

Nov. 29, 1932.

T. WATSON

1,889,507

APPARATUS FOR SPRAYING PARAFFIN WAX AND THE LIKE

Filed Aug. 8, 1930

2 Sheets-Sheet 1

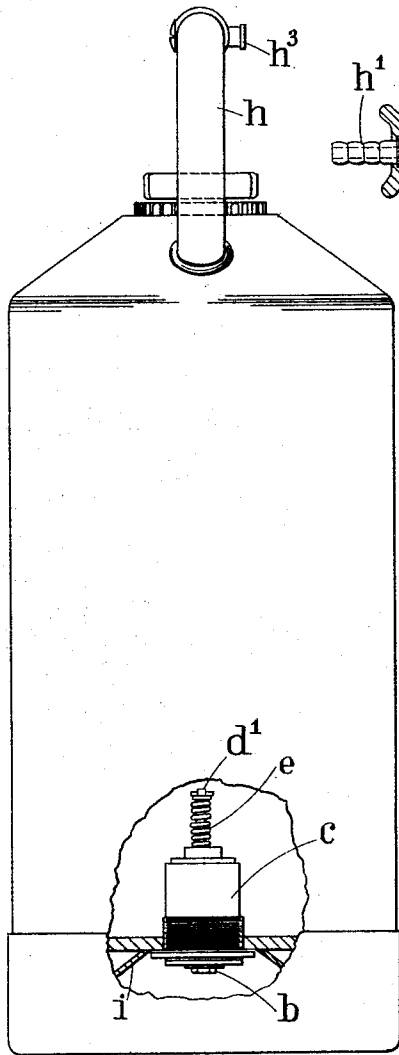


Fig. 1.

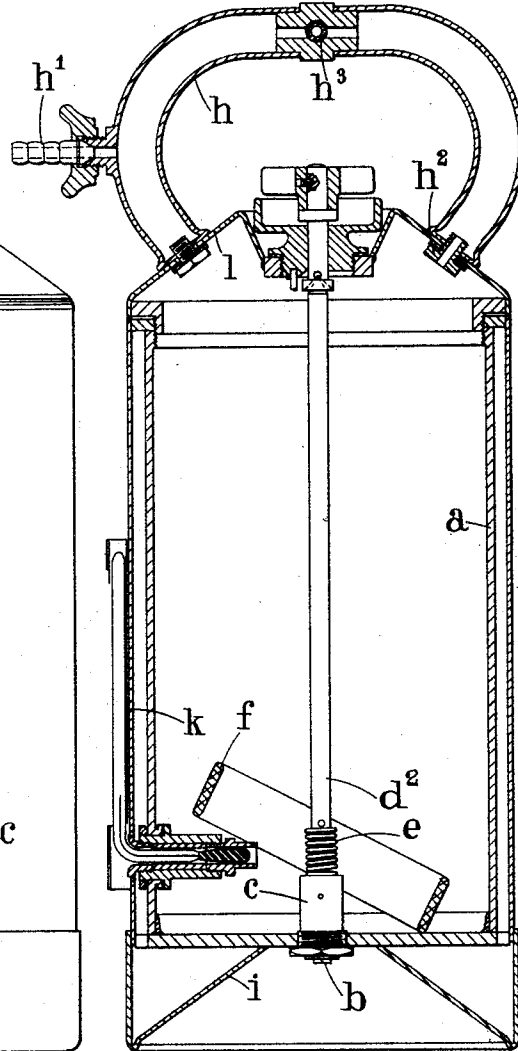


Fig. 2.

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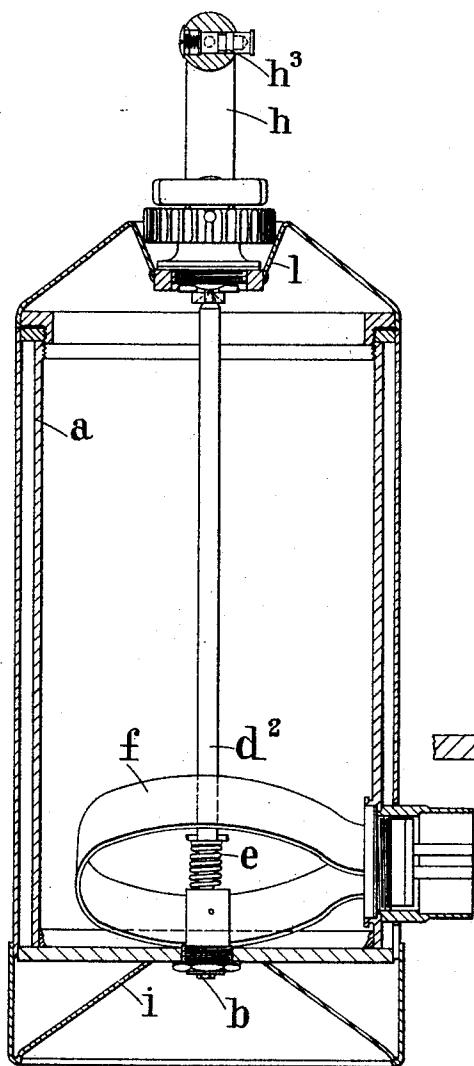


Fig. 3.

