

Dec. 3, 1957

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2,814,817

WASHING DEVICE

Filed June 5, 1953

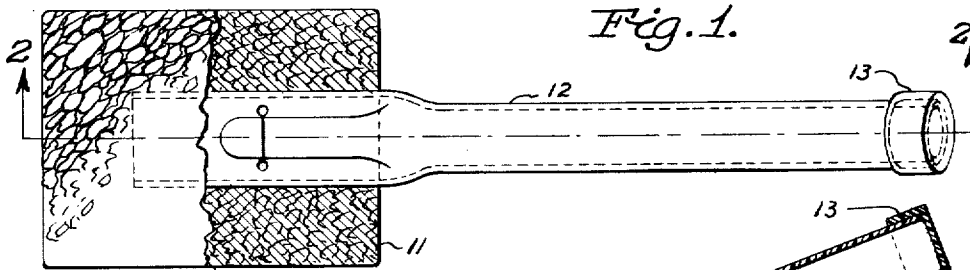


Fig. 1.

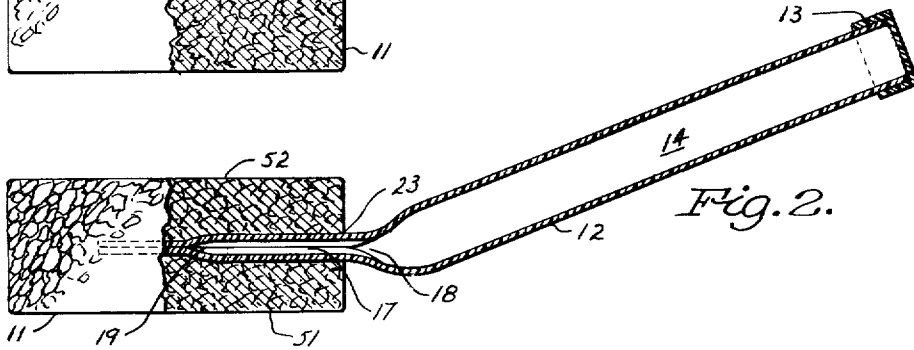


Fig. 2.

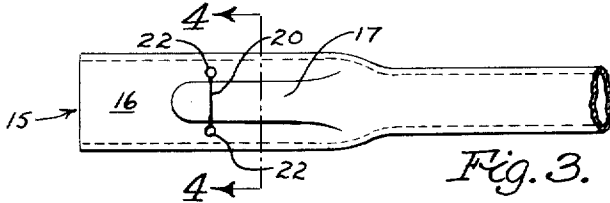


Fig. 3.

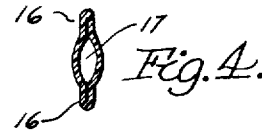


Fig. 4.

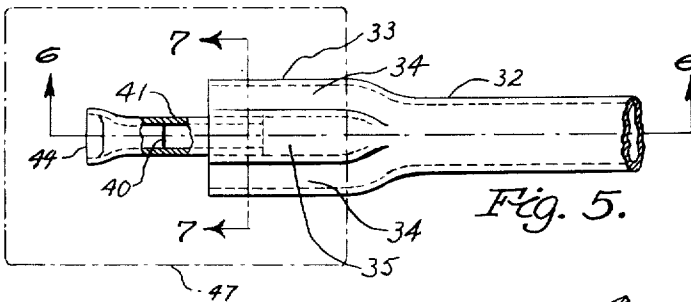


Fig. 5.

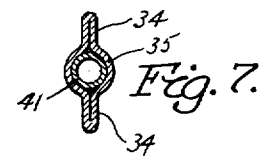


Fig. 7.

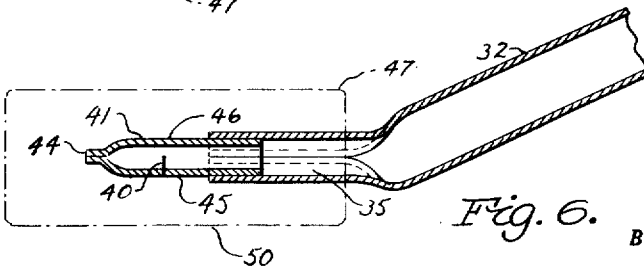


Fig. 6.

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2,814,817

WASHING DEVICE

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Application June 5, 1953, Serial No. 359,749

5 Claims. (Cl. 15-139)

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This invention consists of a washing device of the type having a scrubbing or scouring element, a reservoir for cleaning fluid and means for supplying cleaning fluid from the reservoir to the washing element as required.

The reservoir for cleaning fluid preferably is formed by a handle of hollow tubular construction. One end of this handle is formed to support the washing element, and includes a conduit section for conducting cleaning fluid from the reservoir to the washing element. A valve is provided at the discharge end of this conduit for controlling the amount of cleaning fluid supplied. Preferably, the valve consists merely in a slitlike passage cut in a section of the conduit. This section, at least, is formed of a flexible material so that the slitlike valve passage can be distorted from a normally closed to an open position by applying force through the device in the proper direction.

