June 12, 1934. F. J. BICKEL 1,963,044

BRUSH

Filed Sept. 18, 1930

Fig. 1

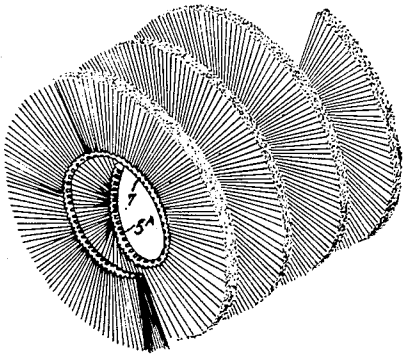


Fig. 5

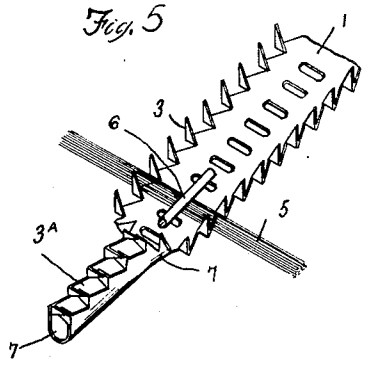


Fig. 2

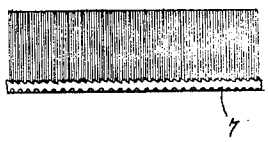


Fig. 6



Fig. 7

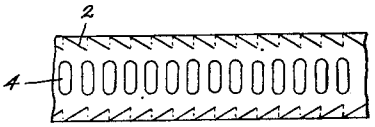
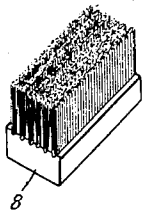


Fig. 4



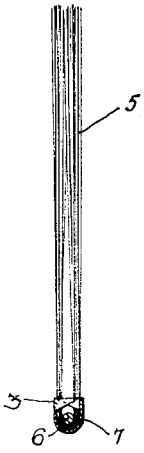
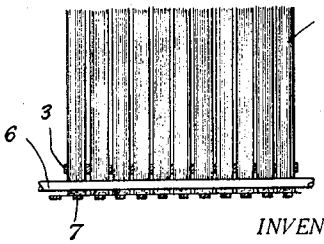


Fig. 3

Fig. 8



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Patented June 12, 1934 1,963,044

UNITED STATES PATENT OFFICE

1,963,044

BRUSH

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Application September 18, 1930, Serial No. 482,790

7 Claims. (Cl. 15—182)

This invention relates to brushes and a method of manufacturing the same and aims to provide a brush element that can be manufactured as a continuous strip of any length, self-supporting at least to the extent that it can be handled without any outside supporting means during further manufacturing or assembling steps, capable of being stored or transported in strip form as a completed article, and capable of being cut and shaped as desired at any time after making.

Further aims and objects of the invention will be apparent from the following description and accompanying drawing, which is illustrative of, but not limiting upon, the strip, the method of making the same, and some characteristic uses to which it may be put.

In the drawing, Fig. 1 illustrates in perspective section of the completed continuous brush strip which has been conveniently formed in a spiral; Fig. 2 is a side elevation of a short straight completed strip; Fig. 3 is a section on the line 3—3 of Fig. 8, but on a larger scale; Fig. 4 is a perspective view of a brush assembly using straight strips as shown in Fig. 2; Fig. 5 shows in perspective certain of the manufacturing steps; Fig. 6 is a side elevation of a brush assembly made from a spiral strip such as shown in Fig. 1; Fig. 7 shows in plan the formation of the backing strip; and Fig. 8 is a central longitudinal section through Fig. 3, but showing the core wire in elevation.

My improved brush strip may conveniently be formed by taking a strip 1 of metal, or other material having appropriate characteristics, and slitting one or both edges diagonally inward for a suitable distance, as indicated at 2, Fig. 7, then bending up the tongues so formed into teeth 3, Fig. 5. To prevent buckling of the strip 1 in the subsequent longitudinal bending, and reduce its stiffness, transverse slots 4 may be cut. Bunches 5 of bristles of any suitable material, such as animal or vegetable fiber, or wire, are laid across the strip 1 between successive teeth, and a wire 6 laid over the bristles. This is best shown in Fig. 5, where for the sake of clearness only a single bunch of bristles and a short length of the wire 6 are illustrated.

