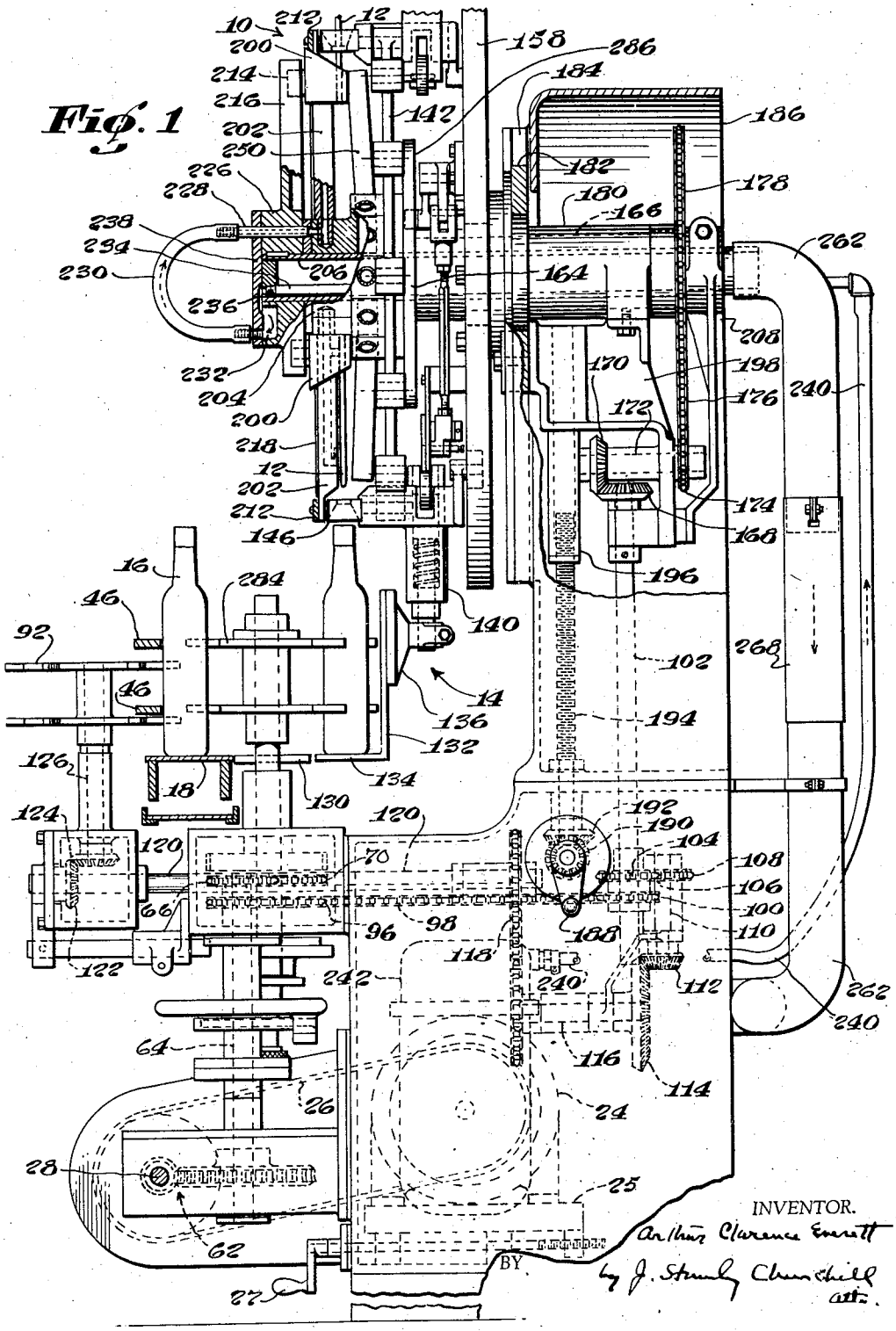
July 25, 1944. A. C. EVERETT 2,354,308

CONTAINER CLEANING MACHINE

Filed May 27, 1942 6 Sheets-Sheet 1

Fig. 1



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CONTAINER CLEANING MACHINE

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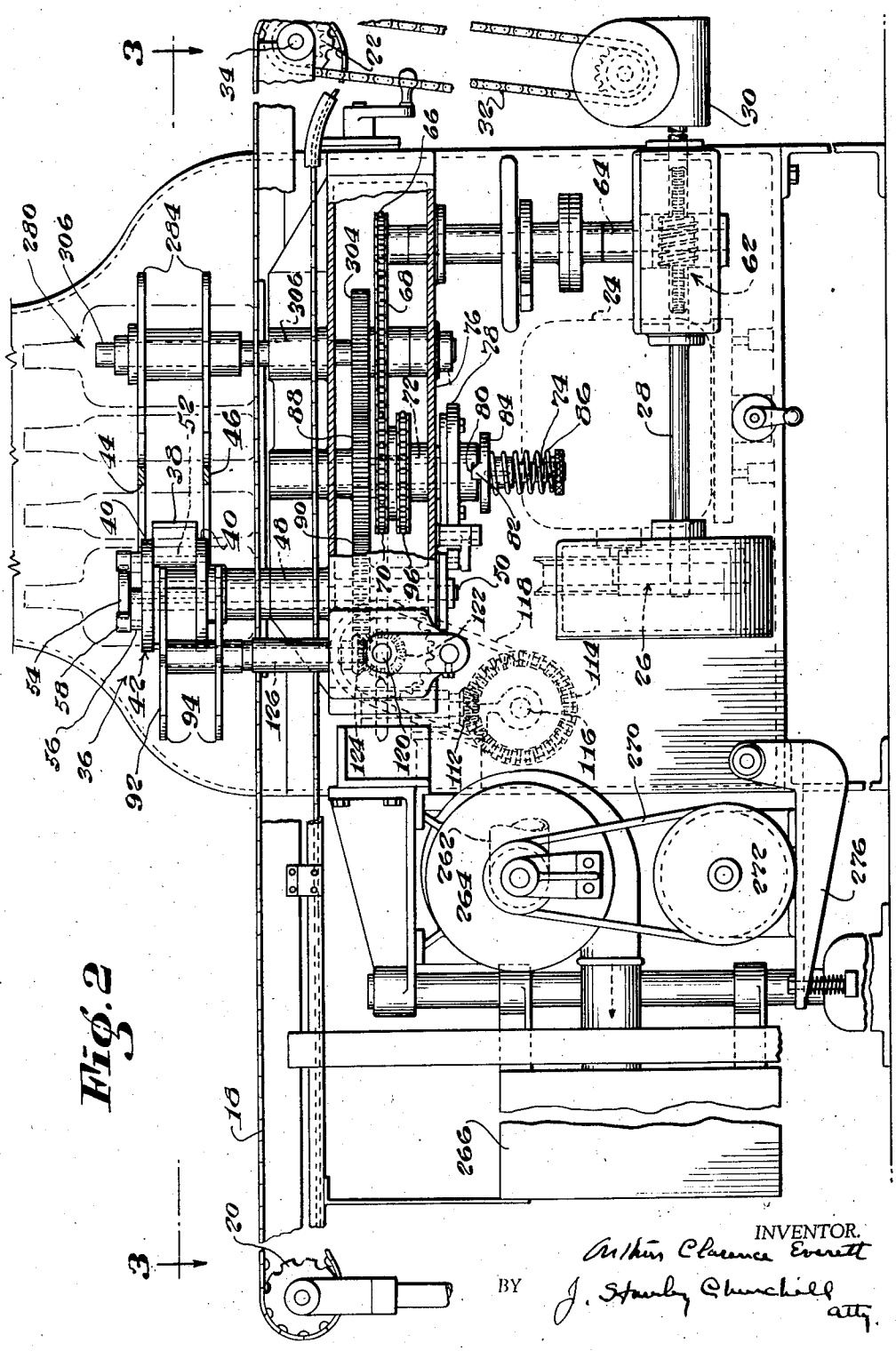


