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P. ENGSTRUM

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VALVE ASSEMBLY

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Fig. 1.

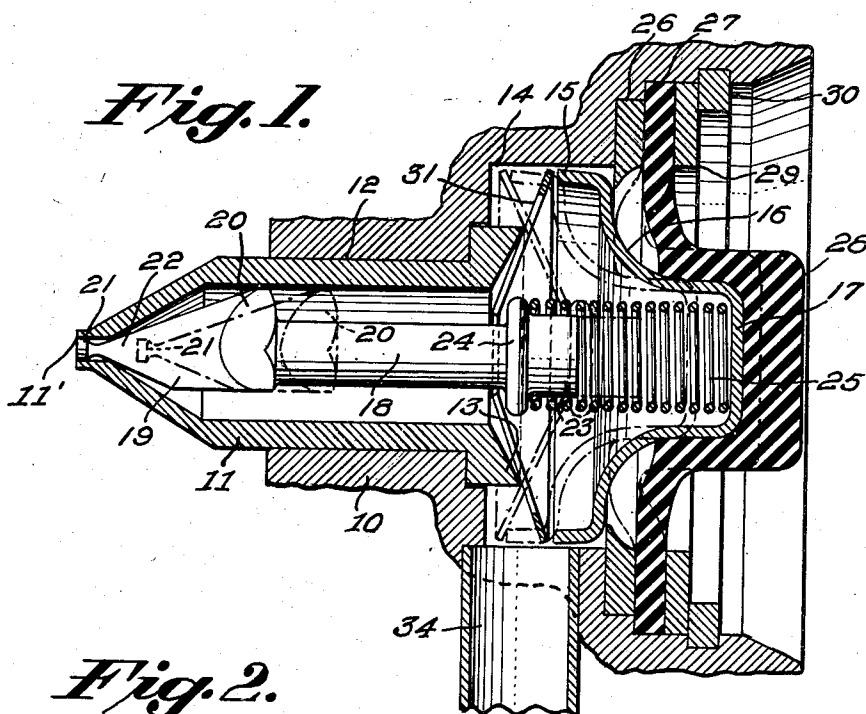


Fig. 2.

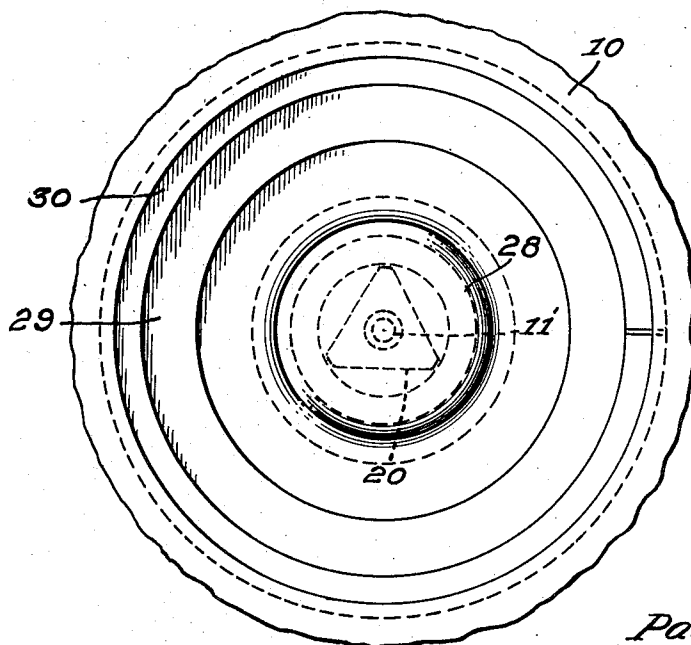
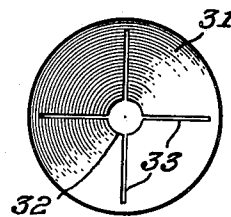


Fig. 3.



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VALVE ASSEMBLY

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4 Claims. (Cl. 137-701)

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This invention relates to a valve assembly.

The invention is more particularly concerned with a valve assembly for use in connection with small containers for liquids having a high volatile solvent in chemical compositions, such as resins, waxes, paints, etc.

Furthermore, the invention is more particularly characterized by a relatively small valve assembly for operative association with a relatively small container, and wherein the valve assembly is adapted to control jet dispensing of liquid from the container.

The improved valve assembly, in general, comprises a housing having a chamber for communication with the interior of a container, a small liquid dispensing port opening out from the chamber, and a valve seat and cooperating valve within the chamber for controlling the flow of liquid from a container and through the port.

In such a valve construction, the port is relatively small and is subject to becoming partially or wholly closed by the drying of liquids therein between dispensing operations. Furthermore, in such construction, the end of the port is substantially distant from the valve and accordingly some liquid remains in the port after closure of the valve, which results in objectionable droplets falling from the end of the port.

It is accordingly a primary object of this invention to provide a valve assembly for the above noted purpose, wherein the above noted objections are wholly overcome.

A further object of the invention is to provide a valve assembly of the above noted character, wherein the liquid flow-controlling valve is provided with a port closing and cleaning member.

Other objects and advantages of the invention will become apparent in the course of the following detailed description, taken in connection with the accompanying drawing, wherein—

Figure 1 is a vertical axial section of the improved valve assembly, the valve being shown in open position in dot-and-dash lines.

