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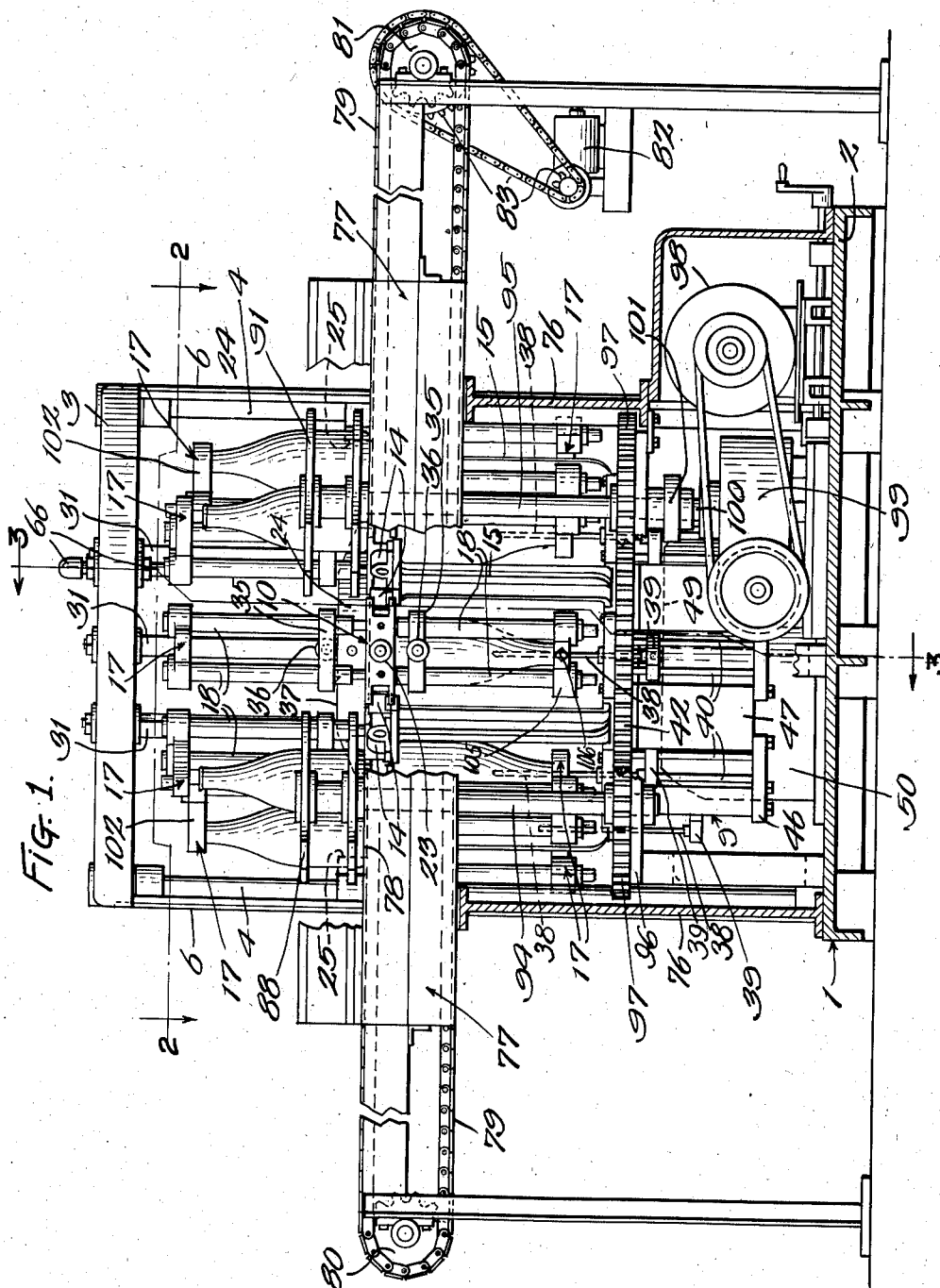
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2,280,424