Fig. 2

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CONTAINER CLEANING MACHINE

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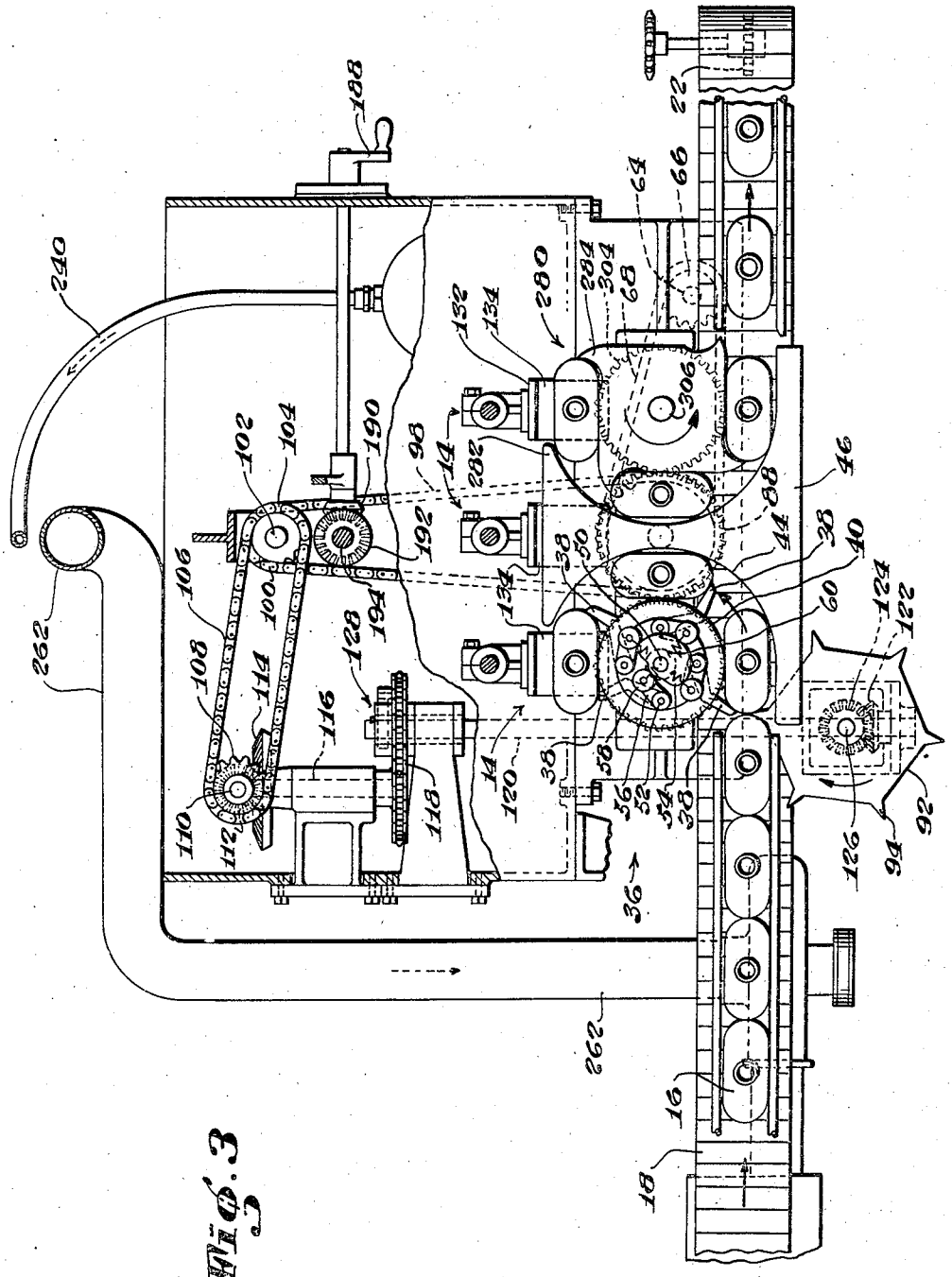


