Nov. 7, 1950 J. E. DUNN 2,528,644

BOTTLE FILLING MACHINE

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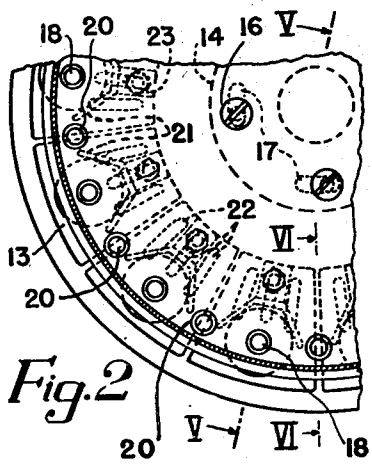


Fig. 2

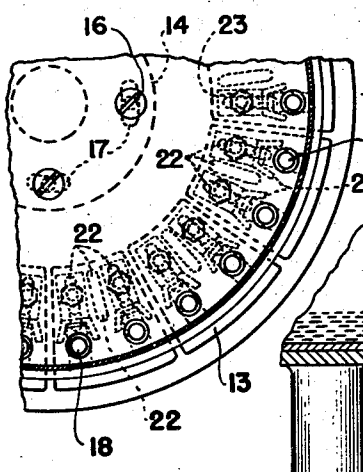


Fig. 4

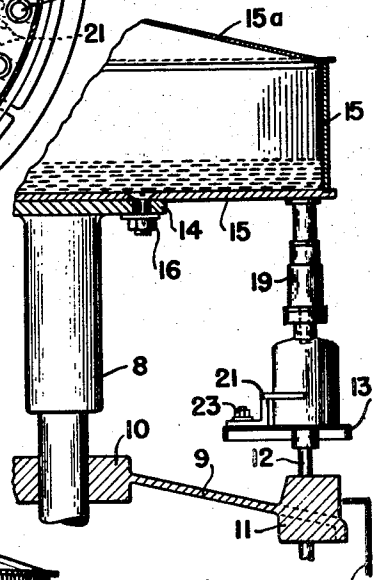


Fig. 5

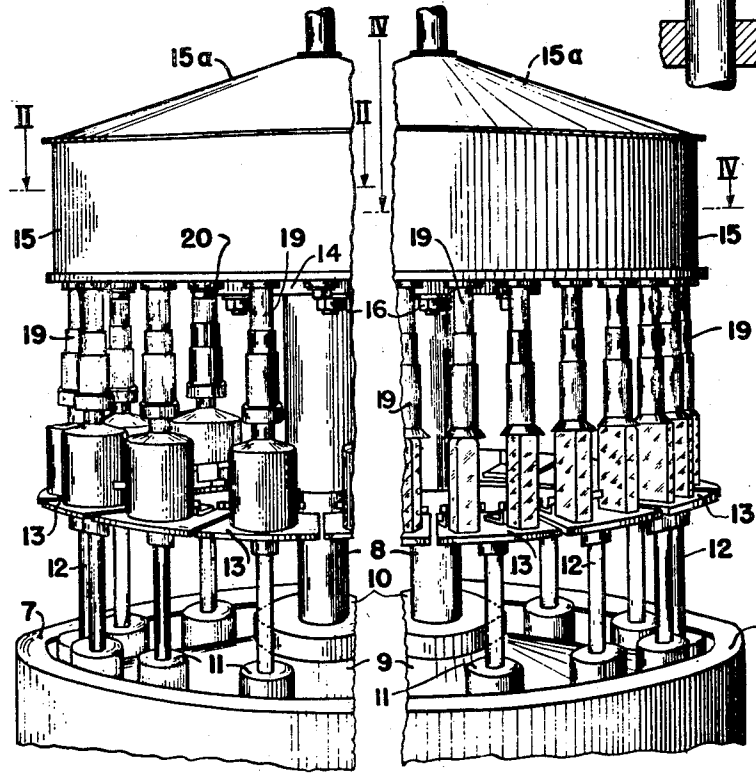


Fig. 1

Fig. 3

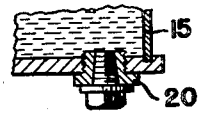


Fig. 6

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BOTTLE FILLING MACHINE

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4 Claims. (Cl. 226—96)

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This invention relates generally to bottle filling machines and has for an object to produce such a machine capable of being employed for the filling of bottles of materially different sizes and capable of being readily conditioned to receive and fill bottles of materially different sizes.

A further object is to provide a bottle filling machine wherein the liquid-containing tank thereof is adjustable to different positions to accommodate bottle filling operations where different numbers of bottle filling nozzles are employed in such operations.

A further object is to produce a bottle filling machine so constructed and arranged that it may be readily and quickly fitted and adjusted to accomplish a bottle filling operation where all or only a part of the liquid dispensing apertures are employed in such operation.