CONTAINER CLEANING MACHINE

Filed July 8, 1940

5 Sheets-Sheet 1



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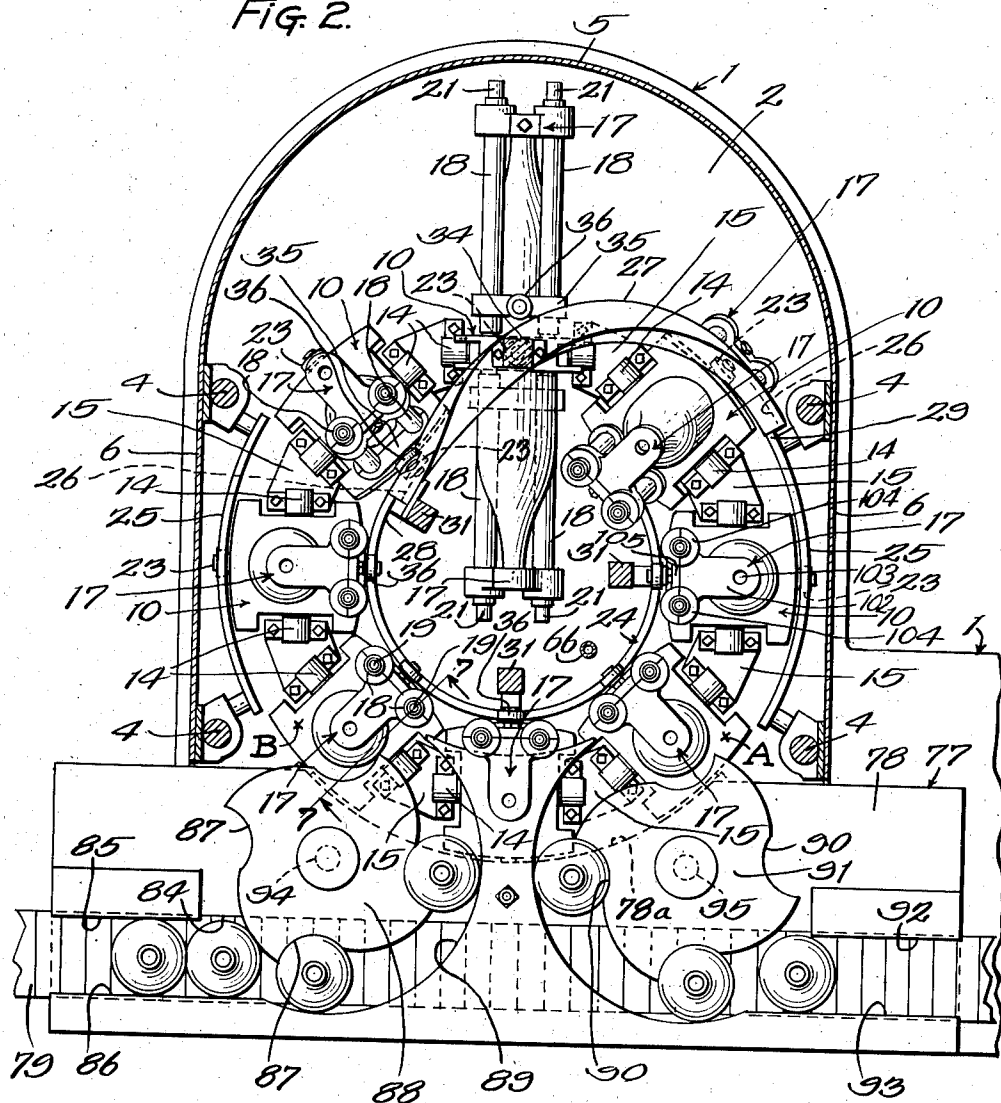
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FIG. 2.



