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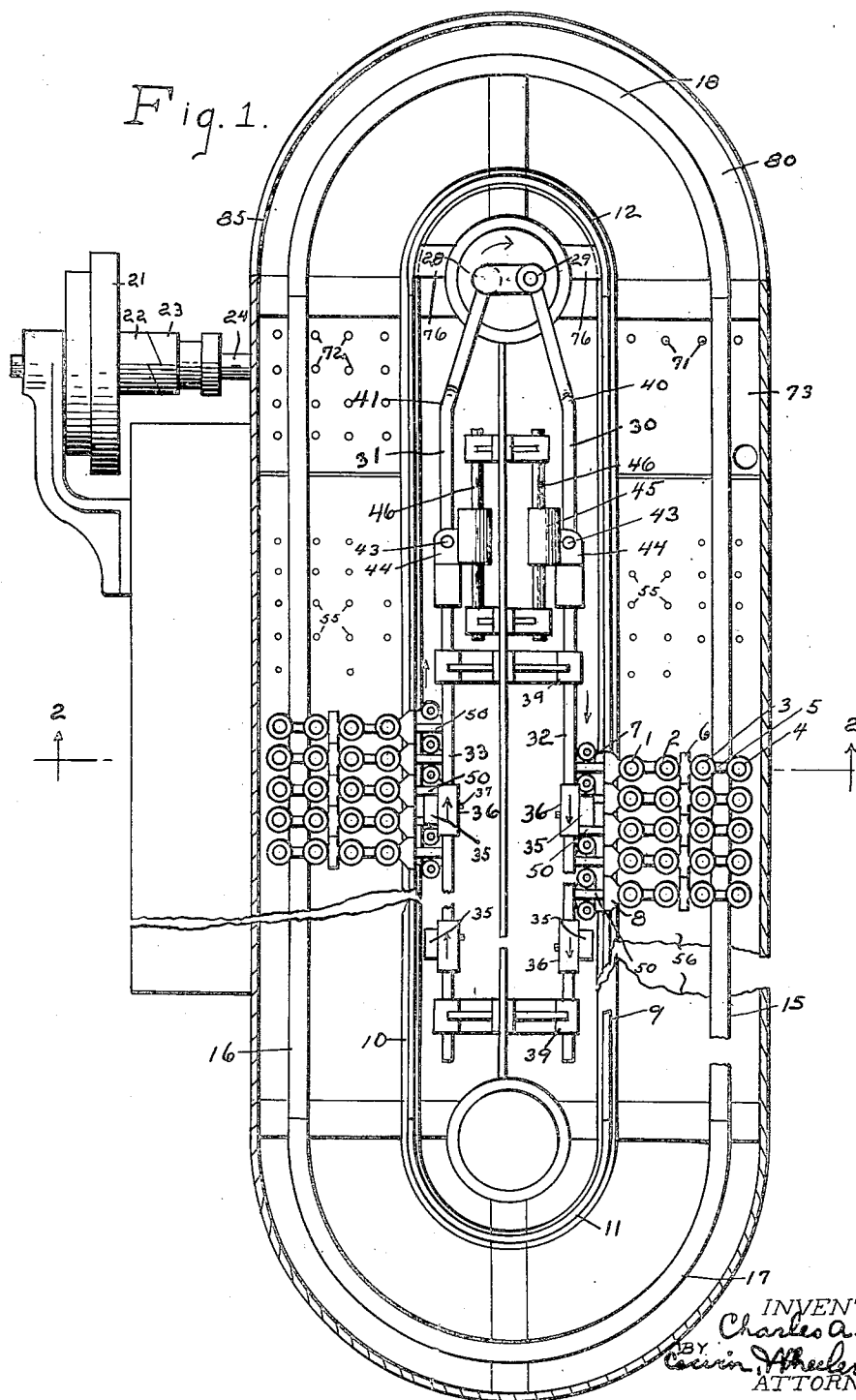
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1,708,694

BOTTLE WASHING MACHINE

Filed March 12, 1924

3 Sheets-Sheet 1



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Fig. 2.

