Nov. 8, 1927. 1,648,743

W. C. SHEFFIELD

BOTTLE WASHING MACHINE

Filed July 11, 1925 4 Sheets-Sheet 1

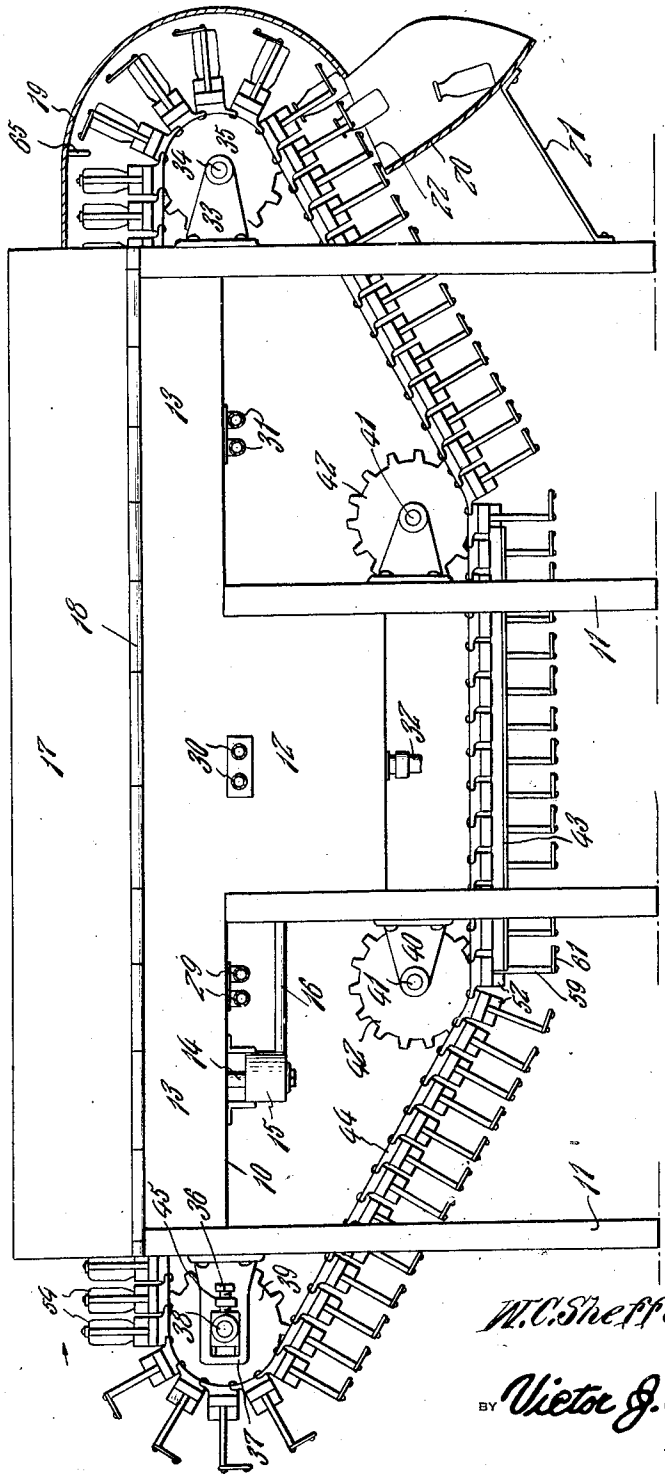


Fig. 1.

