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DEVICE FOR FILLING SMALL CONTAINERS

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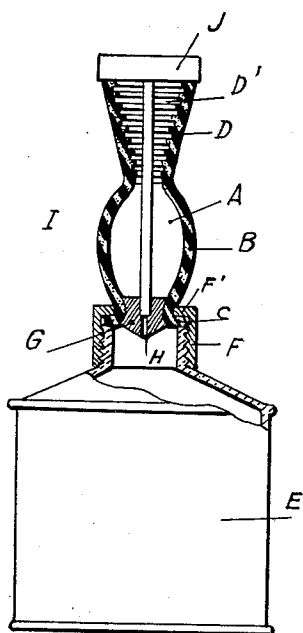


Fig. 1

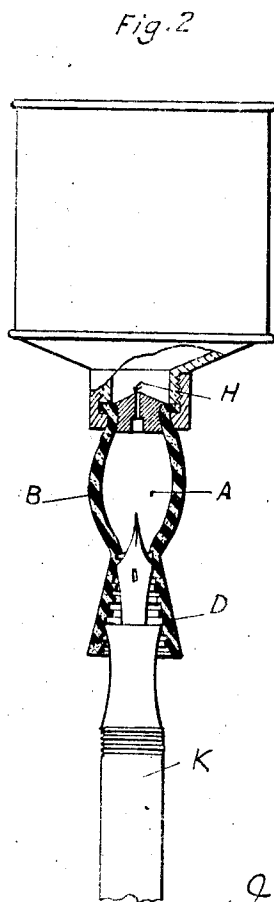


Fig. 2

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DEVICE FOR FILLING SMALL CONTAINERS

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4 Claims. (Cl. 226-63)

The present invention relates to the filling of containers of relatively small capacity (averaging some cubic centimetres) and it applies more especially, although not exclusively, to the filling of fountain pens and the like; the application of the invention may also be considered for the filling of other vessels, such for instance as phials suitable for pharmaceutical and medicinal purposes, injections, and similar uses.

My invention has for its object a device of this type for filling small receptacles or containers, said device consisting essentially, although not limitatively in a compressible body connected to the mouth of a reservoir and provided, at the opposite end to such connection, with a joint adapted to couple with said receptacle, wherein the connection between the reservoir of the liquid and the receptacle to be filled is effected through a plug by means of a vertical passage of small diameter provided in said plug. This device is adapted to receive endwise the receptacle to be filled, and comprises in its inner end annular steps or the like to effect a sealed connection with receptacles of different size, form and diameter.

According to a preferred embodiment, the device according to the invention includes a hollow body made of any appropriate material such as moulded rubber, on which are fitted the various elements necessary for obtaining the effects above indicated, to wit, the elastic organ formed by a flexible rubber bag, the connecting organ adapted to cooperate with the container to be filled, which may also form a fluid-tight joint between the deformable element and said container, and finally the organ of connection between the deformable part and the container to be filled (fountain pen or the like), arranged in such manner as to fit on containers of various shapes and sizes. Between the deformable element and the liquid reservoir, there is interposed a plug, provided with a passage of small diameter through which the flow of the liquid takes place when the lift and force pump formed by the above mentioned elastic part is working.

With the arrangement which has just been indicated, it becomes easy to fill for instance fountain pens, whatever be the system thereof, through the very channel which serves to the flow of the ink, since the successive compressions first force the liquid into the container and, as the contents are allowed to resume their former volume, allow the compressed air to escape from the container. In order to reduce the risks of leakage, I prefer to provide between the reservoir of the fountain pen and the pen

thereof a diaphragm of a semi-permeable material the capillary passages of which permit only a very slow flow of the liquid. On the other hand, the device above described may be completed by an organ for stopping the passage provided in the plug of the container, in order to avoid the loss of ink, even drop by drop in the case of the container being overturned.

It should also be mentioned that with the arrangement according to the invention, it is possible to consider the use of fountain pens without any filling system, that is to say consisting merely of a hollow stem containing a reservoir as large as possible and a pen, with the usual organs for ensuring the flow of ink. As a matter of fact, fountain pens of this kind can be filled easily and quickly with the device according to the invention, this filling then taking place only at remote intervals of time in view of the very great capacity that can be given to the pen reservoir due to the absence of any filling system.

I attain these objects by the device illustrated in the accompanying drawing in which

Fig. 1 is an elevation view partly in section of a filling device in the position of rest;

Fig. 2 shows the same apparatus in service.

