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(54) **HAIRCARE DEVICE**

(57) It is an object of the invention to increase the ion output in haircare devices. According to one aspect the invention is a haircare device. The haircare device comprises an air inlet, an air outlet,
an air channel in between the air inlet and the air outlet,
an ionizer configured for ionizing air and
a fan configured for moving the air from the air inlet to the air outlet and along the ionizer.

The air outlet and / or the air channel comprises a conductive additive in order to improve the ion output to the hair when the haircare device is in use.

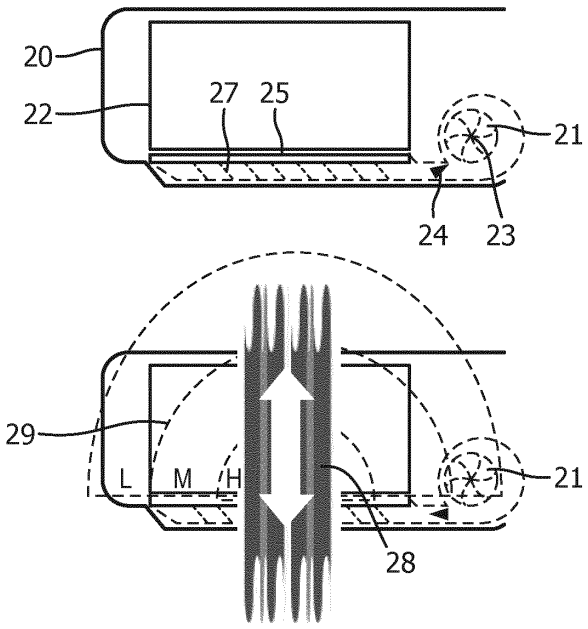

FIG. 2b

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Description

FIELD OF THE INVENTION

[0001] The invention relates to the field of haircare, in particular to hair dryers, hair straighteners, hair curlers, electronic brushes, and more particular to the use of an ionizer in an electronic haircare device.

BACKGROUND OF THE INVENTION

[0002] Frizz and static hair are most often undesired in hair styling. Frizz and static hair occur, because hair obtains a (positive) charged, e.g. through styling, brushing or combing.

[0003] EP2759224 describes a hair straightener that is configured to reduce electrostatic charging of the hair. The hair straightener according to EP2759224 comprises silicon strips that are at least partially electrically conductive and grounded.

[0004] Further, in the art of haircare ionizers are increasingly used, because they have the potential to prevent or reduce frizz by applying (negative) ions to the hair. However, the ion output of these ionizers can be unsatisfactory.

SUMMARY OF THE INVENTION

[0005] It is an object of the invention to increase the ion output in haircare devices. According to one aspect the invention is a haircare device according to claim 1.

[0006] In state of the art haircare devices, ion output can be reduced for several reasons. One of the reasons is that the haircare device is charged, for example through its use or by ions delivered by the ionizer. The electrical charge of the haircare device will influence the path of ions generated by the ionizer. An electrically charged haircare device can either attract or repel ions generated by the ionizer. Both effects can be undesired and may result in less ions reaching the hair. The use of a conductive additive in the air channel and / or air outlet, preferably used in a coating, will neutralize the air outlet and / or air channel such that the air outlet and / or air channel does not affect the course of the ions coming from the ionizer. As a result, the ion output to the hair may be increased. Such conductive additive could for example comprise carbon, a metal, like copper or silver.

[0007] Further, in haircare products like hair straighteners, hair curlers or hair brushes, the ion output may decrease over time, because the environment near the ionizer may get saturated. By providing an airstream along and away from the ionizer, the ion output to the hair may be improved when the haircare device is in use.

[0008] Examples of molecules or atoms that can be ionized are air molecules, water molecules or metals.

[0009] According to embodiments of the invention the haircare device is a hairdryer. According to further embodiments of the invention the air outlet is a nozzle or an air outlet grill. The air outlet could also be any other attachment known in the art, like e.g. comb or brush like structures.

