April 19, 1960 H. T. LATHROP 2,932,840

CLEANING DEVICE

Filed May 21, 1958

Fig. 1.

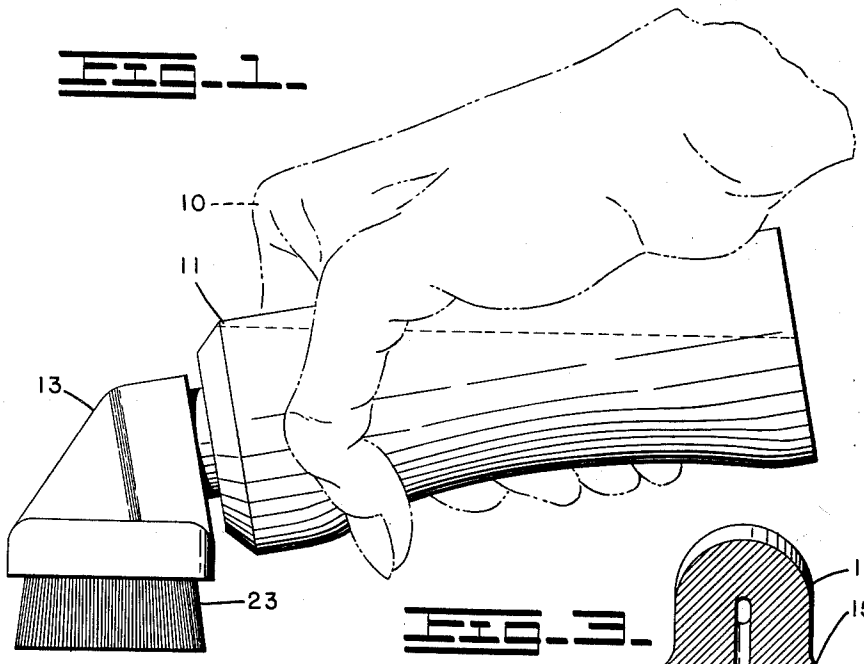


Fig. 3.

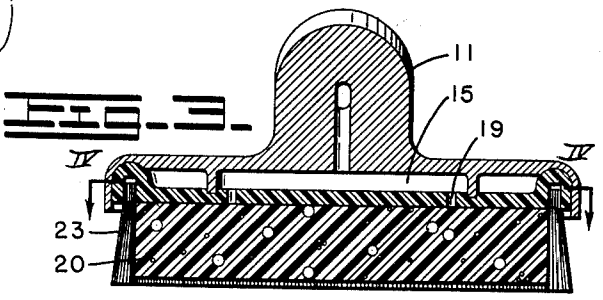


Fig. 2.

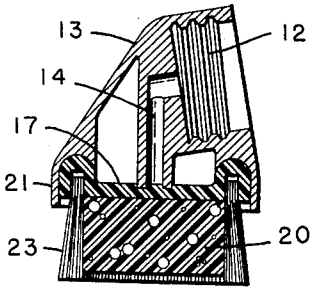
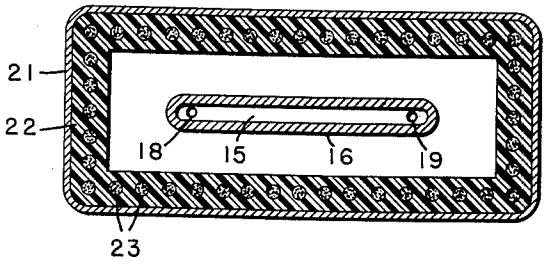


Fig. 4.



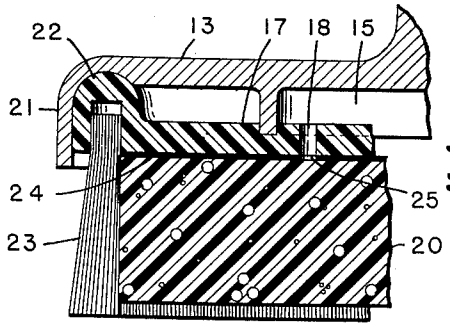


Fig. 5.

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CLEANING DEVICE

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2 Claims. (Cl. 15—136)

This invention relates to the construction of cleaning devices, and has been developed primarily as a tool for cleaning fabrics and upholstery. It has also been found useful in cleaning baseboards, walls, cupboards, and numerous other surfaces. The primary function is that of a dispenser for a liquid cleaning solution carried in a flexible reservoir which preferably also serves as a handle. The cleaning solution is of the type capable of being foamed, and the structure of the unit is directed toward generating the necessary rate of release of the liquid and at the same time inducing the foam formation as a result of the movements made with the device.

