1,644,515

Oct. 4, 1927.

J. R. DOSTAL

BOTTLE WASHING MACHINE

Filed Oct. 13, 1923

5 Sheets-Sheet 1

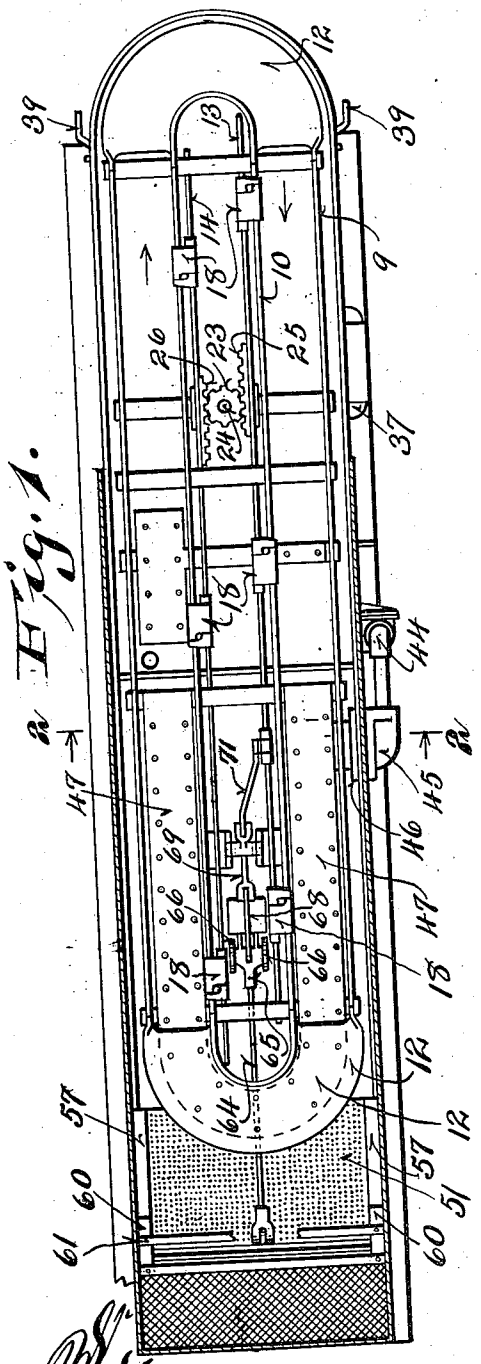


Fig. 1.

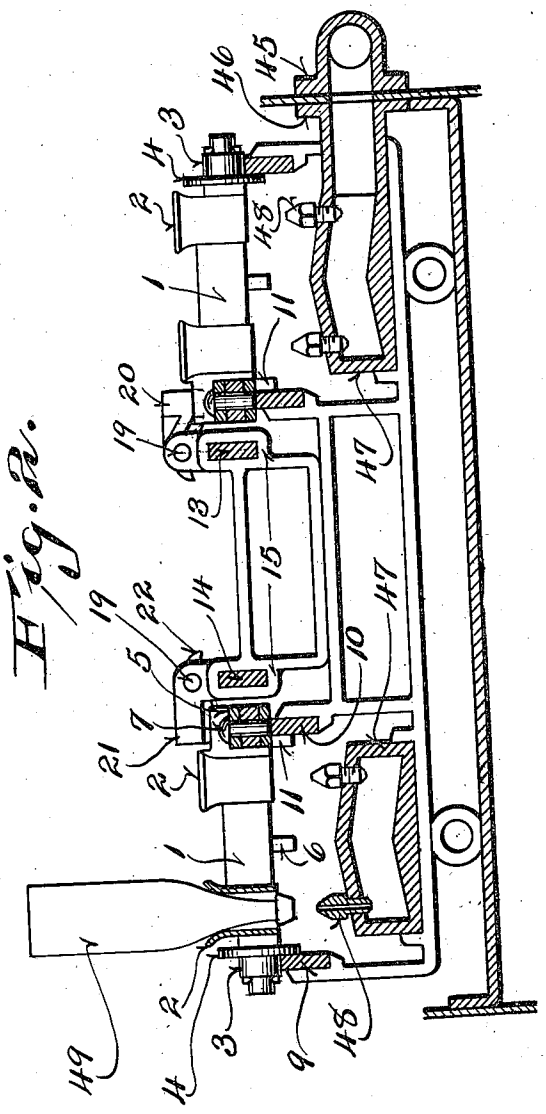


Fig. 2.

