Aug. 20, 1935. C. W. WALKER 2,011,786

MILK BOTTLE WASHING MACHINE

Filed March 22, 1934 2 Sheets-Sheet 1

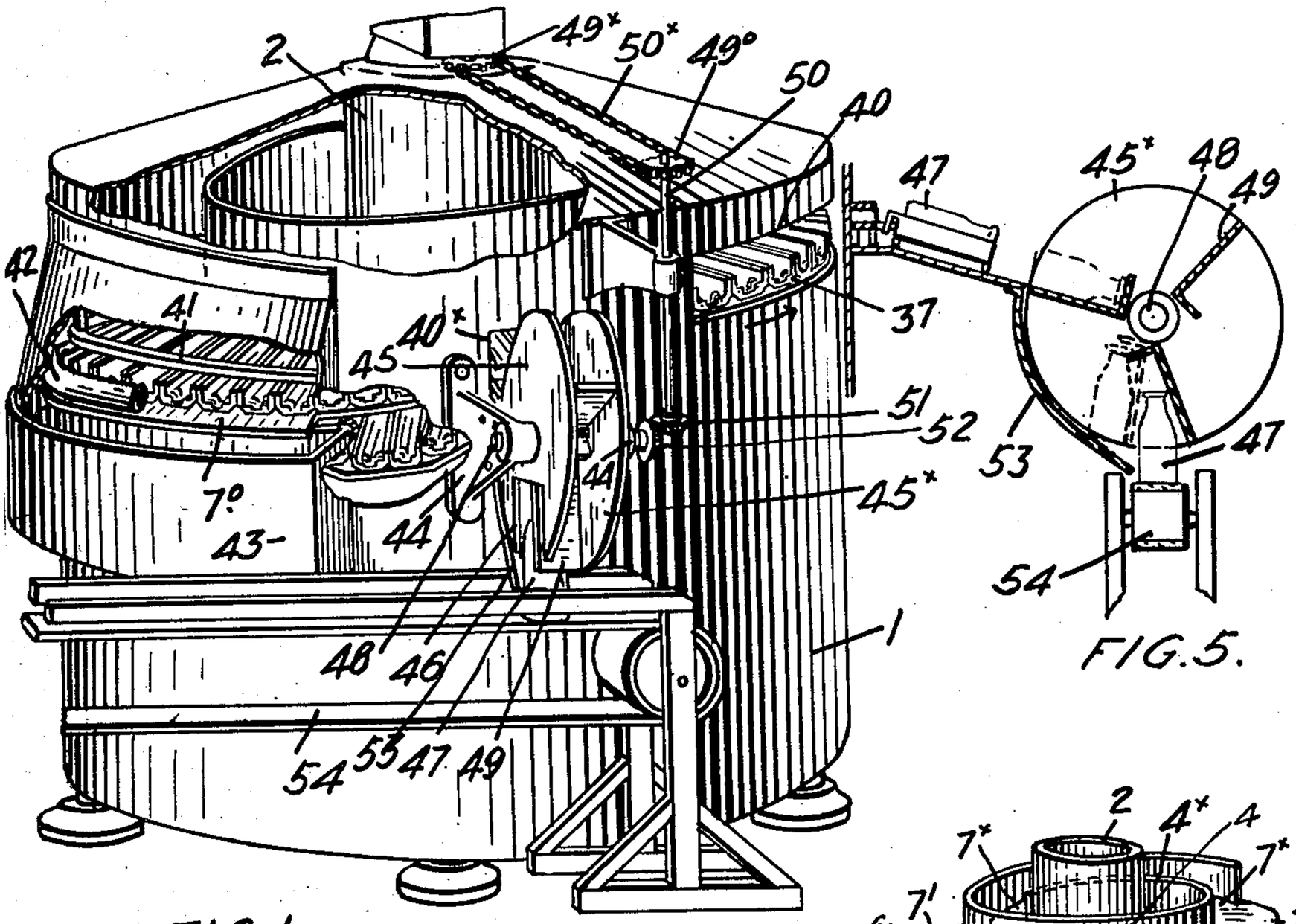

FIG. 1.