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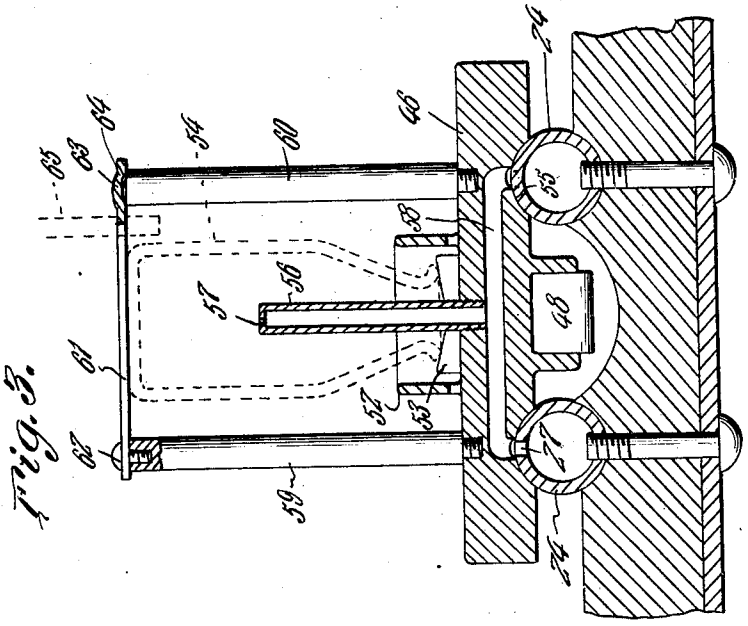


Fig. 5.

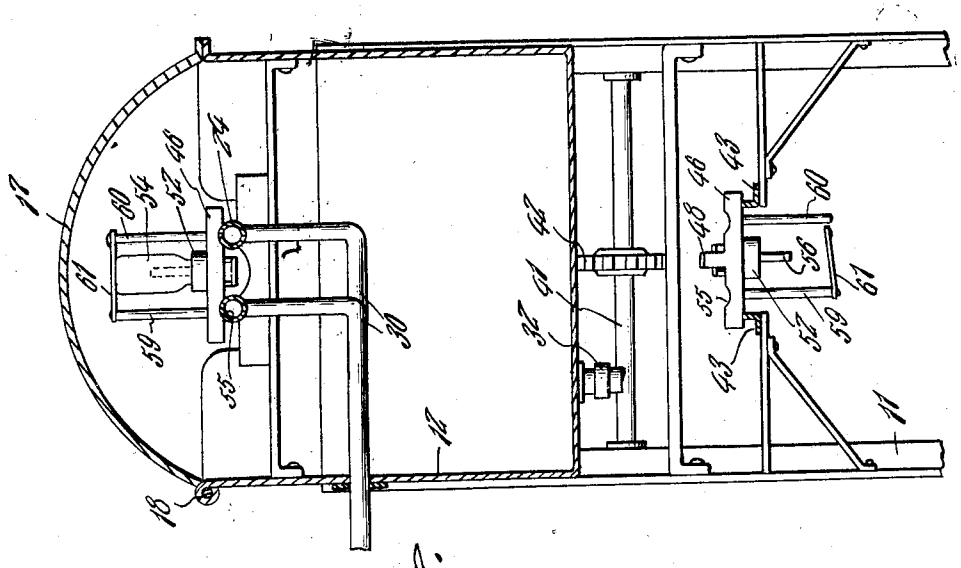


Fig. 6.

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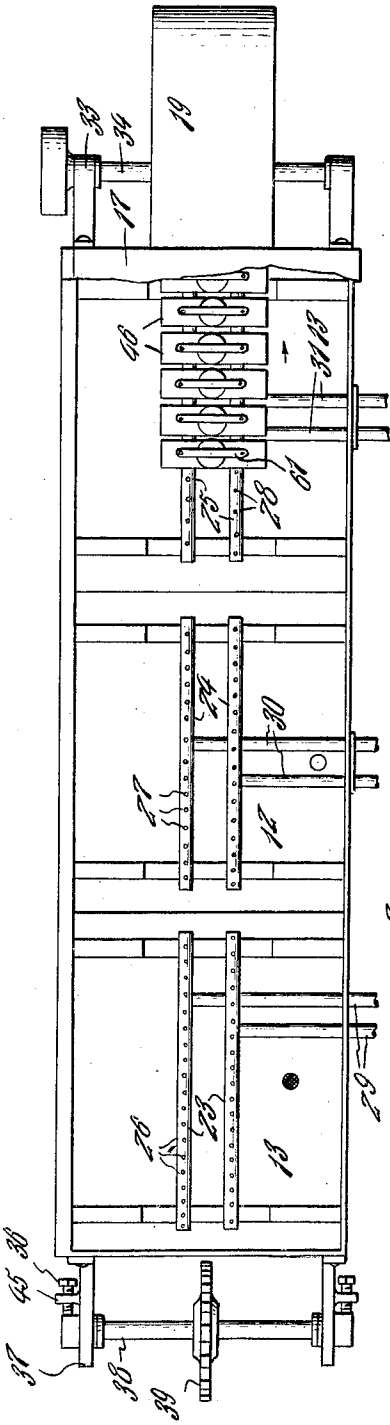


