

March 7, 1944.

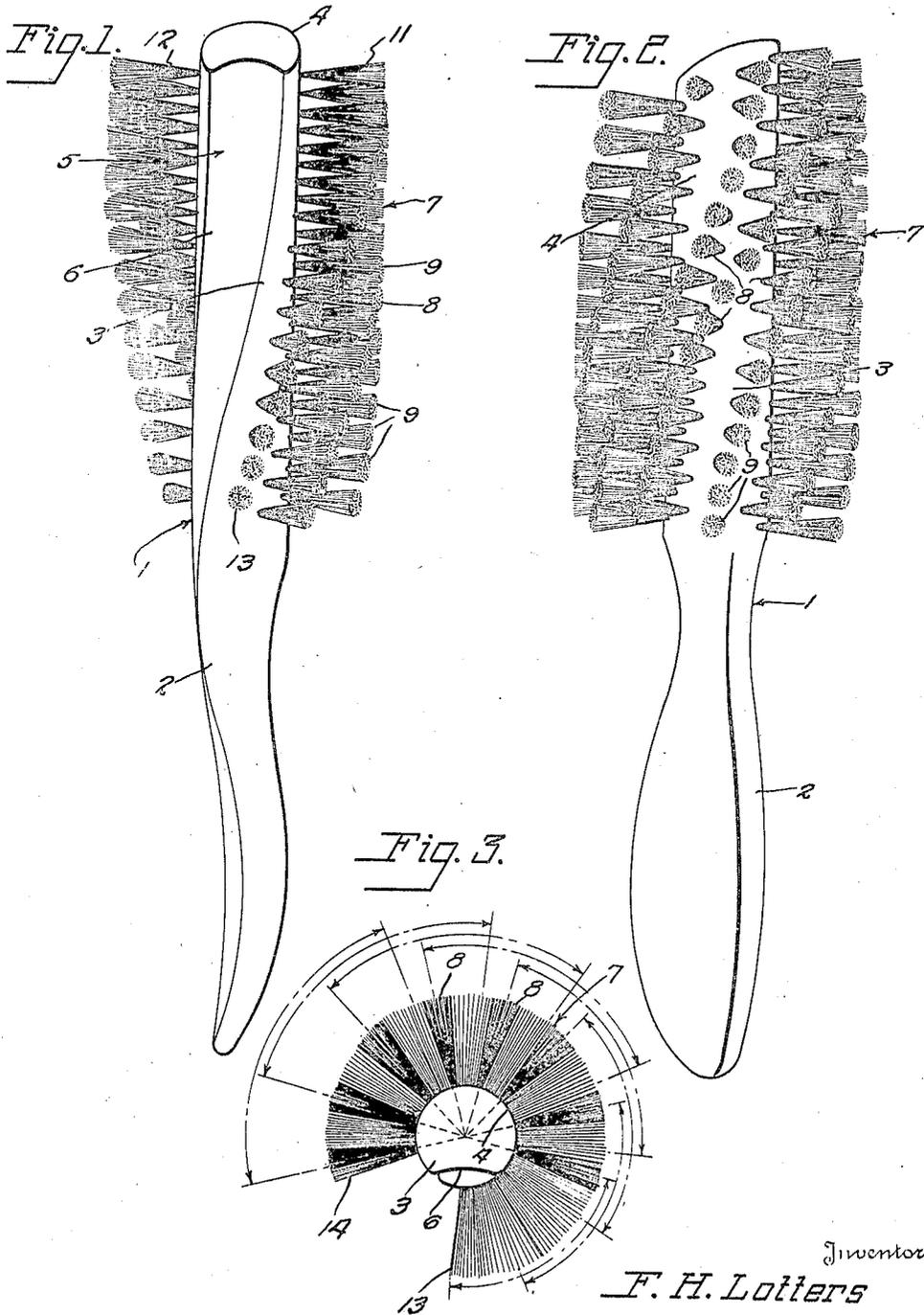
F. H. LOTTERS

2,343,782

SPIRAL HAIR BRUSH

Filed Dec. 16, 1941

3 Sheets-Sheet 1



Inventor

F. H. Lotters

By *Max Fenwick Lawrence*
Attorney

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F. H. LOTTERS

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Fig. 4.

