

Feb. 13, 1923.

1,445,359.

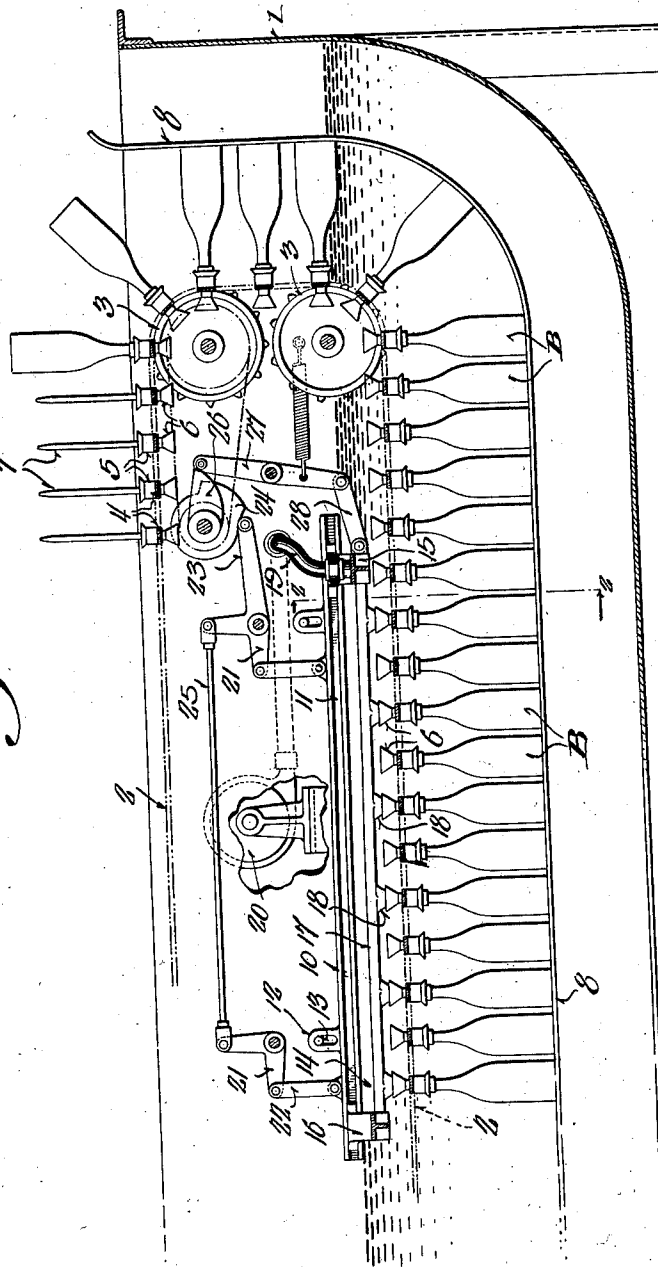
H. SCARBOROUGH ET AL.

APPARATUS FOR CLEANING BOTTLES AND LIKE CONTAINERS.

FILED SEPT 16, 1919.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESS:

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2 SHEETS—SHEET 2.

*Fig. 5.*

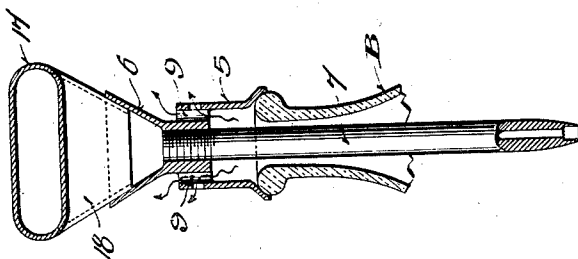
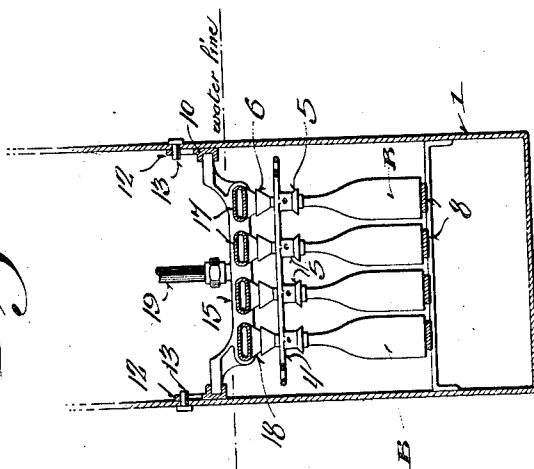


*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

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DOSTAL ASSIGNOR TO SAID SCARBOROUGH.

APPARATUS FOR CLEANING BOTTLES AND LIKE CONTAINERS.

Application filed September 16, 1919. Serial No. 324,080.

*To all whom it may concern:*

Be it known that we, HENRY SCARBOROUGH and JOHN R. DOSTAL, citizens of the United States, and residents of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Apparatus for Cleaning Bottles and like Containers; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to new and useful improvements in means for cleansing bottles and the like by thoroughly soaking and rinsing the same.

