Aug. 18, 1959 H. VON KOHORN ET AL 2,899,697

SCOURING TOOL

Filed June 6, 1958

Fig. 1.

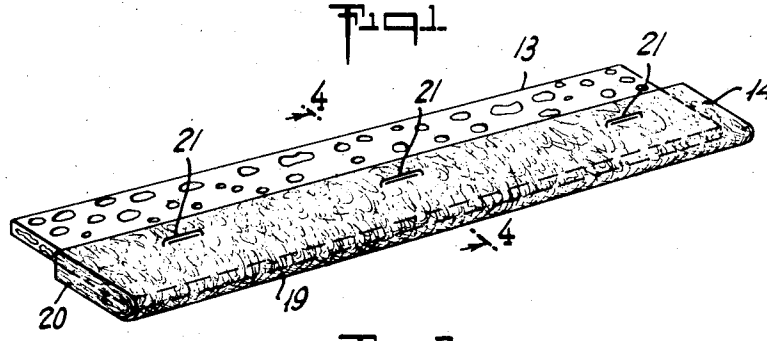


Fig. 2.

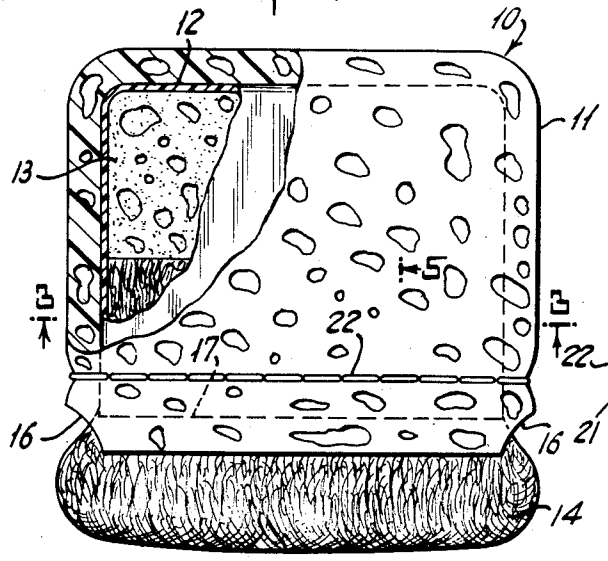


Fig. 4.

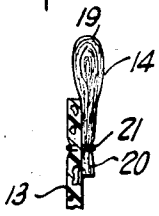


Fig. 5.

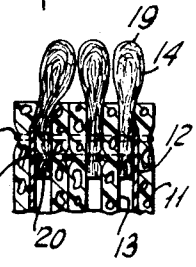


Fig. 3.

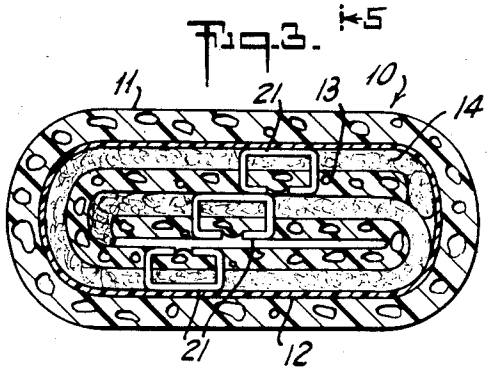
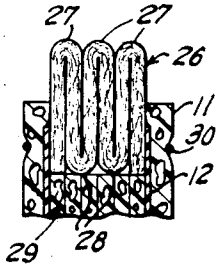


Fig. 6.

Fig. 7.



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SCOURING TOOL

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6 Claims. (Cl. 15—123)

The present invention relates in general to devices of an abrasive quality for use in cleaning, scouring, polishing and similar applications of a domestic and industrial nature, and it relates more particularly to an improved abrasive type cleaning, scouring and polishing tool capable of retaining and dispensing large quantities of detergent and cleaning solution and adapted for long and repeated employment.

The conventional cleaning and scouring devices range in character from the relatively soft highly water absorbent natural or synthetic sponge to the highly abrasive steel wool pads. These devices are particularly suited for certain limited uses but when employed for other purposes they possess numerous drawbacks and disadvantages and at best represent an unsatisfactory compromise. The sponge type device is characterized by being capable of retaining and dispensing large quantities of water and detergent solution but has a low abrasive quality. As a consequence, it is frequently necessary to employ a powdered abrasive or grit with the sponge, thus necessitating the subsequent rinsing of the scoured surface and the cleaning of the sponge to remove the powdered abrasive from the surface and sponge.

