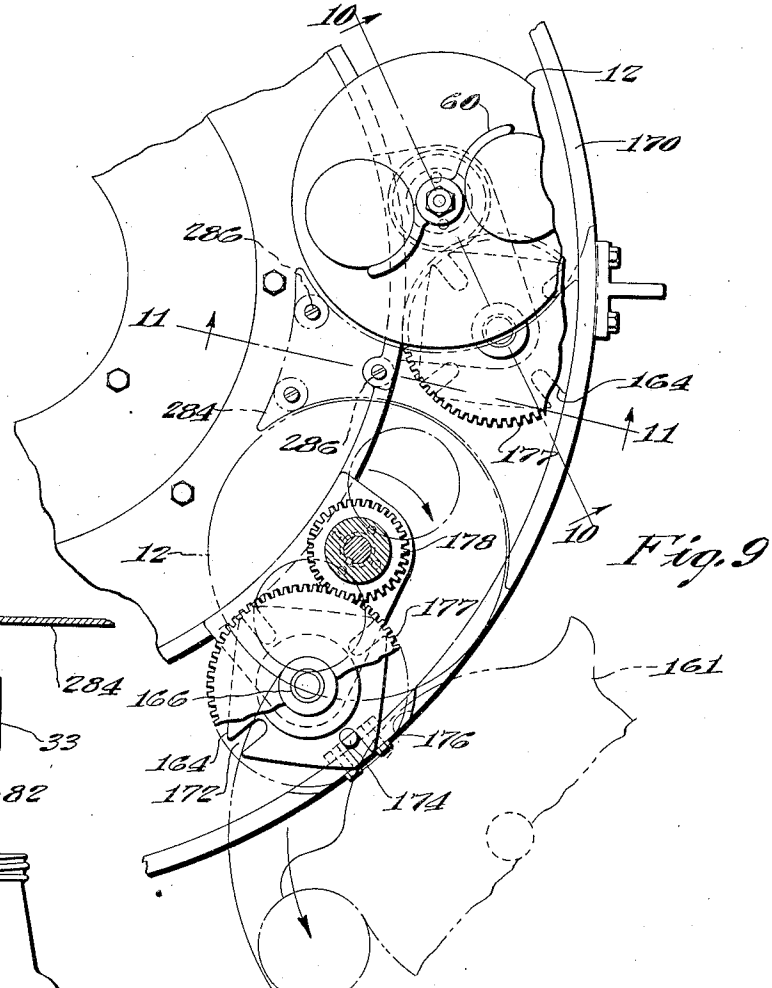

Fig. 9

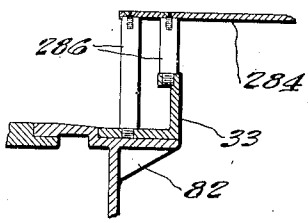

Fig. 11

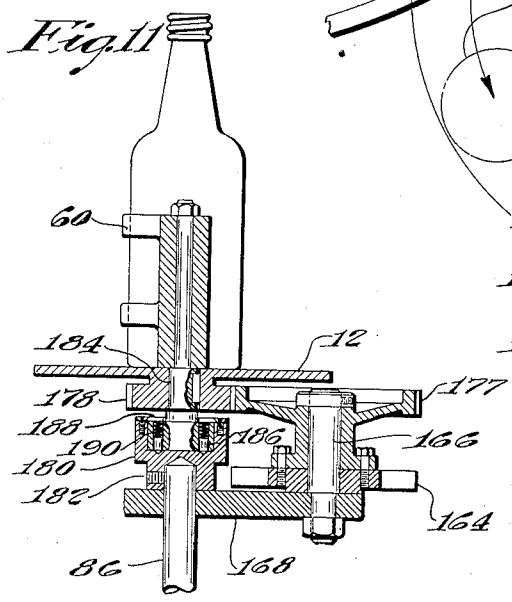

Fig. 10

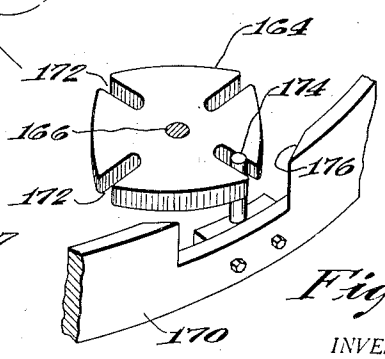

Fig. 12

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UNITED STATES PATENT OFFICE

2,107,474

RECEPTACLE CLEANING AND FILLING MACHINE

Arthur Clarence Everett, Boston, Mass., assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass., a corporation of Massachusetts

Application April 13, 1935, Serial No. 16,175

12 Claims. (Cl. 226—68)

This invention relates to a receptacle cleaning and filling machine, and more particularly to a bottle cleaning and filling machine.

