Dec. 2, 1941. E. P. CRESSLER ET AL 2,265,102

TOOTHBRUSH

Filed May 21, 1940

Fig. 1.

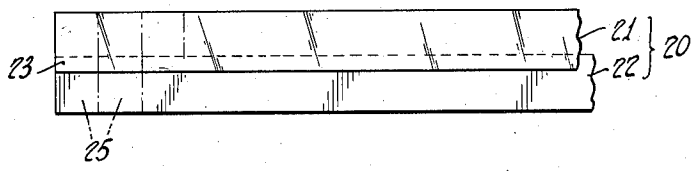


Fig. 2.

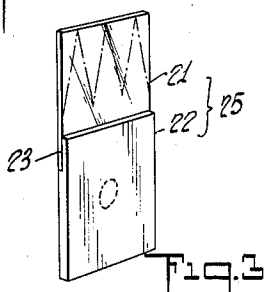


Fig. 3.

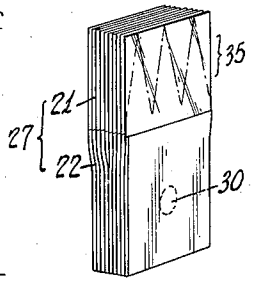


Fig. 4.

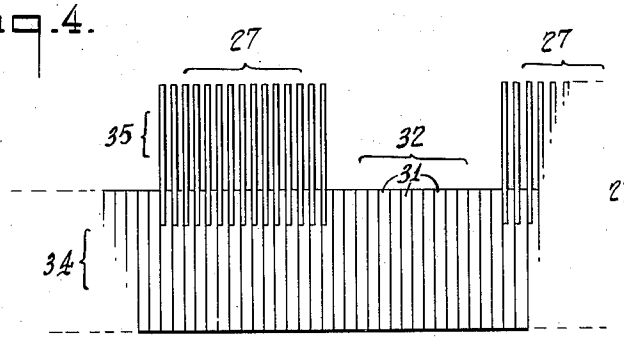


Fig. 5.

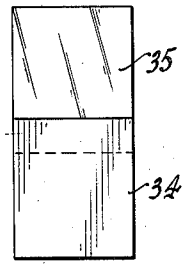


Fig. 6.

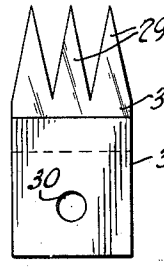


Fig. 7.

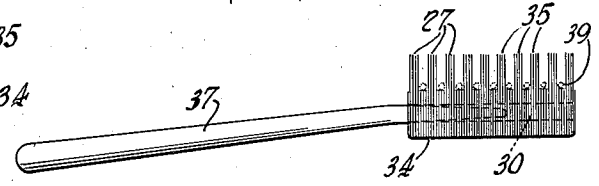


Fig. 8.



Fig. 9.

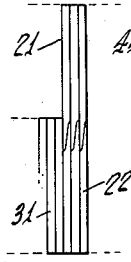


Fig. 10.



Fig. 11.

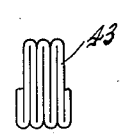


Fig. 13.

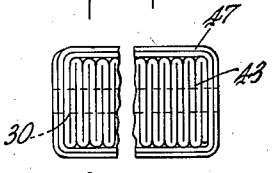
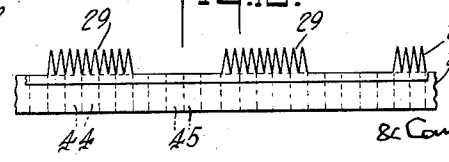


Fig. 12.



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UNITED STATES PATENT OFFICE

2,265,102

TOOTHBRUSH

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Application May 21, 1940, Serial No. 336,318

3 Claims. (Cl. 15—167)

This invention relates to toothbrushes and more particularly it comprises an improved brush, with handle carrying a head of sanitary character.

The conventional toothbrush, having a construction of bristles embedded in a head at the end of the handle is relatively costly to manufacture, and the general object of the present invention is to afford a construction of toothbrush of exceedingly cheap manufacturing cost, such indeed that each brush may be discarded after each use. By this improvement the best sanitary conditions are assured since there are obviated the dangers from the lodging or accumulation of decayed particles or disease germs in a brush which is to be used repeatedly, which notoriously has an adverse influence in counteracting somewhat the desired cleansing action. The product hereof is necessarily surgically clean, and may be supplied in individual wrappers to keep it so.

