

United States Patent

Lane

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[54] DISPOSABLE SCRUB BRUSH

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[51] Int. Cl. **A47k 7/03**

[58] Field of Search **401/201; 15/244, 223, 224, 15/104.93, 104.94, 228, 187, 188, 210; 132/73, 73.5; 15/118**

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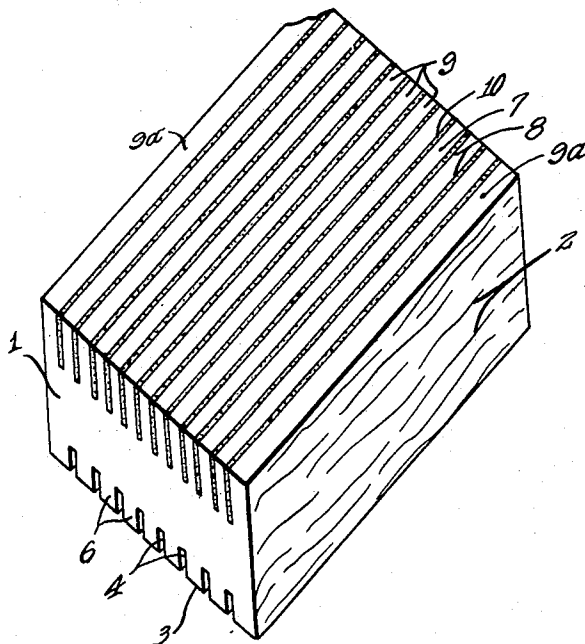
Attorney—Hill, Sherman, Meroni, Gross & Simpson

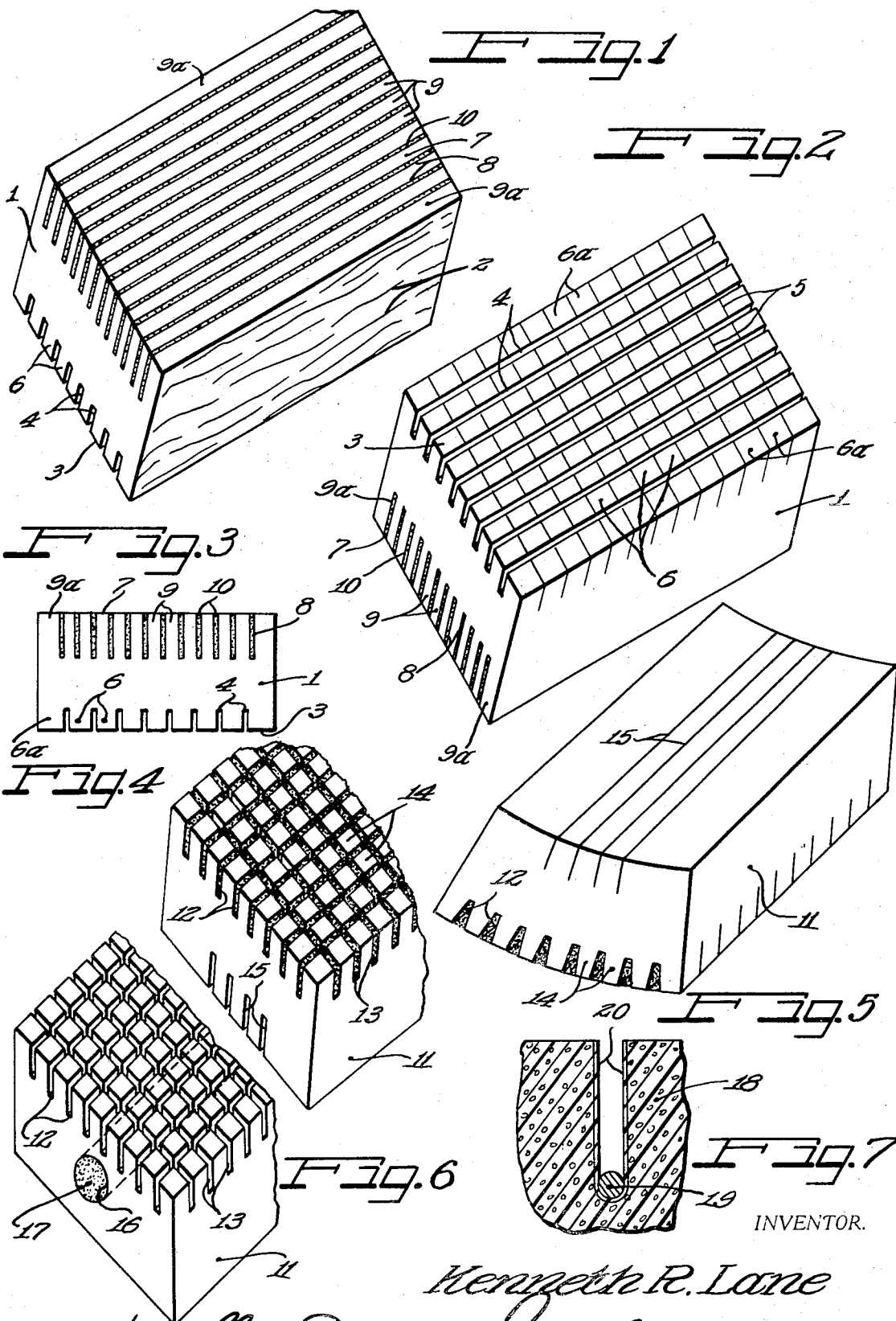
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ABSTRACT

