

This invention relates to an attachment through which air is adapted to flow, which is mounted on a hair dryer or is an independently handleable attachment for use with a hair dryer according to the prior-art portions of claims 1 or 2.

An attachment of this type is known in the art from U.S. Pat. No. 4,132,360. This known pulsator which is adapted to be mounted on the hair dryer is configured as a cylindrical attachment having in its interior struts on which an asymmetrical, unbalanced single fan blade is rotatably mounted. The air stream exiting from the hair dryer and impinging on the blade causes the blade to rotate, with the aim to produce a pulsating spiral flow of air.

Further, stationary nozzles are generally known which are either made integrally with the hair dryer housing or adapted to be pushed or clipped onto the housing as an independently handleable attachment. These known nozzles for hair dryers are suitable for either merely concentrating or dissipating the air stream exiting from the hair dryer. A dynamic operation on the exiting air stream - say, in the form of pulse-like air-flow variations with time and/or space - is not possible with the prior known nozzles.

By contrast, it is an object of the present invention to improve upon an attachment for a hair dryer for a dynamic variation of the exiting air stream with time and/or space, such as to obviate the need for further moved or rotating parts. Another object is to provide an attachment which, being attachable to and detachable from the hair dryer in particular as an independently handleable part, allows the temperature of the exiting air stream to be varied, such as to enable the exiting air stream to be at two different temperatures at one and the same heat setting of the hair dryer, depending on whether the attachment is mounted or demounted.

This object is essentially accomplished by an attachment incorporating the features of claim 1 and claim 2. Because the attachment is configured as a nozzle and the fastening means permit a rotation of the nozzle relative to the hair dryer, with the nozzle including air-directing means which, in cooperation with the air stream discharged from the hair dryer and flowing through the nozzle, exert a torque on the nozzle, a nozzle for concentrating or dissipating the air stream discharged from the hair dryer is advantageously utilized

also to vary the exiting air stream in the form of dynamic variations with time or space, which is conducive to a particularly fast drying of the hair. When the attachment is employed as an independently handleable part, it is equally advantageously configured as a nozzle, with the nozzle including air-directing means which, in cooperation with the air stream discharged from the hair dryer and flowing through the nozzle, exert a torque on the nozzle. Owing to the provision of such air-directing means on the nozzle, the nozzle can be rotated readily by means of the air stream flowing therethrough, thus enabling the exiting air stream to be not only spatially concentrated or dissipated but also varied with time. Additionally, the rotation of the nozzle and the attendant rotation of the exiting air stream causes the hot air stream discharged from the hair dryer to be mixed with the ambient cold air, resulting overall in a reduced temperature of the air stream. With this arrangement, the number of existing temperature settings of the hair dryer can be increased by attaching or detaching the nozzle.

In an embodiment of the present invention, the fastening means are configured as an axle and an associated bearing receiving the axle.

Advantageously, the fastening means are provided on the nozzle or on the hair dryer. This provides a straightforward nozzle structure, independently of whether it is removably or fixedly connected to the hair dryer.

According to a further aspect of the present invention, the air-directing means are formed by air-directing elements arranged on the inner wall of the nozzle or by providing the nozzle with an asymmetrical shape. The air-directing elements may be of a helical configuration, for example, in order to produce a corresponding torque acting on the nozzle as the air stream impinges on the air-directing elements.

In an alternative embodiment, the outlet opening of the nozzle is of an asymmetrical configuration as regards its longitudinal edges, providing, for example, relatively offset cutouts or the like in order to produce, by a correspondingly reduced flow resistance, a torque in diametrically opposite areas of the outlet opening.

Because the nozzle includes two or more channel-type apertures, it is possible to accomplish a variation of the air stream in particular with space, for example, a

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fanning out of the air stream in the form of the surface of a cone. This enhances the hair drying action.

Further, it is advantageous to configure the air-directing means as one or several channels which are arranged eccentrically and at an inclination relative to an axis of rotation of the nozzle.

Further features, advantages and application possibilities of the present invention will become apparent from the subsequent description of the embodiments illustrated in more detail in the accompanying drawings. In the drawings,

FIG. 1 is a perspective view of a hair dryer and a nozzle;

FIG. 2 is a view of a nozzle illustrating a further embodiment thereof;

FIG. 3 is a schematic side view of the nozzle of FIG. 2;

FIG. 4 is a schematic side view of the nozzle of FIG. 1;

FIG. 5 is a view of the nozzle of FIG. 1, as seen looking in the direction of the inlet opening; and

FIG. 6 is a view of a nozzle illustrating still another embodiment thereof.

In FIG. 1, the nozzle 1 is shown in a perspective view. In this Figure, the nozzle 1 is drawn in a position detached from the hair dryer 2. The axle 3 of the nozzle 1 has a slot or a gap 4 at its free end which is shaped in the manner of a sphere 5. By means of the slot 4, the axle 3 is mountable in the bearing 6 of the protective grid 7 of the hair dryer 2, such that the nozzle 1 is rotatable in this bearing 6. The bearing 6 is preferably disposed in the longitudinal axis of the fan motor shaft of the hair dryer 2. In this representation, the nozzle 1 has a narrow air outlet opening 8 and concave surfaces 9. Asymmetrically arranged recesses 10a are provided in the longitudinal edges 10. As a result of these recesses, opposed forces take effect at in particular diametrically opposite points of impact on the nozzle as air is discharged, exerting a torque on the nozzle causing it to rotate in the direction of arrow 11. The axle 3 of the nozzle 1 is disposed in the center of the brace 12 (FIG 5) which is provided on the round base

edge 13 conforming to the contours of the exhaust port of the hair dryer 2.