It has been proposed to incorporate a powdered abrasive in a synthetic sponge but this is of little value since any abrasive that is available at the sponge surface is very shortly dissipated or masked. The common steel wool pad, on the other hand, while possessing suitable abrasive qualities, is of low water retention and rapidly deteriorates by reason of its rusting and physical disintegration. By substituting a rust-proof material, such as bronze or stainless steel for the steel wool, the rusting is eliminated but the other disadvantages remain while the cost is greatly increased. Soap impregnated steel pads are likewise short-lived and the soap rapidly dissipated. All have the drawbacks of being rough on hands and fiber pads frequently prick the skin and cause festering sores.

It is thus a principal object of the present invention to provide an improved tool for use in cleaning, scouring, polishing and similar applications of a domestic and industrial nature.

Another object of the present invention is to provide an improved abrasive type of scouring and cleaning device.

Still another object of the present invention is to provide an improved abrasive type scouring and cleaning device capable of long and repeated employment.

A further object of the present invention is to provide an improved abrasive type scouring and cleansing device capable of holding and dispensing large quantities of water and soap or detergent solutions.

Still a further object of the present invention is to provide an improved abrasive type scouring and cleansing device characterized by its simple, inexpensive and rugged construction.

The above and other objects of the present invention will become apparent from a reading of the following

description taken in conjunction with the accompanying drawings, wherein

Figure 1 is a perspective view of the abrasive and core elements of a preferred embodiment of the present invention, illustrated prior to shaping and assembly thereof;

Figure 2 is a front elevational view of the improved scouring device, illustrated partially broken away and partially in section;

Figure 3 is a sectional view taken along line 3—3 in Figure 2;

Figure 4 is a sectional view taken along line 4—4 in Figure 1;

Figure 5 is a sectional view taken along line 5—5 in Figure 2;

Figure 6 is a transverse sectional view of another form of assembled core and abrasive element, shown partially broken away for convenience of illustration; and

Figure 7 is a sectional view similar to Figure 5 of still another embodiment of the present invention, shown partially broken away for convenience of illustration.

In a sense, the present invention contemplates the provision of an improved scouring tool comprising an envelope having an opening at one end thereof and closed at the other end thereof and formed of a flexible water-impervious material, a pad formed of a non-rusting abrasive fibrous material registering with said envelope opening and having a leading end directed out of said opening and trailing end disposed in said envelope forward of said closed end to define a reservoir in said envelope communicating with said pad and a filler and detergent material located in said reservoir.

In a preferred form, the improved scouring tool includes a plurality of substantially contiguous scouring strips formed of bands of intermatted rustproof fibers, each of said bands being folded along their longitudinal axis to provide an outwardly directed looped edge and inwardly directed legs, said outwardly directed looped edge defining a working surface, and means maintaining said bands in looped condition.

The contiguous loops may be formed by folding the strip along its longitudinal axis in an undulating manner to present a plurality of abutting parallel loops and the portions of the loops remote from the working face are secured to each other by staples, stitching or the like. However, the legs of a singly folded abrasive mat are preferably attached to a flexible base strip, the looped or working ends projecting beyond the edge of the base strip and the base strip is wound into a flat, circular or oval spiral or in the alternative a plurality of such fiber mat-carrying base strips may be superimposed upon each other. The thickness of the base strip and the dimensions and configuration of the loops may be such as to provide spacing between the successive loops, or the successive loops may be in abutment with each other. Furthermore, the loops may be outwardly directed or laterally bent. The flexible base strip is preferably of a water absorbent sponge material such as regenerated cellulose sponge or a synthetic thermoplastic foam, for example, polyurethane or polyvinyl chloride and the abrasive mat may be formed of stainless steel wool, bronze wool or other suitable abrasive non-rusting fiber. The metal wool fibers should preferably possess a general orientation parallel to the tarnsverse axis of the abrasive bands so that the individual fibers are folded across their lengths in the area of the mat loop portions.

The assembled abrasive mat loops, including the base strip, where provided, are secured to a handle which may be in the form of an open-ended envelope, the working face of the abrasive fiber loops being outwardly directed and disposed outside the envelope opening. The envelope may likewise be formed of a sponge material and is preferably provided with a water impermeable inner

liner to restrict the passage of liquid to the envelope opening and the working face of the abrasive member. The envelope may carry a soap or detergent in liquid or solid state in the form of a power, pellet or bar or a sponge or the base strip within the enevlope may be impregnated with soap or detergent. The present scouring tool, as will be hereinafter set forth, is preferably of certain dimension and possesses certain physical characteristics which greatly improve its usefulness, effectiveness and ease of application.

Referring now to the drawings and more particularly to Figures 1 through 5 thereof which illustrate a preferred embodiment of the present invention, the improved scouring device is generally designated by the numeral **10** and includes an outer envelope **11**, an inner envelope **12**, a nesting core member **13** which carries an abrasive element **14**, as will be hereinafter set forth.