A disposable scrub brush, preferably made of chemical foam, and which is sufficiently economical to warrant discarding after a single usage. The brush, while being highly desirable for surgical usage for scrubbing the arms and hands prior to an operation, may also be utilized for numerous other purposes including use as a cosmetic brush, industrial usage, and many others as will be apparent to one skilled in the art. The brush carries its own soap or detergent supply and this, of course, may be varied in accordance with the intended usage of the brush.

6 Claims, 11 Drawing Figures





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Fig. 8

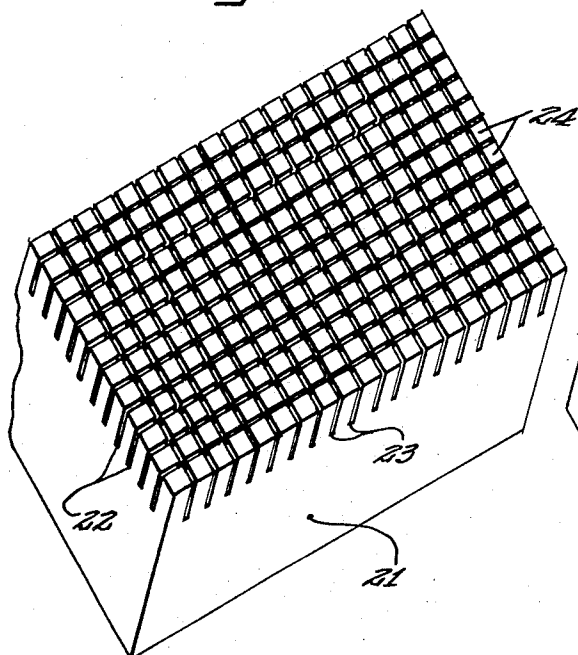


Fig. 9

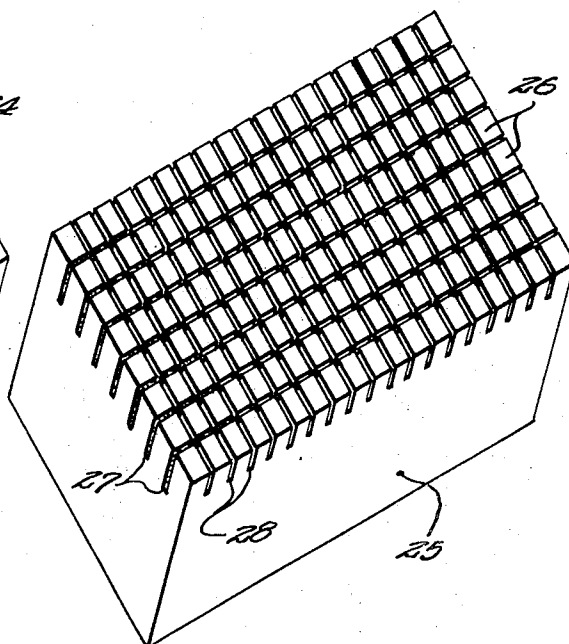


Fig. 10

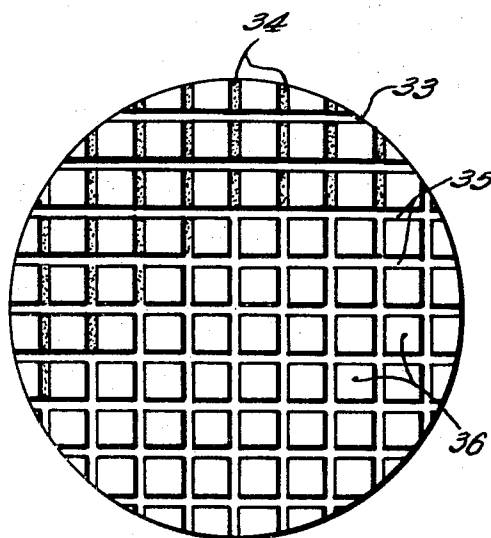
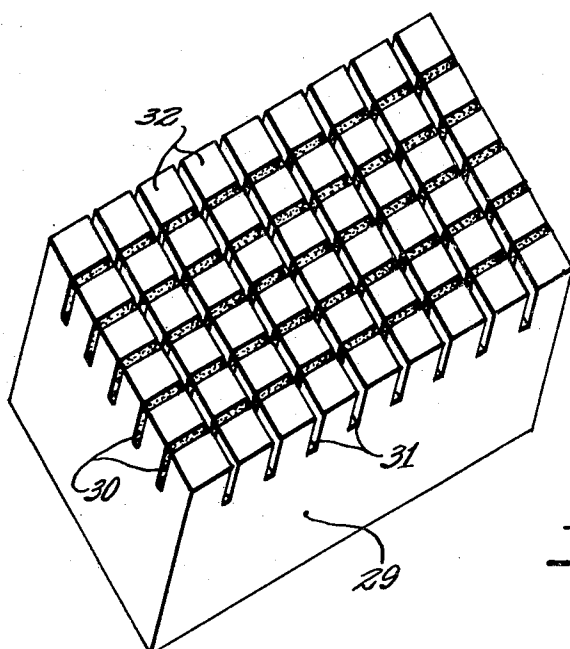


Fig. 11

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DISPOSABLE SCRUB BRUSH

SUMMARY OF THE INVENTION

Heretofore, brushes of the general type of the instant invention were in many cases not disposable after a single usage, but were designed for repeated usage requiring the resterilization, an expensive operation for the hospitals, in the event the brushes were used for surgical purposes. In the instances where the brushes were sufficiently economical to be discarded after a single usage the brushes functioned in the manner of a sponge, absorbing water and soap or detergent and accordingly losing their shape during usage with the concurrent lessening of the desired texture of the scrubbing faces as absorption increased, thereby rendering the brushes difficult to handle and properly manipulate, thereby rendering the brushes unsatisfactory for surgical as well as other uses. Further, no provision was made in such brushes heretofore for the effective cleansing of the nails as distinguished from the scrubbing of smooth skin surfaces. All in all, brushes of this type developed heretofore, especially single usage brushes, have proven undesirable for surgical purposes.

