Aug. 27, 1929. J. KANTOR 1,726,229

BOTTLE WASHING MACHINE

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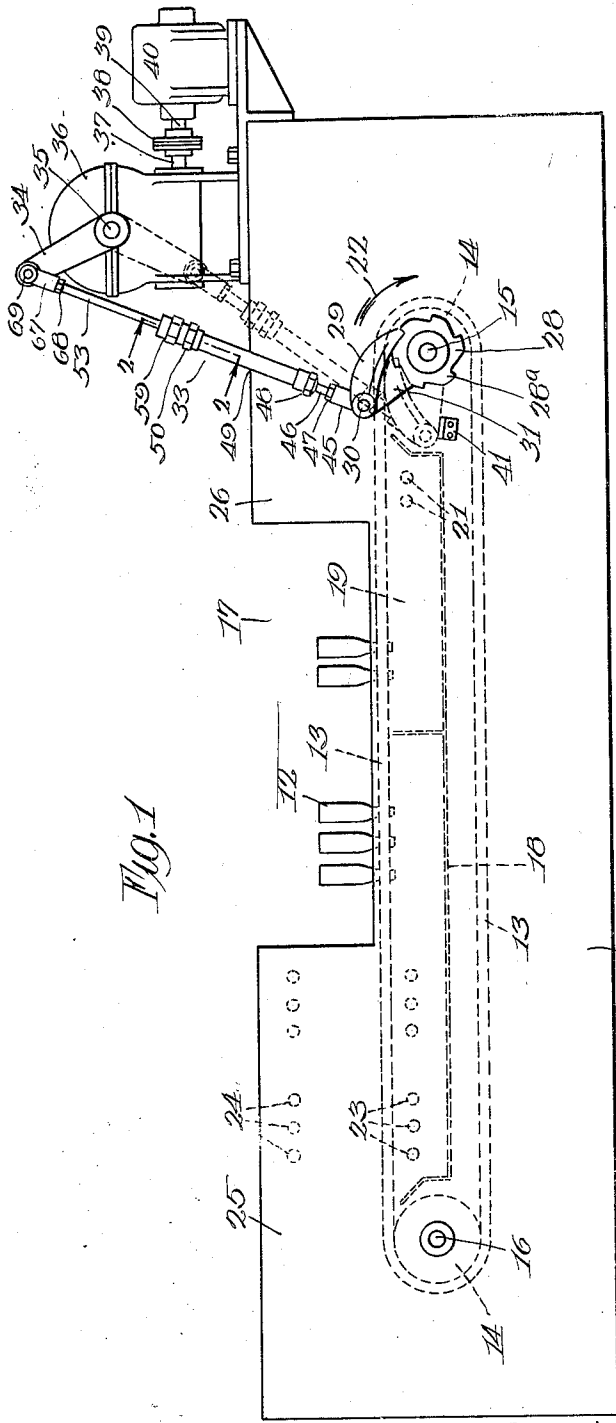


Fig. 1

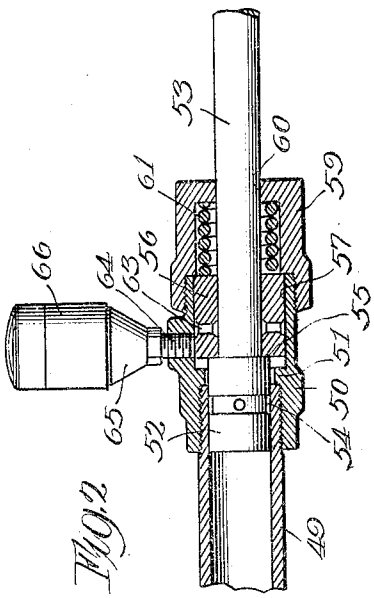


Fig. 2

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BOTTLE-WASHING MACHINE.

Application filed December 20, 1924. Serial No. 757,100.

This invention relates to improvements in bottle washing machines and its purpose is to provide improved actuating mechanism adapted for use, for example, with the form of bottle washing machine disclosed in my co-pending application Serial No. 728,570, filed July 28, 1924.

The principal object of the invention is to provide improved power transmitting mechanism for actuating the bottle conveyor. Still another object is to provide a bottle washing machine comprising an endless bottle conveyor driven by mechanism comprising means for imparting an intermittent movement to the bottle conveyor without undue shock or strain upon any parts of the mechanism. Still another object of the invention is to provide pawl and ratchet mechanism for imparting an intermittent movement to the bottle conveyor, including a connecting rod having resilient means embodied therein for relieving the shock when the movement of the bottle conveyor begins. Other objects relate to various features of construction and arrangement which will appear more fully hereinafter.