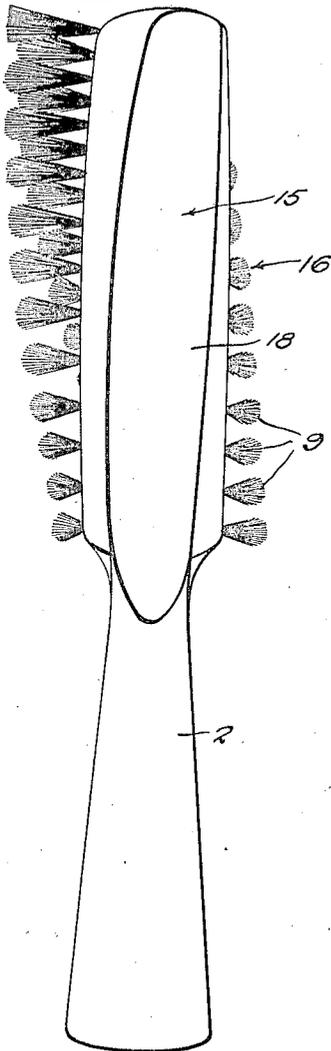


Fig. 5.

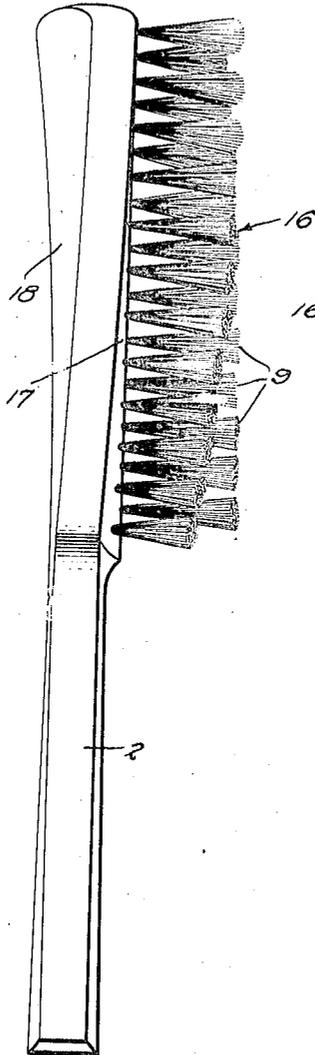
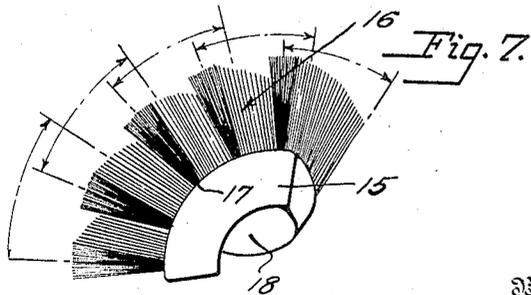
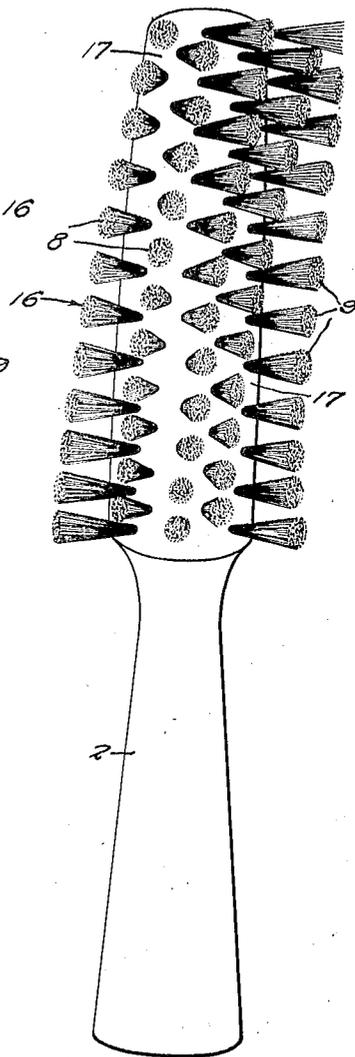


Fig. 6.



Inventor
F. H. Lotters

By Marion Fenwick Lawrence
Attorney

March 7, 1944.