FIG. 3

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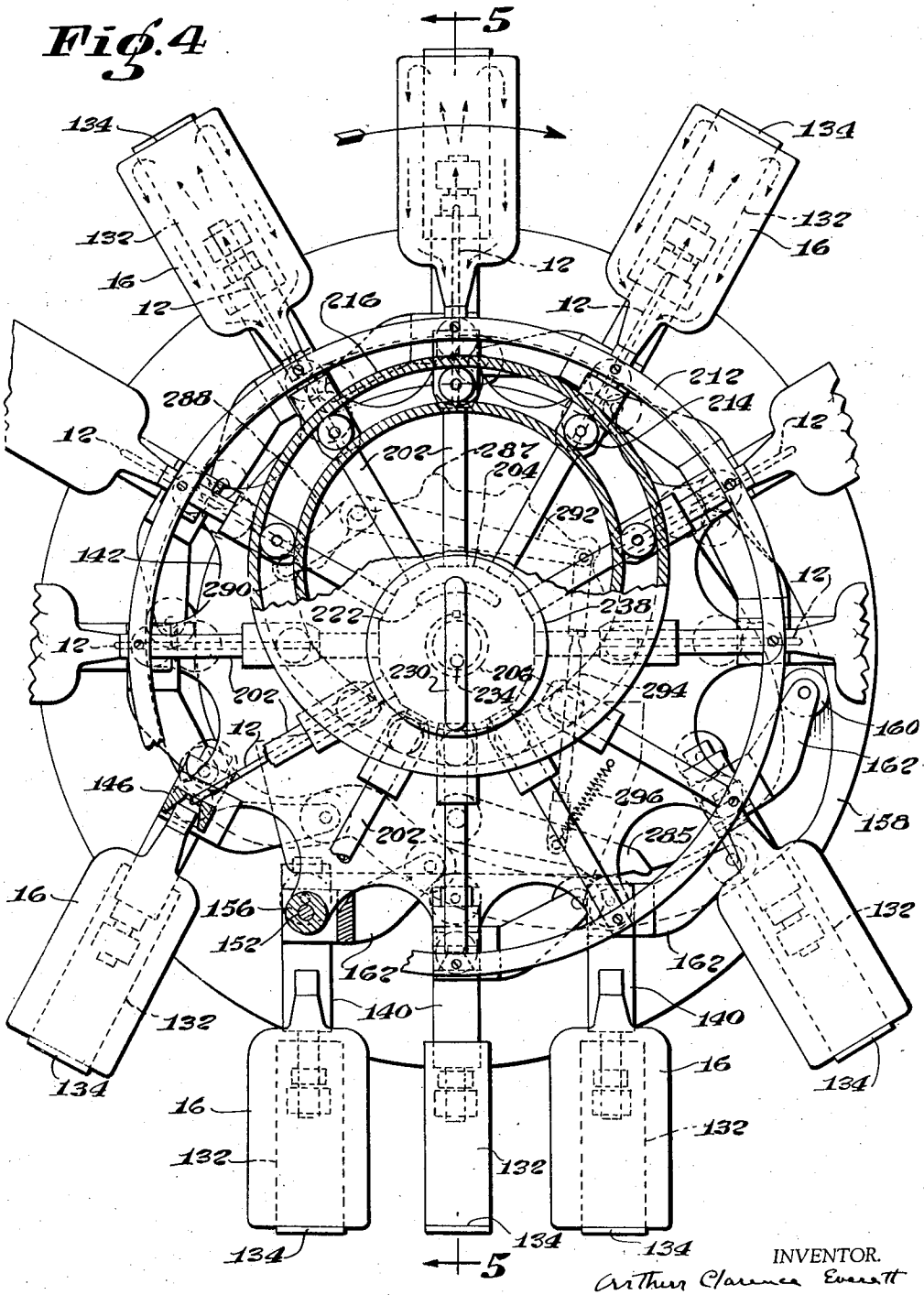
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CONTAINER CLEANING MACHINE