One object of the invention is to provide a novel receptacle cleaning and filling machine in which the cleaning and filling operations are simultaneously performed upon a plurality of movable receptacles whereby the receptacles may be cleaned and filled in a rapid, economical and practical manner.

A further and more specific object of the invention is to provide a novel rotary receptacle cleaning and filling machine in which the receptacles may be delivered to the machine, cleaned during their movement in a circular path, and then transferred to a separate circular path where they may be filled during the operation of the machine and subsequently discharged from the machine.

A still further object of the invention is to provide a novel rotary receptacle cleaning and vacuum filling machine of such a construction as to enable receptacles, and particularly bottles, to be cleaned and filled in a rapid, economical manner in a single unitary machine of such a construction as to avoid the necessity of employing special valves and controls which have heretofore been required in connection with the separate cleaning and filling machines which have heretofore been used.

With these objects in view and such others as may hereinafter appear, the invention consists in the rotary cleaning and filling apparatus, and in the various structures, arrangements, and combinations of parts hereinafter described and particularly defined in the claims at the end of this specification.

In the drawings illustrating the preferred embodiment of the invention, Fig. 1 is a front elevation of a rotary cleaning and filling machine embodying the invention; Fig. 2 is a plan view of the machine shown in Fig. 1; Fig. 3 is a plan view similar to Fig. 2, with the cleaning and filling units omitted; Fig. 4 is a cross-section taken on the line 4—4 of Fig. 1; Fig. 5 is a sectional detail of one of the filling nozzles and associated parts; Fig. 6 is a sectional detail of one of the cleaning heads; Fig. 7 is a view in vertical section taken on the line 7—7 of Fig. 2; Fig. 8 is an end view of a portion of the machine shown in Fig. 1 viewed from the left; Fig. 9 is an enlarged plan view of the turning device with some of the parts in section; Fig. 10 is a cross-sectional detail taken on the line 10—10 of Fig. 9; Fig. 11 is a cross-sectional detail taken on the line 11—11 of Fig. 9 and Fig. 12 is a perspective view of a detail to be referred to.

The present commercial practice, with respect to the rotary cleaning and filling of receptacles comprises the cleaning of the receptacles, such as bottles, on one machine and filling the bottles on a separate machine. In general, the present invention aims to provide a unitary rotary machine for cleaning and filling receptacles and preferably bottles in which provision is made for effecting the simultaneous filling and cleaning of a plurality of receptacles during the rotary movement thereof. In the preferred embodiment of the invention, provision is made for pneumatically cleaning a plurality of bottles in one path, preferably circular, while the bottles are supported upon a rotary moving bottle supporting carrier and the cleaning operation is performed by suction created within the bottles arranged to induce the flow of air into the bottles, to the end that foreign matter may be removed by the air current and thereafter provision is made for transferring the bottles to a second path through which they are moved in succession. In the preferred machine each bottle is transferred to a second circular path on the continuously rotating bottle supporting carrier, and during the movement of the bottles through the second path the bottles are filled, the filling operation being preferably effected by the evacuation of the bottle in accordance with the well-known vacuum principle, after which the bottles are automatically discharged from the machine.

Referring now to the drawings which illustrate the different features of the invention as embodied in a machine for automatically cleaning and filling bottles, the empty bottles, ready to be cleaned and filled are deposited on an incoming conveyor 10 and are transferred from the incoming conveyor 10 to an elevating platform 12 of the rotary cleaning and filling device by a continuously rotating spider 14 which is mounted on a shaft 16. The lower end of this shaft is rotatably mounted in bearings 18 and 20 formed in the machine frame and is driven by a gear 22 which is fast thereon. The transfer spider 14 is provided with bottle engaging portions 24 formed to fit the shape of the bottle, while the back portions 26 are of such curved shape that the successive bottles are caused to move with an accelerated motion in the direction of travel of the spider. Guide members 28 and 30 serve to guide the bottles on the conveyor 10 so that as they are delivered to the spider the movement of the bottles is not stopped entirely and, consequently the

bottle does not have to be picked up by the bottle engaging portion 24 from a dead stop, thereby assuring smooth continuous movement of the bottles. The gear 22 meshes with and is driven by a gear 32 which forms the driving gear for the rotary bottle cleaning and filling device.

