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Scivoletto

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[54] **HAIR STYLING APPARATUS**

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[52] **U.S. Cl.** ..... **132/11 A**; 132/9; 132/11; 132/11 A; 15/22; 132/34 R

[51] **Int. Cl.** **A45d 24/00**

[58] **Field of Search** ..... 132/11 R, 11 A, 9; 15/22; 242/74; 34/91

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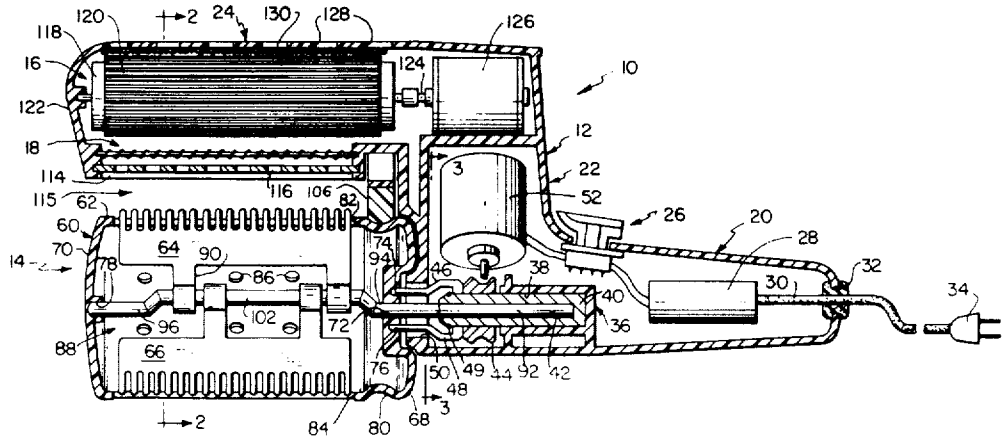
[57] **ABSTRACT**

A hair styling apparatus comprising a rotatable comb assembly and a heated air blower. The comb assembly is rotatably mounted to a housing and comprises a drum having an outer surface of revolution and hair engaging devices extending from the surface of the drum. Both the drum and the hair engaging devices are rotatably mounted on a shaft which is non-rotatably supported in the housing. A portion of the shaft within the drum is eccentric to the axis of rotation of the drum, thereby permitting the hair engaging devices to reciprocate relative to the outer surface of the drum. The hot air blower is coupled to the housing and blows heated air towards the outer surface of revolution and the longitudinal axis of the rotating drum to dry hair engaged by the hair engaging devices and wrapped around a portion of the drum.