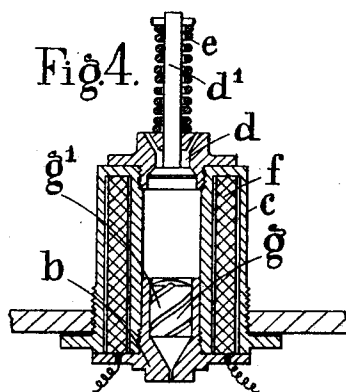


Fig. 4.

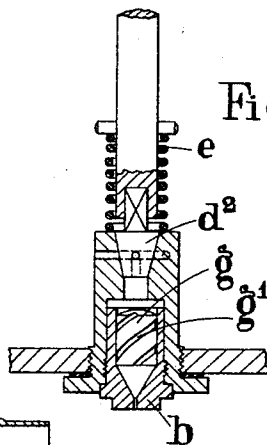


Fig. 6.

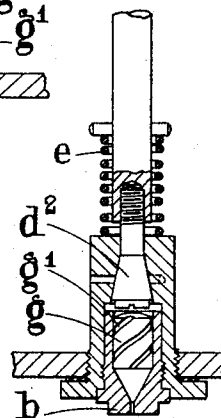


Fig. 5.

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UNITED STATES PATENT OFFICE

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APPARATUS FOR SPRAYING PARAFFIN WAX AND THE LIKE

Application filed August 8, 1930, Serial No. 474,012, and in Great Britain October 24, 1929.

This invention relates to apparatus for spraying paraffin wax or other similar low melting point substances.

Many attempts have been made to spray substances of this character by the employment of compressed air or gas but so far as I am aware all such attempts have failed owing to the fact that by reason of the arrangements adopted the wax or other low melting point substance immediately solidifies on issuing from the spray nozzle due to its contact with the cold atmosphere or the stream of air or gas under pressure by means of which the spraying is effected.

The object of the present invention is to devise a form of apparatus which may be employed successfully for the spraying of paraffin wax or other low melting point substance, and the invention consists in apparatus for the purpose referred to comprising a container for the wax or the like with a heated nozzle therein through which the wax issues in the form of spray and means for introducing air or gas under pressure at a point within the container remote from the spray nozzle and separated therefrom by the melted wax or other substance within the container.

The invention also consists in apparatus of the above character in which the supply pipe for the air or gas under pressure is so arranged that the air or gas stream will strike the heated wall of the container so as to be somewhat heated thereby before coming into contact with the melted wax or other substance to be sprayed.

The invention also consists in the provision of means for preventing the access to the spray nozzle of any sediment or other foreign matter which may be present in the wax and other details and arrangements hereinafter described or indicated.

The accompanying drawings illustrate several modes of carrying out the invention.

Figure 1 is an elevation (with a part broken away) showing one form of apparatus.

Figure 2 is a longitudinal sectional elevation of a modified form of apparatus.

Figure 3 is a side sectional elevation of Figure 2, and

Figures 4 to 6 are views on a somewhat larger scale illustrating details.

In carrying my invention into effect in one convenient manner as, for example, in its application to the production of an apparatus for spraying paraffin wax for medical or other purposes and as illustrated in Figures 1 and 4 I form my improved apparatus with a vessel or container *a* of cylindrical or other form and of suitable size, and this container I preferably lag or surround with some heat-insulating material so as to prevent as far as possible the loss of heat by radiation from the vessel or container.

In the lower part of the vessel I arrange a spray or atomizing nozzle *b* (Figure 4) of suitable form and this I preferably secure in a smaller chamber or container *c* adapted to be screwed into or otherwise secured to the lower part of the main reservoir and in such a manner that the inlet *d* from the main reservoir to the supplementary nozzle container is situated at a point above the level of the bottom of the main reservoir so that any sediment or foreign matter contained in the wax will be able to settle to the floor of the main container and will not pass through the inlet to the nozzle container.

The inlet referred to may be controlled by a mushroom or other type valve *d'* held upon its seating by means of a spring *e* of such a strength that the inlet will not be opened until the pressure within the main reservoir or container has reached a predetermined point.

The nozzle container also contains a suitably designed electric heater *f* which is supplied with current by means of suitable leads or other connections (not shown) and which is properly constructed to maintain the issuing wax or other substance at a predetermined temperature, which temperature will in general depend upon the purpose for which the wax or the like is required and the distance through which it will be required to travel from the nozzle before being deposited upon some part of the body of the patient or other surface to which it is to be applied.