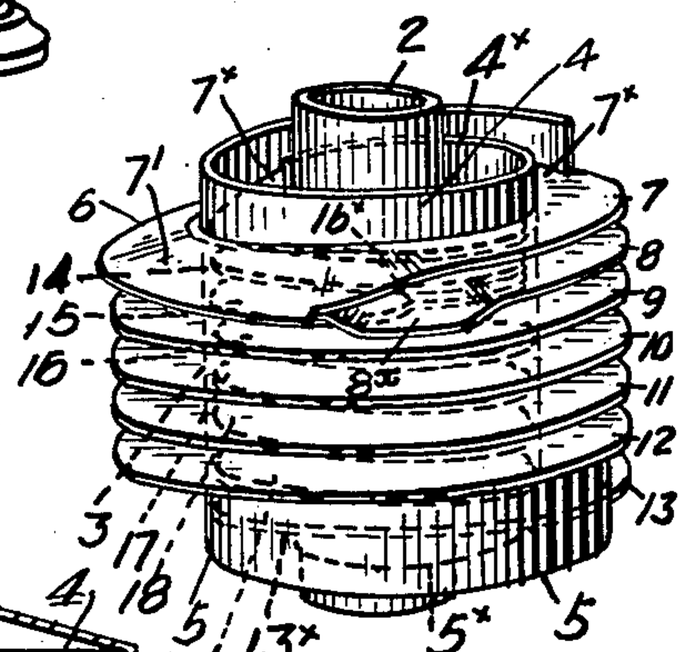

FIG. 4.

