L. L. STEVENSON.

VISCOUS FLUID APPLIER.

APPLICATION FILED MAY 25, 1916.

1,230,052.

Patented June 12, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

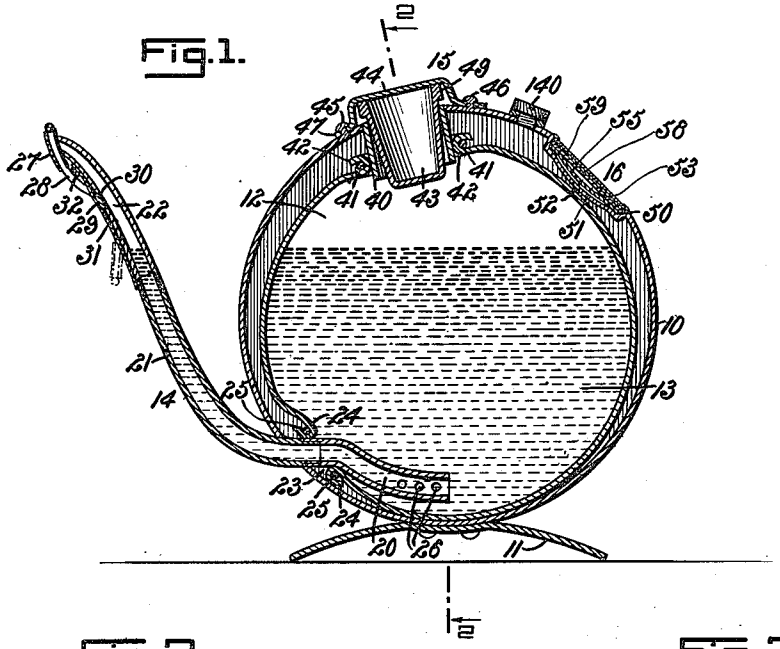


Fig. 2.

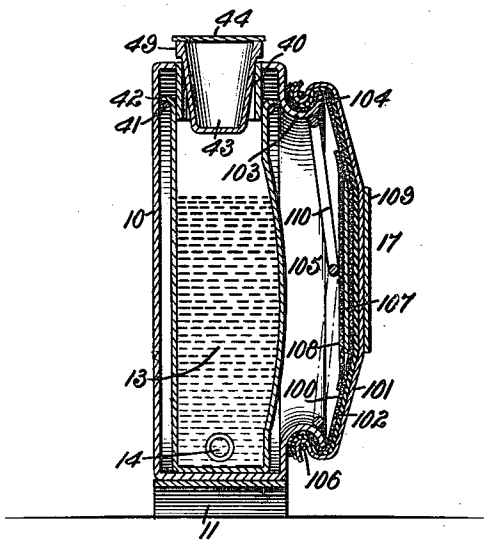


Fig. 3.

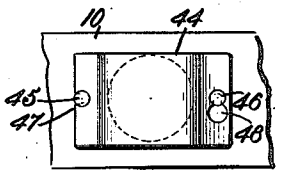


Fig. 4.

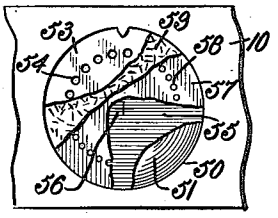
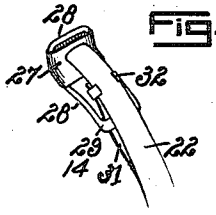


Fig. 5.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 6.

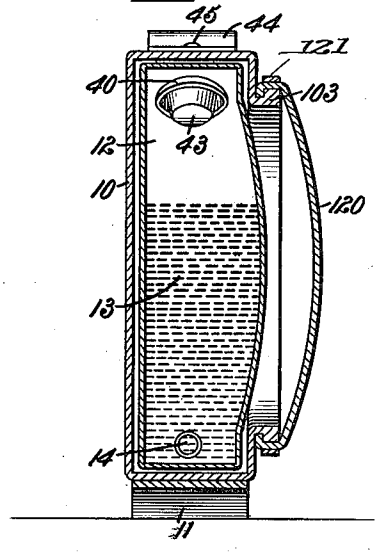


Fig. 7.