With the usual kinds of toothbrush hog bristles have been the prevailing ones used, and these tend to become brittle in use; and it is known that fragments of bristle have been the cause of appendicitis, having been found in the appendix after operation; and it is one object hereof to avoid this objection.

The nearest prior construction known to us is the toothbrush disclosed in the patent of Cressler No. 1,725,852, of August 27, 1929; but the article illustrated in said patent does not attain the desired objects to a sufficiently desirable extent, especially since the mode of manufacture and the resulting product are insufficiently low in manufacturing cost to render it practical to sell the article with the expectation of its being discarded after a single use.

A particular object of the present invention therefore is to provide a novel construction of cleaning or toothbrush which will attain the advantages mentioned and overcome the objections to the article of said prior patent. Another object is to provide a construction of toothbrush which tends to disintegrate after a single wetting and use, in other words the head will soften and become objectionable to use, and may loosen to such extent that the bristles or prongs will not hold their position. Thereby repeated unsanitary use of the brush is guarded against.

Another object is to afford a single-use toothbrush which resembles the conventional article, feels like it on the teeth, is equally efficient or more so, and is free from the objection of breaking of bristles or their coming out of place.

An advantage of the present brush is that it may be marketed with a suitable amount of cleansing material or powder applied between its bristles or in a recess, so that a traveler or hotel guest can be accommodated to his maximum convenience.

Further objects and advantages of the present improvement will be explained in the hereinafter following description of certain illustrative embodiments thereof or will be manifest to those conversant with the subject. To the attainment of such objects and advantages the present invention consists in the novel cleaning brush, the novel structural features thereof, and its method of manufacture, and the principles thereof, herein illustrated or described.

In the accompanying drawing are shown, more or less diagrammatically, and with some exaggeration of dimensions, not only the cleaning brush or product, but the steps constituting the preferred method of manufacture thereof. Thus Fig. 1 indicates the character of the structural material, in the first step of production, showing a continuous strip of the combination of bristle or prong material and head material, broken lines indicating how this continuous material may be formed or severed into small or separate units.

Fig. 2, on a larger scale, shows in perspective a bristled unit, that is, an individual brush component comprising a portion of the head material combined with a portion of the bristle material.

Fig. 3 is a similar perspective view showing how a considerable number of the bristle units may be combined into a bristled or pronged group to be embodied in the final product or brush.

Fig. 4 is a side elevation view, with exaggeration of relative longitudinal dimensions, showing the preferred make-up of the product or brush from a series of bristled groups such as that shown in Fig. 3 alternated with a series of non-bristled or unpronged groups, separators or fillers, composed of the head material; for example there may be ten bristled groups separated by nine filler groups in the complete assemblage.

Fig. 5 is an end elevation view of the complete assemblage indicated in Fig. 4.

Fig. 6 is a view similar to Fig. 5, showing a later stage, wherein the bristle or prong portions have been cut into the shape of prongs or pointed bristles, while the head portion has been bored to receive a handle; although these steps could be previously performed, on the separate groups, as shown dotted in Fig. 3.

Fig. 7 is a side elevation view on a smaller scale, corresponding to the scale of Fig. 1, showing the completed assemblage of head with

bristles and handle, constituting an illustrative product embodying the invention.

Fig. 8, in side elevation view, shows a modified construction of bristled unit differing from that of Fig. 2.

Fig. 9, in similar view, shows another modification of the unit of Fig. 2, with several such units assembled.

Figs. 10, 11 and 12 refer to a modification in the mode of manufacture, Fig. 10 being a top view of a continuous strip such as that of Fig. 1 disposed or bent to form a head with bristles, without severing; Fig. 11 indicating the same with the interconnected units pressed into final contacting position; while Fig. 12, in a view similar to Fig. 1, shows a continuous strip modified for use according to Figs. 10 and 11, to provide alternated bristled and non-bristled groups.

Fig. 13 shows in top view a modified construction with principles of uniting the assembly which may be applied to any of the other disclosures.