The instant invention overcomes the disadvantages and problems of the brushes made heretofore by providing an economical single usage brush formed of a block of chemical foam which in its original state is uniform throughout but which after being formed is provided with cuts in one or both faces, which cuts define grooves and a cleansing substance such as soap or a detergent, preferably in paste form, may be inserted in as many of the grooves as desired. The brush is self-sustaining as to shape and if forcibly compressed will promptly assume its original shape upon relief of pressure. The shape retaining property of the brush is effective throughout its use and regardless of how much moisture is carried by the brush. The number and spacing of the cuts determine the rigidity of the portions between cuts and the texture of the scrubbing surfaces. Further the brush is preferably manufactured in a manner such that it will not absorb water or other liquids but will carry such on the various surfaces which are increased as to area by virtue of the cuts. The cuts may be arranged in various ways to vary the number of scrubbing edges on the respective scrubbing faces of the brush, whereby brushes may be provided through a considerable range of scrubbing face textures and rigidity of parts, and also whereby it is a simple matter to vary the widths between the cuts on the same scrubbing face to provide more rigid portions for the cleansing of the nails and a less rigid portion for scrubbing over the skin. It will be apparent therefore that brushes embodying improvements of the instant invention may easily be made for numerous purposes, such as a fairly stout brush having non-irritating scrubbing surfaces that feel fairly soft to the skin for surgical usage, softer feeling brushes for bathing infants, brushes having a comfortable feel for cosmetic use and bathing, brushes having coarser rubbing surfaces for scrubbing pots and pans, sinks, automobile tires and various other objects, heavy-duty brushes for use by machinists and other industrial workmen and others as will be apparent to one skilled in the art. The cleansing substance content of the brushes may be also varied as desired.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a scrubbing brush embodying principles of the instant invention showing the same in an inverted position with respect to the use of the brush;

FIG. 2 is a perspective view of the structure of FIG. 1 in position for usage;

FIG. 3 is an end view in elevation of the structure of FIG. 1;

FIG. 4 is a fragmentary perspective view showing a modified form of the instant invention;

FIG. 5 is a perspective view of the structure of FIG. 4, inverted, and illustrating the manner of compressing the brush to provide more expulsion of cleansing substance;

FIG. 6 is a fragmentary perspective view of another modification of this invention illustrating a different manner of carrying the cleansing compound in the brush;

FIG. 7 is an enlarged fragmentary vertical sectional view through a brush illustrating a method of providing cuts in the scrubbing surface of a brush for heavy-duty work;

FIG. 8 is a fragmentary perspective view of another modification of the instant invention;

FIG. 9 is a perspective view of still a further modification of the instant invention;

FIG. 10 is a perspective view illustrating the cuts necessary for a heavy-duty brush; and

FIG. 11 shows a different shape of brush.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The instant invention is preferably made of a chemical foam, and while the desired rigidity and scrubbing texture may be obtained from such foams as the styrene, urethane and vinyl foams, among others, a highly satisfactory and proven brush embodying the instant invention is made from an expanded low density polyethylene foam. This foam is initially formed in a uniform block of material that is semi-rigid and provides excellent scrubbing surfaces especially when cuts are made in the surface of the material. Further, the preferred foam used with the instant invention is of a closed cell type so that the ultimate scrub brush will not function in the manner of a sponge, but, on the contrary, will maintain its shape during use, and the original integrity or texture and optimum feel of the scrubbing face or faces will remain constant throughout use.

The brush may be of any desired shape and it has been found that a brush in the form of a rectangular block is highly satisfactory. For most cases a brush approximately 2 inches wide, 3 inches long, and 1 inch in thickness is very easy to hold, highly effective in use, and amply sufficient for body cleansing purposes.

By way of example, the instant invention in all its various modifications will be herein described as made of expanded polyethylene foam of a weight between 2 and 3 pounds per cubic foot.

In FIGS. 1, 2 and 3, I have shown a form of the invention highly satisfactory for surgical usage, cosmetic usage, and bathing. This brush is illustrated in the form of a block 1 of polyethylene foam, which material when formed into a uniform piece has a grain as indicated at