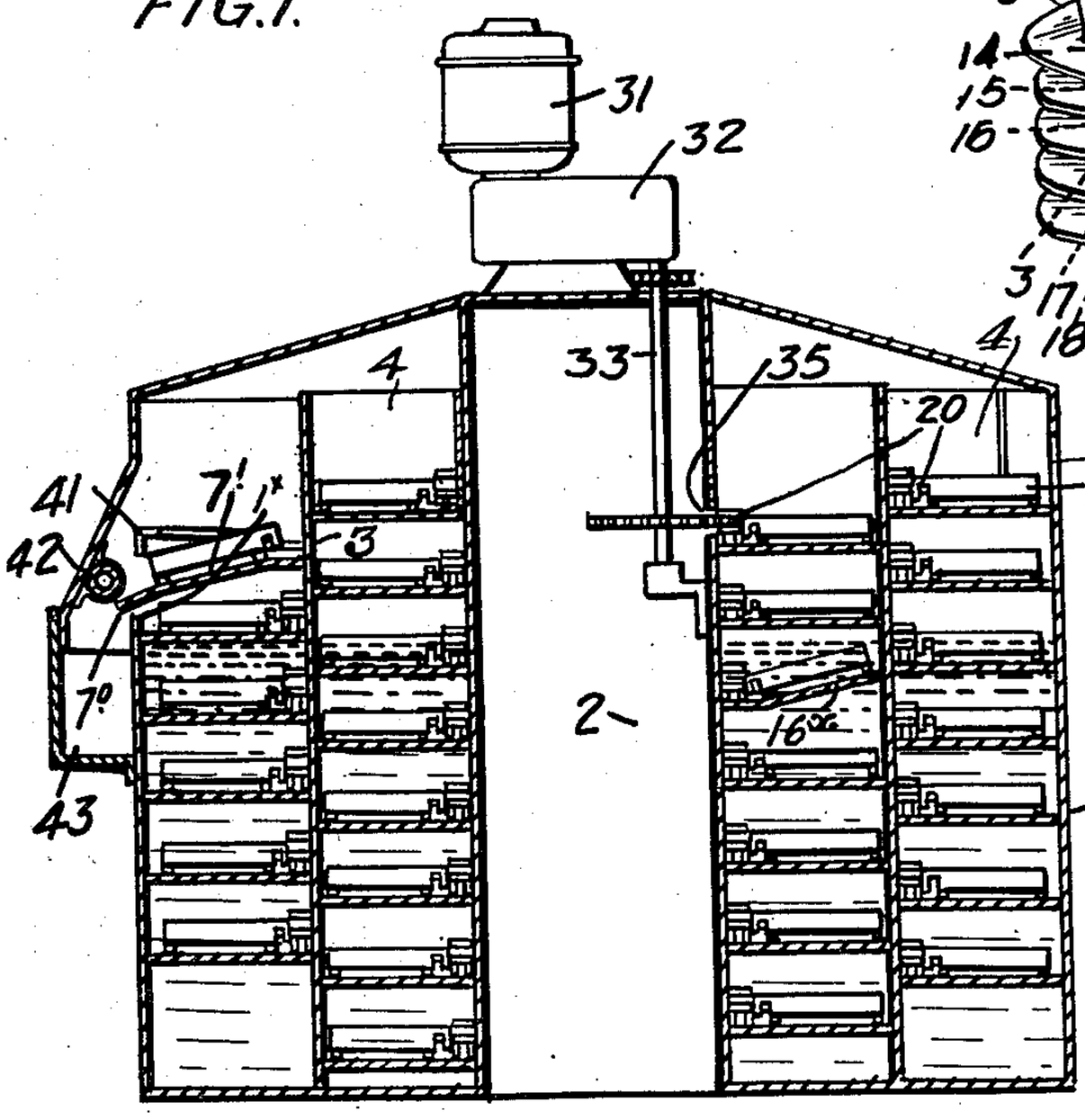

FIG. 2

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MILK BOTTLE WASHING MACHINE

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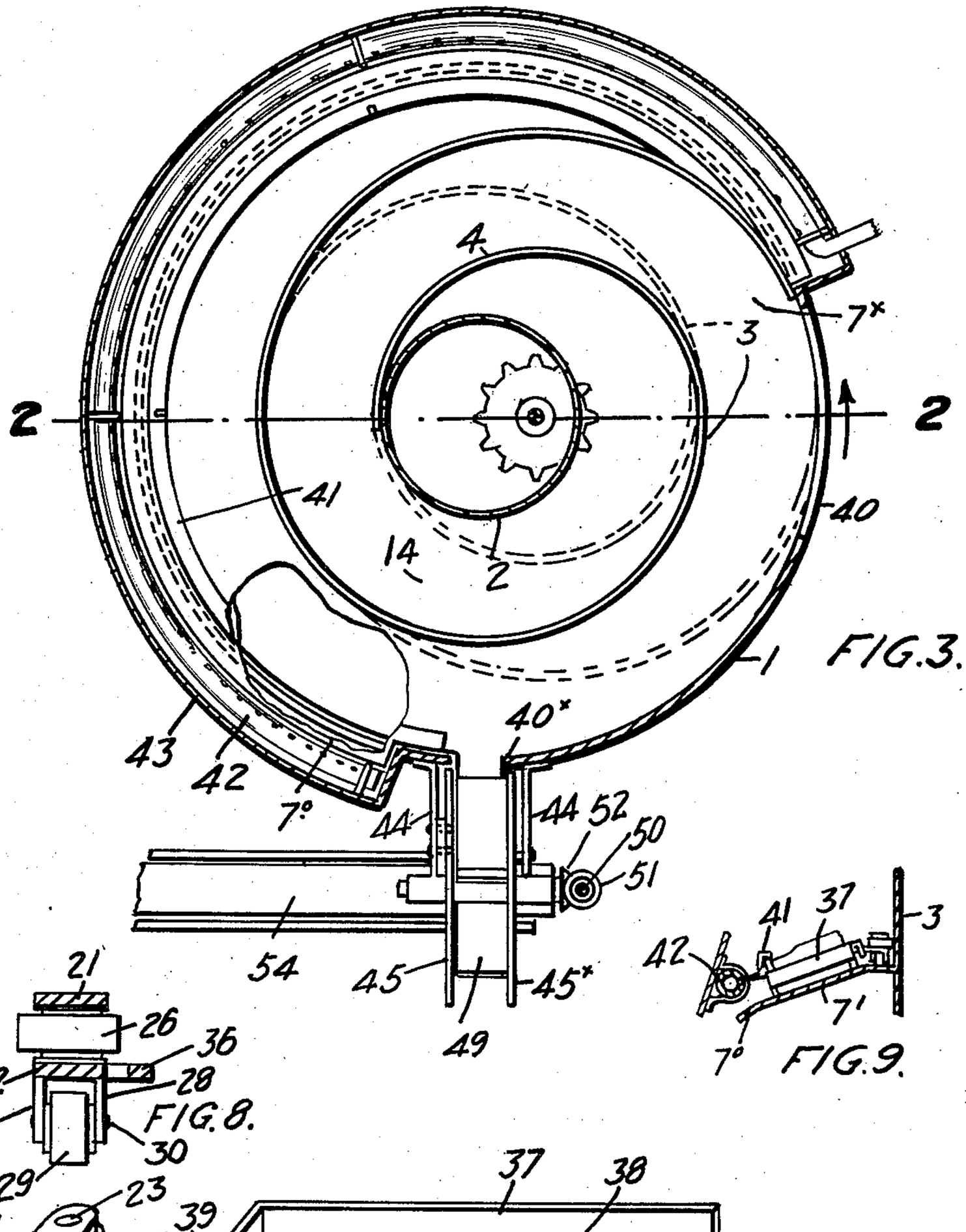

