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(54) **Hair dryer**

(57) The purpose of the present device is to provide a hair dryer that is capable of spreading the effects of far-infrared rays and the effects of electromagnetic

waves onto almost the entire portion of the air flow to increase the sensation of moisture and gloss on the hair, and that is consequently capable of rendering the resulting hair moist, smooth, and easy-to-care for.

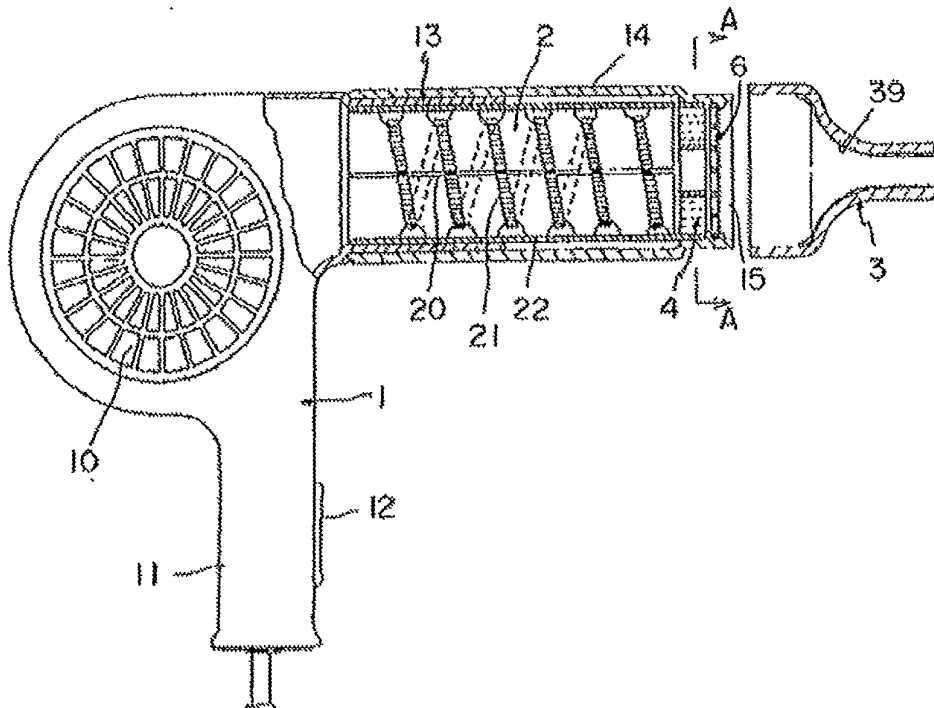


Fig. 1

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Description

[Means for Solving the Problem]

5 **[0001]** Hair dryer comprising an air-rectifying member such as diffuser (4), which is provided on air outlet (15); wherein a ceramics coated layer, which is formed by coating a mixed powder formed by far-infrared ray powder and multi-element mineral powder, is provided on the surface of the air-rectifying member.

[Detailed Explanation of the Device]

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[Industrial Field of Application]

[0002] The present device relates to a hair dryer that is utilized to dry or blow-set hair, and particularly to a hair dryer that is capable of providing effective care for hair and scalp by utilizing far-infrared rays emitted from far-infrared ray emitting powder and electromagnetic waves (weak energy) emitted from multi-element mineral powder.

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[Background Technologies]

[0003] When utilizing a hair dryer, it generally takes a long time to dry or blow set hair by causing hot air or cold air to be blown from the blower onto the hair. In particular, when utilizing a hair dryer that is merely capable of blowing either hot air or cold air, blow-setting cannot be conducted in an effective manner, and thus it takes even longer to dry and blow-set hair. Moreover, [when utilizing such hair dryer as stated above,] hair color is not sufficiently absorbed into the hair, and moisture and gloss of the hair become unfavorable, which have been problematic.

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[0004] In order to solve the above-stated problems, the applicant of the present device has already proposed a hair dryer in which a mixed powder formed by mixing far-infrared ray emitting powder and multi-element mineral powder is coated on the inner surface of the air passage to form a ceramics coated layer (see Patent Literature 1).

