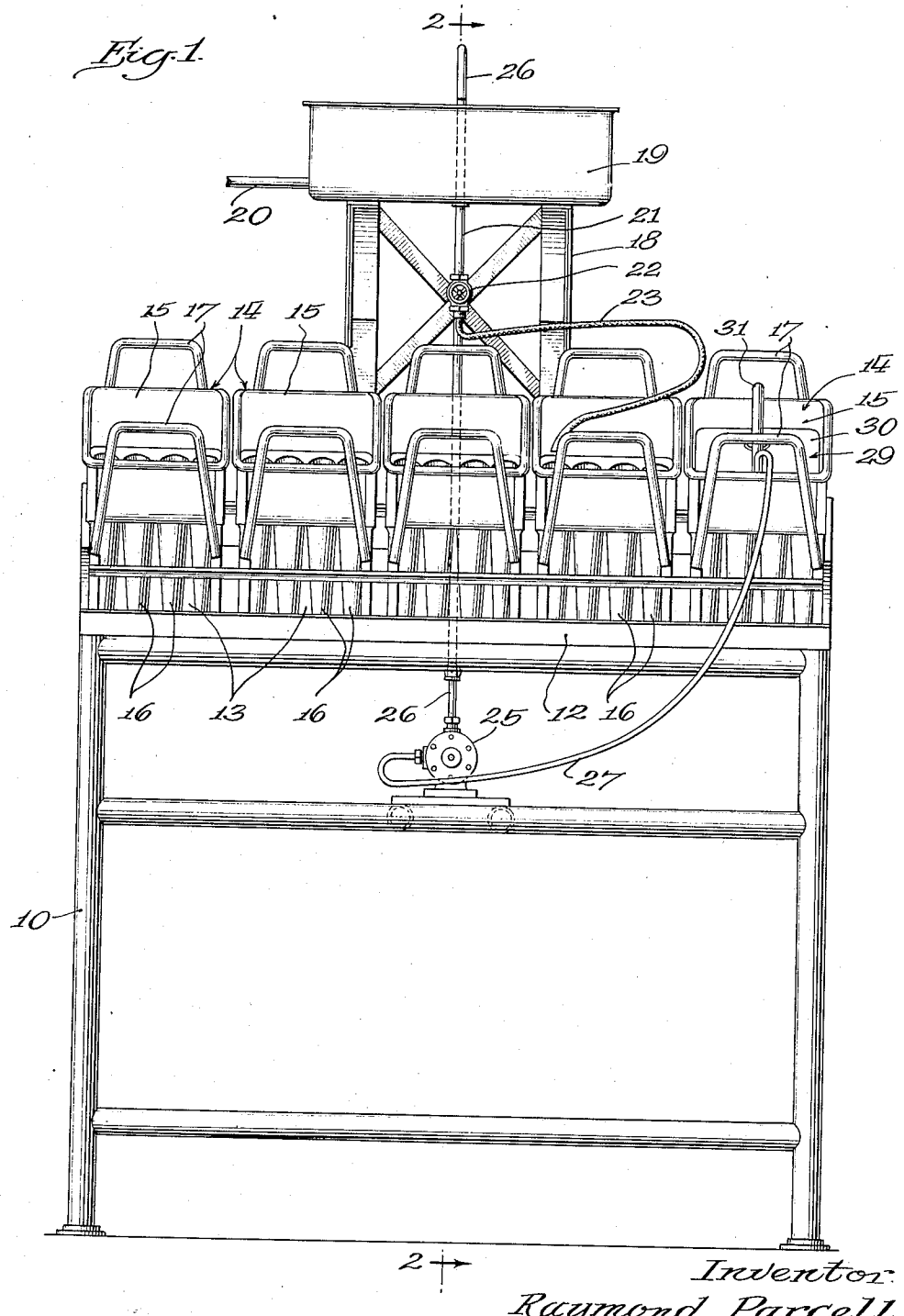
Oct. 24, 1939. R. PARCELL 2,177,375

APPARATUS FOR FILLING MOLDS

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Fig. 1.



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Fig. 2.