The outer envelope **11** is illustrated as being of substantially oval transverse cross section but may assume any desired shape, for example, round or rectangular and is preferably provided wtih sharp edges and corners or rounded corners of small radius to permit its reaching into the corners of pots and pans, etc. The envelope **12** is of a flexible material and is preferably porous and water absorbent, such as natural or synthetic sponge material, for example, regenerated cellulose sponge or a synthetic organic plastic foam as polyurethane and polyvinyl chloride. Where the envelope **11** is formed of regenerated cellulose sponge material it may be formed by sewing or otherwise securing a pair of superimposed rectangular panels along three contiguous edges and inverting the resulting envelope so that the lower edges are inwardly directed. However, when the panel **11** is formed of regenerated cellulose or of a synthetic organic thermoplastic foam it may be cast or formed as such or may be formed in the manner described in connection with the regenerated cellulose sponge envelope. The lower corners of the envelope **11** are beveled as at **16** to extend the opening in the envelope from the lower edges a short distance along the side edges thereof.

The interior face of the envelope **11** is coated with a water impermeable material or is lined with the inner envelope **12** which extends to a line **17** disposed above the lower edge of the envelope **10**. The envelope **10** may be formed of any suitable water impermeable flexible material, such as cellophane, polyethylene, polyvinylchloride or the like.

The core assembly is formed of the core member **13** which is initially in the form of an elongated or rectangular strip. The core member **13** is flexible and likewise initially in the form of an elongated or rectangular strip. The core member **13** is fiexible and preferably formed of a water absorbent porous sponge material, such as regenerated cellulose sponge or a synthetic organic thermoplastic foam. It may also consist of any other suitable flexible or resilient material. The abrasive member **14** comprises a panel or strip of intermatted abrasive fibers of a rust-proof or non-rusting nature, for example, stainless steel wool and bronze wool. The fibers possess a general orientation extending transversely to the length of the strip **14**. The strip **14** is folded along its longitudinal axis to form an outwardly directed looped end **19**, the outer face of which defines a working surface and rearwardly directed abutting legs **20**. The abutting legs **20** are superimposed upon the lower border of the core member **13** and secured thereto by means of staples **21** or other suitable fastening means. It should be noted that inasmuch as the fibers forming the abrasive mats **14** are parallel to the transverse axis of the strip **14** they are folded across their length in the area of the looped end **19**. It should also be noted that the abrasive mat **14** may extend beyond the end edges of the core member **13**.

The assembled core member **13** and the folded abrasive strip **14** are then wound into a flat spiral, the lower peripheral surface of which is surrounded by the abrasive strip **14**, as seen in Figures 3 and 5 of the drawings. The spirally wound core is compressed and nested within the envelopes **11** and **12** with the working face of the abrasive strip **14** projecting beyond the open ends of the envelopes. As seen in Figure 5 of the drawings, the looped ends **19** of the folded strip **14** are of greater width than the compressed legs **20** and are spread to provide a continuous—though not necessarily uninterrupted—working face. A line of stitches **22** or other suitable fasteners extend through the envelopes **11** and **12** and the assembled core to effect a securing of the final assembly and to form an outer or peripheral groove along the lower border of the envelope **11** which protects the fingers of the user from the abrasive head of the scouring device and from scraping against the surface to be cleaned. As seen in Figure 2 of the drawings the provision of the beveled edges **16** permit a peripheral flaring of the lower portion of the abrasive mat **14** and increases the outer flaring of the lower borders of the envelope **12**.

The core member **13** may be impregnated with soap or any suitable liquid or solid synthetic detergent or the space between the successive convolutions of the strip **14** may be filled with such soap or detergent either in liquid or solid form as a powder, pellet or bar.

In use, the working face of the scouring device is immersed in water so that the water travels through the working face of the scouring device into the core member. There, some of the soap or detergent is dissolved and may be controllably dispensed through the working face by the pressure applied to the envelope **11**. The surface being scrubbed thus receives the detergent carrying water in controlled amounts and there is no dissipation and loss of the detergent through non-applied faces of the scouring device. As the abrasive fibers are worn, fibers in lower levels become accessible and there is no unravelling of the abrasive mat by reason of its being secured to the core member or by reason of the fibers being intermatted and oriented in the manner above set forth. It is important to note that even if some of the looped or tufted fiber bundles get caught on an object and pulled out, the tool will not be materially damaged. Further, the dissolved detergent or soap dispensed through the working face for the most part emerges from the reservoir and travels through the restricted passageways between the confronting faces of adjacent loops.

