

### Hair Styling/Drying Device and Method

The invention relates to an implement and to a process with an implement for the styling and/or drying of hair for an air-moving appliance for personal use, in particular a hair dryer or a hot-air curling brush.

- 5 An attachment for a hair dryer has been disclosed in WO 89/09554, which comprises a body and an air discharge means provided with several air discharge apertures. Around the edge of these air discharge apertures there are provided short hair pickup elements of which the downstream ends are bent at right angles in order to grip below and lift the hair to be styled. The hair pickup elements  
10 have a uniform length, the bent ends being arranged in a plane. During use, the bent ends are introduced into the user's hair, are moved in a circular motion and are then removed from the scalp again, the bent ends picking up and lifting the hair. However, there is a danger with long-haired users that the hair will hook in the device. The manipulation of this device is complicated for users with short  
15 or shorter hair as the device must not be lifted too far from the head for obtaining the desired hair styling result.

- Another hair styling implement is already known from the printed specification GB 2230184A. This implement is securable to a conventional hand-held hair dryer. The front face of the attachment includes a plurality of projecting prongs  
20 which are at least 0.5 cm thick and air discharge apertures. This device is intended to be suitable for untangling the hair as it is dried, for example. Because the prongs decrease in length radially outwardly from the centre of the attachment, the user has difficulty in manipulating the device, and styling or drying of hair is not conveniently accomplishable. In addition, only a small  
25 region of the hair can be picked up and styled or dried, making it a time-consuming and fatiguing task for its user.

A further implement is already known from DE 41 00 387 A1. That document describes an electric hair dryer with a receiver, equipped with a handle, for a blower and with a heating register of which the housing and handle are formed by mutually connected dish-shaped bodies. The hair dryer has a cylindrical central part which holds the blower and heating register which extends with a web into the handle and an inlet aperture which is arranged with the housing and through which the cylindrical central part penetrates with its free end. With this hair dryer, a substantially pot-shaped carrier part can be placed removably rigidly on the peripheral face of the free end of the cylindrical central part or the adjacent part of the housing. The carrier part is formed by a push-on sleeve and a base which has a plurality of air passage apertures and, on the exterior, carries a number of short pins, prongs or attachments which are arranged next to one another with spacing and extend axially parallel to the blower outlet. The base converges concavely and the convergence can be adapted to the curvature of the head in the broadest sense. The pins, prongs or attachments are substantially cylindrical in design and can have identical or different lengths and/or diameters. This comb- or brush-like adaptor should at the same time allow for the drying and lifting of the hair.

A diffuser for a hair dryer is known from US 4295283 in which a freely rotatable rotor is mounted in the diffuser housing. The rotor is to produce a gentle air stream which does not complicate but rather simplifies the styling of hair. The outlet grid of the diffuser can be provided with a plurality of finger-like spacers which should prevent the head of the user coming too close to the diffuser housing.

In contrast, it is an object of the invention to develop an implement and a process so as to improve the treatment of the hair and simplify the manipulation of the device for its user, the implement or process being suitable, in particular, for providing volume or height in the hair.

This object is achieved with an implement having the features of claim 1.

When the implement mounted on the hair dryer is moved in the hair using light circular motions, the hair will be caught by the hair pickup elements, entering the space between them. As a result of this movement, more hair will be caught and  
5 lifted in the direction of the air discharge means, causing the hair to be fluffed out between the hair pickup elements. The exiting air will dry the hair in this position and, as a result, the hair will be given a better height in its root area. Greater fullness and volume will be imparted to the hair. The motion of the hair pickup elements has an added massage effect, producing a pleasant feel on the  
10 scalp as at least several hair pickup elements will engage the scalp. Furthermore, a greater region of hair is caught and styled or dried during use of the implement owing to the application of a plurality of hair pickup elements over or on the user's scalp, so, overall, the duration of the styling or drying process is reduced. It is advantageous if the hair pickup elements have a length to mean diameter ratio  
15 greater than about 5:1, preferably of 8:1 to 14:1. As a result, the desired effect during the pickup of hair, for example the production of a better hair height at the hair root, in particular also with short hair is greatly enhanced. Since the concave face is a cut out in the surface of a substantially spherical body corresponding substantially to the mean head diameter, substantially all hair pickup elements are  
20 in contact with the scalp during use. Therefore, a greater region of hair can be styled or dried in each case. This arrangement also allows hair to be gripped easily and to be fluffed out during movement of the implement on or over the scalp.