12 Claims, 8 Drawing Figures



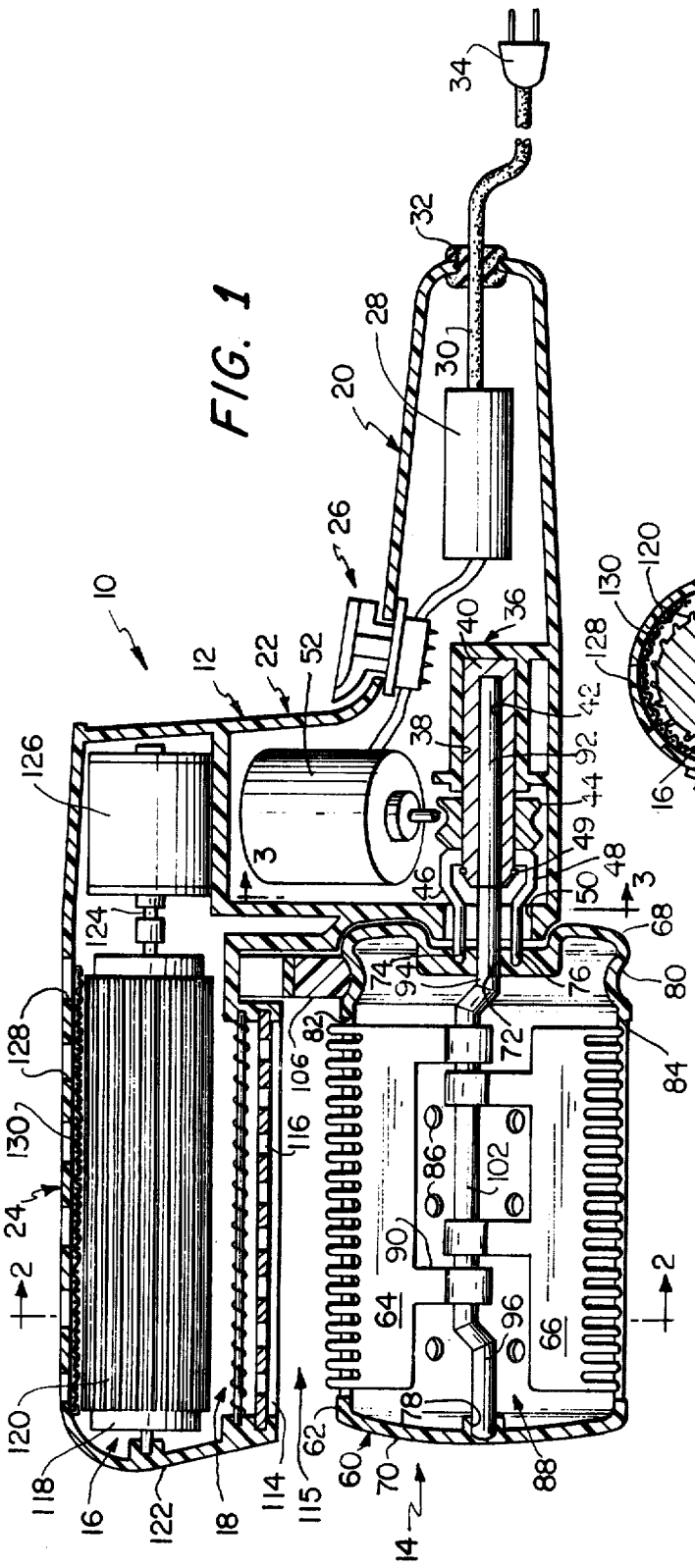


FIG. 1

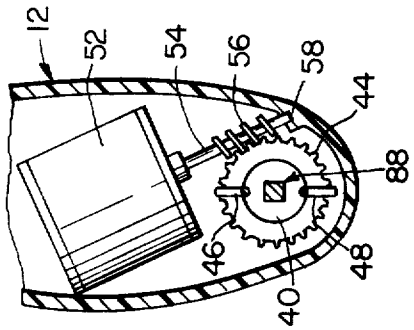


FIG. 3

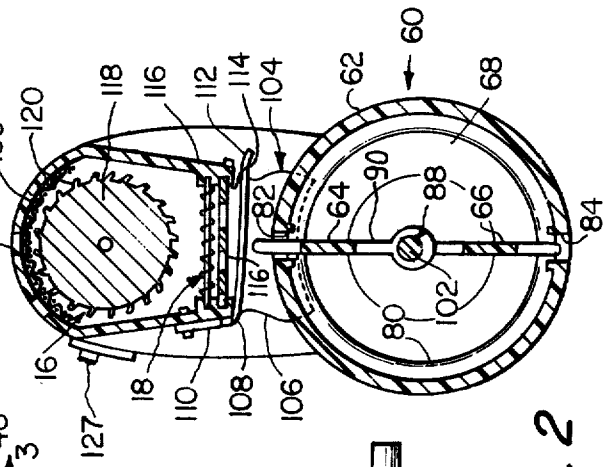


FIG. 2

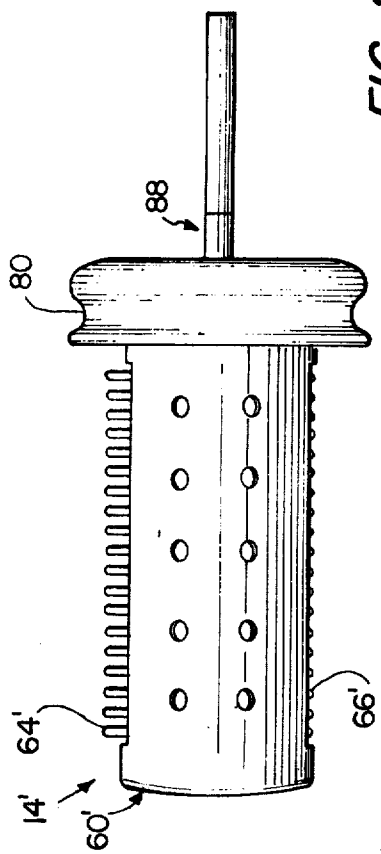


FIG. 4

FIG. 5

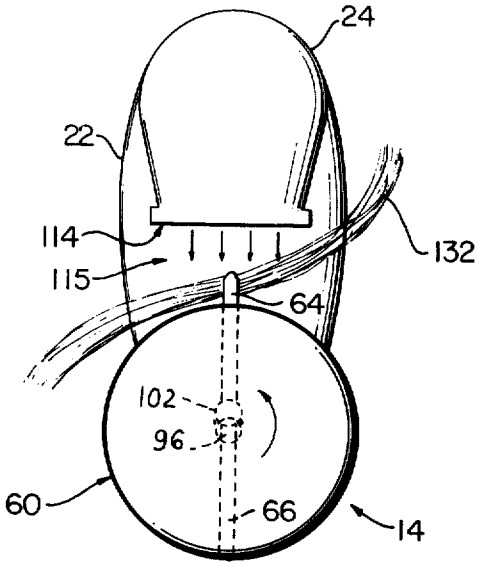


FIG. 6

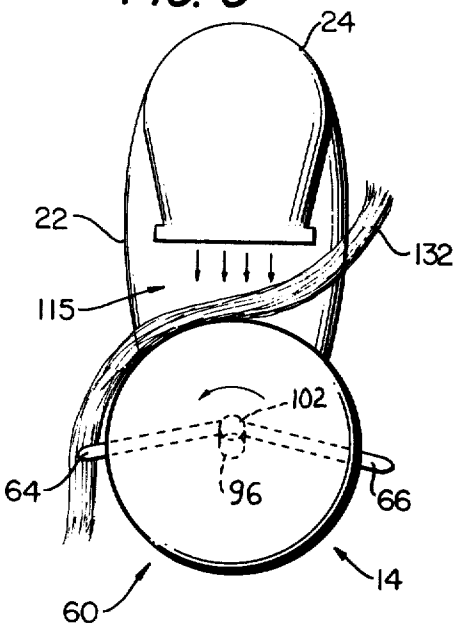