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Oct. 4, 1927. 1,644,515

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BOTTLE WASHING MACHINE

Filed Oct. 13, 1923 5 Sheets-Sheet 2

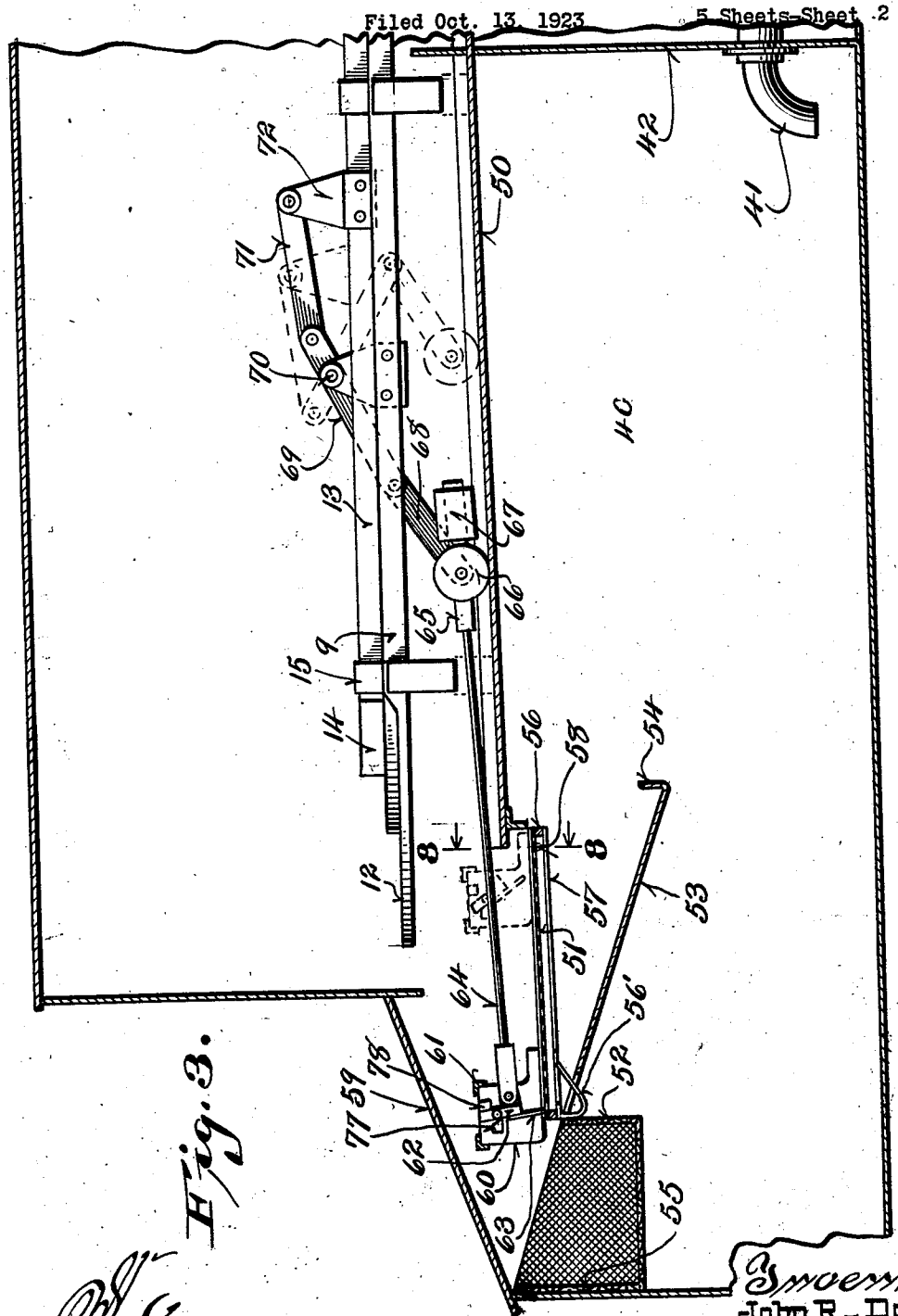


Fig. 3.