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Fig. 4



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CONTAINER CLEANING MACHINE

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Fig. 5

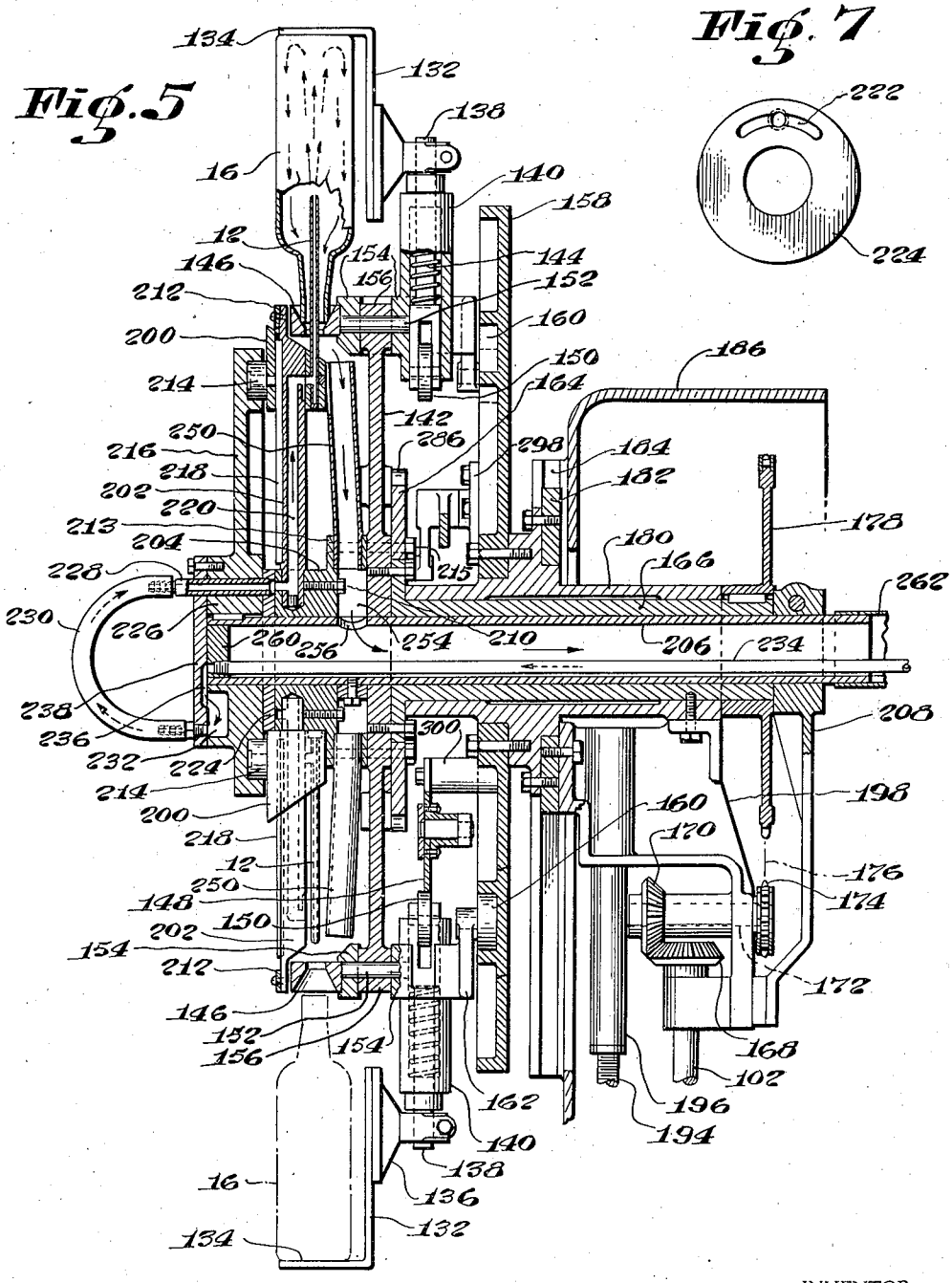


Fig. 7

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CONTAINER CLEANING MACHINE

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Fig. 6

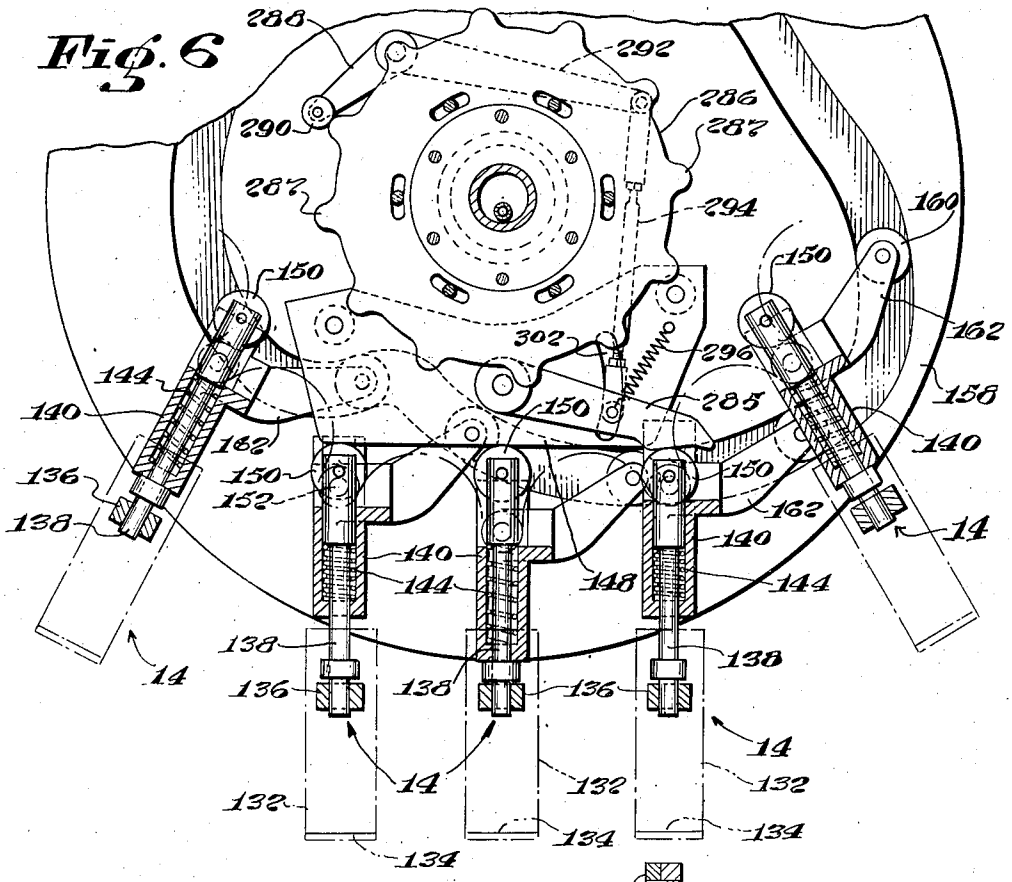


Fig. 8

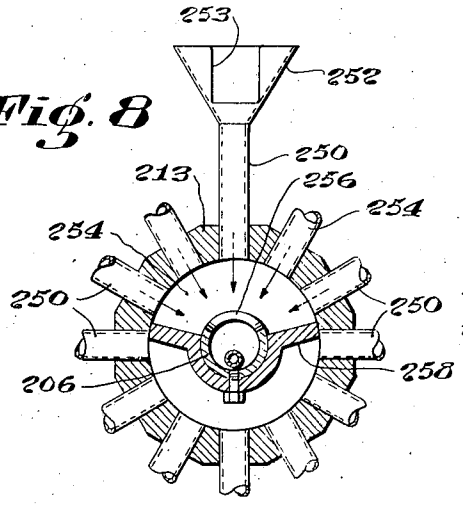
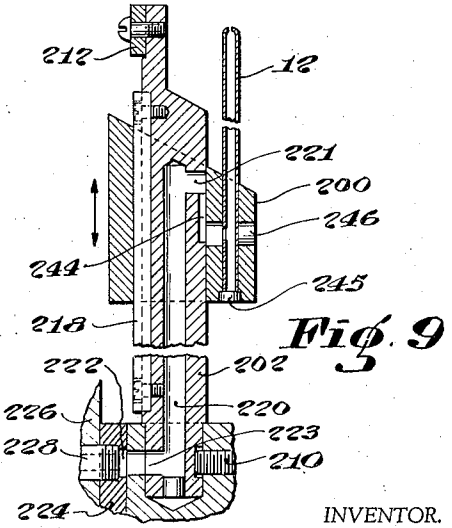


Fig. 9



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Patented July 25, 1944 2,354,308

UNITED STATES PATENT OFFICE

2,354,308

CONTAINER CLEANING MACHINE

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

Application May 27, 1942, Serial No. 444,612

5 Claims. (Cl. 15—14)

This invention relates to a container cleaning machine and more particularly to a machine for pneumatically cleaning bottles or other containers.

