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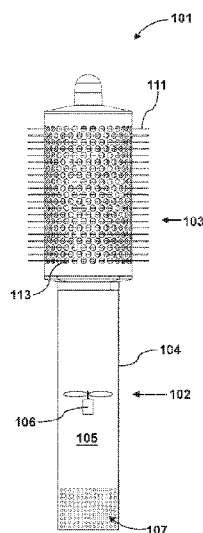


Fig. 1

(57) Abstract: A hair brush for attachment to an air outlet of a hair styling appliance is disclosed. The hair brush comprises an elongated cylindrical body comprising an air inlet at an end of the body for receiving airflow from the hair styling appliance, a plurality of openings through the side wall, and an airflow path between the air inlet and the plurality of openings, a plurality of bristles anchored inside of the cylindrical body and protruding outwards through the openings, wherein the cylindrical body has a diameter in the range of 50 millimetre to 60 millimetre, and the bristles protrude outwards through the openings to an average distance in the range of 9 millimetre to 13 millimetre from an exterior surface of the cylindrical body.

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A HAIR BRUSH

Field of the Disclosure

The present disclosure relates to a hair brush for attachment to a hair styling appliance.

5 Background of the Disclosure

A hair brush tool is attachable to an airflow outlet of a hair styling appliance, such as a hair dryer or hot air styler, and functions to deliver airflow to the hair simultaneous with brushing the hair.

10 Summary of the Disclosure

A first aspect of the present disclosure provides a hair brush for attachment to an air outlet of a hair styling appliance, comprising: an elongated cylindrical body comprising an air inlet at an end of the body for receiving airflow from the hair styling appliance, a plurality of openings through the side wall, and an airflow path between the air inlet and the
15 plurality of openings, a plurality of bristles anchored inside of the cylindrical body and protruding outwards through the openings, wherein the cylindrical body has a diameter in the range of 50 millimetre to 60 millimetre, and the bristles protrude outwards through the openings to an average distance in the range of 9 millimetre to 13 millimetre from an exterior surface of the cylindrical body.

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The present inventors have discovered that the diameter and length of the cylindrical body and the length of the bristles are strongly correlated with the tension exerted on the hair by the hair brush, and so the characteristics of the style imparted on the hair and the user experience of the hair brush. And indeed, it has been discovered that those parameters of
25 the brush are intercorrelated, for example, inasmuch that the tension exerted on the hair by each bristle is function of the length of the bristle and the diameter of the cylindrical body. For example, it has been discovered that a larger diameter cylindrical body, which may be preferred to impart certain hair styles such as loose hair curls, may tend to have the effect of contacting a greater length of the hair, and thus for a given bristle length and
30 density, the tension exerted on the hair by the hair brush may be relatively greater than for a smaller diameter cylindrical body.

In particular, it has been identified, that for a cylindrical body with a diameter in the range of 50 millimetre to 60 millimetre, which diameter range may be desirable to impart relatively loose curls to hair being styled, it is desirable for the bristles to have an exposed length, i.e., the radial distance to which they protrude outwards from the exterior
5 cylindrical surface of the cylindrical body, in the range of 9 millimetre to 13 millimetre.

The bristles may protrude outwards through the openings to an average distance in the range of 10 millimetre to 12 millimetre from the exterior surface.

- 10 The bristles may protrude outwards through the openings to an average distance of 10.5 millimetre from the exterior surface.

The plurality of bristles may be arranged to have an average density along the length of the cylindrical body in the range of 360 to 400 bristle protrusions per 10 millimetre of
15 length of the cylindrical body.

The plurality of bristles may be arranged to have an average density along the length of the cylindrical body in the range of 370 to 390 bristle protrusions per 10 millimetre of length of the cylindrical body.

- 20 The cylindrical body may have a length in the range of 80 millimetre to 90 millimetre.

The cylindrical body may have a length in the range of 83 millimetre to 87 millimetre.

- 25 The cylindrical body may have a diameter in the range of 53 millimetre to 57 millimetre.