F. H. LOTTERS
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3 Sheets-Sheet 3

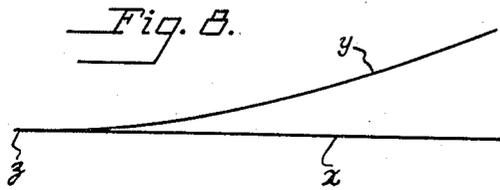


Fig. 10.

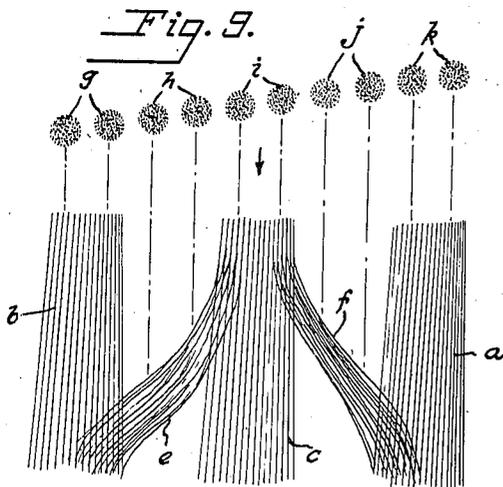
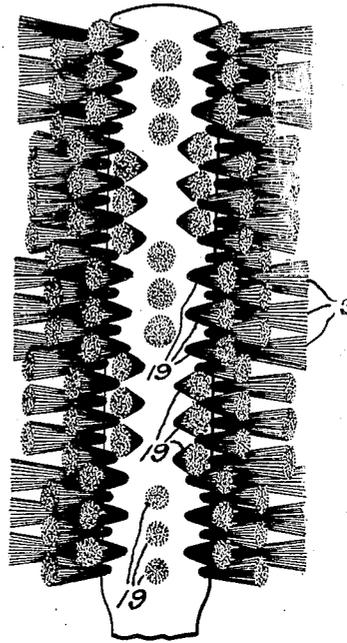
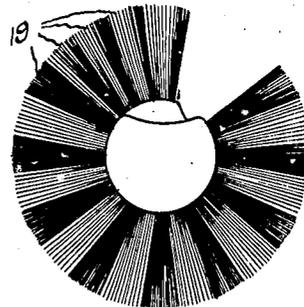


Fig. 11.



F. H. Lotters ^{Inventor}

384 *Mason Fenwick Lawrence*
Attorneys

UNITED STATES PATENT OFFICE

2,343,782

SPIRAL HAIRBRUSH

Fred Hermann Lotters, Albany, N. Y., assignor to
Mohawk Brush Company, Albany, N. Y., a cor-
poration of New York

Application December 16, 1941, Serial No. 423,214

5 Claims. (Cl. 15—160)

This invention relates to hair brushes of that type in which the bristle tufts have a combing as well as a brushing action, and it is an improvement upon the type of hair brush covered by the patent to Aufesser, No. 1,628,299, May 10, 1927, and the patent to Weber, No. 1,628,291, granted May 10, 1927.

In the following specification, the various parts of the brush will be designated as follows: the handle; the rigid or molded part which carries the bristles, the core; the side of the core from which the bristle tufts emanate, the core face, and the opposite side, the back. The bristle mass as a whole will be referred to as the bristle head, and the surface in which the free ends of the bristles terminate, the bristle face. Corresponding nomenclature is employed also in referring to the brushes of the above mentioned patents. In both of the above patents the brushes are described as deriving their combing function from the arrangement of the bristle tufts in longitudinal parallel rows emanating from a transversely convex core face, and angularly displaced so that the ends of the bristle tufts of the respective rows are quite a distance apart in the bristle face.

The brushes of both patents are manipulated by rotating them about the axis of the convex surface represented by the bristle face; in other words, the brush is journaled in the hair. This causes the widely spaced rows of bristle tufts to act in sequence upon the hair, the leading row burying itself deep into the mass of hair and lifting and arranging the hair which it engages when the first row of bristle tufts begins to lift, the next row penetrating deep, and so on through the entire arc of rotation of the brush.