Finally, the massage effect is enhanced by simultaneous application of several or  
25 all hair pickup elements on or over the scalp.

Because those hair pickup elements that are arranged in an outer region, in particular an edge segment of the air discharge means, are of greater length than the hair pickup elements that are arranged in an inner region of the air discharge

means, the ends of the hair pickup elements are disposed in an imaginary inclined plane, simplifying the manipulation of the implement still further. Arranging the fingers of different lengths in this manner enables the implement to cover also parts of the head which are otherwise hard to reach or the hair root area in the neck with ease, styling/drying the hair in these areas.

Advantageously, the air discharge means is of a convex configuration, enabling the hair to glide over the air discharge means as the device is used. This increases the hair's shine.

In an embodiment of the present invention, the hair pickup elements are arranged on concentric circular rings relatively spaced at approximately equal distances. This approximately uniform distribution of the hair pickup elements provides a sufficient distance between the hair pickup elements for catching individual strands of hair, in addition to ensuring an effective utilization of the surface of the air discharge means.

In an advantageous embodiment of the present invention, the hair pickup elements are arranged on the air discharge means in the form of two quadrangles disposed in a 90° offset relation to each other, their sides being curved in a concave fashion relative to a centre of the air discharge means. Arranging the hair pickup elements in this manner is particularly advantageous when the implement is guided so as to engage within the hair close to the head from the side, as for dry combing and smoothing longer hair. The diameter of curvature of the sides is approximated to the mean diameter of a person's head, enabling all hair pickup elements on one side to be held close to the scalp and thus sufficiently large sections of hair to be caught.

Advantageously, the concave sides of the quadrangles correspond approximately to the arcs of a circle. As a result, a series of hair pickup elements will engage the hair also in cases where the hair styling/drying implement is held at an

inclination, enabling even awkward-to-reach hair sections to be readily caught and styled by the implement.

Because the air discharge means is formed by circular rib members disposed in offset relation to each other in two planes, the exiting air will be swirled, slowing  
5 the airflow. This prevents the undesired effect of hair being upset as it is dried or styled.

Advantageously, the rib members are at least in part configured as annular walls of different heights, thereby adding to the uniformity of the exiting air stream and improving the styling and drying effect, particularly also the combing of the hair.

10 In an advantageous further feature, downstream end portions of the annular walls lie on a convex surface. As a result of this configuration, the hair is guided over these end portions as it is combed and/or smoothed, for example, utilizing a maximum surface and thus adding lustre to the hair.

In a further embodiment of the present invention, the hair pickup elements are  
15 fixedly secured to the rib members. As a result, the air exiting intermediate the annular walls impinges directly on the hair that has entered the space between hair pickup elements, which has a beneficial effect on the styling and drying process.

In an advantageous embodiment of the invention, the hair pickup elements are arranged substantially parallel to one another and in the main direction of flow.  
20 Therefore, the implement can be placed on the scalp relatively easily and without great resistance by the hair and can be moved through the hair with circular motions.

According to a still further feature of the present invention, the hair pickup elements are preferably of a star-shaped cross section with rounded edges.  
25 Shaping the hair pickup elements in this manner increases the number of edges

engaging the hair, enabling a slight pull to be exerted on the hair and the smoothing effect to be improved, particularly where long hair is combed. In addition, this shape is advantageous from the injection-moulding engineering point of view.