As shown in Figs. 1 and 2, the apparatus consists essentially of a piece A for instance of moulded rubber, which forms in its intermediate hollow body a deformable pocket or bag B, the lower end of which is folded at C, whereas the upper end D, in the shape of an inverted truncated cone, is provided with inner ribs D', the function of which will be hereinafter explained. This device is fitted on a reservoir, for instance on the ink bottle E, by means of a threaded hood F, the flange F' of which applies the folded portion C against the edge of the vessel, thus ensuring fluidtightness. A plug G, of a matter resisting the action of ink, is mounted into the lower opening of pocket B; this plug is provided with a channel H, the upper end of which, of larger diameter, is screw-threaded and receives the threaded end of a stopping rod I terminated by a head J bearing against the end of cone D. For using the apparatus, the receptacle to be filled, such as a fountain pen, of any type whatever, with or without any special system, with or without a filling system, is fully engaged into cone D until the end of the body K of the receptacle to be filled comes to bear against one of the steps D', and thus forms a fluidtight joint. The whole receptacle to be filled and container of the fluid being then turned upside down into the position of Fig. 2, it suffices to exert, for

instance with two fingers, repeated pressures upon the lateral walls of the deformable pocket B, for producing an inflow of ink through channel H and the flow of ink into the reservoir of the fountain pen through the passages provided for this purpose. The filling may be complete since it suffices to act upon deformable pocket B until the desired result is obtained.

It is clear that with the invention it is possible to make use of fountain pens which are free from any filling system, a certain number of pens, belonging to the staff of an office, the pupils of a class-room, etc. being eventually filled by means of a single apparatus mounted on any bottle of suitable size.

While I have shown and described the preferred form of construction for carrying my invention into effect, it is to be understood that it is capable of modifications. Changes, therefore may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is intended to claim all novelty inherent in my invention as broadly as possible in view of the prior art.

What I regard as new and desire to secure by Letters Patent is:

1. A device for filling a small container from a reservoir containing a liquid, which comprises, in combination, a compressible hollow body provided with two apertures, means adjacent one of said apertures for connecting the mouth of said container in a fluid-tight manner with said aperture, a part around the other aperture adapted to fit in the mouth of said reservoir, and a solid plug in said last mentioned aperture provided with a passage extending therethrough, at least a portion of said passage being of a narrow cross section adapted to stop the flow of liquid therethrough from the reservoir closed to the atmosphere under the mere effect of gravity, but capable of permitting said flow under the effect of a suction produced by deformation of said compressible hollow body.

2. A device for filling a small container from a reservoir containing a liquid, which comprises, in combination, a compressible hollow body provided with two apertures in line with each other, means adjacent one of said apertures for connecting the mouth of said container in a fluid-tight manner with said aperture, a part around the other aperture adapted to fit in the mouth of said reservoir, and a solid plug in said last men-

tioned aperture provided with a passage extending therethrough, at least a portion of said passage being of a narrow cross section adapted to stop the flow of liquid therethrough from the reservoir closed to the atmosphere under the mere effect of gravity, but capable of permitting said flow under the effect of a suction produced by deformation of said compressible hollow body.

3. A device for filling a small container from a reservoir containing a liquid, which comprises, in combination, a compressible hollow body provided with two apertures in line with each other, a flaring frusto conical part of an elastic material provided on the outside of one of said apertures and around it for accommodating the mouth of said container, with annular steps on the inner face of said frusto-conical part for forming a fluidtight joint with said mouth of the container, a part around the other aperture adapted to fit in the mouth of said reservoir, and a solid plug in said last mentioned aperture provided with a passage extending therethrough, at least a portion of said passage being of a narrow cross section adapted to stop the flow of liquid therethrough from the reservoir closed to the atmosphere under the mere effect of gravity, but capable of permitting said flow under the effect of a suction produced by deformation of said compressible hollow body.

4. A device for filling a small container from a reservoir containing a liquid, which comprises, in combination, a moulded rubber bag provided with two apertures in line with each other, a flaring frusto-conical extension integral with said bag provided on the outside of one of said apertures and around it for accommodating the mouth of said container, with annular steps on the inner face of said frusto-conical extension for forming a fluidtight joint with said mouth of the container, a flange integral with said bag surrounding the other aperture and adapted to fit in the mouth of said reservoir, and a solid plug in said last mentioned aperture provided with a passage extending therethrough, at least a portion of said passage being of a narrow cross section adapted to stop the flow of the liquid therethrough, from the reservoir closed to the atmosphere, under the mere effect of gravity, but capable of permitting said flow under the effect of a suction produced by deformation of said rubber bag.

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