

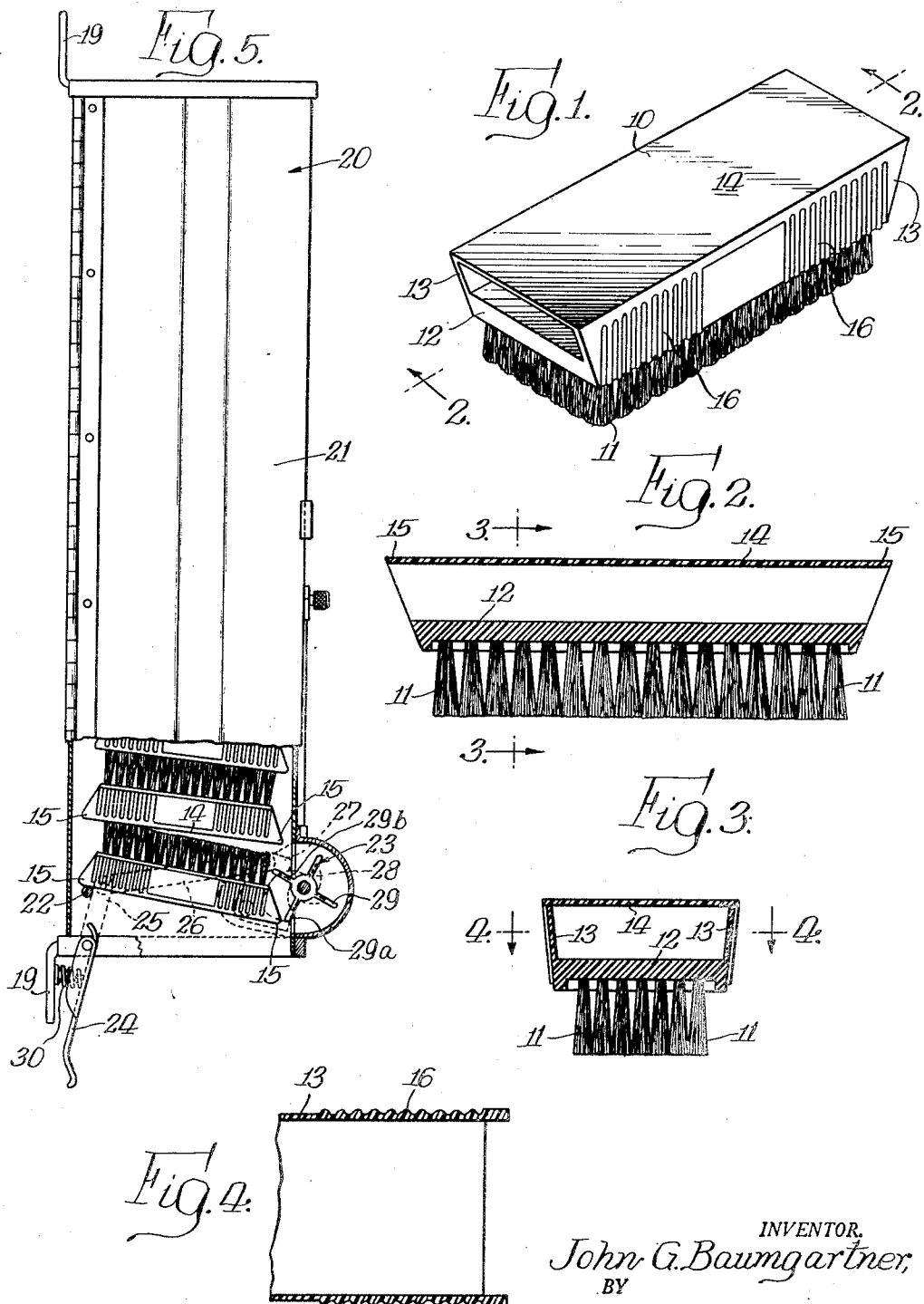
March 27, 1951

J. G. BAUMGARTNER

2,546,291

SURGICAL HAND BRUSH

Filed May 9, 1947



INVENTOR.
John G. Baumgartner,
BY
Loorman L. Mueller
Att'y.

UNITED STATES PATENT OFFICE

2,546,291

SURGICAL HAND BRUSH

John G. Baumgartner, Oswego, Ill.

Application May 9, 1947, Serial No. 747,004

2 Claims. (Cl. 15-160)

1

This invention relates generally to brushes and more particularly to a surgical hand brush as used by a physician for sterilizing his hands.

It has been common practice in hospitals and doctors' and dentists' offices to provide surgical hand brushes to be used by physicians or surgeons for sterilizing their hands as required for professional practice. Such brushes have generally included a wooden back in which the bristles are set which is of a size to be comfortably held in the hand of the user. For convenient handling of such brushes dispensers have been provided in which the brushes are placed and the dispenser and brushes are all placed in the sterilizer where they are treated at a high temperature which may be of the order of 300° F. The dispenser is then taken out of the sterilizer and hung on a wall or placed on some suitable support where the brushes are readily available when it is desired to use one for scrubbing the hands of a physician or the like.