The strip 1 is next bent up at the sides into a channel, as indicated at 7, Fig. 5, thus bending the bristles upon the wire and clamping wire and bristles in place, Figs. 3 and 8. The application of the channel bend brings the teeth 3 into inward overlapping relation, forming pockets 3A wherein each bristle tuft is secured in an upright position relative to the channel 7 and wire 6, and held against slippage along the channel.

The teeth 3 are of particular value where rather light bristles are employed, or where the tufts are thin. By varying the length of the pockets 3A (which of course is determined by the distance apart of the teeth), and also by varying the number of bristles in a tuft, the tuft stiffness may be governed, within the limits of stiffness or flexibility of the bristle material. Thus thin tufts in long pockets will tend to fall into the tangential position shown at 5A, Fig. 1, which is useful for certain classes of work, whereas stiffer bristles and thicker tufts will stand upright, or normal to the backing 7. Ordinarily the tuft thickness and pocket depth will be such as to keep the tufts normal to the backing.

It will be understood that the process of assembling and forming the brush strip will ordinarily be a continuous one. It is within the purview of the invention to make up the formed brush strip in indefinite lengths, so that it can be stored, shipped or otherwise handled in large coils or other suitable arrangement, and cut off as needed.

As the brush strip is formed it may conveniently be disposed in a spiral, as in Fig. 1, and is self-supporting and somewhat flexible. It is not, however, the usual practice to make the backing 7 heavy enough to support the assembled brush in operation. The brush strip, as shown in Fig. 1 or Fig. 2, may be stored for a short or an indefinitely long time, shipped, sold as an article of merchandise, and otherwise disposed of. Ordinarily it will be further assembled for commercial use by placing as many turns of a spiral as desired on a mandrel to make a rotary brush, as in Fig. 6, or short lengths may be cut off, straightened and mounted, as shown in Fig. 4, which is a somewhat diagrammatic illustration of a non-rotary brush.

Such assemblies as Fig. 4 and Fig. 6 differ from known types of brushes in that it is not necessary to assemble the bristles directly upon the ultimate support, such as the brush back 8 of Fig. 4 or the mandrel of Fig. 6, but it is only necessary to fasten the pre-formed strips thereon. In certain of the claims a distinction is made between the longitudinal and the transverse direction of the backing 7. The longitudinal direction is that parallel to the wire 6, and the transverse direction is transverse thereto. Consequently, the transverse direction is parallel to the axis of the helical coil, Fig. 1 and likewise parallel to the axis of the mandrel, Fig. 6.

It will be understood that my invention is not limited to the precise forms and methods herein shown and described, but is susceptible of various changes and modifications within the scope of the appended claims.

I claim:

1. A brush element comprising a channel, flat inwardly-projecting overlapping teeth having their faces transversely disposed on the edges of said channel, a wire disposed within said channel and lengthwise thereof, and bristles held in said channel beneath said wire.

2. A brush element comprising a channel, flat inwardly-projecting teeth transversely disposed on the edges of said channel, a wire disposed within said channel and lengthwise thereof, and tufts of bristles held folded upon said wire by said channel, said teeth lying in planes parallel to said tufts.

3. A brush element comprising a strip of stiff material forming a channel, means relieving said stiffness disposed centrally of said strip, inwardly-projecting flat teeth transversely disposed on the edges of said channel, a wire disposed within said channel and lengthwise thereof, and a plurality of tufts of bristles held folded upon said wire by said channel, said tufts being defined by said teeth.

4. A brush composed of a plurality of rows of tufts of bristles, each of said rows being independently supported in a self-sustaining backing member, said backing member comprising a U-shaped channel of stiff material having inturned flat teeth with faces laterally disposed to said channel between and parallel to said tufts, and a wire above the bases of said tufts and beneath said teeth.

5. A brush composed of bristle strip material disposed around a cylindrical support, said strip being formed of successive tufts of bristles, a metal channel having inturned flat teeth with faces laterally disposed to said channel between and parallel to said tufts, and a wire above the bases of said tufts and beneath said teeth.

6. A brush element comprising a channel of thin flat material, inwardly projecting integral teeth on the channel edges having their faces transverse to said channel, a wire disposed lengthwise of said channel and beneath said teeth, and bunches of bristles held in said channel between successive teeth and beneath said wire.

7. A brush element comprising, in combination, a channel, a wire disposed along and within said channel, and bristles held under said wire in said channel, said channel comprising a strip having teeth on its edge fixed to the channel at their base by a bend on a line transverse to the strip.

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