Provision is made for rotating the rotary carrier 33 upon which the bottles are supported from a motor 34 belted to a shaft 36 and to this end the latter is provided with a worm 38 cooperating with a worm gear 40 on a shaft 42 mounted in bearings in the machine frame. A bevel gear 44 formed as a part of a clutch housing 46 is normally arranged free on the shaft 42 until the clutch housing 46 is engaged by the second member 48 of the clutch when a manually operated clutch lever 50 is thrown. In this manner, the bevel gear 44 is driven from the shaft 42 through the clutch and operates to drive a bevel gear 52. The bevel gear 52 is provided with a gear 54 attached thereto which is free to turn on a vertical stud 56 and meshes with an idler gear 58 cooperating with the gear 32 which is arranged to drive the rotary carrier 33 in which the bottle elevating platforms 12 are mounted.

Referring now to Fig. 3, during the rotary movement of the rotary carrier, the bottles are engaged by supporting arms 60 mounted on the elevating platforms 12 and positioned in alignment with cleaning nozzles 62. As herein shown provision is made for elevating the bottles into sealing engagement with the individual nozzles, and as illustrated in Fig. 7, a circular bearing member 64 is fastened to the top of the base 66 and comprises an outer cam ring 68 having a cam surface 70 formed on the top edge thereof, and an inner supporting sleeve 72 which acts as a bearing for a rotating sleeve 74 rotatably mounted therein. The gear 32 is fast to the bottom of the sleeve 74. An end disc 76 which is supported by the column 78 formed in the base 66 is also fastened to the bottom of the sleeve 74 and forms a vertical supporting member for the sleeve. An anti-friction bearing 80 located between the disc 76 and the column 78 facilitates the rotation of the sleeve 74. A cylindrical casing 82 is attached to a circular flange 84 formed on the sleeve 74 and supports a plurality of bottle elevating devices, each comprising a rotatable platform 12 mounted to rotate on the end of a vertical rod 86 extending through a bearing in the carrier 33, the latter being attached to the top of the cylindrical casing 82. A roll supporting sleeve 88 free to slide on the rod 86 is provided with a roller 90 rotatably attached thereto which cooperates with the cam surface 70 above described. The sleeve 88 yieldingly raises the platform 12 through the spring 92 which freely encircles the rod 86 and cooperates with the underside of a collar 94 fast on the rod 86.

A guide pin 96 fastened to the roll supporting sleeve 88 and guided in a hole in the casing 82 serves to keep the roll 90 in proper alignment with its cam 70. The vertical rod 86 is held from rotation by provision of a key 98 secured to the roll supporting sleeve which slides in a keyway 100 cut in the rod 86. A pin 102 fastened in the rod 86 serves as a stop to hold the sleeve from sliding off the rod.

A sleeve 104 mounted in the sleeve 74 is arranged to be adjusted for varying heights of bottles by means of an adjusting screw 106, the lower end of which is provided with screw threads cooperating with a threaded nut 108 fast in the end disc 76. The upper end of the adjusting screw 106 is mounted in a bearing formed in a bracket 110 and is provided with a bevel gear 112 fast thereon which cooperates with the bevel gear 114 fast on the end of a shaft 116 mounted in a bearing 118 held in the sleeve 104. The shaft 116 is provided with a pin 120 to which a wrench may be applied to turn the shaft 116 and 106 and vertically adjust the sleeve 104. A clamping screw 122 is provided in the top of the sleeve 74 to normally hold the sleeve 104 in position after an adjustment has been made.

A plurality of cleaning and filling nozzles are mounted on top of the sleeve 104 to rotate therewith, each of said cleaning and filling nozzles being in alignment with the bottles on the cooperating elevating platforms 12 by which individual bottles are raised into operative engagement with the cleaning and filling nozzles depending from and carried by the filling chamber 124. As illustrated in Figs. 2, 6, 7, the cleaning nozzles 62 are secured to a flanged ring 126 which is supported by brackets 128 extending radially from and secured to the filling chamber 124. The flanged ring 126 is arranged to support a stationary ring 130 adjacent to and in sliding contact therewith. The stationary ring is provided with a passageway 132 around a portion of its underside which is in communication with a motor driven vacuum pump unit, of any usual or preferred construction, indicated generally at 134. A flexible tube 136 connects the vacuum pump unit with the passageway 132 in the stationary ring 130 through an opening 138 and connection 140 in the ring. Provision is made for preventing the ring 130 from rotating and as herein shown the ring is provided with a lug 142 in which a depending pin 144 is mounted. The pin is extended through a hole in a lug 146 extending from a supporting bracket 148 forming a part of the machine frame. This construction permits vertical adjustment of the cleaning and filling unit. A retaining plate 150 secured to the top of the flanged ring 126 serves to hold the stationary ring 130 from vertical displacement.