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1,644,515

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BOTTLE WASHING MACHINE

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5 Sheets-Sheet 3

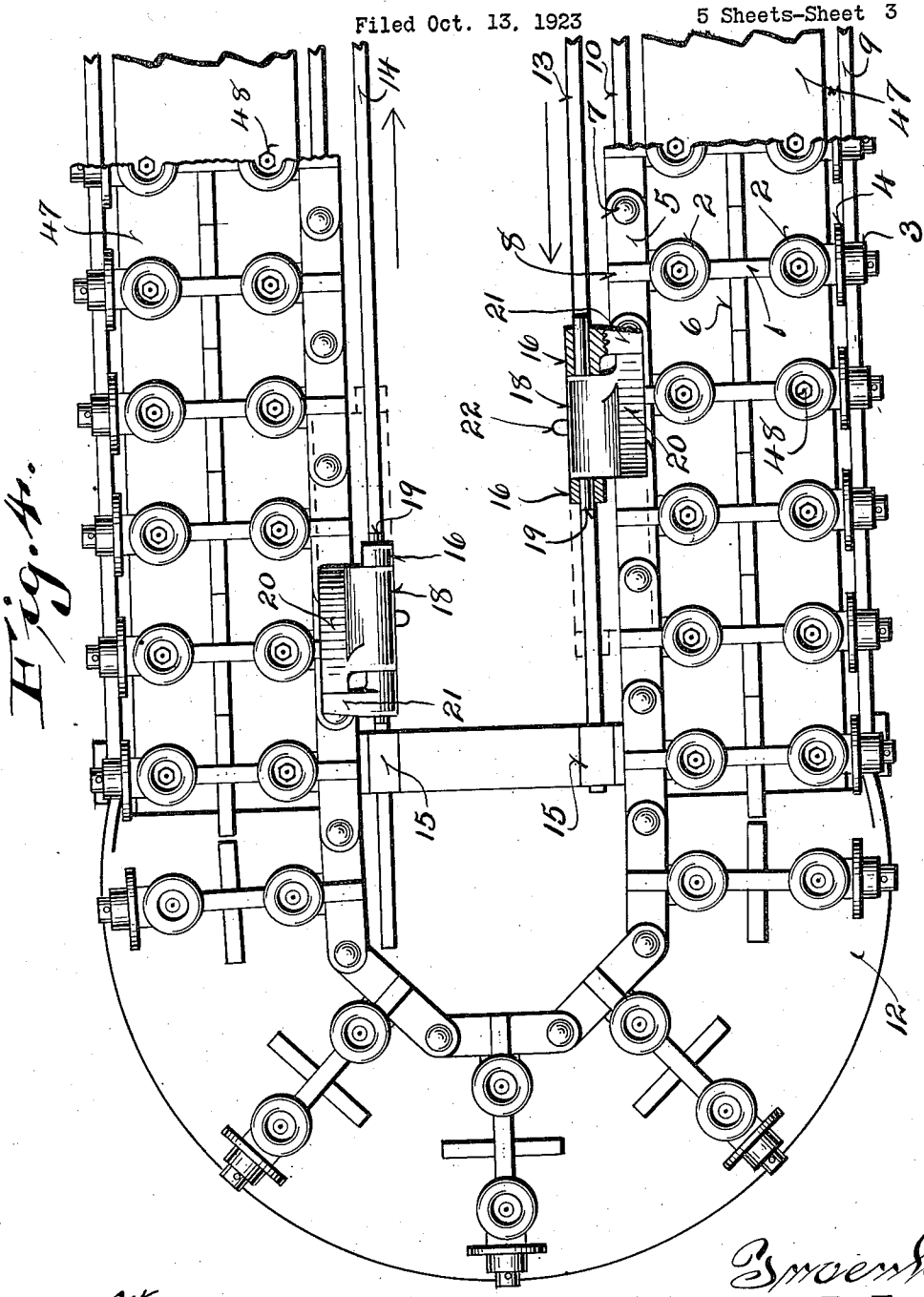


Fig. 4.

