

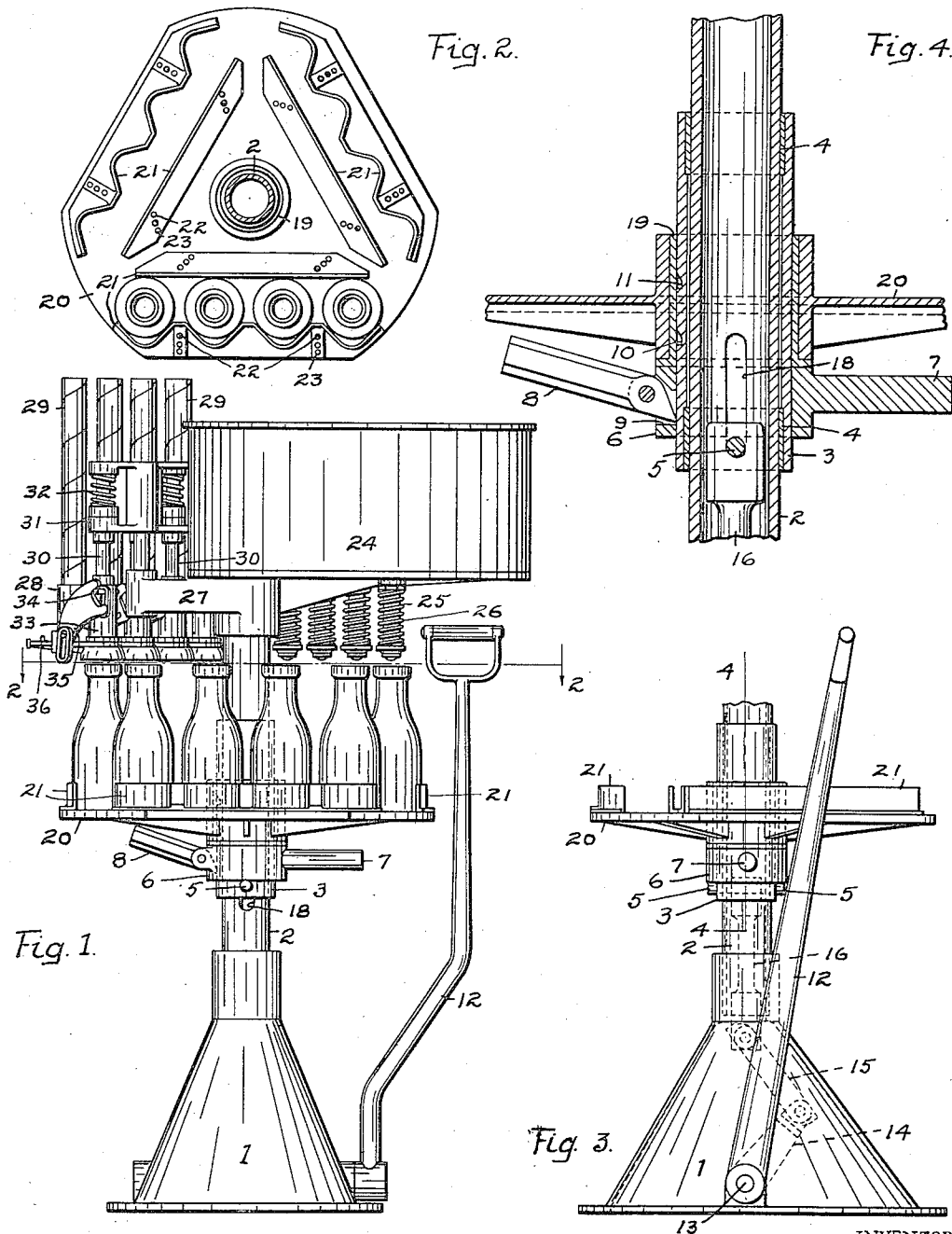
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BOTTLE FILLING AND CAPPING MACHINE

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BOTTLE FILLING AND CAPPING MACHINE

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3 Claims. (Cl. 226—76)

The invention relates to machines for filling and capping bottles such as the bottles used in dairies.