The invention has for an object to provide a novel and improved machine for pneumatically cleaning the interior of bottles or other containers by which the containers may be cleaned in a superior, rapid and economical manner.

A further object of the invention is to provide a novel and improved container cleaning machine of the type having a rotary container supporting member capable of moving the container from an upright to an inverted position in which provision is made for enabling the rotary supporting member to receive and discharge the containers in an upright position during the continuous operation of the machine.

With these general objects in view and such others as may hereinafter appear, the invention consists in the machine for cleaning containers 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 side elevation of a container cleaning machine embodying the present invention, some of the parts being broken away and the underlying parts being shown in cross section; Fig. 2 is a front elevation of the lower portion of the machine shown in Fig. 1; Fig. 3 is a plan view of the lower portion of the machine as viewed from the line 3—3 in Fig. 2; Fig. 4 is a front view of the rotary carrier or bottle supporting member comprising the upper portion of the machine shown in Fig. 1 and illustrated on a somewhat enlarged scale; Fig. 5 is a cross section of the rotary carrier taken on the line 5—5 of Fig. 4; Fig. 6 is a detail view of a portion of the mechanism shown in Fig. 4, some of the parts being omitted and others shown in cross section; Fig. 7 is a detail view of a valve member, to be referred to; Fig. 8 is a detail sectional view of a portion of the exhaust mechanism to be referred to; and Fig. 9 is a cross sectional detail of the flower nozzle and associated mechanism to be hereinafter described.

In general, the present invention contemplates an improvement in a container cleaning machine of the type illustrated and described in the U. S. Patent to Everett, No. 2,176,126 dated October 17, 1939. In such prior machines provision was made for presenting a container in radial alignment with a cleaning nozzle on a rotatable supporting member or carrier by which the container was rotated into an inverted position. During the progress of the container into and from an inverted position provision was made for injecting a stream of air into the interior of the container by means of suction whereby the foreign particles in the container were placed in suspension in the air stream, the inversion of the container during the cleaning operation assisting in the suspension of the foreign particles in the air stream and their ultimate discharge through the mouth of the container.

One feature of the present invention is to provide a cleaner of the type specified in which provision is made for positively blowing a stream of air into the container while the latter is in an inverted position. In this manner a stream of clear filtered air may be introduced into the container under a relatively high pressure whereby to obtain a particularly efficient cleaning operation. In addition, suitable suction ducts are provided adjacent the mouths of the containers arranged to receive the foreign matter blown out of the latter and to convey such material to a dust collector.

Another feature of the present invention contemplates novel container intake and discharge mechanisms by which the containers may be received by and discharged from the rotary supporting member in a vertical position. The improved intake and discharge mechanism preferably includes carrier members mounted on a rotary carrier capable of movement in a vertical position with relation to the rotary carrier as they pass the intake and discharge positions, and capable of movement into a radially aligned position with the cleaning mechanism for the remainder of the rotary movement of the rotary carrier.

Referring now to the drawings which illustrate the preferred embodiment of the invention, the present container cleaning machine includes a rotary carrier 10 provided with a plurality of radially arranged cleaning nozzles 12 and a plurality of pivotally mounted container supporting members 14 arranged to receive and discharge containers in a vertical or upright position with relation to the carrier 10 and adapted to be moved to present the containers into radial alignment with their respective cleaning nozzles during the continuous rotation of the carrier 10. The containers 16 to be cleaned are supplied to the machine by a conveyer belt 18 which, as herein shown, may be extended to also receive and convey the cleaned containers being dis-

charged from the machine. As best shown in Fig. 2 the conveyer belt 18 is arranged to run over sprockets 20, 22 and is arranged to be driven through connections from the main driving motor 24 including a belt connection 26 to a shaft 28, speed reduction unit 30, and a sprocket and chain connection 32 to the sprocket shaft 34. As shown in Fig. 1, the motor 24 is mounted on a sliding base 25 arranged to be manually adjusted by a handwheel 27 to maintain the belt connection 26 in a taut condition.

Provision is made for controlling the feed of the containers whereby to present successive containers in position to be received by their respective supporting members 14 in timed relation to the movement of the rotary carrier. As illustrated in Figs. 1, 2 and 3 the containers being conveyed by the belt 18 are arranged to be transferred therefrom by a rotary container feeding mechanism, indicated generally at 36, which is provided with a plurality of pusher fingers 38 adapted to engage the rear surface of successive containers and to advance the containers between spaced flanges 40 of a rotary member 42 and circular cutouts 44 of spaced guide rails 46 to consecutively present the containers to a position to be received by their respective supporting members 14.

The rotary member 42 is fast on a hollow shaft 48 rotatably mounted on a vertical stationary shaft 50, and the pusher fingers 38 are pivotally mounted between the spaced flanges 40 of the rotary member 42, as best shown in Fig. 2. The pivotal fingers 38 are fast upon pins 52 journaled in the spaced flanges 40, and provision is made for rocking the fingers 38 from their extended position to a retracted position when the container has been advanced onto an individual supporting member 14 being carried past the same. As illustrated in Fig. 3, the retracting movement of the fingers 38 is effected by a stationary cam 54 fast on the upper end of the vertical shaft 50. Each pusher finger is provided with a cam lever 56 which carries a cam roll 58 arranged to cooperate with the cam 54 during the rotation of the feeding member. Each finger is also provided with a spring 60 arranged to hold its cam roll in cooperative engagement with the cam 54.