The nature of the invention will be understood from the following specification taken with the accompanying drawings in which one embodiment is illustrated. In the drawings, Figure 1 shows a somewhat diagrammatic side elevation of a bottle washing machine showing the improved mechanism of the present invention applied thereto; and Fig. 2 shows an enlarged detail section taken on the line 2—2 of Fig. 1.

The invention is illustrated in connection with a bottle washing machine 10 comprising a tank 11 adapted to contain a heated soaking solution through which the bottles 12 are passed while carried on an endless chain conveyor 13. This chain conveyor is mounted on sprockets 14 which are secured on shafts 15 and 16 journaled in bearings carried by the side wall of the tank and an intermittent rotary movement is imparted to the shaft 15, by the mechanism hereinafter described, so that the bottles 12 are moved gradually through the soaking solution contained in the tank 11. The bottles are placed on the endless conveyor 13 while in inverted position in the space 17 adjacent the central part of the tank. These bottles are then located over an auxiliary tank 18 having at one end thereof a compartment 19 into which the residue of soda water and other materials remaining in the bottles are washed by sprays 21. The bottles then are inverted and turned into their upright positions as they pass around the shaft 15, the direction of movement of the conveyor being illustrated by the arrow 22. After passing through the soaking solution in the tank 11 in their upright positions, the bottles are moved to their inverted positions as they pass around the shaft 16 at the other end of the machine and they are then acted on by sprays 23 and 24 which are located beneath the hood 25 at the end of the machine. The sprays 21 which act on the bottles initially are located under a hood 26 at the right-hand end of the machine as viewed in Fig 1. These parts of the bottle washing machine have been illustrated only in a general way, and for a more complete disclosure reference may be had to the co-pending application above referred to.

To permit the insertion and withdrawal of the bottles from the bottle conveyor and to permit the proper spraying of the bottles by the nozzles 21, 23 and 24, it is desirable to impart to the endless conveyor 13 an intermittent movement of such nature that the bottles remain at rest for relatively long periods, between which periods they are quickly advanced by the motion of the shaft 15. For this purpose, the shaft 15 has mounted thereon a ratchet wheel 28 having relatively long teeth 28^a which are adapted to be engaged by a pawl 29 pivotally mounted on a pin 30 carried at the outer end of a crank arm 31 which is pivoted on the shaft 15 between the ratchet wheel 28 and the adjacent bearing of the shaft in the side wall of the tank. The crank arm 31 is connected by a composite connecting rod 33 to a crank arm 34 which is fixed on the shaft 35 of change speed gearing located in the casing 36. The casing 36 is mounted on the hood 26 at the right-hand end of the machine, as viewed in Fig. 1, and the driving shaft 37 of the change speed mechanism is connected by a coupling 38 with the armature shaft 39 of an electric motor 40 having connection with a suitable source of electrical energy. When the machine is in operation, the change speed gearing in the casing 36 is driven continuously by the electric motor 40 and an intermittent movement is imparted to the bottle conveyor 13 by the engagement of the

pawl 29 with successive teeth of the ratchet wheel 28. In order that the periods of rest of the bottle conveyor may be relatively long as compared with the intervening periods of movement, the connecting rod 33 is provided with a lost-motion connection which permits the crank arm 33 to move through a considerable part of its arc of travel without affecting the crank arm 31 which normally rests by gravity on a ledge 41 secured to the side wall of the tank.

The connecting rod 33 comprises a block 45 which is pivotally connected to the crank arm 31 and which is threadedly engaged at its upper end by a stud 46 secured in adjusted position by a lock nut 47. The stud 46 has a head 48 which is secured to the lower end of a sleeve 49 having a threaded connection at its upper end with a cylinder 50, as shown in Fig. 2. The cylinder 50 is provided with an annular shoulder 51 adapted to engage the end of the sleeve 49 and the upper end of the sleeve has slidably mounted therein the piston 52 secured to the lower end of a piston rod 53. The piston is provided with an oil groove 54 and the shoulder 55 at the upper end thereof is adapted to engage a movable piston or cylinder 56 which is mounted to reciprocate in the upper bore 57 of the cylinder 50 and which is slidably engaged by the piston rod 53. The upper end of the cylinder 50 is externally threaded and is engaged by a cylindrical cap member 59 having an aperture 60 in the top wall thereof to receive the piston rod 53. A coil spring 61 is mounted between the top wall of the cap member 59 and the movable piston 56 so that the spring tends normally to force the member 56 downwardly against the annular shoulder 51. The movable piston 56 is provided with radial oil holes 63 and grease or other lubricant is adapted to be supplied through these holes to the contacting surfaces of the piston 56 and piston rod 53 by a pipe 64 leading from a grease cup 65 which is externally threaded and engaged by a cap member 66 capable of adjustment for forcing the grease inwardly to the bearings. The upper end of the piston rod 53 threadedly engages a block 67 and is held in adjusted position with respect to the block by a lock nut 68. The block 67 is pivoted at 69 on the crank arm 34 which is actuated from the motor 40 through the change speed gearing contained in the housing 36.