Fig. 4.

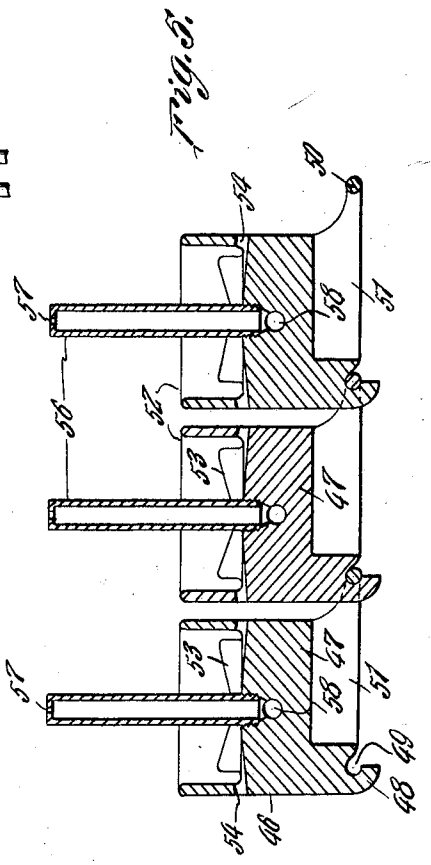


Fig. 5.

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BOTTLE WASHING MACHINE

Filed July 11, 1925 4 Sheets-Sheet 4

Fig. 6.

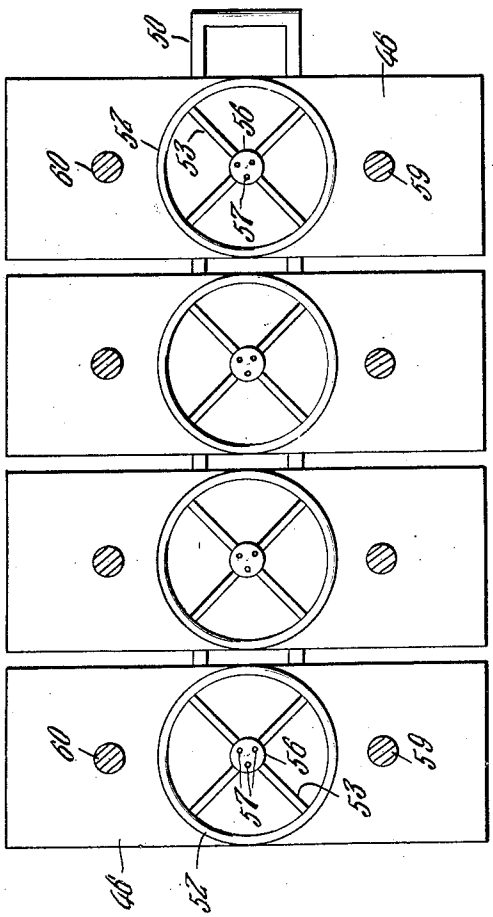
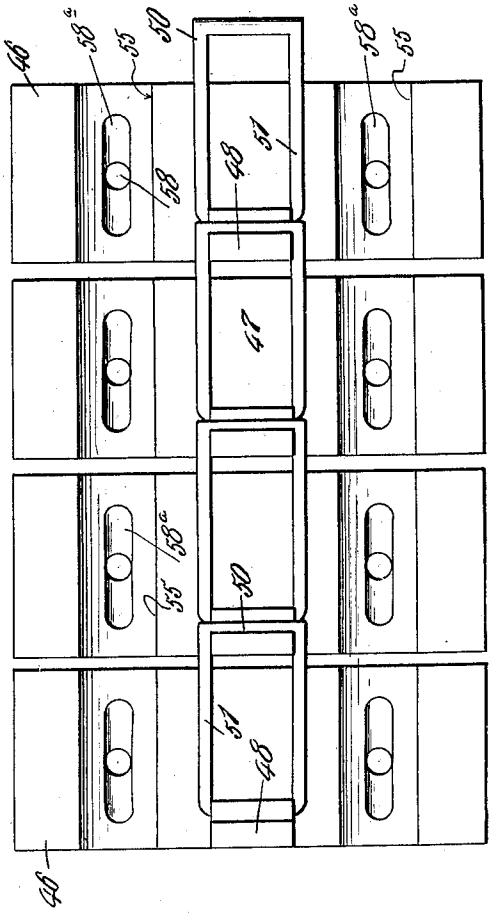