I have developed an extremely simple construction which incorporates all of the foregoing features. This construction will be described in detail but, in its simplest form, consists in a washing element such as a piece of synthetic sponge and a length of tubing having a certain degree of resiliency. One end of the tubing is provided with a transversely extending slit and is deformed from its normal circular cross-section in such a way as to provide a portion for attaching the sponge element, and an internal conduit section leading to the slit, which forms the valve. This deformed portion is inserted within the sponge which is secured thereto, and in operation a force can be applied through the sponge to cause deflection of the walls of the conduit section and consequent opening of the slit to allow passage of cleaning fluid from the tubular reservoir portion of the handle to the sponge.

In a modified form of the invention, control over the flow of cleaning fluid from the reservoir to the washing element is provided by employing a separate flexible conduit member attached to the handle and reservoir of the device. This flexible conduit section incorporates the valve slit, and again is positioned within the sponge or cleaning element so that force applied in the proper direction through the cleaning element will cause separation of the slit and flow of cleaning fluid.

The accompanying drawings show presently preferred constructional examples of the invention and comprise the following views:

Fig. 1, a plan view of the device showing a handle attached to a block of cellulose sponge which is partly broken away to show the main portion of the attaching and valve section of the handle in full line.

Fig. 2, a sectional elevation taken along the line 2-2 of Fig. 1.

Fig. 3, a plan view of the end of the handle upon which the washing element is mounted.

Fig. 4, a sectional view taken along the line 4-4 of Fig. 3.

Fig. 5, a plan view of a modified form of handle and valve construction, a washing element being here indicated in phantom.

Fig. 6, a sectional elevation taken along the line 6-6 of Fig. 5.

Fig. 7, a section taken along the line 7-7 of Fig. 5. Referring first to the construction shown in Figs. 1 to 4, a washing element 11 is shown secured to one end of a handle 12. The particular washing element illustrated is a block of synthetic spongelike material, such as du Pont cellulose.

The handle 12, one end of which is equipped with a removable cap 13, is of tubular construction to form a reservoir 14 within the handle for holding a supply of any suitable cleaning fluid such as liquid soap or detergent. The other end of the handle is formed in such a way as to provide a mounting for the washing element and means for dispensing cleaning fluid from the reservoir at a controllable rate. For convenience, this end of the handle will be referred to as the dispensing end, and is generally designated by the reference numeral 15.

This dispensing end is formed with a flattened portion 16 so that the handle can be assembled to the sponge 11 by merely cutting a slit in one side of the latter and inserting the flattened portion 16 of the handle in the slit. The dispensing end is also formed with a conduit section 17, one end 18 of which opens to the reservoir 14, and the other end 19 of which is closed by the adjacent flattened portion 16.

A dispensing opening, or valve, consisting in a slit 20 extending transversely of the conduit section 17 through one wall thereof is provided for the escape of cleaning fluid from the reservoir to the sponge 11. The dispensing end of the handle is formed of a material which has a certain degree of resiliency in order to provide for operation of the valve 20, which is normally closed. With such resiliency, the dispensing end of the handle can be deflected so that the meeting edges of the normally closed valve slit 20 can be parted to provide an opening for the passage of cleaning fluid. Naturally, the size of the opening which results will depend upon the amount of deflection, and the flow of cleaning fluid from the reservoir to the sponge can thus be controlled by the amount of force applied for deflecting the dispensing end of the handle and the length of time it is applied.

All of these constructional features can readily be provided in a handle of one-piece construction, formed in the following representative manner: A length of Lucite or Tenite tubing, for example, having a 3/4 inch outside diameter and 1/16 inch wall thickness is cut to the length desired. One end is selected for the dispensing end, and a pair of holes 22 are drilled through one wall only of the tubing. The valve slit 20 is cut between these two holes with a knife or very fine saw. Heat is then applied to the dispensing end of the tubing which can then be flattened between suitable forms, using a mandrel to define the cleaning fluid conduit section 17. During this forming operation, pressure is applied to the free or handle end of the tubing in a direction to cause the mating edges of the valve slit 20 to be forced together and, at the same time, the handle may be bent to any desired working angle between dispensing end and handle portion such as shown in Fig. 2. A suitable nonsoluble cement is applied to the dispensing end, except in the region of the valve slit 20, and the dispensing end inserted within a slit in the sponge 11. Additional cement can then be applied at 23 to securely unite the handle with the washing element.

Preferably, the length of the dispensing end of the tubing is between one-half and three-fourths the length of the sponge into which it is inserted. This stabilizes the sponge and gives better leverage for operating the valve, which gives best results if located so as to be placed about the middle of the sponge. Flattening the dispensing end gives increased stability to the sponge and seals

the holes 22 from the conduit 17. While these holes are not essential, they do relieve stress concentration at the ends of the slit and thus prolong the life of the device.

It can thus be seen that this construction is extremely simple and cheap to manufacture. With the reservoir portion 14 of the handle filled with cleaning fluid, pressure applied through the sponge and handle to cause a tensile stress in the side walls of the conduit section adjacent the valve slit 20, and compressive stress in the opposite side wall, produce separation of the adjacent faces of the valve allowing cleaning fluid to seep from the handle into the sponge.

