

Jan. 26, 1932.

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1,842,939

APPARATUS FOR STORING AND DISPENSING PAINTS AND OTHER LIQUIDS

Filed Oct. 2, 1929

2 Sheets-Sheet 1

FIG. 1.

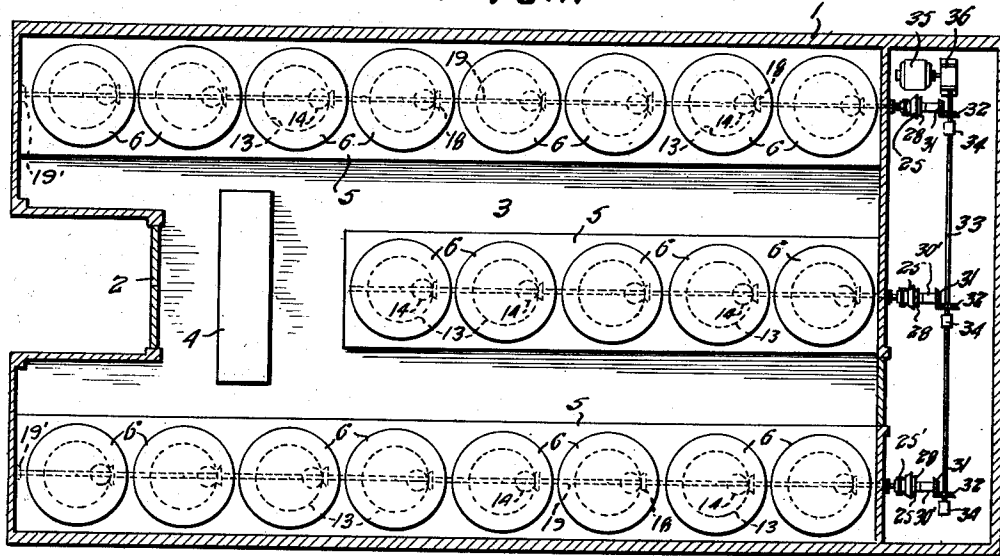
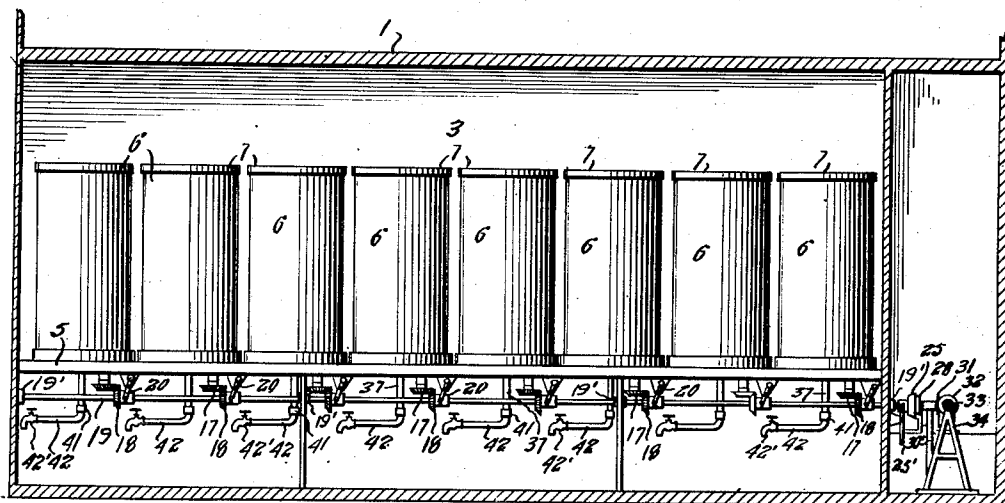


FIG. 2.



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2 Sheets-Sheet 2

FIG. 3.