Fig. 7.



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Patented Nov. 8, 1927. 1,648,743

UNITED STATES PATENT OFFICE.

WALTER C. SHEFFIELD, OF BAINBRIDGE, GEORGIA.

BOTTLE-WASHING MACHINE.

Application filed July 11, 1925. Serial No. 42,914.

This invention relates to bottle cleaning machines and has for its object the provision of a novel machine by means of which bottles may be interiorly cleaned by means of a suitable solution or the like and subsequently rinsed whereby any accumulation of dirt or other matter therein will be effectually removed and the bottles placed in sanitary condition fit for use for any desired purpose.

An important object is the provision of a machine of this character embodying means whereby a plurality of bottles may be carried over means for supplying streams or jets of solution or water into them for the purpose of effecting the desired action.

Another object is the provision of a novel arrangement of endless carrier provided with means for supporting the bottles in inverted position and provided with other means acting automatically to supply a continuous flow of water or other liquid into the bottles for cleaning them, a peculiar and novel mechanism being provided for insuring a proper flow of the liquid at all times.

Yet another object is the provision of a device of this character in which the bottle carrier is provided with spring retaining means for holding the bottles in place above the nozzles provided for the purpose of permitting injection of water into the bottles, means being also provided at a certain point in the travel of the carrier for automatically releasing the spring retaining means and permitting the bottles to drop out onto a delivery chute.

Still another object is the provision of a machine of this character embodying a carrier formed of flexibly connected sections of peculiar construction, each of which is equipped with bottle holding means and a nozzle device together with drain means so that the liquid forced into the bottles may drain back into a collecting pan and be subsequently returned to a supply tank or the like for repeated use.

The invention further contemplates the provision of various details of construction and arrangement whereby the cost of manufacture will be reduced to the minimum while at the same time the efficiency of operation and durability in service will be greatly increased.

With the above and other objects and advantages in view, the invention may consist in the details of construction and the arrangement and combination of parts to be hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of the complete machine the delivery chute structure being shown in section.

Figure 2 is a vertical cross section.

Figure 3 is a detail cross section through the water header or supply pipe and one of the bottle carriers in operative position thereon.

Figure 4 is a plan view.

Figure 5 is a detail longitudinal section taken through the endless carrier.

Figure 6 is a top plan view thereof, and

Figure 7 is a bottom plan view thereof.