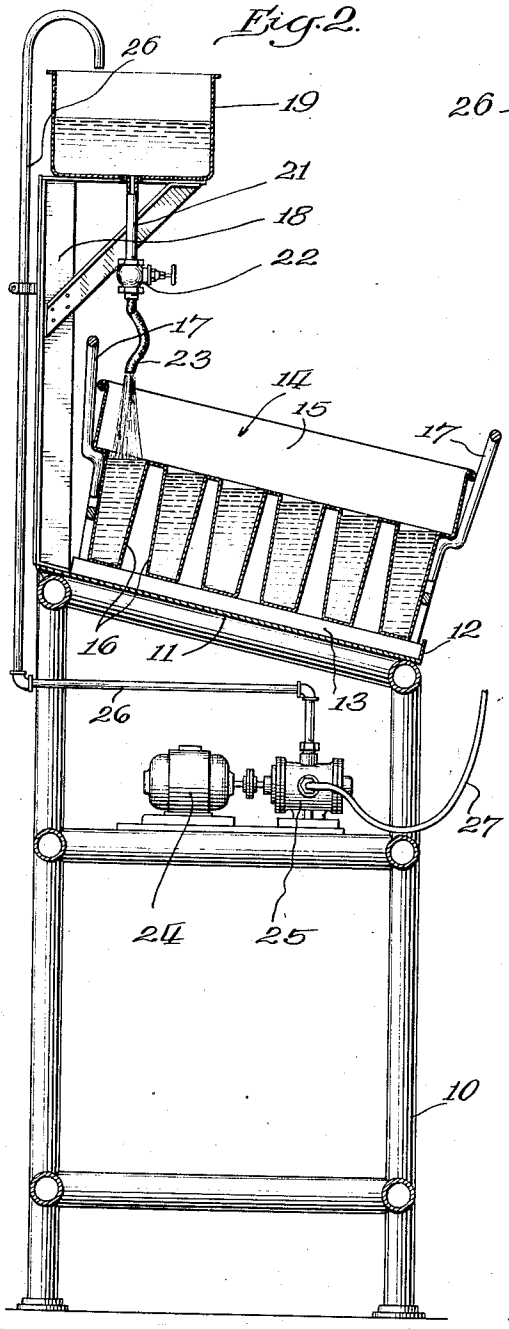
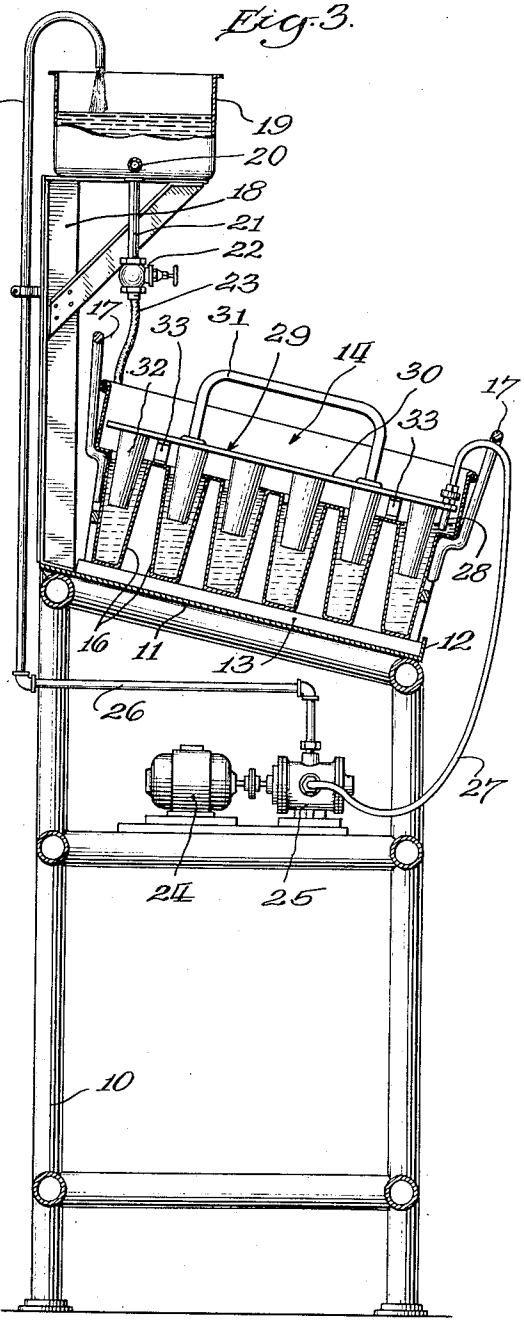


Fig. 3.