FIG. 7

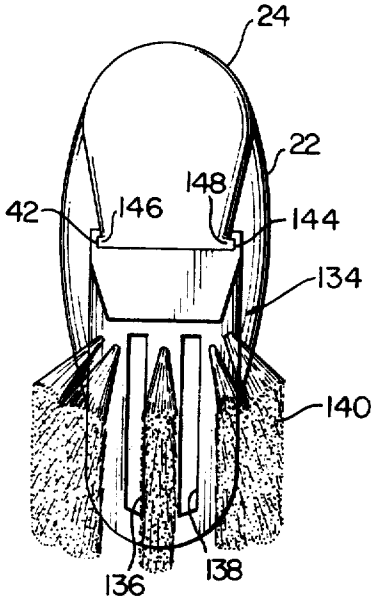
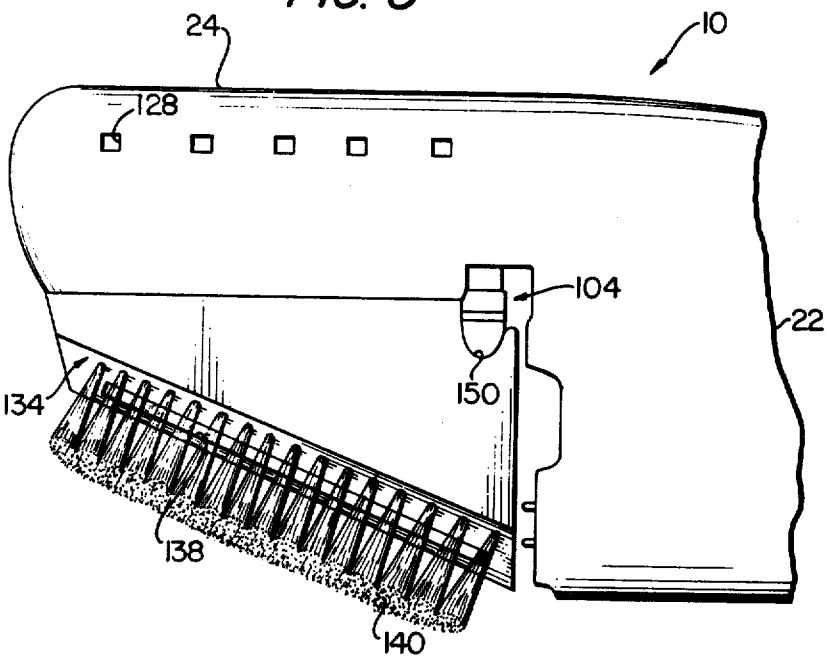


FIG. 8



HAIR STYLING APPARATUS

The present invention relates to hair styling devices and more particularly it relates to a device which includes the combination of a rotating comb assembly and a hot air blower.

