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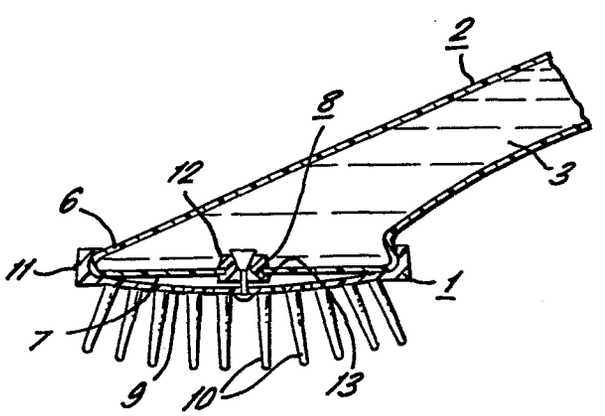
(54) Cleaning device with reservoir of cleaning liquid.

(57) A cleaning device comprises a work head (1) carried by a handle (2) which constitutes a reservoir for a cleaning liquid (3) to be dispensed by way of the head (1) during use of the device, the reservoir (2) communicating with the head (1) by way of a valve (8) which is normally closed but which is opened on engagement of the head (1) with a surface to be cleaned.



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CLEANING DEVICE

This invention relates to a cleaning device, and particularly to a cleaning device comprising a work head carried by a handle which incorporates a reservoir for a cleaning liquid to be dispensed by way of the work head during use of the device.

Such a device is known in which the handle is hollow and constitutes the reservoir, there being a discharge hole from the reservoir, by way of which cleaning liquid contained in the reservoir can leave the reservoir and enter the work head which is detachably mounted on one end of the handle over the discharge hole in the reservoir.

In the known device the work head comprises a sponge-like member which is compressed during use of the device, such compression serving to draw cleaning liquid from the reservoir through the discharge hole which is open at all times, the reservoir being otherwise sealed in air-tight manner.

For certain cleaning operations, for example cleaning lavatory bowls, it is necessary to use

a device having a work head in the form of a brush, the use of any sponge-like member on the work head being impractical for reasons of hygiene.

Thus, a known cleaning device as discussed above is not suitable for such certain cleaning operations since cleaning liquid could leak from the reservoir through the discharge hole when the device is not in use, particularly in the case of devices for cleaning lavatory bowls, which are normally kept in a vertical position, work head down, when not in use.

According to this invention there is provided a cleaning device comprising a work head carried by a handle which incorporates a reservoir for a cleaning liquid to be dispensed by way of the work head during use of the device, in which the reservoir communicates with the work head by way of a normally closed discharge valve which is opened on application of the work head to a surface to be cleaned.

The device of this invention has the advantage that cleaning liquid can leave the reservoir only when the discharge valve is open, the valve being automatically opened during use of the device to allow cleaning liquid to pass to the work head as required. Further, the device can be kept in work-head-down condition when not in use without any leakage of clean-

ing liquid from the reservoir occuring.

Two cleaning devices according to this invention will now be described by way of example with reference to the drawings, in which:-

Figure 1 is a side view of either device;

Figure 2 is a sectional view through the work head end of a first device in a first condition;

Figure 3 is a view similar to Figure 2 but with the first device in a second condition; and

Figure 4 is a sectional view through the work head end of the second device.

Referring to Figures 1, 2 and 3, the cleaning device comprises a work head 1 carried by a handle 2 which also constitutes a reservoir for a cleaning liquid 3 to be dispensed by the work head 1 during use of the device.

The handle 2 is a hollow elongate transparent member moulded from high tensile polyvinylchloride, having an open end 4 by which the liquid 3 can be introduced into the handle 2, the open end 4 being closed after introduction of the liquid 3, by a cap 5 which is in screw-thread engagement with the handle 2.

The other end 6 of the handle 2 terminates in an enlarged circular cross-section portion 6 closed by

an end wall 7 having a valve member 8 mounted at its centre.

