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CLEANING BRUSH

Filed June 20, 1932

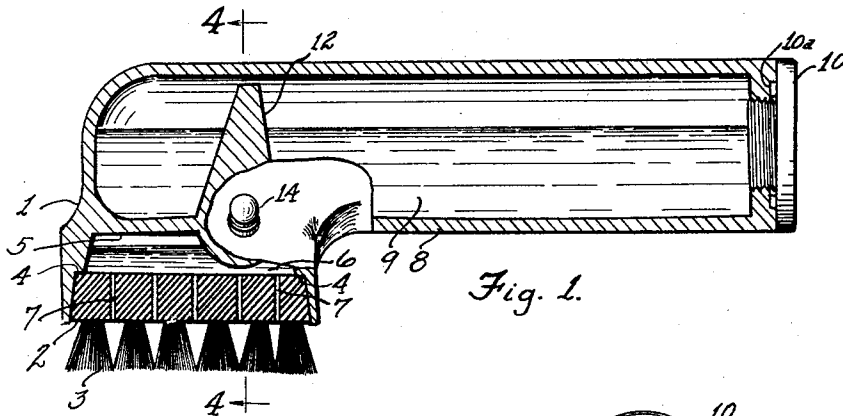


Fig. 1.

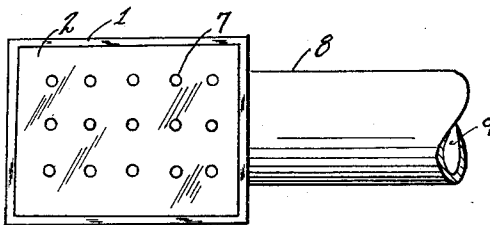


Fig. 3.

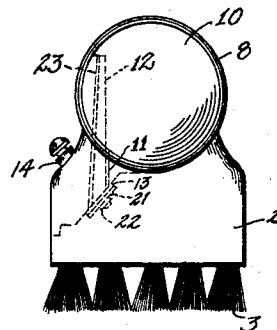


Fig. 2.

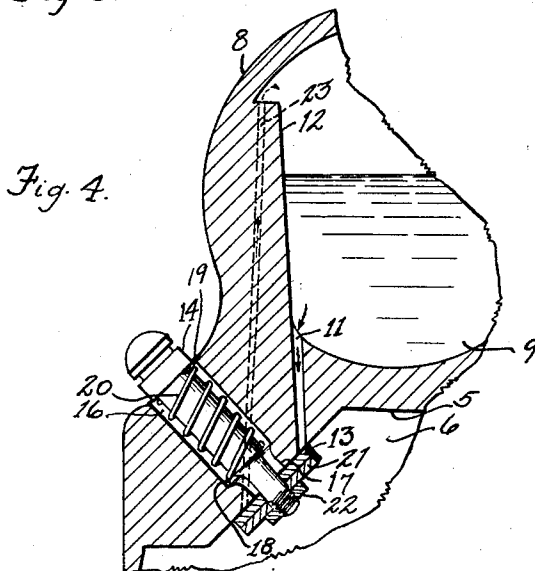


Fig. 4.

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CLEANING BRUSH

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This invention relates to a device for cleaning materials and particularly to a brush for effectively applying chemical cleaning liquids to the material or object to be cleaned.

One object of the present invention is to provide a compact and durable brush having a reservoir for the storage of the liquid cleaner from which the liquid cleaner may be fed freely to the brush bristles in regulated flow during the brush operation.

Another object is to provide a brush for this purpose in which the liquid is sealed so that the brush may be carried in any position when not in use without spilling the liquid.

Another object resides in a simple and efficient liquid control valve for the control of the flow of cleaning liquid from the sealed storage reservoir to the brush bristles which valve may be easily assembled and installed in the brush.

Another object is to provide such a valve which may be conveniently operated by the operator during the brushing operation.

Other objects and advantages will be apparent from the following specification wherein reference is made to the drawing.

In the drawing—

Fig. 1 is a longitudinal sectional view of a preferred form of brush embodying the principles of the present invention.

Fig. 2 is an end elevation of the brush illustrated in Fig. 1.

Fig. 3 is a bottom plan view of the brush illustrated in Fig. 1, the bristles of the brush being removed for purposes of clearness in illustration.

Fig. 4 is an enlarged partial cross sectional view of the brush taken on a plane indicated by the line 4—4 of Fig. 1.

Referring to the Figs. 1 to 3 inclusive, a preferred form of the brush embodying the principles of the present invention is illustrated, and comprises a hollow head 1, which may be formed of aluminum or enameled metal or other material which will not be deleteriously affected by the chemical used for cleaning. The head comprises a solid top wall and integral depending side walls, the bottom of the head being closed by a plug 2 in which are mounted uniformly

spaced tufts of bristles 3. The plug 2 is preferably secured in place within the head 1 by a suitable cement, an internal peripheral shoulder 4 being provided on the side walls to retain the plug 2 in spaced relation to the top wall 5 of the head, so as to form with the wall 5 and side walls of the head a feed reservoir 6.