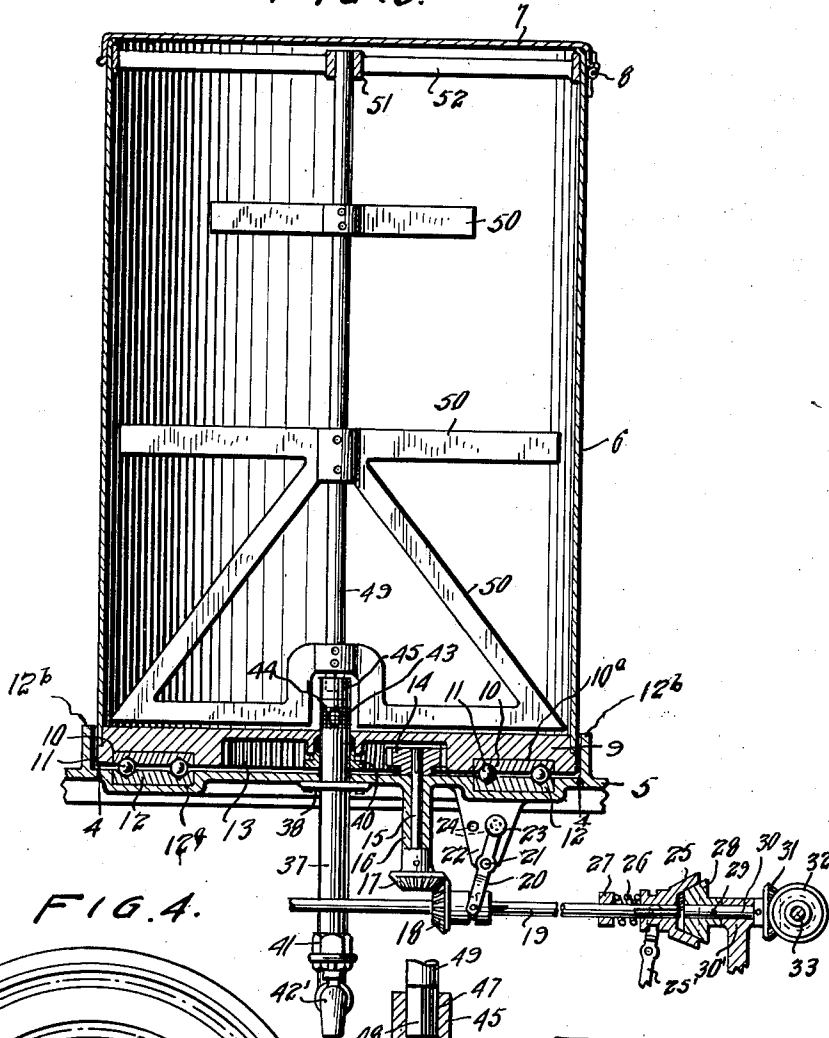


FIG. 4.

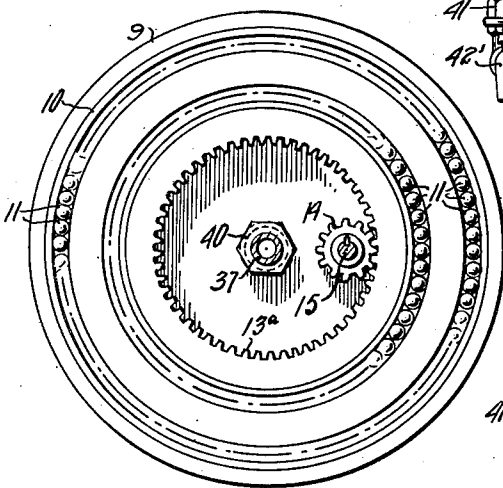
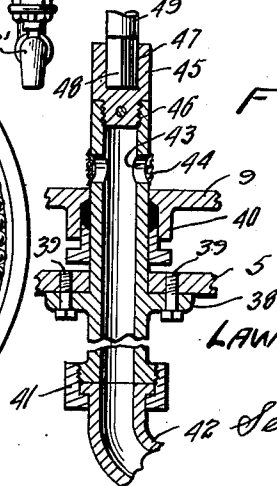


FIG. 5.