A second aspect of the present disclosure provides a hair styling apparatus comprising, a hair styling appliance comprising a fan for generating an airflow and an air outlets for discharging the airflow, and a hair brush according to any one of the preceding claims that is releasably attachable to the hair styling appliance such that when attached the air
30 inlet of the hair brush is fluidically coupled to the air outlet of the hair styling appliance.

Brief Description of the Drawings

In order that the present disclosure may be more readily understood, embodiments of the disclosure will now be described, by way of example, with reference to the accompanying drawings, in which:

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Figure 1 is a schematic side elevation view of a hair styling apparatus comprising a hair styling appliance and a hair brush attached to the hair styling appliance;

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Figure 2 is a schematic side elevation view of the hair styling apparatus in which the hair brush is detached from the hair styling appliance;

Figure 3 is a schematic perspective view of the hair brush;

Figure 4 is a schematic side elevation view of the hair brush;

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Figure 5 is a schematic top plan view of the hair brush;

Figure 6 is a schematic bottom plan view of the hair brush;

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Figure 7 is a schematic side cross-sectional view of the hair brush;

Figure 8 is a schematic perspective view of a cylindrical body of the hair brush; and

Figure 9 is a schematic side elevation view of the cylindrical body.

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Detailed Description of the Disclosure

A hair styling apparatus 101, embodying aspects of the present disclosure, is shown schematically in Figures 1 and 2. The apparatus comprises a hair styling appliance 102 and a hair brush 103 attachable to the hair styling appliance. The hair styling appliance 102 is configured to be handheld by a user and used for styling a person's hair using
30 airflow.

The hair styling appliance 102 comprises a cylindrical body 104 defining externally a handle portion 105 for grasping in a user's hand, and defining internally a void in which a motor driven fan 106 is located. The motor driven fan 106 is depicted as visible in Figures 1 and 2, but in actuality may be obscured from view by the body 104 which may be opaque. The body 104 defines a plurality of air inlets 107 at a lower end and an air outlet 108 at an upper end. The motor driven fan 106 is operable to draw air in through the air inlets 107 and discharge an airflow via the air outlet 108.

The hair styling appliance 102 could, for example, include a heater located in the airflow path to heat air flowing therethrough, and could include user-operable controls mounted to the body 104 for controlling the operation of the motor-driven fan 106 and or the heater.

The hair brush 103 comprises an elongated cylindrical body 109 and a plurality of bristles 111. The body 109 comprises an air inlet 110 at an end of the body and a plurality of openings 113 in the cylindrical side wall of the body 109. An opposite end of the cylindrical body 109 to the air inlet 110 is closed. The body 109 comprises bayonet features 112 arranged about the periphery of the air inlet 110 which cooperate with corresponding features of the main body 104 of the hair styling appliance 102, to thereby releasably attach the hair brush 103 to the hair styling appliance 102. In the attached condition, depicted in Figure 1, the air inlet 110 of the hair brush 103 is fluidically coupled to the air outlet 108 of the hair styling appliance 102 to receive airflow from the hair styling appliance.

In use, the user may draw the bristles 111 of the hair brush 103 through the hair whilst airflow generated by the hair styling appliance 102 is discharged through the openings 113. The tension exerted on the hair by the bristles 111, along with the airflow, which may be heated airflow, may thus be used to style the hair.

Referring next collectively to Figures 3 to 9, the cylindrical body 109 of the hair brush 103 is hollow and defines an airflow path 901 for carrying airflow between the air inlet 110 and the plurality of openings 113.

The cylindrical body 109 is relatively rigid, and may be formed of rigid plastic or metal. The cylindrical body 109 comprises a rigid rod 902 fixed internally to extend along a diametric centre of the cylindrical body 109. The cylindrical body 109 has a diameter 'D1' in the range of 50 millimetre to 60 millimetre, for example, approximately 55 millimetre.

