HAIR-COMB CLEANER
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This invention relates to a hair-comb cleaner and, more particularly it is concerned with a device of the type designed for removing the dirt, hairs and greasy matters from a hair-comb toothed portion and, particularly from the narrow gaps or intervals comprised between the teeth thereof, by causing the said hair-comb to be, and preferably to be, lengthwise reciprocated between two rotatably supported and parallel small cylindrical brushes.

A plurality of devices of the type referred to above have been herebefore proposed and currently produced. A such device generally consists of a substantially rectangular frame structure, confining a space wherein two small cylindrical brushes are rotatably supported about parallel axes at an interval smaller than the diameters of said brushes, so that the tips of the bristles thereof are caused to relatively intersect when such brushes are caused to rotate. The hair-comb may be cleaned by the action of said bristle tips when the comb is forced through said brushes.

Such known devices are subject to certain common objections, and in particular the said devices cannot be made use of for cleaning hair-combs of a size larger than the said space confined in said frame structure. Also the rib portion of the hair-comb is obviously caused to pass between the rotary brushes, compelling the bristles thereof to excessive bending, prejudicing their consistency and making the device promptly wear out.

Further, the known devices of the type referred to above are subject to progressively lose their ability of proper cleaning of hair-combs, as the bristles of the rotary brushes thereof are progressively worn down, therefore reducing the actual diameter of said brushes in respect to the interval existing between the axis thereof. Still further, a given hair-comb cleaner of the type currently produced cannot be properly made use of for cleaning hair-combs of differing type, in particular of different sizes and intervelled teeth, because thin and closely toothed combs require little penetration of bristle tips while combs provided with big sized and noticeably spaced teeth require a deeper penetration of said brush bristles in the respective gaps for proper cleaning.

It is therefore an object of this invention to provide a new and improved hair-comb cleaner of the type referred to above, capable of better and more complete operation than heretofore possible.

More specifically, it is an object of the present invention to provide a new and improved hair-comb cleaner of the above character, wherein the parallel rotary brushes thereof are arranged in and in respect to the space defined in and by the brushes supporting structure so that said rib portion of the comb may be passed through the device without contacting the brush bristles, while the said bristles effectively operate on the toothed portion of the comb.

Another object of this invention is to provide a new and useful hair-comb rotary cleaner as above, wherein the brushes supporting frame structure thereof is provided with a passage in the plane of reciprocation of the hair-comb between the rotary brushes thereof, so that the device of the invention may be made use of for cleaning of hair-combs of size larger than the size of said space.

A further object of this invention is to provide a new and advantageous hair-comb cleaner as above, wherein the frame structure thereof is adapted for varying at will the interval between the brushes' axis, for proper adaptation of the device to differing modes of operation, and further for overcoming the progressive wearing down of the bristles.

A still further object of this invention is to provide a new and advantageous device improved as above and which may be economically produced and readily operated.

Other objects and advantages of the invention are in part obvious and in part will be made apparent as this description proceeds, and the features which are considered as new and characteristic of the invention will be set forth in particular in the appended claims.

The invention itself, however, both as to its construction and to its mode of operation, will be best understood from the following detailed description of one preferred form of embodiment thereof, when read in conjunction with the accompanying drawings, forming an essential component of this disclosure, and wherein:

Figure 1 is a perspective view of a preferred form of embodiment of the invention, and it includes an end portion of a currently produced hair-comb, positioned for passage through the illustrated device;

Figure 2 is a vertical sectional view of same, taken substantially on the line 2—2 of Fig. 1, and further illustrating an end portion of said current hair-comb, but inversely positioned in respect to the position shown in Fig. 1;

Figures 3 and 4 are horizontal sectional views of same devices, taken on lines and shown in directions indicated by arrows 3—3 and respectively 4—4 in Fig. 1; and

Figure 5 is a horizontal sectional view corresponding to Fig. 4, but illustrating the device of the invention as set to operate with a reduced interval or spacing between the axis of the rotary brushes thereof.

Referring now to the drawings, wherein like numerals refer to like parts and elements throughout the several Figures, and wherein the rotary brushes of the device are illustrated in a rather simplified way, owing to the fact that the structural details thereof are comprised in the current knowledge of the art to which this invention appertains:

In the preferred form of embodiment of the invention, shown in the accompanying drawings, the device includes a one-piece made structural member constructed as a symmetrically shaped and substantially flat plate made of resiliently pliable material, preferably of synthetic resin of resilient character, say a poly-ethylene, or a chloro-vynil resin. Such member comprises an elongated and tapered handle forming portion 10 having a middle longitudinal part 11 located in the plane of symmetry of the said member (corresponding to the plane defined by line 2—2 of Fig. 1), and wherein the thickness of the material is noticeably reduced in respect to the thickness of the whole remaining portions thereof. The said member is constructed so thick, in respect to the physical character of the material, that it is made easily pliable at its thinner portion 11, while at its remaining portions the said member behaves as a substantially rigid structure.

A pair of parallel and spaced arm portions 12 are made integral with said handle portion 10 co-planar to and at the corners of the larger upper edge 16 thereof, and the said arm portions 12 are made integral with co-planar, symmetrical in-turned end portions 13, arranged to define a space or opening 15 therebetween (Fig. 1) and having hub forming ends 14. Therefore,
the described structural member of the device defines a space, confined by the said upper edge 16 of portion 10, the said arms 12 and the in-turned end portion 13, having an opening at 15 in the plane of symmetry of the device.

A pair of conventionally constructed cylindrical brushes 17 are rotatably and symmetrically supported in said space, and the axis thereof may be for example embodied in conventionally constructed structures consisting of tightly twisted wires clamping the brush bristles thereinbetween. The end portions of said axis forming structures are rotatably arranged into bores provided in said hub end portions 14 and in said upper edge 16. The said rotary brushes 17 are diametrically dimensioned and rotatable about axis 18 located at such interval or spacing $S$ (Fig. 3) that the cylinders defined by the bristle tips thereof (the traces of said cylinders are shown by dashed circles at 19 in Fig. 3) intersect at 20 for a proper depthness as required for effective cleaning of small sized closely toothed hair-combs. Further, the said rotary brushes 17 are axially dimensioned so that the bristled portions thereof extend substantially to cover the whole height of said space, i.e. the interval existing between the said upper edge 16 and the in-facing edges of the in-turned portions 13.

An up-facing hollow 23 is provided in the said upper edge of handle forming portion 10, in the plane of symmetry of the device, i.e. oppositely located in respect to said passage at 15 and the said space including the rotary brushes 17. The depth of said hollow 23 is chosen to nearly correspond to the height of the rib portion 22 of a conventionally constructed middle sized hair-comb, as the one fragmentarily illustrated in Figs. 1 and 2, provided with a toothed portion 21.

Upon the provision of the above described features, the new hair-comb cleaner of the invention may be advantageously operated as it will be readily understood by a consideration of Fig. 1 and 2. When a medium sized currently produced hair-comb having a toothed portion 21 including teeth of length not larger than the axial dimension of the bristled portions of brushes 17 is to be cleaned, the said hair-comb is preferably introduced between the said brushes in the up-turned position illustrated in Fig. 2. The outer edge of the rib portion 22 of the comb is caused to slide in the said hollow 23 while the hair-comb is lengthwise reciprocated between the brushes, in the plane of symmetry of the device.

Therefore, the said rib portion 22 of the comb passes free from the bristles of the brushes, without causing an undesirable excessive bending thereof, while said brushes correctly and usefully operate on the toothed portion 21 of the comb. The said hair-comb is readily supported and guided in the said hollow 23, for easy performance of the cleaning in the most correct relative position of the comb across the device of the invention.

If a larger size hair-comb including exceptionally long teeth is to be cleaned, said comb may be passed across the device in the down-turned position shown in Fig. 1, wherein the end portions of the comb teeth may be passed between the bristled portions of brushes 17, while the remaining portions of the comb, near to its rib 22, may freely pass through said space 15.

From what is set forth above and by a consideration of Figs. 1 and 2, it will be readily understood that a device, even if small sized, easily pocketable and economically produced, constructed according to the present invention, is capable of full and proper cleaning of any big sized hair-combs, too, having teeth which are twice as long as the length or axial dimension of the bristled portion of the brushes 17, by successively causing the comb to pass between the brushes in the up-turned position of Fig. 2 and in the down-turned position of Fig. 1. Upon reciprocation of the comb across the device of the invention in said two inverted positions, the portions near to the rib 22 and respectively the end portions of teeth 21 of the comb will be successively cleaned.

The advantage which may be enjoyed by featuring the device of the invention with a structural member of pliable material and with a particularly pliable part at 11 in the plane of symmetry thereof will be readily understood upon consideration of Fig. 5, wherein the hair-comb is illustrated as noticeably bent at its part 11, so that interval or spacing comprised between the axis 18 of brushes will be reduced at $S$, in respect to its initial amplitude, as shown in Fig. 3. The deepness of penetration of the bristles of rotary brushes 17 will be correspondingly increased, as desired say for proper cleaning of big toothed combs, and/or for overcoming a progressive wearing-down of the bristles.

By properly choosing the material of which the said structure member may be produced, say commercially available poly-ethylene or like resinous materials, and by properly sizing the said member at its part 11, the device may be made readily capable of resisting a very severe bending, greatly more than the bend illustrated in Fig. 5, say of $120^\circ$ or more.

While the invention has been heretofore described and shown in but one form of embodiment thereof, it is intended that the invention is not limited to the very details shown, and that said details should not be taken as restrictive of the invention, as it is obvious that various modifications in design may be resorted to by those skilled in the art to which this invention appertains, without departing from the spirit and the scope of the invention, as defined in and by the appended claims.

Without further analysis, the foregoing will so fully reveal the gist of this invention that others can, by applying current knowledge, readily adapt it for various applications in hair-comb cleaners of the type considered, without omitting features that, from the standpoint of prior art, fairly constitute characteristics of the invention and, therefore such adaptations should and are intended to be comprehended within the range of equivalents thereof.

Having thus described the invention, what is claimed as new and desired to have protected by Letters Patent is:

1. A hair comb cleaner, comprising, in combination, a flat elongated support member having a longitudinal resilient portion intermediate the sides thereof, so as to be hingedly foldable along a line longitudinal thereof; a pair of cylindrical brushes rotatably mounted on said support member on respective sides of said line, said brushes having axes substantially parallel to said line and respective bristle means radially arranged on said brushes for mutual interengagement when said support member is folded; and guiding support means on said support member for slidably supporting a comb to be cleaned, said support means being arranged on said line.

2. A hair comb cleaner, comprising, in combination, an elongated support member hingedly foldable along a line longitudinal thereof; a pair of cylindrical brushes rotatably mounted on said support member on respective sides of said line, said brushes having axes substantially parallel to said line and respective bristle means radially arranged on said brushes for mutual interengagement when said support member is folded; and guiding support means on said support member for slidably supporting a comb to be cleaned, said support means being arranged on said line and defining a guide channel extending in a plane substantially parallel to the plane defined by said comb and tangential relative to said cylindrical brushes.

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