In recent years, the use of a hot air blower for styling hair has become very common. Basically, the advantage of styling the hair with a hot air blower is that when the hair is tensioned by means of engagement with a brush or comb and hot air is blown onto the tensioned hair, the hair tends to dry and remain in the position in which it is dried, and therefore presents the styled look.

Usually, the hot air blower is used in conjunction with a separate brush or with a brush rigidly secured to the outlet of the blower.

With the brush attached, the operator of the device merely runs the brush through the hair in a straight line with the hair simply being engaged by the brush bristles, or in a curving, flipping motion with the hair being partially wrapped around the brush, the latter manipulating being performed by a twist of the wrist. Usually, the straight manipulation is performed on the longer hair at the front or top of the head and the flipping manipulation is performed on the shorter hair at the sides or rear of the head.

However, this flipping manipulation is rather difficult for one to perform on his own head with an attached brush since the apparatus itself is rather cumbersome. Additionally, the sides and rear of one's own head are difficult to see, and, thus, it is difficult to properly manipulate this type of apparatus to style the hair in all parts of the head.

With the brush or comb separate from the air blower, the flipping manipulation is easier to perform since the brush or comb are smaller and lighter; however, the proper flipping motion is still difficult to perform due to the relative inaccessibility of the rear of one's own head.

Additionally, and perhaps more significantly, with the brush or comb unattached, the precise location of the stream of heated air is difficult to perceive and thus it is difficult for the operator to know if the stream is being properly directed onto his or her hair while it is engaged by the brush or comb.

Usually, professional barbers prefer the separate brush and blower arrangement and can readily perform the required styling operation. However, difficulties still remain for the individual person trying to style his or her own hair at home.

Therefore, it is an object of the present invention to provide an apparatus in one unit, for home use, which can be used to easily and efficiently style the hair in all locations of the head.

Another object of the present invention is to provide an apparatus in a single unit which can engage hair, wrap that hair around a drum, and subject the wrapped hair to a properly directed stream of heated air to dry the hair in the wrapped configuration, all performed with one hand and without the necessity of separately aiming the heated air stream.

A further object of the present invention is to provide a hair styling apparatus which combines a hot air blower and a rotating comb assembly for the efficient styling of hair.

Another object of the present invention is to provide a hair styling apparatus which can provide varied degrees of heat and air velocity as well as a variety of sized rotating comb assemblies.

Another object of the present invention is to provide a hair styling apparatus which is capable of use by either the left hand or the right hand.

Another object of the present invention is to provide an apparatus which includes both a rotating comb assembly and a fixed hairbrush in combination with a hot air blower.

The foregoing objects are attained by providing a hair styling apparatus formed as a unit which includes a housing; a rotatable comb assembly, coupled to the housing, for engaging and tensioning hair; a blower, coupled to the housing, for producing a stream of air directed onto the hair engaged by the comb assembly; a heater for elevating the temperature of the stream of air; and a mechanism coupled to the housing for rotating the comb assembly. The comb assembly includes a drum having an outer surface of revloution and hair engaging devices which can be reciprocated through apertures located in the outer surface of the drum. The comb assembly can be rotated clockwise or counterclockwise, as desired, and the blower and heater can be operated at two speeds and temperatures, respectively. The comb assembly can have a variety of sizes and can readily be removed from the housing for cleaning. With the comb assembly removed, a brush assembly may be coupled to the housing so that air from the blower can pass through the brush to thereby provide an alternate way of styling the hair.

Other objects, advantages and salient features of the present invention will become apparent from the following detailed description which, taken in conjunction with the annexed drawings, discloses a preferred embodiment of the present invention.

