

[54] **ELECTRICALLY DRIVEN AND HEATED  
HAIR TREATING DEVICE**[75] Inventor: **Joseph P. Scivoletto**, Brooklyn, N.Y.[73] Assignee: **Malibu Personal Beauty Products,  
Inc.**, New York, N.Y.[22] Filed: **Dec. 28, 1973**[21] Appl. No.: **429,630****Related U.S. Application Data**[63] Continuation of Ser. No. 323,246, Jan. 12, 1973,  
abandoned.[52] U.S. Cl. .... **132/11 A**[51] Int. Cl. .... **A45d 24/00**[58] Field of Search ..... 132/11 R, 11 A, 9, 34 R,  
132/36, 118; 128/51, 52, 2; 15/22, 22.3[56] **References Cited****UNITED STATES PATENTS**

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*Primary Examiner*—G. E. McNeill*Attorney, Agent, or Firm*—Roylance, Abrams, Berdo  
& Kaul[57] **ABSTRACT**

A drive motor that is adapted to be electrically driven is mounted in a first, hollow housing together with a gear train that is responsive to the energization of the motor. A second hollow housing having at least one elongated, axially extending slot through the wall thereof is coupled to the output gear of the gear train for rotation together therewith. One or more combs or brushes equal in number to and aligned with the slots in the housing, are loosely mounted on a drive shaft that is eccentric with the rotational axis of the output gear. When the motor is energized the second housing will rotate about the axis of the output gear and the combs, because of their eccentric mounting, will be continually moved inwardly and outwardly relative to the outside surface of the second housing. In this manner entanglement of the hair will be prevented. In addition, means are provided for reversing the direction of rotation of the second housing so that the device may be used with either hand and on opposite sides of the head. A heater, a fan and a thermostat may be included in the first housing in order to heat the combs or brushes.