It is quite essential to the efficient operation of a plant in which bottles or other forms of containers are filled and capped that the said operations shall be performed with rapidity and at small cost. The cost of the bottle filling and capping machines commonly in use in large dairies is such that the smaller dairies are unable to purchase them. Hence a simple, relatively inexpensive machine is desirable for the smaller dairies, and it is one of the objects of my invention to provide a simple machine by which bottles or containers may be economically filled and capped.

Another object is to provide a machine in which the containers or bottles are so supported that by a single movement of the support any number of empty bottles is caused to be filled and simultaneously therewith any number of filled bottles is caused to be capped, and in a highly sanitary manner.

Other objects and advantages will appear hereinafter.

The invention consists in a rotatable carrier adapted to support a plurality of bottles or containers preferably in groups and to move the groups successively to a filling station where the members of each group are filled simultaneously and then to a second station where the members of each group are capped simultaneously and finally to a discharge station, a group at the capping station being capped while another group is being filled at the filling station, said filling and capping operations being caused by a single upward movement of the support.

The invention is illustrated in the accompanying drawing in which

Figure 1 is a front elevational view of a machine embodying the invention; Fig. 2 a cross-section on line 2—2 of Fig. 1; Fig. 3 a side elevational view of the carrier and its support and Fig. 4 an enlarged cross-sectional view on line 4—4 of Fig. 3.

Referring to the illustrative embodiment of the invention 1 is a base or pedestal in the top of which is fixed a tubular member or support 2. A sleeve 3 is mounted on the support 2, bushings 4 being disposed in the opposite ends of the sleeve. The opposite ends of a pin 5 project laterally from the lower end of the sleeve 3 and serve as stops against which the lower end of a collar 6 abuts. The collar is slidable on the sleeve. A handle 7 projects from one side of the collar and on the

opposite side of the collar is pivoted a lever 8 having its inner end tapered and projecting into an opening 9 formed in the collar 6. The pointed end of the lever is adapted to engage in either of the notches 10, 11 formed in the sleeve 3 and when so engaged locks the collar to the sleeve.

A lever 12 is connected to a rock shaft 13 mounted in the lower end of the base 1. A link 14 is secured to the shaft 13 and is pivoted to a second link 15 that is pivoted to the lower end of a rod 16. This rod extends upwardly in the support 2 and its upper end is connected to the sleeve 3 by the pin 5 which extends through vertical slots 18 formed in the support 2. By rocking the lever 12 in proper direction the rod 16 is elevated to cause the sleeve 3 and the parts thereon to elevate.

Above the collar 6 is a bushing 19 and a table 20 is revoluble on the bushing. Three sets of bottle retainers 21 are adjustably mounted on the top side of the table, the adjustment of each member being accomplished by the pins 22 which project upwardly from the table and are adapted to be received by the apertures 23 formed in the horizontal flanges of the retainers, there being three such apertures for each pin shown in Fig. 2. The members of each set of retainers may therefore be relatively adjusted to accommodate the size of the bottles to be filled and capped.

A reservoir 24 is mounted on the support 2 and the well known filler valves 25 normally close discharge openings formed in the bottom of the reservoir. There will be as many filler valves 25 as each set of retainers 21 will receive bottles. When the table 20 is elevated the tops of the bottles in apposition with the valves will engage the valves and move them upwardly and thereby unseat them so that the contents of the reservoir will discharge into the bottles. The springs 26 reseal the valves when the table is lowered.

A rigid member 27 projects laterally from the support 2 and suitably supports the capping mechanism 28 of well known design. Four tubes 29 of caps are shown in Fig. 1 to correspond in number to the filler nozzles. The plungers 30, four in number, are slidably mounted in the bracket 31, the upward movement of the plungers being opposed by the springs 32. The capper bells 33 are slidable on the plungers and are adapted to be engaged at their lower ends by the tops of the bottles, and elevated thereby when the table 20 is elevated. Pins 34 project from the capper bells and engage the plates 35 which by the movement of the capper bells reciprocate the slides 36 that extend under the capper-con-

5 taining tubes 29 and move the lowermost cap in each tube into apposition with the bottles below. The upward movement of the table occasioned by rocking the lever 12, causes the bells to elevate and causes the upper ends of the bottles to engage the caps and force them against the lower ends of the plungers and thereby cause the caps to engage the usual seats in the necks of the bottles. This upward movement of the bells causes the plates 35 to retract the slides. The 10 gravital movement of the bells causes the plates 35 to carry the caps into proper position for the next operation. It is thus seen that the operation of the capping mechanism and of the filler mechanism is automatic and requires but one initiating effort, that of rocking the lever 12.