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[Prior Art Literature]

30 [Patent Literature]

[0005] [Patent Literature 1] Publication of Utility Model Registration No: 3097758

[Outline of the Device]

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[Problem that the Device is to Solve]

[0006] The traditional hair dryer stated above is certainly capable of providing care to hair and scalp through far-infrared rays and electromagnetic waves that are emitted from the ceramics coated layer. However, because the ceramics coated layer is provided on the inner surface of the air passage, the air is not in contact with the ceramics coated layer to a sufficient degree in the central portion of the air flow, and thus the desired effects are not obtained to a sufficient degree, which has been problematic.

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[0007] A hair dryer is equipped with an air-rectifying member at the air outlet (for example, a diffuser and an air-rectifying plate), and this air-rectifying member prevents the air flow from being diffused when the air is blown out through the air outlet. In other words, the air flow that is blown out through the air outlet, when it comes in contact with the air-rectifying member, is rectified without its being diffused. In paraphrasing this, almost all of the air flow comes in contact with the air-rectifying member before it is blown out through the air outlet.

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[0008] The creator of the present device paid attention to such air-rectifying member as stated above, and thus the purpose of the present device is to provide a hair dryer in which a ceramics coated layer is provided on the surface of this air-rectifying member, and thus the effects of the far-infrared rays and electromagnetic waves that are both emitted from the ceramics coated layer can be spread onto almost the entire portion of the air flow to increase the sensation of moisture and gloss on the hair, and which is consequently capable of rendering the resulting hair moist, smooth, and easy-to-care for.

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55 [Means for Solving the problem]

[0009] In order to solve the problem stated above, the hair dryer of the present device (Claim 1) is constituted as follows: Hair dryer comprising heater (2), which is provided on an air passage extending from air inlet (10) to air outlet

(15), and air-rectifying member (4), which is provided on air outlet (15); wherein ceramics coated layer (49), which is formed by coating a mixed powder formed by far-infrared ray powder and multi-element mineral powder, is provided on the surface of air-rectifying member (4).

[0010] The hair dryer of the present device (Claim 2) is constituted as follows:

Hair dryer of Claim 1, wherein blowing-out nozzle (3) is provided on air outlet (15) in a freely mountable/dismountable manner, and ceramics coated layer (39), which is formed by coating a mixed powder formed by far-infrared ray powder and multi-element mineral powder, is provided on the inner surface of blowing-out nozzle (3).

[0011] The hair dryer of the present device (Claim 3) is constituted as follows:

Hair dryer of Claim 2, wherein intermediate nozzle (5) is provided between air outlet (15) and blowing-out nozzle (3) in a freely mountable/dismountable manner, air-rectifying members (51) and (52) are provided on the inner surface of intermediate nozzle (5), and ceramics coated layer (59), which is formed by coating a mixed powder formed by far-infrared ray powder and multi-element mineral powder, is provided on the inner surface of intermediate nozzle (5) and the surface of air-rectifying members (51) and (52).

[Effects of the Device]

[0012] The far-infrared rays emitted from the far-infrared ray powder, which is one of the materials constituting the ceramics coated layer, is capable of warming the hair from the inside thereof. Thus, warming the hair in such a manner as stated above is different from heating the hair only from the outside thereof, which makes it possible to dry and blow-set the hair in a short amount of time.

[0013] Moreover, the electromagnetic waves (weak energy) of 4μ to 14μ emitted from the multi-element mineral powder electronically change the surrounding areas of atomic nuclei, and cause the atoms and the corresponding substance to be in an excited state (vibrated state). Consequently, the electromagnetic waves cleave/shorten the polymerization of water clusters; this causes the water volume to be reduced, the specific gravity to increase, and water (free water) to attach to the epicytes of animals/plants, to a sufficient degree, Water as well as Ca^{2+} then infiltrates into the cells in an accelerated manner, and thus various functions of the cells are rendered more active.

[0014] Thus, when these electromagnetic waves (weak energy) are applied to hair or scalp as hot air or cold air, the moisture content contained within the hair and scalp is rendered as a mineral, activating the protein contained within the hair and scalp, which makes the hair healthy and glossy. By applying the above-stated electromagnetic waves to the hair and scalp as hot air or cold air, hair that has been damaged by hair color, hair perm liquid, and the like or hair that is hard to set can be set neatly. Moreover, when hair color or acid color are applied to hair, the cluster phenomenon (effects of rendering water molecules smaller), which are effects from the electromagnetic waves, helps the hair color and acid color to be better absorbed into the hair.