The reason that the brush is enabled to penetrate deep into the hair mass is that the resistance to penetration is substantially limited at any one time to a single row of bristle tufts, in contradistinction to the ordinary hair brush in which the bristles are so closely set, and the resistance to penetration therefore so great, that the brush merely depresses the hair, smoothing it without sinking into it and therefore lacking the combing function.

In the Weber patent which emphasizes the grooved back, the flanges which define the sides of the groove are employed for their girder effect, giving rigidity to a light weight core construction.

In the brushes of both the above patents the anterior row of bristle tufts combs the hair simultaneously along a rectilinear front equal to

the entire length of the row. The hair mass against which the anterior row operates is generally mussed, that is, the ends of some locks may be in laterally displaced position with their free ends buried under laterally adjacent locks, and the resistance which these buried locks oppose to the forward thrust of the bristle tufts may be so great that the bristles yield and skip over them so that they are not drawn out and the combing action is therefore imperfect.

One of the objects of the present invention is to provide a hair brush of the type described, in which the rows of bristle tufts are spirally arranged, so that the bristle tufts at the leading end of the foremost row first penetrate the hair, the region of penetration progressively shifting longitudinally of the foremost row toward the trailing end thereof. Now, assuming that certain locks are diverted in the direction of the leading end, and some in the direction of the trailing end with their free ends buried beneath adjacent tracts of hair, the relatively leading tufts engage the free ends of those locks which are diverted toward the leading end, freeing them from the overlying hair before the relatively trailing tufts engage the base portions of the same locks, and with respect to those locks diverted toward the trailing end, the relatively leading tufts engage the base portions before the relatively trailing tufts press the overlying hair against the buried ends of said locks, the result being a more complete combing action than if the bristle tufts were to act simultaneously against the entire combing front.

Another object of the invention is to provide a hair brush in which the rows of bristle tufts are spirally arranged, this construction producing a deeper combing penetration, for the incident edge of the bristle head enters progressively into the hair, the leading end foremost, the resistance to penetration being opposed only by a few bristle tufts at a time.

Another object of the invention is to provide a hair brush which when used in wavy or waved hair, will assist the hair in resuming its normal waved position of repose by conforming it more or less to the spiral contour of the parallel rows of bristle tufts, particularly the row or rows adjacent the trailing end of the bristle head, which operate adjacent the surface of the hair through the lifting of the brush at the time the hair is released.

Other objects of the invention will appear as the following description of a preferred and practical embodiment thereof proceeds.

In the drawings which accompany and form a part of the following specification, and throughout the several figures of which the same characters of reference have been employed to designate identical parts:

Figure 1 is a view in back elevation of a brush embodying the principles of the present invention;

Figure 2 is a front elevation of the same;

Figure 3 is an end view;

Figure 4 is a back view in elevation of a modified form of hair brush;

Figure 5 is a side elevation;

Figure 6 is a front elevation;

Figure 7 is an end view;

Figure 8 is a diagrammatic view illustrating the feature that only a few bristle tufts at a time in any row, are in the position of deep penetration;

Figure 9 is a diagrammatic view illustrating the combing operation;

Figure 10 is a front elevation of still another modification;

Figure 11 is an end view.

Referring now in detail to the several figures, and first adverting to the modification shown in Figures 1 to 3, inclusive, the numeral 1 represents as a whole a hair brush comprising the handle 2 and core 3, these two parts being of substantially rigid material, preferably of an integrally molded plastic. The core face 4 is convex in all transverse sections, and as shown, is cylindrical in contour. The back 5 of the brush may have a concave groove 6 extending lengthwise thereof which gives girder rigidity to the core 3, particularly when it is molded from relatively light weight sheet plastic with the edges of the sheet turned toward the back in the manner described in connection with the Weber patent. The groove incidentally affords a convenient seat for the forefinger in rotarily manipulating the brush in the contemplated manner.

The bristle head 7 comprises a plurality of longitudinally arranged parallel rows 8 of bristle tufts 9, the tufts of a row emanating from a spirally disposed series of holes in the transversely convex core face 4. The bristle tufts of all the rows are of substantially equal length. The rows 8 radiate or diverge outwardly relative to one another so that the outer ends of the bristle tufts of the several rows are spaced quite a distance apart in the bristle face 10.