In the plug 2 are a plurality of discharge ducts 7 which communicate with the feed reservoir 6 and discharge exteriorly of the plug 2. The duct outlets are evenly distributed about the outer surface of the plug 2 and preferably are staggered longitudinally and laterally relative to the tufts 3.

Mounted on the head 1 is a handle 8 which may be formed integral with the head and which projects laterally from the head of sufficient distance to be grasped conveniently by the hand of the operator.

The handle 8 is hollow, the interior thereof forming a sealed storage reservoir 9 for storing cleaning liquid to be used. In order that the reservoir 9 may be filled conveniently, one end of the handle is provided with a passage which is sealed by a removable cap 10, the cap being threaded for engagement with the handle for effecting a tight sealing pressure. To render this seal more effective an internal annular shoulder 10a is formed about the filling passage a short distance inwardly from the end of the handle, and receives an annular gasket of cork or other suitable compressible material. This gasket may be of greater thickness than the depth of the shoulder and is compressed between the cap and shoulder to effect a tight seal when the cap is screwed into abutting engagement with the end of handle 8.

The storage reservoir 9 communicates with the feed or distributing reservoir 6 by means of a suitable duct 11. For convenience in manufacture a portion of the wall 5 and a contiguous portion of the wall of the handle are thickened to form an internal boss 12 through which the duct 11 may be cast or drilled. The duct 11 is sealed, preferably at its outlet, as illustrated, by a valve disc 13. The disc 13 is operable from the outside of the body by an axially movable stem 14 for

controlling the flow of fluid through the duct 11. This disc is preferably formed of material which is yieldable yet impervious to the cleaning chemical and unaffected chemically thereby.

In order that the valve mechanism may be assembled in the body economically, coaxial bores 16 and 17 of different diameters are formed in the wall 5, the bore 16 being of full diameter for its entire length and defining with the end wall of the smaller diameter bore 17, an annular shoulder 18. The stem 14 is provided near its outer end with an annular shoulder 19 for engagement with one end of the coil spring 20, the opposite end of the spring engaging the shoulder 18. The innermost end of the stem 14 is tapered so as to pass freely through the bore 17 and to protrude into the feed reservoir 6. On the protruding end of the stem are mounted the disc 13 and, if desired, a stiff backing disc 21. The end of the stem is threaded to receive a nut 22 for securing the discs in place thereon. Thus the valve may be easily assembled by inserting stem 14 and spring 20 into the bore 16 and, with the spring compressed, securing the valve disc 13 and backing disc 21 on the inner end of the stem. Consequently, in one step, an easily made connection retains the valve mechanism in place, the stem and spring cooperating to hold the disc 13 in sealing position and the disc in turn retaining the stem in operating position in the bore 16.

The stem 14 is preferably positioned to extend out of the body 1 close to the wall of the handle 8 and to slope inwardly at an angle to the plane of the head 1 such that the stem is in a position to be pressed inwardly by the thumb of the operator when the handle is grasped in his hand and the thumb flexed inwardly in a natural and easy gripping manner.

The duct 11 may be sufficiently large so as to permit a comparatively free flow of liquid into the reservoir 6. However, in order to render the flow more positive, an air duct 23 is formed in boss 12. The air duct 23 communicates with the reservoir 9 near the top or so that the mouth of the duct is above the normal level of the liquid when the brush is in operating position. The opposite end of the duct 23 opens into the feed reservoir 6 in a position to be sealed by the valve disc 13 when the disc is seated for closing the duct 11.

Unless the feed reservoir 6 is filled, sufficient air can enter the duct 23 therefrom to relieve the negative pressure in the storage reservoir 9 and allow liquid to flow freely from the reservoir 9 into the reservoir 6. If for any reason the reservoir 6 becomes flooded and blocks the duct 23, further flow of fluid from the storage reservoir to the reservoir 6 is substantially stopped. However,

as soon as the level in the distributing reservoir 6 drops a slight amount, more liquid can pass thereinto from the reservoir 9.

Since both ducts 11 and 23 are closed by the valve disc 13 it is apparent that the liquid in the storage reservoir 9 will be retained without leakage in any position of the brush.

In operation the brush handle is grasped in the usual manner, the thumb of the operator falling naturally into position on the valve stem 14 so that easy and accurate operation of the valve can be effected by clinching the hand more tightly about the handle in a natural gripping manner. Upon unsealing of the valve, liquid is passed into the reservoir 6 in sufficient quantity to meet the requirements of the particular rate of cleaning. This liquid passes downwardly from the reservoir 6 through the ducts 7 and is uniformly distributed thereby to the tufts of the bristles at their respective bases.