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APPARATUS FOR STORING AND DISPENSING PAINTS AND OTHER LIQUIDS

Application filed October 2, 1929. Serial No. 396,871.

The invention relates to a storing and dispensing method and more particularly has reference to a method and apparatus for storing and dispensing liquids in bulk.

5 This application is a continuation in part of an application filed by me on September 6, 1929, upon a process and apparatus for dispensing liquids, Serial No. 390,828.

10 As it is pointed out in the above mentioned application, the art has failed to develop any methods whereby liquids, particularly those possessing the characteristics of paint, may be stored for considerable lengths of time and be dispensed in a condition ready
15 for immediate use. This is especially true in the storing and dispensing of paints, varnishes, lacquers, and other similar liquids including those used in the mixing thereof.

20 The major object and purpose of this invention is to provide a novel method and apparatus which ameliorates the inherent defects of the present day practice, for storing, dispensing, and mixing of liquids possessing characteristics similar to paint.

25 An equally important object of the invention is the provision of a process and apparatus for storing, agitating, dispensing, and mixing a plurality of liquids.

30 Another object of the invention is the provision of a process and means for storing and dispensing liquids in a condition ready for immediate use, the liquids being maintained in this condition by the frequent rotation of the storing means.

35 Yet another object of the invention is to devise a process and apparatus whereby liquids may be stored with the exclusion of air and may be strained while being dispensed.

40 A still further object of the invention is the devising of a container for storing and dispensing a suspension, the container being capable of agitating its contents so as to evenly distribute the suspension throughout its vehicle.

45 Yet another object of the invention is the provision of a container for storing and dispensing a suspension, the container being capable of agitating its contents so as to evenly distribute the suspension throughout its vehicle, and means extending through the

container for straining and drawing off the liquid.

With these and other equally important objects in view, which may be incident to my improvements, the invention includes a
55 special method and apparatus for storing, dispensing, and mixing liquids in a condition ready for immediate use, with the understanding that the several necessary steps comprising my process and the several elements
60 of the apparatus may be varied without departing from the spirit and scope of the appended claims.

It is the purpose of this invention to dispense liquids in a condition ready for im-
65 mediate use. One method of practically effecting the concept thereof is to provide a system and means for storing the liquids with the exclusion of air, frequently agitating
70 them by the rotation of the storing means, and straining the liquids while dispensing them.

In order to make my invention more clearly understood, I have shown, in the accompanying drawings, means for carrying
75 the same into practical effect without limiting the improvements in their useful applications to the particular constructions which, for the purpose of explanation, have been
80 made the subject of illustration.

In the drawings:

Figure 1 is a horizontal section of the apparatus arranged upon the floor of a building.

Figure 2 is a cross sectional view showing
85 the apparatus in elevation.

Figure 3 is a detailed sectional view through one of the containers employed in the apparatus.

Figure 4 is a horizontal section taken along
90 the line 4-4 of Figure 3.

Figure 5 represents in detail the portion of the draw-off line extending through the bottom of the container.

Throughout the drawings similar reference
95 numerals designate similar parts in the different views. Shown in Figure 1 is a cross sectional horizontal view of a building having walls 1, a doorway 2, entering into a room generally designated as 3. There is
100 provided in the room, a dispensing or store

counter 4. Arranged along the walls of the room and also in the center thereof are platforms or mounting plates 5, upon which are positioned a plurality of cylindrical containers or storage tanks 6. The storage tanks 6 are positioned adjacent to each other so as to form a row upon each mounting plate or platform.

As shown in the drawings, the mounting plates 5 form in effect a plurality of platforms which are raised above the floor of the building by suitable supports.

