Feb. 20, 1934. C. M. LARSON 1,947,994

APPARATUS FOR HANDLING SOAPS

Filed April 4, 1931

Fig. 1.

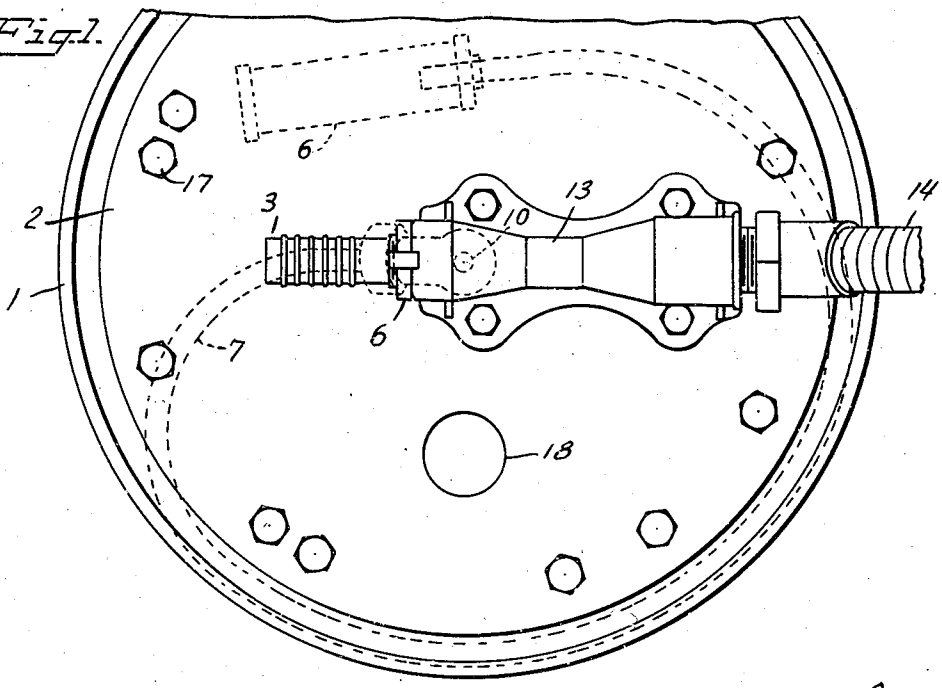
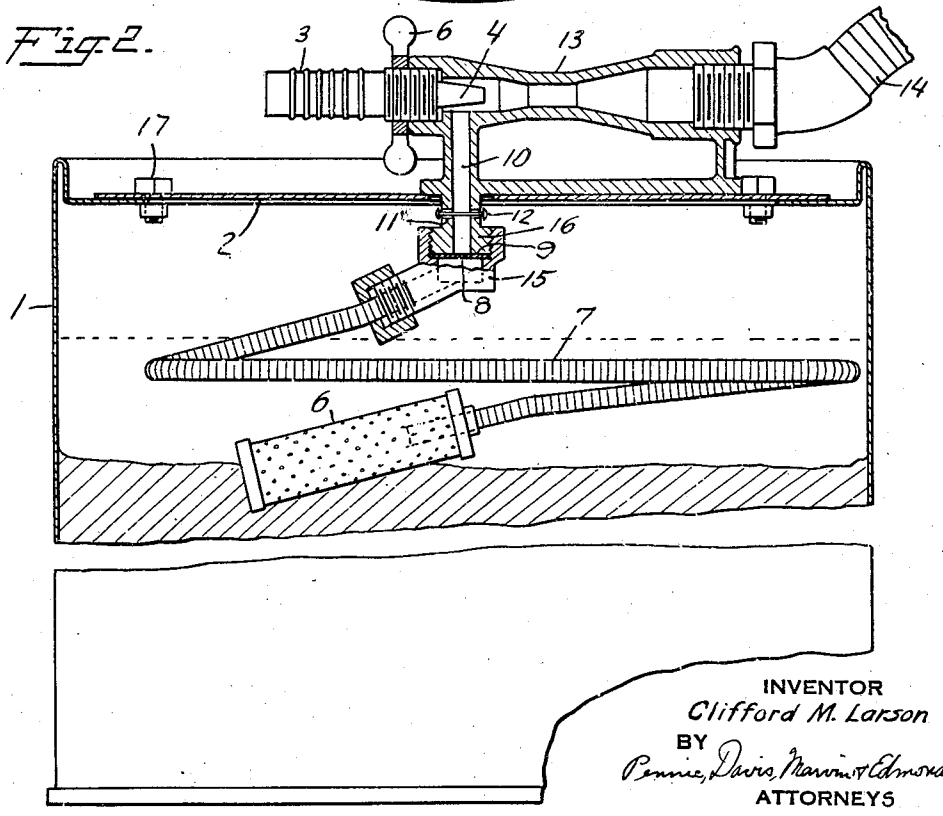


Fig. 2.