As stated above, such brushes have generally had backs made of wood, and it has been found that after the wood back brushes have been placed in the sterilizer a few times the backs go to pieces and the brush must be replaced by a new one. Attempts have been made to find a material for making the backs for these brushes which can be subjected to the sterilizing temperature of 300° F. without being substantially affected, but these attempts have been unsuccessful. Although plastic materials have been suggested, relatively few plastic materials are available which will stand the 300° F. sterilization temperature without softening and these materials are relatively expensive. Further it is difficult to mold a heavy or thick back for a brush such as has been heretofore provided as it is difficult to mold a member having a thickness greater than $\frac{1}{4}$ of an inch. The size of the back of the brush is important in the present case, both in order to provide a back which can be easily gripped in the hand, and also because the dispensing machines now used have a release mechanism arranged to operate on the backs of the brushes. Therefore, to permit use of these standard dispensing machines, the brushes must be provided with a back of substantially the same shape as the brushes now used.

It is, therefore, an object of the present invention to provide an improved surgical hand brush having a back of such size and shape to be easily gripped by the hand of the user and to fit in standard dispensers.

It is a further object of this invention to pro-

2

vide an inexpensive surgical hand brush having a back made of material which is not harmed when subjected to high temperatures as required for sterilizing the brush.

A feature of this invention is the provision of a surgical hand brush having a light weight hollow handle of such size to be conveniently held in the hand of the user and of the proper size to be handled by the standard dispensing machines.

A further feature of this invention is the provision of a surgical hand brush having a back portion molded of plastic material which is hollow so that the walls thereof are relatively thin and can be easily molded and a relatively small amount of material is required.

A still further feature of this invention is the provision of a surgical hand brush having a plastic back and bristles made of synthetic fibers which will withstand temperatures of 300° F. and higher so that the brush can be sterilized without harmfully affecting the same.

Further objects, features and advantages of the present invention will be apparent from a consideration of the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a perspective view of a surgical hand brush in accordance with the invention;

Fig. 2 is a cross-sectional view along the lines 2-2 of Fig. 1;

Fig. 3 is a cross-sectional view along the lines 3-3 of Fig. 2;

Fig. 4 is a fragmentary cross-sectional view along the lines 4-4 of Fig. 3; and

Fig. 5 is a side view of a dispenser for surgical brushes with a portion of the side broken away to show the manner in which the brushes are held in the dispenser.

In practicing the invention there is provided a small hand brush having a back molded of thermoplastic material with bristles made of suitable material such as a synthetic fiber secured thereto. The back is of a rectangular channel-shaped configuration having a relatively thick bottom wall in which the bristles are set and top and side walls which are relatively thin, being thick enough to provide a sturdy back for a brush. The top wall of the brush back is slightly longer than the bottom wall to provide extending corners adapted to be engaged by the holding mechanism in the dispensing machines. The side walls are provided with ribs to facilitate holding the back of the brush in the hand of the user.

3

Referring now to the drawings, in Fig. 1 there is illustrated the surgical hand brush in accordance with the invention having a back 10 and bristle tufts 11 including bristles made of synthetic fiber or the like. The back is hollow and includes a bottom wall 12 in which the bristle tufts 11 are set, side walls 13 and a top wall 14. As is apparent from Fig. 3 the bottom wall is substantially thicker than the top and side walls this being necessary to provide a firm mounting for the bristle tufts. In a brush of standard size in which the over-all length is somewhat greater than four inches, the bottom wall may be substantially less than $\frac{1}{4}$ of an inch thick so that the back can be easily molded from thermoplastic material. The back is molded from a thermoplastic material which is not deleteriously affected by temperatures of the order of 300° F. so that it will not be harmed when the brush is sterilized. Although thermoplastic materials having this characteristic are relatively expensive, only a small amount of material is required due to the hollow or channel-shaped configuration. As is apparent in Fig. 2, the top wall 14 extends on either end beyond the bottom wall 12 providing corners 15 for a purpose to be further explained. To facilitate holding the brush in the hand of the person using the same, ribs 16 are provided on the sides 13 which make it easier for the person using the brush to grip the brush securely in his fingers so that it will not be dropped while he is using it to scrub and sterilize his hands. Fig. 4 illustrates more in detail the configuration of the ribs 16.