FIG. 3.

FIG. 9.

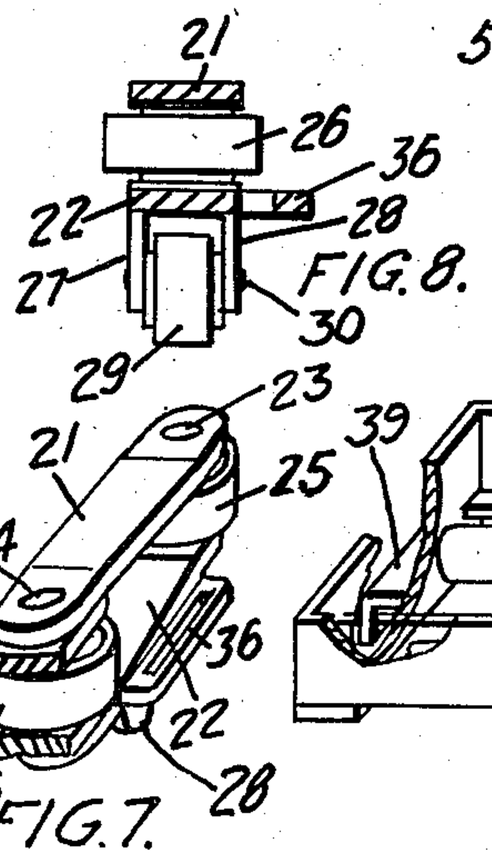

FIG. 8.

FIG. 7.

