

PATENT SPECIFICATION

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- (21) Application No. 41885/71 (22) Filed 8 Sept. 1971
 (31) Convention Application No. 4642 (32) Filed 9 Sept. 1970 in (19)
 (33) Denmark (DK)
 (44) Complete Specification published 26 June 1974
 (51) International Classification A45D 4/16
 (52) Index at acceptance A4V 14A7
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(54) HAIRSETTING APPARATUS

(71) We, BRISTOL-MYERS COMPANY, a Corporation organised and existing under the laws of the State of Delaware, United States of America, having its principal offices at 345 Park Avenue, New York, New York 10022, 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:—

This invention relates to hairsetters.

Recently, heated hairsetters have gained great acceptance in the marketplace. Several different types of such hairsetters are commercially available, one of which employs hair rollers which are heated by a number of electrical heating pins mounted on a base. The hair rollers are filled with a heat storage material to retain the heat imparted to them by the pins. Such a hairsetter is described, for example, in U.S. Reissue Patent No. RE 26,766. Other hairsetters also are commercially available in which the rollers are heated by steam rather than by an internal heating pin. These hairsetters not only heat the hair rollers by use of the steam, but also deposit a film of moisture on the surface of the rollers. One hairsetter of this type is described in U.S. Patent No. 3,565,083. Another hairsetter which is commercially available employs a combination of steam and heating pins to provide rollers which are heated and have a film of moisture on the exterior roller surfaces. This latter type of hairsetter also can employ a hair treatment liquid in preference to water as the liquid which is vaporized and deposited on the surfaces of the rollers.

Hairsetters providing heated hair rollers which have a moisture coating on their surface have gained great popularity. However, hairsetters which employ steam have the drawback, as any unit employing steam, that there is a danger, or at least a

fear, that the hot steam produced might injure the user. Furthermore, there is the drawback that if a liquid other than water is to be used, the constituents of that liquid must be volatile at approximately the same temperature as water, or lower, or they will not be vaporized by the heat generated and will not condense onto the surface of the hair roller. Furthermore, if constituents of the liquid which are non-volatile are used, they will tend to clog any small orifices present in the device, if they become entrained in the vapor.

This invention provides a hairsetter having heated hair rollers on which a moisture coating is applied by a spray generated without the use of heat. Since heat is not employed to apply the moisture, no steam is generated and, thus, the dangers, or the fears aroused by the use of steam are not present. Additionally, hair treatment liquids can be used which are not volatile at temperatures comparable to that of water, and thus, the problem of non-volatilized constituents of the treatment liquid clogging small orifices in the apparatus is avoided. Furthermore, as will be explained in greater detail below, as a result of the way in which the moisture is applied in the hairsetter apparatus of the invention, it is possible to apply moisture to one, two or as many hair rollers as the user desires without the need to apply moisture to all of the rollers.

The hairsetter of the invention comprises a housing, a supporting means for holding a plurality of hair rollers in the housing, a means for heating the hair rollers while positioned within the housing, and a spraying means for communicating with a source of supply of a liquid and adapted to direct atomized, dispersed or vaporized liquid in the form of a spray at one or more selected rollers, said spraying means, including means for mechanically atomizing dispersing or vaporizing the liquid to be applied to the roller surface without heating

the liquid to thereby generate vapor.

As indicated above, in this invention, rollers are moistened by use of an atomized, dispersed or vaporized spray of liquid onto the surface of the hair rollers. This spray is preferably applied after the rollers have been heated. However, if so desired, the spray can be applied after the rollers have been heated to somewhat less than their preferred operating temperature but before they are completely ready to use.

The spray is preferably applied in a moistening chamber in which, one, two or more rollers can be placed after they are heated. In the preferred embodiment of the hairsetter of the invention, the moistening chamber comprises an enclosure having a central cavity for receiving a roller spray nozzles are positioned at the interior of the chamber or cavity. These spray nozzles are positioned to direct the spray onto the surface of a hair roller when placed in the chamber.

The moistening chamber can take any shape and can accommodate any number of rollers. In fact, the moistening chamber can be coextensive with the heating chamber, i.e., the chamber in which the rollers are held during heating so that all of the rollers are moistened at once after heating. However, it is preferred that the chamber be distinct from the heating chamber and only accommodate one or a small number of rollers at one time. In this way, the user can select how many rollers will be moistened and how many will not be moistened and there will be no waste of treatment liquid.