15 It will be noted that I have three stations on the table 20, to-wit: one for filling the bottles, another for capping the filled bottles and an unloading station to which the bottles in groups are carried successively and that one group of filled bottles is capped simultaneously with the filling of another group. Since the empty bottles are placed on the table in front of the operator and he is not required to approach or touch them again until they are filled and capped, the operations are carried on in a highly sanitary manner.

20 In the drawing the table is shown in its lowest position, that adapted for quart bottles. If pint bottles are to be filled and capped the operator grasps the handle 7 and the lever 8 and raises the table until the lever will when released engage in the notch 10. This engagement locks the table to the sleeve 3. The notch 11 is used 25 where half pint bottles are to be filled and capped. The three sizes of bottles mentioned are those commonly in use in dairies but the machine, however, could be readily adapted for other sizes of bottles or other containers.

30 When the adjustment of the table and the retainers is completed the bottles are inserted in the retainers facing the operator and the table is turned to carry the bottles beneath the filler valves 25. The lever 12 is then operated to elevate the table and cause the bottles to engage and open the filler valves 25 and thereby permit the contents of the reservoir to fill the bottles. While the filling operation is taking place, other bottles may be engaged in the next retainers now in the loading position. The next turn of the 35 table carries the unfilled bottles under the valves and the previously filled bottles under the capping mechanism. The operation of the lever 12 raises the table and causes the bottles to operate the filler valves and the capping mechanism. Other bottles are engaged in the third set of retainers 21 which are now in the loading position. Thereafter each turn of the table carries a set of empty bottles to the filling station, a set 40 of filled bottles to the capping station, and a set of filled and capped bottles to the unloading station where the latter bottles are removed and empty bottles are substituted for them. Since the retainers are arranged at equidistant points 45 on the table simultaneous registration of the bottles with the filler valves and with the capping

mechanism is assured, so that by a single operation of the lever 12 the valves and the capping mechanism are caused to operate. The toggle formed by the links 14, 15 passes over the center when the lever 12 is fully rocked and the lever remains in the new position so that the operator's hands are free to unload and load the bottles while the filling and capping operations are taking place. The lever is then rocked in the opposite direction to lower the table.

10 In case any of the capping devices are out of order the remainder may be used and the bottles engaged in the corresponding retainers, thus avoiding a shut down of the machine. Any number of retainers may be used and each retainer may be adapted to hold any selected number of bottles, all in accordance with the composition of the filling and capping mechanisms determined for the machine.

What I claim is:

20 1. A bottle filling and capping machine comprising a support, a sleeve on the support, a table revolvably mounted on the sleeve, an adjustable member on the sleeve and supporting the table in vertically adjusted position on the sleeve, a reciprocable member in the support and having connection with the sleeve and with the adjustable member; filling and capping mechanisms above the table and arranged in spaced groups, means to support bottles in correspondingly spaced groups on the table, and means to reciprocate the reciprocable member to cause the table to raise the groups of bottles into simultaneous operating engagement with the filling and capping mechanisms.

35 2. A bottle filling and capping machine comprising a base, an upright tube fixed in the base and having longitudinal slots therein, a sleeve on the tube, means extending transversely through the slots and vertically movable therein, a collar revolvably mounted on the sleeve and adapted to be engaged by the said means, means on the collar by which to lock it to the sleeve in vertically adjusted position thereon, a table revolvably mounted on the sleeve and supported by the collar, filling and capping mechanisms arranged in groups respectively above the table, and means on the table to retain groups of bottles thereon.

40 3. A filling and capping mechanism comprising a support, a non-rotatable sleeve reciprocably mounted on the support, a table revolvably and vertically movably mounted on the sleeve, a filler mechanism and a capper mechanism mounted on the support above the table, each said mechanism including a plurality of receptacle engaging units, means on the table to support receptacles in groups for registration with said units, the groups being so spaced that when one group is in registration with one of said mechanisms another group is in registration with the other mechanism, means to adjust the table vertically relatively to said mechanisms, and mechanism operatively connected to the sleeve for elevating the table to cause the receptacles to engage and operate the units simultaneously.

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