The mounting plates 5 are constructed of a single piece of metal and are provided with circular grooves or recesses 12a located at definite intervals along the upper surfaces thereof. A circular lip or guard ring 12b extending above the top surface of the plate is shown positioned around each recess 12a.

While I have shown this construction in the drawings, it is obvious that many varied means for supporting or mounting the containers may be employed without departing from the spirit of the invention. As an example of this, platforms may be constructed of wood, concrete or any other suitable building material and may be provided with individual mounting plates for each container 6. The individual plates would differ only from the form shown in that they would be constructed separately and would not be one continuous piece of material.

Provided at the top of each container 6, is an air tight cover 7, the purpose of which will hereinafter appear. As shown in Figure 3, the cover 7 is hinged in any conventional manner as at 8. A suitable gasket may be provided around the top of the container, adjacent to the cover, so that the possibility of any air entering into the container may be eliminated.

The bottom of the container is of peculiar and novel construction and consists of a bottom member 9 secured to the sides thereof and in any conventional manner such as sweating, welding or other means. This bottom member is provided with a circular recessed portion 10a into which is fitted a circular ball run 10. It may be observed that the width of each recess 10a is substantially equal to that of the recess 12a formed in the mounting plate 5. Adapted to be positioned within each recess 12a is a ball run 12 similar to the ball run 10 and adapted to cooperate with the latter to form an anti-friction member by means of ball bearings 11 interposed between the two runs so as to form a ball race.

While I have shown an anti-friction means comprising a ball race interposed between the bottom member 9 and the plate 5, it should be understood that other friction eliminating devices may be employed, for example roller bearings may be used therefor. In mounting the containers ball bearings are placed upon the ball run 12 and the containers

are positioned thereon, the sides of each container being positioned between a projecting lip 12b. It may be observed that each lip 12b forms a suitable guard ring for the container.

Provided upon the underside of the bottom member 9 is a recessed portion 13 having an annular gear 13a positioned therein. It is obvious that if it is desired the gear 13a may be cut within the recess or it may be formed separately and secured therein. Moreover if it is desired it is possible to eliminate the recessed portion 13 and mount an annular gear upon the under surface of the bottom member 9.

Adapted to engage the annular gear 13a is a pinion 14 provided with a shaft 15 extending through a bearing 16 mounted upon the underside of the plate 5. At the lower end of the shaft 15 there is secured a bevel gear 17 adapted to cooperate with a similar gear 18 mounted upon a driven shaft 19.

It may be observed from an inspection of the drawings that upon the rotation of each of the pinions 14 the containers 6 will be caused to revolve. Extending below each row of containers is a driven shaft 19 having positioned thereon bevel gears 18 adapted to mesh with the bevel gears 17, mounted upon the container shafts 14. In order to operate the container drive shafts a suitable power source 35 is connected through the gear box 36, to a driven shaft 33. The main shaft 33 is supported upon suitable bearing members 34. Mounted upon main shaft 33 are bevel gears 32, one gear for each row of containers, which are adapted to mesh with similar bevel gears 31 mounted upon stub shaft 30 of conventional clutches.

Each clutch is supported upon a bearing support 34 by means of the arm 30'. Keyed upon the stub shaft 30 by means of keys 29 is a cone 28 which is adapted to be engaged by a female member 25 slidably keyed upon the shaft 19. A spring 26 is mounted between the end of the female member 25, and a wear take-up nut 27. The clutch is provided with a conventional handle 25' for actuating the mechanism.

It should be noted that each of the bevel gears 18 is slidably mounted upon the shaft 19 in order that each of the container shafts 15 may be rotated when desired. Cooperating with each sliding gear 18 is a conventional operating handle 20 pivoted at 21 to a support or plate 22, the latter being positioned upon the mounting plate 5. There is shown in each plate 22 a plurality of holes 24 adapted to receive engaging means 23 for maintaining the gears 18 and out of engagement with the gears 17.

