

PATENT SPECIFICATION (11)

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(54) HAIRSETTERS AND METHOD FOR HEATING HAIRSETTING ROLLERS

(71) We, BRISTOL-MYERS COMPANY, a Corporation organised and existing under the laws of the State of Delaware, United States of America, of 345 Park Avenue, New York, State of New York, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The hairsetters now in use employing heated hair rollers are generally one of two types. One type of hairsetter is the "dry-type" hairsetter in which the hair rollers are removably mounted on mounting posts which are heated and which heat the rollers interiorly by thermal conduction. Typical hairsetters of this type are shown in U.S. Patent No. 3,410,985 to Giaccherio, and U.S. Patent No. Re 26,766 to Jorgensen.

The other type of hairsetter is the "wet-type" hairsetter in which the hair rollers are bathed in steam or boiling water to heat them. One such hairsetter is shown in U.S. Patent No. 3,480,019 to Popeil. The "wet-type" hairsetter has the advantage that the moisture which collects on the hair rollers aids in setting the hair and also inhibits the drying of the hair which can result from the heat of the rollers. The "wet-type" hairsetter also has, however, several drawbacks. Firstly, as a result of the high temperature of the steam in which the rollers are bathed, the exterior surface of the rollers becomes quite hot and the rollers are difficult to handle. In addition, it is of course necessary to have a supply of water at hand in order to use the rollers at all. Thus, the "wet-type" hair-setter has not proven to be completely satisfactory.

This invention relates to a hairsetter in which hair rollers can be heated either interiorly by thermal conduction (for use in a "dry-setting" mode) or both interiorly by thermal conduction and exteriorly by a vaporized liquid (for use in a "wet-setting" mode). When used in a "wet-setting" mode, the rollers can have a lower surface temperature for a given amount of heat stored

in each roller than was heretofore possible. This makes the rollers easier to handle, and also promotes condensation of the vaporized liquid on the surface of the rollers thereby improving the hair setting efficiency of the rollers.

The hairsetter of the invention comprises a housing, a base plate in the housing adapted to receive and retain a quantity of liquid thereon for vaporization; a plurality of mounting posts associated with the base plate each adapted to support a hair roller in the housing in a position so as to be exposed to the vaporized liquid from the base plate; and heating means in the housing for heating the liquid retained on the base plate and the mounting posts such that each roller supported on a mounting post can be heated simultaneously interiorly by the post, and exteriorly by the vaporized liquid.

This invention also provides a method for heating hair rollers for setting hair which comprises heating the roller interiorly from an axially positioned heat source while simultaneously passing a heated fluid over the surface of the rollers to heat the rollers exteriorly and to deposit condensed fluid on the roller surface.

The invention is now described by way of example with reference to the accompanying drawings in which:

Figure 1 is a view in perspective of a hairsetter assembly in accordance with the invention;

Figure 2 is a view in cross-section taken along the line 2—2 of Figure 1;

Figure 3 is a top plan view of part of the mounting post and heating plate assembly of the invention; and

Figure 4 is a side view partially in cross-section and partially broken away of the mounting post and heating plate assembly of the invention.

The hairsetter of the invention is particularly suited for using hair rollers of the type shown in U.S. Patent No. Re 26,766 which are generally tubular and have an internal sleeve which is adapted to accommodate a heating or mounting post. Such

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rollers have an annular cavity formed between the internal sleeve and the exterior casing of the roller. This cavity is filled with a heat storage substance such as a paraffin as described in U.S. Patent No. Re 26,766.

Although the use of a heat storage substance such as referred to above is desirable, the instant invention is suitable for use with rollers which do not employ a special heat storage substance in the roller but which merely use the material of which the roller itself is made to retain the heat for setting the hair.