2 in the illustrated instance, the grain runs lengthwise of the block. This grain while diagrammatically illustrated in FIG. 1 is not visible when a brush is cut from a slab of foam of indefinite width, but is visible if one side or face of the brush has contacted the form or mold during the making of the foam slab. The grain disposed as indicated in FIG. 1 renders the block 1 more compressible laterally than it is lengthwise. The upper face 3 of the block 1 is provided with a series of spaced cuts lengthwise of the block defining grooves 4, and a series of extremely fine cuts 5 crosswise of the block which, with the grooves 4 define polygonal projections 6, square in the illustrated instance. The underface 7 of the block is also provided with a series of spaced cuts running lengthwise of the block and defining grooves 8 between which are lengthwise extending ribs 9. The grooves 8 are filled with a cleaning substance 10 such as a soap or detergent in paste form which will emanate from the grooves during usage of the brush, and may be encouraged by compressing the brush laterally adjacent the top face thereof to expand the grooves 8 as shown in FIG. 5 illustrating the second embodiment of the invention. Since the cuts are provided in the foam block 1 after the foam has been formed uniformly throughout, the provision of the cuts will provide open cells in the foam along each of the opposed faces of the grooves, thereby increasing the holding capacity of the grooves for cleaning substance. This is desirable particularly in connection with brushes for surgical or bathing usage in order to provide the brushes with a life approaching 20 minutes. For surgical purposes the cleaning substance preferably contains an anti-bacterial element, while for cosmetic or bathing usage the cleaning substance may be provided with a pleasant odor, such substance varying in accordance with the individual task a brush is to perform.

The surface brush resistance, texture of the scrubbing faces and the optimum feel for the desired scrubbing surfaces are dependent upon and controlled by the depth of the grooves, the width of the grooves, the number of ribs or projections per inch in either direction, and the direction of the cut of the grooves in relation to the grain of the block. Consequently when a brush is made for a new task it is necessary to employ a somewhat cut-and-try method of determining these dimensions and directions of cut in order to provide a brush most effective for the particular task for which it is designed. For example, the brush illustrated in FIGS. 1, 2 and 3, when made for surgical purposes, may satisfactorily have the grooves 8 in the bottom face approximately three-eighths inch deep, the grooves 4 in the upper face approximately three-sixteenths inch deep, cross cuts 5 approximate five-sixteenths inch deep. The longitudinal grooves in the top and lower faces may be between one sixty-fourth and one thirty-second inch in width, while the lateral cuts 5 in the top face are so fine that as long as the brush is in its original condition and not bent longitudinally, the grooves made by these lateral cuts are virtually invisible.

Also, in the construction of the brush seen in FIGS. 1, 2 and 3, it will be noted that the longitudinal ribs 9 between the grooves in the underface of the block are of less width than are the projections 6 in the upper face of the block. This, along with the deeper cuts of the grooves renders the bottom ribs 9 less rigid than the

projections in the upper face of the block. Thus there is a distinct variance in the scrubbing surfaces which can be adopted at will during use of the brush. In the illustrated instance the bottom ribs may satisfactorily be seven forth-eighths inch in width while the widths of the projections 6 are approximately nine forty-eighths inch. It will further be noted that the marginal ribs 9a-9a on the bottom scrubbing surface 7 are wider than the ribs in between them, while the marginal projections 6a on the scrubbing face 3 of the block are wider than the intermediate rows of projections. This provides a stiffer or more rigid marginal region for the cleansing of finger nails by inserting the nail in the adjacent longitudinal groove.

It will be understood that with the embodiment of the instant invention above described, cleaning substance may be placed in any or all grooves in either of the scrubbing faces of the block 1 as may be deemed desirable or necessary, and the same is true with other embodiments of the invention to be later set forth herein.

In use, the instant invention is extremely simple and effective. The user need only wet his hands, the brush, or both, and proceed immediately with the scrubbing operation. Usually the side of the brush carrying the cleansing substance will be first applied to the skin, and then if desired, the brush may be reversed and the scrubbing surface that does not carry the soap may be utilized against the skin. In the instance of the above described embodiment, there will be a slight variation in the top scrubbing surface 3 depending upon which direction the brush is moved over the skin. Due to the grain in the block 1, the projections 6 and 6a are a trifle stiffer when the brush is moved longitudinally than the projections are when the brush is moved laterally. Vigorous scrubbing with the brush will cause some separation between the projections along the fine cross cuts 5, thereby exposing more scrubbing edges. The brush may be laterally compressed by the hands of the user if desired in order to encourage release of the cleaning substance, but regardless how vigorous the scrubbing or how the brush may be handled, it will always tend to assume its original shape when pressure is released. Consequently, the ribs and projections on the scrubbing faces will also retain their original degree of stiffness or rigidity because the liquid is surface-carried by the brush and not absorbed in the closed cells of the brush. After a relatively long scrubbing operation by a surgeon or the like, from 10 to 20 minutes, the brush may be discarded, it being sufficiently economical to warrant such. For the next scrubbing operation, a new sterilized brush is utilized. After each operation, the skin is thoroughly and effectively cleansed.