Preferably the atomizing nozzle comprises a plug *g* having a rounded top and with one or more helical channels *g'* therein, the plug being arranged in the nozzle outlet chamber so that the wax or other material issuing from the helical grooves impinges upon the lower conical portion of such chamber before issuing from the outlet orifice.

For the purpose of establishing the requisite spraying pressure within the container I provide suitable means for admitting air or gas under pressure to the container at the upper part thereof so that such air or gas supply will be separated from the spray nozzle by the body of wax or other material within the container. Thus in one particular construction (shown more particularly in Figure 2) the handle *h* of the container may be of hollow or tubular construction with a fitting *h'* therein to which a pressure supply may be connected and with an outlet *h²* by means of which such pressure supply may be admitted to the interior of the container or reservoir. If desired I may arrange intermediate of the pressure supply inlet and outlet a button-operated or other hand-operated spring-controlled valve *h³* for the purpose of admitting the pressure supply to the container or cutting the same off therefrom at the will of the person manipulating the spraying apparatus. Moreover, the handle or the like is preferably so curved or the inlet for the pressure supply to the main container is so inclined or directed that the air or gas stream will strike against the heated wall of the container before reaching the wax or other material so that the upper part of this will not be unduly cooled by the incoming air or gas. The device may be fitted with a suitable form of indicator or gauge to indicate and/or register the pressure of the spray.

In some cases I may provide a hand-controlled valve to cut off the wax supply to the nozzle in addition to or in substitution for the valve controlling the air supply. Thus in Figures 2, 3, 5 and 6 I have shown such a hand-controlled valve *d²*, the valve being operated by a rotary, axial, or other movement, if necessary, against the action of a suitable torsion, compression, or other spring. In Figure 5 the valve is shown arranged for axial movement (which may be produced by a rotary cam) and in Figure 6 the valve is arranged for rotary movement. Also I may arrange a safety cowl *i* to protect the spray nozzle and a thermometer *h* (Figure 2) may be mounted in a suitable position on the apparatus to indicate the temperature of the contents of the reservoir.

The molten wax or other material at the requisite temperature may be introduced into the container or reservoir through a suitable opening normally closed by a filler cap and which may, if desired, be surrounded by a

funnel-shaped portion *l* in order to facilitate the filling operation or, alternatively, a second electric heater may be introduced into the container or steam coils may be arranged round the same or other means may be provided for heating the wax or the like from its solid state.

As shown in Figures 2 and 3 I may employ a larger form of electric heater, and this may be arranged in the vicinity of the nozzle so as both to heat the nozzle and to maintain the wax or the like in a molten condition.

In operation the heater within the supplementary or nozzle container or other nozzle heater maintains the nozzle in a heated condition and since the air or gas supplied under pressure is not allowed to come into contact with the molten wax or like material in the neighbourhood of the spray nozzle such wax or the like is maintained in a molten condition after issuing from the nozzle and if the temperature of the material within the container be suitably high in relation to the melting point the wax or the like may be sprayed for a considerable distance from the nozzle before showing any tendency to solidify.

The invention is not to be limited to the foregoing details of construction which are given purely by way of illustration and not of limitation since I may vary the form of container, the means adopted for introducing air or gas under pressure and the means provided for heating the outlet nozzle or spraying device depending upon the material for the spraying of which the apparatus is to be employed and the purpose for which such material is to be used.

I claim:

1. Apparatus of the character described comprising a heat insulated vessel, an atomizing device at one end of the vessel embodying a container mounted through the wall of the vessel and having a chamber therein provided with an inlet and an outlet, a nozzle associated with the outlet, a valve associated with the inlet of the chamber, the inlet of the chamber being spaced inwardly from the wall of the casing, an electric heating element surrounding the chamber, a hollow handle connected with the casing at a point opposite the container for supplying gas or air under pressure to the casing, and the ends of the handle being curved and connected with the casing so that the incoming pressure medium will strike the walls of the casing prior to contacting with the fluid within the casing.

2. Apparatus as claimed in claim 1, wherein a spring is associated with the valve and is tensioned to open the valve when the pressure in the casing reaches a predetermined point.

3. Apparatus as claimed in claim 1, wherein a stem is connected with the valve, a spring associated with the valve and stem for normally holding the valve closed, a handle ac-

cessible from a point exterior of the casing for operating the stem and the valve.

4. Apparatus as claimed in claim 1, wherein the container for the nozzle is provided with a secondary chamber, and wherein the
5 electric heating element is annular shaped and fitted within the secondary chamber so as to surround the first mentioned chamber.

5. Apparatus as claimed in claim 1, wherein the electric heating element is annular
10 shaped and is arranged within the casing in spaced surrounding relation with respect to the container.

In testimony whereof I have signed my
15 name to this specification.

THOMAS WATSON.

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