In accordance with the embodiment of the present invention illustrated in Figure 6 of the drawing the outer and inner envelopes **11** and **12** may be of a construction similar to that described in connection with the first embodiment. However, the core is formed not by spirally winding a single strip as previously set forth but by superimposing a plurality of parallel sponge strips **23** to each of which is secured by staples or the like the folded abrasive wool mats **24** which are similar in structure to the abrasive mats **14**. The assembled strips **23** and mats **24** are then compressed and nested in the envelopes **11** and **12** with their looped working faces extending beyond the open end of the envelopes. The assembled envelopes and core are then suitably fastened. Here again liquid or solid soap or detergent may impregnate the strips **23** or may be disposed in the spaces between the strips.

In Figure 7 of the drawing there is illustrated still another embodiment of the present invention in which a wide strip of intermatted non-rusting abrasive fibers generally oriented in the direction of the width of the strip **26** is folded in an undulating or sinuous manner to provide a plurality of abutting forwardly directed loops **27** which define a working surface and rearwardly directed loops **28**. Here again are provided envelopes **11** and **12** similar in structure to those previously described. Nested within the envelopes **11** and **12** is a

core member **29** which is preferably of a water absorbent permeable sponge material which may be impregnated with liquid soap or detergent or which may be provided with one or more pockets carrying such soap or detergent. The sinuous strip **26** is inserted through the open ends of the envelopes **11** and **12**, their inner portion thereof being in abutment with the core **29** and the working faces **27** being disposed externally to the envelopes **11** and **12**. The line of stitches **30** or other fasteners pass through the envelopes **11** and **12** and the inner border of the sinuous strip **26** to effect the final assembly of the scouring device.

It should be noted that the envelope **12** may be defined by a water-impervious coating on the inner face of the envelope **11** and in any event the composite envelopes **11** and **12** are impervious to the passing of fluid through their walls so that the soap carrying fluid can only pass through the working face of the abrasive strip **14**. The manner of employing the embodiment last described is similar to those previously described and the various modifications disclosed in connection with the earlier embodiments may be equally applied to the present embodiment.

It is also possible to exemplify the construction of the scouring tool by combining the water-impermeable, detergent containing envelope with the flexible outer housing. Such materials as rubber or flexible water-impermeable plastic films may be used to contain detergent and may also contain a filler material. The fiber mat forming the scouring head may be fastened directly to the combined envelope housing, in which event no base strip is required. It may be cast or molded as a unitary envelope or may be formed of a pair of superimposed rectangular panels secured along three of their contiguous edges by stitching, adhesive or the like.

The dimensions and physical properties of the present improved scouring tool are of great importance since the effectiveness of the tool is highly dependent thereon. Appreciable deviation from these dimensions greatly detracts from the tool's usefulness. The overall height of the tool should be between 4 and 10 centimeters, preferably 6 centimeters, its width between 4 and 9 centimeters, preferably 7½ centimeters, and its depth between 2 and 6 centimeters, preferably 4 centimeters. The reservoir dimensions should be in height between 3 and 8 centimeters, preferably 5 centimeters, in width between 3 and 8 centimeters, preferably 6½ centimeters, and in depth between 2 and 5 centimeters, preferably 3 centimeters.

The materials forming the tool should possess a flexibility such that a tool having the preferred dimensions and in a thoroughly moistened state would require a force of between 1 and 4 pounds applied to the end thereof to flex the tool 90° when the other end is firmly clamped. The necessary flexing force should preferably be of the order of about 2 pounds. The resistance to this flexing may be possessed approximately 40% by the envelope and 60% by the remainder of the tool.

We claim:

1. An improved scouring tool comprising a plurality of substantially parallel base strips having front edges and a plurality of scouring strips formed of bands of intermatted rust-proof fibers, each of said bands being folded along their longitudinal axis to provide an outwardly directed looped portion and inwardly directed legs, said legs being secured to said base strips whereby said scouring strips are substantially parallel to each other and said outwardly directed looped portions are disposed forwardly of said base strip front ends and define a working surface, and means maintaining said base strips and said scouring strips in assembled condition.

2. An improved scouring tool in accordance with claim 1, wherein said outwardly directed scouring strip looped portions are substantially contiguous.

3. An improved scouring tool in accordance with claim 1, wherein the fibers forming said band are substantially parallel to the transverse axis thereof whereby said fibers are folded across their length in the looped portions of said scouring strips.

4. An improved scouring tool in accordance with claim 1, wherein said base strips are integrally formed in end-to-end relationship and are spirally wound.

5. An improved scouring tool in accordance with claim 4, wherein said scouring strips are integrally formed in end-to-end relationship, the legs thereof being sandwiched between the confronting faces of successive convolutions of said base strips.

6. An improved scouring tool in accordance with claim 1, wherein said base strips are formed of a water absorbent porous sponge material.

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