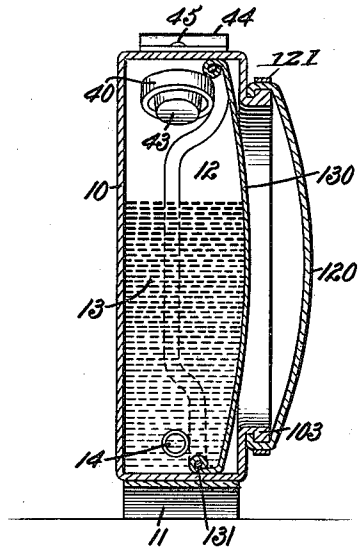


Fig. 8.

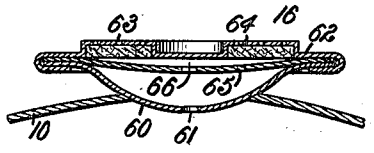


Fig. 9.

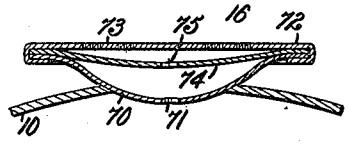


Fig. 10.

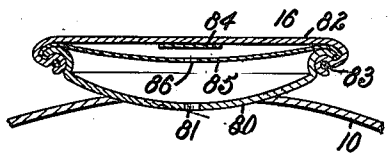
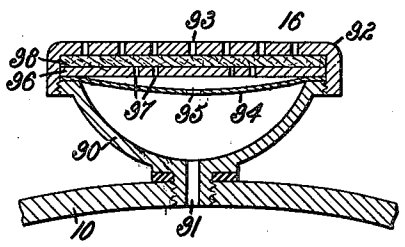


Fig. 11.



WITNESSES

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LEMUEL LESTER STEVENSON, OF EMPORIA, KANSAS.

VISCOUS-FLUID APPLIER.

1,230,052. Specification of Letters Patent. Patented June 12, 1917.

Application filed May 25, 1916. Serial No. 99,857.

To all whom it may concern:

Be it known that I, LEMUEL L. STEVENSON, a citizen of the United States, and a resident of Emporia, in the county of Lyon and State of Kansas, have invented a new and Improved Viscous-Fluid Applier, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved viscous fluid applier arranged to enable the user to accurately control the outflow of the mucilage, liquid glue, fluid cement or other similar viscous fluid as needed or desired, and arranged to quickly respond to the pressure exerted by the user and needed for expelling the fluid, to cause the flow to cease instantly the pressure is released and to prevent leakage.

In order to accomplish the desired result, use is made of a casing provided at one side with a flexible diaphragm, a collapsible receptacle within the casing and adapted to contain a viscous fluid to be applied, an outlet spout leading from the said receptacle and extending through the said casing to the outside thereof, and an air admission valve arranged on the said casing and adapted to admit air to the casing on the collapsing of the said receptacle.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the viscous fluid applier;

Fig. 2 is a transverse section of the same on the line 2—2 of Fig. 1;

Fig. 3 is a plan view of the filling device;

Fig. 4 is an enlarged plan view of the air admission and air filtering valve;

Fig. 5 is a perspective view of the valved outlet spout;

Fig. 6 is a cross section of a modified form of the viscous fluid applier;

Fig. 7 is a similar view of another modified form of the viscous fluid applier; and

Figs. 8, 9, 10 and 11 are enlarged sectional side elevations of various forms of air admission and air filtering valves.