The openings 113 each extend through the side wall of the body 109 to discharge airflow from within the airflow path 901. The plurality of openings 113 are distributed about a full circumference of the cylindrical body 109 and along a majority of an axial length of the cylindrical body 109, to thereby diffuse airflow over a user's hair. In examples, the openings have an average diameter in the range of 1 millimetre to 4 millimetre, for example, an average diameter in the range of 2 millimetre to 3 millimetre.

The bristles 111 are anchored to the rod 902, and are arranged to extend radially outwardly therefrom to protrude outwardly of the cylindrical body 109 through the openings 113. In the example, the bristles 111 are double-ended, such that a single bristle 111, forms a first bristle protrusion 903 protruding in a first radial direction out of a first opening and a second bristle protrusion 904 protruding in a second radial direction, for example, an approximately diametrically opposite radial direction, out of a second opening. Thus, in the example, a single bristle structure may form two bristle protrusions protruding out of the cylindrical body 109. In other examples, the bristles 111 may be single-ended, and form only a single bristle protrusion protruding out of only a single opening. The bristles 111 are relatively flexible, and may be formed of a flexible plastic such as nylon or a natural material such as animal hair.

The present inventors have discovered that the diameter and length of the cylindrical body 109, the length of the bristles 111, and the density of the bristles 111 are strongly correlated with the tension exerted on the hair by the hair brush, and so the characteristics of the style imparted on the hair and the user experience of the hair brush. And indeed, it has been discovered that those parameters of the brush are intercorrelated, for example, inasmuch that the tension exerted on the hair by each bristle is function of the length of

the bristle and the diameter of the cylindrical body. For example, it has been discovered that a larger diameter cylindrical body, which may be preferred to impart certain hair styles such as loose hair curls, may tend to have the effect of contacting a greater length of the hair, and thus for a given bristle length and density, the tension exerted on the hair by the hair brush may be relatively greater than for a smaller diameter cylindrical body. Consequently, to maintain a desired hair tension, for styling and/or user experience reason, if the diameter of the cylindrical body is increased, it may be desirable, for example, to reduce bristle length and/or bristle density.

In particular, it has been identified, that for a cylindrical body 109 with a diameter in the range of 50 millimetre to 60 millimetre, which diameter range may be desirable to impart relatively loose curls to hair being styled, it is desirable for the bristles 111 to have an exposed length, i.e., the radial distance 'D2' to which they protrude outwards from the exterior cylindrical surface of the cylindrical body, in the range of 9 millimetre to 13 millimetre. It has further been found that it is desirable for the plurality of bristles 111 to be sufficiently numerous to have an average density of in the range of 360 to 400 bristle protrusions for every 10 millimetre axial length of the cylindrical body 109. In the case of single-ended bristles, this could mean 360 to 400 bristles. In the case of double-ended bristles, this could mean 180 to 200 bristles. It has been identified that these parameters may advantageously provide a desirable balance of cylindrical body diameter, dictating tightness of curl imparted to the hair, and tension exerted on the hair, relevant to user experience and hair style retention.

In particular, it has been found that a cylindrical body diameter in the range 53 millimetre to 57 millimetre may provide a desirable curl tightness. And a cylindrical body length in the range of 80 to 90 millimetre, for example, in the range of 83 millimetre to 87 millimetre, an average bristle protrusion length in the range of 10 millimetre to 12 millimetre, for example, approximately 10.5 millimetre, and an average bristle density in the range of 370 to 390 bristle protrusions per 10 millimetre axial length of the cylindrical body 109, has been found to exert desirable high tension characteristics.

