W. A. TIMM.

LIQUID DISTRIBUTING SYSTEM.

APPLICATION FILED JULY 29, 1918.

1,341,447.

Patented May 25, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

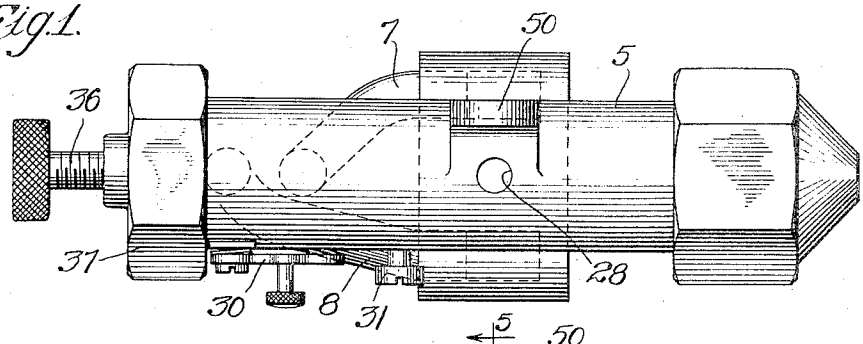


Fig. 2.

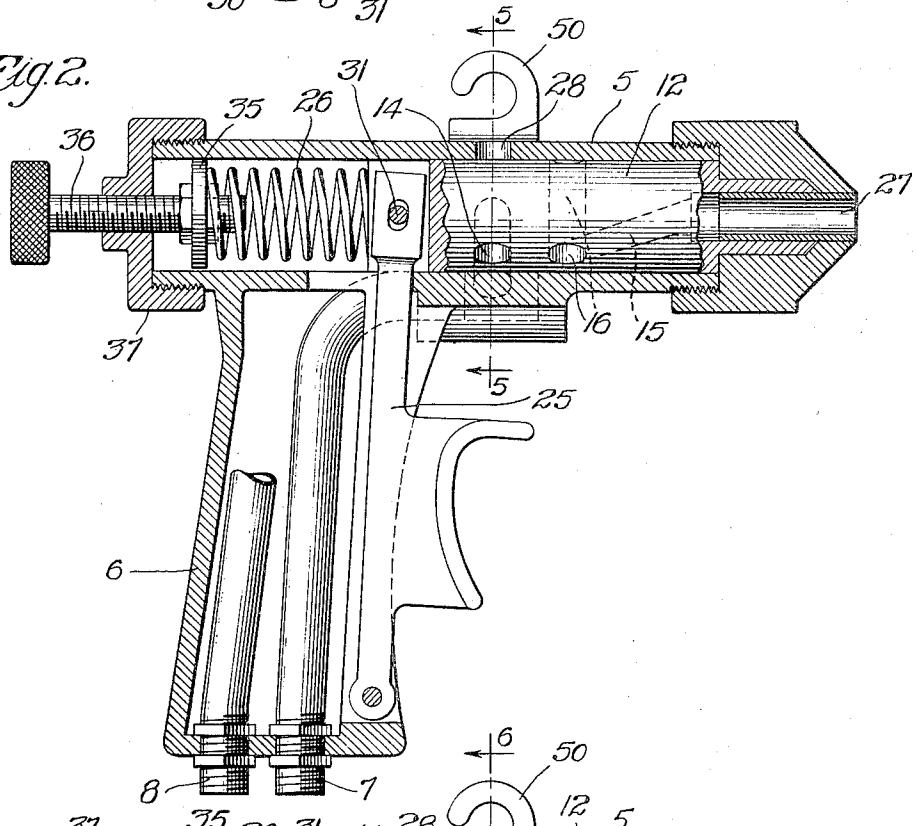
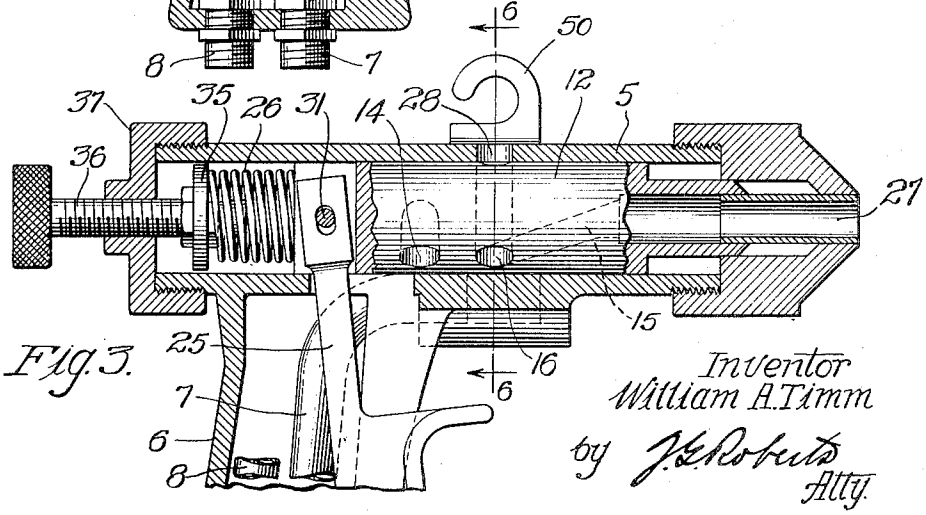