From an inspection of the drawings it is obvious that upon the operation of the power source 35, the main shaft 33, will rotate the container drive shafts 19 and that these in

turn will actuate the container shafts 15 with a consequent rotation of the internal gear construction at the bottom of each container. This, of course, causes the containers themselves to revolve. It is equally apparent that by use of the clutches connecting the shafts 19 with the main shaft 33 one or more of the former may be driven. By reason of each of the bevel gears 18 being slidably keyed upon the shafts 19 it may be seen that any desired number of containers may be rotated in one or more of the container rows.

While I have shown each of the container drive shafts 19 as being connected to the main shaft 33 by suitable clutches and also each of the container shafts 15 being connected to the shafts 19 by reason of the bevel gears 18 being slidably keyed thereto, it should be understood that this construction may be dispensed with if desired and all of the containers operated simultaneously. It is equally obvious that a greater or lesser number of rows of containers may be employed with the apparatus without departing from the scope of the invention.

Each of the bottom members 9 is provided with an opening through its center adapted to allow a draw-off line 37 to pass there-through. As may be observed from an inspection of Figure 3, the draw-off line of each container extends for a substantial distance within the interior thereof.

Mounted within the upper end of the interior portion of the draw-off line is a bearing member 45. The bearing member may be provided with an externally screw threaded portion adapted to engage screw threads provided within the upper end 46 of the interior portion of the draw-off line.

It may be observed that the upper end of the bearing member 45 is recessed and adapted to support the squared end of a shaft 49. The opposite end of this shaft is supported in a bearing 51 positioned upon a suitable bearing support 52 near the top of the container. The support 52 may be secured within the container in any conventional manner.

A plurality of blade or vane elements 50 are secured to the shaft 49. It should be noted that the shaft 49 is stationary, as its lower end is squared to fit into the recessed portion of the bearing member 45. This construction allows the vane elements 50 to remain in a fixed position when the container is revolved. Although I have shown only one set of blade elements it is obvious that another set positioned at right angles to those shown may be employed if desired, the scope of the invention not being limited to the number of sets of vanes used.

In order to prevent the contents of the container from leaking through the opening provided for the draw-off line 37, a packing gland 40 employing suitable packing material is shown.

As it has been pointed out a portion of the draw-off line extends for some distance within the container. To maintain the draw-off line therein a plate 38 is positioned thereon and adapted to be secured to lower side of the mounting plate 5 by means of the tap bolts 38. Each draw-off line 37 is provided with a swiveled elbow 42 which is secured to the straight portion, depending from the container bottom, in any conventional manner, as the coupling 41. The end of each elbow 42 is provided with a draw-off cock 42'. As may be observed from Figure 2, draw-off cocks 42' may be so positioned that a single receptacle may be filled from two or more of the containers 6.

Positioned in the draw-off line below the bearing support 45, are a plurality of openings 43 adapted to allow the contents of the container to pass into the line. To strain the liquid passing through the openings 43 a screen 44 is employed.

It is evident that upon rotation of the containers 6 the contents thereof will be agitated as they are given a swirling motion due to this rotation. Because of the vanes within each container, it is apparent that the liquid will be thoroughly agitated.

The process and the apparatus are of particular advantage in ameliorating the difficulties of present day practice in dispensing various liquids, as will hereinafter appear. Various paints of different colors and grades are placed within the container 6 by raising the top 7 of each tank and pouring into it paint from the receptacles in which it has been received. The covers 7 are then closed, care being taken that they fit snugly around the top of the container. This construction eliminates possibility of the oxidation of the paint due to the presence of air, and consequently materially reduces the loss thereof.