Claims

1. A hair brush for attachment to an air outlet of a hair styling appliance, comprising:
5 an elongated cylindrical body comprising an air inlet at an end of the body for receiving airflow from the hair styling appliance, a plurality of openings through the side wall, and an airflow path between the air inlet and the plurality of openings,
a plurality of bristles anchored inside of the cylindrical body and protruding outwards through the openings, wherein
10 the cylindrical body has a diameter in the range of 50 millimetre to 60 millimetre, and
the bristles protrude outwards through the openings to an average distance in the range of 9 millimetre to 13 millimetre from an exterior surface of the cylindrical body.
- 15 2. The hair brush of claim 1, wherein the bristles protrude outwards through the openings to an average distance in the range of 10 millimetre to 12 millimetre from the exterior surface.
3. The hair brush of claim 1 or claim 2, wherein the bristles protrude outwards
20 through the openings to an average distance of 10.5 millimetre from the exterior surface.
4. The hair brush of any one of the preceding claims, wherein the plurality of bristles are arranged to have an average density along the length of the cylindrical body in the range of 360 to 400 bristle protrusions per 10 millimetre of length of the cylindrical body.
25
5. The hair brush of any one of the preceding claims, wherein the plurality of bristles are arranged to have an average density along the length of the cylindrical body in the range of 370 to 390 bristle protrusions per 10 millimetre of length of the cylindrical body.
- 30 6. The hair brush of any one of the preceding claims, wherein the cylindrical body has a length in the range of 80 millimetre to 90 millimetre.

7. The hair brush of any one of the preceding claims, wherein the cylindrical body has a length in the range of 83 millimetre to 87 millimetre.

5 8. The hair brush of any one of the preceding claims, wherein the cylindrical body has a diameter in the range of 53 millimetre to 57 millimetre.

9. A hair styling apparatus comprising:

10 a hair styling appliance comprising a fan for generating an airflow and an air outlets for discharging the airflow, and

a hair brush according to any one of the preceding claims that is releasably attachable to the hair styling appliance such that when attached the air inlet of the hair brush is fluidically coupled to the air outlet of the hair styling appliance.