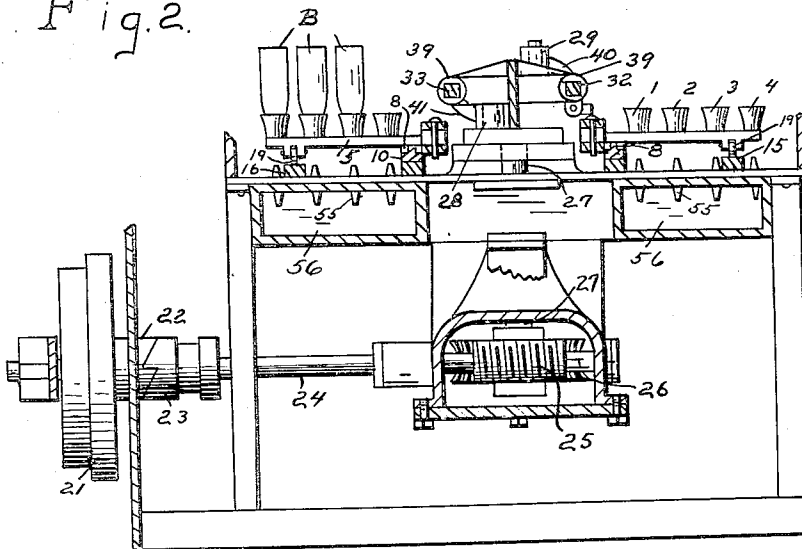
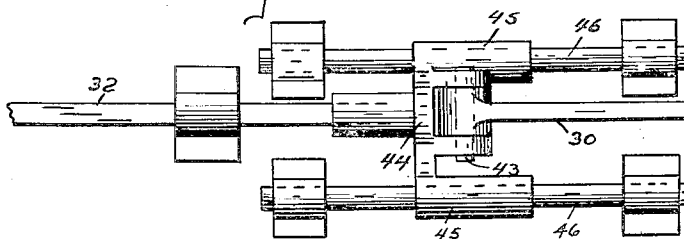


Fig. 3.



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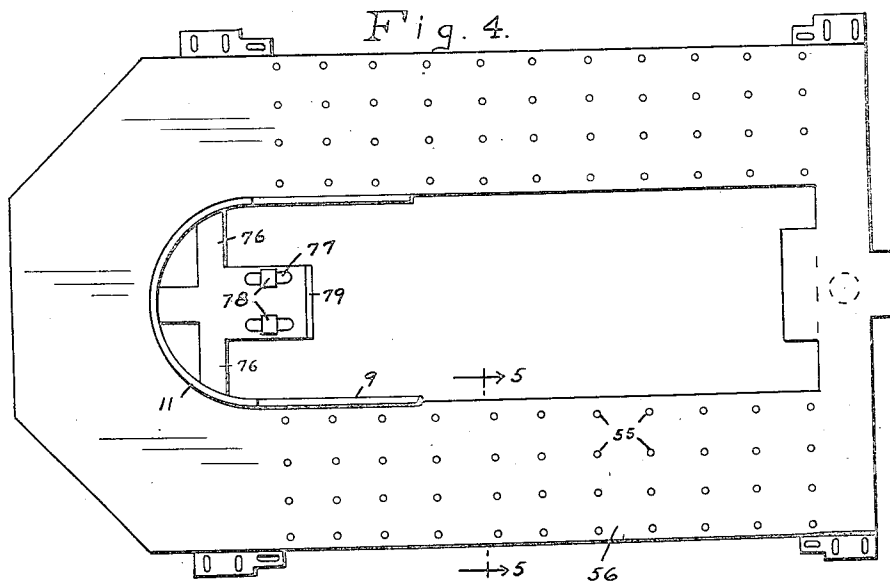
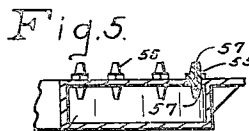
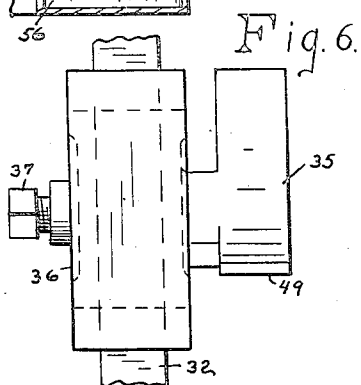
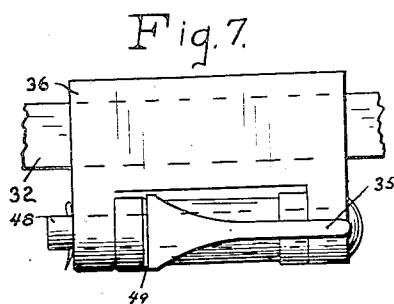
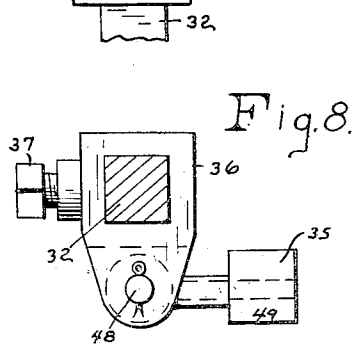
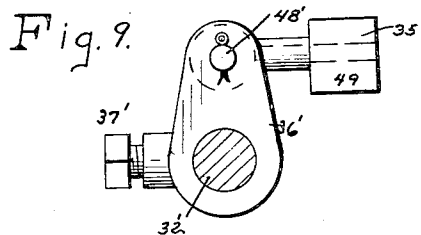
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BOTTLE WASHING MACHINE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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BOTTLE-WASHING MACHINE.