At frequent intervals—once a day or oftener—the power source 35 is operated to rotate the containers and hence maintain the paint in a thoroughly mixed condition so as to prevent separation of the pigment from its vehicle. As it has been pointed out the rotation of the containers gives a swirling motion to the contents thereof. A more even and thorough agitation of the liquid may be derived from this expedient than by rotating the blade or vane elements 50. This is apparent when it is considered that upon the rotation of stirring means placed within a stationary container the liquid currents created thereby are directed from the center to the periphery of the container.

Due to centrifugal force any lumps or globules in the liquid will therefore be forced towards the walls of the container. While the size of these lumps is considerably decreased during this operation it is possible that some may not be eliminated entirely and may reach the wall of the container. Upon

reaching the container side it is readily conceivable that they would cling thereto. Moreover, it may be seen that in such position these lumps do not present their total surface area to their vehicle and their probabilities of being carried in suspension are thereby decreased.

By rotating the containers and not the vane elements positioned therein the above effects are overcome. The fluid flow is directed from the periphery of the container towards its center and any lumps in the liquid are carried to this position where their total surface area is in contact with the liquid. The vane elements aid in the even and thorough agitation of the container contents. It is apparent that lumps in the liquid can not cling to the container walls because of the direction of flow imparted to the liquid. This is equally true for the stationary vane elements which cooperate in the agitation of the suspension.

It will be well understood that the frequent agitation, mentioned above, decreases the possibility of the pigment and body of the paint settling and hardening. Moreover, it may be observed that the paint is maintained in a constantly mixed condition ready for immediate use. Hence the necessity of stirring the paint before applying is done away with.

By reason of the clutches and couplings connected to the shafts of the apparatus, any number of the tanks may be rotated. In the event that some of the containers are unfilled, the benefit of this expedient is apparent.

When it is desired to dispense the paint from any container, its valve 42' is opened and paint is allowed to flow through the draw-off line 37. It is apparent, by reason of the screen 44, that the paint passing through the openings adjacent thereto will be strained and any lumps of pigment prevented from passing into the draw-off line. The amount of liquid dispensed and the rate at which it is drawn off may be controlled by the operation of the valves 42'. It is apparent that in dispensing in the above described manner, the use of a color card for selecting the paint desired is obviated as the user or purchaser is enabled to see the exact color at the time of obtaining the paint.

When it is desired to mix several paints in one receptacle so as to obtain a color different from that possessed by either of these paints, the swiveled arms 42 of several tanks may be positioned above a receiving receptacle. It is possible in this way to simultaneously receive paint, from several containers, in the same receiving vessel. If it is desired, hose may be attached to the various valve outlets 42' of the arms or elbows 41.

There is no limitation upon the size of the containers or storage tanks 6 as it is pos-

sible, for example, to employ such sizes as 25, 50, 75, 100 gallons, etc. This feature depends upon the size the user desires. Moreover, it is possible to vary the size of the containers in a row and to have different size tanks in different rows. While cylindrical containers have been shown it is obvious that containers of other geometrical outlines may be employed without departing from the spirit of the invention.

If it is desired the container system may be mounted upon an upper floor of a building and by running pipe lines therefrom the dispensing valves could be located upon a lower floor. Equally apparent is a construction wherein the container system is mounted upon a lower floor of a building for example, a basement and by means of suitable pumps the liquid could be dispensed upon an upper floor.

The method and apparatus previously described is of particular utility to the paint trade where the handling and sale of paints is involved. At the present paint manufacturers use a great number of small containers for paints. This is due to the fact that the average consumer requires paint in small sized lots. When compared upon a unit cost basis it is evident that the expense involved in constructing a small size container is greater than that for a large container. Moreover in labeling and packing for shipment the small sized containers involve a greater expense to the manufacturer with a consequent increase in the cost of paint. Hence it may be observed that a method and apparatus for dispensing paint in bulk would be welcomed by the consumers who if they prefer, can furnish their own containers which would further decrease the ultimate cost of the paint.

While I have described the process and the apparatus as being particularly applicable for the dispensing of paint, it should be understood that it may be used for any other kinds of liquid without departing from the spirit and scope of the invention.

