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BOTTLE FILLING MACHINE.
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2 Sheets—Sheet 2.

WITNESSES

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BOTTLE-FILLING MACHINE.


To all whom it may concern:

Be it known that I, THOMAS HOWARD, a citizen of the United States, residing in Ashland, in the county of Boyd, State of Kentucky, have invented certain new and useful Improvements in Bottle-Filling Machines, of which the following is a specification.

My invention relates to machines for filling bottles with beer or other liquids and is designed to provide certain improvements in the construction of the same whereby the bottles may be fed to and removed from the filling devices from either side, the bottle-necks automatically sealed, except as to the supply-tubes and vent-pipes, when the bottles are in the filling position, the supply of liquid to the bottles automatically turned on and automatically cut off when the mouths of the filling-tubes are reached, and the surplus liquid in the filling-tubes and vent-pipes automatically fed into the bottles as the latter are being removed from the filling-tubes.

My invention also comprises certain minor improvements, as will be hereinafter more definitely described, and set forth in the claim accompanying this specification.

Referring to the accompanying drawings, Figure 1 is a front elevation of a structure embodying my improvements. Fig. 2 is a side elevation of the same, the strainer or filter being shown partly in section. Fig. 3 is an enlarged detail vertical longitudinal sectional view of the supply-pipe. Fig. 4 is an enlarged detail vertical sectional view taken through one of the filling-tubes and showing the supply-pipe connection and the air-valve.

Similar numerals of reference denote corresponding parts in the several views.

In the said drawings the reference-numeral 1 denotes the frame of the supporting structure, carrying at its top a bottle-receiving table 2 and having near its bottom a framework 3. Rotatably mounted in suitable bearings in said framework 3 is a shaft 4, having a power-wheel 5 at one end and gear-wheels 6 intermediate its length, that mesh with similar gear-wheels 7 on the lower ends of vertical screw-threaded shafts 8, also mounted in suitable bearings in the frame 1. These shafts 8 engage with threaded apertures in a horizontal cross-bar 9, that in turn supports the uprights 10 and 11, suitable guide-rods 12 being also mounted on the framework 3 and extending up through apertures in the cross-bar 9.

Mounted in the upper ends of the uprights 10 is a supply-pipe 13, extending transversely of the structure over the table 2, into which, midway of its length, is tapped a pipe 14, the said supply-pipe 13 being closed at one end by any suitable means and open at its other end, for a purpose hereinafter to be described.

The pipe 14 at its rear horizontal end extends into a closed square chamber 15, that is provided with a vertical foraminous screen 16 and with a blow-off cock 17, as shown in Fig. 2. Into the rear side of this chamber 15 are tapped, preferably, two feed-pipes 18, each provided with a valve 19 and extending to suitable sources of supply, such as beer-kegs, preferably located above the plane of the chamber 15. If desired, however, these pipes 18 may terminate in a single pipe between the valves 19 and the chamber 15.

The supply-pipe 13 is provided with a series of sleeves 20, freely rotatable thereon to either side, said sleeves having screwed thereinto a filling-tube 21, as shown in Fig. 4. Mounted on each of said filling-tubes 21 is a bottle-receiving casing consisting of a body portion 22, a closed top cap 23, and a bottom cap 24, that is centrally apertured to freely receive a bottle-neck 25. In its interior said bottle-receiving casing is provided with a movable resilient pad 26, preferably composed of rubber, that is normally pressed to its lowest position by a spiral spring 27, the bottom cap 24 limiting its downward movement, as clearly seen in Fig. 4. Extending down into the filling-tube 21 is the vent-pipe 28, which terminates at its lower end a little above the lower end of the filling-tube 21 and passes out through the side of said filling-tube above the bottle-receiving casing and terminates at its upper end in a valve-chamber 29, containing a suitable float-valve 30.

The supply-pipe 13 is provided in its under side with a series of apertures 31, corresponding in number to and adapted to register with the filling-tubes 21 when the latter are in.
position shown in the full lines in the several figures. Intermediate the several sleeves 20 are suitable washers 32 to prevent the escape of the liquid, while at each end of the supply-pipe 13 is located a jam-nut 33 for forcing the said sleeves together.

At the open end of the supply-pipe 13 is a vertical pipe 31, having a valve 35 therein and terminating at its upper end in a funnel 36.

A suitable draw-off cock 37 is provided for the table 2, the latter being also provided with vertical sides to prevent any other escape for the liquid that may drip thereonto from the filling-tubes 21.