As the brush is moved in short strokes across the surface to be cleaned, the bristles flex, and upon relieving the pressure by partially lifting the brush for beginning the next stroke, the bristles reflex with a sharp snap action and throw off the liquid near the lower or cleaning ends of the bristles. During the stroke, the liquid at the lower ends of the bristles has picked up foreign matter and this flexing action of the bristles continually throws out the used cleaning liquid and foreign matter. Fresh liquid is fed continuously onto the bristles from above, thus rendering the bristles self-cleaning. Also, due to the stiffness of the bristles and the even distribution of the liquid thereto, as the brush moves along in contact with the surface to be cleaned so that the bristles are continually flexed and reflexed, a fine mist of cleaning fluid over and adjacent the surface being brushed is created.

Experience has shown that in cleaning fabrics with a device such as herein described, grease, dust and foreign matter are effectively removed and the usual spotted appearance resulting from saturation of the material with cleaning liquid is eliminated. Furthermore, the use of such a brush more efficiently applies the cleaning liquid and effects economies in the amount required for a particular cleaning operation.

Having thus described my invention, I claim:

1. A brush for the purpose described, comprising a hollow body, bristles secured therein and extending outwardly thereof, said body having ducts communicating with the interior and discharging exteriorly of the body and onto the bristles, a handle surrounding said body and extending longitudinally therefrom and adapted to be gripped in the hand of an operator, a reservoir within said handle for storing cleaning fluid, a duct communicating the reservoir with the

interior of the body, said body extending laterally from said handle and forming an exposed upwardly facing wall at one side of said handle, a valve for controlling the flow of liquid through said duct, a stem for operating said valve, said stem extending exteriorly of the body through said upwardly facing wall and being in position for engagement by the thumb of the operator while the handle is grasped in the operator's hand, said stem being moved for operating the valve and positioned for movement consequent upon normal flexure of the thumb of the operator in the direction when the hand and thumb are flexed for more firmly gripping the handle.

2. A brush for the purposes described comprising a hollow body, bristles secured therein and extending outwardly thereof, said body having ducts communicating with the interior and discharging exteriorly of the body and on to the bristles, a handle surmounting said body and adapted to be gripped in the hand of an operator, a reservoir within said handle for storing a cleaning liquid, a duct communicating the reservoir with the interior of the body, a valve for controlling the flow of liquid through said duct, a stem receiving bore through one wall of said body, said bore being disconnected from the reservoir, a stem reciprocable in said bore and extending exteriorly of the body at the side of the handle in position for engagement by the thumb of the operator while the handle is grasped in the operator's hand, said stem being movable for operating the valve, and positioned for movement consequent upon normal flexure of the thumb of the operator in the direction for gripping the handle.

3. A brush for the purposes described comprising a hollow body, bristles secured therein and extending outwardly thereof, said body having ducts communicating with the interior and discharging exteriorly of the body and onto the bristles, a handle on said body adapted to be gripped in the hand of an operator, a reservoir within said handle for storing a cleaning liquid, a duct communicating the reservoir with the interior of the body, a valve for controlling the flow of liquid through said duct, a stem receiving bore through a wall of said body, said bore being disconnected and spaced from the reservoir and from said duct, a stem reciprocable in said bore and extending exteriorly of the body and being positioned for engagement by the thumb of the operator while the handle is grasped in the operator's hand, said stem being movable for operating the valve and positioned for movement consequent upon normal flexure of the thumb of the operator in the direction for gripping the handle.

4. A brush for the purposes described com-

prising a hollow body, bristles secured therein and extending outwardly thereof, said body having ducts communicating with the interior and discharging exteriorly of the body and on to the bristles, a handle on said body and adapted to be gripped in the hand of an operator, a reservoir within said handle for storing a cleaning liquid, a duct communicating the reservoir with the interior of the body, a valve for controlling the flow of liquid through said duct, a stem receiving bore through one wall of said body, said bore being disconnected from the reservoir and spaced therefrom, a stem reciprocable in said bore and extending exteriorly of the body and being positioned for engagement by the thumb of the operator while the handle is grasped in the operator's hand, said stem being movable for operating the valve and positioned for movement consequent upon normal flexure of the thumb of the operator in the direction for gripping the handle.

5. A brush for the purposes described comprising a hollow body, bristles secured therein and extending outwardly thereof, said body having ducts communicating with the interior and discharging exteriorly of the body onto the bristles, a handle on said body adapted to be gripped in the hand of an operator, a reservoir within said handle for storing cleaning liquid, a feed duct communicating with the reservoir and with the interior of the body, a bore communicating with the interior of the body and with the outside, said bore being entirely disconnected from the reservoir at all times, a valve within the body for controlling the flow of liquid from the reservoir through the feed duct and into the interior of the body, a stem for operating said valve, said stem being disposed in said bore and extending exteriorly of the body and handle and being positioned for operation by the hand of the operator while the handle is grasped thereby.

In testimony whereof, I hereunto affix my signature.

GEORGE V. EVANS.