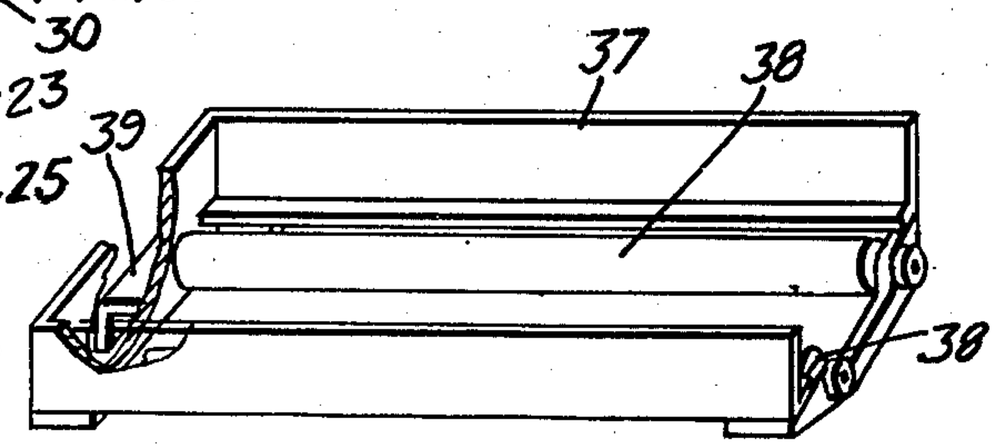

FIG. 6.

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UNITED STATES PATENT OFFICE

2,011,786

MILK BOTTLE WASHING MACHINE

Charles Widmer Walker, Toronto, Ontario, Canada

Application March 22, 1934, Serial No. 716,741

7 Claims. (Cl. 141—7)

REISSUED

My invention relates to improvements in milk bottle washing machines, and the object of the invention is to devise a simple and compact machine which will not be costly to manufacture having a minimum number of moving parts and which will, therefore, not be as liable to become out of order, and it consists essentially of the arrangement and construction of parts as hereinafter more particularly explained.

Fig. 1 is a perspective view of my machine partially broken away to exhibit the interior construction thereof.

Fig. 2 is a cross sectional view through my machine on line 2—2 Fig. 3.

Fig. 3 is a sectional plan view taken through the feed orifice and with the bottle carriers removed.

Fig. 4 is a perspective detail of the spiral runway on a reduced scale.

Fig. 5 is a sectional detail through the delivery mechanism.

Fig. 6 is an enlarged perspective detail of one of the bottle carriers.

Fig. 7 is an enlarged perspective detail of one of the links of the carrier chain to which the bottle carriers are connected.

Fig. 8 is a transverse section through the link illustrated in Fig. 7.

Fig. 9 is a detail showing the bottle in the rinsing position.

Like characters of reference indicate corresponding parts in the different views.

1 indicates a tank containing a strong alkali solution. 2 is a tube located centrally in the tank 1. 3 is a concentric tube, the wall of which is located midway between the external periphery of the tube 2 and the internal periphery of the tank 1.

4 and 5 are volute guiding walls, the central portions of which are in vertical alignment with the wall of the tube 3 and set reversely one to the other so as to provide respectively inlet and outlet spiral channels leading from the exterior of the tube 3 to the interior thereof. 6 is an endless spiral flange forming a runway, the outer or ascending portion of which winds around the exterior periphery of the tube 3 as indicated by the convolutions 7 to 13. The end of the uppermost convolution 7 then leads between the convolutions of the volute wall 4 as indicated at 7^x in Figs. 3 and 4 and the end of the lowest convolution 13 leads between the volute wall 5 as indicated at 13^x in Fig. 4. The volute portions 7^x and 13^x connect to the opposite ends of the inner or descending spiral formed by the convolutions 14 to 19 extending between the interior periphery of the tube 3 and the exterior periphery of the tube 2.

By this means an endless trackway is formed for an endless chain 20 which winds around and down the outer periphery of the tube 2, the inner wall portions 4^x and 5^x extending between the peripheries of the tubes 2 and 3 and the exterior portion between the periphery of the tube 3 and the wall of the tank 1.

The links forming the chain 20 are illustrated in Fig. 7 and comprise the bar plates 21 and 22 connected together by bolts 23 and 24 on which are revolubly mounted rollers 25 and 26 tracking against the walls of the tubes 2 and 3 and the wall portions 4^x and 5^x above referred to. The lower bar plate 22 is provided with lugs 27 and 28 between which is revolubly mounted a roller 29 on a shaft 30 to travel on the upper faces of the spiral flange convolutions 7 to 13 and 14 to 19 to take the weight of the chain.