In FIGS. 4 and 5, I have illustrated a brush more desirable for the cleansing of a surface such as a countertop, a piece of furniture, a wall, or the like rather than body skin. This brush comprises a block 11 of the same material and nature as the block 1, and which is provided on one face with longitudinal and lateral grooves 12 and 13 respectively cut so as to define polygonal projections 14, square in the illustrated instance. With this arrangement a medium heavy brush may be provided by cutting both the longitudinal grooves 12 and the lateral grooves 13 to the same depth approximately one-eighth inch and a width of approxi-

mately one-sixteenth inch and spacing the grooves approximately one-fourth inch apart. The cleansing substance may be placed in any, all, or none of the grooves as may be desired. On the opposite face of the brush a lesser number of longitudinal grooves 15 are provided to permit the brush to be compressed laterally as shown in FIG. 5 to promote expulsion of cleansing substance from the grooves 12 and 13 if the same is used, or to expand the grooves 12 and vary the scrubbing surface. Deepening the grooves 12 and 13 to three-sixteenths inch provides a brush of lesser coarseness, and a further degree of softness may be obtained in the scrubbing surface by narrowing the widths of the grooves to approximately one thirty-second inch and deepening the grooves to approximately one-fourth inch.

In FIG. 6, I have illustrated substantially the same type of brush shown in FIG. 4, but have illustrated a different manner of carrying the cleansing substance within the brush. In this instance, one or more holes 16 may be drilled through the body of the block 11 either laterally or longitudinally thereof, and each hole filled with cleansing substance as indicated at 17. Squeezing of the brush will then expel the cleansing liquid at the ends of the brush. This method of carrying the cleansing liquid can, of course, be utilized with any embodiments of the instant invention. The hole through the brush is preferably in a solid portion of the brush below the depths of the grooves in either face of the brush.

In FIG. 7, I have illustrated a way of providing grooves in a coarse brush for scrubbing pots and pans, sinks, automobile tires, and other articles that will better stand up under such rough abusive. A brush block 18 is shown, and a groove is formed by pressing into the block 18 a hot wire 19 such as an electrical high resistance wire. This results in providing a somewhat skin effect as indicated at 20 on both sides of the groove leaving no open pores but stiffening the outer scrubbing edges of each projection or rib defined by the grooves.

In FIG. 8, I have illustrated a brush comprising a block 21 having a scrubbing surface thereon that is sufficiently soft for the bathing of an infant. This brush can be made by cutting longitudinal grooves 22 and lateral grooves 23 to provide projections 24, square in the illustrated instance, on the scrubbing face. The grooves could be three-sixteenths to one-fourth inch in depth, and of a width one thirty-second inch or less, defining approximately 6 projections per linear inch. A brush having a still softer scrubbing surface will be provided by further slightly narrowing the widths of the grooves and moving them closer together to provide approximately 8 projections per inch maintaining a depth of about one-fourth inch. Cleansing substance may be utilized in any of the grooves that may be desired.

In FIG. 9, I have illustrated a still different scrubbing surface on a brush comprising a block 25 having rectangular projections 26 defined by longitudinal grooves 27 and lateral grooves 28, one set of grooves being spaced farther apart than the other set, and one set of grooves being deeper than those of the other set. Such variations in the manner of cutting directly affects the flexibility of the projections in lateral and longitudinal directions on the brush, giving a difference in roughness depending upon whether the brush is moved

laterally or longitudinally over the surface being cleansed.