INVENTOR
Clifford M. Larson
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

Patented Feb. 20, 1934 1,947,994

UNITED STATES PATENT OFFICE

1,947,994

APPARATUS FOR HANDLING SOAPS

Clifford M. Larson, New Rochelle, N. Y., assignor to Sinclair Refining Company, New York, N. Y., a corporation of Maine

Application April 4, 1931. Serial No. 527,689

13 Claims. (Cl. 299—84)

This invention relates to an apparatus for handling soaps, detergent solutions and the like. The apparatus of the present invention is also adapted for the handling of other solid, semi-solid or liquid materials which it is desired to dispense as a solution, suspension, emulsion or a suds of uniform but readily controllable concentration and consistency.

The apparatus of the present invention is especially adapted for handling soaps, more particularly soft or liquid soaps, and provides means whereby such materials may be dispensed in any desired amount from bulk containers in the form of uniformly dense suds of any desired consistency ready for immediate use and entirely free from particles of undissolved soap which are undesirable because they tend to adhere to the surfaces to which the suds may be applied and are difficult to remove therefrom.

The apparatus of the invention provides means for converting soaps and similar materials to a form in which they can be most advantageously used in any quantity desired for immediate use, thereby promoting more economical use of such materials and reducing waste. It will also be noted that the apparatus of the invention is of simple and cheap but rugged construction, is readily accessible for cleaning and is unusually simple to operate.

The invention will be further described in connection with the accompanying drawing which illustrate one form of apparatus embodying the invention, but it is intended and it will be understood that this further description and illustration are for the purpose of exemplification and the invention is not limited thereto.

In the drawing shown:—

Fig. 1 is a plan view of one form of apparatus embodying the invention; and

Fig. 2 is a side elevation, partly in section and with parts broken away of the apparatus illustrated in Fig. 1.

Referring to the drawing, 1 is a bulk container having a relatively large removable end-cover. The container 1 has no special size or shape, the form illustrated being a standard drum or barrel of the type generally employed for storing or transporting solid or semi-solid materials. The container 1 is provided with a cover plate 2 arranged to substantially close the opening in the upper end of the container and adapted to support an ejector 13. The cover plate 2 need not completely close the opening in container 1, and should not tightly close this opening so as to preclude the admission of air. Bolts 17 are provided for securing the cover plate 2 to container 1. Cover plate 2 has no especial shape and may be made in any shape or form necessary to fit the opening in container 1. As shown in Fig. 1 it is circular and has openings drilled so that it may be readily attached to any of the standard size drums. Nozzle 4 is inserted into the inlet end of ejector 13 and may be connected to any suitable means for supplying hot or cold water or other liquid under pressure. Nozzle lock nut 6 is provided for securely locking nozzle 4 in place. Water or other liquid supplied under pressure to nozzle 4 may be controlled by a control valve not shown. To the discharge end of ejector 13 is attached a hose 14 which is inclined upwardly for a short distance so as to readily form a liquid seal and assist the ejector in establishing suction. Ejector 13 is connected to a flexible tubing 7, through opening 8 in a metering disk 9 and chamber 10 in the channelled projection 16. Metering disk 9 is placed in fitting 15 attached to the end of flexible tubing 7 which is screwed in place to threaded and channelled projection 16 extending through cover plate 2. A screen 6 is preferably connected to the lower end of flexible tubing 7. A small opening 11 connecting with chamber 10 is advantageously provided in the channelled projection 16 for the purpose of admitting a restricted flow of air or other gas necessary for the formation of suds. This opening may be provided elsewhere as, for example, in the throat of the ejector 13 itself. However, it is preferable to position such opening on the low pressure side of the metering disk 9 so that the air or other gas admitted is not required to pass through the metering disk. The opening 11 may or may not be fitted with a loose-fitting pin 12 as shown in Figure 2. Where it is desired to dispense the soap or other material as a solution of any desired concentration rather than in the form of suds, the opening 11 is not necessary.

In the operation of the apparatus illustrated in the drawing to produce suds from a soft soap within container 1, water may be added to the soap, for example, through the opening 18 in the cover plate 2 and the mixture allowed to stand until sufficient soap has been dissolved to form a concentrated soap solution. Water is supplied through hose 3 under pressure and forced through nozzle 4. The flow of water through nozzle 4 creates a region of low pressure around the nozzle and draws the soap solution through the screen 6 and the flexible tubing 7 from whence it passes through opening 8 into chamber 10. Air in

amounts sufficiently restricted so as not to destroy the suction effect created within the ejector 13 is admitted through opening 11. The air and concentrated soap solution are intimately admixed within the ejector with additional water supplied by nozzle 4, and the mixture is discharged as a uniformly dense suds through 14. The flexibility of tube 7 permits gradual lowering of the inlet end of the tube as the soap passes into solution and is discharged, and makes it possible to use the same cover plate assembly with containers of different depths.