Referring now to the drawings which form a part of this original disclosure:

FIG. 1 is a vertical longitudinal sectional view of an apparatus in accordance with the present invention;

FIG. 2 is a sectional view of the apparatus shown in FIG. 1 taken along lines 2—2 in FIG. 1;

FIG. 3 is a sectional view of the apparatus taken along lines 3—3 in FIG. 1;

FIG. 4 is a front elevational view of a comb assembly and its associated shaft having a diameter reduced from the comb assembly shown in FIG. 1;

FIG. 5 is an end view of the apparatus shown in FIG. 1;

FIG. 6 is a view similar to FIG. 5 but showing the hair being engaged by the comb assembly;

FIG. 7 is an end view of the apparatus shown in FIG. 1 with a brush assembly rather than a comb assembly coupled thereto; and

FIG. 8 is a front fragmentary elevational view of the apparatus shown in FIG. 7.

Referring to the drawings in further detail, the apparatus shown in FIG. 1 is generally designated 10 and comprises a housing 12, a comb assembly 14, a blower assembly 16, and a heater assembly 18.

The housing 12 is preferably formed from two molded plastic pieces which fit together to form a hollow enclosure. The housing comprises a hollow handle section 20, a hollow motor section 22 perpendicular to the handle section and a hollow blower section 24 ex-

tending from the top of the motor section in a direction substantially parallel to the handle section.

Located in the top of the handle section **20** adjacent the connection with the motor section **22** is a switch **26** coupled to an electronic speed regulator **28** located within the handle section and having an electrical cord **30** extending therefrom and out the butt of the handle section **20** via outlet aperture **32.** At the end of the cord **30** is a conventional plug **34** receivable in an ordinary electrical outlet. Preferably, the switch **26** and its associated electrical components allow the operator to have the comb assembly **14** rotate in one direction when the switch is pushed in that direction and in an opposite direction when the switch is pushed in the opposite direction. The preferred speed of rotation is 40 r.p.m.

Additionally, the switch can be of the "spring return" type so that it returns to the OFF position when pressure is relieved therefrom.

Formed within the bottom of the handle section **20** is a rigid support **36** defining an elongated open ended bore **38.** Rigidly secured in the bore is a metal cylindrical socket **40** having an open ended longitudinal bore **42** therein, the bore having a square cross section. Rotatably mounted on the portion of the socket **40** extending from the bore **38** is a gear **44** having two prongs **46** and **48** extending outwardly from one side thereof. These prongs extend from the front end of the handle section **20** through a circular aperture **50.** A washer **49** is connected to the socket **40** and secures the gear onto the sprocket.

Suitably supported within the housing **12** in the motor section **22** is a first direct current motor **52,** which as seen in FIG. **3,** is tilted relative to the axis of the gear **44.** At the end of the shaft **54** of the motor **52** is a worm gear **56** which engages the gear **44.** An end of the worm gear **56** is conveniently journalled in bore **58** located in the side of the handle section **20** of the housing. Rotation of the worm gear **56** in a first direction causes a concomitant rotation of the gear **44** and prongs **46** and **48** and rotation of the worm gear in the opposite direction causes these elements to rotate in an opposite direction. The switch **26** operates the motor **52** in the desired direction.

The comb assembly **14** comprises a substantially cylindrical drum **60** having an outer surface of revolution **62** and hair engaging devices **64** and **66.** These hair engaging devices can either be the bristles of a comb or of a brush as long as they are capable of engaging and frictionally tensioning hair which is manipulated into contact therewith. Although only two devices are shown, this is by way of example only, any desired number being usable.

The drum **60** has a rear end **68** and a front end **70,** each of these ends being connected to opposite ends of the outer surface of revolution **62.** The rear end **68** has a central aperture **72** therein as well as two blind bores **74** and **76,** each of which receives one end of the prongs **46** and **48** as will be described in more detail hereinafter. The front end **70** has a central blind bore **78** on the inside thereof.

The outer surface of revolution of **62** of the drum has a circumferential groove **80** therein located adjacent the rear end **68.** Additionally, as best seen in FIG. **2,** diametrically opposed slots **82** and **84** are formed completely through the substantially cylindrical wall of the drum for the reception of the hair engaging devices **64** and **66.** These slots or apertures are both parallel to the longitudinal axis of the drum **60** and extend from in front of the groove **80** to the front end **70** of the drum. Additionally, formed throughout the surface of the drum are a plurality of orifices **86** which facilitate air flow through the drum.

Each hair engaging device is rotatably mounted within the drum **60** on shaft **88** by receiving extensions **90** thereon.