The bristle head 7 is of substantially the same arcuate width throughout all of its transverse sections, excepting at the extreme ends, transverse sections being progressively displaced, following the pitch of the rows of bristle tufts, as illustrated by the arrows in Figure 3. This gives the bristle head when considered from end to end, a cylindrical bearing surface of great arcuate amplitude, as illustrated in Figure 3, and since the bristle head when the brush is being manipulated may be regarded as being journaled in the hair, a large arc of rotary manipulation is thus provided.

Inasmuch as the bristle head 7 is bounded on both its anterior and posterior sides, respectively, by the foremost and rearmost parallel spiral rows of bristle tufts 11 and 12, it has a leading end 13, first to engage the hair, and a trailing end 14, last to release it as the brush is lifted.

Since the spiral rows are wrapped about the transverse convex core face 4 and the bristle tufts are of substantially equal length when the bristle tufts at the leading end 13 of the fore-

most row 11 first engage the hair, the rest of the foremost row and all of the other rows are substantially out of engagement with the hair. At least they are not penetrating it deeply. This is illustrated diagrammatically in Figure 8, in which the line *x* represents the level of combing depth, the curved line *y* a spiral row of bristles showing the leading part only, designated by the reference character *z*, at combing depth.

The pitch and spacing of the spiral rows of bristle tufts is such that several rows intersect a vertical plane embracing the axis of the brush. The effect of this is that when an intermediate portion of the foremost row of bristle tufts assumes the position of deepest penetration, the leading end of the second row is also in position of deepest penetration, and by the time the region of deepest penetration has traveled to the trailing end of the foremost row the intermediate portion of the second row and the leading portion of the third row are all in positions of deepest penetration. In other words, after the initial rotary movement of the brush, during which movement the leading end only of the foremost row penetrates the hair to combing depth, the combing front, that is, the longitudinal line of deep penetration extending the full length of the bristle head, is only one row wide but shared by those portions of all rows which substantially simultaneously intersect the said vertical axial plane.

The improved combing action of the subject brush, due to the arrangement of the bristle tufts in spiral rows, may be readily understood by reference to Figure 9, in which the row of circles represents a spiral row of bristle tufts and *b*, *c* and *a* represent tracts of hair about to be progressively engaged by the row of tufts, the latter moving in the direction of the arrow.

Certain locks *e* and *f* are "mussed," so that their free ends, diverted laterally, are buried beneath the adjacent locks *b* and *a* on either side. Now, if the bristle tufts engaged all three tracts *a*, *b* and *c* simultaneously, the extreme tufts would press the hair in tracts *a* and *b* against the buried free ends of the locks *e* and *f* at the same time that the intermediate tufts are combing against the base portions of the locks *e* and *f* encountering resistance due to the holding of said free ends so that the bristles of the intermediate tufts, flexing, might slip over the locks whose ends are buried, without straightening them.

With the spiral arrangement of bristle tufts, as provided in the subject invention, the leading tufts *g* engage the buried ends of the lock *e*, releasing them before the intermediate tufts *h* engage the base portions. The intermediate tufts *i* also engage the base portions of the lock *f* before the trailing tufts *k* have put any pressure upon the tract *a*, and the ends of the lock *f*, being loosely buried beneath the tract *a*, permit the lock *f* to be drawn out by the intermediate tufts *j*, without opposing much resistance. More perfect combing action thus results than is possible with the brushes of the hereinbefore mentioned Aufesser and Weber patents.

The fact that the initial penetration of the bristle head into the hair mass devolves upon only a few bristle tufts at a time in the foremost row of bristle tufts, causes the brush to encounter less resistance than if a greater number of bristle tufts were involved, permitting deeper penetration and also determining the depth at which the brush journals itself in the hair, the succeeding rows

following in the furrow progressively opened by the foremost row.

In addition to its combing and brushing functions, the subject brush when applied to wavy hair also assists in setting the wave. Wavy hair is reluctant to arrange itself in the direction prescribed by the passage of the combing tufts, but with an ordinary comb or a combing brush of the type described in the above mentioned patents wherein the teeth or bristle tufts act simultaneously upon the wave along the entire combing front, the small side by side groups of hair simultaneously released when the comb or brush is lifted are constrained to fall into the passages in the hair mass vacated by the teeth or bristle tufts. This tends to impair the wave. In the brush of the present invention, the hair groups are progressively lifted by the bristle tufts and therefore have room to freely spring laterally in assuming their natural wavy position of repose. When released from the rows of bristle tufts upon the lifting of the brush they are more or less in conformation with the spiral contour of said rows, thus tending to preserve or improve the wave.