The casing 10 of the paste applier is preferably of cylindrical shape but the form may be varied, and the casing 10 is provided with a suitable base 11 for conveniently supporting the paste applier on a table or other surface. Within the casing 10 is arranged a receptacle 12 of a soft or limp, pliable material capable of being collapsed, such as a rubberized fabric or a fabric made fluid-proof with any suitable substance, or thin pliable leather, or soft rubber and the like, and this receptacle is adapted to be filled with a viscous fluid 13 to be applied to a surface or article, as the case may be. The receptacle 12 is provided with an outlet spout 14 extending through the peripheral face of the casing 10 to the outside thereof, and the said receptacle 12 is further provided with a filling device 15 likewise extending through the peripheral face of the casing 10 to the outside thereof. The casing 10 is provided with an air admission and an air filtering valve 16 for supplying the interior of the casing 10 with air and one side of the casing 10 is provided with a flexible diaphragm 17 for collapsing the receptacle 12 with a view to force the fluid 13 contained therein out through the spout 14.

The spout 14 is preferably made in sections 20, 21 and 22, of which the section 20 extends into the receptacle 12 by way of an opening 23 and which opening has its wall formed into a flange 24 engaged by a binding means 25 such as a cord, twine or the like for binding the flange around the spout section 20. The inner end of the spout section 20 is preferably provided with apertures 26 for the passage of the viscous fluid 13 into the spout. The section 21 extends through an opening in the peripheral face of the casing 10 and is removably connected with the outer end of the section 20, and the nozzle section 22 is held removably on the section 21. The mouth of the spout section 22 is adapted to be closed by a valve 27, preferably made of soft material such as rubber, and attached to a frame 28 having a flattened crossbar 29 engaging a recess 30 on the nozzle section 22. A flat spring 31 engages and presses the crossbar 29 and this spring 31 is attached at one end to the nozzle section 22 and slidingly engages at its free end a loop 32 held on the section 22. By the arrangement described, the spring 31 normally holds the valve 27 closed but allows the user to swing the frame 28 into open position and with it the valve 27 whenever it is desired to discharge the viscous fluid from the receptacle 12 for applying it to a surface or article.

The filling device 15 consists of a tube 40 secured at its inner end to the peripheral

face of the receptacle 12 by the use of a binding means 41 such as a cord, twine or the like engaging a flange 42 through which extends the inner end of the tube 40. Into the tube 40 extends a thimble 43 fitting with its side against the outer end of the tube 40 and the outer end of the thimble 43 is engaged by a spring cover 44 to press the thimble 43 inward, thus fitting the latter tightly into the outer end of the tube 40, to hermetically close the same. The spring cover 44 is normally held on studs 45 and 46 attached to the rim of the casing 10, the stud 45 engaging a notch 47 in one side of the cover 44 and the other stud 46 engaging a slot 48 formed in the other side of the cover and enlarged at one end for the passage of the head of the stud 46, when placing the cover in position on the studs or removing it therefrom. The outer end of the thimble 43 is provided with an exterior flange 49 to permit of obtaining a firm hold of the thimble when removing it from the tube 40 after the cover 44 has been removed to allow of gaining access to the interior of the receptacle 12 for filling the same. After the receptacle 12 is filled the thimble 43 and the cover 44 are replaced. The tube 40 extends through the peripheral face of the casing 10, preferably at or near the top thereof, to permit of conveniently filling the receptacle 12.

The valve 16 is specially designed to retard the inflow of air into the casing 10 with a view to check a superfluous outflow of the viscous fluid as hereinafter more fully explained. The valve 16 also filters the air and thus prevents obstructive particles from passing into the incisions in the sheet rubber in the valve.

The valve 16 shown in Figs. 1 and 4 is arranged in a cup-shaped depression 50 formed in the rim of the casing 10 and the bottom 51 of this depression is provided with a central air port 52. The valve 16 consists of an outer metallic cover or cap 53 provided with a circular row of apertures 54. This cover or cap 53 is soldered or otherwise fastened in place in the outer portion of the depression 50. Next to the bottom 51 is arranged a disk 55 preferably of rubber and having incisions 56 which readily open and allow the passage of air into the casing 10. Next above the rubber disk 55 is arranged a metallic disk 57 having perforations 58, and between the disk 57 and the cover or cap 53 is arranged a layer of filtering material such as felt to prevent dust from passing with the air into the casing 10.