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APPARATUS FOR FILLING MOLDS

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Application June 4, 1938, Serial No. 211,714

6 Claims. (Cl. 107—8)

This invention relates to apparatus for filling molds and is particularly adapted for the filling of molds with liquid so that a substantially uniform quantity of liquid may be provided in the molds.

The invention is particularly adaptable to the manufacture of frozen confections of known kinds, which are manufactured and sold with and without handles.

According to the present invention an approximate charge is supplied to each mold and thereafter the excess over a certain amount is displaced and the displaced excess is removed. The displacement of excess may suitably be performed by introducing a displacing member of such volume that a part of the rough charge is displaced, leaving a predetermined amount of liquid in the mold. Means are provided on the displacement member so that its entry into the mold is limited to a definite extent.

For the specific purpose above mentioned, that is, the manufacture of frozen confections, it is usual to employ a multiple mold, that is, a metal tray from which depends a large number of mold pockets of uniform size. When operating with such molds it is preferred to supply a charge to each of the pockets which is definitely greater than the volume intended to be frozen. The displacement members, one for each pocket, are preferably mounted on a single unit, which may suitably be a plate from which the displacement members depend. It will, of course, be understood that the displacement members are relatively located in the same manner as are the mold pockets, so that one displacement member enters each pocket.

I provide means whereby the displacement members have only a limited entry into the pockets, such means comprising complementary contacting elements on the displacement member unit and on the mold tray. In order to facilitate removal of the excess displaced from the mold pockets, I prefer to mount the mold tray at a definite angle so that the excess flows to one side thereof. At this side I have mounted on the displacement member unit a suction nozzle, which is connected to a suitable pump or other ejecting mechanism, which withdraws the excess liquid and returns it to the supply tank.

The invention will readily be understood from the following description of a preferred apparatus and method of filling the molds, with reference to the accompanying drawings, in which:

Figure 1 is a front view of an apparatus adapted for the filling of a plurality of trays, each comprising a large number of mold pockets;

Fig. 2 is a vertical section therethrough, taken on the line 2—2 of Fig. 1, and

Fig. 3 is a view similar to Fig. 2, showing the displace-member and excess withdrawal elements in operation relation.

Referring to the drawings, the reference numeral 10 designates a stand which supports a table surface 11 which is sloped in the manner shown in Figs. 2 and 3. Along its lower end the table surface 11 is provided with a stop 12 which is adapted to be engaged by the sub-structures 13 of mold trays 14. The mold tray 14, which may be of known type, comprises an upper tray portion 15 from which depends a plurality of pockets 16 arranged in uniform rows. The tray 14 is provided with handles 17 whereby it may be conveniently handled and moved from place to place. The frame 10 is provided with an upward extension 18 which carries a supply tank 19. This tank may be replenished from a suitable source of supply by means of a pipe 20. From a low point in the tank 19 extends a pipe 21 which is provided with a valve 22. From the pipe 21 extends a hose 23 which may suitably be a flexible stainless steel hose of known type.

The stand 10 serves as a support for a motor 24 and a pump 25, these elements being suitably located below the table surface 11. The outlet of the pump 25 is connected to a discharge pipe 26 which returns the material passing through the pump to the supply tank 19. The inlet of the pump 25 is connected by a flexible hose 27, suitably a flexible stainless steel pipe, to a nozzle 28. This nozzle is rigidly mounted on a displacement unit 29 which will now be described.

The displacement unit 29 may suitably comprise a plate 30 which carries on its upper side a handle 31. On its under side the plate 30 carries a large number of similar displacement members 32 which correspond in number and relative location to the pockets of the mold tray. Thus, in the mold tray shown in the drawings there are four longitudinal rows of pockets, each row comprising six mold pockets. The displacement members are similarly arranged on the plate 30, the spacing between the centers of the displacement members being similar to the spacing of the mold pockets.

As shown in the drawings, the mold members 32 are of substantial volume, but are smaller than the pockets so that they may readily enter thereinto. Means are provided whereby the extent to which the displacement members 32 may

enter the mold pockets is definitely limited. These means may take the form of elements on the mold tray and on the displacement unit which are adapted to engage when the displacement unit is in proper displacing relation to the mold tray. Thus, the plate **30** may be provided with a suitable number of abutments **33** which are adapted to engage the bottom of the tray portion of the mold, that is, the portion of the tray between adjacent mold pockets. The nozzle **28** is mounted adjacent one end of the plate **30** and that end is always applied to a mold so that it is located at the lowest end of the mold, as shown in Fig. 3.