The groove 6 in the back of the brush preferably follows the pitch of the spirals of the rows of bristle tufts, so that in any transverse section through the brush, excepting at the extreme ends of the bristle head, said groove is symmetrical with respect to the median line of symmetry of the bristle head in that section. This gives the core of the brush the maximum aggregate longitudinal rigidity.

Referring now to that form of the invention shown in the group of Figures 4 to 7, inclusive, the same principle of construction is involved as in the first described modification, the main difference being that while in the first described form the radii of the bristle tufts meet in an axis which is substantially within the mass of the core, the radii of the bristle tufts of this modification terminate at a point which is some distance outside of the mass of the core 15, as indicated in Figure 7. Therefore, the bristle face of the bristle head 16 as well as the core face 17, are arcs of larger circles than the corresponding parts of the first described form of the invention. This gives a smaller amplitude of manipulation to the brush; otherwise, the structural features are similar. The parallel rows 8 of bristle tufts are spirally arranged about the transverse convex core face 17. The rows are relatively divergent and the bristle tufts 9 are of substantially the same length. The bristle head is of uniform width throughout its length, except at the extreme ends. The core 15 has a groove 18 in the back with a spiral pitch corresponding to the pitch of the rows of bristle tufts.

In Figure 10 a further modified form of brush is shown embodying the spiral row principle and which is structurally similar to the foregoing forms, excepting that the bristle tufts 9 of each row are differentiated into groups of several each, the tufts which constitute a group being in a line parallel to the axis of rotation of the brush and the groups 19 of a row being progressively spirally offset. The only difference in operation between this brush and those previously described is that

instead of the bristle tufts of a row progressively coming into combing action with the hair, one tuft at a time, they progressively engage the hair a group of tufts at a time, the engagement being simultaneous as to all the tufts of a group.

In functions and in mode of operation, the brushes of the three herein described modifications are similar.

While I have in the above description disclosed what I believe to be a preferred and practical embodiment of the invention, it will be understood to those skilled in the art that the specific details of construction and arrangement of parts are by way of example and not to be construed as limiting the scope of the invention defined in the appended claims.

What I claim as my invention is:

1. A hair brush of the type manipulated by a rotary wiping movement through the hair, comprising a handle and a core forming a longitudinal extension of the handle, said core having a transversely convex face, the arcuate amplitude of said face being less than the transverse perimeter of said core, a bristle head emanating from said core face comprising a plurality of relatively divergent rows of bristle tufts secured to said core face, including the leading and trailing rows, along parallel lines inclined with respect to longitudinal elements of said core face.

2. A hair brush as claimed in claim 1, said bristle tufts being of substantially equal length, whereby in the aggregate their ends form a transversely convex bristle face.

3. A hair brush as claimed in claim 1, said bristle tufts being of substantially equal length whereby in the aggregate their ends form a transversely convex bristle face, said bristle face being of substantially uniform width throughout the length of said bristle head.

4. A hair brush as claimed in claim 1, said bristle tufts being of substantially equal length whereby in the aggregate their ends form a transversely convex bristle face of substantially uniform width throughout the length of said bristle head, said bristle tufts radiating from a common axis.

5. A hair brush having a convex bristle face which forms a concave seat in the hair mass and which seat, and the translatory movement of the axis of said brush, are mutually modified by rotation of said brush, said brush including a core having a transversely convex face and a bristle head emanating therefrom comprising a plurality of relatively divergent rows of bristle tufts secured longitudinally to the face of said core along parallel spiral lines, said bristle tufts being of substantially equal length, said bristle face being of substantially uniform width substantially throughout the length of said bristle head, the back of said core having a longitudinal groove with a spiral pitch corresponding to that of the rows of bristle tufts, whereby said groove is symmetrical with respect to the medial lines of symmetry of said bristle head in all cross-sections through that part of said bristle head which is of uniform width.

FRED HERMANN LOTTERS.