The alternate construction shown in Figs. 5 to 7 offers the same advantages of simplicity of operation. This construction can be employed to eliminate the necessity for resiliency in the material of which the handle is formed and/or permit the dispensing of cleaning fluid from the reservoir with the application of less pressure for deflecting the valve structure.

The handle 32 of this construction can similarly be formed from a single length of tubing. The dispensing end 33 of the handle is deformed to provide a longitudinally extending flattened shoulder 34 and a central conduit section 35, the conduit section being shown as round in cross-section (see Fig. 7).

A valve slit 40 is provided in a separate tubular member 41 which is inserted and cemented within the end of the conduit section to form an extension thereof. The outer end 44 of this tubular member is sealed. Rubber or one of the soft pliable plastic materials may be employed for the member 41 so that it can be easily deflected to place the side wall 45 in which the valve slit 40 is formed in tension and the opposite side wall 46 in compression to produce separation of the mating edges of the valve slit.

This handle construction can also be readily inserted within an opening formed in a washing element 47, indicated in phantom, and the parts joined together by any suitable means such as cementing.

Attention is directed to the relative positioning of the valve slit 40 of Figs. 5 to 7, and the valve slit 20 of Figs. 1 to 4. Valve 40 opens towards what will ordinarily be the working face 50 of the sponge 11. Thus, normal usage of the device will result in the application of deflecting pressure to the dispensing end of the handle in the proper direction for causing the valve 40 to open. Cleaning fluid will be supplied to the sponge automatically, in the sense that no special manipulation of the device is required.

Valve 20 opens away from the normal working face 51, or, in other words, is located in the side wall of the conduit section 17 that is placed in compression by the deflection which takes place in normal use of the device. In order to supply cleaning fluid to the sponge, the device must be reversed from what would be its normal position with the particular design of handle shown, to apply pressure through the opposite face 52 of the sponge. A particular manipulation is required for dispensing and, in many cases, this type of valve positioning will give better results because the supply of cleaning fluid can be regulated independently of the operating force normally applied through the device for cleaning. Naturally, either type of valve positioning can be employed on any particular type of device as desired.

If necessary, an air-vent opening (not shown) can be provided at the upper end of the handle or in the cover cap 13 to promote flow of cleaning fluid through the valve when open. I have found that such an air vent is not essential when sponge-like material is employed for the washing element 11. This material seems to possess enough capillary attraction to withdraw cleaning fluid from the valve opening.

The constructional examples illustrated and described herein are intended to be representative embodiments of the invention only. Obviously, many modifications can

be made to adapt the invention to the construction of particular types of washing device for special uses, and therefore it is understood that the invention is not limited except as may be defined in the following claims.

I claim:

1. A washing device comprising a tubular member forming a handle and a reservoir for cleaning fluid, said member being bent toward one end thereof to form a portion extending at an angle to the remaining handle portion thereof, said angularly extending portion having its end sealed and its remaining portion partially flattened to provide side flanges on either side of a tubular conduit communicating with said reservoir, a valve comprising a slit cut transversely through a curved portion of the wall of said tubular conduit, the mating edges of said slit normally abutting each other and the ends of said slit being defined by small holes, a cellular washing element secured to said angularly extending portion and surrounding the valve thereof in direct contact therewith, said tubular member being made from a material having sufficient rigidity to function as a handle and sufficient resiliency to enable the edges of said valve slit to be separated and the application of a force through said handle and cleaning element which produces bending of said tubular conduit.

2. A washing device comprising a tubular member forming a handle and a reservoir for cleaning fluid, one end portion of said member being partially flattened to provide a tubular conduit communicating with said reservoir, a cellular washing element attached to and stabilized by the length of said flattened end portion, valve means provided between said conduit and said washing element and surrounded by said washing element in direct contact therewith whereby said washing element will tend to draw cleaning fluid from said reservoir upon opening of said valve means, means for sealing said reservoir from said washing element except for the passage afforded by said valve means, said valve means comprising a normally closed slit whose mating edges can be separated to form a valve opening by the application of a force through said handle and cleaning element which tends to produce bending of said tubular conduit section relative to said handle.

3. A washing device according to claim 2 further characterized by the said partially flattened end portion of said tubular member being formed to extend at a working angle to the remaining handle portion thereof.

4. A washing device according to claim 2 further characterized by a resilient tubular member secured to the end of said tubular conduit to form an extension thereof, means sealing the unsecured end of said resilient tubular member, and said valve means being formed in said resilient tubular member between the sealed end thereof and the end of said conduit, said resilient tubular member being in contact with said washing element.

5. A washing device according to claim 2 further characterized by said means for sealing said reservoir from said washing element comprising a complete flattening of the end of said tubular conduit, said valve slit being cut through a curved portion of the wall of said tubular conduit between said flattened end and said reservoir, said tubular member being made from a material having sufficient rigidity to function as a handle and sufficient resiliency to enable the edges of said valve slit to be separated upon the application of said force.

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