By regulating the amount of water used to dissolve the soap and the amount of water forced through nozzle 4 and by using an appropriate metering disk, any desired concentration and consistency of suds may be obtained. A further control may be effected by regulating the amount of air admitted through opening 11, for example, by varying the size of the opening 11 or the loose fitting pin 12. Opening 11, as previously stated, may or may not be fitted with a loose fitting pin 12 as shown in Fig. 2. The use of such pin is desirable, however, as the flow of material past opening 11 causes the pin to move or vibrate about in the opening 11 and thereby offsets the tendency of this opening to become clogged that is frequently encountered particularly where very hard water is used in preparing the concentrated soap solution. During operation the opening 18 in cover plate 3 is preferably left open to admit air to the container and water or other liquid may be added through this opening as needed.

In the preferred apparatus of the invention the screen 6 is attached to the end of the flexible tubing 7 and operates to prevent any undissolved soap from being drawn into the flexible tubing 7. The form of screen illustrated is particularly advantageous in that it is adapted to support the lower end of the flexible tube 7 on the upper surface of the undissolved soap body, or other body of solid or semisolid material such as accumulated sediment formed when using hard water so as to keep the inlet of tube 7 clear. The flexible tubing 7 and screen 6 are with advantage constructed of a material resistant to corrosion caused by the material being handled. Brass and chromium-plated metal have been found to be especially resistant to corrosion caused by soaps; zinc and galvanized iron, on the other hand, are readily attacked by the soaps and the reaction products so formed tend to frequently clog the minute opening in the metering disk.

The opening 8 in the metering disk 9 may be of any desired size depending upon the solvent used. For example, where hard water is used the opening should be larger than when soft water is used. Metering disks having progressively smaller openings, for example, may be employed for hard, medium and soft water. By the use of such metering disks approximately 500, 1,000, and 1,500 gallons of suds per 100 pounds of soap respectively may be obtained.

Ejector 13 is, as shown in the drawing mounted on the upper surface of cover plate 2 and is provided with removable nozzle 4 and removable end connection 14, whereby the interior of the ejector is easily accessible and may be readily cleaned when necessary. The accessibility of this construction is of special advantage where the liquid supplied to the ejector has a tendency to deposit on the walls of the ejector. As an illustration it has been found that where hard water is used, a lime like deposit tends to accumulate rapidly in the ejector, thereby interfering with the efficient operation of the apparatus. This difficulty, however, may be readily remedied, for example, by merely removing the nozzle 4 and connection 14 and passing a swab soaked with kerosene through the ejector body.

From the foregoing description of the apparatus it will be seen that the invention provides a novel means for dispensing soap and other materials in the form of suds of any desired consistency and concentration. The apparatus of the invention possesses the advantage that it is very compact. As the various parts are assembled entirely upon the cover plate 2, the assembly may be readily removed from one container and inserted into a new one of the same or different size without disturbing the adjustment of the various parts, and if nozzle 4 be equipped with a flexible connection such removal may be accomplished without disconnecting nozzle 4 from the source of liquid supply. The apparatus of the invention possesses the further advantage that no pressure or vacuum is necessary on the container, accordingly no special container made to withstand pressure or vacuum is required.

I claim:

1. In an apparatus of the class described the combination comprising a container having an opening in the upper end, a cover plate adapted to partially close said opening, an ejector mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, a metering disk in said ejector suction inlet passage for regulating the flow of material through said channelled projection, a flexible tubing connected to the said channelled projection and having a strainer attached to its lower end and means for supplying liquid under pressure to the ejector.

2. In an apparatus of the class described the combination comprising a container having an opening in the upper end, a cover plate adapted to partially close said opening, an ejector mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, a metering disk in said ejector suction inlet passage for regulating the flow of material through said channelled projection, a flexible tubing of non-corrodible material connected to the said channelled projection and having a strainer attached to its lower end and means for supplying liquid under pressure to the ejector.

3. In an apparatus of the class described the combination comprising a container having an opening in the upper end, a cover plate adapted to close said opening, an ejector mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, said cover plate being provided with an opening for the admission of a liquid to said container, a metering disk in said ejector suction inlet passage for regulating the flow of material through said channelled projection, a flexible tubing connected to the said channelled projection and having a strainer attached to its lower end and means for supplying liquid under pressure to the ejector.