Referring more particularly to the drawings, the numeral 10 designates, generally, a suitable supporting frame which is preferably mounted upon legs 11 and which may be of any desired size, shape and construction depending upon the intended size of the completed machine and also depending upon the taste of the individual manufacturer. Mounted within the central portion of this frame is a suitable tank 12 adapted to contain some cleansing solution, and mounted outwardly of this tank are pans 13. Obviously, if such should be preferred, the pans and the tank might be constructed all in one or they may be in free communication although in the present instance I have shown the first pan 13 as equipped with a drain pipe 14 leading to a suitable strainer 15, not shown in detail, from which leads a pipe 16 emptying into the tank 12. Any suitable means may be provided for admitting the cleansing solution into the tank 12.

Movably mounted upon the frame or upon the upper edges of the tanks and pans is a hood or shield 17 here shown as hinged at 18 though obviously it might be mounted in some other manner. Any desired means may be provided for securing the hood in place though it is probable that gravity alone would be sufficient for this purpose. Mounted at one end of the frame of the machine is a guide or guard 19 of curved shape leading to a delivery chute 20 which is preferably braced by means of a bar 21 or the like. Obviously, the guard 19 must be provided with an opening 22 to permit communication between its interior and the delivery chute.

Suitably mounted within the frame and

above the pans and tank 13 and 12 respectively, are spaced parallel pairs of header pipes 23, 24 and 25 which are intended to be turned in a lathe or otherwise treated so as to have a smooth exterior permitting sliding thereon of certain carrier mechanisms to be described. The header pipes in each pair are closed at their ends and throughout their lengths they are provided with rows of perforations indicated at 26, 27 and 28. Connected with the pipes 23 are supply pipes 29, connected with the pipes 24 are similar supply pipes 30 and connected with the pipes 25 are other supply pipes 31. All of these supply pipes are adapted to be connected with a suitable source of liquid, such as water, under pressure, and if preferred a pump mechanism might be provided for maintaining a high pressure, though this pump mechanism is not illustrated as it really forms no part of the present invention. If the tank 12 be used for supplying a cleansing solution to any or all of the pipes, instead of plain water, it is quite obvious that a suitable force pump must be used to effect proper circulation of the liquid. It should be mentioned in passing that the tank 12 is preferably provided with a suitable drain 32 whereby the entire system may be emptied when desired.

Mounted at the rear end of the frame are suitable bearings 33 for a shaft 34 carrying a sprocket 35, and similarly mounted at the forward end of the frame are slotted brackets 36 within which are slidable bearing members 37 carrying a shaft 38 on which is a sprocket 39. Mounted on the outer side of the innermost legs 11 are bearing brackets 40 for shafts 41 equipped with sprockets 42. Mounted between the innermost legs 11 are guide rails 43 held in place by any desired means. Trained about these four sprockets is an endless carrier designated broadly by the numeral 44, this carrier also engaging upon the guard or guide rails 43 so as to prevent it from displacement at its lower stretch. Any suitable tightening means indicated at 45 may be provided in connection with the slidable bearings 37 for adjusting the tension of the carrier and holding it sufficiently taut that slackness will be prevented.

The endless carrier consists of a plurality of similar links 46 each of which is formed as a body 47 provided at one edge with an extension 48 having a notch 49 therein and provided at its opposite edge with an extension 50. Connecting the extensions 48 and 50 are webs 51 forming a socket adapted to receive and engage a sprocket tooth, the arrangement of the successive elements being such that they will all be engaged by the successive teeth on the sprockets. Power may be applied to any one of the shafts for the purpose of moving the carrier. Each member 46 is formed at its upper side with a cup-like portion 52 located at the center and formed in its bottom with a plurality of radial webs 53 which are preferably inclined as shown to serve as centering means for bottles 54 to be washed by the machine. Each member 46 is provided with a plurality of drain holes 54. The body members 47 may be said to be of block like formation and at their under sides they are grooved or concaved as indicated at 55 so as to slide upon the pairs of header pipes 23, 24 and 25 during the travel of the carrier throughout the length of the machine. Rising centrally of each cup member 52 is a tubular nozzle 56 having its outer end closed except for one or more perforations 57 provided for the escape of liquid used in cleansing the bottle. Formed transversely through each member 47 is a channel or passage 58 communicating at its central point with the nozzle 56 and having its ends leading into grooves 58[a] the concavities or grooves 55 so as to register with the successive holes or perforations 26, 27 and 28 in the header pipes 23, 24 and 25. It will be observed that the perforations in the different pipes of each pair are in staggered relation so that by the time one end of the passage 58 has passed over and out of communication with the perforation in one pipe the other end thereof will have reached the point where it will be in communication with the corresponding or next perforation in the adjacent pipe, thus insuring a constant flow of liquid to the nozzle members.