Rollers of the type which do not employ an internal opening for a mounting post, such as shown in U.S. Patent No. 3,410,985 to Giaccherio, but which employ a heat conducting element formed within the roller itself can also be used. Such rollers are formed with a heat conductive strip or member which fits on or in a heating element. The roller, for example, can have a heat-conducting member formed in a recess to accommodate a protruding mounting stub on the hairsetter assembly.

In the hairsetter assembly of the invention the rollers can be heated both interiorly via the central sleeve or an internal heat conducting strip as described above, and simultaneously exteriorly heated by the application of steam or a heated vapor of a hair treating agent to the exterior surface of the hair rollers. If hair treating agent is employed, it should be capable of being readily vaporized at temperatures of from about 220°F to about 400°F. Suitable treating liquids are treatment oils such as dimethyl silicones, both linear and cyclic types, high boiling point alcohols, hydroxy ethers, all preferably in aqueous solutions or suspensions. The heating of the exterior surface of the roller by the vapor or steam, combined with the interior heating by the mounting posts has several advantages. Firstly, during the "heat-up" time, the roller surface remains relatively cool permitting moisture or treating liquid to condense on the surface of the roller. The condensed liquid provides a "wet-set" which will prevent undue drying of the hair. In addition, in view of the fact that the roller can be simultaneously heated both interiorly and exteriorly, the roller is heated uniformly throughout its diameter as contrasted to a roller which is merely heated exteriorly. With such solely exterior heating, the thermal gradient would be from the exterior of the roller toward the interior, and the exterior surface would be the hottest part of the roller. As contrasted to this, with this invention since the roller is heated both from the interior and the exterior there is no significant difference in temperature between the interior sleeve and the exterior

surface. This means that for a given amount of heat stored in the roller, it will have a relatively cool surface temperature as compared to a solely exteriorly heated roller. Thus, the rollers will be able to condense and hold a greater amount of liquid on its surface. In addition, the roller will be easier to handle since its surface is cooler.

As a further feature of the invention, due to the fact that the hairsetter of the invention provides means for both interiorly and exteriorly heating the rollers, it is possible to use the hairsetter in a "dry-setting" mode, by heating the rollers interiorly by thermal conduction, such as is shown in U.S. Patent No. Re 26,766, without the application of a heated vapor or steam to the exterior of the rollers. By being able to function in this manner the instant apparatus can be used where there is no liquid available.

As more particularly described herein-after, the heating of the mounting posts or other means for heating the rollers interiorly and the heating the liquid to vaporize it and thereby heat the rollers exteriorly, can be accomplished by employing a single heat source such as a mica plate-type heater which is connected in heat conducting contact with the mounting posts, and the reservoir in which the liquid is contained.

It is also possible for the mounting posts to be heated by the treatment liquid or steam and thus be heated by the same heat source which heats the liquid in the reservoir. This can be done by heating the liquid in the reservoir and circulating a portion of the heated or vaporized liquid through channels connected to the support posts. The heated fluid can then be circulated through the support posts so as to heat them while the remaining portion of the vaporized liquid is dispersed over the surface of the rollers. If desired, apertures can be provided in the support posts to permit escape of the heated treatment liquid to the surface of the mounting posts to aid in interiorly heating the hair rollers thereby.

As a further possibility, other or additional heaters can be employed, such as coil heaters, and strap heaters to heat either the liquid in the reservoir, or the mounting posts, so that the heating of the posts and the liquid is independent of each other. Such separate heating mechanisms can be controlled by separate electrical circuits and switches which would make it possible to heat the hair rollers only from the interior, or from the exterior, or both from the interior and from the exterior.