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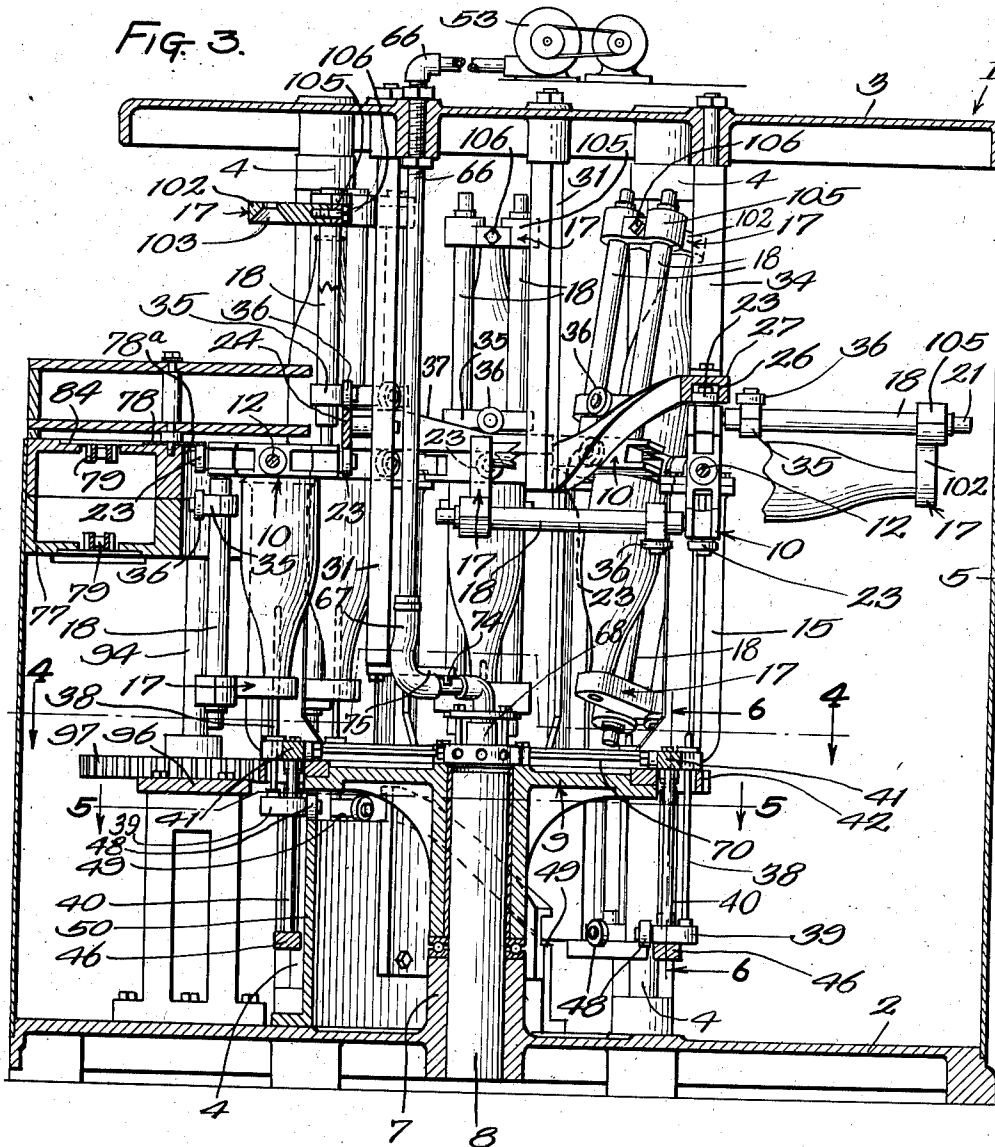
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CONTAINER CLEANING MACHINE