The shaft **88** has four sections, the first section **92** having a square cross-section and fitting within the square bore **42** in the socket **40** thereby preventing rotation of the shaft **88.** The second section **94** extends from the first section through central aperture **72** in the rear end **68** of the drum **60** thereby allowing the drum to rotate relative to the shaft. The third section **96** is received in the central blind bore **78** in the front end **70** of the drum **60** and allows the drum to rotate around it.

The fourth section **102** of the shaft **88** is located between the second and third sections, is laterally displaced therefrom, and is parallel thereto over most of its length. Thus, the first, second and third sections of the shaft **88** are all oriented along the same line which is the axis of rotation of the drum **60;** however, the fourth section **102** is laterally displaced from that axis of rotation and forms the axis of rotation of the hair engaging devices **64** and **66.** Although the first section has a square cross section, the second, third and fourth sections have a circular cross section to allow the drum and the hair engaging devices to easily rotate thereabout.

As best seen in FIG. **2,** a spring loaded detent **104** is coupled to the blower section **24** of the housing and releasably engages and is received in the groove **80** formed in the outer surface of revolution **62** of the drum in order to keep the comb assembly **14** and the shaft **88** coupled to the housing **12.** The detent is formed from a first member **106** and a second member **108.** The first member is preferably formed of plastic and has a width, as shown in FIG. **1,** substantially equal to the width of the groove **80** and has at its bottom a curvature consonant with the radial curvature of the groove itself. If desired, friction reducing material such as TEFLON can be secured to the bottom of the first member so as to reduce the friction between the member and the rotating drum. The second member **108** is a metal leaf spring fixedly secured along its midsection to the top of the first member and having one end **110** secured, as by riveting, to the side wall of the motor section **22** and a second end **112** extending outwardly from the opposite end of the first member **106.** Preferably, the second end **112** is slightly curved downward so as to be readily engagable by a finger of the operator of the apparatus.

In order to remove the comb assembly **14** and the shaft **88** from the position shown in FIG. **1,** the detent **104** is moved upwardly by means of pressure being applied to the second end **112** until the bottom of the first member **106** is clear from the groove located in the outer surface of revolution of the drum. Then, the comb assembly and shaft may be pulled directly from the housing **12.** In order to replace the comb assembly and shaft, this operation is reversed.

Referring now to FIGS. **1** and **2,** an elongated slot **114** is formed in the bottom of the blower section **24,** the slot extending substantially parallel to the axis of

rotation of the drum **60** and being spaced from the outer surface of the drum. A space or slot **115** is thereby defined between the bottom of the blower, the detent **104** and the surface of the drum.

Received in the slot **114** and extending across it is a metal screen **116** which is supported in slots located in the inside of the side walls forming the blower section **24.** Located above the metal screen is the heater assembly **18** which is formed of metal wires connected to an electrical source such that the wires are heated by means of resistance heating.

Rotatably mounted within the blower section **24** is the blower assembly **16** which is formed in a fan configuration and comprises a cylindrical member **118** and a plurality of elongated projections **120** extending from the surface thereof at an angle to the radius of the cylindrical member. The member **118** is rotatably mounted in the blower section along an axis which is substantially parallel to the axis of rotation of the drum **60.** The cylindrical member is journalled at one end in the front end **122** of the blower section and is coupled to a shaft **124** at its other end, the shaft being part of the second direct current motor **126** which is suitably supported in the rear of the blower section **24** substantially above the first motor **52.**

Formed in the top surface of the blower section **24** are a plurality of slots **128** which allow ambient air to be drawn in by the rotation of the blower assembly and then directed downwardly by means of the walls of the blower section **24** across the heater assembly **18** and then out the slot **114** from the blower section **24** towards the shaft **88** in the drum. Preferably, a second screen **130** is suitably supported on the inside of the top of the blower section **24** covering the slots **128** so as to prevent unwanted articles or hair from being drawn into the rotating blower assembly **16.**

As shown in FIG. **1,** the ends of the prongs **46** and **48** are received in the blind bores **74** and **76** on the rear end **68** of the drum when the rear end of the first section **92** of the shaft is fully received in the socket **40** and the detent **104** is engaged in the groove **80** of the drum. Therefore, when the motor **52** is actuated, rotation of the shaft **54** thereof will cause the drum to rotate. Since the hair engaging devices **64** and **66** are rotatably mounted on the fourth section **102** of the shaft and have their ends extending into the slots **82** and **84** in the outer surface of revolution of the drum, rotation of the drum causes the hair engaging devices to rotate with the drum. However, since the hair engaging devices are rotatably mounted along the laterally displaced or eccentric part of the shaft **88,** when the drum rotates, the hair engaging devices will not only rotate with the drum but will reciprocate in and out relative to the outer surface of revolution because the axis of rotation of the drum is different from the axis of rotation of the hair engaging devices.