These and other objects are accomplished by means of apparatus such as is illustrated and described in the accompanying drawings. In the drawings,

Figure 1 is a fragmental, perspective view of a bottle filling machine embodying my invention and fitted to receive and fill bottles having body portions of large diameter or girth.

Figure 2 is a sectional view along the line II—II of Figure 1.

Figure 3 is a fragmental, perspective view of the machine illustrated in Figure 1 but fitted to receive and fill a large number of bottles having body portions of substantially smaller diameter or girth than those shown in Figure 1.

Figure 4 is a sectional view along the line IV—IV of Figure 3.

Figure 5 is a fragmental and partial sectional view along the line V—V of Figure 2.

Figure 6 is a fragmental sectional view along the line VI—VI of Figure 2.

The machine generally illustrated in the drawings is one of the type in which the liquid-dispensing tank is located above and immediately over a plurality of bottle-supporting trays, which are movable vertically toward and away from the tank. Bottles are loaded onto the trays while they are in their lowermost position. Each tray is then lifted to an elevated position in which it holds the bottle carried by it in cooperative relation with a filling nozzle communicating with the tank and which is rendered operative as a dispensing agent by the upward movement of such bottle. After the bottle is filled, the tray is lowered, thus releasing the bottle from its cooperative engagement with the nozzle and, also, closing the nozzle against further flow of liquid from

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the tank. The bottles or containers are then removed or unloaded from the tray while it is in the lowered position.

In the bottle filling machines described, and such as are here involved, the tank and trays rotate together and under conditions such that the rotation moves the trays first to a loading position and then to an unloading position. As previously noted, each tray is in its lowermost position, at the time of both loading and unloading. It, therefore, moves upwardly and into cooperative relation with a filling nozzle carried by the tank as it moves with the tank from the loading position to the unloading position.

My invention involves such a machine in which each bottle-supporting tray is so constructed and arranged that it may be equipped with either a single bottle-positioning bracket or a plurality of such brackets. Likewise, the liquid dispensing tank of the machine embodying my invention is provided with a plurality of liquid-dispensing apertures, each of which is adapted to separately receive either a liquid-dispensing nozzle or a closing plug. The number of apertures provided in the tank is a multiple of the number of trays with which the machine is provided and the arrangement is such that the tank may be fitted with as many liquid-dispensing nozzles as there are bottle-positioning brackets on the trays. In addition, the relative position of the tank and the trays can be so adjusted that each bottle carried by and positioned on a tray can be accurately aligned with a nozzle fitting to the tank.

As illustrated, the machine is provided with a frame or base of usual form and which, for simplicity of illustration, is not shown. It is, however, noted that the base or frame is surrounded by a housing 7, supports, a central standard 8 and includes a table 9 which is provided with a central apertured boss 10 which surrounds and constitutes a stay or support for the standard 8.

The table 9 is also provided with a plurality of bosses 11, each of which is apertured and forms a guide for a separate rod 12 which extends through the aperture thereof and carries a bottle-supporting tray 13.

The standard 8 is shown as provided with a flat, table-like flange 14 on which a liquid-dispensing receptacle or tank 15 is mounted. In the machine illustrated, the tank 15 is substantially cylindrical, its bottom rests on the flange 14 and is secured thereto by nut and bolt assemblies 16 which are carried by the bottom of the tank and each of which extends through an elongated arc-shaped slot 17 formed in the flange 14. The

bolt of each bolt and nut assembly 16 may be, and preferably is, so secured to the bottom of the tank 15 as to provide a liquid-tight joint between it and the tank. The tank is shown as provided with a cover 15a.

As illustrated, the bottom of the tank is provided with a plurality of liquid-dispensing apertures 18 which are equally spaced in a circular series adjacent the cylindrical wall of the tank. Each of these apertures is adapted to be fitted with a liquid-delivery nozzle 19, such, for example, as the nozzle illustrated and defined in Dunn Patent 1,793,684 of February 24, 1931. For this reason, each aperture is tapped to receive a plug member forming a part of the nozzle. In Figure 6, I have shown one such aperture provided with a composite plug 20, employed for the purpose of closing the aperture 18 there illustrated.

In the illustrated embodiment of the invention, the tank 15 is provided with twice as many apertures 18 as the machine has trays 13. It will, therefore, be apparent that the tank may be equipped with either one or more nozzles for each tray, depending upon the number of bottle-positioning brackets carried by each tray. By properly positioning each such bracket on its carrying tray and then by adjusting the relative position of the tank with relation to the trays, it is possible to accurately align each bottle carried by a tray with one of the nozzles 19 fitted to the tank 15.