31 is a motor (see Fig. 2), the shaft of which is connected through a suitable reduction gear contained in the casing 32 to a shaft 33 on which is secured a driving gear 34 engaging the links of the chain 20 through a slot 35.

The lower bar plate 21 of each link is provided with a slotted lug 36. 37 is a bottle carrier comprising a rectangular frame of suitable construction at each side of which is journalled a roller 38 on which the milk bottle is laid. The rollers 38 bear upon the upper faces of the spiral 6 and travel freely thereover, a carrier being freely connected to each link by a hook 39 engaging in the slotted lug 36 to allow of a swinging movement in a vertical plane.

40 is a slotted opening in the wall of the tank 1 through which the bottles are manually fed, one bottle being laid in each carrier 37. The upper flange convolution 7 has a portion 7^1 which is downwardly inclined towards its outer edge, such inclined portion extending from a point adjacent the remote end of the feed slot 40 to a point adjacent the discharge opening 40^x.

41 is an angle bar curved concentric to the centre of the machine against which the bottle mouth bears as indicated in Fig. 9. 42 is a perforated tube also concentric with the centre of the machine and so positioned as to inject water into each bottle mouth to rinse the same. The tube, if desired, may be divided into sections, each section separately supplied with water at gradually decreasing temperature. The inclined portion 7^1 is provided with an extension lip 7^0 extending through an opening 1^x in the wall of the tank 1 so as to shed the rinsing water into a

receptacle 43 from which it is drained preventing the water entering the alkaline solution and diluting it.

The convolution 8 is provided with a short downwardly inclined portion 8^x which is also located above the fluid level of the tank so that the alkaline solution is drained therefrom, the bottle tending to invert. The convolution 16 of the inner spiral is inclined upward as indicated at 16^x at a point just below the level of the solution so that any air imprisoned in the bottle by the inflowing solution will have a chance to escape upward.

Opposite the discharge orifice 40^x is located the discharging mechanism comprising a pair of brackets 44 to one of which is secured a stationary disc 45 having an opening 46 for the passage of the bottles 47. 48 is a shaft mounted in the brackets 44 and to which is secured a revolving disc 45^x carrying bottle receivers 49 secured thereto at one edge and extending closely adjacent to the disc 45 at the opposite edge. The shaft 48 is driven from the shaft 33 by means of the shaft 50 driven at one end by the sprockets 49^x and 49^0 and sprocket chain 50^x and connected at its opposite end by the bevel gears 51 and 52 to the shaft 48.

53 is a guide plate, the upper portion being concentric to the discs 45 and 45^x, the lower portion extending tangentially so as to allow the bottle bottom to slide easily onto the travelling conveyor 54 to be conveyed to a suitable point.

Having described the principal parts involved in my application I will briefly describe the operation of the same.

The soiled milk bottles are passed through the feed slot 40 and placed in the bottle carriers as they travel in the direction of the arrow past such slot driven by the gear 34. As they continue to travel in this direction they are carried over the flange portion 7^x into the descending or inner spiral of the runway, passing down the same into the solution. As they enter the solution, the bottle mouth is tipped upward by the inclined portion 16^x releasing air contained in the bottle. The bottles then travel successively to the bottom of the descending spiral and then pass outward by the volute 5 into the ascending spiral formed around the exterior of the tube 3. When they are carried upward by the ascending spiral above the level of the solution, they are momentarily tipped down at their mouth end as they pass over the downwardly inclined portion 8^x so as to empty the alkali solution therefrom into the tank 1 before they are rinsed to prevent waste of the solution.