The moistening chamber generally is formed as a part of the overall housing of the assembly. However, the moistening chamber can be a separate unit adapted to fit on, or be attached to or otherwise associated with the hairsetter apparatus. However, no mechanical connection, in use, between the heating mechanism and the moistening chamber is required.

As noted above, the means for applying the spray to the surface of the rollers includes means for mechanically atomizing, dispersing or vaporizing the treatment liquid. The terms "atomizing", "dispersing" and "vaporizing" as used herein include any method or means of holding, suspending, entraining, carrying and delivering moisture or other liquids onto the surface of an object such as a roller in a finely divided form, such as a mist-like or wet droplet spray. The term "mechanically" as applied to atomizing, dispersing or vaporizing as used herein means any method or means for, accomplishing the holding, suspending, entraining, carrying and delivering of the liquid as defined above which does not involved the application of heat to the liquid to raise it to its normal boiling temperature.

For example, a liquid can be atomized by forcing or drawing it through a small orifice under pressure in the presence of a gas. This is commonly done with perfumes and liquid cleansers. The pressure can be applied by a simple pump mechanism which directly acts on the liquid or by passing a gas over the liquid at a rapid rate in a narrow region so as to reduce the pressure over it and draw it into the gas stream. It is also possible to employ a pressurized gas or carrier such as is done in an aerosol container to force the liquid through a nozzle and atomize it for delivery. A liquid can also be mechanically formed into an atomized or dispersed mist-like spray by simply passing air such as by use of a fan or blower against and over the surface of the liquid. This will cause a portion of the liquid to become entrained in the high volume gas flow producing a fine mist-like spray. Such a mechanism does not require a spray nozzle. It is also possible to cause a liquid to vaporize and then form a spray by reducing the pressure over it, such as by employing a vacuum pump and then flowing this super-saturated gas through a nozzle into an environment in which the moisture can condense. Atomizing or dispersing the liquid in a gas are preferred to vaporizing a liquid since in atomizing or dispersing a liquid no change of state is required as is the case when a liquid is vaporized and, therefore, generally, less energy need be used. Other methods and associated devices for atomizing, dispersing or vaporizing a liquid can be used. However, none of the mechanisms and methods referred to above employ heat to boil the liquid, or raise the temperature of the treatment liquid to a point where it could ever possibly cause injury, or at least the fear of injury.

The spray can be actuated manually by pressing a button or actuator knob which opens a valve releasing a pressurized spray onto the surface of the roller in the moistening chamber. The spray can also be actuated automatically by means such as a switch or sensing mechanism positioned in the moistening chamber and responsive to the placement of a hair roller into the chamber thereby releasing or opening the valve mechanism to permit the spray to pass onto the surface of the roller. In instances where a pre-pressurized liquid is not used, the spray can be simultaneously generated and released onto the surface of the roller by a pump mechanism. Pump mechanisms, such as a piston pump or a bellows pump or a diaphragm pump, are suitable and can be actuated manually or by the roller as it is placed under manual force into the moistening chamber. A bellows pump is preferred because of its low cost and reliability.

wardly into the cup to actuate the spray mechanism. The roller 2 in this embodiment is supported on a central pin 10 and the nozzles 9 are positioned beneath a lip formed on the upper edge of the cup. The nozzles in this embodiment direct the spray downwardly and inwardly onto the surface of the roller so that the spray is completely contained within the cup. As noted earlier, it is possible for the nozzles 9 to project the spray at an angle to the axis of the roller so that the spray rotates the roller about the axial support. In this embodiment, the nozzles so direct the spray as to rotate the roller. However, in order to allow the roller to be free to turn, in this embodiment, the upper edge of the cup 5 protrudes from the top of the moistening chamber so as to be accessible to be depressed for actuating the spray rather than by forcing the roller against the pin and preventing it thereby from rotating when the spray is directed at its surface.

