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BY A. P. C. Filed Jan. 15, 1940

FIG.1

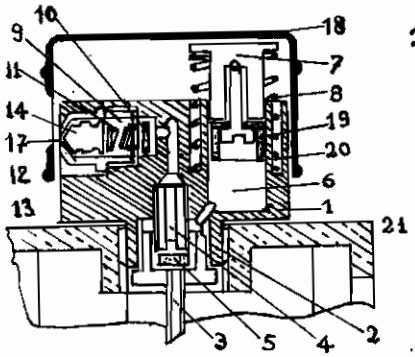


FIG.2

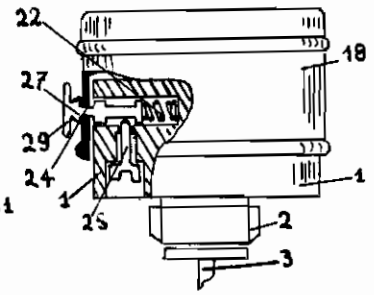


FIG.3

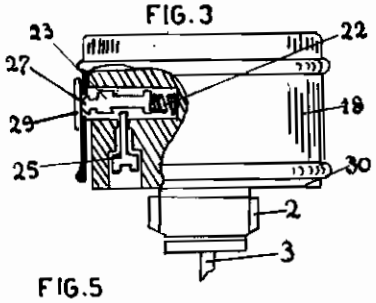


FIG.4

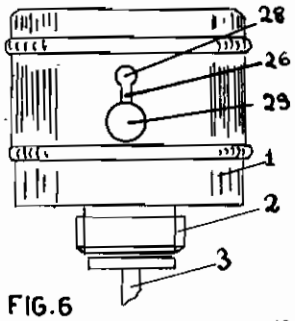


FIG.5

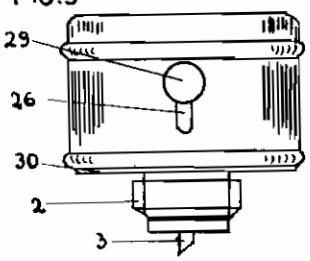


FIG.6

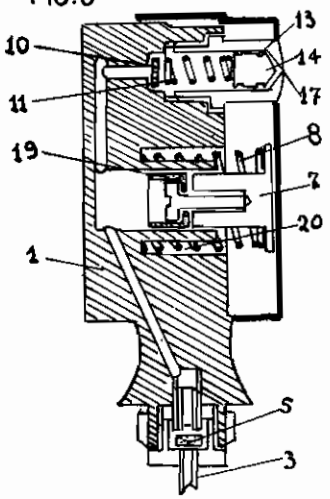
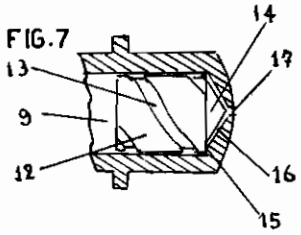


FIG.7



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ALIEN PROPERTY CUSTODIAN

PERFECTIONS BROUGHT TO ATOMIZERS FOR LIQUIDS

Luigi Mai, Nice, France; vested in the Alien Property Custodian

Application filed January 15, 1940

The object of the present invention regards perfections brought to atomizers for liquids and in special way to the type described in my patent filed in the Granducate of Luxemburg the 26th. August 1936 having the number 22,667.

The perfections permit to realize a mechanical atomizer which occupies a very little space and in which all its organs are reunited in a unic body which is covered with a cap so as to form an independent whole, which can also carry organs adapted to fix it to the receptacle containing the liquid to be atomized.

The cap also serves to action the pump and all the other organs, to keep them in their places and moreso it has the function to cover completely and block the mechanism.

To realize this atomizer the following perfections have been made:

The piston is formed by an element with a fiat head carrying a stopper, on the opposite end it carries a head with a diametre larger than the piston, on which comes to lean a spring which actions the piston in its return run and does also other work which we shall describe hereafter.

This spring is wound around the outside of the piston and goes to collocate itself in a chamber extending along the outer wall of the cylinder; thus obtaining a piston "commanded by a spring" extremely short which occupies very little space, although allowing the spring to have all the elasticity and the necessary run, moreso this realization allows the piston to arrive right to the bottom of the cylinder expelling all the air or the liquid, and so obtaining the necessary and constant pression for a good atomization.

A cap covers the body and the organs of the atomizer and it is mounted movably on the same body.

A dispositive made by a fixed pivot a running pivot or a jumping pivot, allows the cap to be guided, kept or held, stopped and freed, which more than keeping the organs of the atomizer, serves to action the piston.

The spring bound around the piston has the work (more than the work above mentioned) to make the cap return always to the same position and to allow the cap, when you want to keep it in the closed position, fixed into the guiding and stopping pivot.

In order to obtain a perfect atomization I have brought to the already known atomizer dispositive, made by an element of helycoidal channel and by the usual orifice the following perfection: the head of the element which carries the helycoidal channel has the wall with the same profile of the internal chamber of the orifice, but carries a light pressing down so as to leave a space of a few tenths of millimetre, to avoid that this element functions as a valve and permitting the liquid, to which has been impressed a speedy roundabout movement, to exit from the orifice perfectly centred and in equilibrium, regulating in this way a perfect and uniform exit of the liquid which mixes itself thus with the atmosphere in the most regular conditions to obtain a very good atomization.