In the preferred embodiment, it has been found desirable to employ a single heating element for both the heating of the mounting posts, and the heating of the treatment liquid in the reservoir; and to provide means to adjust the temperature which the heating

means reaches according to whether the apparatus is being used to both heat and vaporize the liquid in the reservoir and to heat the mounting posts, or merely to heat the mounting posts. This can be done merely by providing a thermostatic control associated with the heating means to sense the temperature of the support posts and automatically limit the heat applied to them according to the temperature sensed. In order to vary the temperature reached by the posts, a heat shield can be provided which is moveable over the thermostatic control in one position and away from the thermostatic control in another so that in one position the thermostat is exposed to, and senses, the temperature of the posts directly, and in a second position the thermostat is shielded from the temperature of the posts so as to permit the heating element to reach a higher temperature. This is desirable when the device is to be operated only in the "dry-setting" mode and permits a higher temperature to be reached by the support posts to decrease the time required for heating of the hair rollers to an operative temperature.

It has been found that temperatures within the range of from about 220°F to about 400°F are sufficient to vaporize the treatment liquid and heat the rollers both interiorly and exteriorly within minutes. Temperatures within the range of from 170°F to about 300°F are sufficient to heat the rollers to an effective operating temperature of at least 140°F within 10 minutes when the rollers are heated only interiorly.

The hairsetter, as shown in Figure 1, comprises a hairsetter assembly 1 having a housing 3 formed of plastics material. The housing has a transparent cover 5 which is mounted by means of a hinge 7 to the back side of the plastics housing so as to swing open to expose a plurality of the hair rollers 10 mounted within the housing on support posts 12. Each heat conducting metal support post 12 fits within a tubular sleeve 14 on the inside of each hair roller. The hair rollers are constructed substantially in accordance with U.S. Patent Re 26,766 and are filled with a heat storage material (not shown). The support posts 12 are formed at one end with a pair of annular peripheral flanges 16 which capture between them the main support plate 15 of heater assembly 13. The flanges 16 also capture an adjacent heat contact plate 19, which abuts the heating mechanism and the mounting posts 12 and insures good thermal transfer between the two. The contact plate also abuts the support plate 15 which, as will be described more particularly below, also defines a reservoir for the treatment fluid. Thus, the contact plate 19 provides good thermal transfer to the plate 15 to in-

sure efficient heating of the treatment fluid.

The plate 15 is formed with a pair of troughs 21 which are best seen by reference to Figure 3. These troughs in combination with the overall dished-shaped configuration of the plate 15, define a reservoir to contain the liquid to be vaporized. The liquid is received through a liquid inlet 22 formed at the front of the casing 1, as best seen in reference to Figure 1.

The support plate 15 is positioned in the housing by a mounting or bracket 25. The plate 15 is thermally insulated from the remainder of the housing by the mounting bracket 25, and thereby the high temperatures reached by the support plate do not affect the plastics housing in any way.

The plate 15 is shielded by a cover plate 27. The cover plate 27 has a plurality of orifices 29 therein to permit the vaporized treatment liquid to pass through the cover plate 27 to the rollers. The cover plate 27 is loosely fitted on the heating reservoir assembly 13 and has apertures through which fit the support posts so that the plate can be readily removed for cleaning of the assembly.

The housing is formed with a baffle 30 on the rear wall thereof for directing liquid which may condense on the walls of the housing down into the reservoir.

A heating element 20 is mounted beneath the plate 15. The heating element contacts the heat conducting plate 19 and transmits heat by conduction therethrough to the plate 15 and the roller posts 12. The heating element is held in position by engagement with a down-turned flange 17 on the plate 19. The heating element 20 comprises a mica plate-type electric coil heater which has a plurality of heating coils which extend over the surface of the mica plates. The temperature which the heating element 20 reaches, is controlled by a thermostat 35 mounted in the bottom of the housing 3. The thermostat 35 is operatively connected to the heating element so as to automatically cut off current flow to the heating element 20 when a predetermined temperature is reached.