In Figure 4, another embodiment of a mechanism for directing a spray onto the surface of the roller is shown. In this embodiment, the roller is supported on a pin 10, which is axially movable apart from the cup 5 as contrasted to the pin in the previous embodiment. Movement of the pin in this instance actuates the spray mechanism in the cup 5 by a switch (not shown); this can be done by manually depressing the roller 2 against the pin 10 which will, as in the embodiment described above, cause actuation of the pumping mechanism driving liquid through the internal passages to and through the spray nozzles 9 onto the hair roller. The distance *b* represents, in a schematic manner, the distance the roller 2 is moved downwardly against the pin 10 to actuate the spray mechanism.

In Figures 5 and 6, another embodiment of the spray mechanism is shown. In this embodiment, the cup and the support posts are both fixed in position and are not movable for actuating the pumping mechanism. Rather, a manually operated piston pumping mechanism 12 is provided with plungers 11 which are positioned exteriorly of the moistening chamber for easy grasp of the user. The pumping mechanism 12 communicates with a reservoir for the liquid, and also communicates via a pipeline 13, with the nozzles 9. In this embodiment, there are two levels of spray nozzles to be certain that the entire surface of the roller 2 is coated with the liquid spray.

By depressing the plungers 11 the pump mechanism forces liquid from the nozzles 9 onto the surface of the roller. The liquid in a finely divided spray then coats the surface of the heated roller and it is ready for use.

In operation, a roller having been heated

to a temperature of approximately 180°, is removed from its heating pin and is placed in the central passage 4 of the moistening chamber 3. The pumping mechanism is then actuated either by depressing the roller into the cup or by manually actuating a switch or pumping mechanism to delivery the finely divided mist-like spray to the surface of the heated roller. The roller is then ready for use in setting hair.

WHAT WE CLAIM IS:—

1. A hairsetter which comprises a housing; a supporting means in the housing for holding a plurality of hair rollers in the housing; a means for heating the hair rollers while positioned within the housing; and a spraying means for communicating with a source of supply of a liquid and adapted to direct atomized, dispersed or vaporized liquid in the form of a spray at one or more selected rollers, said spraying means, including means for mechanically atomizing, dispersing or vaporizing the liquid to be applied to the one or more selected rollers.
2. A hairsetter according to claim 1 including a moistening chamber.
3. A hairsetter according to claim 2 in which the moistening chamber has a cavity for receiving one or more hair rollers.
4. A hairsetter according to claim 3 including a post centrally positioned in the cavity of the moistening chamber.
5. A hairsetter according to claim 3 or 4 including means responsive to the positioning of the roller in the cavity to actuate the spraying means.
6. A hairsetter according to claim 5 in which the means for actuating the spraying means comprises a pressure switch.
7. A hairsetter according to any of claims 1 to 4 including manually operated means for actuating said spraying means.
8. A hairsetter according to any of claims 3 to 7 in which the spraying means is situated within said cavity.
9. A hairsetter according to any of claims 1 to 8 in which the spraying means includes a pump.
10. A hairsetter according to claim 9 in which the spraying means includes at least one spray nozzle which communicates with the pump.
11. A hairsetter according to claims 2 and 10 in which the or each spray nozzle, in use, directs a spray of liquid at a roller positioned in the moistening chamber.
12. A hairsetter according to claim 11 including a plurality of spray nozzles adapted to direct a spray of liquid at the roller and cause it to rotate in the moistening chamber.
13. A hairsetter according to any of claims 1 to 12 in which the means for heating the rollers comprises a plurality of support pins