Application filed March 12, 1924. Serial No. 698,605.

My invention relates to improvements in bottle cleansing machines of that type in which the bottles are conveyed step by step along an endless path or trackway in an inverted position and presented successively to a series of cleaning devices, such for example as injector nozzles, each adapted to direct a cleansing fluid into the bottles in the intervals between said step movements.

The objects of my invention are to provide improved means for actuating the conveyor, whereby the power may be applied to an endless conveyor at various points, the actuating pressures balanced on opposite sides, and the conveyor accurately positioned with reference to the spray nozzles; to provide means whereby a reciprocating actuator may engage and advance the conveyor when moving in one direction and then release the conveyor and return to its initial position without danger of catching any portion of the conveyor during the return movement; to provide an improved takeup for a conveyor, in which the trackway may be lengthened in proportion to the wear in the connections of the conveyor elements; and in general to eliminate the causes of delay in the operation of said machines as heretofore constructed and which delays were due to imperfect operation, necessity for frequent repairs, etc.

In the drawings:

Figure 1 is a plan view of my improved machine with the overhead pipe and spray heads omitted.

Figure 2 is a sectional view drawn generally on line 2—2 of Figure 1.

Figure 3 is a detail side view of a fragment of one of the reciprocating conveyor actuating bars with associated connecting rod and guide.

Figure 4 is a plan view of the spray box and adjustable track.

Figure 5 is a detail sectional view of the spray box, drawn on line 5—5 of Figure 4.

Figure 6 is an enlarged detail plan view of one of the conveyor actuating dogs.

Figures 7 and 8 are front and side views, respectively, of said dogs.

Figure 9 is a view, similar to Figure 8, showing a modified structure.

Like parts are identified by like reference characters throughout the several views.

As indicated in Figs. 1 and 2, the bottles B

are received in multiple series of bottle holding sockets 1, 2, 3 and 4, carried by a suitable endless conveyor composed of transverse bars 5, spacing elements 6 and link elements 7; the latter being connected in the form of an endless chain. Each of the link elements 7 has a channeled portion 8 which embraces and slides along a trackway having parallel portions 9 and 10, connected at their respective ends by semi-circularly curved track portions or sections 11 and 12. The transverse bars 5 of the conveyor are supported at their outer ends by a similar trackway having parallel portions 15 and 16 connected by curved end sections 17 and 18. The bars 5 are provided with rollers 19 which travel along said track way.

Except as hereinafter described, the conveyor and its supporting trackways may be assumed to be of ordinary construction.

The conveyor is actuated from a suitable source of power through the cone pulley 21, clutch members 22 and 23, shaft 24, worm 25, worm wheel 26, vertical shaft 27, cranks 28 and 29, connecting rods 30 and 31, reciprocating sliding bars 32 and 33 and conveyor engaging dogs 35, each adjustably coupled to one of the sliding bars 32 (or 33) by a coupling member 36.

The sliding bars 32 and 33 are preferably square in cross section and the coupling members 36 may be secured thereto by set-screws 37. The bars slide in suitable frame bearings indicated at 39, and as these bars are located in the same horizontal plane, the connecting rods 30 and 31 are provided with offsets at 40 and 41 respectively. The connecting rod 30 is offset upwardly at 40 and the rod 31 is offset downwardly at 41. This enables the rods to be connected with the cranks 28 and 29 at different levels and with the sliding bars 32 and 33 at a common intermediate horizontal plane.

The connecting rods are respectively connected to the bars 32 and 33 by coupling members 44, supported by slides 45 from guide rods 46. The coupling members 44 are pivotally secured to the connecting rods by vertically disposed pivot pins 43. The guide rods 46 are parallel with the bars 32 and 33 and support the coupled ends of these bars for true axial movement in their bearings.