In order to effect the pneumatic cleaning of the bottles contacting with the cleaning nozzles 62, each nozzle has provision for permitting air to be drawn into the bottle by suction produced in the bottle in a manner such that the dust and other foreign matter may be sucked with the air current upwardly and outwardly from the bottle through the suction nozzle. As herein shown, each cleaning nozzle 62 comprises a rubber collar 152 fastened to the lower end of a tube 154 the other end of which is fast in the flanged ring 126 and which is in alignment with the passageway 132 in the stationary ring 130. In order to permit an air current to be drawn into each bottle by the suction created therein, as above described, a vent tube 156 is provided attached to the inside of each cleaning nozzle and the lower end of the vent tube extends below the rubber contact collar 152 and into the mouth of the bottle when the latter is sealed by the collar 152. As illustrated in Fig. 6, the other end of the vent tube 156 is open and communicates with a hole 158 through the side of the flanged ring 126. The vent tubes 156 permit air to flow from the atmosphere into the bottles establishing a current of air through the bottles and outwardly through the passageway 132 in the stationary ring and through the flexible tube 136 to the vacuum pump unit which includes a tank or receptacle 160 of any preferred construction.

The tank 160 may also serve to collect the dust and foreign matter removed from the bottles and drawn into it by the vacuum pump.

When, as above described, the bottle has been raised up on the elevating platform 12 by the cam 70, the mouth of the bottle will have been brought up into sealing engagement with the suction nozzle 62. During the rotation of the carrier 33 the bottle remains in sealing engagement with the suction nozzle until the bottle reaches a point just prior to a discharge spider 161, where the cam 70 lowers the elevating platform 12 to the receiving and discharging level. Provision is now made for rotating the elevating platform 12, one half turn, on its own axis, so as to present the cleaned bottle to the inner circular path and in alignment with the filling nozzles 162, and at the same time as will be described, a previously filled bottle is presented to the discharge spider 161 to be carried away from the machine. As illustrated in Figs. 9 and 10, in order to rotate the elevating platforms one half revolution, and to hold them in alignment with the cleaning and filling nozzles during the advance of the elevating platforms, a Geneva plate 164 is provided which is loosely mounted on a stud 166 fixed to an extension 168 on the carrier 33. Each Geneva plate 164 is four-sided in outline, each side being of a radius to conform to a controlling bar 170 fixed to the frame of the machine. The Geneva is provided with a set of four slots 172 which extend inwardly diagonally from the corners toward the center of the plate. The Geneva plates of each elevating unit are arranged to travel radially of and with one or another of their curved sides in engagement with the controlling bar. While the elevating unit is being carried around during the rotation of the machine with a curved side of its Geneva plate in engagement with the bar 170, the Geneva will be locked against rotation and hence the elevating platform 12 will be maintained in a fixed angular position. However, when the elevating unit arrives to a position just prior to the discharge spider 161 the Geneva is rotated through a quarter revolution by a pin 174 which is fixed alongside the bar 170 and the upper side of the bar is recessed as at 176 to accommodate the corner of the Geneva plate during the rotation thereof.

When the Geneva plate 164 of an elevating unit reaches the pin 174 which projects vertically from and is positioned inside of the radius of the bar 170, the pin 174 will enter the forward diagonal slot 172 in the Geneva plate and as the elevating unit continues its advance, the Geneva plate will be caused to rotate through a quarter revolution, and during the continued advance of the elevating unit, another curved face of the Geneva plate will bear on the bar 170, thereby locking the Geneva in the new position into which it has been rotated.

The quarter turn produced by the Geneva causes the elevating plate 12 to rotate one half turn by provision of a pair of gears in the ratio of two to one. One of the gears 177 is fastened to and arranged to rotate with the Geneva plate and the other gear 178 is formed underneath and as a part of the elevating platform 12, as shown in cross section in Fig. 10. In order to permit the elevating platform 12 to rotate on its axis without rotating the elevating rod 86, a spring-pressed pin coupling is provided, herein shown as including a casing 180 which is secured to the upper end of the elevating rod 86 by a set screw 182. The upper part of the coupling comprises a shoulder stud 184 which fits into the casing 180 and is provided with two holes in which spring-pressed pins 186 are loosely held. The ends of the pins are pointed to fit into countersunk holes in the casing 180. A plate 188 is provided on top of the coupling to retain the shoulder stud 184 within the casing 180 and to serve as a retainer for the springs 190. The elevating platform 12 is keyed to the upper part of the shoulder stud 184.

During the rotation of the elevating platform 12 by the Geneva 164 through the gears 177, 178, the spring-pressed pins 186 will be urged out of the countersunk holes causing the springs 190 to be compressed until the end of the one half revolution when the pins 186 will again enter the countersunk holes. During the operation of the machine when the elevating platform is raised up, the gear 178 will be raised out of mesh with gear 177 and during this time the spring-pressed coupling will maintain the elevating platform in fixed angular position. When the elevating platform is again lowered the gears 177, 178, will again mesh with each other in the same relation as when they were disengaged as both the Geneva and the elevating platform are locked against rotation. The teeth of the gears may and preferably will be beveled in the usual manner to facilitate the meshing of the gears.

Referring now to Figs. 5 and 7, provision is made for filling the bottles after they have been cleaned and as herein shown, a plurality of filling heads 200 are mounted radially from the filling chamber 124 to rotate therewith, each of said filling heads being in alignment with the bottles on the cooperating elevating platform 12 and having a nozzle 162 which is connected to a supply tank 202 through the pipe 204. The supply tank 202 is attached to the bracket 148 mounted on the base 66.

Provision is made for exhausting the air in the bottles in order to create a vacuum therein to cause liquid to be drawn from the supply tank 202 into the bottles, and provision is also made for removing any excess liquid that is discharged into the bottles above the end 206 of the filling nozzles 162.

Referring now to Fig. 8, it will be observed that a valve 208 is connected by a pipe 210 to a vacuum pump unit, indicated generally at 212 in Fig. 2, and which may comprise any of the well-known types. The valve 208 is adapted to be operated by a worm 214 on the end of the shaft 42 through a worm wheel 216 fast on a valve shaft 218. The valve 208 is connected to vacuum chambers 220, 221 by pipes 222, 223 and the bottom of the vacuum chambers 220, 221 are provided with drain pipes 224, 225. The drain pipes 224, 225 extend into the supply tank 202 and are provided with check valves 226, 227 which allow the surplus liquid drawn from the top of the bottles, as will be described, to be discharged into the supply tank 202 when there is no vacuum in the chambers 220, 221. The valve 208 is adapted to be operated to alternately connect the chambers 220, 221 with the vacuum pump and to alternately open them to atmospheric pressure. It will be seen therefore, that the chamber open to atmospheric pressure will immediately discharge any liquid which has accumulated therein into the supply tank 202. In order to remove any excess liquid that is discharged into the bottles, the nozzles 162 are connected to either of the vacuum chambers 220, 221, and comprise an

outer tube 228 fast in the filling head 200 and a smaller inner tube 230 concentrically positioned in the outer tube 228 and attached to the filling head 200, as shown in Fig. 5. The tube 230 communicates with the liquid supply pipe 204 through the chamber 232, check valve 234 and passageway 236. The annular space 237 formed between the outer tube 228 and the inner tube 230 communicates with the vacuum chambers 220, 221 through the passageways 240, 241, 242, pipe connections 243, 244 and check valves 245, 246. It will be observed that when the vacuum chamber 220 is connected to the vacuum pump through the valve 208, the check valves 226, 246 will be closed and the check valve 245 will be open, thus drawing the surplus liquid from the bottle into the chamber 220 when the liquid reaches a level above the end 206 of the nozzle 228 and, likewise, when the chamber 221 is connected to the vacuum pump through the valve 208, the check valves 227, 245 will be closed and the check valve 246 open and the air and surplus liquid will be withdrawn from the bottles into the chamber 221. When the chamber 220 is opened to atmospheric pressure through the valve 208, as has been described, any surplus liquid which may have accumulated in the chamber 220 will be discharged through the pipe 224 and check valve 226 into the supply tank 202. The chambers 221 will likewise be emptied when it is opened to atmospheric pressure.

From the description thus far, it will be apparent that during the continuous movement of the bottles around with the rotary carrier 33 and the rotary cleaning and filling mechanisms above described, the bottles are cleaned in one circular path, rotated to present the bottles to another circular path where they are filled and thereafter the bottles are presented to a discharging station where the filled bottles are transferred to the belt 10 of the conveyor to be discharged from the machine without interruption in the continuity of their movement and without sudden jarring which would tend to spill the contents of the bottles. As shown, in Figs. 3 and 4 the filled bottles are transferred from the elevating platform 12 to the conveyor 10 by a continuously rotating discharging spider 161 mounted on a shaft 250. The lower end of this shaft is rotatably mounted in bearings 252, 254 formed in the machine frame and is driven by a gear 256 secured thereon. The gear 256 is driven from the gear 22 which drives the receiving spider through the medium of an intermediate idler gear 258 rotatably mounted on a stud 260 fast in the machine frame. The timing of the machine is so arranged and the gearing is so constructed that as the elevating platform 12 is rotated by the turning device, a filled bottle is presented to one of the bottle engaging arms 262 of the discharge spider and as the spider rotates, the bottle is transferred to the belt 10. The bottle is guided from the elevating platform by a curved surface 264 of the guide rail 30 which projects in front of the bottle, as shown in Fig. 3. In travelling from the elevating platform 12 to the moving belt 10 the bottle is supported on a table 266 secured to the machine frame.

In order to drive the continuously moving conveyor belt 10 a gear 270 fast on the shaft 42 drives a gear 272 fast on the end of a shaft 274 mounted in bearings in the machine frame. A sprocket 276 fast on the other end of the shaft 274 drives a sprocket 278 fast on the conveyor shaft 280 through a chain 282.

Filling plates 284 inserted between each elevating unit, see Figs. 3 and 11, are mounted on supporting rods 286 fixed to the carrier 33 and are arranged to be flush or on a level with the elevating platforms 12 when the latter are in their loading and discharging position. These filling plates serve as bridge plates when the bottles are transferred from the receiving spider to the elevating platform and likwise when the bottles are transferred from the elevating platform to the discharge spider.

Yieldable guide blocks 290 with openings 292 to permit the necks of the bottles to enter therethrough assist in guiding the bottles into register with their respective cleaning and filling nozzles. During the rotation of the machine when the bottles are elevated, the guide blocks exert a yielding pressure upon the lower portion of the necks or shoulders of the bottles through springs 294 to the end that when the bottles are lowered away from the nozzles the guide blocks 290 will cause the seal to be broken between the suction nozzles and the mouths of the bottles and thereby prevent the bottles from being held to their respective nozzles by the vacuum created therein. A stop member 296 secured to a supporting bar 298 which slides in a bracket 300 secured to the flanged ring 126, limits the downward movement of the guide block 290. The spring 294 is coiled around a guide rod 302 which fits freely through a hole in the bracket 300.

From the description thus far it will be observed that the present machine may be economically manufactured and the single unitary machine operates to perform the cleaning and filling operation in a rapid and efficient and practical manner, reducing to a minimum the liability of spilling the contents of the filled bottles.

While as illustrated herein, the different features of the invention are shown as embodied in a machine for cleaning and filling bottles, it will be understood that the invention may be embodied in a machine for cleaning and filling other containers.

Having thus described the invention, what is claimed is:—

1. A receptacle cleaning and filling machine having, in combination, means for moving a plurality of receptacles through the machine in a plurality of concentric but spaced circular paths, pneumatic cleaning means for the receptacles being moved in the outer path, filling means adapted to fill the receptacles being moved in the inner path, and means for transferring receptacles after having been cleaned from the outer to the inner path, all of said means being operatively connected to operate in timed relation.

2. A receptacle cleaning and filling machine having, in combination, rotatable receptacle supporting means, means for rotating the same, a plurality of cleaning heads, a plurality of filling heads, means for rotating said filling and cleaning heads in two spaced circular paths concentric with the axis of rotation of the receptacle supporting means, transferring means operative to transfer receptacles on said supporting means from a path beneath the cleaning heads to a path beneath the filling heads.

3. A receptacle cleaning and filling machine having, in combination, rotatable receptacle supporting means, means for rotating the same, a plurality of cleaning heads, a plurality of filling heads, means for rotating said filling and cleaning heads in two spaced circular paths concentric with the axis of rotation of the receptacle

supporting means, transferring means operative to transfer receptacles on said supporting means from a path beneath the cleaning heads to a path beneath the filling heads, and means for relatively moving said receptacle supporting means and said cleaning and filling heads to present the receptacles into operative filling and cleaning position.

4. A receptacle cleaning and filling machine having, in combination, rotatable receptacle supporting means, means for rotating the same, a plurality of cleaning heads, a plurality of filling heads, means for rotating said filling and cleaning heads in two spaced circular paths concentric with the axis of rotation of the receptacle supporting means, transferring means operative to transfer receptacles on said supporting means from a path beneath the cleaning heads to a path beneath the filling heads, said transferring means including a plurality of rotatable members, and means for effecting their rotation about axes disposed between the said cleaning and filling heads.

5. A receptacle cleaning and filling machine having, in combination, rotatable receptacle supporting means, means for rotating the same, a plurality of cleaning heads, a plurality of filling heads, means for rotating said filling and cleaning heads in two spaced circular paths concentric with the axis of rotation of the receptacle supporting means, transferring means operative to transfer receptacles on said supporting means from a path beneath the cleaning heads to a path beneath the filling heads, said transferring means comprising a plurality of individual supporting members capable of rotary and vertical movement.

6. A receptacle cleaning and filling machine having, in combination, rotatable receptacle supporting means, means for rotating the same, a plurality of cleaning heads, a plurality of filling heads, means for rotating said filling and cleaning heads in two spaced circular paths concentric with the axis of rotation of the receptacle supporting means, transferring means operative to transfer receptacles on said supporting means from a path beneath the cleaning heads to a path beneath the filling heads, said transferring means comprising a plurality of individual supporting members, means for effecting rotation of said receptacles, and means for elevating said members and the receptacles supported thereby into operative relation with said cleaning and filling heads.

7. A receptacle cleaning and filling machine having, in combination, rotatable means operative to movably support a plurality of receptacles during their cleaning and a plurality of other receptacles during their filling, means for rotating the same, a plurality of cleaning heads, a plurality of filling heads, said cleaning heads and filling heads being arranged in two spaced circular paths concentric with the axis of rotation of the receptacle supporting means and with the cleaning heads disposed around the filling heads, means for relatively moving said filling and cleaning heads and the receptacles, and means for transferring the receptacles from beneath the cleaning to beneath the filling heads.

8. A receptacle cleaning and filling machine having, in combination, rotatable means operative to movably support a plurality of receptacles during their cleaning and a plurality of other receptacles during their filling, means for rotating the same, a plurality of cleaning heads, a plurality of filling heads, said cleaning heads and filling heads being arranged in two spaced circular paths concentric with the axis of rotation of the receptacle supporting means and with the cleaning heads disposed around the filling heads, means for simultaneously elevating a pair of receptacles into operative position with relation to a cleaning and a filling head, and means for transferring receptacles from beneath the cleaning heads to beneath the filling heads.

9. A receptacle cleaning and filling machine having, in combination, means for rotating a plurality of receptacles through two spaced but concentric circular paths, a plurality of cleaning heads, a plurality of filling heads, means for rotating said filling and cleaning heads in two spaced circular paths concentric with the axis of rotation of said receptacles and transferring means operative to transfer receptacles from a path beneath the cleaning heads to a path beneath the filling heads.

10. A receptacle cleaning and filling machine having, in combination, means for moving a plurality of receptacles through the machine in two spaced but concentric circular paths, means for cleaning a plurality of said receptacles during their movement through one of said paths, and means for simultaneously filling a plurality of different receptacles during their movement through the second of said paths, all of said means being operatively connected to operate in timed relation.

11. A receptacle cleaning and filling machine having, in combination, means for moving a plurality of receptacles through the machine in two spaced but concentric circular paths, means for pneumatically cleaning a plurality of said receptacles during their movement through one of said paths, and means for simultaneously filling a plurality of different receptacles during their movement through the second of said paths, all of said means being operatively connected to operate in timed relation.

12. A receptacle cleaning and filling machine having, in combination, means for moving a plurality of receptacles through the machine in two spaced but concentric circular paths, suction operated means for pneumatically cleaning a plurality of receptacles during their movement through one of said paths, and means for filling a plurality of different receptacles during their movement through the second of said paths, all of said means being operatively connected to operate in timed relation.

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