[0010] According to further embodiments, the haircare device is any of a hair straightener, (electronic) brush or a hair curler.

[0011] These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

Fig. 1 diagrammatically shows a part of a hair dryer according to embodiments of the invention and
Fig. 2 diagrammatically shows part of a hair straightener according to the state of the art and part of a hair straightener according to embodiments of the invention and
Fig. 3 diagrammatically shows a hair curler according to embodiments of the invention and
Fig. 4 diagrammatically shows a hairbrush according to embodiments of the invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0013] Fig. 1 diagrammatically shows a side view of the air outlet area of a hair dryer according to embodiments of the invention. The outgoing air flows through air channel 12 in the direction of arrow 10 to the air outlet 11, which as known in the art, can take many different forms and configurations, like an air outlet grill (11a) or a nozzle (11b), but for example also a brush, comb or diffuser. The hair dryer according to Fig. 1 further comprises an ionizer 13. The fan of the hairdryer (not shown) moves the air from the air inlet of the hair dryer to the air outlet 11 and along the ionizer 13. The air outlet 11 and / or the air channel 12 comprises carbon such that the air channel and / or air outlet do not or minimally affect the course of the ions generated by ionizer 13. As a result, the number of ions reaching the hair is increased. The hair dryer may further comprise a non-conductive element, isolating element 14 for increasing safety. This part may be beneficial if high voltage parts such as the coil are too close to the air outlet or air channel and the conductivity of these parts is high.

[0014] Fig. 2 diagrammatically shows part of a hair straightener according to the state of the art (a) and part of a hair straightener according to embodiments of the invention (b). Both hair straighteners comprise an arm and a straightener plate 22. Further, both hair straighteners comprise an ionizer 24 for generating ions. The hair straightener according to the state of the art comprises an ionizer outlet 26 from which the generated ions exit.

[0015] The lower Figs. of 2a and 2b depict the hair straightener in use. A strand of hair 28 is placed on top

of straightener plate 22, after which the hair is clamped by a second arm, which is not shown in the figures. The straightener plate may be heated in order to bring the temperature of the hair above the glass transition temperature. By applying heat while clamping the hair, the hair can be straightened. For both the hair straighteners the ion distribution 29 is depicted. H indicates a high ion density, M a medium ion density and L indicates a low ion density. In Fig. 2a can be seen that for the hair straightener according to the state of the art the ion density at the location of the strand of hair 28 is low (L).

[0016] The hair straightener according to the invention further comprises a fan 23, which is configured for moving air from the air inlet 21 to the air outlet 25 and along the ionizer 24. Preferably, the air outlet has a length substantially the same as the straightener plate 22. This is advantageous because in this way the air will be blown towards the strand of hair independently of how the hair is exactly positioned in the straightener. The length of the straightener plate is defined as the edge that is perpendicular to the strand of hair 28 when the straightener is in use. More preferably, the air outlet is configured as a slot comprising multiple air outlets. The fan 23 transports the air from the air inlet to the air outlet 25 via air channel 27 in order to increase the number of ions at the location of the hair. Preferably, the air channel and / or the air outlet comprises carbon. More preferably, the air channel and / or air outlet is coated with a carbon coating. The fan will therefore blow the ions generated by the ionizer 24 through the air channel 27. The ion density at the location of the strand of hair 28 will hence be higher than in a hair straightener according to the state of the art. This is clearly visible when comparing the diagrammatically visualized ion distributions 29. The state of the art straightener results in a low ion density at the location of the strand of hair (Fig. 2a, 29), while the hair straightener according to embodiments of the invention results in a high ion density at the location of the strand of hair (Fig. 2b, 29).