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

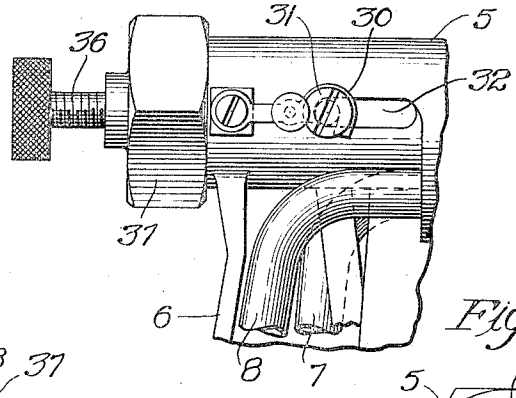


Fig. 5.

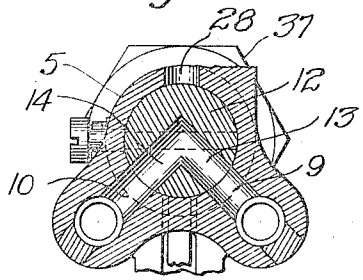


Fig. 6.

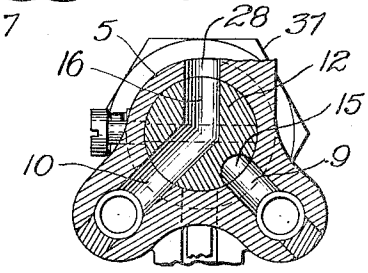


Fig. 7.

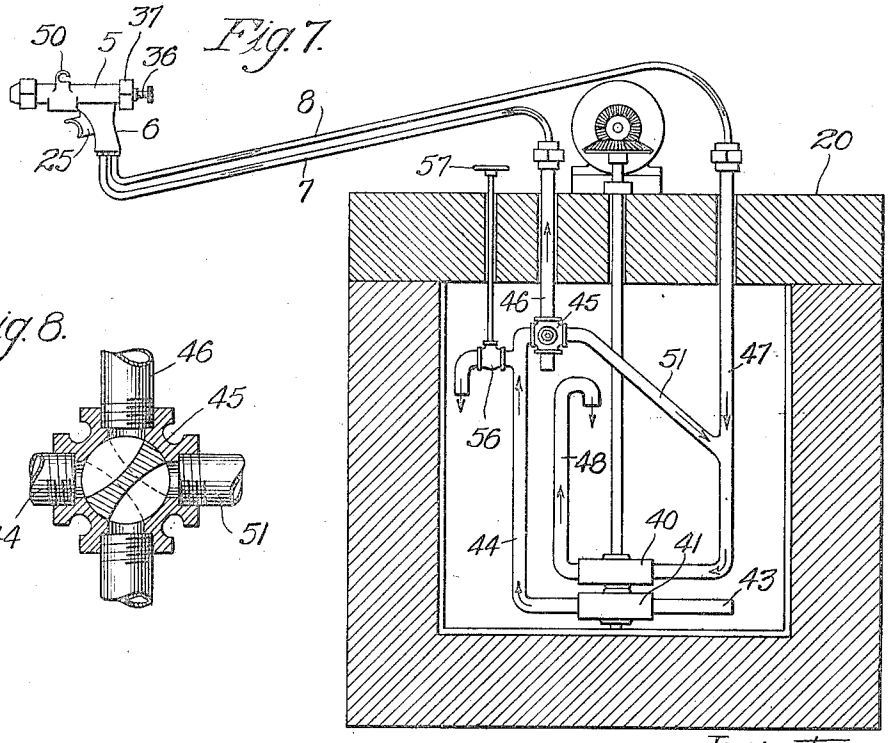


Fig. 8.

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UNITED STATES PATENT OFFICE.

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LIQUID-DISTRIBUTING SYSTEM.

1,341,447. Specification of Letters Patent. Patented May 25, 1920.

Application filed July 29, 1918. Serial No. 247,349.