- 5 In a further advantageous embodiment of the invention, the hair pickup elements have a circular cross section.

In a further embodiment, the downstream ends of the hair pickup elements are rounded so the movement of the elements over the scalp advantageously produces a pleasant feeling and a massage effect, irritation of the scalp being avoided.

- 10 The design of an air discharge element with a circular base essentially corresponds to the same geometric shape of the air discharge aperture of the body and therefore ensures optimum air permeation.

- In a further embodiment, the implement advantageously has a plane which is placed on the ends of the hair pickup elements and is inclined to the hair dryer  
15 front or main direction of flow. This further simplifies manipulation of the implement. Owing to this arrangement, regions of the head or of the hair root at the nape of the neck which are otherwise difficult to reach can easily be reached with the implement and the hair there can be styled or dried.

- The invention also relates to a process for building up height or volume in the  
20 hair according to claim 19. For this purpose, the implement is placed on the head with the downstream ends of the hair pickup elements and is moved in the hair. The hair is picked up by the hair pickup elements, lifted between the elements in the direction of the air discharge element and dried in this position, producing height at the hair root and fullness in the hair. This process allows the build up  
25 of height and volume in the user's hair in a simple manner. An implement according to claims 1 to 18 is advantageously used in the process.

Further objects, features, advantages and application possibilities of the present invention will become apparent from the following description of embodiments.

In the drawings,

Fig. 1 is a front view of an implement illustrating a first embodiment of the  
5 present invention;

Fig. 2 is a top plan view of the implement of Fig. 1;

Fig. 3 is a side view of the implement of Fig. 1;

Fig. 4 is a schematic illustration, in section, of a second embodiment of the present invention; and

10 Fig. 5 is an enlarged top plan view of a hair pickup element.

Referring now to Fig. 1 of the drawings, there is shown an implement for styling/drying hair, comprising a body 10 and an air discharge means 12 which are connected with each other. The air discharge means 12 includes a series of air exit apertures 14 and hair pickup elements 16 arranged adjacent to each other,  
15 the air exit apertures 14 being not shown in this figure for clarity of illustration. The hair pickup elements 16 are of different lengths, terminating with their downstream ends 18 in a concave surface, that is, a surface curving inwardly relative to the air discharge means 12. This concave surface is a portion of a spherical surface, the sphere having a diameter corresponding approximately to  
20 the mean diameter of a person's head. It is thereby ensured that all hair pickup elements 16 of both the outer region 40 and the inner region 42 are in engagement with the scalp and that, when moving the hair dryer using an appropriate circular motion, the hair within the entire area bounded by the outer region 40 will be lifted up in the space between the hair pickup elements 16. The hair will be dried

in this position, and a good stand of the hair in the root area will be accomplished. The hair will become softer and be made more voluminous. In addition to the fashioning and drying effect, the user will experience a very pleasant massage effect resulting from the engagement of all hair pickup elements 16 with the scalp and the use of a circular motion. For straightening out the hair or dry-combing longer hair, the hair styling/drying implement is held so as to engage in the hair from the side of the head, the longer length of the hair pickup elements 16 of the outer region 40 then enabling a sufficient section of hair to be caught and divided up into individual strands by the hair pickup elements 16. The strands of hair will be pulled over the convex, that is, outwardly curving, air discharge means 12 and dried as this occurs. An attendant advantage is that the hair will also be smoothed in the process. The gliding action of the hair over the surface of the air discharge means 12 adds lustre to the hair. The implement may be used as an accessory for a hair dryer, or alternatively, it may form an integral part of the hair dryer. In either event, the user has the advantage of requiring only one hand for styling/drying, the need for an additional brush being obviated.

The hair pickup elements 16 are fixedly mounted on four equidistantly disposed concentric circular rings 30, 31, 32 and 33. In addition, they are arranged on the air discharge means 12 in the form of two quadrangles 34 disposed in a 90° offset relation to each other, their sides being curved in a concave fashion, with in particular individual ones of the hair pickup elements 16 being associable with either quadrangle 34.