The primary object of the invention is to improve the standard or well known means of cleansing bottles, and in arriving at this desired result, the applicants have devised an arrangement whereby the bottles may be successively filled with a cleansing solution and emptied. In removing such solution the same is thoroughly agitated by means of compressed air or other gaseous fluid. Furthermore the agitation and expulsion of the internal washing solution is carried out while the bottles or the like are submerged in an exterior cleansing liquid.

With this primary object in view, as well as other minor objects which will become apparent as the description proceeds, the invention resides in the novel feature of construction, combination and arrangement of parts which will be hereinafter more particularly described and claimed.

In the accompanying drawings:

Figure 1 represents a vertical longitudinal sectional view through one end portion of a bottle cleaning machine constructed in accordance with our invention.

Figure 2 is a vertical transverse section taken on the plane of the line 2-2 of Figure 1, and

Figure 3 is an enlarged detail vertical sectional view through one end of a bottle and the means used for injecting air thereinto.

In the illustrated embodiment of our invention the numeral 1 denotes a tank of suitable size and shape for containing the cleansing solution which is preferably of an alkaline nature. The height of the solution in the tank is such as to completely cover the bottles or the like B which are disposed therein for soaking and rinsing. As is cus-

tomary in a machine of this character, the bottles are passed through the solution on an endless flexible conveyer 2, the same being trained about a suitable number of supporting and driving sprockets 3. Two of these sprockets are shown in Figure 1 at one end of the tank.

The conveyer consists of a plurality of bottle carrying bars 4 linked together at their opposite ends or in any other desired manner. Each of the bars has a number of bottle engaging caps 5 fixed to one side and a like number of flared inlet mouths 6 on the other side. Each of the mouths 6 communicates with a hollow stem 7 that extends through the adjacent cap 5 and is adapted to project into one of the bottles B.

The stems 7 are of such length that when disposed in the bottles their inlet ends will be adjacent the bottoms of the latter. As will be seen from Figure 1 the stems on the upper stretch of the conveyer 2 extend vertically upwardly to receive the bottles B in an inverted position. As the conveyer is moved around the sprocket wheels 3 the bottles are successively brought into engagement with tracks 8 disposed parallel with the ends and lower stretches of the said conveyer. The bottles are thus retained in engagement with the caps 5 as they are moved from an inverted to an upright position.

As soon as the mouth of each bottle is carried beneath the level of the solution in the tank 1, it is filled therewith through the inlet mouth 6 and through ports 9 in the cap 5. As hereinbefore mentioned the bottles are thoroughly cleaned by agitating the solution therein and successively emptying and refilling the same. The initial and each refilling is procured by having the bottles submerged in the said alkaline solution in the tank 1.

The means for agitating the solution and expelling the same from the bottles may be carried out in any desired manner for instance by the arrangement shown in the accompanying drawings. In this connection a frame bar 10 channeled as at 11, is hung from the inner surface of each opposite side wall of the tank 1. These frame bars are disposed horizontally and are vertically slidably supported through slotted

ears 12 and pins 13. An injector header 14 is slidably supported with respect to the frame bars 10 by means of cross members 15 and 16, the opposite ends of which are movable in said channels 11. The members 15 and 16 are connected by means of a plurality of parallel header pipes 17, said pipes being disposed in the direction of movement of the endless conveyer 2 and over the tracks 8.

Each of the header pipes 17 has a number of outlet nipples 18 adapted to co-operate with the flared mouths 6. The cross member 15 of the injector header is hollow and is connected through a pipe or flexible tube 19 with a blower or any suitable compressor machine 20 for supplying air or a gaseous fluid under pressure. The member 15 being in communication with each of the header pipes 17, the compressed air or the like will be conveyed to each of the nipples 18 and when the same are connected with the mouths 6, compressed air or the like will be injected into certain of the bottles B.

It will be noticed that the nipples are spaced such a distance apart that only the alternate mouths 6, below the injector header 15 will be engaged, and consequently every other bottle will be supplied with compressed air or the like gaseous fluid used for agitating and expelling the cleansing solution therein. The nipples are moved into and out of engagement with the mouths 6 by the reciprocation of the frame bars 10, and the same being elevated and lowered by means of bell crank levers 21 connected therewith by links 22, a crank 23, and a cam 24. The cam is rotated in any preferred manner to rock the bell cranks 21, the corresponding arms of each being connected together by a rod 25.

When the several nipples are engaged with their respective mouths 6, the header 14 is moved longitudinally in the direction of movement of the lower stretch of the conveyer 2 for a predetermined distance; and when this limit is reached and the mouths disengaged by the elevation of the frame bars 10, the injector header 14 is returned to its initial position. This movement is also performed through the medium of a cam 26, said cam actuating a lever 27 having one end linked as at 28 to the cross member 15.

The operation of our invention is substantially as follows: As the upwardly extending stems 7 pass along the top of the tank 1, the operator places the bottles to be washed thereon; the movement of the endless conveyer 2 being continuous, said bottles will eventually be brought into engagement with the tracks 8 and thus held upon the conveyor. Thereafter the bottles are filled with cleansing solution by submersion therein, and disposed in upright position.