4. In an apparatus of the class described the combination comprising a container having an opening in the upper end, a cover plate adapted to partially close said opening, an ejector body mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, a nozzle removably mounted in one end

of the ejector body and a removable connection at the other end thereof, a metering disk in said ejector suction inlet passage for regulating the flow of material through said channelled projection, a flexible tubing connected to the said channelled projection and having a strainer attached to its lower end and means for supplying liquid under pressure to the ejector.

5. In an apparatus of the class described, the combination comprising a container having an opening in the upper end, a cover plate adapted to partially close said opening, an ejector mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, a metering disk in said ejector suction inlet passage for regulating the flow of material through said channelled projection, an opening extending through the wall of said channelled projection and communicating with the said suction inlet passage, said opening being above the said metering disk and adapted to admit a gas, a flexible tubing connected to the said channelled projection and having a strainer attached to its lower end, and means for supplying a liquid under pressure to the ejector.

6. In an apparatus of the class described, the combination comprising a container having an opening in the upper end, a cover plate adapted to partially close said opening, an ejector mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, a metering disk in said ejector suction inlet passage for regulating the flow of material through said channelled projection, an opening having a loose fitting pin therein extending through the walls of said channelled projection and communicating with the said suction inlet passage, said opening being above the said metering disk and adapted to admit a gas, a flexible tubing connected to the said channelled projection and having a strainer attached to its lower end, and means for supplying a liquid under pressure to the ejector.

7. In an apparatus of the class described, the combination comprising a container having an opening in the upper end, a cover plate adapted to partially close said opening, an ejector body mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, a nozzle removably mounted in one end of the ejector body and a removable connection at the other end thereof, said removable connection having an upwardly inclined portion, a metering disk in said ejector suction inlet passage for regulating the flow of material through said channelled projection, a flexible tubing connected to the said channelled projection and having a strainer attached to its lower end, and means for supplying liquid under pressure to the ejector.

8. In an apparatus of the class described, the combination comprising a container having an opening in the upper end, a cover plate adapted to close said opening, an ejector mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, said cover plate being provided with an opening for the admission of a fluid to said container, a metering disk in said ejector suction inlet passage for regulating the flow of material thru said channelled projection, an opening extending thru the wall of of said channelled projection and communicating with the said suction inlet passage, said opening being above the said metering disk and adapted to admit a gas, a flexible tubing connected to the said channelled projection and having a strainer attached to its lower end and means for supplying liquid under pressure to the ejector.

9. In an apparatus of the class described, the combination comprising a container having an opening in the upper end, a cover plate adapted to close said opening, an ejector mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, said cover plate being provided with an opening for the admission of a fluid to said container, a metering disk in said ejector suction inlet passage for regulating the flow of material thru said channelled projection, an opening having a loose fitting pin therein extending thru the wall of said channelled projection and communicating with the said suction inlet passage, said opening being above the said metering disk and adapted to admit a gas, a flexible tubing connected to the said channelled projection and having a strainer attached to its lower end and means for supplying a liquid under pressure to the ejector.

10. In an apparatus of the class described, the combination comprising a container having an opening in the upper end, a cover plate adapted to partially close said opening, an ejector mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, a metering disk in said ejector suction inlet passage for regulating the flow of material thru said channelled projection, said metering disk being beneath the cover plate, a flexible tubing connected to the said channelled projection and having a strainer attached to its lower end and means for supplying liquid under pressure to the ejector.

11. In an apparatus of the class described, the combination comprising a container having an opening in the upper end, a cover plate adapted to partially close said opening, an ejector mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, a metering disk in said ejector suction inlet passage for regulating the flow of material thru said channelled projection, a flexible tubing connected at an angle to the said channelled projection and having a strainer attached to its lower end and means for supplying liquid under pressure to the ejector.

12. In an apparatus of the class described, the combination comprising a container having an opening therein, a cover plate adapted to close said opening, an ejector mounted on the outer surface of the cover plate and having a suction inlet passage including a channelled projection extending thru said cover plate into the container, a second opening in the container above the normal liquid level, a metering disk in said ejector suction inlet passage for regulating the flow of material thru said channelled projection, an opening in the wall of said channelled projection communicating with the said suction inlet passage, said opening being adapted to admit a gas, a flexible tubing connected to said channelled projection and having a strainer attached to its lower end and means for supplying liquid under pressure to the ejector.

13. In an apparatus of the class described, the

combination comprising a container having an opening in the upper end, a cover plate adapted to partially close said opening, an ejector mounted on the upper surface of the cover plate and having a suction inlet passage including a channelled projection extending beneath said cover plate, an opening having a loose fitting pin therein extending through the walls of said channelled projection and communicating with the said suction inlet passage, said opening being adapted to admit a gas, a conduit connected to said channelled projection and extending downwardly within the container and means for supplying liquid under pressure to the ejector.

CLIFFORD M. LARSON.