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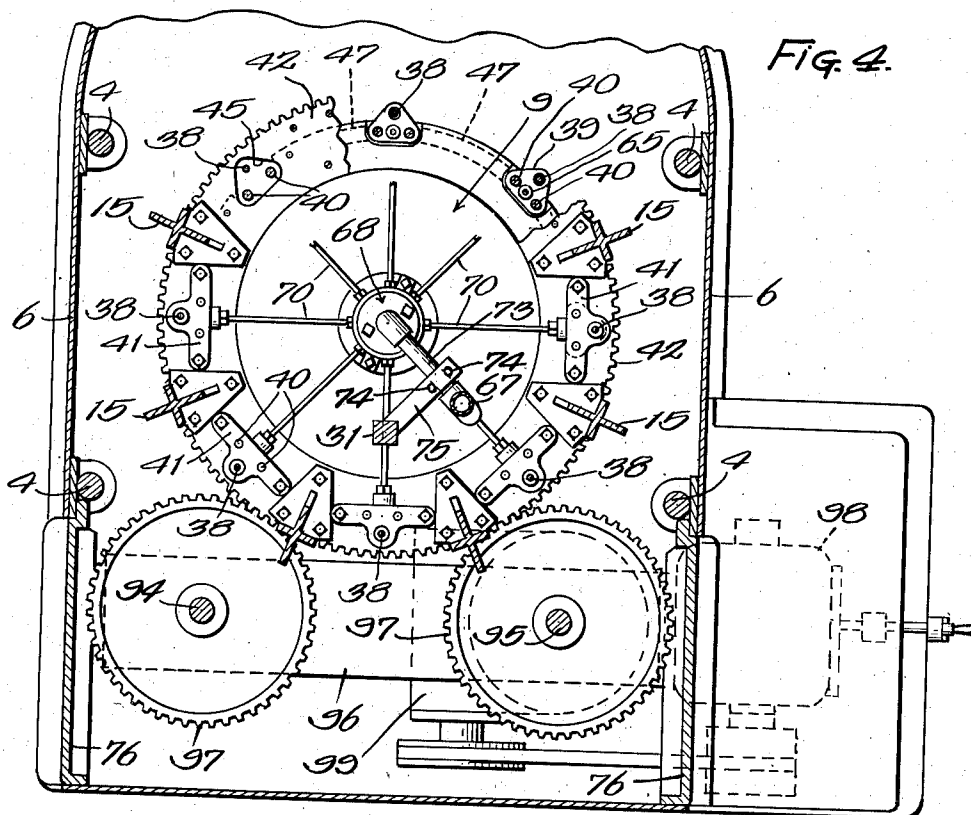


Fig. 4.

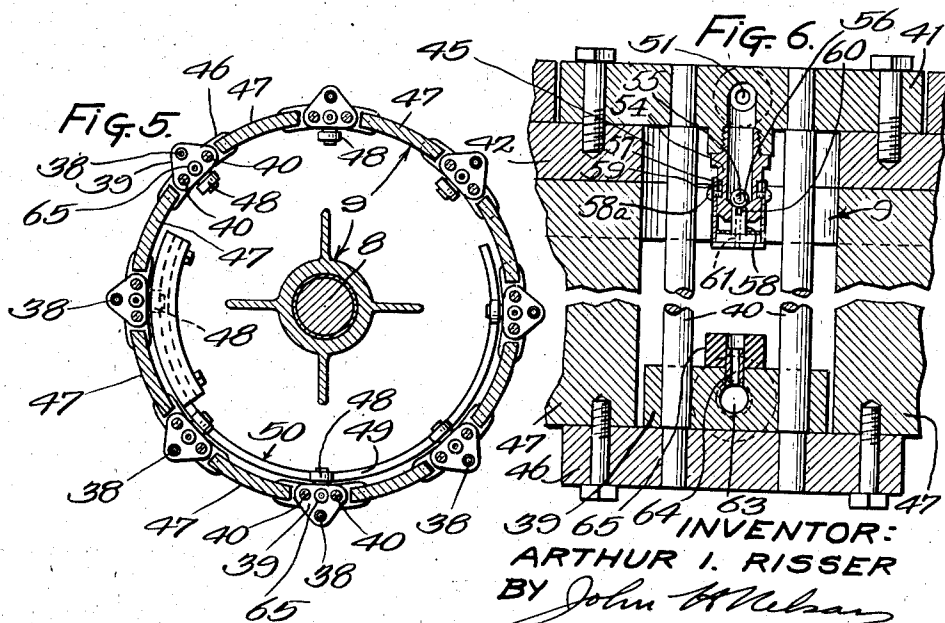


Fig. 5.

Fig. 6.