The bottles then pass up the ascending convolution 7 and are again tipped downward at the mouth to receive water from the jets of the pipe 42, the rinsing water pouring from the bottles over the lip preventing it passing into the alkali to dilute it and directing it into the separate waste receptacle 43. The bottles finally are carried opposite the discharge orifice and are free to slide from the downwardly inclined carriers 37 through the discharge orifice into one of the receivers 49. The revolving of the discharge mechanism is so timed as to receive a bottle in each receiver as the mechanism revolves in the manner above described to discharge the bottle onto the endless conveyor 54 which carries it through the opening 46 to any convenient point.

From this description it will be seen that I have devised a very simple device for washing milk bottle and other containers which is not costly and is compact, easily operated and efficient.

What I claim as my invention is:—

1. A milk bottle washer comprising a solution receptacle having bottle receiving and discharge openings in the wall thereof, a runway element comprising inner and outer spaced apart cylindrical walls within the receptacle, a spiral endless runway consisting of an outer ascending portion extending between the receptacle wall and the outer wall of the element and a descending portion extending between the outer and inner element walls, and means for conveying bottles disposed horizontally and transversely of the runway along such runway from the receiving opening to the discharge opening of the receptacle.

2. A milk bottle washer comprising a solution receptacle, a spiral endless runway consisting of an outer ascending portion and an inner descending portion extending into the solution and a portion of which is inclined upward towards its outer edge for releasing imprisoned air from each bottle as it passes beneath the surface of the solution, bottle carriers, and means for driving the bottle carriers continuously over the runway from a feed to a discharge point.

3. A milk bottle washer comprising a solution receptacle, a spiral endless runway consisting of an outer ascending portion and an inner descending portion extending into the solution the ascending portion being downwardly inclined laterally towards its outer edge at a point above the solution level to discharge solution from each bottle as it passes over such laterally inclined portion, bottle carriers, and means for driving the bottle carriers continuously over the runway from a feed to a discharge point.

4. A milk bottle washer comprising a solution receptacle, a spiral endless runway consisting of an outer ascending portion and an inner descending portion extending into the solution the ascending portion being downwardly inclined laterally towards its outer edge at a point above the solution level to discharge solution from each bottle as it passes over such laterally inclined portion, bottle carriers, means for driving the bottle carriers continuously over the runway from a feed to a discharge point, and means for automatically rinsing each bottle after the solution is discharged therefrom.

5. A milk bottle washer comprising a solution receptacle, a spiral endless runway consisting of an outer ascending spiral portion and an inner descending spiral portion extending into the solution, an endless sprocket chain guided around the endless runway, means for driving the chain, bottle carriers pivoted to the chain and travelling over the runway from a bottle receiving point to a bottle discharging point, and means for automatically discharging the bottles at the discharge point.

6. A milk bottle washer comprising a solution receptacle having a feed opening, a discharge opening and a rinse water outlet opening above the solution level, a spiral endless runway consisting of an outer descending portion and an inner descending portion extending into the solution, bottle carriers, means for driving the bottle carriers continuously over the runway to carry the bottles from a point opposite to the feed opening to a point opposite to the discharge opening, a laterally downwardly inclined portion in that portion of the ascending spiral runway

opposite to the rinse water outlet opening for depressing the bottle mouths, means for injecting rinse water through the depressed mouths into the bottles, and means for simultaneously guiding the rinse water as it is discharged from the depressed mouths through the rinse water outlet opening.

7. In a milk bottle washer, a spiral runway comprising inner and outer tubes spaced apart, an endless spiral flange including an ascending spiral portion extending around the outer tube and a descending spiral portion extending around the inner tube and a volute guide wall at each end of the outer tube each comprising a central portion carried by the outer tube and concentric therewith, an end portion curving outward from each central portion to the outer edge of each end turn of the ascending spiral flange portion, and an inner portion curving inward from the opposite end of each central portion to the wall of the inner tube, said endless spiral flange including a flange portion extending between the ends of the ascending and descending spiral flange portions and between the outwardly and inwardly curved portions of the volute guide wall to form a guide way for the bottles from the ascending to the descending spiral portion at one end of the runway and from the descending to the ascending spiral portion at the opposite end of the runway.

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