The work head 1 comprises a plastics material moulding providing a resilient diaphragm 9 having a plurality of bristle members 10 projecting from one surface. The diaphragm 9 is formed with an upstanding peripheral flange 11 by which the work head 1 can be mounted on the end portion 6 of the handle 2 in a clip-on arrangement.

The valve 8 consists of a body member 12 secured in a hole in the wall 7 of the handle/reservoir 2, and a plunger member 13 comprising a stem carrying at one end a closure member which co-operates with a hole in the body member 12 to provide the valve action, and carrying at the other end an enlarged head by which the plunger member 13 is connected to the diaphragm 9.

The arrangement is such that when the device is not in use the diaphragm 9 of the work head 1 is bowed outwardly as shown in Figure 2, and serves to hold the valve 8 in a normally closed condition with the enlarged head on the stem closing the hole in the body member.

When the device is used the bristle members are engaged with an object to be cleaned, and the engagement pressure causes the diaphragm 9 to be

distorted inwardly as shown in Figure 3. This distortion of the diaphragm causes the plunger member 13 of the valve 8 to be moved relative to the body member 12 thereof such that the enlarged head of the plunger member is lifted out of the hole in the body member whereby cleaning liquid 3 can flow from the handle/reservoir 2 into the space between the diaphragm 9 and the wall 7 of the handle/reservoir 2, and from there through holes in the diaphragm 9 to be discharged between the bristle members 10 as required. The discharge flow of the cleaning liquid 3 is indicated by arrows in Figure 3.

When cleaning is finished and the bristles 10 are disengaged from the object being cleaned the diaphragm 9 reverts to its outwardly bowed condition as shown in Figure 2, thereby closing the valve 8 to prevent loss of liquid from the handle/reservoir 2.

Referring now to Figure 4, parts of the device here shown corresponding to parts of the device of Figures 2 and 3 have been given the same reference numerals.

In this second device the valve 8 again comprises a body member 12 secured in a hole in the wall 7 of the handle/reservoir 2, and a plunger member 13 comprising a stem carrying at one end a closure

member which co-operates with a hole in the body member 12 to provide the valve action. The stem of the plunger member 13 is relatively long and projects through the diaphragm 9 of the work head 1 to terminate adjacent the free ends of the bristle members 10.

The valve 8 is completed by a spring member 14 acting between the plunger member 13 and the body member 12 to hold the valve 8 in a normally closed condition as shown in Figure 4.

In use of this second device, engagement of the bristle members 10 with an object to be cleaned also brings the stem of the plunger member 13 of the valve 8 into engagement with the object, the plunger member 13 thus being moved relative to the body member 12 of the valve 8, against the action of the spring member 14, to open the valve member 8 and allow cleaning liquid 3 from the handle/reservoir 2 to discharge from the device, as described for the device of Figures 2 and 3.

When cleaning is finished and the work head 1 is disengaged from the object being cleaned, the spring member 14 will return the valve 8 to its closed condition thereby preventing any further discharge of cleaning liquid 3 from the device.

Either of the devices described above can

be kept in a vertical position with the work head 1 at the bottom, when not in use, without leakage of cleaning liquid 3 occuring, since when the device is not in use the valve 8 is maintained in the closed condition either by the diaphragm 9 in the device of Figures 1, 2, and 3, or by the spring member 14 in the device of Figures 1 and 4.

The use of a clip-on work head 1 as described gives the advantage that when necessary a used work head 1 can be removed from the handle/reservoir 2 and discarded, to be replaced by a new work head 1. In view of the material from which it is made, the handle/reservoir 2 can be sterilized by boiling when the work head 1 has been removed.

A new work head 1 can be provided in a package which, after removal of the new work head 1 therefrom, can be used to remove the old work head 1 from the device such that contact with the old work head 1 can be avoided in the interests of hygiene.