As indicated above, it is desirable to change the operating temperature of the heater depending upon whether the hairsetter is to be used in the "wet-setting" mode or the "dry-setting" mode. In order to accomplish this, a heat shield 37 is provided. The heat shield 37 comprises a generally L-shaped arm 38 made of aluminum which is moveable in a slide assembly 40 mounted in a cooperating portion of the housing 3 which is formed so as to act as a guide for slideable movement thereof. The slide assembly 40 projects through slot 43 the front of the housing 3 so as to be easily accessible. The slide assembly 40 has a tab

42 on the exterior of the housing by means of which the heat shield is moved. The arm 38 is moveable with the tab 42 so that the arm 38 can be positioned over the thermostat assembly 35 and also can be moved away from the thermostat so as to expose the thermostat directly to the temperature of the heating assembly. In this way, when higher temperatures are desired, such as when the hairsetter is to be used in the "dry-setting" mode, the heat shield is moved into position over the thermostat. The shielding effect permits the heating element to reach a higher temperature than it would otherwise reach before the thermostat shuts off the current flow. When the hairsetter is to be used in the "wet-setting" mode, the shield is moved away from the thermostat and the temperature reached by the heater is thereby lowered.

In operation, if a "wet-setting" mode is desired, the slide assembly 40 is moved into the wet treatment position and a treatment liquid is poured into inlet 22. Liquid passes onto the reservoir plate 15 and as the temperature of the plate increases, the liquid is vaporized. At the same time, the support posts 12 are heated by conduction via the heat conducting plate 19. The rollers 10 positioned on the post are thereby heated simultaneously interiorly by the posts by thermal conduction and exteriorly by the treatment vapor which passes from the plate 15 through the orifices 29 in the cover plate 27. The vapor, which heats the exterior surface of the rollers, also deposits condensed treatment liquid on the exterior of the rollers to provide the liquid for a wet set of the hair. When removed from the assembly, the rollers, although having a large amount of heat stored therein, do not have an excessively high surface temperature since the heating of the rollers is accomplished both interiorly and exteriorly. If a "dry-setting" mode is desired, the slide assembly 40 is moved into the dry position in which the heat shield is over the thermostat assembly. No treatment liquid is used. The rollers are heated interiorly by the mounting posts by thermal conduction until the desired temperature is reached.

As shown in Figure 1 of the drawings partitions are provided between the ends of the housing 3 and the hair rollers 10, these partitions forming closed compartments with the cover 5 when the latter is closed. The left-hand compartment may be used to contain the cord set for connecting the socket at the base of the right-hand end of the housing 3 with an electrical power point. The right-hand compartment is divided up into pockets for hair-clips for use with the hair rollers 10. An on/off switch may be contained at the front of the right-hand compartment together with, if desired, a

light which is illuminated when the rollers are heated to the temperature required for use. Desirably the partitions form a fluid-tight fit with the cover 5.

Although the cover 5 is shown as comprising a dome having a flat top, the internal surface of the top may be formed with downwardly-pointing pyramidal projections, corresponding pyramidal indentations being formed in the external surface of the top. The apices of the pyramidal projections are arranged above and in alignment with the longitudinal axes of the posts 12. Thus vapour and/or steam condensing on the underside of the dome is directed to drip onto the rollers 10, which are themselves provided with suitably shaped conical upper ends to permit condensate to flow down over the cylindrical surface of the rollers. The front of the cover 5 is provided with two spaced-apart tabs to assist in opening the cover.

WHAT WE CLAIM IS:—

1. A hairsetter, comprising, in combination, a housing; a base plate in the housing adapted to receive and retain a quantity of liquid thereon for vaporization; a plurality of roller mounting posts associated with the base plate and adapted to support a corresponding plurality of rollers thereon in a position so as to be exposed to the liquid vaporized from the base plate; and heating means for heating the liquid retained on the base plate and the mounting posts such that the rollers supported on the mounting posts can be heated simultaneously exteriorly by the heated vaporized liquid and interiorly by the heated mounting posts.

2. A hairsetter in accordance with Claim 1, in which the base plate comprises a reservoir for the liquid and has trough-like indentations thereon.