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1,644,515

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BOTTLE WASHING MACHINE

Filed Oct. 13, 1923

5 Sheets-Sheet 4

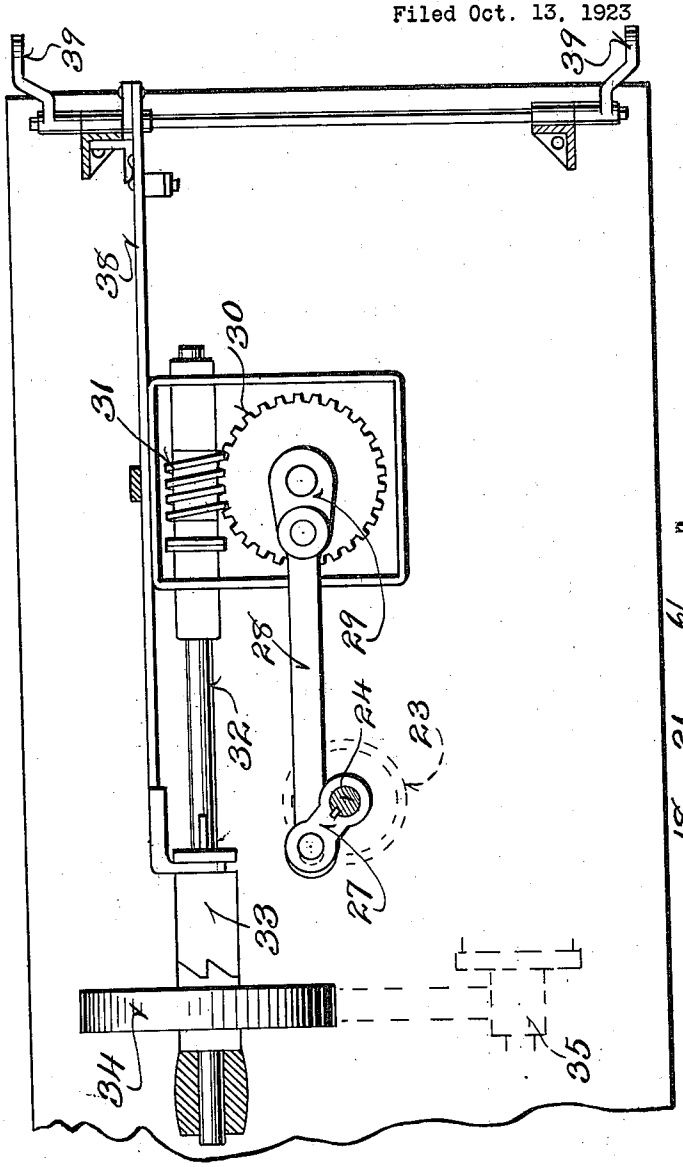


Fig. 5.

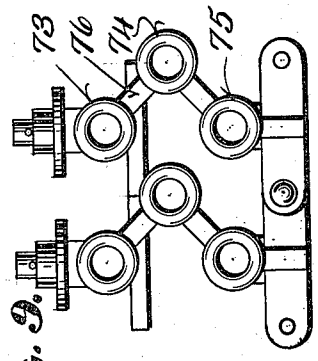


Fig. 9.

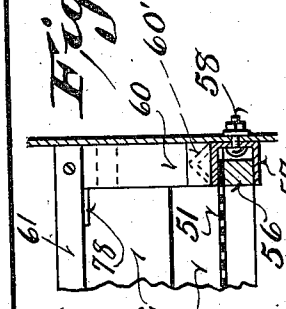


Fig. 8.

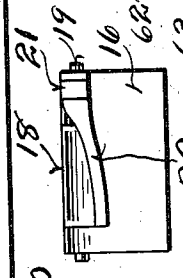


Fig. 7.

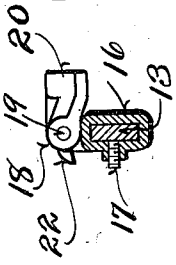


Fig. 6.