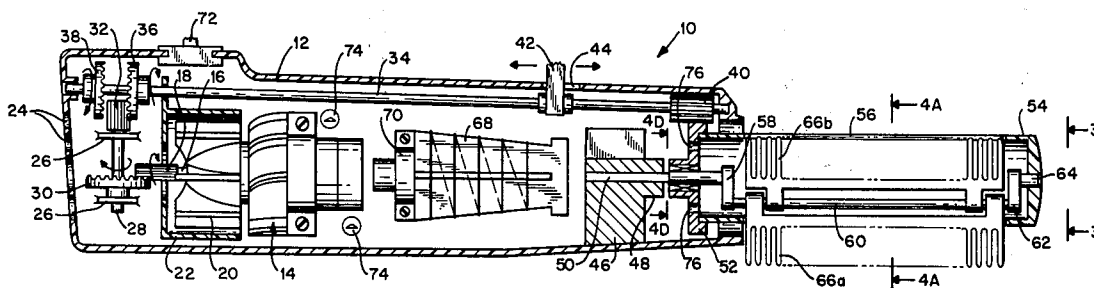
**8 Claims, 10 Drawing Figures**

FIG. 2

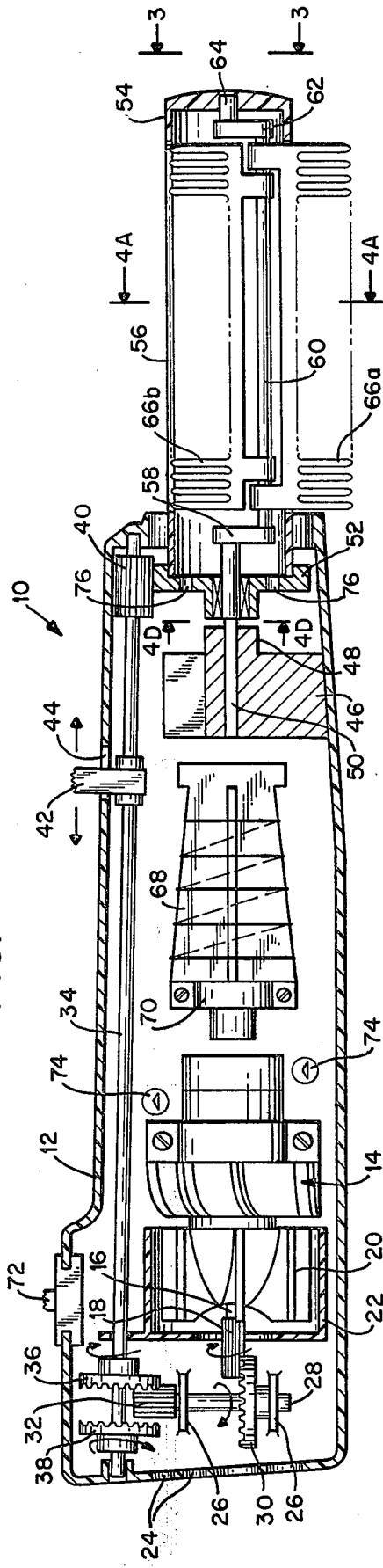


FIG. 6

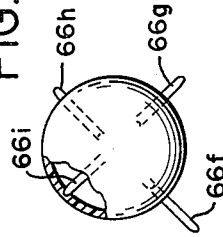


FIG. 5

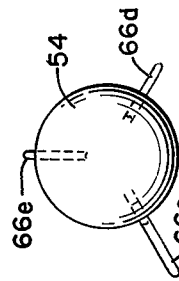


FIG. 4A

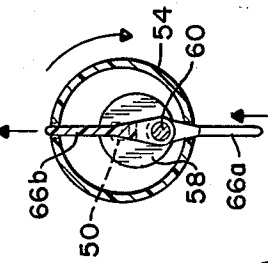


FIG. 4C

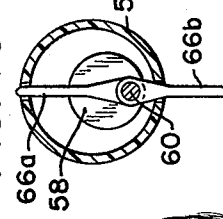


FIG. 4B

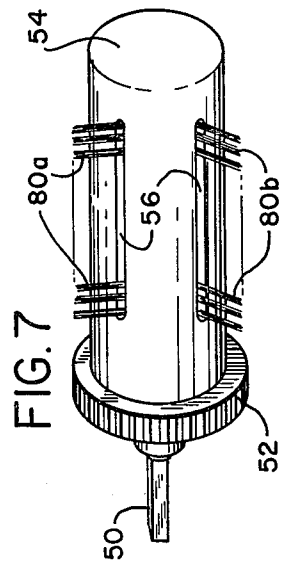
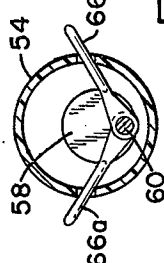


FIG. 4D

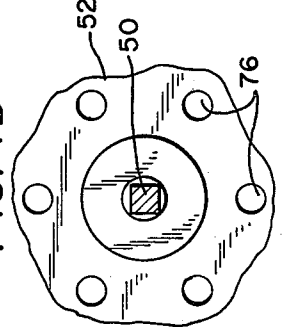
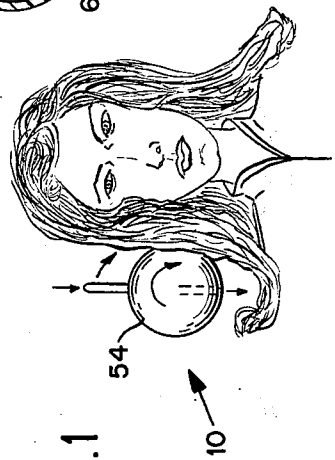


FIG. 1



## ELECTRICALLY DRIVEN AND HEATED HAIR TREATING DEVICE

This is a continuation, of application Ser. No. 323,246 filed Jan. 12, 1973, now abandoned.

The aforementioned Abstract is neither intended to define the invention of the application, which of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates generally to hair grooming devices and more particularly to a heated, electrically driven rotating comb or brush.

#### 2. Description of the Prior Art

It has been known that by using the combination of heat air and a rotating brush or comb, hair can be more effectively groomed. However, the prior art devices presently known have not been able to provide the efficiency of elongated bristles normally associated with a brush or the plurality of parallel teeth that are normally associated with a comb in a rotating heated device because of the possibility of the hair becoming entangled. One example of a prior art device that attempted to overcome this problem is disclosed in U.S. Pat. No. 3,491,774 issued on Jan. 27, 1970 to Anthony Carbone. The issued patent provides a hollow drum that is motor driven and through which heated air may be passed. The drum is provided with a sleeve on the outer surface thereof so as to engage but only apply a frictional tension to the hair. As an alternative embodiment, the patentee states that the drum may be provided with a multiplicity of small projections or bristles. However, it is clearly pointed out in the patent that the bristles must be relatively short and serve only to increase the frictional resistance with respect to the hair. The aforementioned patent therefore does not teach the use of conventional, elongated teeth or the like such as are associated with a comb or a brush.