3. A hairsetter in accordance with Claim 1 or Claim 2, in which the roller mounting posts are supported by the base plate.

4. A hairsetter in accordance with any one of Claims 1 to 3, in which the base plate is suspended in the housing in a position spaced from the walls of the housing.

5. A hairsetter in accordance with any one of the preceding Claims, including an apertured cover plate positioned above the base plate.

6. A hairsetter in accordance with Claim 5, in which the cover plate is removable.

7. A hairsetter in accordance with any one of the preceding Claims, including a heat conducting plate positioned between the heating means and the base plate and in contact with both the heating means and the base plate for transmitting heat to the base plate.

8. A hairsetter in accordance with any one of the preceding Claims, in which both



42 on the exterior of the housing by means of which the heat shield is moved. The arm 38 is moveable with the tab 42 so that the arm 38 can be positioned over the thermostat assembly 35 and also can be moved away from the thermostat so as to expose the thermostat directly to the temperature of the heating assembly. In this way, when higher temperatures are desired, such as when the hairsetter is to be used in the "dry-setting" mode, the heat shield is moved into position over the thermostat. The shielding effect permits the heating element to reach a higher temperature than it would otherwise reach before the thermostat shuts off the current flow. When the hairsetter is to be used in the "wet-setting" mode, the shield is moved away from the thermostat and the temperature reached by the heater is thereby lowered.

In operation, if a "wet-setting" mode is desired, the slide assembly 40 is moved into the wet treatment position and a treatment liquid is poured into inlet 22. Liquid passes onto the reservoir plate 15 and as the temperature of the plate increases, the liquid is vaporized. At the same time, the support posts 12 are heated by conduction via the heat conducting plate 19. The rollers 10 positioned on the post are thereby heated simultaneously interiorly by the posts by thermal conduction and exteriorly by the treatment vapor which passes from the plate 15 through the orifices 29 in the cover plate 27. The vapor, which heats the exterior surface of the rollers, also deposits condensed treatment liquid on the exterior of the rollers to provide the liquid for a wet set of the hair. When removed from the assembly, the rollers, although having a large amount of heat stored therein, do not have an excessively high surface temperature since the heating of the rollers is accomplished both interiorly and exteriorly. If a "dry-setting" mode is desired, the slide assembly 40 is moved into the dry position in which the heat shield is over the thermostat assembly. No treatment liquid is used. The rollers are heated interiorly by the mounting posts by thermal conduction until the desired temperature is reached.

As shown in Figure 1 of the drawings partitions are provided between the ends of the housing 3 and the hair rollers 10, these partitions forming closed compartments with the cover 5 when the latter is closed. The left-hand compartment may be used to contain the cord set for connecting the socket at the base of the right-hand end of the housing 3 with an electrical power point. The right-hand compartment is divided up into pockets for hair-clips for use with the hair rollers 10. An on/off switch may be contained at the front of the right-hand compartment together with, if desired, a

light which is illuminated when the rollers are heated to the temperature required for use. Desirably the partitions form a fluid-tight fit with the cover 5.

Although the cover 5 is shown as comprising a dome having a flat top, the internal surface of the top may be formed with downwardly-pointing pyramidal projections, corresponding pyramidal indentations being formed in the external surface of the top. The apices of the pyramidal projections are arranged above and in alignment with the longitudinal axes of the posts 12. Thus vapour and/or steam condensing on the underside of the dome is directed to drip onto the rollers 10, which are themselves provided with suitably shaped conical upper ends to permit condensate to flow down over the cylindrical surface of the rollers. The front of the cover 5 is provided with two spaced-apart tabs to assist in opening the cover.

WHAT WE CLAIM IS:—

1. A hairsetter, comprising, in combination, a housing; a base plate in the housing adapted to receive and retain a quantity of liquid thereon for vaporization; a plurality of roller mounting posts associated with the base plate and adapted to support a corresponding plurality of rollers thereon in a position so as to be exposed to the liquid vaporized from the base plate; and heating means for heating the liquid retained on the base plate and the mounting posts such that the rollers supported on the mounting posts can be heated simultaneously exteriorly by the heated vaporized liquid and interiorly by the heated mounting posts.