Heater assembly **18** and motor **126** are connected to a two position switch **127** (FIG. **2**) of conventional type which is, in turn, connected to the source of power at regulator **28,** switch **127** being connected to select either one of two voltages for connection to heater **18** and motor **126.** This arrangement permits the device to be operated in a high heat and high blower speed mode, or in a low heat and low blower speed mode.

In use, the person desiring to style or dry his or her hair first determines whether he or she desires a high speed and high heat from the blower assembly or a low speed and low heat. It is contemplated that the higher speed and heat will be used initially to partially dry the hair and then the lower speed and lower heat will be used to finish the styling of the hair. Once this is determined, the operator of the apparatus merely turns on the motor **126** and the heater assembly **18** to the desired speed and temperature and grasps the apparatus by means of the handle **20.** The operator next determines which way the comb assembly is to be rotated, taking into account the side of the head to be styled and the hand in which the operator will be holding the apparatus and turns on motor **52** accordingly by manipulating switch **26.**

Once the heater assembly and blower assembly are operating and the comb assembly is rotating, the operator of the apparatus places the outer surface of revolution of the drum adjacent the head as shown in FIG. **5** with the blower assembly **16** oriented substantially as shown therein. The rotation of the comb assembly **14** in the direction indicated in FIG. **5** causes the hair engaging device **64** protruding from the outer surface of the drum to frictionally engage and begin to tension the hair, generally designated **132,** and pull the hair outward from the head and under the heated air flow emanating from slot **114** from the blower section **24** and traversing slot **115.** With the apparatus held in the same position, the continued rotation of the comb assembly **14,** as shown in FIG. **6,** pulls the hair **132** and wraps the hair around the outer surface of the drum as the hair engaging device **64** rotates from the position shown in FIG. **5** to that shown in FIG. **6.** Thus, the hair is pulled and wrapped around the drum as it is exposed to the heated air emanating from the blower section **24.** This cycle is repeated in each individual area of the head as long as desired and until those desired portions of the hair are styled or dried. If the hair is extremely long, it may be manually separated into locks and placed into slot **115,** with the operation of the blower assembly and the comb assembly being substantially the same as outlined above.

In this manner, the individual may completely style all areas of the head by merely manipulating one instrument, i.e., the combined blower and hair engaging device, rather than attempting to manipulate two instruments consisting of a separate blower and a separate brush or comb.

Since the hair engaging devices reciprocate in and out of the slots in the drum, hair engaging device **66** moves from the position shown in FIG. **5** to that in FIG. **6** so that it now begins to engage the hair tensioned by the other hair engaging device **64.**

As shown in FIGS. **1** and **2,** the hair engaging device **66** is retracted substantially within the slot **84** while the hair engaging device **64** is extending therethrough. Thus, each time a complete revolution is made of the drum, each of the hair engaging devices is pulled within the slot, thereby providing a means for cleaning each device of any broken hair connected thereto and also preventing the hair from becoming completely wrapped around the drum and possibly being pulled from the head.

Referring now to FIG. **4,** a comb assembly **14'** is shown having an outside diameter of its drum **60'** which is substantially less than the outside diameter of the drum shown in FIG. **1.** It is contemplated that since hair on the head in various locations is of a different length that one sized comb assembly would not be suffi-

cient. Therefore, both the hair engaging devices **64'** and **66'** and the drum **60'** are reduced in size. Additionally, since the different sizes are provided, people having various lengths of hair may utilize one overall apparatus.

Furthermore, it is contemplated that use of the larger diameter drum would create straighter hair since the radius of the drum would be larger and that curlier hair can be provided when using the smaller diameter drum since its radius is smaller.