[0015] The hair dryer of the present device (Claim 1) is characterized by a constitution wherein a ceramics coated layer, which is formed by coating a mixed powder formed with far-infrared ray powder and multi-element mineral powder, is provided on the surface of the air-rectifying member, which is provided on air outlet.

[0016] In other words, because the air flow blown out of the air outlet is blown out after almost all of it has been in contact with the air rectifying member, the air flow is able to receive, on the entire portion thereof, the effects of far-infrared rays and the effects of electromagnetic waves emitted from the ceramics coated layer provided on the surface of the air rectifying member. Thus, it becomes possible to enhance the moisture and gloss of the hair, rendering the resulting hair to be moist, smooth, and easy-to-care for without damaging the hair or scalp.

[0017] The hair dryer of the present device (Claim 2) is a mode in which the ceramics coated layer is provided on the inner surface of the blowing-out nozzle that is provided on the air outlet in a freely mountable/dismountable manner. The hair dryer of the present device (Claim 3) is a mode in which the ceramics coated layer is provided on the inner surface of an intermediate nozzle, that is provided between the air outlet and the blowing-out nozzle in a freely mountable/dismountable manner, as well as on the surface of air-rectifying members that are provided on the inner surface of the intermediate nozzle. As stated above, due to the constitution in which the ceramics coated layer is provided on the blowing-out nozzle as well as on the intermediate nozzle, the effects of the far-infrared rays and the effects of the electromagnetic waves are receivable in a further increased manner.

[Brief Explanation of the Drawings]

[0018] Fig. 1 is a partially cutaway side view showing the essential part of the hair dryer of Working Example 1.

[0019] Fig. 2 is an A-A cross-sectional view of Figure 1, which shows a cross-sectional view of the air rectifying member.

[0020] Fig. 3 is a cross-sectional view showing the essential part of the hair dryer of Working Example 2.

[0021] Fig. 4 is a B-B cross-sectional view of Figure 2, which shows a cross-sectional view of the intermediate nozzle.

[Modes for Carrying Out the Device]

5 [Working Example 1]

[0022] The hair dryer shown in Figure 1 primarily comprises body 1, heater 2, and blowing-out nozzle 3. This hair dryer is constituted with a heat-resistant plastic material.

10 [0023] Body 1 stated above is equipped with a fan (not shown in the figures) therein, and air inlet 10 is provided on both sides of the fan. Moreover, handle 11 is provided on body 1 so that the user is able to hold the hair dryer with their hand. On handle 11, toggle switch 12 for toggling between hot air and cold air or for changing the amount of air, temperature, and the like is provided.

[0024] On body 1, connecting cylinder 13 is formed; on the outer circumference of connecting cylinder 13, blowing-out cylinder 14 is inserted, and the tip of blowing-out cylinder 14 is formed into air outlet 15.

15 [0025] Heater 2 stated above heats the air sent by the fan, and is formed in the following manner: mica plate 20 is formed into a cross shape; on the outer circumference of mica plate 20, nichrome wire 21 is wound around, and the above is inserted into the inside of cylinder-shaped mica member 22. The base of cylinder-shaped mica member 22 is inserted into the inner circumference of connecting cylinder 13 stated above, and the tip thereof is formed in a manner so that it is engaged with the inside of the tip of blowing-out cylinder 14.

20 [0026] On the tip of cylinder-shaped mica member 22, which constitutes air outlet 15, diffuser 4 as the embodied air rectifying member is mounted. On the cenhal portion of diffuser 4, as shown in Figure 2, circular-shaped frame 41 is provided; in the direction of outer circumference 8 thereof, radial plates 42 are provided in a protruding manner with an equal interval in between. The air flow passes through the inside of circular-shaped frame 41, radial plates 42, space between radial plates 42, and small holes 43; thus, this constitution prevents the air flow from being diffused, and consequently the air flow is rectified before it is blown out.

25 [0027] Moreover, on the surface of diffuser 4, ceramics coated layer 49, which is formed by coating a mixed powder formed by far-infrared ray powder and multi-element mineral powder, is provided. In this working example, blowing-out grill 6 functioning as the embodied air rectifying member is provided on the front surface of diffuser 4, and the same ceramics coated layer (omitted in the figures) is also provided on the surface of blowing-out grill 6. Moreover, as the air rectifying members, it is not necessarily mandatory to have both diffuser 4 and blowing-out grill 6; either one of these may be utilized.