From the foregoing description, it may be observed that I have provided a process and apparatus for storing and dispensing liquids in a condition ready for immediate use, which comprises frequent agitation of the liquid with the absence of air and straining the liquids while dispensing them in desired quantities.

While I have shown and described the preferred embodiment of my invention, I wish it to be understood that I do not confine myself to the precise details of construction herein set forth, by way of illustration, as it is apparent that many changes and variations may be made therein, by those skilled in the art, without departing from the spirit of the invention, or exceeding the scope of the appended claims.

I claim:

1. A liquid storing and dispensing apparatus comprising a container, a plurality of stationary vanes mounted therein, means for rotating said container, means for drawing off the liquid therefrom, and means in said draw off means for straining the liquid. 70
2. A dispensing apparatus for liquids, comprising a plurality of containers, a plurality of stationary blades mounted within each container, means for rotating the containers, means for drawing off the liquid from said containers, and means in the draw-off means for straining the liquids. 75
3. A liquid dispensing apparatus comprising a plurality of containers, stationary blades mounted within each container, a draw-off cock for each container, said cocks being so constructed that liquids from two or more containers may be drawn off into a receptacle, means for rotating the containers and means for straining the liquids while drawing them off. 80
4. A liquid dispensing apparatus comprising a container whose bottom is rotatively mounted upon a mounting plate, stationary draw off means extending through said bottom, said draw off means providing a support for a stationary shaft positioned in said container, a plurality of blade elements on said shaft, and means on the bottom of said container for cooperating with driven means for rotating said container. 85
5. A liquid dispensing apparatus comprising a container whose bottom is rotatively mounted upon a mounting plate, stationary draw off means extending through said plate and the bottom of said container, said draw off means providing a support for a stationary shaft having blade elements thereon positioned in the container, straining means in the draw off means, and driven means on the bottom of said container for rotating the same upon said base plate. 90
6. In a liquid dispensing apparatus comprising a container whose bottom is rotatively mounted upon a base plate, a stationary draw off conduit extending through said base plate and said bottom and into the container, a bearing member for supporting a stationary shaft having a plurality of blade elements thereon mounted in the inner end of said conduit, the portion of said conduit within said container being provided with a plurality of openings, a straining device over each of said openings and means on the bottom of said container for cooperating with driven means so as to rotate the container. 95
7. The combination in a liquid dispensing apparatus of a container whose bottom is provided with a bearing race for rotatively mounting the container on bearings in a second bearing race carried by a mounting plate with stationary draw off means extending through said plate and through the bottom of said container, said draw off means providing a support for a stationary shaft positioned in said container, a plurality of blade elements on said shaft, and means on the bottom of said container for cooperating with driven means for rotating said container. 100
8. The combination in a liquid dispensing apparatus of a container whose bottom is provided with a bearing race for rotatively mounting the container on bearings in a second bearing race carried by a mounting plate with stationary draw off means extending through said plate and the bottom of said container, said draw off means providing a support for a stationary shaft having a plurality of blade elements thereon positioned in said container, straining means on the draw off means, an annular gear on the bottom of said container, a driven shaft extending through said plate, a pinion on said driven shaft in mesh with said annular gear and means for rotating said driven shaft. 105
9. In a liquid dispensing apparatus having a plurality of containers, each container being rotatively seated upon mounting plates, separate stationary draw off conduits extending through the bottom of each container and its mounting plate, the inner end of each draw off conduit provided with a bearing for supporting a stationary shaft having a plurality of blade elements within each container, each of said shafts being also supported at the top of their respective containers, means on each draw off conduit for straining the liquid while drawing it off, an annular gear on the bottom of each container and power driven means for driving any desired number of said gears so as to cause the rotation of a like number of containers. 110

In testimony whereof I affix my signature.
LAWRENCE H. HANCOCK. 115

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