The valve 16 shown in Fig. 8, consists of a cup-shaped valve body 60 fastened to the rim of the casing 10 and provided with an inlet port 61. On the valve body 60 is crimped a cap 62 having perforations 63 and a recess for the reception of the filtering material 64. Between the cap 62 and body 60 is held a disk 65 of rubber provided with incisions 66.

The construction disclosed in Fig. 9 comprises a valve body 70 having a port 71, a cap 72 having perforations 73 and a rubber disk 74 having incisions 75.

The valve body 80, shown in Fig. 10, is provided with a port 81 and over the top of the valve body is stretched a cap 82 of a porous material and fastened in place by a binding means 83 such as cord, twine or the like. A piece 84 of non-porous material extends centrally across the under side of the cap 82 and the said piece 84 and the rubber disk 85 having incisions 86 are secured in place on the edge of the valve body 80 by the cap 82 and its binding means 83.

In the modified form shown in Fig. 11, the valve body 90 is screwed into the casing 10 and is provided at the top with perforations 93. Within the body 90 are held the rubber disk 94 having the incision 95, the disk 96 having perforations 97 and the filtering material 98.

The diaphragm 17 may be made in various forms. As shown in Fig. 2, the diaphragm consists of an inner layer 100 of a fabric material, an outer layer 101 of leather or other suitable material, and an intermediate layer 102 of rubber, rubberized fabric or a fabric made air-proof with any suitable substance. The several layers 100, 101 and 102 have their ridges extending into an annular groove 103 formed in a flange 104 on the wall of an opening 105 formed in one side of the casing 10. The edges of the layers 100, 101 and 102 are securely held in air-tight position on the flange 103 by means of cementing and by a wire 106 or other binding device. On the middle portion of the inner face of the inner layer 100 is arranged a reinforcing disk 107 held in place by a piece of fabric 108 sewed or otherwise fastened to the layer 100. A like reinforcing disk 109 is arranged on the middle of the outer face of the outer layer 101, and this disk is fastened by stitches or other means to the outer layer 101. A spring 110, preferably of S shape, is secured at its ends to the flange 104 and bears with its middle portion against the inner face of the diaphragm 17 so as to normally bulge the same outward. Now when the operator presses against the disk 109 the diaphragm 17 is caused to swing inward against the tension of the spring 110 thus compressing the air within the casing 10 and thereby collapsing the receptacle 12 with a view to force the paste or other substance 13 out of the receptacle by way of the spout 14. The moment the operator releases the pressure on the diaphragm 17 the latter returns to its outermost position by the action of the spring 110. As the diaphragm 17 is constructed of

fabric materials it readily yields and hence immediately after the pressure is released it returns to outermost bulging position thus immediately allowing the air in the casing 10 to expand thereby relieving the receptacle 12 of pressure and instantly stopping the outflow of the paste or other substance 13. The air valve 16 always maintains a normal atmospheric pressure within the casing 10. It will further be noticed that by the arrangement described the paste or other substance is not liable to impair the action of the diaphragm 17 and that of the valve 16, and hence these parts will always be in proper working condition.

It will be noticed that the soft limp pliable material of the receptacle does not retain the compression on the fluid 13 whether the compression be produced by heat or by the pressure on the diaphragm by the user. It is understood that when the pressure on the diaphragm is released by the user, the latter returns to its normal outermost position, and air can pass by way of the air valve 16 into the casing but this inflow of air is retarded by the special construction of the valve to assist in checking superfluous outflow of the fluid on the user releasing the pressure on the diaphragm. It will also be noticed that no compression is produced by the expansion of the contents of the casing by heat as the inactivity of the valve under a force of such slow action permits escape of air.

It is further understood that whenever there is a slight vacuum left inside of the casing 10 on the user releasing the diaphragm 17 then the rubber sheet or layer 55 is drawn inward or sagged thus tending to draw apart the walls of the cut or incision 56 and thereby letting in the air freely. On the pressure being applied by the user actuating the diaphragm 17, the air within the casing is compressed thus producing a like compression in the valve body and thereby forcing the rubber sheet or layer 55 outward against the stiff disk 58 whereby the side walls of the incision 56 are closed together to prevent any air escaping from the casing 10 by way of the valve 16. From the foregoing it will be seen that the incisions 56 provide a means for quick closing but allow ample air admission.