The container feeding mechanism 36 is arranged to be driven through connections from the main driving shaft 28 including a worm and worm gear connection 62 to a vertical shaft 64 which is provided at its upper end with a sprocket 66. The sprocket 66 is connected by a chain 68 to a sprocket 70 secured to a hollow shaft or bushing 72 rotatably mounted on a vertical shaft 74. The bushing 72 extends through the frame member 76 and is provided at its lower end with a flanged member 78 forming part of a separable driving mechanism normally engaged but which is adapted to slip out of operative engagement in the event that the feeding mechanism should encounter abnormal resistance. The flanged member 78 is provided with a notch 80 which is adapted to be engaged by a tooth 82 provided on a disk 84 rotatable with but vertically slidable upon the shaft 74. A coil spring 86 normally holds the disk 84 in operative engagement to drive the shaft 74 but if a jam occurs, the tooth 82 will slip out of the notch 80 and lower the disk against the resistance of the spring 86. The upper end of the vertical shaft 74 is provided with a gear 88 which meshes with a gear 90 fast on the hollow shaft 48 upon which the rotary member 42 is mounted. Thus in the operation of the machine the rotary feeding mechanism 36 is rotated at a uniform rate of speed in timed relation to the movement of the rotary carrier 10.

In the operation of the machine, the containers are carried along the conveyer 18 in contiguous relation and in order to register successive containers with the container engaging fingers 38 provision is made for engaging and releasing successive foremost containers in timed relation to the movement of the rotary feeding mechanism 36. As herein shown, a star wheel 92 is rotatably mounted adjacent the conveyer and is provided with a plurality of equally spaced teeth 94 arranged to enter between successive containers as they are delivered and to release such containers in timed relation to the arrival of the container pusher fingers 38.

The star wheel 92 is arranged to be driven continuously and in timed relation to the feeding mechanism 36 through connections from a second sprocket 96 formed integrally with the sprocket 70. The sprocket 96 is connected by a chain 98 to a sprocket 100 fast on a vertical shaft 102. A second sprocket 104 fast on the shaft 102 is connected by a chain 106 to a sprocket 108 secured to a shaft 110. The shaft 110 is connected by bevel gears 112, 114 to a shaft 116 which is connected by a chain and sprocket drive 118 to an elongated shaft 120. The forward end of the shaft 120 is connected by bevel gears 122, 124 to a vertical shaft 126 upon which the star wheel 92 is securely mounted. As best shown in Fig. 3, a separable driving connection, indicated generally at 128, may be provided in the drive to the star wheel in order to prevent damage thereto in the event of a jam.

From the description thus far it will be observed that the containers are transferred consecutively from the belt 18 into a position to be received by their respective supporting units 14 on the carrier 10, and, as best shown in Figs. 1 and 2, during the transferring operation the containers are moved from the belt 18 across a stationary platform 130 and then onto their respective supporting and elevating brackets 132 forming part of the supporting units 14. Provision is made for maintaining the horizontally extended portion 134 of the brackets flush with the stationary platform 130 during the transferring operation, as will be hereinafter described, and during the operation of the machine the relative movement of the continuously rotated feeding mechanism 36 and the continuously moving carrier 10 is such that a container is advanced into a central position on the portion 134 whereupon the pusher finger 38 is retracted, as above described. As illustrated in Fig. 5, each supporting bracket 132 is attached to a member 136 adjustably secured to a cam rod 138. The rod 138 is slidingly mounted in a housing 140 pivotally carried by a rotatable spider 142. A compression spring 144 interposed between a shoulder on the upper portion of the cam rod 138 and the bottom of the housing 140 is arranged to elevate the supporting bracket 132 to present the mouth of the bottle into engagement with a guide member 146 attached to the pivotally carried housing 140. The movements of the cam rod 138 and the bottle elevating member 132 are controlled by a stationary cam 148 which cooperates with a cam roll 150 provided on the upper end of each cam rod. As best shown in Fig. 6, the cam 148 is designed to maintain the elevating member 132 flush with the stationary platform 130 during its movement past the container

receiving station, and thereafter the cam roll leaves the cam to permit the spring 144 to elevate the container into engagement with the guide member 146, as above described.

As herein shown, each housing 140, which carries the elevating member 132 and the guide member 146, is pivotally mounted on a pin 152 carried in the rotary spider 142. As best shown in Fig. 5 the housing is provided with ears 154 arranged to embrace a boss 156 of the spider through which the pin 152 extends. Provision is made for maintaining the container supporting units 14 in a vertical position with relation to the carrier 10 during the movement of the units past the receiving and discharging stations, and for rocking the pivotally mounted units into radial alignment with their respective cleaning nozzles 12 after leaving the receiving station. As shown in Fig. 6, this movement is effected by a stationary cam 158 which is arranged to cooperate with a roller 160 carried by an arm 162 extending from and formed integrally with the housing 140. The cam 158 is bolted to a flanged portion of a stationary supporting member 180. The cam is designed to hold the housing 140 and the parts carried thereby in a radial position until the units approach the discharge station whereupon the housing is again rocked to present the container in a vertical and upright position.

Referring now to Figs. 1 and 5, as therein shown, the spider 142 is bolted to a flange 164 formed at one end of an elongated hollow shaft or sleeve 166 arranged to be rotated through connections from the vertical shaft 102. A bevel gear 168 secured to the upper end of the vertical shaft is arranged to mesh with a bevel gear 170 fast on a short intermediate shaft 172 which is also provided with a sprocket 174 connected by a chain 176 to a large sprocket 178 keyed to the other end of the elongated sleeve 166. The hollow sleeve 166 is rotated in bearings in the supporting member 180 which is attached to a slide member 182 arranged to slide vertically in suitable guideways 184 formed in an upright 186 forming part of the machine frame. The entire carrier unit is thus vertically adjustable to adapt the machine for operation upon containers of various heights. The position of the supporting member 180 and the parts carried thereby is adjustably regulated by a handwheel 188 connected by bevel gears 190, 192 to a vertical threaded rod 194 which is received in a threaded portion 196 of a bracket 198 attached to the supporting member 180, as best shown in Fig. 1. The vertical driving shaft 102 may be axially movable in the drive sprockets 100, 104 and arranged to be rotated therewith in any usual or preferred manner in order to adapt the driving connections to the adjusted positions.