30 [0028] Ceramics coated layer 49 stated above is formed in the following manner: a mixed powder formed by far-infrared ray powder and multi-element mineral powder is mixed with a coating agent, namely heat-resistant formica, to render the resulting mixture paint-like, and the resulting mixture is applied to [ceramics] to bake the coating agent in an oven. The mixing ratio of the mixed powder as the volume ratio is preferably in the range from 3% to 15%; however, the ratio may be changed.

35 [0029] As the far-infrared ray emitting material, alumina (Al₂O₃), titania (TiO₂), ferrite (Fe₂O₃), chromium oxide (Cr₂O₃), silica (SiO₂), yttria (Y₂O₃), magnesia (MgO), and the like may be rendered as a powder and utilized. These powders are blended in a manner so that they will emit far-infrared rays of a wavelength that is suitable to be absorbed into the hair and scalp.

40 [0030] Moreover, "multi-element mineral" refers to a mineral of which the primary component is silicone and which contains multiple elements in a balanced manner. Examples of multi-element minerals include perlite, pitchstone, tourmaline, and the like. This mineral emits the above-stated electromagnetic waves (weak energy); when it is applied to hair as hot air or cold air, the moisture contained within the hair is mineralized, which activates the protein contained within the hair. The multi-element mineral is crushed into multi-element mineral powder, for example by crushing perlite by means of a ball mill, etc. In this case, the degree to which the powder is ground is preferably in the range from 1 μ to 3 μ; however, this may be changed. Two or more types of multi-element minerals are preferably mixed to form the multi-element mineral powder. The multi-element mineral powder may be utilized as is. Or alternatively, the multi-element mineral powder may be mixed with water, heated, pressured, and the resulting supernatant rendered as a powder through vacuum-freeze-drying or jet-drying. Moreover, perlite is constituted with the components shown in Table 1 below.

50 [0031]

[Table 1]

Anhydrous silicone	siO ₂	71.94%
Aluminum oxide	Al ₂ O ₃	14.94%
Iron oxide	Fe ₂ O ₃	2.54%

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(continued)

Magnesium oxide	MgO	0.44%
Calcium oxide	CaO	2.47%
Alkali oxide	K ₂ O + Na ₂ O	6.87%
Manganese oxide	MnO	0.03%
Anhydrous phosphoric acid	P ₂ O ₅	0.14%
Ignition loss (at 110°C)		3.43%
Loss on drying	(at 110° C)	0.07%
Other: Titanium		Trace

15 **[0032]** Nozzle 3 stated above is engaged with and mounted on the outer circumference of the tip of blowing-out cylinder 14 in a freely mountable/dismountable manner; on the inner surface thereof, ceramics coated layer 39, which is the same as ceramics coated layer 49, is provided.

20 **[0033]** Therefore, in the hair dryer of this working example, when toggle switch 12 is turned on to provide power to nichrome wire 21 and to operate the fan, the air heated by nichrome wire 21 is blown out through air outlet 15. In the case of blowing out cold air, power is not provided to nichrome wire 21, and the air is transmitted only by means of the fan.

25 **[0034]** As stated above, the air flow that is blown out through air outlet 15 is rectified by means of diffuser 4 and blowing-out grill 6. At this time, almost all of the air flow comes in contact with diffuser 4 and blowing-out grill 6 before it is blown out. Thus the effects of the far-infrared rays and the effects of the electromagnetic waves emitted from ceramics coating layer 49 may be received by almost all of the air flow to increase the sensation of moisture and gloss on the hair without damaging the hair or scalp, and consequently the resulting hair becomes moist, smooth, and easy-to-care for.

[0035] Moreover, when blowing-out nozzle 3 is mounted on air outlet 15, due to ceramics coated layer 39, which is provided on the inner surface of blowing-out nozzle 3, the effects of the far-infrared rays and the effects of the electromagnetic waves may be received to a greater degree.

30 [Working Example 2]

[0036] Working Example 2 shown in Figure 3 is an example in which intermediate nozzle 5 is provided between air outlet 15 and blowing-out nozzle 3 in a freely mountable/dismountable manner.