The present improvement as a product may be generally described as consisting of a cleaning brush which consists of a laminated structure of combined head portion and prong portion, with preferably a handle; the prong portion consisting of a water-resistant plastic sheet material of sufficiently stiff resilience for brushing purposes, such as Pliofilm, Cellophane or Nylon; the head portion consisting of a built-up assembly of units of suitable sheet material secured together to constitute the head of the brush, and the prong portion being interconnected with and held by the head portion and being cut or shaped into upstanding prongs of the plastic sheet material. The head material might be the same as the prong or bristle material, but preferably is of water absorbent sheet material such as paper or fabric of sufficient initial stiffness to which, in the process of manufacture, the prong material is secured before the materials are assembled into the product or brush. Preferably also the prong portion provides a series of closely positioned groups of upstanding prongs with separations or fillers between groups for greater efficiency in the brushing action.

The further characteristics of said product and the preferred method of manufacturing the same are illustrated in the accompanying drawing, the disclosures of which are described as follows.

A cheap mode of manufacture may commence by the formation of a continuous strip 20 of the bristle or prong material 21 and the head material 22. These are shown as slightly overlapping at 23 where they may be interconnected by adhesive, or in the case of Pliofilm and other materials by merely pressing under heat.

The prong material or strip 21 may be composed of any plastic sheet material which is resilient but sufficiently stiff for cleaning purposes and is water-resistant. Pliofilm, a typical example, is disclosed in United States Patent No. 1,989,632 among others, and this is suitable for the prongs or bristles, being stiff enough, especially in groups, to serve the function of toothbrush bristles, and not softening when wetted. The character of this material should be heavy enough for the purpose, and the more of the prongs in a group the less heavy the material needs to be.

The head strip 22 is also composed of sheet material. It might be of the same material as the prong strip 21, but for cheapness and other reasons it is preferably a water-absorbent material such as paper, initially stiff but adapted on thorough wetting to disintegrate. This paper may be of similar thickness to the bristle material, being shown in Fig. 2 as of twice the thickness.

A preferred material for the head strip 22 is a soft or limp paper or thin fabric which is initially stiffened by starch or similar stiffening agent, so that the brush as a whole is initially stiff but tends to soften and disintegrate within a period of a few minutes after wetting, thus preventing unsanitary reuse of the brush. The head is thus initially stable and rigid, but being water receptive goes to pieces with the first use.

In one form of brush the composite strip 20 is cut into short sections or units 25, indicated in dotted lines in Fig. 1 and shown separately in Fig. 2; although as will be explained in connection with Figs. 10 to 12 a similar product can be produced by bending or folding instead of cutting. As shown in Fig. 3 the next step is the gathering together of a number of the pronged units 25 to form a group 27, for example there may be fifteen units to the group. The upper or prong portion of this group may next be cut into the form of prongs 29, two or three in number, indicated only in dotted lines in Fig. 3, but shown in final form in Fig. 6. A handle receiving hole 30 may be produced in the head portion of each group as also shown in dotted lines in Fig. 3 and in full lines in Fig. 6. In each of the pronged groups 27 the head units 22 may be attached to each other by paste or other adhesive, or may be circumferentially bound as will be furthed described.

Fig. 4 shows with longitudinal exaggeration of dimension the preferred mode of building up the laminated structure of head and prongs. Each group 27 is shown as comprising fifteen pronged units, although there might be more or less. In order to avoid a continuous structure of bristles the pronged groups 27 are separated by spacing or filling means, such as a number of unpronged units 31 composed of the material or paper 22 and assembled into a group 32. A satisfactory brush can be built up by alternating ten of the prong unit groups with nine of the unpronged unit groups. The head 34 of the brush is composed of all of the paper units, with or without prongs, and at the designated points are groups 35 of upstanding prongs. When allowance is made for the exaggerated dimensions, the proportions become suitable for the conventional size of toothbrush head.

A toothbrush made up as so far described is represented in end view by Fig. 5, while Fig. 6 shows the same view after the material 21 has been cut into prongs 29 and a handle hole 30 has been formed, which may be done at this stage, or previously as suggested in Fig. 3. Fig. 7 shows a handle 37 inserted in the handle hole 30, thus completing the toothbrush, it being understood that the pronged head may be removed and discarded and a fresh one applied to the same handle for new use.