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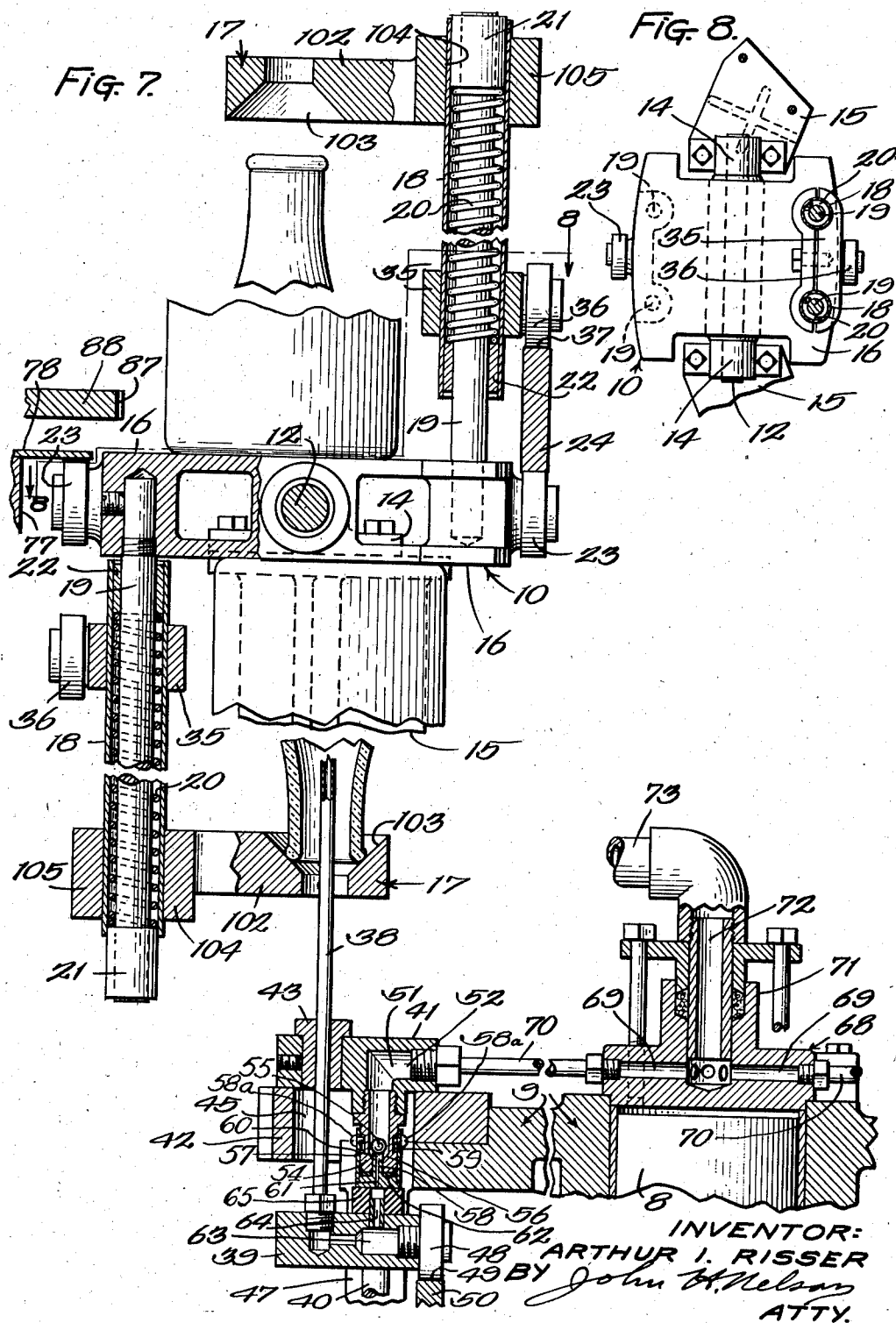
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UNITED STATES PATENT OFFICE

2,280,424

CONTAINER CLEANING MACHINE

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Application July 8, 1940, Serial No. 344,326

4 Claims. (Cl. 15—20)

This invention relates to container cleaning machines, and more particularly pertains to such a machine of the rotary type designed to handle a continuous succession of containers.

One of the main objects of the invention is to provide such a machine of the simplest and most compact construction wherein the containers are cleaned internally while same are inverted, and wherein the containers are inverted for the cleaning operation and then returned to upright position for discharging as they are being carried through the machine in a rotating movement in one direction, whereby smoother operation of the machine is assured, and whereby the machine will be capable of handling the containers more expeditiously than heretofore made possible.

Another object is to provide such a machine as outlined, wherein the containers will remain in inverted position and be cleaned by a fluid cleaning medium under pressure during a longer period of time than heretofore made possible.

Another object is to provide a machine capable of functioning in the manner outlined above wherein the containers pass through the machine on rotatable carriers upon each of which a container is rotated into an inverted position for the cleaning operation while another container is being rotated thereon into an upright position to be discharged.

Other objects and advantages will become apparent by reference to the specification and the accompanying drawings, in which:

Fig. 1 is a front elevation of the machine with parts in section and parts broken away to disclose certain parts otherwise hidden.