[0017] Fig. 3 diagrammatically shows a hair curler according to embodiments of the invention. Hair can be entered into the curler via hair inlet 36. The hair curler may be configured to automatically wind the hair around heated rod 32 or this can be done by the user in a manual fashion. The heated rod may be configured to heat the hair above the glass transition temperature. By heating the hair while the hair is wound around a cylindrical object curls may be obtained. The hair curler may further comprise an outer barrel 36. The hair curler further comprises an ionizer 34 and a fan 33. The fan is configured for moving air from the air inlet 31 to the air outlet 35 through air channel 37 and along ionizer 34 in order to increase the number of ions at the location of the hair. Preferably, the air outlet is configured as a slot comprising multiple air outlets. The air channel 37 and / or the air outlet 35 preferably comprises carbon. Preferably, also the outer barrel comprises carbon.

[0018] Fig. 4 diagrammatically shows hairbrush according to embodiments of the invention. The hairbrush may be configured to be heated, but this is not essential. The hairbrush comprises multiple bristles 40 configured for detangling and / or styling the hair. The hairbrush further comprises an ionizer 44. The hairbrush further comprises a fan configured for moving air from the air inlet 41 to the air outlet 45 through air channel 47 and along ionizer 44 in order to increase the number of ions that reach the hair. The air channel and / or the air outlet may comprise carbon such that the air channel and / or air outlet only minimally affect the course of the ions.

[0019] Whilst the invention has been illustrated and described in detail in the drawings and foregoing description, such illustrations and description are to be considered illustrative or exemplary and not restrictive; the invention is not limited to the disclosed embodiments.

Claims

1. A haircare device comprising

   - an air inlet and
   - an air outlet and
   - an air channel in between the air inlet and the air outlet and
   - an ionizer configured for ionizing air and
   - a fan configured for moving the air from the air inlet to the air outlet and along the ionizer,

   wherein the air outlet and / or the air channel comprises a conductive additive in order to improve the ion output to the hair when the haircare device is in use.

2. A haircare device according to claim 1, wherein the conductive additive comprises carbon.

3. A haircare device as claimed in claim 1, wherein the air outlet and / or the air channel comprises a carbon-based coating.

4. A haircare device as claimed in any of the preceding claims, wherein the haircare device is a hairdryer and wherein the air outlet is a nozzle or an air outlet grill.

5. A haircare device as claimed in claimed in any of the preceding claims, wherein the haircare device is a hair straightener.

6. A haircare device as claimed in claim 5, further comprising a straightener plate wherein the air outlet has substantially the same length as a length of the straightener plate.

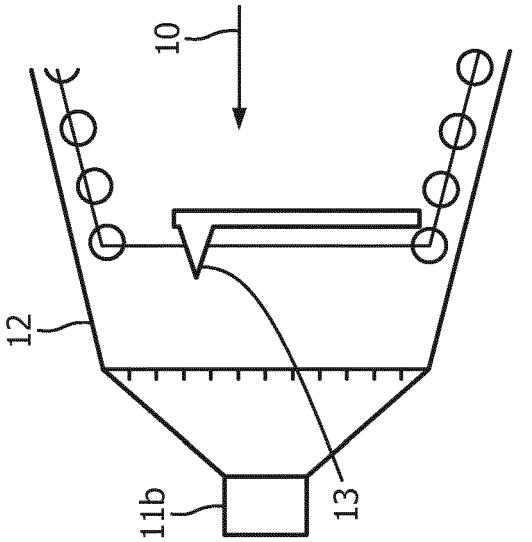
7. A haircare device as claimed in claimed in any of the preceding claims, wherein the haircare device is a brush.

8. A haircare device as claimed in claimed in any of the preceding claims, wherein the haircare device is a hair curler.

9. A haircare device as claimed in claim 8,

- comprising a rod configured to be heated and configured for receiving hair, wherein the hair can be wound around the rod when the haircare device is in use and
- an outer barrel partly surrounding the rod, wherein the outer barrel comprises carbon.