As shown in Figs. 6 and 7, the diaphragm 120 is made from a single piece of flexible material, such as rubber, fastened by a band 121 to the flange 103 of the casing 10.

In the construction shown in Fig. 7, the receptacle 12 is formed partly by the casing 10 and partly by a cup-shaped collapsible receptacle 130 fitting into the casing 10 and having its edge provided with a spring wire 131 for pressing the edge against the inner surface of the rim of the casing 10.

The bottom of the receptacle 130 preferably faces the diaphragm 120 so that there is no fluid in contact with the diaphragm to hinder or impair its action.

The casing 10 is provided with an air vent 140 preferably in the form of a screw which when removed allows escape of excessive air pressure from the casing 10.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A viscous fluid applier, comprising a casing provided at one side with a flexible diaphragm, a collapsible receptacle within the casing and adapted to contain a viscous fluid to be applied, an outlet spout leading from the said receptacle and extending through the said casing to the outside thereof, and an air admission valve arranged on the said casing and adapted to admit air to the casing on the collapsing of the said receptacle.

2. A viscous fluid applier, comprising a casing open at one side and provided at this open side with a grooved annular flange, a diaphragm covering the said opening and having its edge secured in the groove of the said flange, a collapsible receptacle within the said casing and adapted to contain the viscous fluid, a spout leading from the said receptacle and extending slidably through the peripheral rim of the casing to the outside thereof, a filling device on the said receptacle and extending through the casing to the outside thereof, and an air admission valve held on the said casing for admitting air to the casing.

3. A viscous fluid applier of the type described, comprising a casing open at one side and provided at this side with a grooved annular flange, a diaphragm extending over the opening and formed of a plurality of layers of pliable materials having their edges engaging the said grooved flange, stiffening disks on the said diaphragm, a spring attached to the flange and pressing against the inner face of the diaphragm, fastening means for securing the edges of the diaphragm layers to the grooved flange, a collapsible receptacle within the casing and an outlet spout leading therefrom and extending through the casing to the outside thereof.

4. In a viscous fluid applier, the combination of a casing having a diaphragm at one side, a collapsible receptacle within the said casing and having an outlet spout extending through the casing to the outside thereof, and an air admission valve attached to the casing and having means to retard the admission of air and thus assist in controlling the flow of the fluid from the receptacle.

5. A viscous fluid applier, comprising a casing having a diaphragm at one side, a collapsible receptacle within the said casing and having an outlet spout extending through the said casing to the outside there-

of, and an air admission valve held on the said casing and having a flexible valve member provided with incisions normally closed and adapted to open on a suction action from within the casing.

6. A viscous fluid applier provided with an air admission and filtering valve, comprising a valve body having a perforate cap, a layer of rubber stretched across the bottom portion of the valve body and provided with an incision, a layer of felt underlying the cap, and a perforate disk intermediate the felt and the rubber layer.

7. A viscous fluid applier provided with a casing, a collapsible receptacle therein and a filling device for the said receptacle and comprising a filling tube attached to the receptacle and extending through the casing, a cover held on the casing, and a closing thimble fitting into the tube and held in place by the said cover.

8. A viscous fluid applier provided with a casing, a collapsible receptacle therein and a filling device for the said receptacle and comprising a filling tube attached to the receptacle and extending through the casing, a cover held removable on the casing, a closing thimble fitting into the tube and pressed on by the said cover, the thimble having a flange on its outer end.

9. A viscous fluid applier provided with a casing having a discharge spout, a flexible valve normally closing the mouth thereof, an arm pivoted on the spout and carrying the said valve at its free end, and a spring attached to the spout and having its free end bearing on the said arm.

LEMUEL LESTER STEVENSON.