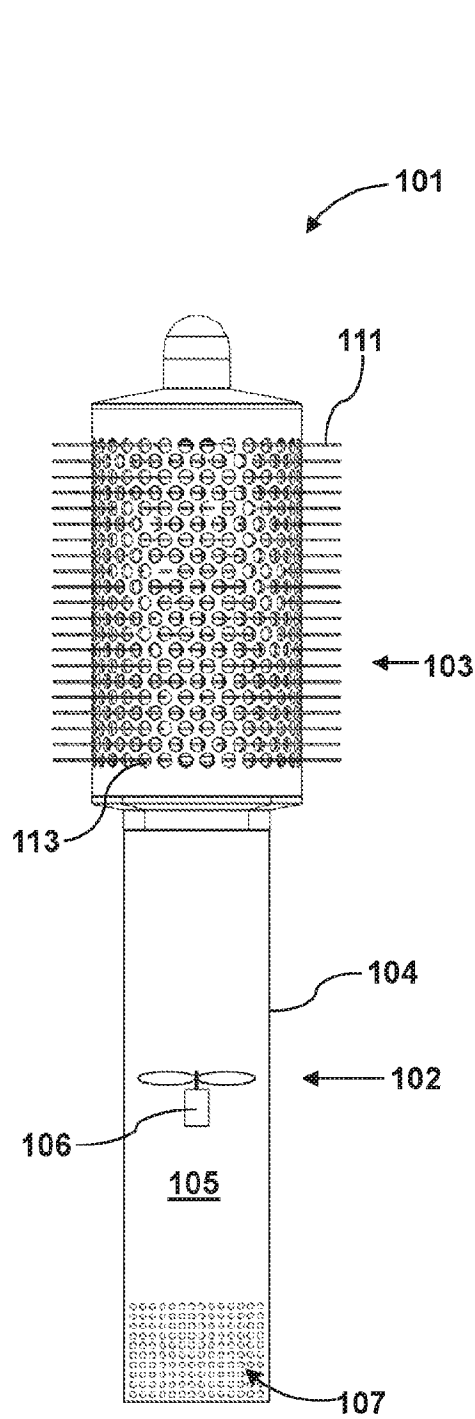


Fig. 1

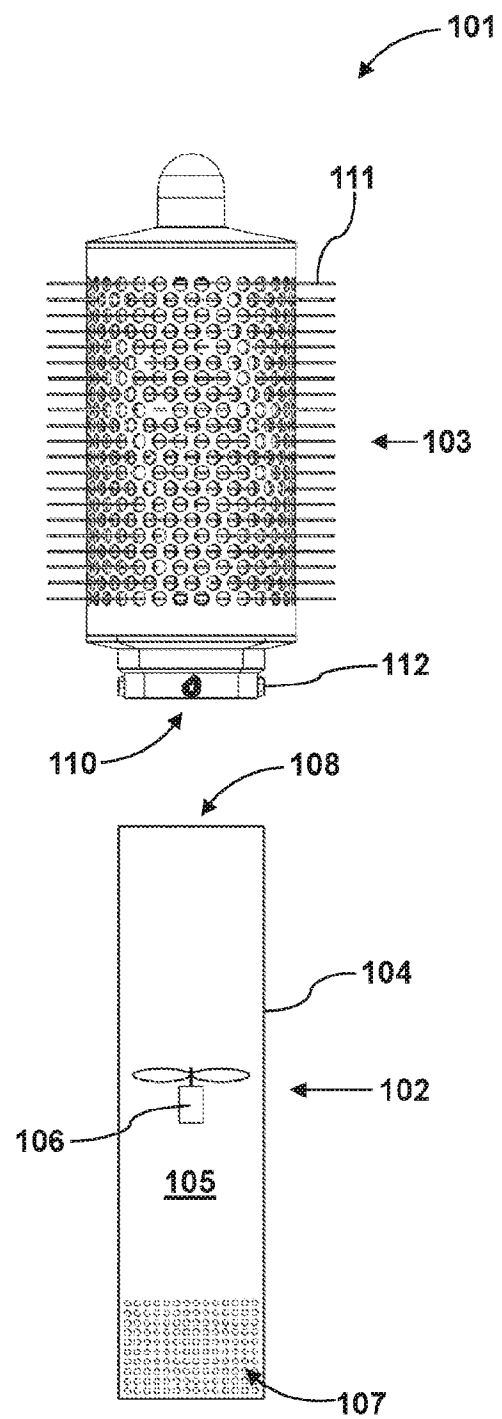


Fig. 2

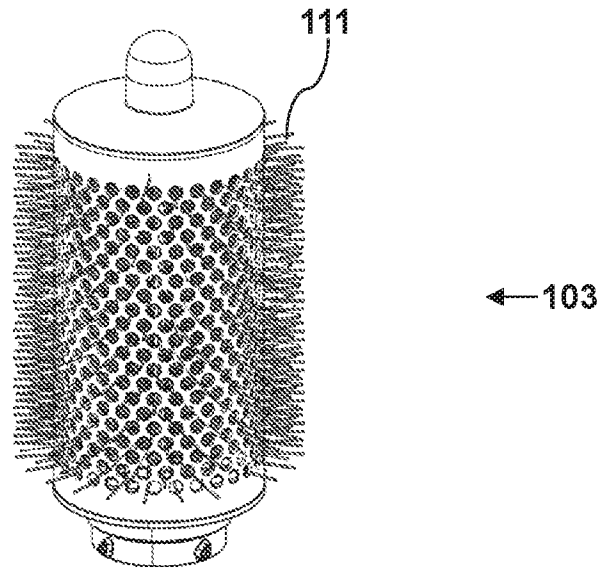


Fig. 3

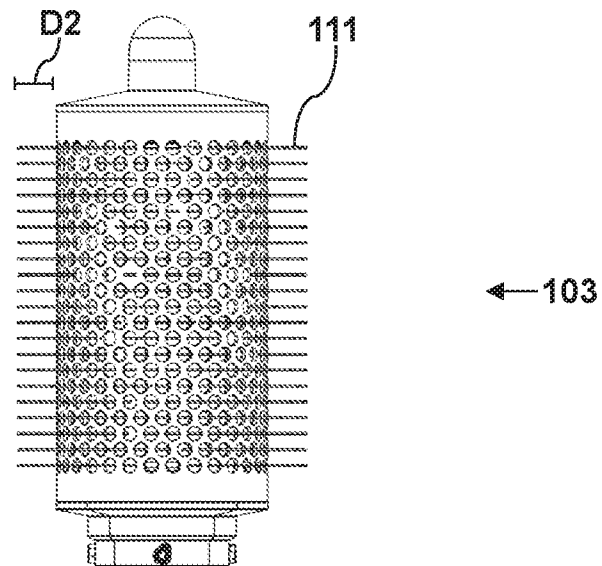


Fig. 4

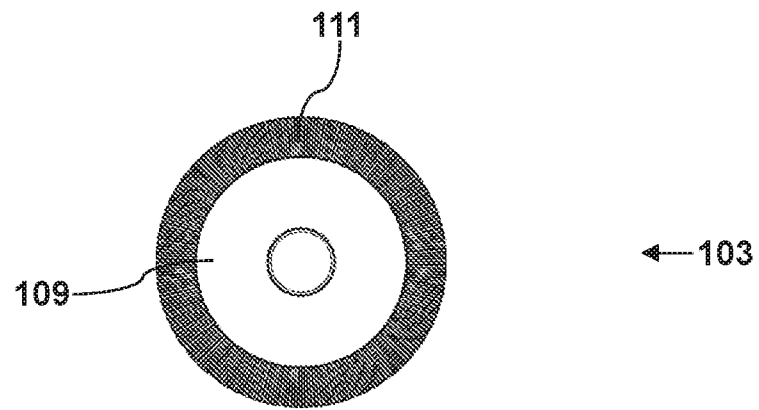


Fig. 5

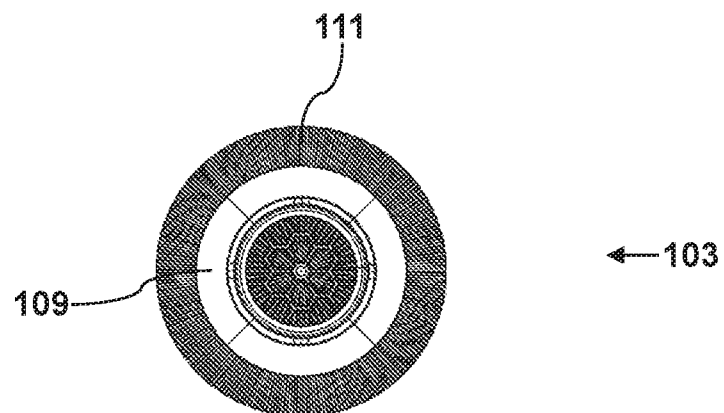


Fig. 6

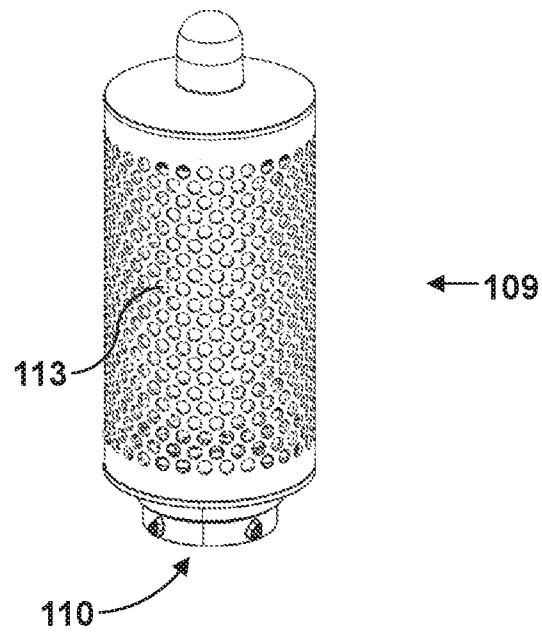


Fig. 7

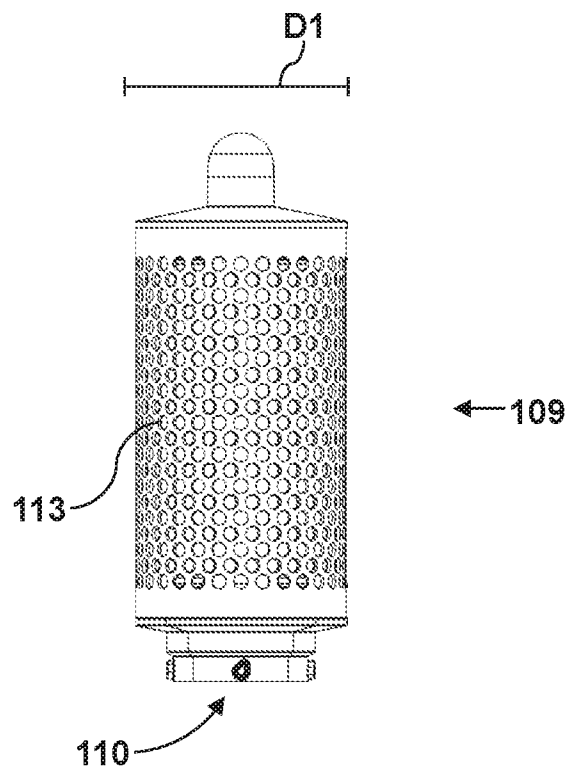


Fig. 8

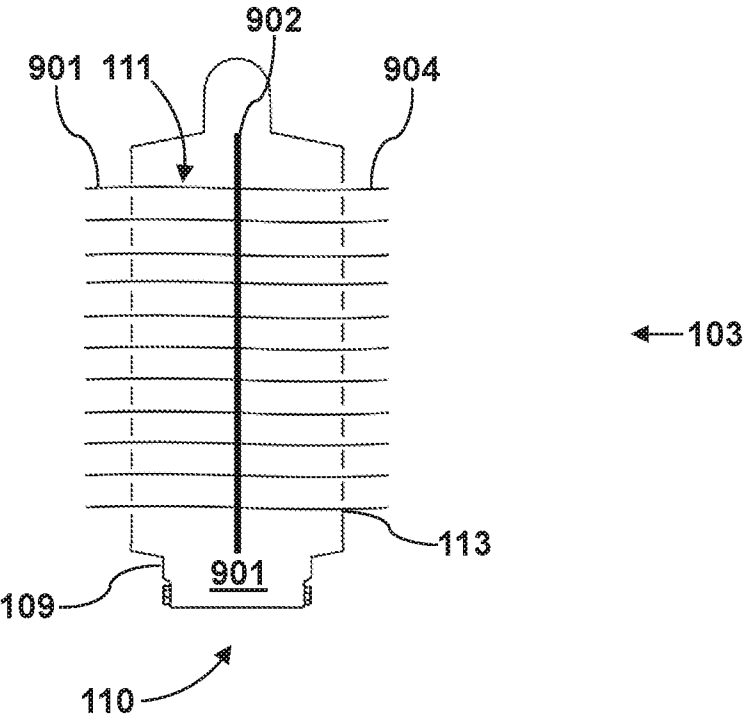


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2024/055490

A. CLASSIFICATION OF SUBJECT MATTER INV. A46B9/02 A45D20/52 A46B15/00 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A46B A45F A45D Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 978 332 A1 (SEB SA [FR]) 1 February 2013 (2013-02-01) claim 1; figures 1-4 page 7, line 26 - page 8, line 12 page 10, line 5 - page 11, line 3 page 12, lines 18-20 -----	1 - 9
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X	US 2023/148724 A1 (HIGGINS COLBY JACKSON [US] ET AL) 18 May 2023 (2023-05-18) paragraphs [0136], [0243]; figures 18, 84a, 72 -----	1, 6, 7
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
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Date of the actual completion of the international search 23 August 2024		Date of mailing of the international search report 03/09/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Rossini, Marco

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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