CLAIMS:

1. A cleaning device comprising a work head (1) carried by a handle (2) which incorporates a reservoir for a cleaning liquid (3) to be dispensed by way of the work head (1) during use of the device, characterised in that the reservoir (2) communicates with the work head (1) by way of a normally closed discharge valve (8) which is opened on application of the work head (1) to a surface to be cleaned.

2. A device as claimed in Claim 1, characterised in that the work head (1) comprises a resilient diaphragm (9) which is connected to a plunger member (13) of the valve (8) the resilience of the diaphragm (9) serving to hold the valve (8) in the closed condition when the device is not in use, and distortion of the diaphragm (9) during use of the device serving to move the plunger member (13) to open the valve (8).

3. A device as claimed in Claim 1, characterised in that the valve (8) has a plunger member (13) which projects into the work head (1) and which, during use of the device, engages a surface being cleaned thereby to open the valve (8).

4. A device as claimed in Claim 3, characterised in that the valve (8) consists of said plunger member (13), a co-operating body member (12) secured in a wall (7) of the reservoir (2), and a spring member (14) acting between said plunger member (13) and said body member (12) to hold the valve (8) in a normally closed condition.

5. A device as claimed in Claim 3 or Claim 4, characterised in that the work head (1) comprises a diaphragm (9) through which said plunger member (13) projects, said diaphragm (9) carrying a plurality of bristle members (10).

6. A device as claimed in any preceding claim, characterised in that the work head (1) is detachably mounted on the handle (2) as a clip-on arrangement.

7. In or for a cleaning device as claimed in Claim 1, a valve (8) consisting of a body member (12) having a hole therethrough; a plunger member (13) comprising a stem passing through the hole in the body member (12) with clearance and carrying at one end a closure member adapted to co-operate with the hole in the body member (12) to provide a valve action; and a spring member (14) acting between the body member (12) and the plunger member (13) to hold the valve (8) in a normally closed condition with the closure member of the plunger member (13) closing the hole in the body member (12).

8. A valve as claimed in Claim 15, characterised in that the body member (12), plunger member (13) and spring member (14) are all plastics material members.