The conveyor engaging dogs 35 are best il-

illustrated in Figs. 6, 7 and 8. These dogs are connected with the coupling members 36 by horizontal pivot pins 48. Each dog is provided at one end with a head having a substantially vertical face 49 adapted to successively engage the upwardly extending projections 50 with which the link elements 7 are provided. The upper and lower surfaces of the dogs converge to the opposite end, forming a tail piece which is generally wedge shaped, the lower surface having an upward inclination at the rear side of the head. The upper surface is preferably similarly inclined downwardly in order that the dogs may be used interchangeably on opposite sides, i. e., in association with either of the bars 32 and 33.

In Fig. 1 the arrows indicate the direction of the conveyor movement and it will, of course, be understood that the dogs are secured respectively to the bars 32 and 33 in relatively reversed or inverted positions, whereby the heads may engage the conveyor projections 50 and push against them in the direction in which the adjacent portion of the conveyor moves.

For example, when the bar 32 moves toward the curved portion 11 of the trackway the heads 49 of its associated dogs 35 will engage the adjacent conveyor projections 50 to move them in that direction. The dogs on the bar 33 will simultaneously engage the conveyor projections 50 on the return side of the conveyor and actuate this portion of the conveyor in the opposite direction as indicated by the arrow adjacent to the bar 33.

The tail pieces of the respective dogs overlap and rest upon the next succeeding conveyor projection 50 in each instance, and during the retractive movement of the bars 32 and 33, the inclined under surfaces of the dogs slide over the supporting projections 50, the dogs lifting or swinging upwardly upon their pivotal connections 48. The length of stroke of the bars 32 and 33 is such that the retractive movement will carry each dog back to a point where the head face 49 will be in a position to engage the next succeeding projection 50 during the initial portion of the conveyor advancing stroke of the actuating bar. At the completion of such stroke, the conveyor will be advanced sufficiently to carry the bottles thereon from a position directly above one set of nozzles 55 to a position directly above the next set of nozzles 55.

The nozzles 55 are arranged in transverse rows along the top of a spray box 56 which underlies the conveyor throughout the rear portion of the machine. The number of nozzles in each row will, of course, correspond to the number of bottle receiving sockets or socket members 1, 2, 3 and 4 carried by each conveyor bar 5. Each nozzle passes through an aperture in the top of the box 56 and extends downwardly therein a sufficient dis-

tance to allow it to receive fluid from the horizontal central portion of the box, substantially midway between its top and bottom, or, at least, from a point which is at a substantial distance from either the top or bottom. Each nozzle is provided with a central port 57 through which the liquid may be discharged and to which liquid may be supplied by any suitable means, not shown.

Between the spray box and the front end portion of the machine where the bottles are inserted and removed, water supply nozzles 71 on the infeeding side and 72 on the outfeeding side are provided. Water may be supplied to the nozzles 71 and 72 by any suitable means, not shown. The nozzles 71 deliver water into and upon the bottles in order that adhering material may be softened or removed before the bottles reach those nozzles which are connected with the spray box above described. On the outfeeding side, the nozzles 72 deliver rinsing water into and over the bottles. The water from the nozzles 71 and 72 drops into drain pans 73 and is delivered to any suitable point of discharge.

The track sections 12 at the front end of the machine have their ends connected by a web 76, having slots 77 through which pass clamping bolts 78 to connect the web 76 with the frame plate 79. The slots 77 allow a longitudinal adjustment of the curved track sections 12 with reference to the straight track sections 9. This adjustment is utilized initially to place the conveyor under proper tension and the sections 12 may be readjusted from time to time to take up the wear in the pivotal connections of the link elements 7 of the conveyor. When the sections 12 are thus adjusted, a slight gap may be left between the ends of these track sections and the opposing ends of the section 9, but these gaps will be short and the link elements 7 of the conveyor will cross them without catching on the track ends. The track sections 17 and 18 are wide enough to permit said adjustment, without unshipping the rollers 19.

In operation, the bottles will be manually fed into the machine by an attendant occupying a station substantially at the point 80 (Fig. 1) and bottles thus fed into the machine will be first conveyed step by step to the successive sets of nozzles 71, after which they will pass successively to the sets of nozzles 55 where they will be sprayed with a caustic solution from the spray box 56. Upon passing the front end of the spray box on the return side, they will receive rinsing water from the nozzles 72 and after passing these nozzles they are removed from the machine by an attendant standing approximately at the point 85.