10. A haircare device as claimed in any of the preceding claims, wherein the air outlet comprises multiple slots.



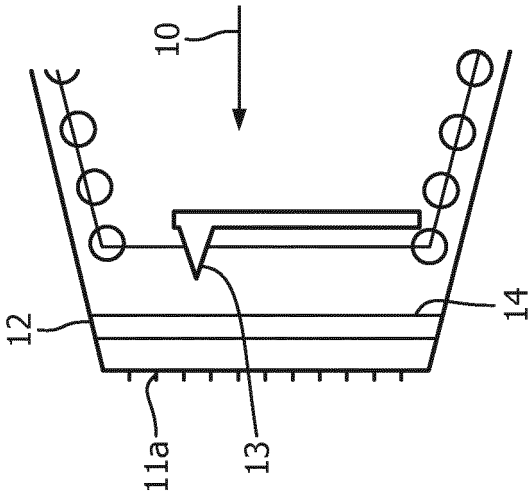


FIG. 1

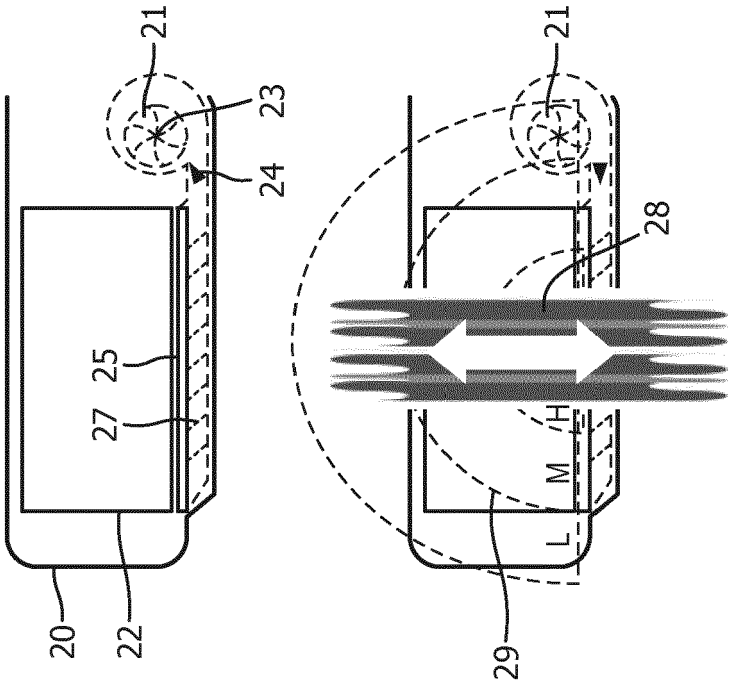


FIG. 2b

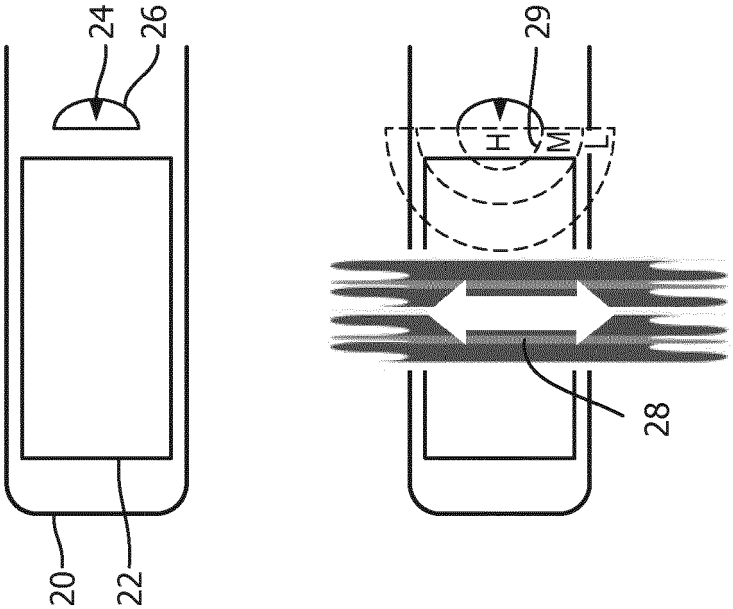


FIG. 2a

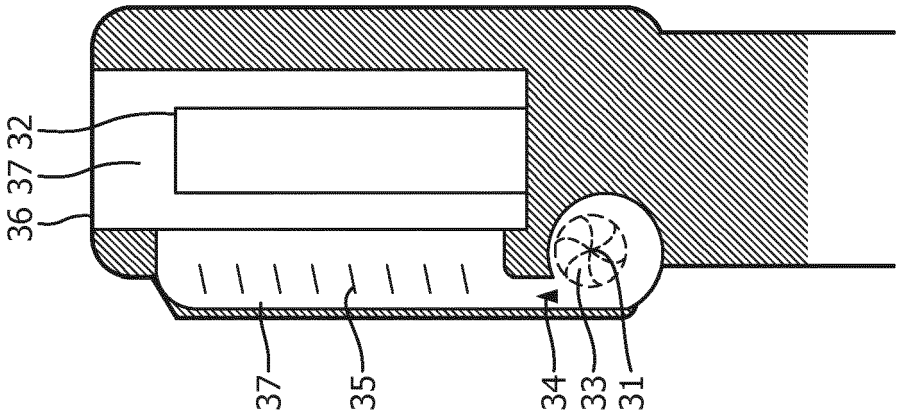


FIG. 3