The concave sides of the quadrangles 34 form lines corresponding approximately to the arcs of a circle. The arrangement of the hair pickup elements 16 is selected such that, when the implement is applied from the side for performing a combing operation, it will engage the hair close to the scalp, as a result of which all hair pickup elements 16 on a side will pick up hair. Through the air exit apertures 14 not shown for clarity of illustration, streams of air will be directed at the hair, drying it.

Fig. 3 shows a side view of the implement illustrating the different lengths of the hair pickup elements 16. The area of cross section 25 of the hair pickup elements 16 increases slightly starting from their downstream end 18 and continuing in the direction of the upstream end of the hair pickup elements 16 close to the air discharge means 12. In this configuration, the ratio of the length to a mean diameter of the hair pickup elements 16 is greater than 5 to 1 for the shortest one of the hair pickup elements. When a plane is applied to the ends 18 of the hair pickup elements 16, its angle of inclination relative to the front face of the hair dryer is between greater than  $0^\circ$  and about  $30^\circ$ , preferably  $15^\circ$ . By virtue of this inclination and the different lengths of the fingers, the user is in a position to manipulate a hair dryer to which the implement is attached with ease even in the head rear area, without the hair pickup elements 16 becoming disengaged from the scalp or the need to incline the hair dryer at an excessively sharp angle. In addition, the inclination assists the individual strands of hair in gliding up on the hair pickup elements 16. The air exit apertures 14 are approximately evenly distributed over the entire surface of the air discharge means 12.

Fig. 4 shows an air discharge means 12 which is of a plane configuration and formed by circular rib members 20. These are disposed in offset relation to each other in two planes, causing the air to be swirled whereby the velocity of flow of the exiting air is reduced. Part of these rib members 20 is in the form of annular walls 22. Downstream end portions 24 of the annular walls 22 lie on a convex surface relative to the surface of the air discharge means 12. Fixedly mounted on the rib members 20 are the hair pickup elements 16.

Fig. 5 shows a hair pickup element 16 which is of a quadrangular, preferably star-shaped cross section 25 with rounded edges 26. The diameter at the downstream end 18 of the hair pickup element 16 is slightly smaller than at the upstream end. In another configuration, the hair pickup elements may also be of a round cross section.

In a preferred embodiment, the air discharge means 12 of the implement has a diameter of about 93 mm and a radius of curvature of 60 mm. The length of the hair pickup elements 16 is between 40 mm and 70 mm, with a mean diameter of about 5 mm. The ratio of the length to the diameter of the hair pickup elements is thus between about 8 to 1 for the shortest, and about 14 to 1 for the longest, hair pickup element 16, with a total of preferably 25 hair pickup elements 16 being arranged on the air discharge means 12. The circular rings 30, 31, 32 and 33 on which the hair pickup elements 16 are disposed have a radius of, respectively, 25 mm, 39 mm, 53 mm and 67 mm. The ends 18 of the hair pickup elements 16 lie on a concave surface representing a portion of a spherical surface with a sphere diameter of about 210 mm. When the implement for styling/drying hair is placed on a section of hair and moved using a circular motion, this section of hair will be caught by the hair pickup elements 16 and lifted up by the hair picked up in succession, the hair winding along the hair pickup elements 16 in the process. The air discharged through the air exit apertures 14 will dry the strands of the hair, providing them with a good condition in the root area and adding volume to the hair. When longer hair is combed dry, the hair will glide over the convex air discharge means 12. This hair gliding movement over the air discharge means 12 and its engagement with the hair pickup elements 16 will bring additional lustre to the hair.