### SUMMARY OF THE INVENTION

The present invention overcomes the short comings of the prior art by providing at least one comb or row of bristles that is displaced eccentrically about the axis of an output gear in the gear train of a drive motor. The combs are disposed in a slotted housing that rotates concentrically with the axis of the output gear so that the teeth of the combs or the ends of the bristles, move inwardly and outwardly, under the influence of their eccentric mounting, with respect to the outer surface of their housing. In this manner entanglement of the hair is avoided.

Another feature of the present invention is the provision of means for reversing the direction of displacement of the combs or bristles. Thus, the present invention may be used with equal facility by either a right handed or left handed individual and may be used on opposite sides of the head with the assurance that the combs will always be displaced in a direction away from the scalp. A heater, a fan and a thermostat may be provided within the hollow handle of the device so that heated air may be blown over the comb or bristles during the displacement thereof.

Accordingly, it is an object of the present invention to provide an improved, electrically driven hair treating device.

It is another object of the present invention to provide a device, as described above, that can be displaced in either of two angular directions.

Still another object of the present invention is to provide means for heating the device while it is being displaced.

These and other objects, features and advantages of the present invention will, in part, be pointed out with particularity, and will, in part, become obvious from the following more detailed description of the invention, taken in conjunction with the accompanying drawing, which forms an integral part thereof.

### BRIEF DESCRIPTION OF THE DRAWING

In the various figures of the drawing like reference characters designate like parts.

In the drawing:

FIG. 1 is a schematic view illustrating the manner of use of the hair treating device comprising the present invention;

FIG. 2 is a longitudinal, sectional view through the hair treating device comprising the present invention; FIG. 3 is an end view taken along lines 3—3 of FIG. 2;

FIG. 4A is a transverse sectional view taken along lines 4A—4A of FIG. 2;

FIGS. 4B and 4C are views similar to FIG. 4A that show alternative positions of the combs used with the present invention;

FIG. 4D is a transverse sectional view taken along lines 4D—4D of FIG. 2;

FIG. 5 is an end view similar to FIG. 3 but illustrating the present invention with a plurality of combs equally spaced apart in an angular direction;

FIG. 6 is a view similar to FIG. 5 illustrating the present invention with four combs equally spaced apart in an angular direction; and

FIG. 7 is a perspective view of a bristle attachment for the present invention.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring first to FIG. 1 there is shown hair treating device 10 comprising the present invention. As will be explained more fully hereinafter, the device 10 which in the first embodiment is in the form of a comb may be used with either hand and on either side of the individual's head with the combs being displaced in a direction so as to move along the strands of hair away from the scalp.

The comb 10, which is more completely shown in FIG. 2, is comprised of a first hollow housing 12 that preferably is made of a suitable insulating plastic and which further comprises the handle of the device. A motor, generally designated by the reference character 14 is suitably mounted in the first housing 12 and is provided with an output shaft 16 having an output pinion 18 secured thereto in any suitable manner.

The output shaft 16 of the motor 14 rotatably supports a fan 20 that is disposed within a cage 22. The fan 20 is constructed so as to force the air to the right as shown in FIG. 2. For this purpose a plurality of inlet holes 24 are formed in the rear wall of the housing 12.

A pair of brackets 26 support a shaft 28 that has a first crown gear 30 mounted in any suitable manner thereon. The output pinion 18 of the motor 14 is in meshing engagement with the first crown gear 30. A

pinion 32 is rigidly secured to the shaft 28 opposite the first crown gear 30 for rotation together therewith.

An elongated shaft 34 is journaled in the housing 12 and also in a flange that forms part of the cage 22 of the fan 20. A pair of spaced apart second and third crown gears 36 and 38 are mounted on the shaft 34 in proximity to the pinion 32. The other end of the shaft 34 is provided with a drive pinion 40. Intermediate the second crown gear 36 and the drive pinion 40 there is provided, integrally with the shaft 34, a reversing lever 42 that extends through an opening 44 formed in the wall of the housing 12. As will be described more fully hereinafter, the reversing lever 42 is used to axially displace the shaft 34 so that either one of the second or third crown gears 36 or 38 may be placed in meshing engagement with the pinion 32. For this purpose the inner end of the lever 42 may be forked so as to straddle an annular groove in the shaft 34. Thus, the lever 42 will not rotate with the shaft 34 but may be used to selectively displace the shaft 34 in both axial directions as shown by the arrows in FIG. 2.