A reference to Figures 1 and 2 will disclose that the tank 15 is so positioned on the standard 8 that alternate apertures 18 are located immediately above and in approximately central relationship with one of the trays 13. Each such aperture is equipped with a nozzle 19, whereas the intermediate apertures are closed by plugs 20. It will also be noted that in Figures 3 and 4 the tank is illustrated as so positioned that the two apertures are located above each tray 13 and all of the apertures 18 of the series are equipped with bottle filling nozzles 19. Such positioning of the tank and its liquid-delivery apertures is made possible by reason of the adjustable connection between the tank and the table-like flange 14 of the standard 8. That is to say, the nut and bolt assembly 16 in cooperation with the arc-shaped slots 17, make it possible to secure the tank in adjusted positions so that all of the apertures 18 may function as bottle-filling apertures or alternate apertures only may function in that way.

In bottle filling machines, such as here illustrated, it is essential to accurately position each bottle on its supporting tray so that it will effectively cooperate with a filling nozzle. A misalignment of the mouth of the bottle with the spout of the nozzle may not only break the bottle but injure the nozzle. For this reason, each tray 13 is provided with means for securing one or more positioning brackets 21 in place thereon. As shown in both Figures 2 and 4 of the drawings, each tray is provided with three substantially radially extending slots 22, each of which is adapted to cooperate with a nut and bolt assembly 23 in securing a bracket 21 in place.

As will be apparent, the brackets 21 are readily replaceable. A special form of bracket will be provided to accommodate the different sized bottles and the radial slots 22 make it possible to readily and quickly interchange brackets and adjust their positions across the face of their carrying trays so as to accurately position the bottles on the trays. In Figures 1 and 2, the central slot 22 of each tray is employed in securing the brackets 21 in place. Whereas, in Figures 2 and 4 each tray carries two brackets 21 and those brackets are secured in place by the cooperation of the outer slots 22.

The nozzles 19 are also interchangeable and readily replaceable. As stated, all of the liquid-dispensing apertures 18 may be equipped with nozzles or only a part thereof may be so equipped, while the remainder are plugged and inactive. For this reason, it is essential to employ adjustable means such that each nozzle employed during a bottle filling operation, will effectively cooperate with one bottle carried by a bottle-supporting element.

The operation of filling the bottles by a machine, such as here illustrated, involves the preliminary adjustment of the tank and the fitting of some or all of the apertures 18 with bottle-filling nozzles 19, depending upon whether or not each tray is to support a single bottle during each filling operation, as shown in Figure 1, or a plurality of bottles, as shown in Figure 3. Depending upon the size or girth of the bottles, one or two are loaded on each tray as the initial step in a bottle filling operation. The loaded tray is then moved upwardly so that the neck of each bottle carried by it enters a nozzle, receives the liquid-delivery spout of the nozzle and cooperates with the nozzle to control the flow of liquid therethrough from the tank 15.

From the standpoint of the present invention, the procedure for loading the trays and the mechanisms for raising and lowering the same are not important. It, therefore, may be noted that the tank 15, the standard 8 on which it is mounted, together with the trays 13, may rotate about the axis of the standard during the operation of loading bottles on the trays, filling the same and removing the bottles from the trays. Likewise, each tray may move up and down during this rotation and thus accommodate the loading of the trays, the filling of the bottles and the unloading of the trays. My present invention, however, contemplates equipping such a machine so that each tray may receive one or more bottles and effectively cooperate with filling nozzles carried by the tank so as to accomplish the filling of the bottles carried by it. This, as previously noted, involves the use of interchangeable parts and the adjustment of one part with relation to another so as to obtain the necessary cooperating action between the various parts.

Throughout the foregoing description I have used the term "bottle" in the board sense, i. e., to means a container of any type, independently of how classed or designated by the trade. Likewise, the term "bottle filling machine" is used in the broad sense, i. e., to include all container filling machines, independently of the type of containers served. These terms are also used in their broad sense in claims appended hereto and defining my invention. It will also be apparent to those skilled in the art that various additions, omissions, substitutions and changes may be made in the apparatus illustrated without departing from the spirit and scope of my invention as defined by the appended claims.

What I claim is:

1. A bottle filling machine including a base, a tank element rotatable on said base about a vertical axis and having a plurality of liquid delivery apertures formed therein, a table element rotatable coaxially with said tank element, bottle supporting trays carried by said table element, said trays being of sufficient extent cir-

cumferentially of said table element to support two bottles having their axes spaced circumferentially of said table element, said tank element being provided with a pair of liquid delivery apertures for each tray, bottle filling nozzles selectively operable in the tank element apertures, one of said elements being adjustable circumferentially of said vertical axis to position each of alternate filling nozzles in vertical alignment with a point centered circumferentially of a tray relative to the path of rotation of said table element, or to position adjacent filling nozzles in vertical alignment with two points on a tray equidistant from said centered point and along said path of rotation of said table element.

2. A bottle filling machine of the character described in claim 1 wherein the tank element is adjustable circumferentially of said vertical axis.

3. A bottle filling machine of the character described in claim 1 wherein said filling nozzles are removably mounted in said tank.

4. A bottle filling machine of the character described in claim 1 including means to support bottles at all of said points on said trays.

JOSEPH E. DUNN.

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