Fig. 2 is an enlarged plan section of the machine, as taken substantially on the section line 2—2 of Fig. 1, with parts broken away.

Fig. 3 is an enlarged vertical section of the machine, as taken substantially on the section line 3—3 of Fig. 1.

Fig. 4 is a plan section of the machine as taken substantially on the section line 4—4 of Fig. 3, with parts broken away, and with the figure arranged as though viewed from the front of the machine.

Fig. 5 is a detail plan section taken substantially on the section line 5—5 of Fig. 3, with the figure arranged as though viewed from the front of the machine.

Fig. 6 is an enlarged detail section taken substantially on the section line 6—6 of Fig. 3, with parts broken away and brought together to reduce the size of the figure.

Fig. 7 is an enlarged detail vertical section

taken substantially on the section line 7—7 of Fig. 2, showing one of the carriers in cooperative relation with the cleaning means of the invention, and with parts broken away and brought together to reduce the size of the figure.

Fig. 8 is a detail plan section in reduced scale of one of the carriers, as taken substantially on the section line 8—8 of Fig. 7.

The machine as illustrated includes a supporting frame 1 comprising a base 2, a top wall 3 supported on four uprights 4 on the base, a back wall 5 and opposite side walls 6 forming a housing having an open front end.

The base is provided with a central bearing 7 in which is fixedly secured a vertical shaft 8 upon which is rotatably mounted a supporting wheel 9 upon which are mounted for rotation a number of bottle carriers 10 equally spaced about the axis of the wheel. Each carrier 10 comprises a flat block-like head through the center of which extends a horizontal shaft 12 upon which the head is secured. The shafts 12 of the carriers are arranged tangent to a circle concentric with the wheel 9 and are mounted at the ends thereof for rotation in suitable bearings 14 mounted respectively on the top ends of upright brackets 15 arranged about the axis of the wheel and mounted thereon between the paths of rotation of the carriers about the axes of their shafts.

The flat sides 16 of each carrier head 10 at opposite sides of its axis form bottle-supporting platforms above each of which is arranged a bottle-centering head 17 mounted on the carrier head for movement to raised and lowered positions out of and into cooperative relation with the neck-end of a bottle on its respective platform to hold same in a given position thereon. To this end, as best seen in Figs. 7 and 8, each head 17 is mounted on the top portions of two laterally spaced sleeves 18 reciprocally mounted, respectively, on two uprights or rods 19 mounted on each carrier head to extend from each platform thereof near the inner edge of same when in position to support an upright bottle.

Surrounding each rod 19 is a coiled compression spring 20 which is confined under compression between a collar 21 on the top end of the rod and a collar 22 on the bottom-end of the sleeve 18 thereon, whereby the heads 17 of the carriers will be resiliently urged into clamping engagement with the bottles supported on the platforms of the carriers.

The supporting wheel 9 is continuously rotated in a clockwise direction, as seen in plan, and

as each carrier head is carried thereby about two thirds of a revolution about the axis of the wheel at the front of the machine, the carrier head is caused to dwell with its platforms in horizontal position, and as the carrier is carried by the wheel the remaining one third of its revolution about its axis at the rear of the machine, the carrier is rotated one half of a revolution about its horizontal axis to reverse the positions of the platforms thereof. Thus it will be seen that upon two complete revolutions of the wheel, the platforms of each carrier will be intermittently and alternately advanced into an upwardly facing position at the front of the machine where they are brought into and out of cooperative relation with means arranged to eject or discharge the cleaned bottles therefrom and then feed new bottles to be cleaned thereto.

As each carrier head is carried by the wheel around the front of the machine about a quarter of a revolution of the wheel from the station A to the station B thereof, the centering head above the top platform of the carrier head is caused to be in raised position so that a cleaned bottle may be discharged from the platform at the station A and a new upright bottle may be fed thereon at the station B for the cleaning operation.

As each carrier head arrives at the station B it is brought into cooperative relation with means designed to place an upright bottle on the upper platform thereof centrally below the centering head thereabove, which head is then lowered into clamping engagement with the neck of the bottle to hold same on the platform as the carrier leaves said station and while the bottle is inverted thereon at the back of the machine and then returned to the station A in upright position to be discharged from the carrier by means later described.