In the housing 12 there is formed an integral web 46 having a hub 48 in which a non-rotatable shaft 50 is releasably secured by means of a ball and detent arrangement (not shown). By means of a bearing a spur gear 52 is loosely mounted on a circular portion of the shaft 50 and is in meshing engagement with the pinion 40. As shown in FIG. 2 the axial dimension of the pinion 40 is somewhat larger than the width dimension of the spur gear 52 so that, regardless of the position of the shaft 34, the pinion 40 will always be in meshing engagement with the gear 52. A second hollow housing 54, preferably made of plastic, is rigidly secured to the face of the spur gear 52 as shown in FIG. 2. The housing 54 is provided with a plurality of elongated axially extending slots 56 through the wall thereof. There may be 1, 2, 3 or more of the slots 56 formed in the housing 54 as will be explained hereinafter. A crank arm 58 is rigidly secured to one end of the shaft 50 so as to support a second shaft 60 eccentrically with respect to the shaft 50. A second crank arm 62 is rigidly secured to the opposite end of the second shaft 60 and is provided with a third shaft 64 that is mounted in the end of the housing 54. In the embodiment illustrated in FIG. 2 there are two combs 66A and 66B loosely mounted 180° apart on the second shaft 60.

The comb 10 may also be provided with a conventional heater mechanism 68 and a thermostat 70. The motor 14 is electrically connected to a switch 72 mounted on the housing 12 of the comb 10 with the switch 72 being adapted to be connected to a suitable source of current. Preferably diodes 74 are used in a conventional manner in the circuitry of the comb 10. When the motor 14 is energized the fan 20 will draw ambient air through the openings 24 and pass the air over the heater 68 and through a plurality of holes 76 formed in the web of the spur gear 52. The heated air is then passed over the combs 66 and outwardly of the housing 54 through the slots 56.

The mode of operation of the present invention may be more fully understood by reference to FIGS. 4A, 4B and 4C. As shown in FIGS. 4A and 4B the second shaft 60 is relatively close to the inside surface of the housing 54. In FIG. 4A the comb 66A extends substantially completely outward of the housing 54 and the comb 66B is generally flush or perhaps slightly below the outside surface of the housing 54. When the motor 14 is

energized the gear train comprising the pinion 18, the first crown gear 30, the pinion 32, the second crown gear 36, the pinion 40 and the spur gear 52 will rotate. Since the housing 54 is rigidly secured to the spur gear 52, the housing 54 will also rotate for example in clockwise direction. As the rotation continues, as shown in FIG. 4B the dimension between the slot 56 for the comb 66A and the shaft 60 will increase so that the comb 66A will be drawn inwardly relative to the outside diameter of the housing 54 and the comb 66B will move in just the opposite relative direction since the dimension between the slot 56 for the comb 66B decreases. Continued rotation will bring the combs to the position shown in FIG. 4C wherein the dimension between the slot 56 for the comb 66A and the shaft 60 is at its greatest and the comb 66A is also at its most inward position relative to the outside diameter of the housing 54. It will be noted that the comb 66B in FIG. 4C is at its most relative outward position. It will be obvious that as the rotation of the housing 54 continues the combs will not only be displaced angularly about the axis of the shaft 60 but will move inwardly and outwardly with respect to the outside surface of the housing 54.

By moving the switching lever 42, for example to the right as shown in FIG. 2, the second crown gear 36 will be disengaged from the pinion 32 and the third crown gear 38 will be placed in engagement with the pinion 32. This will cause an oppositely directed rotation of the first shaft 34, the pinion 40, the spur gear 52 and hence the second housing 54 together with the combs 66. In this position of the switching gear lever 42 the opposite side of the hair may be combed.

FIGS. 5 and 6 illustrate, respectively, two alternative embodiments of the present invention. In the FIG. 5 embodiment three equally spaced apart combs 66C, 66D and 66E are used with a housing 54 having an equal number of equally spaced apart slots similar to the slots 56 shown in FIG. 2. The mode of operation of the FIG. 5 embodiment is the same as that described in connection with the FIG. 2 embodiment. In FIG. 6 four equally spaced apart combs labeled 66F, 66G, 66H and 66I are employed together with four equally spaced apart slots 56 in the housing 54. The FIG. 6 embodiment operates in the same manner as described hereinabove. Even more combs may be used, if desired.