### CLAIMS

1. An implement for styling and/or drying hair for an air-moving appliance for personal use, in particular a hair dryer or a hot-air curling brush, comprising a body (10) and an air discharge means (12) which includes a series of air exit apertures (14) and carries a series of hair pickup elements (16) arranged adjacent to each other and distributed substantially over the surface of said air discharge means (12), wherein the hair pickup elements (16) are of rod-shaped configuration, wherein the ratio of the length of the rod-shaped pickup elements (16) to a mean diameter thereof is greater than 5 to 1, wherein the hair pickup elements (16) are designed such that a plurality of the downstream ends (18) of the hair pickup elements (16) contact, when in use, the scalp of the user and, as a result of a movement of the hair pickup elements (16) on the scalp of the user, the hairs are caught and lifted up between the hair pickup elements (16) in the direction of the air discharge means (12) providing the user's hair with body and volume.

2. An implement as claimed in claim 1, characterised in that those hair pickup elements (16) that are arranged in an outer region (40) in particular an edge segment of the air discharge means (12), are of greater length than the hair pickup elements (16) that are arranged in an inner region (42) of the air discharge means (12).

3. An implement as claimed in any one of the preceding claims, characterised in that the ratio is approximately between 8 to 1 and 14 to 1.

4. An implement as claimed in any one of the preceding claims, characterised in that the air discharge means (12) is arched outwardly towards the downstream ends (18).



5. An implement as claimed in any one of the preceding claims, characterised in that the hair pickup elements (16) are arranged on concentric circular rings (30, 31, 32, 33) in particular spaced from one another at approximately equal distances.
6. An implement as claimed in any one of the preceding claims, characterised in that the hair pickup elements (16) are arranged on the air discharge means (12) in the form of two quadrangles (34) disposed in a 90° offset in relation to each other, their sides being curved in a concave fashion relative to a centre of the air discharge means (12).
7. An implement as claimed in claim 6, characterised in that the concave sides of the quadrangles (34) correspond approximately to the arcs of a circle.
8. An implement as claimed in any one of the preceding claims, characterised in that the air discharge means (12) is formed by circular rib members (20) disposed in offset relation to each other in two planes.
9. An implement as claimed in claim 8, characterised in that the rib members (20) are at least in part configured as annular walls (22) of different heights.
10. An implement as claimed in claim 9, characterised in that downstream end portions (24) of the annular walls (22) lie on a convex surface.
11. An implement as claimed in any one of the claims 8 to 10, characterised in that the hair pickup elements (16) are fixedly secured to the rib members (20).
12. An implement as claimed in any one of the preceding claims, characterised in that the hair pickup elements (16) are arranged substantially parallel to each other and in the direction of the main flow.



13. An implement as claimed in any one of the preceding claims, characterised in that the hair pickup elements (16) are of star-shaped cross section (25) with rounded edges (26).
14. An implement as claimed in any one of the claims 1 to 12, characterised in that the hair pickup elements (16) are of circular cross-section.
15. An implement as claimed in any one of the preceding claims, characterised in that the downstream ends (18) of the hair pickup elements (16) are rounded off.
16. An implement as claimed in any one of the preceding claims, characterised in that the air discharge means (12) has a circular base surface.
17. An implement as claimed in any one of the preceding claims, characterised in that an imaginary plane extending through the ends (18) of the hair pickup elements (16) is inclined with respect to the direction of the main flow.
18. An implement as claimed in any one of the preceding claims, characterised in that the downstream ends (18) of the hair pickup elements (16) lie on a substantially concave surface.
19. A method for creating body and volume in the hair of a user, including an implement for styling and/or drying hair for an air-moving appliance for personal use, having a series of hair pickup elements (16) arranged on an air discharge means (12), characterised in that one places the downstream ends (18) of several hair pickup elements of the implement on the scalp and one moves the implement on the scalp, whereby the hairs are caught by the hair pickup elements (16) and are lifted up between the hair pickup elements (16) in the direction of the air discharge means (12), and one dries the hairs in this position, providing the hair with body and volume.



20. A method as claimed in claim 19, characterised by the use of an implement according to any one of claims 1 to 18.