Witness
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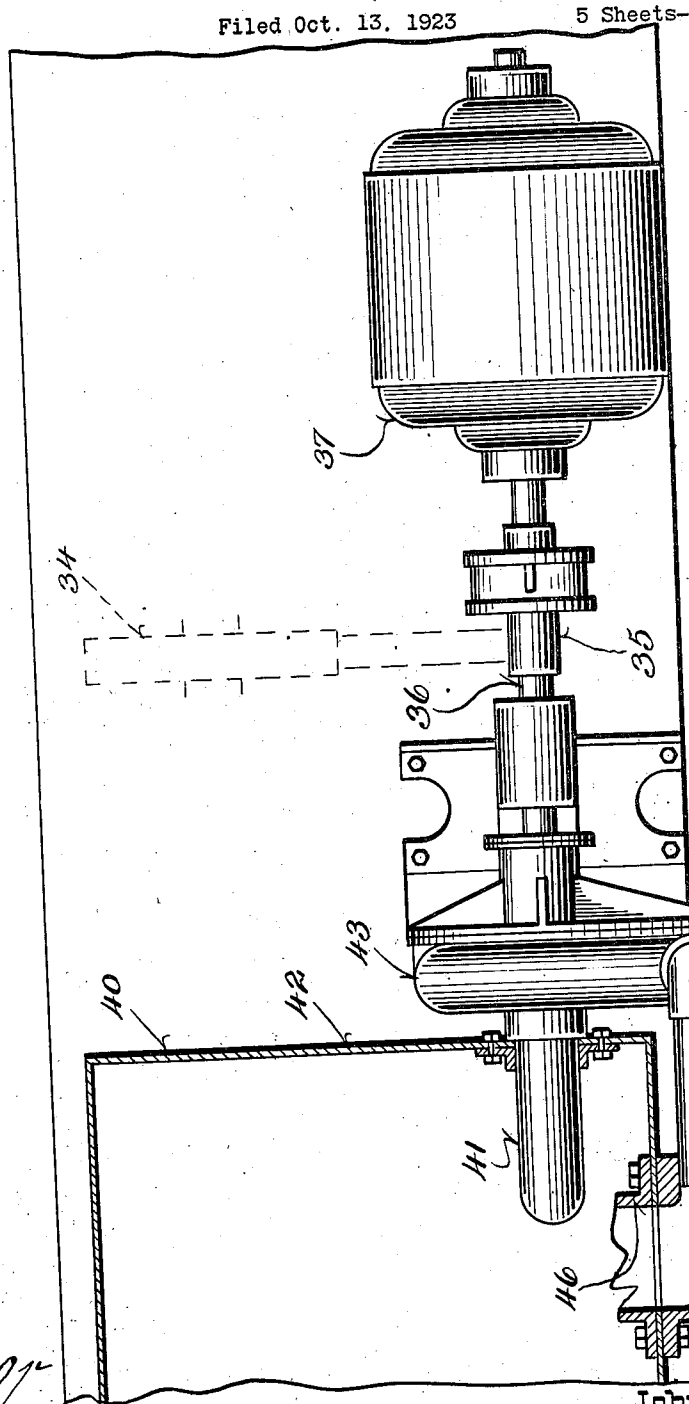
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Oct. 4, 1927. J. R. DOSTAL 1,644,515

BOTTLE WASHING MACHINE

Filed Oct. 13, 1923 5 Sheets-Sheet 5

Fig. 10.



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Patented Oct. 4, 1927. 1,644,515

UNITED STATES PATENT OFFICE.

JOHN R. DOSTAL, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO DOSTAL & LOWEY HYDRO COMPANY, INC., OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

BOTTLE-WASHING MACHINE.

Application filed October 13, 1923. Serial No. 668,352.

This invention relates to bottle washing machines.

Objects of this invention are to provide a bottle washing machine in which an endless conveyor is provided for the bottles and is given a step by step motion to advance the bottles and cause a dwell of such bottles to occur over the interior spraying means, to provide a novel feed for this type of conveyor which will engage the conveyor at a plurality of spaced points on opposite sides thereof and will simultaneously impart motion to the conveyor by force transmitted to the conveyor at these points, which will prevent binding of the conveyor at any portion thereof, and to provide mechanism for accomplishing these functions which is of sturdy, strong and simple design.

Further objects are to provide a plurality of dogs for engaging the conveyor at separate points, to provide an abutment for each of the dogs which will take the strain off of their pivotal connection with the advancing means, and to provide a construction of dogs which will not swing past dead center.

Further objects are to provide a bottle washing machine in which provision is made for collecting the labels in a suitable receptacle, in which means are provided for preventing the labels from clogging the machine and preventing the return of the cleansing liquid to the reservoir, in which accumulation of dirt in the spraying means is prevented, and in which means are provided for withdrawing the cleansing liquid from the reservoir and returning it thereto without causing undue agitation of the liquid in the reservoir.

Further objects are to provide a bottle washing machine in which the conveyor is so constructed that it will hold a plurality of bottles in closely spaced relation and will thus occupy a minimum of room.

Embodiments of the invention are shown in the accompanying drawings, in which:—

Figure 1 is a plan view of the bottle washing machine such view being partly in section and showing the machine with the conveyor removed for the sake of clearness.

Figure 2 is a fragmentary transverse sectional view such view corresponding to a section on the line 2—2 of Figure 1.

Figure 3 is an enlarged sectional elevation of the rear portion of the machine.

Figure 4 is a plan view of one end of the conveyor and the associated parts.

Figure 5 is a detail of a portion of the driving mechanism for the conveyor.

Figure 6 is an end elevation of one of the dogs showing in section a portion of one of the oscillatory bars.

Figure 7 is a side view of one of the dogs.

Figure 8 is a sectional detail showing the manner of mounting the removable screen.

Figure 9 is a fragmentary view of a portion of a further form of conveyor.

Figure 10 is a plan view partly in section of a part of the lower portion of the machine showing the motor and pump and a portion of the reservoir.