The operation of my improved construction will be understood to be as follows: A filled keg 14 being connected to each of the pipes 18 and one of the valves 19 opened, the contents of the keg will pass through the chamber 15 and into the supply-pipe 13, the beer or other liquid being strained or filtered by the foraminous screen 16 in chamber 15. Now when the filling-tubes 21 are turned to the position shown in dotted lines in Fig. 2 said tubes will be out of alignment with the apertures 31 in the said supply-pipe and the sleeves 20 will close said apertures 31 and prevent the escape of the liquid; but when a bottle-neck is applied to a filling-tube and the latter turned to the position shown in full lines in the several figures the aperture 31 will register with the filling-tube 21 and the liquid will pass into the bottle. It will be observed by reference to Fig. 4 that the resilient spring-pressed pad 26 effectually seals the neck of said bottle, which necessitates that the air in said bottle escape through the vent-pipe 28. Now when the level of the liquid reaches the level of the lower end of the filling-tube 21 the escape of the air from the bottle will cease and the liquid will pass up the vent-pipe 28 until it reaches the float-valve 30, which will carry up to the top of the valve-chamber 29 and seal the outlet of said chamber, thus instantly checking the flow of liquid through the filling-tube 21. Now when the operator draws the bottle to one side to remove it this movement also rotates the sleeve 20 on the supply-pipe 13 and the filling-tube 21 is carried out of alignment with its aperture 31, thus cutting off the supply of liquid at this point, where the removal of the bottle-neck from its casing admits air to said bottle and permits the flow of liquid remaining in the filling-tube 21 and vent-pipe 28 into said bottle before the latter is completely disengaged from the filling-tube 21. When the contents of the keg in use is exhausted, it is only necessary to close its valve 19 and open the valve of the other pipe 18, whereupon a fresh supply of liquid is provided and the empty keg can be removed and replaced by a full one, which in turn can be brought into use, thus providing for a practically continuous operation of the machine.

In order to cleanse the strainer of the filter-chamber, it is only necessary to connect a water-supply to one of the pipes 18 and open the cock 17, whereupon the accumulation of rosin and other impurities in said strainer and filter-chamber will be carried off through said cock.

An important feature of my improved construction resides in the fact that as the sleeves 20 are freely rotatable in both directions on the supply-pipe 13 they can be manipulated by operators on both sides of the machine and the filled bottles passed to a single corking-machine without the annoyance of said operators interfering with each other, such capability being particularly desirable when a large number of filling-tubes are used on a single supply-pipe.

It will be observed that while the vertical movement provided for the resilient pads 26 in the bottle-receiving casings permits automatic and effectual temporary stopping for bottles of different heights and sizes where said bottles are of the same general capacity, 20 it is desirable that an adjustment be provided whereby bottles of much greater or smaller capacity may be filled—as, for instance, where it is desired to change from filling pint bottles to filling quart bottles—and this I accomplish through the medium of the screw-threaded shafts 8 and their operating mechanism, said shafts engaging with and supporting the cross-bar 9, that in turn supports the uprights 10 and 11, which carry the whole filling mechanism. The rotation of the power-wheel 5 will thus vertically adjust the filling mechanism bodily to or from the table 2 as may be desired, the resilient pads 26, as before explained, allowing for minor variations in the size of the bottles.

The function of the funnel 36 is to provide a means for reintroducing into the supply-pipe 13 the waste liquid that may have dripped from the filling-tubes 21 and accumulated on the table 2, as the same can be readily drawn off from said table through the cock 37 and poured into said funnel, from whence it may be permitted to run into the supply-pipe 13 by opening the valve 35.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A bottle-filling machine, consisting of a horizontal supply-pipe provided with a series of orifices in its under side, a bottle-support below said pipe, a receiving casing fixed on said supply-pipe, filling-tubes carried by said sleeves and rotatable therewith to either side of a vertical position below said supply-pipe, said tubes registering with the orifices in the supply-pipe when vertically beneath said pipe but out of register therewith when rotated to either side of said vertical position, bottle-receiving casings fixed on said filling-tubes through which the latter pass, vertically-yielding closures in said casings adapted to automatically seal the mouths of the bottles when in the filling position and resting on the
bottle-supports, vent-pipes located interiorly of said filling-tubes but terminating within and above the lower ends thereof, valve-chambers attached to the upper ends of said vent-pipes, and float-valves in said chambers adapted to close said vent-pipes when lifted by the fluid in said pipes, substantially as set forth. In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THOMAS HOWARD.

Witnesses:
L. N. DAVIS,
U. T. NEWMAN.