2. A hairsetter in accordance with Claim 1, in which the base plate comprises a reservoir for the liquid and has trough-like indentations thereon.

3. A hairsetter in accordance with Claim 1 or Claim 2, in which the roller mounting posts are supported by the base plate.

4. A hairsetter in accordance with any one of Claims 1 to 3, in which the base plate is suspended in the housing in a position spaced from the walls of the housing.

5. A hairsetter in accordance with any one of the preceding Claims, including an apertured cover plate positioned above the base plate.

6. A hairsetter in accordance with Claim 5, in which the cover plate is removeable.

7. A hairsetter in accordance with any one of the preceding Claims, including a heat conducting plate positioned between the heating means and the base plate and in contact with both the heating means and the base plate for transmitting heat to the base plate.

8. A hairsetter in accordance with any one of the preceding Claims, in which both



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the base plate and the mounting posts are heated by a single heating means.

9. A hairsetter in accordance with any one of the preceding Claims, including means for adjusting the temperature reached by the rollers according to whether the rollers are heated both interiorly and exteriorly, or only interiorly.

10. A hairsetter in accordance with Claim 9, in which said means for adjusting the temperature reached by the rollers comprises a thermostat and a heat shield moveable into and out of a position so as to shield the thermostat from exposure to the heat radiated from the heating element.

11. A hairsetter in accordance with Claim 10, in which the heat shield comprises a slideable arm.

12. A hairsetter in accordance with any one of the preceding Claims, in which the heating means comprises a plate-type heater.

13. A hairsetter comprising, in combination, a housing; a base plate suspended in the housing in a position spaced from the walls thereof, said base plate defining a reservoir for liquid to be vaporized; a plurality of roller mounting posts supported on said base plate, said posts being adapted to support a corresponding plurality of hair rollers in position in the housing so as to be exposed to the vaporized liquid from the base plate; a cover plate on the base plate having first apertures through which the mounting posts pass, and second smaller apertures through which the vaporized liquid passes; a heat conducting plate operatively associated with the base plate and mounted beneath the base plate in an abutting relationship thereto, said heat conducting plate also being operatively associated with said mounting posts so as to transfer heat both to the mounting posts and the base plate; and a plate-type heater mounted beneath the heat conducting plate and being adapted to heat the heat conducting plate to a temperature of at least 220°F so as to heat the mounting posts and vaporize the liquid on the base plate.

14. A hairsetter in accordance with Claim 13 including means to adjust the temperature to which the heat conducting plate is heated according to whether the hairsetter is to be used in the "dry-setting" mode or the "wet-setting" mode.

15. A process for heating hair rollers for setting hair which comprises applying heat to the hair rollers interiorly while simultaneously subjecting the exterior surface of the rollers to a heated vapor so as to heat the exterior surface of the rollers and deposit condensed vapor thereon.

16. A process in accordance with Claim 15 in which the rollers are heated to at least 140°F.

17. A process in accordance with Claim 15 or Claim 16, in which the vapor is a vaporized hair treatment liquid.

18. A process in accordance with Claim 17, in which the treatment liquid contains an oil.

19. A process in accordance with any one of Claims 15 to 18, in which the heat applied to a liquid to create such heated vapour, and the heat applied to the interior of the rollers, is supplied from a single heating source.

20. A process for heating hair rollers in accordance with Claim 15, substantially as hereinbefore described.

21. A process for heating hair rollers substantially as hereinbefore described with reference to the accompanying drawings.

22. A hairsetter in accordance with Claim 1 substantially as hereinbefore described.

23. A hairsetter substantially as hereinbefore described with reference to the accompanying drawings.

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