The upper spraying means for the bottles may be of any desired type and has been omitted from the drawings for the sake of clearness, as such means need not be specially constructed to cooperate with this machine and, as stated, consequently any satisfactory or usual type of upper spraying means may be employed.

The machine comprises a conveyor composed of a plurality of individual links 1 (see Figure 4) which are provided with a plurality of bottle holders 2. These links each carry at their outer ends a roller or wheel 3 provided with an inner flange 4. The inner ends of these links are provided with transverse portions 5 which are pivotally joined, as shown in Figures 2 and 4, preferably by means of interlapping lugs and pintle pins 7. These links are each provided intermediate their ends with transverse abutting arms 6 which, when the links occupy the straight portion of the raceway, are adapted to contact and to form in effect a solid straight conveyor. However, at the terminal portions, the links pivot above the pintle pins 7 and swing in a semi-circle from one straight portion to the other straight portion as clearly shown in Figure 4. Each of these links is provided with an upstanding lug or shoulder 8 which is adapted to be engaged by the driving dogs hereinafter described.

The conveyor is carried upon parallel tracks, as shown in Figure 1, upon the right and left hand side of the machine. Each of the tracks comprises an outer rail 9 upon which the rollers 3 are adapted to travel, and an inner rail 10 upon which the inner

portions of the links are adapted to slide, such inner portions being provided with downwardly extending lugs 11 (see Figure 2) which, together with the inner flange 4 of the rollers correctly position the links. The outer rail terminates adjacent the ends of the machine, as shown in Figure 1, and a pair of flat semi-circular portions 12 are provided and are adapted to support the flanges 4 of the rollers while the links make these half turns.

The feeding mechanism for the conveyor comprises a pair of oscillatory rods 13 and 14 mounted inside of and paralleling the straight portions of the race-way, as shown in Figures 1, 2 and 4. These rods are carried in suitable guides 15 carried by the frame work of the machine and, as stated, are given an oscillatory motion in opposite directions. Each of the rods carries a plurality of members 16 which are secured thereto by means of set screw 17 (see Figures 4, 6 and 7). Each of the members 16 carries a dog which is provided with a hub portion 18 secured to the upstanding ears of the member 16 by means of a pintle pin 19. The dogs are each provided with an outwardly projecting portion 20 which, as shown in Figures 6 and 7, gradually slants upwardly towards one end. Adjacent this end of the dogs, the members 16 are provided with abutments 21 which are adapted to contact with the outwardly projecting portions 20 and to thus relieve the pintle pins 19 of the major portion of the stresses. The dogs are each provided with an inwardly projecting ear 22, which, as may be seen from Figure 6, is adapted to engage the portion 16 and to prevent the dog from being rocked past dead center. The inclined portions 20 of the dogs are adapted to ride over the lugs 8 of the links of the conveyor and the dogs upon the reverse motion of the rods 13 and 14, are adapted to engage such ears 8 and to advance the conveyor in a step by step manner. It is to be noted from Figure 1 that a plurality of dogs are provided for each of the straight stretches and that binding of the conveyor at any portions of the straight stretches or at their ends is prevented by this construction and by this adequate distribution of driving force.

In bottle washing machines as heretofore constructed, difficulty has been experienced due to the unequal corresponding motions of the oscillatory rods at different points in their travel. This defective operation is wholly avoided by the particular driving means now to be described. This driving means comprises a pinion 23 (see Figure 1) which is rigidly secured to a vertical shaft 24 and meshes with racks 25 and 26 carried by the rods 13 and 14, respectively. The shaft 24 is given a rocking or partial rotary motion by means of a crank 27 secured thereto, as shown in Figure 5, and operated by means of a pitman 28. This pitman is connected to a smaller rotary crank 29 which is driven by means of a worm wheel 30 and worm 31. The worm 31 is rigidly secured to a horizontal shaft 32 which, by means of a clutch 33, is driven from the pulley 34. This pulley may be belted to any suitable source of power, for instance to a small pulley 35 shown in dotted lines in Figure 5 and carried upon the shaft 36 (see Figure 10) directly driven by an electric motor 37. The clutch 33 is adapted to be operated in any convenient manner as by means of a link 38 operatively controlled by oscillatory arms 39 projecting outwardly upon each side of the machine adjacent the forward end thereof.

The feeding mechanism, it will be seen, transforms the rapid rotary motion of the motor into a rocking motion of the pinion 23 and this pinion transmits reciprocatory motion to the longitudinally extending bars 13 and 14 through the medium of the racks 25 and 26. It is to be noted that displacement of the rods 13 and 14 from their neutral or middle position is in opposite directions and is at all times exactly equal so that no binding of the conveyor will occur at any point in its length.