35 **[0037]** Intermediate nozzle 5 is mounted in a freely mountable/dismountable manner so that the inner circumference of the base of intermediate nozzle 5 is engaged with the outer circumference of the tip of blowing-out cylinder 14, and the inner circumference of the base of blowing-out nozzle 3 is engaged with the outer circumference of the tip of intermediate nozzle 5; air rectifying members are provided within intermediate nozzle 5. As shown in Figure 4, the air rectifying members are formed by air rectifying plates 51, which evenly partition the inside of intermediate nozzle 5 into 6 parts in the circumferential direction (the plates do not completely partition the space, leaving the space partially linked) as well as double-circular KURIRU [sic; grill] frame 52, which is provided on the inner portion of the tip of intermediate nozzle 5. Moreover, ceramics coated layer 59, which is the same as ceramics coated layer 49, is also provided on the inner surface of intermediate nozzle 5 as well as on the surface of air rectifying plates 51 and double-circular grill frame 52.

40 **[0038]** When intermediate nozzle 5 is mounted on the hair dryer, the effects of the far-infrared rays and the effects of the electromagnetic waves may be received to a greater degree due to ceramics coated layer 59.

45 **[0039]** As shown in the above, the working examples of the present device are explained based on the drawings thereof. However, the specific constitutions of the present device are not limited by these working examples, and design changes within the scope of the essence of the present device are included in the present device.

50 **[0040]** For example, the diffuser, grill, air rectifying plates and the like are utilized as the air rectifying members. The constitution and number of such air rectifying members may be arbitrarily determined as needed. As long as the effects of preventing the air flow from being diffused and the effects of rectifying the air are retained, any member may be included under the category of air rectifying members for the present device.

[Explanation of the Reference Numerals]

55 **[0041]**

1: Body

- 10: Air inlet
- 15: Air outlet
- 5 2: Heater
- 3: Blowing-out nozzle
- 39: Ceramics coated layer
- 10 4: Diffuser (Air rectifying member)
- 49: Ceramics coated layer
- 15 5: Intermediate nozzle
- 51: Air rectifying plate (Air rectifying member)
- 52: Double-circular grill frame (Air rectifying member)
- 20 59: Ceramics coated layer which has been coated

Claims

- 25
1. A hair dryer comprising:
- an air inlet (10);
- an air outlet (15);
- 30 an air passage extending between the air inlet (10) and the air outlet (15);
- a heater (2) in the air passage; and
- an air-rectifying member (4) within the air passage between the heater (2) and the air outlet (15); the air-rectifying member (4) including a layer (49) comprising a mixed powder including a far-infrared ray powder and a multi-element mineral powder.
- 35
2. The hair dryer of claim 1 further comprising a blowing out nozzle (3) on the air outlet (15) in a freely mountable/dismountable manner, the nozzle including a layer (39) comprising a mixed powder including a far-infrared ray powder and a multi-element mineral powder.
- 40
3. The hair dryer of claim 2 further comprising an intermediate nozzle (5) between the air outlet (15) and the blowing-out nozzle (3) in a freely mountable/dismountable manner, the intermediate nozzle including an inner surface and air-rectifying members (51) and (52) on the inner surface of intermediate nozzle (5), the intermediate nozzle (5) including a layer (59) comprising a mixed powder including a far-infrared ray powder and a multi-element mineral powder.
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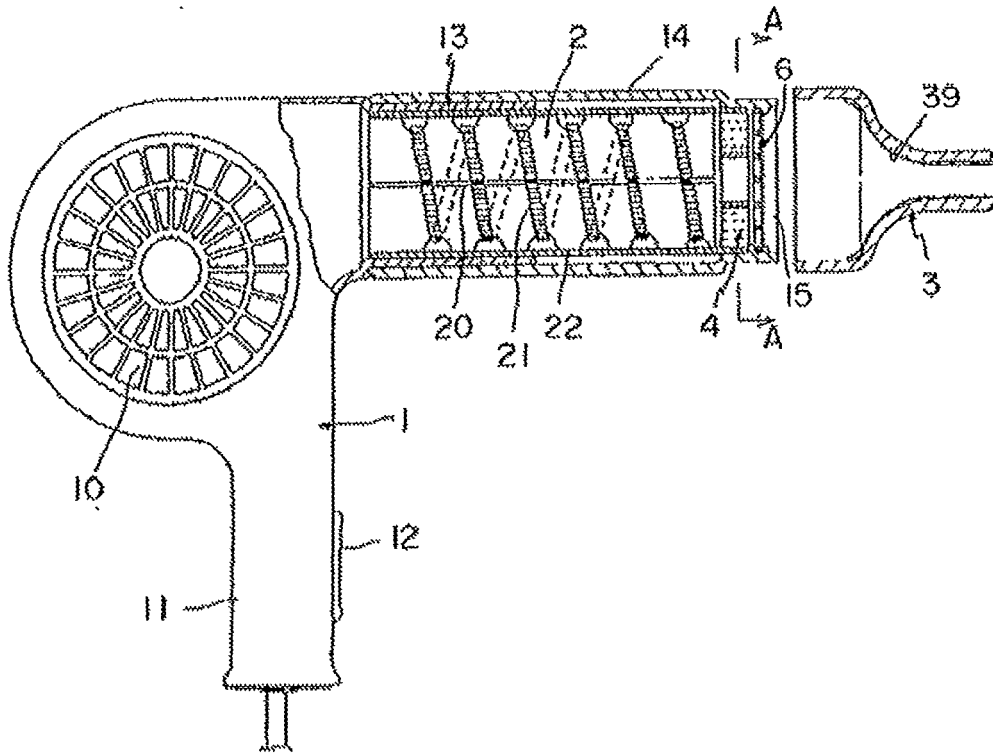