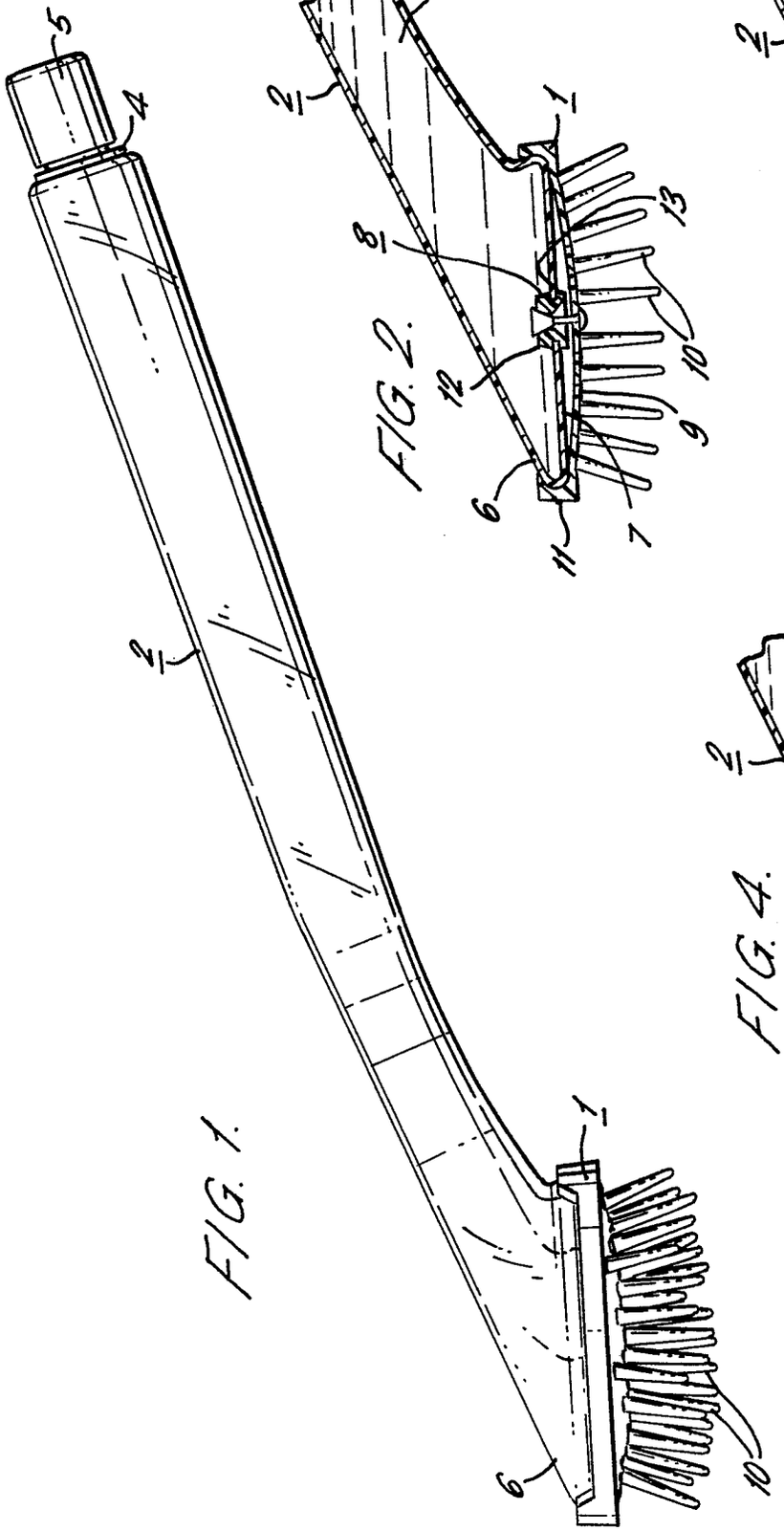

FIG. 1.

FIG. 2.

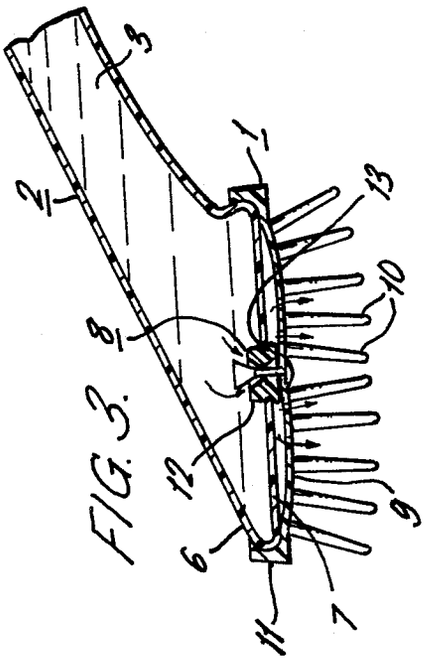

FIG. 3.

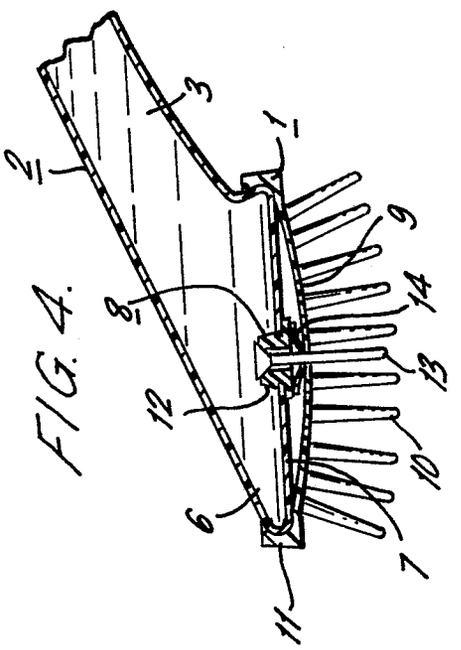

FIG. 4.