The washing system for the machine comprises a reservoir 40 located in the lower portion of the rear part of the machine, as shown in Figures 3 and 10. This reservoir is provided with a downwardly turned outlet pipe 41 which passes through the front vertical partition 42 of the reservoir and into the inlet portion of the centrifugal pump 43. This pump is directly connected to the electric motor 37, as shown in Figure 10, and it is to be noted that the pump and motor are set within the outline of the machine and thus do not require additional width for the machine. The outlet portion 44 of the pump communicates with a fitting 45, such fitting being bolted through the side walls of the machine to the inlet fitting 46 of the lower header 47, as shown in Figures 1 and 10. The header 47 is provided with a plurality of upwardly directed nozzles 48 (see Figure 2) which projects streams of water upwardly into the inverted mouths of the bottles 49. It is to be noted from Figure 1 that this header is substantially U-shaped and that the water or other cleansing liquid is passed into the header by means of the pump at one end thereof and sweeps continually around the header thus carrying with it, and discharging from point to point, any dirt that may be carried by the water, and by this action, thus preventing the formation of quiet places in the header with the consequent depositing of sediment at these points. As previously stated, an up-

per header or spraying means is also provided but is not shown in the drawings as this upper spraying means may be of any usual or accepted type.

The waste water from the machine flows along the rearwardly slanting partition 50 (see Figure 3) and discharges on to a screen 51 (see Figures 1 and 3). This screen is tilted downwardly towards the rear and any liquid or material which is not passed through the apertures in the screen is discharged into a wire basket 52 which is removably held at the rear of the machine. Immediately below the screen a forwardly and downwardly slanting deflector plate 53 is provided and is equipped with an upturning ledge 54 at its lowest end. This plate provides a sheet-like stream of returning water and the ledge prevents the stream from acquiring such velocity as to stir up the liquid in the reservoir 40 but allows the liquid to flow into the reservoir with its velocity materially reduced. It is necessary, as shown in Figure 3, to provide a basket with a high rear wall 55 so as to insure the retention of any material washed downwardly from the screen 51. It thus becomes necessary to provide additional means for permitting the ready removal of the screen. As may be seen from Figures 3 and 8, the screen 51 is carried by a reenforcing frame work 56 which is slidably carried within side channels 57 pivoted, as indicated at 58, to the side walls of the machine. In this way, the screen may be readily removed by rocking the channels 57 upwardly until the line of such channels is above the rear of the basket 55 and of the adjacent portion of the machine. When in this position, the screen may be readily slipped from the channels and may be cleaned,—of course, it is understood that the flap or cover 59 at the rear portion of the machine (see Figure 3) is readily removable to provide access to this portion of the apparatus. If desired a spring latch 56′ may be carried by the frame 56 and contact with the basket 52.

It frequently happens that in bottle washing machines the labels clog any screen mechanism that may be provided. This defect in the operation of the machines, as heretofore constructed, is wholly overcome in the practice of this invention by providing a wiper adapted to travel back and forth across the screen, and to wipe the labels rearwardly therefrom. This wiper consists of a pair of side members 60 adapted to travel upon the channel members 57, as shown in Figures 1, 3 and 8. These side members are connected by transversely extending bars 61, so that, in effect, a crosshead is formed. A flap consisting of a main body portion 62 and a rubber or other strip 63 (see Figure 3) is pivotally mounted adjacent its upper edge between the end member 60. The body portion 62 of this flap is hinged to the outer end of a pitman 64. The inner end of this pitman is pivotally carried by a small truck 65 provided with wheels 66 which travel upon the partition 50. The forward end of this pitman is provided with a counterbalance 67 so that the rear end of the pitman does not press downwardly upon the pivotal joint with the flap 62. This truck is connected by means of a short link 68 (see Figure 3) with the lower end of a level 69 which is pivotally carried, as is indicated at 70, by a stationary portion of the machine body. The upper end of the lever 69 is connected by means of a link 71 with a bracket 72 rigidly secured to one of the oscillatory rods, for instance the rod 13.