In one manner of operating according to the invention, I place a plurality, for example five, mold trays **14** on the table top **11**. I then open the valve **22** and permit liquid to flow from the tank **19** through the hose **23**. By means of this hose all the pockets of a tray are filled in the manner shown in Fig. 2. As shown in that figure there is usually an excess of liquid at the pockets adjacent the right-hand or lowermost side. The other pockets are almost full, being slightly less than full only because the mold tray is located on the sloping table top **11**. When the tray is filled in this manner, the displacement unit **29** is applied thereto in the manner shown in Fig. 3, the displacement members **32** entering the pockets **16** and displacing a certain amount of liquid therefrom. When the displacement unit is thus located in the metal tray **14**, the suction nozzle **28** is immersed in the excess liquid at the lower end of the tray **14** and the pump **25** promptly removes this excess and returns it to the tank **19**. When the excess liquid is thus removed, each of the pockets **16** contains a substantially equal amount of liquid. The displacement member **29** is then transferred to another mold tray **14** which has, in the meantime been charged.

It will, of course, be understood that the procedure may be modified in many respects. Thus, the mold trays may be charged elsewhere, for example, on a level table, sufficient liquid being introduced to fill all the pockets **16** and leave a certain small excess above the pockets. The mold trays are then preferably, though not necessarily, tilted, the displacement unit **29** inserted, and the excess removed by the pump **25**.

It will, of course, be understood that after the mold trays are charged in the manner described, they are removed to suitable locations where they are subjected to freezing temperature or are otherwise treated in accordance with the liquid being treated and the product desired.

Although the invention has been disclosed in connection with the specific details of a preferred embodiment thereof, it must be understood that such details are not intended to be limitative of the invention except in so far as set forth in the accompanying claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. Apparatus for filling the pockets of a mold including a tray and a plurality of pockets depending therefrom, comprising a displacement member having bodies adapted to extend into the pockets to displace liquid therefrom, and suction means carried by said member and terminating within said tray for removing surplus liquid displaced into said tray.

2. Apparatus for filling the pockets of a mold including a tray and a plurality of pockets depending therefrom, with equal quantities of liquid comprising a displacement member having displacement bodies similar in number and location to the pockets, means for limiting the entrance of said bodies into said pockets to a similar extent, and a suction nozzle carried by said member and adapted to extend into said tray for removing from the mold tray surplus liquid displaced from the pockets into said tray.

3. Apparatus for filling the pockets of a multi-pocket mold with equal quantities of liquid comprising a displacement member having displacement bodies similar in number and location to the pockets, means for limiting the entrance of said bodies into said pockets to a similar extent, a suction nozzle carried by said member for removing from the mold surplus liquid displaced from the pockets, and means for supporting said mold at an angle whereby the displaced liquid may flow downwardly to said nozzle.

4. Apparatus for equally filling the pockets of a multi-pocket mold including a dish portion and a plurality of similar pockets depending therefrom, comprising a displacement member substantially coextensive with said dish portion and having displacement bodies similar in number and location to the pockets, means on said member and dish portion adapted to engage and limit the entrance of said bodies into said pockets to a similar extent, and a suction nozzle carried by said member for removing from the dish portion surplus liquid displaced from the pockets.

5. Apparatus for equally filling the pockets of a multi-pocket mold including a dish portion and a plurality of similar pockets depending therefrom, comprising a displacement member substantially coextensive with said dish portion and having displacement bodies similar in number and location to the pockets, means on said member and dish portion adapted to engage and limit the entrance of said bodies into said pockets to a similar extent, a suction nozzle carried by said member for removing from the dish portion surplus liquid displaced from the pockets, and an inclined supporting table for supporting said mold at an angle whereby said displaced liquid may flow downwardly to said nozzle.

6. In combination, an inclined table adapted to support at an angle a multi-pocket mold including a dish portion and a plurality of similar pockets depending therefrom, a supply tank above said table, means for supplying liquid from the tank to said pockets, a displacement member substantially coextensive with said dish portion and having displacement bodies similar in number and location to the pockets, means on said member and said dish portion adapted to engage and limit the entrance of said bodies into said pockets to a similar extent, a nozzle on the lower side of said member projecting downwardly into said dish portion, a pump, flexible conduit means connecting the intake of the pump to said nozzle, and conduit means connecting the outlet of said pump to the supply tank.

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