As the filled bottles move beneath the

raised injector header, the flared mouths of the alternate bottles are aligned with the nipples 18 of the header and the supporting frame bars 10 thereof are lowered to engage the aligned nipples and mouths. The compressed gaseous fluid from the source of supply 20 thereof may be then injected into the bottles whose mouths 6 are engaged by the nipples to agitate the solution therein and gradually expel the same through ports 9 in the cap 5. This expulsion takes place as the header 14 is moved along with the conveyer 2.

At the limit of movement of said header in this direction, it and the frame bars 10 are raised by the action of the cam 24, whereupon the empty or partially empty bottles will be refilled owing to the fact that they are submersed below the level of the solution in the tank 1. The injector header while in a raised position and out of engagement with the mouths 6 is returned to its initial position, it being moved in a direction opposite the movement of the lower stretch of the conveyer 2 by the rocking of the lever 27.

Thereafter the header is again lowered to engage its nipples with the mouths 6 of the bottles which were next adjacent those previously acted upon. The agitation and expulsion of the cleansing fluid contained in these bottles is carried out in the same manner as with the first mentioned bottles. Furthermore the operations preformed on each of the two sets of bottles is repeated many times while the same are passed beneath the header 14. In other words each bottle is successively filled with cleansing solution, then emptied of such solution and again filled, these acts being continued until it is determined that the bottle is thoroughly clean.

After the bottles have been thoroughly cleaned by the agitation of the cleansing solution therein and the successive emptying and refilling, they are moved by the conveyer 2 from beneath the injector member 14 and carried on through the tank 1 or other parts of the machine connected therewith.

For instance in the portion of the tank 1 not shown may be located means for washing or rinsing the bottles both inside and out with clean water or a solution different from that used for soaking the bottles. Furthermore the same mechanism as is illustrated in the several figures of the drawings and used for forcing air under pressure to the several immersed bottles may be used with only slight alterations to supply water or other liquid to the interior of the bottles as they are carried to the upper stretch of the conveyer or while they are in an inverted position. Likewise various other changes may be made in the manner of carrying out the broad principle of our invention, it being

understood that the applicants are not limited to the illustrated structure except in so far as the following claims are limitations.

We claim:

5 1. In a container cleaning machine, a tank for holding a cleansing liquid, a conveyor for receiving a series of containers, immersing them successively in the tank and conveying them in the tank while immersed, an  
10 injector head connected with a source of compressed gaseous fluid and means for reciprocating the head to alternately establish and interrupt communication between  
15 said source and the containers successively as they are conveyed through the liquid.

2. In a container cleaning machine, a tank for holding a cleansing liquid, a conveyor passing through the liquid in the tank, a series of hollow stems connected with the  
20 conveyor, means for securing the containers to the conveyor with the stems projecting into the interior of said containers, means for supplying a gaseous fluid under pressure and means for alternately connecting  
25 and disconnecting said supply means with said stems successively while they are traveling through the liquid.

3. In a container cleaning machine, a container conveyor, a tank adapted to contain  
30 cleansing liquid in which said conveyor operates to fill the containers with liquid by submersion, and means for intermittently introducing gaseous fluid into said containers to expel the liquid therefrom while  
35 they are being conveyed through the tank, said last named means including an injector head and cam actuated means for reciprocating the same to successively establish and interrupt communication with alternate series  
40 of containers.

4. In a container cleaning machine, a container conveyor, a tank adapted to contain  
45 cleansing liquid in which said conveyor operates to fill the containers with liquid by submersion, a series of hollow stems carried by the conveyor, means for securing the con-

tainers on the conveyor with the stems in relatively fixed position within the containers, a fluid injector head, means for placing the head into communication with  
50 certain of said stems when the same reach a predetermined point in their travel through the liquid, means for moving the head with the stems a predetermined distance, means  
55 for retracting the head to interrupt the communication with said stems, said second mentioned means being operative for returning the head to its initial position for engagement with the next adjacent series of  
60 stems and means for supplying gaseous fluid through said injector head and stems to expel the liquid from the containers.

5. In a machine of the class described, a container conveyor, a tank adapted to contain  
65 a cleansing liquid in which the conveyor operates to fill the containers with liquid by submersion, a series of injector nozzles carried by the conveyor, and each having a plurality of vents, means for securing the nozzles in relatively fixed position  
70 within the respective containers, an injector head having a plurality of outlets, means for moving the head to place said outlets in communication with certain alternate  
75 containers to connect the nozzles therewith, means for moving the head with the containers a predetermined distance, means for disconnecting the head from said nozzles, said second mentioned means being  
80 operative for returning the head to its initial position and placing the outlets thereof in communication with the nozzles disposed between the nozzles first engaged, and means for supplying gaseous fluid under pressure  
85 to said injector head.

In testimony that we claim the foregoing we have hereunto set our hands at Milwaukee, in the county of Milwaukee and State of Wisconsin.

HENRY SCARBOROUGH.  
JOHN R. DOSTAL.