While in FIG. 1 the longitudinal edges 10 of the air outlet opening 8 include asymmetrically arranged recesses 10a, FIG. 2 shows an air outlet opening 8 in which the longitudinal edges 10 extend in a straight line. However, the edge arrangement is such that their gradient is reversed in the side view (FIG. 3). The dashed line completes the view-obstructed gradient of the one longitudinal edge 10. FIG. 3 also shows the stop 14 provided on the axle 3. The stops serves the function of preventing contact of the base edge 13 with the hair dryer during rotation of the nozzle 1.

FIG. 4 shows in a schematic side view the embodiment of the nozzle illustrated in perspective view in FIG. 1. The longitudinal edges 10 of the surfaces 9 of the air outlet openings 8 show an asymmetrical arrangement of the recesses 10a. The view-obstructed shape of the one recess 10a is indicated by a dashed line.

FIG. 5 shows the nozzle 1 as seen looking in the direction of the base edge 13. The air outlet opening 8 with the asymmetrically arranged recesses 10a can be seen clearly in this Figure. Also the positions of the brace 12 and the axle 3 reflect the structural features of the pulsating nozzle. As the nozzle 1 rotates, the surfaces 9 of the air outlet opening 8 have the effect of a rotating propeller, causing air at ambient temperature to be drawn in sideways and conveying it onwards in the exhaust direction. This action produces the particular cooling effect of the nozzle 1.

FIG. 6 illustrates a further embodiment of a nozzle 1 in which the nozzle includes two channel-type apertures. The apertures are formed by channels 16, 17 arranged eccentrically and at an inclination relative to the axis of rotation 15 of the nozzle 1. Whilst the means for carrying or fastening the nozzle 1 on the hair dryer 2 are not drawn in this Figure, they correspond substantially to those of the foregoing description or Figures. With the hair dryer activated, this nozzle produces a rotating air stream which is comprised of one or several single jets of air extending circumferentially on the surface of a cone. Depending on the inclination of the channels 16, 17, it is possible to adjust the rotational velocity of the nozzle 1 or a concentration or diffusion of the air stream.

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Patent Claims

1. An attachment through which air is adapted to flow for the production of a pulsating air stream, the attachment being mounted on the exhaust port of a hair dryer (2) by means of fastening means, characterized in that the attachment is configured as a nozzle (1), that the fastening means permit a rotation of the nozzle (1) relative to the hair dryer (2), and that the nozzle (1) includes air-directing means which, in cooperation with the air stream discharged from the exhaust port of the hair dryer (2) and flowing through the nozzle (1), exert a torque on the nozzle (1).

2. An attachment through which air is adapted to flow for the production of a pulsating air stream, the attachment allowing the passage of air therethrough which is discharged from a hair dryer (2) and including means for fastening the attachment to a hair dryer, characterized in that the attachment is configured as a nozzle (1), that the fastening means permit a rotation of the nozzle, and that the nozzle (1) includes air-directing means which, in cooperation with the air stream discharged from the hair dryer (2) and flowing through the nozzle (1), exert a torque on the nozzle (1).

3. The attachment as claimed in claim 1 or claim 2, characterized in that the means for fastening the nozzle (2) are configured as an axle (3) and an associated bearing (6) receiving the axle.

4. The attachment as claimed in claim 3, characterized in that the fastening means are provided on the nozzle (1) or, alternatively, on the hair dryer (2).

5. The attachment as claimed in any one of the preceding claims, characterized in that the air-directing means are formed by air-directing elements arranged on the inner wall of the nozzle (1).

6. The attachment as claimed in any one of the preceding claims, characterized in that the air-directing means are formed by providing the outlet opening of the nozzle (1) with an asymmetrical shape.



7. The attachment as claimed in any one of the preceding claims, characterized in that the nozzle (1) includes an axle (3) held in its center by means of a brace (12).

8. The attachment as claimed in claim 7, characterized in that the nozzle (1) includes an outlet opening (8) whose longitudinal edges (10) are arranged in an asymmetrical relationship and, when viewed from the side, have a reversed gradient relative to the periphery.

9. The attachment as claimed in any one of the claims 7 or 8, characterized in that individual longitudinal edges (10) of the outlet opening (8) of the nozzle (1) have asymmetrical recesses (10a) towards the periphery or extend in a straight line.

10. The attachment as claimed in any one of the claims 3 to 9, characterized in that the axle (3) has its free end thickened in the form of a sphere (5), and that the thickened end includes a slot, in particular a gap (4).

11. The attachment as claimed in any one of the claims 3 to 10, characterized in that the axle (3) is provided with a stop (14).

12. The attachment as claimed in any one of the preceding claims, characterized in that the hair dryer (2) is provided with a bearing (6) conforming to the diameter of the axle in the center of the air discharge port, for example, in the center of the protective grid (7).

13. The attachment as claimed in any one of the preceding claims, characterized in that the nozzle (1) includes at least two channel-type apertures through which the air stream is adapted to flow.



14. The attachment as claimed in any one of the preceding claims, characterized in that the air-directing means are formed by one or several channels (16, 17), with the channel or the channels (16, 17) being arranged eccentrically and at an inclination relative to an axis of rotation (15) of the nozzle (1).