In most instances, one or more nozzles will be provided in the chamber to direct the spray onto the surface of the roller. However, in some cases, depending on how the spray is generated, slots or guide openings or vents can be used to direct the spray onto the roller surface. When a pump is employed, it is possible, and in fact preferred, to use a type of pump in which a metered quantity of liquid is delivered on each pumping stroke so that a precise desired quantity of liquid can be dispensed onto the surface of the hair roller to provide the correct amount of liquid required. The spray nozzles or guides can be mounted in the walls of the moistening chamber, and can be directed obliquely to the surface of the roller so as to impart a turning rotating force on the hair roller and cause it to rotate in the chamber. This will ensure that uniform moistening of the surface of the roller results. In this embodiment, it is preferred that rollers of the type having a central cavity are employed, and that these rollers be mounted on a pin in the chamber so that the rollers can freely turn when the spray is directed at an angle to their surface. Such rollers are described in U.S. Reissue Patent RE 26,766, and the overall construction of these rollers and the heating apparatus for the rollers is particularly suited for use in this invention. Additionally, the spray nozzles or guides are preferably pointed downwardly toward the central cavity of the chamber so as to keep the liquid spray in the chamber. In an embodiment wherein a pressurized aerosol container is used, it is possible merely to have a pre-packaged aerosol cartridge filled with a conditioning liquid and a pressurizing gas. This cartridge can be connected in an easily detachable manner to the spray nozzles via a connecting pipelines or tubing. A valve mechanism, which can be either associated with the aerosol cartridge or with the line intermediate the cartridge and the nozzles, can be used to control the flow of the conditioning liquid from the aerosol container to the hair rollers.

Preferred features of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a view in perspective of a hair-setting apparatus having a spray device in accordance with the invention.

Figure 2 is a cross-sectional view taken along the line 2—2 of Figure 1.

Figure 3 is a schematic view partially in cross-section of another embodiment of a mechanism for spraying a conditioning liquid on a hair roller in accordance with the invention.

Figure 4 is a schematic view partially in cross-section of still another embodiment of

a mechanism for spraying a conditioning liquid on a hair roller in accordance with the invention.

Figure 5 is a schematic view partially in cross-section of still another embodiment of a mechanism for spraying a conditioning liquid on a hair roller in accordance with the invention, and,

Figure 6 is a schematic top view of the embodiment shown in Figure 5.

In Figure 1, a hairsetter apparatus in accordance with the invention is shown. The apparatus includes a housing 1 having a lid 1a. A number of hair rollers 2 are supported on a corresponding number of heating posts (not shown) in the housing. The heating posts serve to position the rollers in the housing and heat the rollers to a temperature suitable for setting hair. Positioned forwardly of the rollers in the housing are two receptacles 15 for accommodating hair pins, clips, and the like for holding the hair firmly in position on the hair rollers. To one wise of the housing a moistening chamber 3 is provided. The moistening chamber 3 is best shown by reference of Figure 2. The moistening chamber has a central passage 4 adapted to accommodate any of the hair rollers 2 supported on the posts. The central passage in the moistening chamber opens into a cup-shaped receptacle 5. The cup-shaped receptacle 5 is provided with internal passages 5a which communicate via a pumping mechanism 6 with a reservoir 8 in which a liquid such as a hair conditioning liquid or water is stored. The cup 5 is slidable with respect to the pumping mechanism 6 and a pressure-sensitive knob 7 serves as the mechanism which actuates the pumping mechanism. The cup 5 is provided with a series of nozzles 9 which point interiorly toward the center of the cup and thereby toward the roller 2.

When a roller is placed through the central passage 4 and into the cup 5, and pressed downwardly, the cup 5 moves downwardly and bears against the pressure switch 7. This actuates the pump mechanism thereby forcing liquid from the reservoir 8, through the pumping mechanism 6, and the internal passages 5a of the cup 5, through the nozzles 9 and onto the surface of the roller. The cup 5 normally can be kept in an unactuated position by a spring or other bias means not shown. In this instance, the pumping mechanism is a vacuum pump, electrically operated. However, as noted above, many other pump mechanisms can also be used.

In Figure 3, another embodiment of a spray mechanism which employs a cup which is axially movable, is shown. In this embodiment, the distance *a* represents, in a schematic manner, the distance the cup is moved when the roller is pressed down-

wardly into the cup to actuate the spray mechanism. The roller 2 in this embodiment is supported on a central pin 10 and the nozzles 9 are positioned beneath a lip formed on the upper edge of the cup. The nozzles in this embodiment direct the spray downwardly and inwardly onto the surface of the roller so that the spray is completely contained within the cup. As noted earlier, it is possible for the nozzles 9 to project the spray at an angle to the axis of the roller so that the spray rotates the roller about the axial support. In this embodiment, the nozzles so direct the spray as to rotate the roller. However, in order to allow the roller to be free to turn, in this embodiment, the upper edge of the cup 5 protrudes from the top of the moistening chamber so as to be accessible to be depressed for actuating the spray rather than by forcing the roller against the pin and preventing it thereby from rotating when the spray is directed at its surface.