Bottles to be cleaned are placed in inverted position upon the nozzle 56 at the forward or left end of the machine and while it is possible that they might be retained in position with sufficient firmness, it is preferable to make use of some holding means which will urge the bottles resiliently into engagement with the centering webs 53 at the bottom of the cup members 52. In carrying out this feature I may provide a pair of upstanding posts or rods 59 and 60 suitably mounted on the end portions of each member 47 and normally bridged by an elongated leaf spring 61 pivoted at 62 upon the post 59 and having its other end formed with a depression 63 adapted to receive a rounded projection 64 on the outer or free end of the post 60 so that the spring member will be held in place against accidental movement. In Figure 3 I have illustrated in detail the position of a bottle mounted with its neck or mouth portion within the cup 52 in engagement with the webs 53 therein and with its bottom engaged by the resilient member 61. Obviously, when the parts are so arranged the bottle will be urged resiliently against the webs 53 and cannot rock or become otherwise displaced. This is of great importance

inasmuch as the pressure of the liquid issuing from the hole or holes 57 will then not be able to dislodge the bottle. It is preferable to provide a trip 65 at the right or rear end of the machine, which trip is so positioned as to be engaged by the successive spring members 61 during the travel of the endless carrier so that the spring members will be swung out of engagement with the post 60 so that the bottles will be freed and permitted to slide off from the nozzle members upon reaching the delivery chute 20.

In the operation of the device, let it be assumed that power is applied to one of the shafts for the purpose of moving the endless carrier and let it also be assumed that liquid under pressure is supplied through the pipes 29, 30 and 31 to the pairs of header pipes 23, 24 and 25. An operator standing at the left or forward end of the machine places the soiled bottles in inverted position upon the nozzles 56 as they are moved upwardly and passed around with the links or members 47. The operator also swings the leaf spring members 61 to engage the recessed ends 63 thereof with the ends 64 of the posts 60 in order that the bottles will be firmly held in place. As the bottles are carried along by the carrier they will pass through the hood 17 and as they pass over the successive pairs of header pipes 23, 24 and 25, it is quite clear that the liquid issuing from the perforations therein will pass into the channel members or passages 58 in the blocks or links 47 and out through the hole or holes 57 in the nozzles 56, the water or other liquid impinging against the inside of the bottles and thoroughly cleansing them. In case a solution is used instead of plain water, it is apparent that the liquid draining out of the bottles through the holes 54 in the members 47 will be caught in the pans 13 and will pass into and through the strainer 15 into the tank 12 for repeated use. In case plain water is used it is obvious that there is no necessity for using it over and over as it may be discarded, the pipe 32 being provided for the purpose of permitting the draining away. By the time the bottles have passed entirely through the hood 17 and subjected to the action of the water, solutions or the like issuing from the holes or perforations in the three sets of header pipes it is quite clear that the bottles will be clean and fit for subsequent use. Upon reaching the rear end of the machine the spring members 61 will engage against the trip 65 and be swung into released position out of obstructing relation to the bottles so that as the links of the carrier pass around the sprocket 35 the bottles will slide down the nozzle 56 and be deposited onto the delivery chute 20.

From the foregoing description and a study of the drawings it will be readily apparent that I have thus provided a simply constructed, comparatively inexpensive and very efficient machine for the purpose specified. It is believed that the construction, operation and advantages will be readily apparent to one skilled in the art without further elaboration.

