

April 21, 1964

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3,129,448

BRUSH FOR FABRIC AND THE LIKE

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Fig. 1.

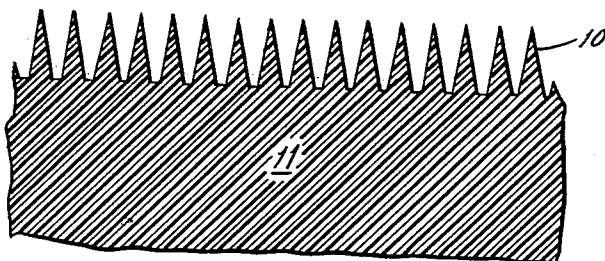


Fig. 2.

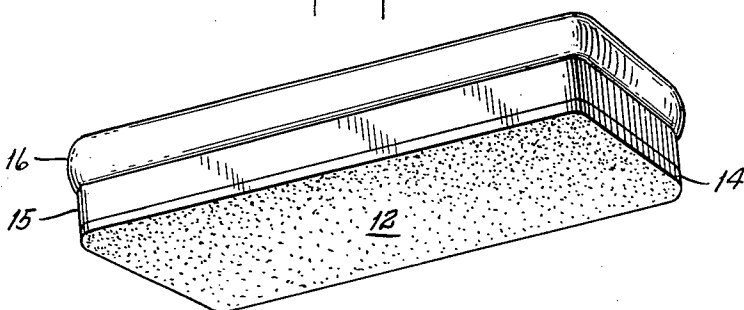
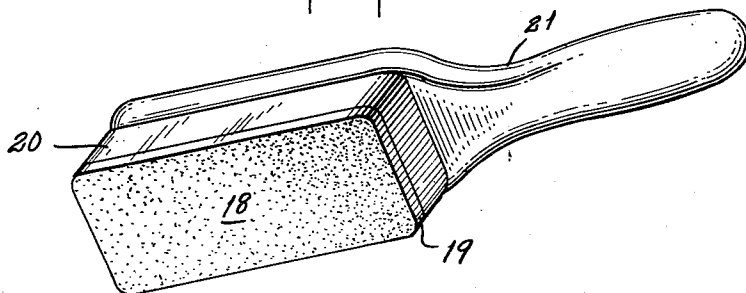


Fig. 3.



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BRUSH FOR FABRIC AND THE LIKE

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5 Claims. (Cl. 15—1.5)

This invention relates to means for removing adherent, extraneous solid materials, such as dust, dirt, lint and the like from the surface of fabrics, suede-like materials etc. More particularly, this invention relates to the removal of dust, dirt, lint and the like entrapped or clinging to or mechanically held within the interstices of or by the fibrils of fabrics, such as velvet fabrics, natural suede materials and the like.

It has been a practice heretofore when it is desired to remove dirt, dust, lint and the like from the surface of fabrics to brush the surface to be cleaned with a fiber brush. It has also been a practice heretofore to clean suede material by brushing the surface thereof with a fine wire brush to freshen and abrade the surface of the suede material to remove any surface adhering dirt therefrom. Continued use of a wire brush to clean suede material relatively soon results in the wearing away of the suede material to expose the less attractive underlying material.

It is particularly difficult with an ordinary brush to remove dirt, dust and lint and the like from a tightly woven or closely knitted fabric or from suede-like material. The fibers of the brush fail to reach into the smaller interstices to mechanically dislodge or remove the dirt, dust and lint particles therefrom.

It is an object of this invention to provide a brushing surface and means employing the same for the removal of dirt, dust and lint and the like from fabrics and suede-like materials.

It is another object of this invention to provide an improved means for the removal of dirt, dust and lint and the like from natural suede or simulated suede materials.

Still another object of this invention is to provide a brush or brushing surface particularly suitable for removing dirt, dust and lint and the like entrapped or otherwise mechanically held within the interstices of or on the surface of tightly woven or closely knitted fabrics and suede-like materials.