In Figure 4, another embodiment of a mechanism for directing a spray onto the surface of the roller is shown. In this embodiment, the roller is supported on a pin 10, which is axially movable apart from the cup 5 as contrasted to the pin in the previous embodiment. Movement of the pin in this instance actuates the spray mechanism in the cup 5 by a switch (not shown); this can be done by manually depressing the roller 2 against the pin 10 which will, as in the embodiment described above, cause actuation of the pumping mechanism driving liquid through the internal passages to and through the spray nozzles 9 onto the hair roller. The distance *b* represents, in a schematic manner, the distance the roller 2 is moved downwardly against the pin 10 to actuate the spray mechanism.

In Figures 5 and 6, another embodiment of the spray mechanism is shown. In this embodiment, the cup and the support posts are both fixed in position and are not movable for actuating the pumping mechanism. Rather, a manually operated piston pumping mechanism 12 is provided with plungers 11 which are positioned exteriorly of the moistening chamber for easy grasp of the user. The pumping mechanism 12 communicates with a reservoir for the liquid, and also communicates via a pipeline 13, with the nozzles 9. In this embodiment, there are two levels of spray nozzles to be certain that the entire surface of the roller 2 is coated with the liquid spray.

By depressing the plungers 11 the pump mechanism forces liquid from the nozzles 9 onto the surface of the roller. The liquid in a finely divided spray then coats the surface of the heated roller and it is ready for use.

In operation, a roller having been heated

to a temperature of approximately 180°, is removed from its heating pin and is placed in the central passage 4 of the moistening chamber 3. The pumping mechanism is then actuated either by depressing the roller into the cup or by manually actuating a switch or pumping mechanism to delivery the finely divided mist-like spray to the surface of the heated roller. The roller is then ready for use in setting hair.

WHAT WE CLAIM IS:—

1. A hairsetter which comprises a housing; a supporting means in the housing for holding a plurality of hair rollers in the housing; a means for heating the hair rollers while positioned within the housing; and a spraying means for communicating with a source of supply of a liquid and adapted to direct atomized, dispersed or vaporized liquid in the form of a spray at one or more selected rollers, said spraying means, including means for mechanically atomizing, dispersing or vaporizing the liquid to be applied to the one or more selected rollers.
2. A hairsetter according to claim 1 including a moistening chamber.
3. A hairsetter according to claim 2 in which the moistening chamber has a cavity for receiving one or more hair rollers.
4. A hairsetter according to claim 3 including a post centrally positioned in the cavity of the moistening chamber.
5. A hairsetter according to claim 3 or 4 including means responsive to the positioning of the roller in the cavity to actuate the spraying means.
6. A hairsetter according to claim 5 in which the means for actuating the spraying means comprises a pressure switch.
7. A hairsetter according to any of claims 1 to 4 including manually operated means for actuating said spraying means.
8. A hairsetter according to any of claims 3 to 7 in which the spraying means is situated within said cavity.
9. A hairsetter according to any of claims 1 to 8 in which the spraying means includes a pump.
10. A hairsetter according to claim 9 in which the spraying means includes at least one spray nozzle which communicates with the pump.
11. A hairsetter according to claims 2 and 10 in which the or each spray nozzle, in use, directs a spray of liquid at a roller positioned in the moistening chamber.
12. A hairsetter according to claim 11 including a plurality of spray nozzles adapted to direct a spray of liquid at the roller and cause it to rotate in the moistening chamber.
13. A hairsetter according to any of claims 1 to 12 in which the means for heating the rollers comprises a plurality of support pins

which hold the rollers in position in the housing during heating.

14. A hairsetter according to any of claims 1 to 13 including a reservoir in the housing communicating with said spraying means.

15. A hairsetter according to any of claims 1 to 8 in which the spraying means comprises a chamber containing a pressurized liquid and a carrier gas.

16. A hairsetter substantially as herein-

before described with reference to Figures 1 and 2 of the accompanying drawings or such Figures as modified by either Figure 3, or Figure 4, or Figures 5 and 6.

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Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1974.
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from
which copies may be obtained.



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