Turning now to FIG. 7 there is shown a modification of the present invention that utilizes one or more brushes 80A, 80B etc. in place of the combs 66A, 66B etc.. The remaining structure and mode of operation is the same as described previously. That is, the brushes 80A and 80B are loosely mounted on the same type of crank arm arrangement as shown in FIG. 2. Neither the square shaft 50 nor the crank arm rotates but the spur gear 52 and the housing 54 do. Thus, the slots 56, through which the brushes 80 project, rotate with the housing 54 so that more or less of the brushes 80 project through the wall thereof. It will therefore be appreciated that the rotation of the housing 54 causes the brushes 80 (or the combs 66) to be angularly displaced about the axis of the drive shaft 60. The concurrent rotation of the housing 54 also causes displacement of the outer end of the brushes 80 (or the combs 66) with respect to the outside surface of the housing 54.

From the foregoing it will be apparent that an improved hair treating device has been provided. The combs or brushes of the present invention are not only

angularly displaced but move inwardly and outwardly with respect to the outside surface of the rotating housing in which the combs are mounted. By this means entanglement of the hair is prevented and the combs or brushes may be used with equal facility with each hand on both sides of the head. Switch means are provided for reversing the direction of the gear train of the combs in order to permit the aforesaid ambidextrous usage. A heater having an associated thermostat and a fan driven by the motor may also be employed so that hot air may be discharged through the slots in which the combs or brushes are located. One or more combs or brushes may be used with the present invention.

There has been disclosed heretofore the best embodiment of the invention presently contemplated. However, it is to be understood that various changes and modifications may be made thereto without departing from the spirit of the invention.

What I claim as new and desire to secure by Letters Patent is:

1. An electrically driven hair treating device comprising, in combination:
  - a first, hollow housing;
  - a drive motor having an output shaft and an output pinion secured thereto, said drive motor being mounted in said first housing;
  - a gear train including an input gear in meshing engagement with said drive motor output pinion and an output pinion;
  - a rotatable second, hollow housing responsive to and driven by said output pinion of said gear train, said second housing including at least one slot extending through the wall thereof;
  - a non-rotatable shaft mounted in said first housing and journaled in said second housing concentrically with the rotational axis thereof, said shaft having a section positioned eccentrically with respect to the rotational axis of said second housing;
  - at least one hair treating member loosely mounted on said eccentric section of said shaft and driven by said second housing, said hair treating member being in alignment with and adapted to traverse said slot; and
  - means for directing heated air out said at least one slot,
- whereby, when said second housing is driven, said hair treating member is angularly displaced by the rotational movement of said slot in said second housing to thereby cause said hair treating member to rotate about the axis of said eccentric section so

that said hair treating member moves in directions towards and away from the outer surface of said second housing and combs hair adjacent thereto and whereby the heated air contacts the hair combed by said hair treating member.

2. The hair treating device in accordance with claim 1 wherein said hair treating member is a comb.

3. The hair treating device in accordance with claim 1 wherein said hair treating member is a brush.

4. The hair treating device in accordance with claim 1 wherein said direction changing means comprises a second shaft that is driven by said gear train and an axially movable, nonrotatably lever loosely engaging said second shaft.

5. The hair treating device in accordance with claim 1 wherein said gear train further includes a gear coupled to and driven by said input gear, a pair of axially spaced apart driven gears each one of which is adapted to be selectively placed in meshing arrangement with said gear driven by said input gear, said spaced apart gears being coupled to said gear train output pinion whereby depending upon which of the two spaced apart gears is driven, said output pinion will rotate in a given angular direction.

6. The hair treating device in accordance with claim 3 wherein there are a plurality of said slots in said housing and a like number of said combs.

7. The hair treating device in accordance with claim 3 wherein there are a plurality of said slots in said housing and a like number of said brushes.

8. A hair treating device comprising:

a first, hollow housing;

a second hollow housing coupled to said first housing and rotatable relative to said first housing;

means, located in said first housing, for rotating said second housing;

means for heating air in said first housing;

means for transferring the heated air from said first housing into said second housing;

hair treating means, coupled to said second housing, for combing hair; and

means for reciprocating said hair treating means relative to said second housing as said housing rotates, said second housing having a surface defining at least one elongated slot in an axial direction for the reception of said hair treating means and for transferring the heated air entering said second housing out thereof and into contact with the hair combed by said hair treating means.

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