In FIG. 10, I have illustrated the formation of a stout heavy duty brush, desirable for the cleansing of a mechanic's hands and nails or for the cleansing of various articles. Such a brush may be provided from a block 29 having both longitudinal grooves 30 and lateral grooves 31 defining substantially square projections 32. Cutting both sets of grooves to a depth of substantially one-eighth inch and a width from one thirty-second to one-sixteenth inch so as to provide approximately 3 projections per linear inch results in a scrubbing surface that is highly durable and with a hard, coarse feel. Again, the texture of the scrubbing surface may be altered by deepening the grooves or by spacing them closer together.

In FIG. 11, I have illustrated a brush 33 merely to indicate that the brush need not necessarily be rectangular in shape but may be circular or various other shapes. In this instance a circular brush is provided with grooves 34 extending across the scrubbing surface and grooves 35 extending at right angles to the first set of grooves. The grooves may be spaced apart to provide projections 36 of any desirable size, and the grooves may be made shallow or deep to provide a scrubbing texture as desired. As in the case with the previous brushes, detergent may be supplied in as many or as much of each set of grooves as is desired. Such cleansing substance may be placed in grooves substantially over half the scrubbing surface leaving the other half of the surface clean if that renders the brush more suitable for the individual task it is to perform.

From the foregoing it is apparent that I have provided a disposable scrubbing brush that effectively maintains its shape and texture of the scrubbing surface throughout its use, and which may be simply made in any of a great variety of degrees of softness or coarseness, for anything from light duty such as bathing of a new born infant to heavy duty such as the cleansing of automobile tires and other relatively rough-surfaced objects. The brush can be provided with or without cleansing compound carried therein, opposed scrubbing surfaces of different texture and which may be provided in a sterile condition, sufficiently economical to warrant disposal of the brush after a single usage.

It will be understood that modifications and variations may be effected without departing from the spirit and scope of the novel concepts of the present invention.

I claim as my invention:

1. A disposable brush comprising:

an elongated semi-rigid chemical foam block; the foam of said block being of the closed cell type whereby the block will only adsorb and not absorb and therefore will retain its shape and texture throughout rough washings;

a series of longitudinal cuts in one face of said block defining spaced grooves and providing a good scrubbing surface;

and said foam block having a grain lengthwise of the block and said grooves extending generally parallel to said grain whereby the brush is more compressible in direction across the grain and grooves than with said grain and grooves.

2. A disposable brush according to claim 1, said grooves being separated by longitudinal ribs;

and the ribs along the longitudinal side margins of said face being wider and stiffer than the ribs between said side marginal ribs to facilitate scrubbing the fingernails.

3. A disposable brush comprising:

a semi-rigid chemical foam block;

the foam of said block being of the closed cell type whereby the block will only adsorb and not absorb and therefore will retain its shape and texture throughout rough washings;

a series of cuts in one face of said block defining spaced grooves and providing a good scrubbing surface;

a series of cuts in the opposite face of said block of different depth than those in said one face and defining grooves;

and a cleansing substance carried within a plurality of the deeper grooves.

4. A disposable brush according to claim 3:

said grooves being separated by longitudinal ribs;

and the outside ribs between the edge of the block and the next inside groove on said one face being wider than the other ribs to facilitate cleansing of

the nails.

5. A disposable brush comprising:

a semi-rigid chemical foam block;

the foam of said block being of the closed cell type whereby the block will only adsorb but not absorb and therefore will retain its shape and texture throughout rough washings;

a series of cuts in one face of said block defining spaced grooves;

a second series of cuts in said face running at an angle to said first series of cuts, thereby defining rows of polygonal projections between the grooves each having a plurality of scrubbing edges on the outer end thereof; a series of cuts in the opposite face of said block defining spaced grooves separated by longitudinal ribs;

and a cleansing medium in certain of said grooves.

6. The brush of claim 5, wherein the outside ribs between the edge of the block and the next inside groove in said opposite face are wider than the other ribs to facilitate cleansing of the nails.

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