The means for operating each carrier as outlined includes a pair of cam-engaging rollers 23 rotatably mounted on the narrow opposite sides, respectively, of each carrier head and being arranged to hold the carrier head with its platforms in horizontal position between rotations thereof about its axis by having cooperative engagement respectively with the under sides of an inner segmental or semi-circular track 24 formed about the axis of the wheel 9 and an outer semi-circular track 25 arranged at each side of the path of the carriers adjacent the side walls of the housing 1. It may be stated that while a carrier is being moved from the station A to the station B, the inner roller 23 of the carrier is maintained in engagement with the inner track 24 by means associated with the operating means for the centering heads later described.

As the rollers 23 of each carrier head are advanced off the tracks 24 and 25 during movement of the head around the rear of the machine, the inner roller of the head is caused to rotate the head one half of a revolution about its axis by entering and operating within the cam groove 26 of a channel-like cam 27 formed helically about a circular center line to which the axes of the shafts 12 of the heads are tangent. The cam 27 continues from the leaving end 28 of the inner track 24 to the receiving end 29 of one of the outer tracks 25 within an arc of about one hundred and twenty degrees about the axis of the wheel 9.

The inner track 24 is supported on three hangers 31 arranged about the axis of the wheel and depending from the top wall 3 of the frame.

The outer tracks 25 are each mounted upon two of the uprights 4 of the frame. The helical cam 27 is supported on the bottom end of a hanger 34 depending from the top wall of the frame, and also has its ends connected, respectively, with the leaving end 28 of the inner track 24 and the receiving end 29 of one of the outer tracks 25.

The means for raising the centering heads 17 out of cooperative relation with the platforms of the carriers when same are traveling around the front of the machine from the station A to the station B, is inclusive of a cross-head 35 secured to the lower ends of each pair of sleeves 18 of each carrier head, which cross-head is arranged to raise the centering head 17 and sleeves against the tension of the springs 20 within the sleeves by means of a roller 36 on the inner side of the cross-head having cooperative engagement with the cam formation 37 on the top edge of the inner track 24. It will be seen that as each carrier head travels from the station A to the station B, the springs 20 of the head also serve to resiliently hold the inner roller 23 of the head in cooperative engagement with the under side of the track 24, in maintaining the platforms of the head in horizontal position.

During the time each carrier head is traveling from the station A to the station B, in front of the machine, the bottle supported on the under side or platform of the head in inverted position is in cooperative relation with means supported on the wheel 9 for pneumatically cleaning the bottle. To this end, the cleaning means includes an upright cleaner nozzle 38 arranged below each carrier head so as to be central with an inverted bottle thereon. Each nozzle is supported on a cross-head 39 which is reciprocally mounted upon a pair of spaced vertical guide rods 40 depending from a supporting head or block 41 mounted upon a ring-like gear 42 concentric with and secured to the periphery of the wheel 9. Each block 41 has a removable bearing 43 within which the nozzle on the cross-head 39 therebelow is slidably supported. The rods 40 and nozzle 38 of each block 41 extend through an opening 45 of the gear 42 with the bottom ends of the rods being supported on a cross-piece 46 whose ends are secured respectively on the bottom ends of bracket portions 47 arranged about the periphery of the wheel and depending therefrom.

Each cross-head 39 is so operated that the nozzle thereon will be in lowered position when the carrier thereabove is being rotated about its axis at the rear of the machine, and whereby the nozzle will be in raised position projecting into the inverted bottle on the carrier in cleaning relation therewith as the carrier is traveling around the front of the machine from the station A to the station B. For so operating each cross-head 39, each has a cam-engaging roller 48 on the inner side thereof adapted to have cooperative engagement with the upper cam surface 49 of a semi-circular cam 50 mounted on the base concentric with the wheel 9.

When each nozzle 38 is in raised position within a bottle it is caused to be in cooperative connection with a source of fluid under pressure, such as air, whereby dust or other foreign matter will be blown out of the bottle through the neck thereof, and when the nozzle is lowered it is caused to be out of cooperative connection with said source of fluid. To accomplish this, as best seen in Figs. 6 and 7, each supporting block 41 has an air passage or duct 51 having an inlet 52 in constant communication with a motor-driven