By the system thus described it is feasible to include and sell a portion of tooth powder embodied in each brush. It might be placed loosely in the handle hole 30, for example in the form of a round bar, turning into a powder when placed upon the tongue; or several small bars 39 of tooth powder may be placed between the prong groups 35 as indicated on Fig. 7.

Referring further to certain details, the plastic film 21 may be attached by heat or adhesive to the strip 22 under high pressure so that the former is forced into the latter, indenting it as indicated in Figs. 2 and 4. This tends to leave a slight thickening at the overlap 23, but by ex-

cessive pressure the thickening can be obviated and a better final product afforded in the manner shown in Fig. 9. Another way of combining the component strips is as shown in Fig. 8, where a wide paper strip **41** is refolded, with one edge overlapping the other, forming a natural recess in which the plastic strip is received. In all embodiments the entire series of head units, of paper, cloth or other material, are to be attached by adhesive or equivalently under pressure so that the brush head as a whole is rigid. The same result may be obtained by a circumferential band as shown in Fig. 13. While the head is a rigid laminated body, the upstanding prongs are free or bendable, and preferably pointed, and being in small groups are well adapted for thorough cleansing purposes, better than an arrangement without gaps.

Referring to the modification of Figs. 10 to 12, instead of producing separate pronged units **25** as indicated in Fig. 2, the dotted lines in Fig. 1 may represent folds or creases, and the continuous material may be folded back and forth, in zigzag manner, as indicated by the zigzag strip **43** in Fig. 10. Each pronged unit **44** or unpronged unit **45** may be made in this manner, being bent and then compressed as indicated in Fig. 11. Instead of making the two kinds of groups separately and assembling them, the entire series of pronged and unpronged groups may be made from a single continuous strip, formed in the manner shown in Fig. 12, the plastic strip portion **21** being formed with alternate lengths having tongues and having no tongues; so that when bent, folded and compressed as in Figs. 10 and 11 the product will be afforded substantially like that shown in Figs. 4 to 7.

In the modification shown in Fig. 13 the material is bent back and forth, similarly to that in Figs 10 to 12, but the last of the bent units is in this case extended as a surrounding binder or strip **47** carried for example twice around the entire assembly, all under pressure, so that the head and prongs are produced and combined without the need of adhesive between units.

The handle hole **30** may be a cylindrical bore carried through from end to end, as shown in Figs. 7 and 13. It may contain powder and be plugged. On emptying it the handle may be applied at either end.

A modification of brush structure within the principles of the invention comprises a series of pronged groups alternated with fillers or unpronged groups to produce gaps; each pronged group constituted of a single piece of sheet strip wound spirally and flattened by compression and then cut to form the prongs; each filler being preferably a similar flat spiral of either the same or different sheet material; for example the entirety being made from sheet plastic which under heat and longitudinal can consolidate into a unitary brush head with upstanding prongs or tongues serving as bristles.

The cutting of the prongs or tongues **29** and the handle hole **30** may be done at any convenient stage; for example in the original strip **21—22** as shown in Fig. 12, or in severed units **25** as shown in dotted lines in Fig. 2, or in pronged groups **27** as shown in dotted lines in Fig. 3, or in the completely assembled head as shown in Fig. 6.

Having thus described a cleaning brush embodying the structural features hereof both generally and in their preferred embodiment, as well as the preferred method of manufacture or product thereof, it is to be understood that the invention is not intended to be limited to the disclosed matters of construction and method except to the extent set forth in the appended claims.

What is claimed is:

1. A toothbrush having a head composed of laminated sheet material of water-receptive character and exposed to wetting in use thereby to disintegrate soon upon saturation with water, combined with a system of tongues or upstanding prongs composed of a water-repellant sheet material of resilient stiffness to serve as bristles, such tongues being anchored in the head by interconnection with the two different sheet material components.

2. A toothbrush as in claim 1 and wherein the laminated sheet material comprised in the head is a normally limp material or paper rendered initially stiff by a water-vulnerable adhesive or starch that assists rigidifying the head before wetting.

3. A toothbrush head having a body portion including a material of water-absorptive character adapted quickly to disintegrate upon saturation with water when put in use, said body portion being provided with spaced groups of upstanding prongs formed of a water-repellant sheet material of such resilient stiffness as to serve as bristles, with the water-repellant material of the prongs extending down into the body of the head and there anchored and held by the disintegrable body material until released by wetting and disintegration of the body.

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