How these and other objects of this invention are achieved will become apparent in the light of the accompanying disclosure made with reference to the accompanying drawings wherein:

FIG. 1 is a greatly enlarged, fragmentary, cross-sectional view of a brushing surface or a brushing head in accordance with this invention;

FIG. 2 is a perspective view of a brush provided with a brushing surface in accordance with this invention; and wherein

FIG. 3 is a perspective view of a brush provided with a handle and having a brushing surface in accordance with this invention.

It has been discovered that a brushing surface useful for removing and dislodging surface-adhering and entrapped dirt, dust and lint and the like from the surface of fabrics and suede-like materials is provided by a plurality of closely packed, substantially rigid, substantially conically-shaped fibrils having a base diameter in the range 0.002–0.02 inch and a height in the range 0.002–0.02 inch. More particularly, it has been discovered that a brush suitable for cleaning fabric and the like is provided by a brush comprising a brushing head having as the brushing surface a plurality of closely packed, substantially rigid, substantially conically-shaped fibrils having a base diameter in the range 0.002–0.02 inch, e.g.,

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about 0.005 inch, and a height in the range 0.002–0.02 inch, such as in the range 0.010–0.012 inch, extending substantially upwardly from and integral with said brushing head.

The brushing head is preferably made of electrically non-conductive, substantially rigid, plastic material having on one side as the brushing surface a plurality of closely packed, substantially rigid, substantially conically-shaped fibrils, extending perpendicularly with respect to and integral with said brushing head. Desirably suitable holding means, such as a handle, is fixed to the other side of the brushing head.

The fibrils formed on the brushing head and providing the brushing surface in accordance with this invention are closely packed, conically-shaped, substantially uniformly dimensioned, rigid fibrils and are provided on the brushing head integral therewith at a density in the range 12,000–25,000, more or less, fibrils per square inch.

The brushing surface and the fibrils formed thereon and integral therewith are made of any suitable thermoplastic or thermosetting material. Desirably, plastic material is employed and has properties such that the fibrils formed thereof to provide the brushing surface are rigid and substantially non-deformable, such that during use the fibrils maintain their position with respect to the brushing head substantially unchanged, i.e., perpendicular with respect to the underlying surface of the brushing head from which the fibrils are formed.

Materials suitable for the manufacture of the brushing head and associated fibrils in accordance with this invention include unplasticized polyvinyl chloride resin, nylon, polystyrene, polyolefins, such as the high molecular weight, rigid, so-called linear polyethylenes, polypropylene and the like. In general, any plastic material which can be formed to provide a brushing head having substantially rigid, conically-shaped fibrils extending upwardly therefrom is suitable for use in the practice of this invention. Desirably, the plastic material employed to provide the brushing surface is electrically non-conductive, i.e., is not inherently electrically conductive and does not contain an amount of extraneous additive materials, such as inhibitors, fillers, etc. to make the resulting material electrically conductive.

Referring now to the drawings, particularly FIG. 1, there is schematically illustrated a brushing surface in accordance with this invention provided by closely packed fibrils of relatively rigid plastic material, such as unplasticized polyvinyl chloride. There is provided a brushing surface made up of a plurality of upstanding, substantially rigid, conically shaped fibrils 10 integral with the substrate 11 made up of the same material as fibrils 10. The fibrils illustrated in FIG. 1 have an average base diameter of about 0.05 inch and an average height measured from the base of the fibril to the top of the fibril in the range 0.010–0.012 inch. The fibrils, as illustrated, are substantially uniform in size and closely packed on substrate 11 so as to present a brushing surface having a fibril density in the range 12,000–25,000 fibrils per square inch. In appearance and touch the brushing surface appears to be smooth and presents a surface somewhat similar to fine grain sand paper or so called frosted glass.

Fibrils 10 are shown substantially uniformly distributed but, as actually manufactured, the fibrils may be in a closely packed, randomly distributed array. As shown, and preferably, the fibrils are substantially conically shaped but other forms, such as a truncated conical shape or a substantially cylindrical shape, but coming to a point at the end, are also suitable.