To all whom it may concern:

Be it known that I, WILLIAM A. TIMM, a citizen of the United States, residing at Berwyn, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Liquid-Distributing Systems, of which the following is a full, clear, concise, and exact description.

This invention relates to a liquid distributing system, and more particularly to a system and apparatus for distributing a hot viscous compound to a plurality of individual containers.

The object of this invention is to provide a system and apparatus by means of which a plurality of small individual containers may be rapidly and efficiently filled with a hot compound which will be maintained at a desired temperature and will be free from lumps and bubbles.

In accordance with the general features of this invention, there is provided a liquid containing tank connected by means of suitable piping with a discharge nozzle which is provided with suitable controlling mechanism by means of which the compound from the tank may be circulated through it to heat the connecting pipe and nozzle preparatory to the discharge of the liquid into the containers.

Means are also provided in the nozzle whereby, during the time that the liquid is discharging through one connecting pipe and the discharge nozzle, another pipe connected with the nozzle will be open to the air which will be drawn through it to remove all of the liquid remaining therein after the heating process.

Means, are also provided for draining both nozzle connecting pipes when the nozzle is not in use for filling containers.

Other features of the invention relate to the details of construction of the nozzle and the arrangement of pipes in the supply tank for eliminating air bubbles from the nozzle and for recirculating the liquid in the tank for the purpose of thoroughly mixing it.

In the drawings illustrating this invention:

Figure 1 is a plan view of a nozzle embodying features of this invention;

Fig. 2 is a longitudinal sectional view of the nozzle with the operating parts in normal position;

Fig. 3 is a longitudinal sectional view of the nozzle with the parts in operative position;

Fig. 4 is a fragmentary detail view of the nozzle illustrating details of a locking mechanism;

Fig. 5 is a sectional view of the discharge nozzle taken upon line 5—5 of Fig. 2;

Fig. 6 is a cross-sectional view of the discharge nozzle taken upon line 6—6 of Fig. 3;

Fig. 7 is a view in side elevation with the tank in cross section illustrating the pumping and piping arrangement of the tank, and

Fig. 8 is a detail cross-sectional view of a four-way valve used in this invention.

As shown in the drawings, 5 designates a valve casing provided with a pistol grip handle 6 through which extend supply and return pipes 7 and 8 which terminate at one end in port openings 9 and 10 leading through the wall of the valve casing 5. Located within the valve casing 5 is a cylindrical slide valve 12 provided with passages 13, 14, 15, and 16. Passages 13 and 14 are joined together within the valve 12 and are adapted in the normal position of this valve to register with the port openings 9 and 10 of the valve casing 5. In this position of the valve 12 there will be a free passage for liquid from the supply pipe 7 through the openings 9 and 10 in the casing, the passages 13 and 14 in the valve, to the return pipe 8. The supply and return pipes 7 and 8 lead to a liquid supply tank 20 and are there connected with pumping mechanism in a manner and for the purpose hereinafter described.

The valve 12 is slidable within the casing 5 and has one end connected with a pivotal lever 25 adapted to be grasped by the hand of an operator to move it inwardly against the tension of a spring 26 to bring the openings 15 and 16 of said valve into registering relation with the port openings 9 and 10 through the casing 5. As shown in the drawings, and particularly in dotted lines in Fig. 2, the passage 15 leads out to the right-hand end of the slide valve 12 and thence through a passage 27 in the discharge end of the valve mechanism. The other passage 16 opens through the upper surface of the slide valve 12 and is adapted, when this valve is moved, to bring the passages 15 and 16 into a registering relation

with the passages 9 and 10, to register with an air inlet passage 28 through the upper part of the valve casing 5.

The valve member 12 may be locked in its operated position by means of a hook member 30 pivotally supported upon the outside of the casing 5 and adapted to engage an extending pin 31 carried by the inner end of the valve member 12 and operating in a slot 32 through the casing member 5. This locking mechanism is used when it is desired to drain the liquid from the piping and valve during the time that it is not in use. This feature will be further described in connection with the description of the operation of the apparatus and system.

The left end of the spring 26 bears against a plate or washer 35 carried by a screw threaded stud 36 which extends through a removable cap 37 mounted upon the left end of the valve casing 5.

In the operation of the apparatus and system of this invention it is desirable that the piping and nozzle be first heated to approximately the temperature of the liquid compound before the liquid compound is supplied to the containers. This may be accomplished by setting the slide 12 in its normal position and operating pumps 40 and 41 located in the container 20. As these pumps operate, liquid will be drawn into a pipe 43 by the pump 41 and will be forced through a pipe 44, a four-way steam valve 45, pipe 46, the supply pipe 7, through the port opening 9 of the valve mechanism, passages 13 and 14 of the valve, opening 10, and through the return pipe 8 to pipe 47 through the pump 40 and a pipe 48 back into the container. Since the liquid in this container is also maintained at the temperature at which it is to be used, its circulation through the pipes 7 and 8 and the valve mechanism, as hereinbefore described, will bring the temperature of these pipes and the valve mechanism up to approximately the temperature of the liquid, thereby preventing the liquid from being discharged in a lumpy or otherwise unsatisfactory condition.

After the pipes 7 and 8 and the discharge nozzle have been heated to the required temperature the valve 12 will be moved backward into its operating position to bring the passages 15 and 16 into registering relation with the port openings 9 and 10, whereby liquid will be discharged from the tank through the opening 27 of the nozzle mechanism into suitable containers. In this position of the parts liquid will be drawn from the tank 20 through the pipe 43, the pump 41, which will force it through the pipe 44, the four-way steam valve 45, the pipe 46, the discharge pipe 7, the port opening 9 in the casing 5, and the passage 15 in the valve 12 to the discharge passage 27. At the same time the pump 40 will by its action draw air through the valve casing 5 at the opening 28, through the passage 16 in the valve, through the port opening 10 in the casing 5, the return pipe 8, pipe 47, and through the pump 40 and pipe 48 which opens downwardly into the tank 20. This action of the pump 40 will clear all remaining liquid from the pipe 8 and prevent air from getting into the pipe 7 or the discharge passage 27 of the nozzle mechanism. When the filling operation has been completed it is desirable to drain both pipes 7 and 8 of the compound in order to prevent it freezing in these pipes and thereby interfering with the circulation of the compound from the tank when the apparatus is again put into use. To accomplish this the valve 12 is locked in its operating position by means of the hook 30 and pin 31 and is then suspended by means of a hook 50 provided on the casing 5. The four-way steam valve 45 is then turned to the position shown in dotted lines in Fig. 8, whereby the pump 40 will, by its suction, draw air through the openings 27 and 28, the passages 15 and 16, the pipes 7 and 8, and through pipes 46, 47, and 51. All liquid remaining in the nozzle and pipes at the completion of the filling operation will therefore be withdrawn from these pipes back through the pump 40 and discharged into the tank through the pipe 48.

The pressure at which the liquid is circulated through the discharge pipe 7 by the pump 41 may be regulated by means of a valve 56 connected with the pipe 44 and controlled by means of a handle 57 above the container 20. The opening of this valve will provide a by-path for the liquid from the pipe 44 and the amount of its opening will determine the amount of pressure upon the liquid which passes through the pipes 46 and 47.

What is claimed is:

1. In a liquid distributing system of the class described, a liquid supply tank, a discharge nozzle provided with a discharge opening and with an air inlet, supply and return pipes connecting said tank with said nozzle, movable valve mechanism in said nozzle provided with a plurality of passages adapted in one position of said valve to connect said supply pipe with the discharge opening of said nozzle and the return pipe with the air opening of said nozzle, and pumping mechanism in said tank adapted in its operation to force liquid through said supply pipe and draw air through said return pipe.

2. In a liquid distributing system of the class described, a liquid supply tank, a pumping mechanism in said tank, a discharge nozzle, supply and return pipes connecting said

tank and said nozzle, and a system of pipes and connections in said tank whereby said pumping mechanism may be caused to force liquid through said nozzle or draw air through the nozzle and supply pipe.

3. In a liquid distributing system of the class described, a liquid supply tank, a pump in said tank, a discharge nozzle, supply and return pipes connecting said tank and said nozzle, a system of pipes and connections in said tank, and adjustable valve mechanism associated with said pipes and connections adapted in one position to cause said pump to force liquid through said supply pipe and nozzle and in another position to draw air through said nozzle and supply pipe.

4. In a distributing system of the class described, a liquid supply tank, pumping mechanism in said tank, a discharge nozzle, supply and return pipes connecting said nozzle and said tank, pipes in said tank connecting said supply and return pipes with said pumping system, other pipes in said tank connecting with said pumping system and opening into said tank, and a valve in said piping system for directing the liquid from said pumping system through said supply pipe or back into the tank.

5. In a distributing system for liquid compounds, a discharge nozzle, a supply tank, supply and return pipes extending from said tank to said nozzle, pumping mechanism in said tank, and means in said tank and said nozzle for circulating the liquid in said tank and for draining said nozzle and said supply and return pipes at the same time without circulating said liquid through said nozzle.

In witness whereof I hereunto subscribe my name this 18th day of July, A. D., 1918.

WILLIAM A. TIMM.