When the bottle conveyor 13 is at rest during the operation of the machine, the crank arm 31 rests on the ledge 41 with the pawl 29 resting by gravity on the ratchet wheel 28, as shown by dotted lines in Fig. 1. After the crank arm 34 has passed through the dead center position, the upward movement of this crank arm in a clockwise direction, as viewed in Fig. 1, elevates the rod 63 without, at first, effecting an upward movement of the sleeve 49, by reason of the sliding engagement of the piston 52 with the sleeve. The upward movement of the crank arm 34 without effecting movement of the crank arm 31 continues until the piston 52 engages the tubular piston 56 which is slidably mounted in the cylinder 50 and which is normally in engagement with the annular shoulder 51. When the piston 52 engages the piston 56, the spring 61 is compressed and the upward movement of the sleeve 49 with its connected crank arm 31 begins without shock to the crank arm 31 and the parts actuated thereby. The compression of the spring 61 continues until the piston 56 engages the shoulder formed on the lower end of the cap 59 so that the continued upward motion of the rod 53 continues to carry the crank arm 31 upwardly with a resulting angular motion of the ratchet wheel 28 and shaft 15, until the crank arm 34 reaches its dead center position, whereupon the crank arm 31 returns by gravity to the supporting ledge 41 in a counterclockwise direction, and the crank arm 34 continues its clockwise movement with a consequent downward movement of the piston 52 in the sleeve 49. In this way, the feeding movement of the bottle conveyor 13 takes place during a relatively small arc of the path of travel of the crank arm 34, the bottles remaining at rest during the downward travel of the crank arm 34 and also during a part of its upward movement. The inertia of the bottle conveyor with the bottles mounted thereon and immersed in the soaking solution in the tank 11, is effectually overcome by the provision of the spring 61 and the movable piston or block 56 which permit the acceleration of the sleeve 49 and the crank arm 31 without shock to the connected mechanism.

Although but one form of the invention has been illustrated, it will be understood that it may be constructed in various other embodiments within the scope of the appended claims.

I claim:

1. The combination in driving mechanism, of a driven member, and driving mechanism for said driven member comprising a connecting rod having a sleeve, a piston slidably mounted in said sleeve, a rod connected to said piston, and a spring mounted in said sleeve and adapted to be compressed after a predetermined movement of said piston in said sleeve.

2. The combination in driving mechanism, of a driven member, and driving mechanism for said driven member comprising a connecting rod having a sleeve, a piston slidably mounted in said sleeve, a rod connected to said piston, a relatively movable piston adapted to be engaged by said first-mentioned piston after a predetermined movement thereof, and a spring adapted to be

compressed by said relatively movable piston.

3. The combination in driving mechanism, of a driven member, and driving mechanism for said driven member comprising a connecting rod having a sleeve, a piston mounted in said sleeve, a piston rod connected to said piston, a cylinder mounted at the end of said sleeve, a relatively movable piston slidably mounted in said cylinder and slidably engaged by said piston rod, and a spring mounted in said cylinder to be compressed by said relatively movable piston after a predetermined movement of said first-mentioned piston in said sleeve.

4. The combination in driving mechanism of driving means, a rod pivotally attached to said driving means, a rotatable shaft, a reciprocating arm, means actuated by said reciprocating arm for rotating said shaft, a sleeve pivotally connected to said reciprocating arm, a piston connected to said first mentioned rod and slidably mounted in said sleeve, and a relatively movable piston adapted to be engaged by said first mentioned piston after a predetermined movement thereof.

5. The combination in driving mechanism of driving means, a rod pivotally attached to said driving means, a rotatable shaft, a reciprocating arm, means actuated by said reciprocating arm for rotating said shaft, a sleeve pivotally connected to said reciprocating arm, a piston connected to said first mentioned rod and slidably mounted in said sleeve, a relatively movable piston adapted to be engaged by said first mentioned piston after a predetermined movement thereof, and a coil spring adapted to be compressed by said relatively movable piston.

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