As previously stated, surgical hand brushes must be sterilized before being used and to do this easily, dispensers are provided such as that shown in Fig. 5. The brushes are loaded in the dispenser and then the dispenser and brushes are placed in a sterilizer in which the entire mechanism and brushes are sterilized. The dispenser may then be supported on a wall or other suitable support so that it is convenient for a person desiring to use a brush to obtain a brush therefrom. The brush is then used for applying liquid soap or other antiseptic for sterilizing the hands of a surgeon or other person engaged in the medical profession. Referring now more particularly to Fig. 5, the dispenser 20 includes projecting portions 19 at the top and bottom to facilitate mounting the dispenser on a wall. The dispenser has a hinged side 21 (shown partly broken away) which is adapted to be opened to permit placing the brushes therein prior to being sterilized. The brushes are stacked one on top of the other in the dispenser with the back of the bottom brush resting on rod 22 at one end and on a rotatable dropping mechanism 23 at the other end. The dropping mechanism is in the shape of a paddle wheel having a plurality of angularly spaced projections or paddles 29. For rotating the paddle wheel, an arm 24 is provided on the dispenser which includes an extension 25 arranged to operate the dropping mechanism. The extension 25 is connected through linkage 26 to a pawl 27 which engages a tooth wheel 28 supported on the same shaft as the dropping mechanism 23. A spring 30 is provided between the arm 24 and the projecting portion 19 to hold the arm 24 in a normal position. When it is desired to obtain a brush from the dispenser, the arm 24 is pushed against the spring and the movement thereof is transmitted to the ratchet mechanism causing the dropping mechanism to be turned in a counter-clockwise direction so that the paddle 29a on the

4

dropping mechanism moves downwardly releasing the corner 15 of the back 10 of the brush. This allows the bottom brush to drop out and the next brush to drop down to a position where the corners 15 thereof engage the rod 22 and the next paddle 29b of the dropping mechanism. This brush now is in a position to be dropped when the arm 24 is again operated.

The dispenser 20 is not a part of the present invention and is shown merely to point out the specific requirements which the back of a brush must meet in order for the brush to be suitable for use in such dispensers. It is apparent that the top of the brush 14 must be of sufficient length to be engaged by the rod 22 and the dropping mechanism 23 of the dispenser. By providing a top portion 14 slightly longer than the brush proper, corners 15 are provided which engage the rod and paddles and the likelihood of the brush jamming in the dispenser is considerably reduced. Further, it is apparent from Fig. 5 that the top surface of the brush back must be flat as the brushes are stacked in the dispenser on top of each other and each brush is supported on the bristles of the brush underneath it. In order to prevent deformation of the bristles of the brushes the weight of the brushes must be uniformly distributed thereon and this requires that the top of the brush back be flat so that the weight of the brush is substantially uniformly distributed among the bristles of the brush below. This tends to prevent deformation and matting of the bristles which would render the brush unsatisfactory for use.

It is apparent that a brush having a plastic back in accordance with the invention is much neater in appearance and much more easily cleaned than the prior wooden brushes. The hollow configuration provides a very light brush and one which is of suitable size to be easily gripped in the hand. By using a hollow back construction a relatively small amount of plastic material is required to provide a back which is sufficiently large both for convenient use and for handling in standard dispensing machines. A back of this configuration is also much easier to mold than would be a solid back of adequate size to be held in the hand. The feature of the brush which is most material with respect to cost, however, is the ability of the brush to withstand the high temperatures used in sterilization without being deleteriously affected thereby. Both the plastic back and the synthetic fiber bristles are substantially unaffected by temperatures of the order of 300° F. as used in sterilizing surgical brushes and other surgical instruments. Therefore, the life of the brush is many times more than that of a wooden brush so that the over-all cost is much less than that of present brushes having wood backs.

Although I have described one embodiment of my invention it is apparent that various changes and modifications can be made therein without departing from the intended scope of the invention as defined in the appended claims.

I claim:

1. A hand brush comprising a one-piece plastic back which is substantially oblong in outside configuration and having four relatively thin walls, with opposite walls thereof spaced apart from one another and providing therebetween a hollow bore open at each end and extending longitudinally of the long dimension of said back, bristles secured in one of said walls, two of the remaining said walls being integral with said bristle-carrying wall and oppositely disposed

5

from one another, and serving as hand holds for holding the brush in the hand, and the fourth of said walls spaced from said bristle-carrying wall and integral with each of said two hand-hold walls to complete the four-wall-hollow-bore plastic back.

2. In a hand brush as defined in claim 1 where-in the bristle-carrying wall is of lesser length in the longitudinal long dimension of the brush back than said fourth of said walls to provide an angular configuration for said back at each of the open ends of said hollow bore.

JOHN G. BAUMGARTNER.

6

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,398,864	Kelly -----	Nov. 29, 1921
1,847,668	Reh -----	Mar. 1, 1932
2,097,461	Johnson -----	Nov. 2, 1937
2,303,800	Swann -----	Dec. 1, 1942
2,326,811	Wiggam -----	Aug. 17, 1943

FOREIGN PATENTS

Number	Country	Date
535,671	Great Britain -----	Apr. 17, 1941