Referring now to FIG. 2 of the drawings, brushing surface 12 of the type described in connection with FIG. 1 is formed on a suitable plastic substrate material 14

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which is fixed to, either by the use of suitable adhesive material or by fusion or otherwise integral with, holder or carrier means 15. Holder 15 is provided with gripping means or surface 16. Holder 15 and/or gripping means 16 may be made of any suitable material, such as wood, synthetic plastic, such as vinyl resin, nylon, phenol formaldehyde resin, urea formaldehyde resin, melamine resin, and the like or of the same material as substrate 14 and the fibrils providing brushing surface 12.

Referring now to FIG. 3 of the drawings, there is illustrated therein brushing surface 18 in accordance with this invention formed on substrate plastic material 19 which is fixed to carrier or holding means 20 which, in turn, is fixed to and/or provided with handle 21. As described in connection with FIG. 2 handle 21 and carrier 20 and substrate plastic material 19, from which brushing surface 18 composed of a plurality of closely packed fibrils is formed, can be made of any suitable material.

The brushing surface or brushing means of this invention is applied to the surface of the fabric to be cleaned in the usual manner, e.g., in a brushing fashion preferably using short strokes with relatively light pressure so as not to unduly wear away the surface to be cleaned. When so applied the fibrils of the brushing surface exert a combing action upon the surface of the cleaned, dislodging the surface adhering and entrapped dust, dirt and lint particles from the fabric surface and the like and entrapping these particles within the interstices of the fibrils of the brushing surface. The action of the brushing surface in removing dust particles and the like from the surface to be cleaned is enhanced by electrostatic forces inherently produced during the brushing operation, the brushing surface being substantially electrically non-conductive and made of dielectric material and tending to attract dust particles and the like from the surface being cleaned. The dust particles removed during the brushing operation and carried away on the brushing surface are subsequently removed therefrom by any other suitable means, such as by washing with water or other suitable fluid.

The brushing surface comprising closely packed, substantially rigid, substantially conically shaped fibrils extending upwardly from a plastic substrate, such as an unplasticized polyvinyl chloride substrate, is prepared by heating a film or layer or suitable mass of thermosetting or thermoplastic plastic material, and forcing this material onto an embossing surface provided with a plurality of conically shaped indentations therein. The plastic material is forced into the indentations provided on the em-

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bossing surface to substantially completely occupy the same. The resulting embossed plastic material is then stripped away from the embossing surface to yield an embossed plastic material having formed thereon fibrils integral with the plastic material and substantially exactly corresponding to the shape and density of the indentations on the embossing surface.

As will be apparent to those skilled in the art in the light of the foregoing disclosure, many modifications, substitutions and alterations are possible in the practice of this invention without departing from the spirit or scope thereof.

What is claimed:

1. A brush for fabric and the like comprising a brushing head made of electrically non-conductive, substantially rigid plastic material having on one side as the brushing surface a plurality of closely packed, substantially rigid, substantially conically shaped fibrils having a base diameter in the range 0.002-0.02 inch and a height in the range 0.002-0.2 inch and extending substantially perpendicularly with respect to and integral with said brushing head, said brushing surface having a fibril density in the range 12,000-25,000 fibrils per square inch of brushing surface, and holding means fixed to the other side of said brushing head.
2. A brush in accordance with claim 1 wherein said plastic material is unplasticized polyvinyl chloride resin.
3. A brush in accordance with claim 1 wherein said plastic material is nylon.
4. A brush in accordance with claim 1 wherein said plastic material is polystyrene.
5. A brush in accordance with claim 1 wherein said plastic material is a polyolefin.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,129,448

April 21, 1964

Emanuel Mittman

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 20, for "0.002-0.2" read -- 0.002-0.02 --.

Signed and sealed this 13th day of October 1964.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents