Nov. 27, 1962 L. R. PEILET 3,065,757

RETRACTABLE BRUSHES OR THE LIKE WITH LOCKING DEVICES

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4 Sheets-Sheet 1

FIG. 1

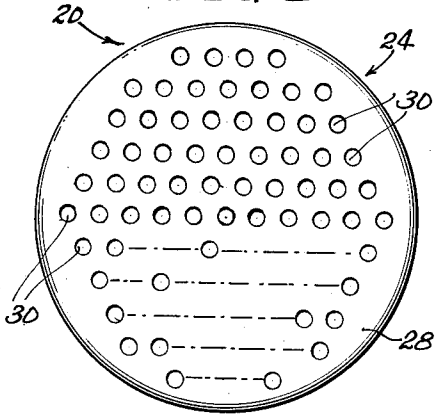


FIG. 2

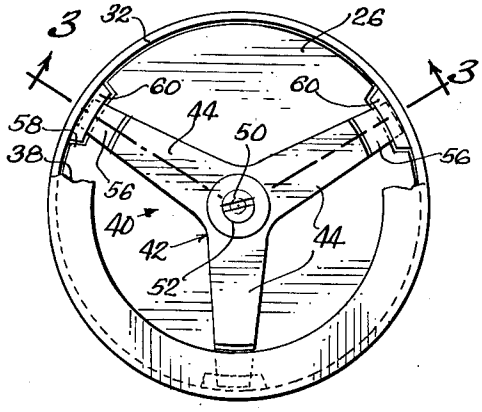


FIG. 3

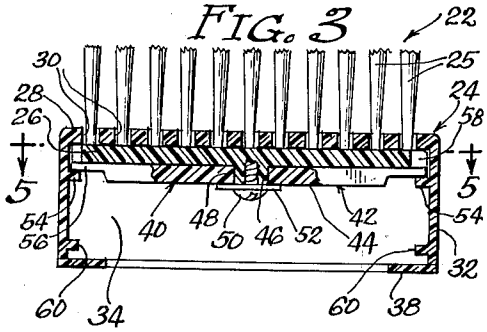


FIG. 4

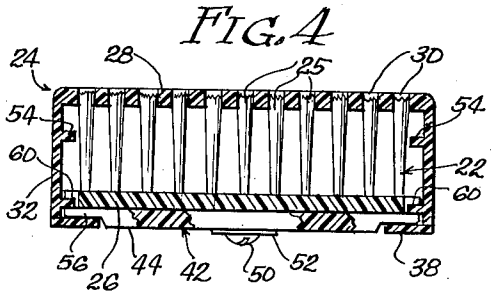


FIG. 5

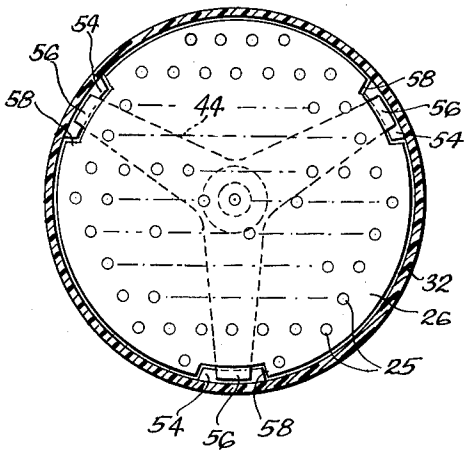
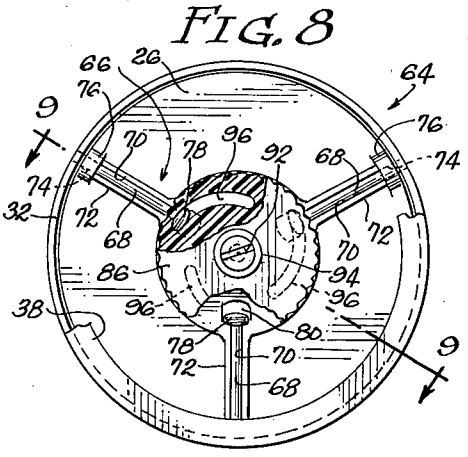


FIG. 8



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RETRACTABLE BRUSHES OR THE LIKE WITH LOCKING DEVICES

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FIG. 6

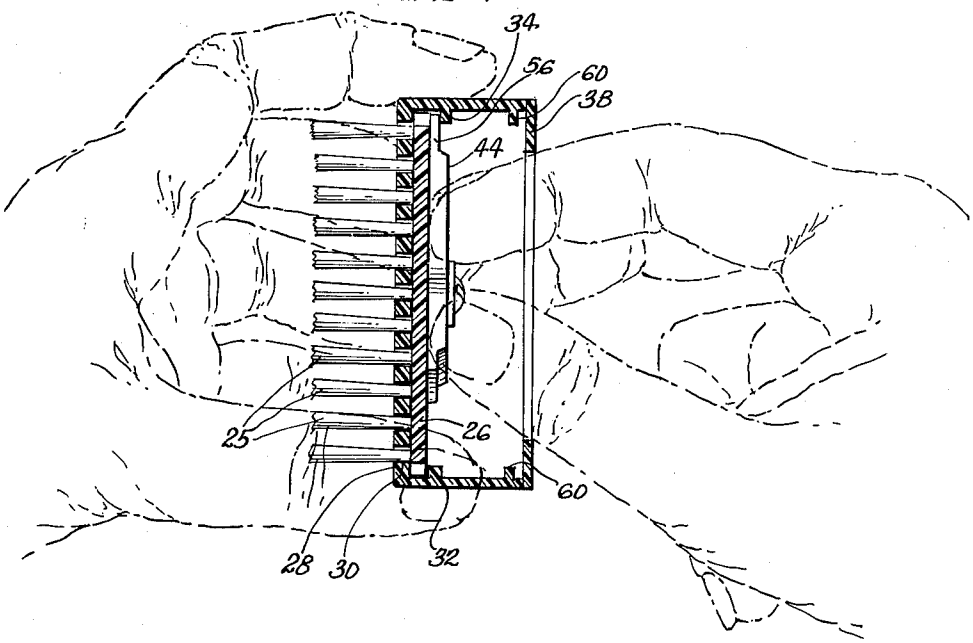
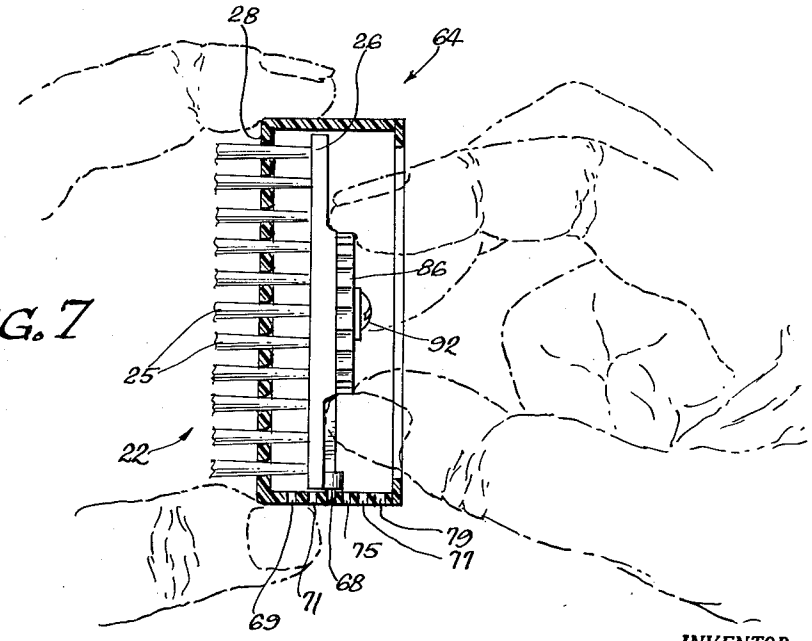


FIG. 7



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RETRACTABLE BRUSHES OR THE LIKE WITH LOCKING DEVICES

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FIG. 9

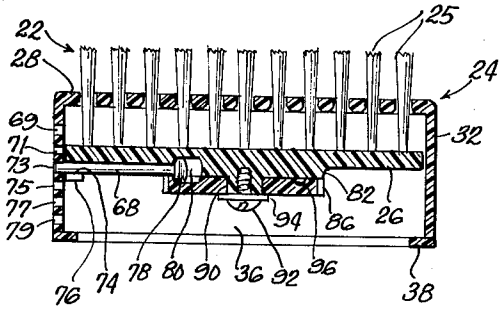


FIG. 10

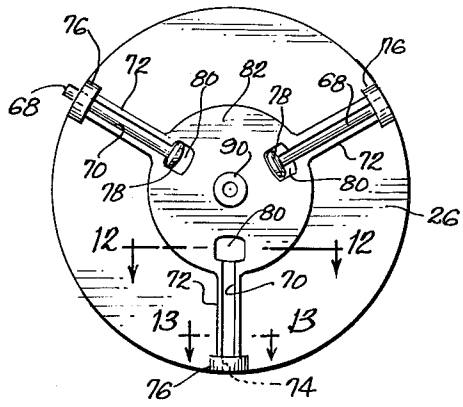


FIG. 11

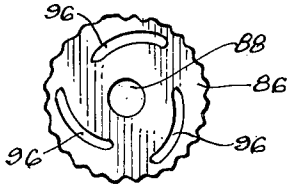


FIG. 12

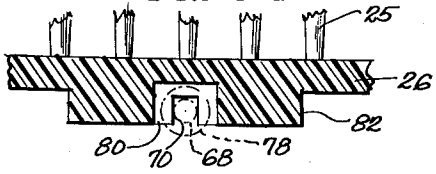


FIG. 13

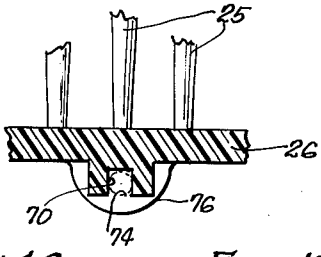


FIG. 14

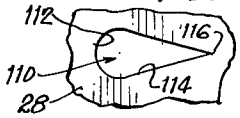


FIG. 15

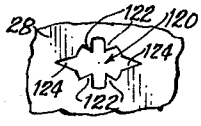


FIG. 16

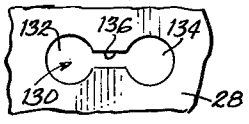


FIG. 17

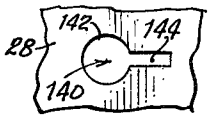


FIG. 18

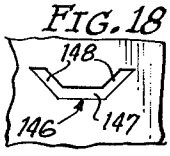


FIG. 19

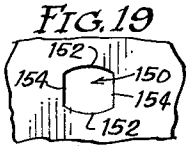


FIG. 20

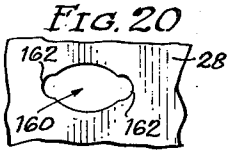


FIG. 21

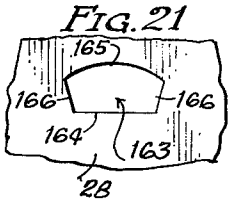


FIG. 22

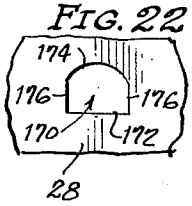


FIG. 23

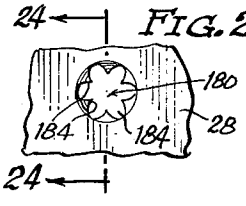
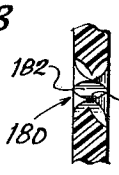


FIG. 24



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RETRACTABLE BRUSHES OR THE LIKE WITH LOCKING DEVICES

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FIG. 25

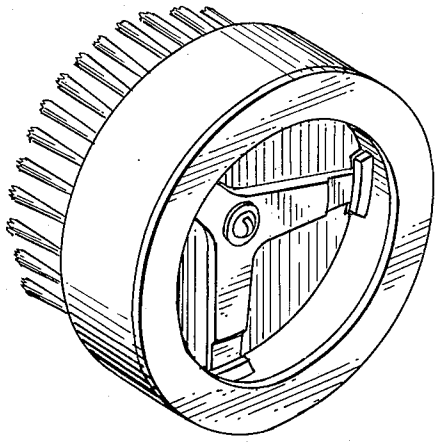
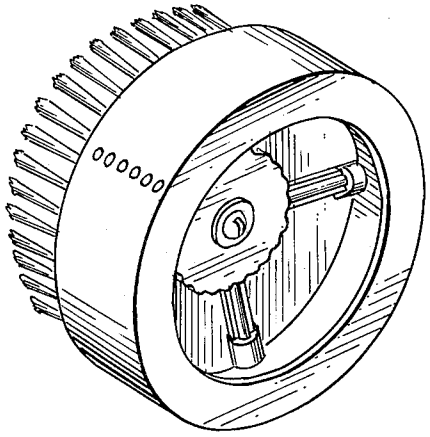


FIG. 26



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United States Patent Office

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Patented Nov. 27, 1962

3,065,757

RETRACTABLE BRUSHES OR THE LIKE WITH LOCKING DEVICES

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Filed Jan. 20, 1960, Ser. No. 3,627

2 Claims. (Cl. 132—9)

This invention relates to brushes, other hair-grooming devices, or the like, and pertains particularly to hair-grooming devices of the type in which the bristles or other hair-grooming elements are retractable into the casing of the brush.

One object of the present invention is to provide a new and improved hair-grooming device in which the bristles or other hair-grooming elements are mounted on a member which is movable within a casing and is provided with means for locking the member in its extended and retracted positions.

A further object is to provide a new and improved brush or hair-grooming device of the foregoing character in which the casing is formed with an opening opposite the rear of the bristle supporting member, so that the member may be operated by inserting the fingers through the opening.

Another object is to provide a new and improved device of the foregoing character, in which the means for locking the bristle supporting member are operable from the rear of the member by inserting the fingers through the opening in the rear of the casing.

A further object is to provide a new and improved brush or hair-grooming device of the foregoing character, which is convenient to use and easy to operate, yet is easy to manufacture and low in cost.

Further objects and advantages of the present invention will appear from the following description, taken with the accompanying drawings in which:

FIG. 1 is a plan view showing the top or front of a retractable brush to be described as an illustrative embodiment of the present invention.

FIG. 2 is a view showing the bottom or rear of the brush of FIG. 1.

FIG. 3 is a sectional view, taken generally along the broken line 3—3 in FIG. 2.

FIG. 4 is a view similar to FIG. 3, but showing the brush in its retracted position, rather than in its extended position, as in FIG. 3.

FIG. 5 is a sectional view, taken generally along a line 5—5 in FIG. 3.

FIG. 6 is a central longitudinal section, showing the operation of the brush of FIGS. 1–5.

FIG. 7 is a central longitudinal section showing the operation of a modified brush.

FIG. 8 is a rear view showing the modified brush of FIG. 7.

FIG. 9 is a sectional view, taken along a line 9—9 in FIG. 8.

FIG. 10 is a rear view of the bristle supporting member shown in FIG. 8, with the lock operating knob and one of the locking pins removed for clarity of illustration.

FIG. 11 is a front view of the locking knob.

FIG. 12 is a fragmentary enlarged sectional view, taken generally along a line 12—12 in FIG. 10.

FIG. 13 is a fragmentary enlarged sectional view taken along a line 13—13 in FIG. 10.

FIGS. 14–23 are fragmentary front views illustrating a number of modified forms of bristle openings in the bristle cleaning plate or member.

FIG. 24 is a fragmentary section, taken generally along a line 24—24 in FIG. 23.

FIG. 25 is a perspective view of the brush shown in FIGS. 1–6.

FIG. 26 is a perspective view of the brush shown in FIGS. 7–13.

As already indicated, FIGS. 1–6 and 25 illustrate a hair-grooming device in the form of a retractable brush 20, having bristles or other hair-grooming elements 22 which are retractable into a casing 24. In this case, the bristles 22 are mounted in a large number of tufts 25 on the front side of a plate or supporting member 26 which is movable in the casing 24. However, various other types of hair-grooming elements may be employed, such as individual bristles, teeth, plates or the like.

As shown, the casing 24 comprises an end wall 28 which is formed with a large number of apertures 30. The bristles tufts 25 are slidably received in the apertures 30. In this case, the apertures 30 are circular in shape, but various other shapes may be employed. When the bristle supporting plate 26 is moved against the rear side of the end wall 28, the bristles 22 are extended, as shown in FIG. 3, so that they may be employed to advantage in brushing the hair, or for any other use. When the plate 26 is moved rearwardly from the end wall 28, the bristles 22 are retracted into the casing 24, as shown in FIG. 4. Even when the bristles 22 are fully retracted, the tips of the bristles remain in the apertures 30 so that the bristles may readily be extended again. As the bristles 22 are retracted, the end wall 28 strips any hair or other foreign material off the bristles. In this case, the bristles are automatically cleaned. When the bristles are retracted as shown in FIG. 4, the brush may be carried very conveniently in a purse, handbag, pocket or the like.

The illustrated casing 24 has a side wall 32 which defines a hollow space or cavity 34 in the casing 24. The bristle supporting member 26 is movable within the space 34 and along the side wall 32. While the side wall 32 may be of any suitable shape, it is shown as being of generally cylindrical shape. The wall 28 closes one end of the side wall 32. At the other end of the side wall, the casing 24 is formed with an opening 36 which gives access to the rear side of the bristle supporting plate or member 26. It is preferred that the casing 24 be formed with an inwardly projecting flange 38 around the opening 36, so as to retain the bristle supporting plate 26 within the casing, against outward movement through the opening 36. In this case, the flange 38 takes the form of a flat ring which is cemented or otherwise suitably secured to the rear end of the side wall 32. It is preferred to mold the casing 24, the bristle supporting plate 26 and the ring 38 from a suitable plastic material, but these components may be made of metal or any other suitable material.

The bristles 22 are extended by inserting one or more fingers through the opening 36 and pushing the bristle supporting plate 26 forwardly against the end wall 28. The bristles 22 may be retracted by pushing them back into the casing with the hand, or by reaching into the opening 36 and pulling the member 26 rearwardly.

Means are provided for locking the bristle supporting

member 26 in its extended position, and also preferably in its retracted position. In this way, the brush may be used without a tendency for the bristles to retract, due to the normal brushing pressure on the bristles. Similarly, the brush may be locked in its retracted position so that the bristles and the bristle supporting plate 26 will not tend to fall into their extended position when the brush is being carried in a handbag or the like. In this case, the brush is provided with a locking mechanism 40 which is disposed at the rear of the bristle plate 26 and is adapted to be operated by inserting one or more fingers through the opening 36. In the illustrated construction, the locking mechanism 40 comprises a rotatable member 42 having a plurality of arms 44. The locking member 42 is rotatably mounted on the rear side of the bristle supporting plate 26. As shown, the member 42 is formed with a central opening 46 which is adapted to be received around a short stub shaft or post 48 formed on the rear of the bristle supporting plate 26. To retain the member 42 on the plate 26, a screw or other suitable fastener 50 may be threaded into or otherwise secured to the post 48. In the illustrated arrangement, a washer 52 is mounted between the post 48 and the head of the screw 50. The washer 52 is of sufficient size to overlap the member 42 by a substantial amount.

To engage the arms 44 and retain the bristle supporting plate 26 in its extended position, a plurality of lugs 54 are formed on the inside of the side wall 32. The outer ends of the arms 44 are formed with reduced portions or blades 56 which are adapted to be moved in front of the lugs 54 so as to prevent retracting movement of the plate 26. In this case, there are three of the arms 44 and three corresponding lugs 54. Three notches 58 are formed in the edge of the plate 26 so that the plate will clear the lugs 54. The engagement of the bristle tufts 25 with the apertures 30 prevents the bristle plate 26 from rotating relative to the casing 24, and thus maintains the notches 58 in alignment with the lugs 54.

It is preferred to form the inside of the side wall 32 with a plurality of additional lugs 60 for engaging the locking arms 44 so as to retain the bristle plate 26 in its retracted position. The lugs 60 are located near the rear end of the side wall 32, so that the blades 56 at the ends of the arms 44 will be movable behind the lugs 60 when the bristle plate 26 is fully retracted, as shown in FIG. 4. Of course, the lugs 54 are located near the front of the casing 24.

When the bristles 22 are to be extended, the locking member 42 is rotated so that the arms 44 are disengaged from the lugs 60. This is done by inserting one or more fingers into the rear of the casing 24 through the opening 36, as shown in FIG. 6. The bristle plate 26 is then pushed to the front of the casing, against the end wall 28. To lock the brush, the member 42 is then rotated so that the blades 56 are moved in front of the lugs 54. The engagement of the blades 56 with the lugs 54 prevents the bristle plate 26 from retracting when the normal brushing pressure is applied to the bristles.

When the brush is to be retracted, the member 42 is rotated so as to disengage the arms 44 from the lugs 54. The bristle tufts 25 may then be pushed into the casing 24 to lock the brush in its retracted position. The member 42 is then rotated so as to move the blades 56 behind the lugs 60.

FIGS. 7–13 illustrate a modified brush 64, which is the same as the brush of FIGS. 1–6, except that the locking mechanism 40 is replaced with a modified locking mechanism 66. The components of the brush 64 have been given the same reference characters in FIGS. 6–11 as in FIGS. 1–5, insofar as such components are the same as the corresponding components of the brush 20. It will be necessary to describe only the differences between the brush 64 and the brush 20.

As shown in FIGS. 7–13, the locking mechanism 66 comprises a plurality of bolts or pins 68 which are slidably mounted on the rear of the bristles supporting plate 26. In the illustrated arrangement, the pins 68 are slidably received in generally radial grooves 70 which are formed in ribs 72 which project rearwardly from the bristle plate 26. The pins 68 are slidable through apertures 74 which are formed in lugs 76 projecting rearwardly from the bristle plate 26 adjacent the edge thereof. As shown, each of the pins 68 is formed at its inner end with an enlarged head 78 which is slidable in a groove or recess 80. As shown to best advantage in FIGS. 8 and 10, the recesses 80 are substantially wider and deeper than the grooves 70. It will be seen that the ribs 72 radiate outwardly from a central boss 82 formed on the rear of the bristle plate 26.

To receive the locking pins 68, the side wall 32 is formed with a plurality of apertures or recesses 69, 71, 73, 75, 77 and 79, so that the bristle plate 26 may be locked in its extended and retracted positions, and also in a number of intermediate positions. Thus, when the bristle plate 26 is fully extended, the pins 68 are movable into the apertures 83. When the bristle plate 26 is fully retracted, the pins 68 are engageable with the apertures 88. In various intermediate positions the pins 68 are receivable in the apertures 71, 73, 75 and 77. In the illustrated construction, there are three pins 68 and three sets of apertures, but various other arrangements could be employed.

The pins 68 are adapted to be moved inwardly and outwardly by inserting one or more fingers into the casing 24 through the opening 36 in the rear thereof. Means may be provided to operate all of the pins 68 simultaneously. In this case, such means take the form of a rotatable knob or disk 86 which is mounted on the rear side of the bristle supporting plate 26. It will be seen that the knob 86 has a central opening 89 which is adapted to be received around a short stub shaft or post 90 projecting rearwardly from the bristle supporting plate 26. A screw or other fastener 92 may be fitted into or otherwise secured to the post 90 to retain the disk 86 on the post. In this case, a washer 94 is mounted between the post 90 and the head of the screw 92 to overlap the knob 86.

To operate the pins 68, the knob 86 is formed with a plurality of cam grooves 96. As shown to advantage in FIG. 11, the cam grooves 96 are formed on the front face 98 of the knob 86. This face 98 of the knob is in sliding engagement with the boss 82. It will be seen from FIG. 9 that the heads 78 of the pins 68 are received in the grooves 96. Each groove 96 spirals or angles outwardly, so that the rotation of the knob 86 will move the pins 68 longitudinally, into and out of engagement witht the apertures 83—88 in the casing 24. The knob 86 covers the recesses 80 and the inner portions of the grooves 70, so as to retain the pins 68 in the grooves 70.

When the bristles 22 are to be extended, the locking pins 68 are disengaged from the apertures 88 by rotating the knob 86 in such a direction that the cam grooves 96 will move the pins inwardly. The bristle supporting member 26 is then pushed forwardly against the end wall 28 so as to extend the bristle tufts 25. To lock the bristles in their extended position, the knob 86 is rotated so as to slide the pins 68 outwardly into the apertures 83.

It will be apparent that the bristles 25 may readily be retracted by a reversal of these operations. If short bristles are desired for a particular brushing operation, the bristle plate 26 may be locked in a number of intermediate positions, by moving the pins 68 outwardly into the apertures 84—87.

When the brush is being used, the engagement of the locking pins 68 with the apertures 83 prevents the bristles from being pushed into the casing by the normal brushing pressure. When the bristles are retracted, the engagement of the pins 68 with the apertures 88 prevents the bristles from being extended accidentally. Thus,

the bristles will remain within the casing, where they will be guarded against damage. When the bristles are retracted, the brush presents a smooth outer surface, so that it may be carried very conveniently in a purse, handbag, pocket or the like, without any tendency for the bristles to engage other objects in the handbag or the like. Whenever the bristles are retracted, the end wall 28 cleans any hair and other foreign material off the bristles. Thus, the brush is automatically kept in a clean condition.

With all of its advantages, the brush may be made very easily and at low cost. The principal components of the brush may be molded very inexpensively from plastic materials. Thus, the brush is economical as well as highly useful.

In the embodiments of FIGS. 1–13, the bristle cleaning plate 28 is formed with bristle openings 30 which are circular in shape. FIGS. 14–24 illustrate a number of modified bristle openings having shapes which are non-circular, so as to improve the cleaning action of the bristle plate 28.

Thus, FIG. 14 illustrates a bristle opening 110 which is generally teardropped in shape. It will be seen that the opening 110 has a large end portion 112 which is formed with an outline corresponding to a major portion of a circle. One side of the portion 112 communicates with a generally triangular slot portion 114, which tapers to a point 116 from the periphery of the circular portion 112. It will be understood that the opening 110 is adapted to receive one of the bristle tufts 25, and that the opening 110 is thus substantially filled with bristles 22. In FIG. 14, however, the bristles are omitted for clarity of illustration.

FIG. 15 illustrates another modified bristle opening 120 which is generally circular but is formed with two pairs of opposite teeth 122 projecting into the opening. Although four of the teeth 122 are illustrated, it will be understood that a larger or a smaller number may be employed. Between the groups of teeth 122, the opening 120 is formed with a plurality of outwardly extending generally V-shaped notches or slots 124. The teeth 122 and the edges of the slots 124 are capable of cleaning the bristles with a high degree of efficiency.

FIG. 16 illustrates another modified bristle opening 130, which comprises twin generally circular portions 132 and 134. A narrow slot or channel 136 extends between the circular portions 132 and 134. In this case, also, the entire opening 130 is filled with bristles. Thus, the edges of the twin circular portions 132 and 134 and the narrow slot 136 have an effective cleaning action on the bristles.

FIG. 17 illustrates another modified bristle opening 140 which has a single generally circular portion 142 and a narrow slot portion 144. It will be seen that the narrow slot portion 144 extends outwardly in one direction from the circular portion 142. Here again, both the circular portion 142 and the slot portion 144 are filled with bristles.

FIG. 18 illustrates a modified bristle opening 146 which is in the form of a generally wing-shaped slot. Thus, the slot 146 comprises a narrow main portion 147, with a pair of wing portions 148 angling outwardly from the opposite ends of the main portion 144. The elongated edges of the portion 147 and 148 have an effective cleaning action.

FIG. 19 illustrates a modified bristle opening 150 which is generally barrel-shaped. Thus, the opening 150 has two opposite curved sides 152 and two parallel, opposite straight sides 154.

FIG. 20 illustrates a modified bristle opening 160 which is generally elliptical in shape. However, the opposite ends of the elliptical opening 160 are formed with generally semi-circular notches 162. Here again, the entire opening 160 is filled with bristles.

FIG. 21 illustrates a modified bristle opening 163 which is generally fan-shaped. Thus, the illustrated opening 163 has an elongated straight side 164. A curved elongated side 165 is provided opposite the straight side 164. The opening 163 has ends 166 which extend between the ends of the straight side 164 and the curved side 165. The ends 166 diverge or fan outwardly from the ends of the straight side 164.

FIG. 22 illustrates another modified bristle opening 170 which is quite similar to the bristle opening 163, in that the bristle opening 170 is provided with an elongated straight side 172 and an elongated curved side 174 which is opposite the straight side 172. In this case, however, the opening 170 has ends 176 which are parallel to each other. Thus, the opening 170 is generally rectangular, but with one curved side.

FIGS. 23 and 24 illustrate still another modified bristle opening 180 which is generally circular but is formed with a plurality of scallop-shaped notches 182 disposed around its periphery. A plurality of points or teeth 184 project inwardly into the opening 180 between the scalloped notches 182. In this case, there are six scalloped notches 182, with six points 184 therebetween. Thus, the opening 180 is generally in the form of a flower having six petals. It will be apparent from FIG. 24 that the points or teeth 184 are tapered in thickness as well as in width, so that the inner ends of the teeth are sharply pointed. In this way, the bristles are subjected to an effective cleaning action. As in all of the other bristle openings, the bristle opening 180 is filled with bristles, although the bristles are omitted in FIGS. 23 and 24, for clarity of illustration.

Various other modifications, alternative constructions and equivalents may be employed without departing from the true spirit and scope of the invention, as exemplified in the foregoing description and defined in the following claims.

I claim:

1. In a hair-grooming device, the combination comprising a casing having an end wall with aperture means therein, a member movable in said casing toward and away from said end wall, a plurality of hair-grooming elements mounted on the front of said member and extending through said aperture means, said hair-grooming elements being extensible and retractable by movement of said member in said casing, said casing having an opening therein giving access to the rear side of said member, a plurality of pins slidably mounted on the rear side of said member and movable outwardly and inwardly toward and away from said casing, said casing having recesses for receiving said pins to lock said member in a plurality of positions with said hair-grooming elements extended and retracted, a manually operable knob rotatably mounted on the rear side of said member, and cams on said knob and operatively connected to said plurality of pins for simultaneously operating said pins in response to rotation of said knob.

2. In a hair-grooming device, the combination comprising a casing having an end wall with aperture means therein, a member movable in said casing toward and away from said end wall, a plurality of hair-grooming elements mounted on the front of said member and extending through said aperture means, said hair-grooming elements being extensible and retractable by movement of said member in said casing, said casing having an opening therein giving access to the rear side of said member, a plurality of pins slidably mounted on the rear side of said member and movable outwardly and inwardly toward and away from said casing, said casing having recesses for receiving said pins to lock said member in a plurality of positions with said hair-grooming elements extended and retracted, a manually operable knob rotatably mounted on the rear side of said member, and means on said knob and operatively connected to said

plurality of pins for simultaneously operating said pins in response to rotation of said knob.

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