From the description thus far it will be observed that during the operation of the machine, the rotary spider 142 is continuously rotated and that the containers positioned on the supporting units 14 are elevated into engagement with guide members 146 whereupon the supporting units are rocked into alignment with their respective cleaning nozzles 12. As the carrier is rotated the containers are turned into an inverted position during which time the cleaning operation is performed. Referring now to Figs. 1, 4 and 5, provision is made for supporting and rotating the cleaning nozzles 12 in alignment with the containers and for projecting and withdrawing each cleaning nozzle into and from its individual container during the rotation of the carrier 10. As herein shown, each nozzle 12 is mounted in a slide block 200 arranged to slide upon radially arranged guide members 202 extending from a hub 204 rotatably mounted on an elongated, hollow, stationary shaft 206 supported within the hollow sleeve 166. The guide members 202 are held fast in the hub 204 by screws 210, and are tied together at their outer ends by a circular rim 212, as best shown in Fig. 4. The rotatably mounted hub 204 is provided with a flanged portion 213 which is bolted to the spider 142 by bolts 215 to rotate with the latter. As clearly shown in Fig. 1, an extension 208 from the bracket 198 is clamped to the further end of the hollow shaft 206 in order to prevent rotation thereof. Each slide block 200 is provided with a roller 214 arranged to cooperate with a closed cam 216 keyed to the forward end of the stationary hollow shaft 206. In the operation of the machine the nozzles 12 are arranged to be moved from a fully withdrawn position as illustrated in the lower section of Fig. 5 to a fully inserted position as illustrated in the upper section of Fig. 5. Each guide member 202 is provided with an elongated key 218 which is received in a groove in the slide member to prevent the latter from turning on the guide member.

Provision is made for releasing a stream of air through the nozzles 12 as they are being rotated in order to perform the cleaning operation, and, as herein shown, each guide member 202 is provided with a passageway 220 having an opening 211 at one end thereof arranged to communicate with the nozzle 12 and having an opening 223 at its other end arranged to communicate with an opening 222 formed in a circular plate 224 attached to the inner face of the hub 226 of the stationary cam 206, as clearly shown in Fig. 5. The opening 222 is connected by a short pipe 228, which extends through the hub 226, to a flexible connection 230 leading to a chamber 232 formed in the lower section of the hub 226. The chamber 232 is connected by a passageway 236, formed in a cover member 238 secured to the outer end of the hub 226, to an elongated pipe 234 extending through the hollow shaft 206. The elongated pipe 234 is connected by a flexible hose 240 to an air pump 242 directly connected with the main driving motor 24. Thus, in operation, air under pressure is supplied through the pipe 234, passageway 236, chamber 232, flexible connection 230 and pipe 228 to the opening 222. As shown in Figs. 4 and 7, the opening 222 comprises an arcuate slot arranged to communicate with the passageway 220 in a guide member 202 only when the latter is passing through the upper portion of its revolution or at the time when the containers are passing through a substantially inverted position. During the remainder of the revolution the air is cut off by the engagement of the opening 223 with the closed portion of the circular plate 224. It will also be observed that the opening 221 in the other end of the guide member 202 is arranged to communicate with the nozzle 12 and its slide block 200 only when the latter is in its extended position, a short passageway 244 being provided adjacent the outlet 221 so that communication may be established a short time prior to the movement of the nozzle into its fully extended position and also for a short time during the withdrawal thereof. Thus, in operation, the air under pressure is released through the nozzles 12 into the container only when the nozzle is inserted in the container and

only during the time the container is in a substantially inverted position.

In order to prevent damage to the nozzle in the event that it should encounter a choked neck bottle or one in which the mouth of the bottle is restricted or entirely closed due to faulty manufacture, provision is made for permitting the nozzle to yield and move with relation to the slide block 200. As shown in Fig. 9, the nozzle is closed at one end by a cap 245 and is held in its normal or operative position by a friction plug 246. In operation, should the open end of the nozzle 12 encounter an obstacle in its path it is permitted to slide through the block 200 against the resistance of the friction plug 246. Thereafter, when the slide block 200 is again retracted, the capped end of the nozzle is arranged to engage the hub 204 which operates to push the nozzle out again into its normal operative position.

In the operation of the machine, the air being blown into the container is permitted to escape, together with the dust and foreign particles, through the mouth of the container and through the opening in the guide member 146 to the atmosphere, the inversion of the container during the cleaning operation aiding in the suspension of the foreign particles in the air stream and their ultimate discharge. Provision is made for receiving and carrying away the dust laden air being discharged into the atmosphere from the mouth of the containers and as herein shown, see Figs. 5 and 8, a plurality of suction tubes 250 having flared ends 252 are provided adjacent the mouths of the containers. The suction tubes 250 are radially supported in the flanged portion 213 of the hub 204 and are arranged to communicate with the interior of the hollow shaft 206 through a chamber 254 formed between the hub 204 and the adjacent face of the spider 142. The hollow shaft 206 is provided with an opening 256 and the dust laden air is confined to the upper portion of the chamber 254 by a member 258 bolted to the stationary shaft 206, as clearly shown in Fig. 8. The forward end of the hollow shaft is plugged by a member 260 and the other end is connected by a pipe 262 to a blower 264, see Fig. 2, which is arranged to exhaust into a dust collecting chamber 266. A telescoping section 268 of the pipe 262 permits elongation or shortening of the connection when it is desired to change the vertical adjustment of the carrier unit, as above described. The blower 264 may be driven by a belt connection 270 from a separate motor 272 supported on a pivotal base 276 attached to the frame of the machine. As shown in Figs. 5 and 8, the radially arranged suction pipes 250 are disposed at a slight angle to the radially extended guides 202 and the flared portion 252 of the suction pipes is provided with openings 253 arranged to receive the adjacent face of slide block 200. It will also be observed that the ends of the guide members 202 and slide blocks 200 adjacent the mouth of the container are cut at an angle such as to guide the air exhausted from the containers into its suction opening.

Provision is made for removing the cleaned containers from the supporting members 14 during the continuous movement of the latter when they arrive at the discharge station, indicated generally at 280, and for transferring the containers back onto the conveyer belt 18. As above described, the cam 158 operates to rock each unit 14 from a radial position to a vertical position with relation to the carrier unit 10 as the supporting units approach the discharge station. The containers being thus carried are brought into engagement with the discharge portion 282 of the stationary guide rail 46 and into the path of a continuously rotated toothed wheel 284 arranged to transfer successive containers from the travelling platform 134, across the stationary platform 130, and then onto the continuously travelling conveyer belt 18, as shown in Fig. 3.