It will be seen, therefore, that as the rod 13 reciprocates, the lever 69 will be rocked back and forth between its full line and dotted line positions, indicated in Figure 3, and consequently the pitman 64 will be drawn back and forth. When the pitman is drawn inwardly the flap 62 is raised by rocking it about its pivoted point, as indicated in dotted lines in Figure 3, thus causing its upper end to contact with the stop 77. Thus while the cross head is being retracted, the flap is in elevated position and does not draw the labels or trash inwardly along the screen 51. However, when outward motion is imparted to the pitman, the flap is immediately rocked downwardly and its rubber or other lip 63 wipes outwardly across the screen 51 and thus wipes or pushes the labels and other trash from the screen into the basket 52. When the flap is rocked downwardly into its full line position, its upper end contacts with the stop 78 thus preventing further rocking motion of the flap. In this way clogging of the screen mechanism is wholly avoided by this invention.

The modified form of link for the conveyor is illustrated in Figure 9 of the drawings. From this figure it will be seen that three bottle holders, indicated at 73, 74 and 75, are provided and are arranged at the apexes of a triangle. These bottle holders are joined by diagonally extending connecting bars 76 which form an integral portion of the links. Otherwise the links illustrated in Figure 9 are similar to those previously described. It is to be noted from this last described construction that three bottles may be held by each link without increasing the width of the link over that necessary for holding two bottles.

It will thus be seen that a bottle washing machine has been provided in which uniform motion is given opposite portions of the conveyor at widely spaced points. It will further be seen that all strains tending to cramp or bind the conveyor are thus avoided and that a smooth and regular operation of the machine results. It will further be seen

that by the peculiar construction of dog and the supporting structures therefor, that stresses are primarily borne by the abutment and are not transmitted to the pintle pins of the dogs. It is to be noted also in connection with these dogs that there is no danger of their being thrown upwardly beyond dead center.

It will be further seen that all possibility of clogging of the machine has been avoided and that a free flow of cleansing liquid is insured.

It may be found advantageous to provide a track for the crosshead 60 to slide upon. This may be readily accomplished by securing inverted V-shaped rails 60′ to the upper side of the channels 57 as shown in dotted lines in Figure 8.

It is to be particularly noted that the construction of this machine is such that a minimum of width is required and that the machine as a whole is self-contained.

Although a few forms of the invention have been described in considerable detail, it is to be understood that the invention may be variously embodied and is, therefore, to be limited only as claimed.

I claim:

1. In a bottle washing machine, the combination of a closed track, a conveyor for holding bottles adapted to travel upon said track, a pinion having an oscillatory crank rigid therewith, a pair of racks meshing with said pinion, means for operatively intermittently connecting said racks with said conveyor, a worm driven rotary crank, and a pitman connecting said cranks.

2. In a bottle washing machine, the combination of a closed track having a pair of opposed straight stretches, a conveyor for holding bottles adapted to travel upon said track, a pair of oscillatory rods mounted parallel to, and adjacent, the straight stretches of said track, means for oscillating said rods in opposite directions with equal displacements at all positions, and means carried by each of said rods for intermittently engaging said conveyor.

3. In a bottle washing machine, the combination of a closed track having a pair of opposed straight stretches, a link conveyor for holding bottles adapted to travel upon said track, a pair of oscillatory rods mounted parallel to, and adjacent, the straight stretches of said track, means for oscillating said rods in opposite directions with equal displacements at all positions, and means carried by each of said rods for intermittently engaging said conveyor at a plurality of widely spaced points.

4. In a bottle washing machine, the combination of a closed track, a link conveyor for holding bottles adapted to travel upon said track, a pinion, means for oscillating said pinion, a pair of racks engaging said pinion, and means for intermittently operatively coupling said racks with opposite sides of said conveyor.

5. In a bottle washing machine, the combination of a closed track having a pair of opposed straight stretches, a link conveyor for holding bottles adapted to travel upon said track, a pinion, means for oscillating said pinion, a pair of rods mounted parallel to said straight stretches, a pair of racks meshing with said pinion and carried by said rods, and means carried by said rods for intermittently engaging said conveyor.

6. In a bottle washing machine, the combination of a closed track having a pair of opposed straight stretches, a link conveyor for holding bottles adapted to travel upon said track, a pinion, means for oscillating said pinion, a pair of rods mounted parallel to said straight stretches, a pair of racks meshing with said pinion and carried by each of said rods, and means carried by each of said rods for intermittently engaging said conveyor at a plurality of widely spaced points.

7. In a bottle washing machine, the combination of a closed track having parallel opposed straight stretches, a conveyor adapted to travel along said track and having a plurality of links provided with lugs and with bottle holders, a pair of rods mounted parallel to, and adjacent, the straight stretches of said track, a plurality of dogs carried by each rod and adapted to intermittently simultaneously engage said lugs, a rack carried by each rod, a pinion meshing with said racks, and means for oscillating said pinion.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin.

JOHN R. DOSTAL.