While I have shown and described the preferred embodiment of the invention, it should be understood that I reserve the right to make such changes in the form, construction and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:

1. In a machine of the character described, a supporting frame, a tank mounted within the frame, pans mounted within the frame adjacent the tank and having restricted communication therewith, guide members located at different points on the frame, an endless carrier trained about said guide members and including a plurality of pivotally connected links, each carrying a nozzle and bottle retaining means, a plurality of pairs of header pipes mounted in the frame above the pans and traveled over by the links of the carrier, the carrier links having passages communicating with the nozzle and leading to the undersides, and the header pipes being formed with holes with which said passages will communicate.

2. In a bottle washing machine, a pair of rigidly supported header pipes, each provided in its uppermost portion with a plurality of perforations, and an endless carrier movable over said header pipes and including a plurality of pivotally connected links, a block member extending transversely with respect to each link and grooved at its underside for conforming and sliding engagement upon the header pipes, the block being provided centrally of its upper surface with an upstanding tubular nozzle and being formed with an elongated transversely extending passage communicating with the nozzle and leading at its ends into the grooves slidable along the header pipes for establishing communication between the perforations of the header pipes and the nozzle, an upstanding cup-like member on the top of each body member arranged in concentric relation to the nozzle and adapted to receive the mouth of a bottle to be cleaned, the cup member having openings in its sides permitting outflow of water.

3. In a machine of the character described, an endless carrier formed of a plurality of pivotally connected links, each consisting of a body formed at its top with a cup provided at its bottom with centering means, a nozzle carried by the body at the center of the cup, the body having a passage therethrough communicating with the nozzle, means for supplying liquid under pressure into the pas-

sage, said means comprising header pipes formed with holes and supplied with liquid under pressure, the links being grooved and slidable along the header pipes, the ends of the passages leading into the grooves for registration with the successive holes in the header pipes.

4. In a bottle cleaning machine, a pair of header pipes perforated throughout their lengths and supplied with liquid under pressure, an endless carrier formed of pivotally connected links grooved for sliding movement along the header pipes, each link carrying bottle holding means and a nozzle and being formed with a passage communicating with the nozzle and leading into the grooves for registration with the successive holes in the header pipes.

5. In a machine of the character described, an endless bottle carrier formed of a plurality of pivotally connected links, each formed as a body carrying a cup element and guide means at the bottom thereof, a nozzle rising from the body and at the center of the cup member, means for supplying liquid under pressure to the nozzle, and bottle retaining means mounted on each link and engaging the bottom of an inverted bottle for holding the bottle over the nozzle with its mouth engaged upon the guide means.

6. In a machine of the character described, an endless bottle carrier formed of a plurality of pivotally connected links, each formed as a body formed with a passage and carrying a cup element on its top and guide means at its bottom, a nozzle rising from the body in communication with the passage and located at the center of the cup member, means for supplying liquid under pressure to the nozzle, and bottle retaining means mounted on each link for holding the bottle in inverted position over the nozzle with its mouth engaged upon the guide means, said holding means comprising a pair of upstanding posts at opposite sides of the cup member and a leaf spring pivoted upon one post and detachably engageable with the other.

7. In a machine of the character described, a plurality of pairs of perforated header pipes, a frame structure supporting the pipes, an endless bottle carrier formed of a plurality of pivotally connected links formed as block members mounted to slide along the header pipes, means for supplying different liquids or solutions to the different header pipes, a nozzle carried by each block member, bottle holding means carried by each block and including a pivoted arm engageable over the bottom of an inverted bottle, the block members being formed with means for establishing communication between the nozzles and the perforated header pipes during travel of the carrier, a delivery chute at the rear end of the machine, and means at said rear end engageable by the bottle retaining means for effecting swinging thereof out of engagement with the bottle.

In testimony whereof I affix my signature.

WALTER C. SHEFFIELD.