Fig. 2 is an end view of the valve assembly as viewed from the right of Fig. 1.

Fig. 3 is a plan view of a spring disk forming an element of the assembly.

Referring now in detail to the drawing, wherein the assembly is illustrated many times the actual size thereof, 10 designates a housing having a broken perimeter, since such housing may be of any suitable form for operative association with any type liquid container.

A cylindrical valve member 11 is suitably supported within an opening 12 in the housing, and

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such member includes a camming flange 13 which projects within a chamber 14 in the housing 10.

Disposed within the chamber 14 for sliding movement axially of the housing is the flange 15 of a cup member 16 having a base 17.

Disposed within the valve member 11 for movement axially thereof is a shaft or stem 18 whose forward end is provided with a head 19 which includes a triangular portion 20 at the rear end thereof and a relatively small cylindrical member 21 at the forward end thereof. The head includes a frustoconical portion 22 between portion 20 and member 21 which provides a valve normally engaged with a seat provided at the rear end of port 11' in which the member 21 is normally disposed.

The shaft 18 further includes an enlarged projection 23 at its rear end and a rib 24 joining such projection with the body of the shaft.

A coil spring 25 has one end thereof engaged over said projection 23 and abutting said rib 24, while the opposite end of the spring rests in the cup member 16 in bearing engagement with the base 17 thereof.

It will be seen from Fig. 1 that the cup member 16 projects rearwardly of the chamber 14 and into a further enlarged chamber in the housing.

A washer 26 provides a stop for the cup member 16 under the action of spring 25, and resting on the washer 26 is the yieldable flange 27 of a button 28, which is preferably formed of rubber and is provided with a recess in which the rear end of cup member 16 is seated.

A second washer 29 is disposed against the opposite side of flange 27 and a split spring locking ring 30 is disposed in contact with washer 29.

A yieldable disk 31 is disposed within chamber 14 between the camming flange 13 and the flange 15 of the cup member 16. Such disk is of frustoconical form and is provided with a central aperture 32 receiving the shaft 18, and a plurality of slits 33 are provided in the disk for effecting proper flexing action thereof.

A suitable conduit 34 is provided for flow of liquid from a container into the chamber 14, and the flow of liquid may be effected by any desired means involving either suction or pressure.

The valve assembly is shown in normal position in full lines in Fig. 1, wherein the valve 22 is seated and the member 21 is disposed within the port 11', whereby liquid cannot be ejected through the port.

When it is desired to render the assembly op-

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erative, finger or thumb pressure is exerted on the button 28 causing same to move inwardly to the position indicated in dot-and-dash lines.

This inward movement of the button causes the cup member 16 to also move inwardly to the position indicated by dot-and-dash lines. Upon such inward movement of member 16, the flange 15 thereof engages the rim of disk 31 and moves same forwardly to the dot-and-dash line position thereof which causes the disk to flex about the camming flange 13, whereby the inner edge thereof about the aperture 32 engages the rib 24 and moves the shaft 18 rearwardly against the action of spring 25.

Upon such rear movement of the shaft 18 the head 19 is also moved rearwardly, thereby unseating valve 22 and withdrawing member 21 from within the port 11' to the position indicated in dot-and-dash lines.

Upon release of pressure on the button 28, the spring 25 will overcome the spring action of disk 31 and move the shaft 18 forwardly and thereby seat the valve 22 and move member 21 into the port 11'. The successive movements of member 21 into and out of port 11' keep the wall thereof clean by its wiping action thereon, and furthermore such member closes the outer end of the port upon closure of valve 22 to preclude drops from falling from the port.

The triangular head portion 20 acts to guide the shaft within the member 11 while permitting flow of liquid, and the spring 25 serves to center the inner end of the shaft within the member 11.

While I have disclosed my invention in accordance with a single specific embodiment thereof, such is to be considered as illustrative only, and not restrictive, the scope of the invention being defined in the following claims.

What I claim and desire to secure by Letters Patent is:

1. In a valve assembly, a housing having a liquid receiving chamber therein, a cylindrical valve member supported within said housing in communication with said chamber and having a liquid flow port in its outer end, a valve stem disposed within said member for movement axially thereof, a valve seat in said member adjacent said port, a valve on said stem normally engaging said seat, a push member supported by said housing, a coil spring disposed between said push

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member and one end of said stem for normally maintaining the valve in engagement with the seat, and yieldable means disposed within said chamber and having an operable engagement with said stem, valve member and push member for withdrawing said valve from the seat in opposition to said coil spring upon movement of said push member in a direction toward said seat.

2. The structure according to claim 1, wherein said yieldable means comprises a frusto-conical disk having a central aperture through which said stem extends, a rib on said stem engageable by said disk, and radially spaced circular projections on said valve member and said push member engageable with opposite sides of said disk for flexing same in the movement of the valve from the seat.

3. The structure according to claim 1, wherein said push member comprises a rigid cup member within which one end of said spring seats, and a yieldable button externally of said cup member and receiving a portion of same.

4. The structure according to claim 1, wherein said push member comprises a rigid cup member receiving one end of said spring, a yieldable button externally of said cup member and receiving a portion thereof, and stop means disposed between said cup member and said button and engageable with the former for limiting retraction of the push member under the action of said spring.

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