The rate of discharge of the cleaning solution is determined by the fact that the entire flow must take place through a permeable sponge, with the liquid being admitted to the sponge at a central point on the side opposite from that at which the cleaning operation is conducted. As the solution flows through the sponge under the to-and-fro movement of a mild scrubbing action, a foaming action is induced within the intercellular spaces of the sponge which results in presenting the completely foamed material to the open face of the sponge in contact with the fabric. It is preferable that the sponge block be surrounded by a group of bristles which add somewhat to the effectiveness of the scrubbing movement, and also provide a porous and yielding confinement to the edges of the sponge block. The bristles facilitate the admission of air and yet serve to support the movements of the sponge material. The several features of the invention will be analyzed in detail through a discussion of the particular embodiments illustrated in the accompanying drawing. In the drawing:

Figure 1 presents a side elevation of a device showing its position when in use.

Figure 2 is a sectional elevation taken through the central portion of the unit on a vertical plane.

Figure 3 is a section through the unit on a vertical plane perpendicular to that of Figure 2.

Figure 4 is a section of the plane IV—IV of Figure 3.

Figure 5 is a view on an enlarged scale showing the perforation of the adhesive film attaching the sponge to the backing member.

Referring to the drawing, the cleaning unit is shown in its operating position being manipulated by the hand **10** indicated in dotted lines. The reservoir **11** is preferably of a molded plastic material having considerable flexibility, and is commonly known as a "squeeze bottle." There are several well-known materials for such containers, with the specific physical characteristics of the plastic material being selected to avoid any reaction with the contained cleaning solution. The end of the container **11** is normally in threaded engagement with the opening **12** in the housing **13**, and a tight threaded engagement will be sufficient to establish a liquid seal. The housing **13** is preferably of die-cast construction, and provides a conduit **14** normally communicating with the container **11** and also with the chamber **15** established by the wall **16** in engagement with and extending below

the inner surface of the backing member **17** of the brush unit. The chamber **15** includes the perforations **18** and **19** which are disposed in the central area of the unit opposite the cellular porous sponge block **20**. The material of the sponge block is preferably of the type referred to as "semi-open" cellular polyurethane. The backing member **17** may be conveniently formed of the conventional molded plastic material, and is normally fixed with respect to the housing **13** through being pressed firmly into engagement with the surrounding flange **21** which serves as a retaining frame. The backing member **17** has a peripheral ridge **22** for receiving a row of groups of bristles **23** surrounding the sponge block **20**. It is preferable that the length of the bristles should be selected to extend slightly beyond the thickness of the sponge block for the best cleaning action. This system tends to provide a support for the sponge so that the bearing action of the scrubbing movement is not carried exclusively by it, with the net result that a small space normally exists under the sponge for facilitating the foam formation and dispensing. With the arrangement of the bristles shown in the drawing, a flexible retaining wall is established by them extending over the full length of the side of the sponge block for admission of the air necessary to foam formation, and for establishing a resilient confinement tending to permit the necessary pulsations of the sponge block and yet provide some degree of structural support.

The most convenient manner of attaching the sponge block **20** to the backing member **17** is through the use of a layer of adhesive as shown at **24**. Unless precautions are taken, however, this adhesive will serve to seal off the perforations **18** and **19** so as to prevent the necessary flow of cleaning solution into the sponge. As a subsequent operation after the application of the adhesive, and before assembling the brush unit to the housing, it is necessary to punch out the material forming the adhesive layer which would otherwise cover over these perforations. Figure 5 illustrates this formation, with the area indicated at **25** being poked through with some convenient instrument to permit the flow of liquid.

The particular embodiments of the present invention which have been illustrated and discussed herein are for illustrative purposes only and are not to be considered as a limitation upon the scope of the appended claims. In these claims, it is my intent to claim the entire invention disclosed herein, except as I am limited by the prior art.

I claim:

1. A cleaning device, comprising: a housing; reservoir means of flexible material normally connected to said housing and having a configuration to form a handle thereon; a brush unit including a relatively rigid backing member having one surface formed with a peripheral rim extending thereabove and normally fixed with respect to said housing, said backing member having perforations exclusively in the central area thereof, said brush unit also including a rectangular cellular body having communicating cells capable of transmitting liquid therethrough, and adhesively secured to another surface of said backing member opposite said perforations and communicating therewith, said brush unit also including a group of bristles projecting from said rim and arranged around said cellular body and extending along the sides thereof and having a free length exceeding the thickness of said cellular body; wall means in said housing extending below said one surface and forming with said backing member a chamber surrounding said perforations; and means forming a conduit communicating with said chamber and with said reservoir.

2. A cleaning device, comprising: a housing; reservoir means of flexible material normally connected to said

housing and having a configuration to form a handle thereon; a brush unit including a backing member having one surface formed with a peripheral rim extending thereabove and normally fixed with respect to said housing, said backing member having perforations exclusively in the central area thereof, said brush unit also including a cellular body having communicating cells capable of transmitting liquid therethrough, and adhesively secured to another surface of said backing member opposite said perforations and communicating therewith, said brush unit also including a group of bristles projecting from said rim and arranged around said cellular body and extending along the sides thereof and having a free length exceeding the thickness of said cellular body; wall means in said housing extending below said

one surface and forming with said backing member a chamber surrounding said perforations; and means forming a conduit communicating with said chamber and with said reservoir.

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