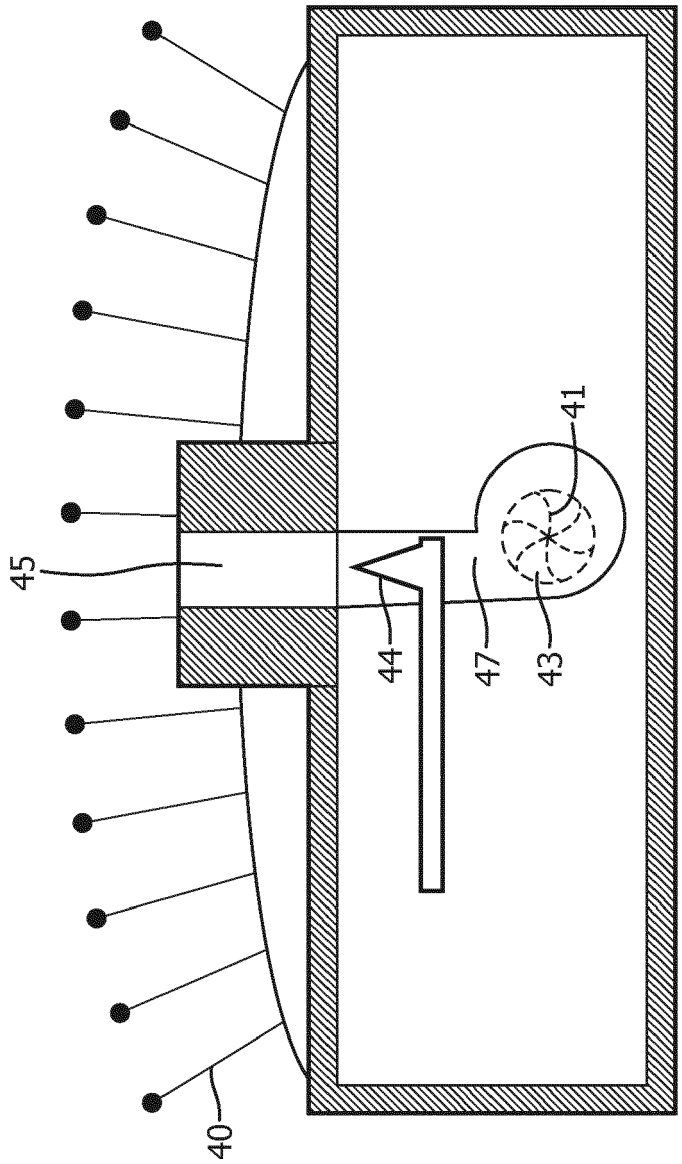


FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 19 20 8611

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

A45D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 April 2020	Ionescu, C

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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