Fig. 1

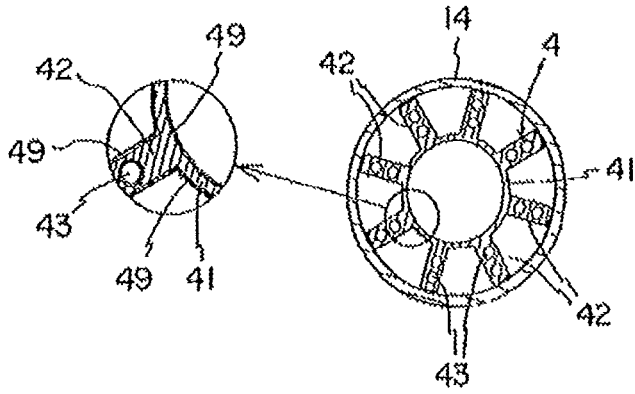


Fig. 2

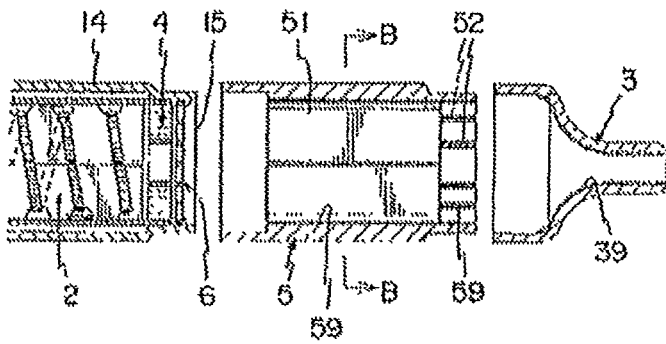


Fig. 3

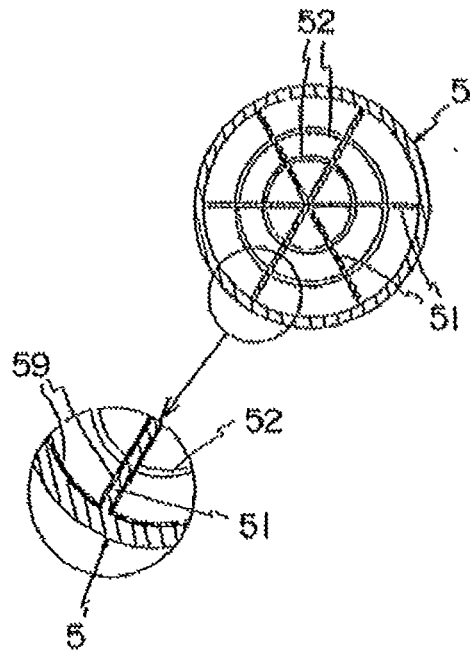


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 13 15 2950

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		29 May 2013	Ionescu, C
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