In any event, the comb assembly **14'** shown in FIG. **4** is usable in substantially the same manner as that described above with regard to the comb assembly shown in FIG. **1** and all of the remaining parts are the same, the only difference being that the radius of the drum **60'** is reduced at a point substantially adjacent the front edge of the groove **80** which remains at the same diameter so that it can be engaged by the detent **104.**

As shown in FIGS. **7** and **8,** it is also contemplated that when the comb assembly **14** is removed, a brush assembly **134** can be mounted on the bottom of the blower section **24** in place thereof. The brush assembly is hollow and has two slots **136** and **138** on its bottom surface thereof so that air heated by the heater assembly **18** and blown downwards by the blower assembly **16** would pass therethrough and dry the hair while the brush bristles **140** connected to the outside of the brush assembly **134** engage and brush the hair.

As shown in FIG. **7,** the brush assembly has two opposing slots **142** and **144** in the top thereof for the reception of elongated extensions **146** and **148** formed on the outside of the walls of the blower section **24** adjacent the slot **114** therein.

As seen in FIG. **8,** the detent **104** is receivable in a groove **150** in the upper right corner of the brush assembly **134** so as to removably retain the brush assembly in the position shown in FIG. **8.**

Although the utilization of the brush assembly **134** in place of the comb assembly **14** will not accomplish the results obtained by the comb assembly, it is contemplated that the use of the brush assembly in conjunction with the comb assembly will provide a full range of drying and styling capabilities to the overall apparatus.

While one advantageous embodiment has been chosen to illustrate the invention, it will be understood by those skilled in the art that various changes and modifications can be made therein without departing from the scope of the invention as defined in the appended claims.

What is claimed is:

1. A hair styling apparatus comprising the combination of:
- rotatable comb assembly means, having an axis of rotation and an outer surface, for engaging and tensioning hair;
- blower means for producing a stream of air;
- heater means for elevating the temperature of said stream of air;
- a housing including
  - means for rotatably supporting said comb assembly means,
  - means for enclosing said blower means and for directing said stream of heated air toward the outer surface of said comb assembly means to dry the hair engaged and tensioned by said comb assembly means, and
  - a handle; and
  - means within said housing for rotating said comb assembly means so that the hair is wrapped thereabout.

2. An apparatus according to claim **1** wherein
- said means for enclosing and directing includes means defining an elongated slot extending substantially parallel to said axis of rotation for directing said stream toward said axis.

3. An apparatus according to claim **1** wherein said comb assembly means comprises
- a drum having a cylindrical outer surface of revolution and
- hair engaging devices extending from said outer surface.

4. An apparatus according to claim **3** wherein said means for rotatably supporting said comb assembly means comprises
- a shaft coupled to said housing and fixed against movement relative to said housing.

5. An apparatus according to claim **4** wherein
- said drum is rotatably mounted on said shaft about a first axis of rotation and
- said hair engaging devices are rotatably mounted on a second axis of rotation on a portion of said shaft laterally displaced from said first axis of rotation,
- said outer surface defining aperture means for receiving said hair engaging devices.

6. An apparatus according to claim **4** wherein
- said outer surface defines aperture means for receiving said hair engaging devices, and
- further including means for reciprocating said hair engaging devices through said aperture means.

7. An apparatus according to claim **6,** wherein said means for reciprocating comprises
- a portion of said shaft located within said drum and laterally displaced from the axis of rotation of said drum.

8. An apparatus according to claim **3** and further including
- means for reciprocating said hair engaging devices relative to said outer surface.

9. An apparatus according to claim **2,** wherein
- said means defining an elongated slot and a portion of said outer surface of said comb assembly means define a second slot therebetween through which hair to be styled can be manipulated.

10. An apparatus according to claim **2,** wherein
- said means defining an elongated slot is spaced from said outer surface of said comb assembly means.

11. An apparatus according to claim **1,** wherein
- said blower means includes a fan member mounted in said housing for rotation about an axis parallel to and spaced from said comb assembly means axis of rotation.

12. A hair styling apparatus comprising the combination of:
- blower means for producing a stream of air;
- heater means for elevating the temperature of said stream of air;
- rotatable comb assembly means having an axis of rotation and an outer surface for engaging and tensioning hair;
- a housing including
  - means for rotatably and releasably supporting said comb assembly means,
  - a handle, and

means for enclosing said blower means and for directing said stream of heated air toward the outer surface of said comb assembly means; and

means within said housing for rotating said comb assembly means so that the hair is wrapped thereabout,

said housing further including means for releasably supporting a hollow brush assembly in said stream of heated air.

* * * * *