From the enclosed drawing the different characteristics will result in a novelty of construction, of a combination of the different pieces of the atomizer.

Figure No. 1 is a view in section of an atomizer through the axile of the piston and that of the chamber of atomization.

Figure 2 is an external view of an atomizer figuring a partial action of the dispositive which assures the guide and the stop of the cap in the working position.

Figure 3 is the same view but presents the cap blocked.

Figure 4 is an external view of the atomizer the dispositive side of the guide and blockade of the atomizer in the normal position of working.

Figure 5 is the same view in the position of the blockade of the cap and therefore of the piston.

Figure 6 is a view in section through the axile of the piston of an atomizer in which the piston and the atomizing chamber notwithstanding the cap are disposed horizontally.

Figure 7 is a view in section of the atomizing dispositive.

The liquid can be put into any type of receptacle, opened or closed and the atomizer can work dipping into the liquid of the collecting tube.

With regard to the type of atomizer represented in the Figures 1, 2, 3, 4, 5, 7, the object is composed of a body 1 having an organ of junction 2, a screw or anything else, which permits to adapt the atomizer above a receptacle adapted containing the liquid.

This body is furnished with a tube 3 which dips into the liquid and which is united to a piece holding seat 21 with the chamber 4 which contains a holding valve 5. This chamber 4 communicates on one side, with the cylinder 6 in which the piston 7 moves, recalled by the spring 8, and on the other side with the chamber 9; this chamber has a valve 10 held in a state of ease, against its seat by a recalling spring 11 which takes its leaning point on the other end against the piece 12 furnished with peripheric

helycoidal channels 13, destined to imprint a roundabout movement on the liquid which exits from the hole 17 atomized.

This piece 12 finishes at the anterior part with the conic part 14 having at the base a light pressing down 15. This pressing down allows it an absolute adherance against the internal wall of the atomizing chamber, and having a conicality about equal to that of the said chamber, it leaves a passage 16 big enough to regulate and center the liquid before its expulsion through the orifice 17.

The piston 7 which runs in the cylinder 6 is commanded by the cap 18 and it is made of a body on which is fixed a plunger 19 which assures the hold.

The recall spring 8 which allows the return of the cap, of the piston and consequently the movement of aspiration, covers the body of the piston for nearly half of the length and penetrates after into an annular chamber 20 made around cylinder 6 and high enough to allow the lodgment of the comprimed spring, when the head of the piston arrives at the bottom of the cylinder.

The action of this atomizer is the following:

You press the cap 18 which runs in the body 1 and actions the piston 7, this piston goes down to the bottom of the cylinder 6 and throws out the air completely which is therein contained. When you have finished to press the cap and the piston effects its suction movement only by means of the recall spring 8 which at the same time makes the cap return upwards.

A certain quantity of liquid becomes inhaled into the chamber 4 where the valve 5 has just been raised and then fallen back on its seat 21.

You press the cap 18 a second time, and the piston 7 throws out the eventual air again which might find itself in the channel, and then the liquid in the chamber 8 and through the helycoidal channel 13 and the passage 16 which regulates and centers the spray, before throwing it out of the orifice 17 in an atomized state.

You release the cap 18 again which returns upwards with the piston, provocating an inhalation of a new quantity of liquid, and the turn starts again at each pression exerted on the cap 18.

Another realization is represented by the Figure 6 and it is characterized by the fact that the cylinder 6 in which the piston 7 runs and the chamber 8 containing the organ of atomization are horizontal.

The cap 18 is disposed laterally on the body 1 instead of being applied on the upper part, and it is actioned through a horizontal axile. The other pieces are simil and their action is the same as the preceeding type described.

In this way we want to prove that we can make the apparatus in different ways, according to the necessity and without going away from the ambit of the invention.

The body and the cap can eventually have any form.

The dispositive figured in the Figures 2, 3, 4, 5, answer to three lists; it hinders the cap to be separated from the fixed body and on which it runs, it guides its run and allows, when wished, to block it in its lower position, avoiding that it becomes actioned accidentally.

The dispositive is formed by a piece 23 which runs in a lodgment foreseen in the fixed body 1 and pushed towards the end by a spring 22. This piece 23 bears a circular groove limiting its run by a screw or by a fixing pivot 25, it has a second circular groove 24 not too large and of a determined diametre, so as to allow the cap 18 to run on it through an opening of special form 26.

The vertical run of the cap is therefore guided by this groove which limits the run through the loophole 26, hindering the cap to go out. At last near this groove there is derived a third conic groove 27, whose diametre at the base is calculated in way to permit it to pass through the circular loophole 28 to block the cap in the following way: You press the cap 18 to push it towards the inferior part of its run; in this moment the circular loophole 28 is in front of the base of the cone 27. Then you press the button 28 of the piece 23 and you leave the cap 18 which returns up lightly leaving the space 30 between its base and that body.

The circular loophole 28 is held by the base of the cone 27 which fits itself in thus blocking the cap. To serve yourself again with the apparatus, you press the cap 18 which goes (through) down lightly covering the space 30 above indicated. Therefore the great diametre of the cone 27 is found before the circular loophole 28 and the piece 23, pushed by the spring 22, takes its normal position again thus freeing the cap.

Various modifications can be brought to the dispositive above described so as to adapt it to different cases.

LUIGI MAI.