Considerable importance is attached to the use of a single spray box for all the nozzles employed to deliver caustic solution into the bottles. The pressure is equalized at all the

nozzles and owing to the fact that the nozzles extend downwardly, a substantial distance within the box, the upper part of the box may, if desired, be utilized as an air chamber, whereby the pressure is not only equalized but kept substantially constant, notwithstanding variations in the speed of the pump.

A slight modification of the conveyor actuating mechanism is indicated in Figure 9. In this figure the rod 32' is a round rod and the connecting member 36' extends upwardly. This modification is used where it is desirable to have the actuating rods operate below the level of the conveyor.

While I have described my invention as a bottle cleansing machine, it will be understood that it may be used for cleansing any other receptacle capable of being supported in an inverted position to receive jets of fluid from the respective nozzles.

I claim:

1. In a bottle washing machine, the combination with an endless bottle conveyor having spaced projections, of a reciprocatory slide bar provided with a pivoted dog having its pivotal axis substantially parallel to the direction of reciprocation of said bar supported upon one of the conveyor projections while engaging the next succeeding projection to actuate the conveyor in the direction of conveyor advancement, said dog having an inclined bearing surface adapted to move upon the supporting projection to effect its retraction and allow it to clear said projection during the retractive movement of the slide bar.

2. In a bottle washing machine, the combination with an endless bottle conveyor having spaced upwardly extending projections, of a reciprocating slide bar substantially parallel to a portion of the conveyor and provided with a pivoted dog of greater length than the distance between said projections and having its pivotal axis substantially parallel to said portion of the conveyor, said dog being adapted to engage the projections successively when the slide bar is reciprocated and having an inclined bearing surface adapted to rest on one projection while the dog is in engagement with the next succeeding projection, whereby during the retractive movements of the slide bar, the dog will pass over the projection upon which it bears to a position for an actuating engagement therewith, preparatory to the next advancing movement of the slide bar.

3. In a bottle washing machine, the combination with an endless bottle conveyor having upwardly extending spaced projections, of a reciprocatory slide bar provided with a pivoted dog adapted to engage said projections successively during successive movements of the bar in one direction and having its pivotal axis substantially parallel to the direction of reciprocation of said bar, a co-operative slide bar provided with a pivoted

dog adapted to simultaneously engage the conveyor projections on the return side during the movements thereof in the opposite direction and having its pivotal axis substantially parallel to the direction of reciprocation of said co-operative slide bar, whereby the actuating pressures exerted by the respective bars are substantially balanced.

4. In a bottle washing machine, the combination with an endless bottle conveyor having upwardly extending spaced projections adapted for travel along substantially parallel lines during portions of the advancing and returning movements of the conveyor, actuating bars adapted to reciprocate along said parallel portions of the path traversed by the conveyor, a crank shaft having oppositely disposed cranks, connecting rods, each linking one of the cranks with one of said actuating bars, and one-way acting dogs associated with the conveyor actuating bars and adapted to transmit the motion of each bar in one direction to the conveyor for the advancement of the latter, step by step.

5. In a bottle washing machine, the combination with an endless bottle conveyor having upwardly extending spaced projections adapted for travel along substantially parallel lines during portions of the advancing and returning movements of the conveyor, actuating bars adapted to reciprocate along said parallel portions of the path traversed by the conveyor, a crank shaft having oppositely disposed cranks, connecting rods, each linking one of the cranks with one of said actuating bars, and means carried by said actuating bars and adapted in one direction of reciprocation of said bars to engage said projections.

6. In a bottle washing machine, a horizontally pivoted conveyor actuating dog provided with a conveyor engaging head piece and having its pivotal axis substantially parallel to the direction of conveyor movement, said dog being adapted to drop by gravity to operating position, a dog retracting tail piece on said dog and having an inclined under surface, means for actuating the dog in one direction to advance the conveyor, and means associated with the conveyor for engaging said inclined surface to lift and retract the dog from conveyor actuating position when said dog is moved in the opposite direction.

7. In a bottle washing machine, a bottle conveyor having a continuous series of link elements in pivotal connection with each other, each link element having a channeled under surface adapted to receive a supporting trackway and a projection on its upper surface adapted to be engaged by an actuating device.

8. In a bottle washing machine, a bottle conveyor having a continuous series of link elements in pivotal connection with each other, each link element having a channeled

under surface adapted to receive a supporting trackway and a projection on its upper surface adapted to be engaged by an actuating device, and an actuating device adapted when
5 moved in one direction, to slide across one of said projections and to engage the latter for a conveyor advancing movement when moved in the opposite direction, said actuating device being of such length as to continuously maintain bearing contact with at least, one 10 of said projections, while in actuating relation to another of said projections.

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