When a supporting unit 14 is rocked into a vertical position, as above described, provision is made for abruptly lowering the platform 134 in order to release the container from clamping engagement with its guide member 146 and to dispose the platform 134 in a position flush with the stationary platform 130 to permit the container to be transferred thereto. As best shown in Fig. 6, for this purpose, a cam arm 285 pivotally mounted on the stationary cam 148 is arranged to be rocked into engagement with the roller 150 of the elevating unit 14 immediately prior to the engagement of the roller with the stationary cam 148. The rocking of the cam arm 285 is effected by a stationary cam 286 formed on the peripheral edge of the flange 164 through connections including a bell crank, one arm 288 of which carries a roller 290 cooperating with the cam 286. The second arm 292 of the bell crank is connected by a link 294 to the cam arm 285 and a spring 296 connected to the latter is arranged to urge the cam arm into an upwardly rocked position. As illustrated in Fig. 6, the high points 287 of the cam 286 operate to effect the downward rocking movement in timed relation to the arrival of successive cleaned containers past the discharge station. As shown in side elevation in Fig. 5, the bell-crank member is pivotally mounted in a bracket 298 secured to the stationary cam 158. The cam 148 is likewise connected by extension members 300 to the stationary cam 158. The linkage to the cam arm 285 is arranged to extend through a slotted opening 302 in the stationary cam 148. In operation, during the continuous movement of the carrier unit 10, the roller 150 is guided by the cam arm 285 into engagement with the stationary cam 148 which operates to hold the platforms 134 flush with the stationary platform 130 until they pass the receiving station, as above described. The toothed member 284, as illustrated in Fig. 3, is arranged to be continuously rotated in timed relation to the movement of the carrier unit 10 by the gear 88 which is arranged to mesh with a gear 304 fast on the lower end of a vertical shaft 306 upon the upper end of which the toothed member is mounted. Thus successive cleaned containers are transferred into the discharge end of the conveyer belt 18 to be carried away from the machine.

From the above description it will be observed that the present construction of container cleaning machine enables the continuously rotating container supporting and cleaning unit to receive and discharge successive containers from spaced points on the rotary unit with the containers disposed in an upright vertical position, thus providing a smoothly operating and efficient transferring mechanism capable of operation at a relatively high rate of speed. It will also be observed that the present construction of cleaning mechanism enables the containers to be pneumatically cleaned by a positive blowing action and that the foreign matter thus removed may be carried away by suction mechanism in a simple and efficient manner.

While the preferred embodimnet of the invention has been herein illustrated and described, it will be understood that the invention may be embodied in other forms within the scope of the following claims.

Having thus described the invention, what is claimed is:

1. A container cleaning machine of the character described having, in combination, a rotary carrier provided with a plurality of radially arranged cleaning heads, a plurality of individual container supporting members mounted on and movable with said carrier and engageable with the bottoms of the containers, said container supporting members being arranged to dispose the containers in radial alignment with their respective cleaning heads during the cleaning operation, means for performing the cleaning operation while the containers are in a substantially inverted position, container delivery means, container discharging means spaced from said delivery means, and means for moving and maintaining said individual supporting members in a vertical position with relation to said carrier as they pass said delivery and discharge means, whereby to enable the containers to be delivered to and discharged from spaced points on the carrier in a substantially upright position during the continuous movement thereof.

2. In a container cleaning machine for cleaning the interior of containers, in combination, a rotary carrier rotatable in a vertical plane and provided with a plurality of radially arranged cleaning heads, a plurality of individual container supporting members pivotally mounted on said carrier and rotatable therewith, said container supporting members being arranged to engage the bottoms of their respective containers, a container receiving station and a container discharging station disposed upon either side of a vertical centerline through said rotary carrier, and means for rocking said pivotal supporting members to cause them to assume a position in radial alignment with their respective cleaning heads during the cleaning operation, and to assume and maintain a vertical position with relation to the carrier as they pass said receiving and discharging stations during the continuous movement of the carrier.

3. In a container cleaning machine for cleaning the interior of containers, in combination, a continuously rotated carrier rotatable in a vertical plane and provided with a plurality of radially arranged cleaning heads, a plurality of container individual supporting members pivotally mounted on said carrier and rotatable therewith, said container supporting members being arranged to engage the bottoms of their respective containers, a conveyer for feeding successive containers into the machine, transfer mechanism for delivering successive containers in an upright position from the conveyer to successive supporting members, a second transfer mechanism spaced from said first transfer mechanism and arranged to discharge successive cleaned containers from the carrier back onto said conveyer, and means for rocking said pivotal supporting members to cause them to assume a position in radial alignment with their respective cleaning heads during the cleaning operation, and to assume and maintain a vertical position with relation to the carrier as they pass said transfer mechanisms, whereby to enable the containers to be received and discharged by said carrier at spaced points thereon in a substantially upright position during the continuous movement of the carrier.

4. In a container cleaning machine for cleaning the interior of containers, in combination, a rotary carrier having a hub and provided with a plurality of radially arranged cleaning heads, a plurality of container supporting members mounted on said carrier and arranged to dispose the containers in radial alignment with their respective cleaning heads during the cleaning operation, each of said cleaning heads including an air nozzle arranged to be inserted into and withdrawn from their respective containers, blower operated means operatively associated with said nozzle to perform the cleaning operation, each of said nozzles being mounted to be longitudinally displaced from its normally extended position in the event that it encounters an obstacle in its path during the inserting movement, and to be automatically returned to its normally extended position by engagement with said hub during the withdrawal movement.

5. A container cleaning machine of the character described having, in combination, a rotary carrier provided with a plurality of radially arranged cleaning heads, a plurality of individual container supporting members mounted on and movable with said carrier and arranged to dispose the containers in radial alignment with their respective cleaning heads during the time the containers are in a substantially inverted position, means for performing the cleaning operation during such time, each of said supporting members including a clamping member arranged to engage the base of its container, container delivery means, container discharging means spaced from said delivery means, means for moving and maintaining said supporting members in a vertical position with relation to said carrier as they pass said delivery and discharge means, and means for maintaining the base engaging portion of each clamping member in the same horizontal plane during such vertical movement, whereby to permit the containers to be delivered to and discharged from spaced points on the carrier in an upright position during the continuous movement thereof.

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