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(54) **Combing device**

(57) The present invention relates to a combing device (1) for combing hair, the device (1) comprising, a container (2), a plurality of teeth (5) and a triboelectric generator (7). The container (2) is suitable for housing some content (11), the container (2) comprising holes (3) arranged in a brushing zone (4) of the container (2). The plurality of teeth (5) are attached to the brushing zone (4) of the container (2). The shaking means (6) are suitable for causing a movement in the interior of the container (2), and the triboelectric generator (7) is adapted for creating a triboelectric effect on the hair to be combed.

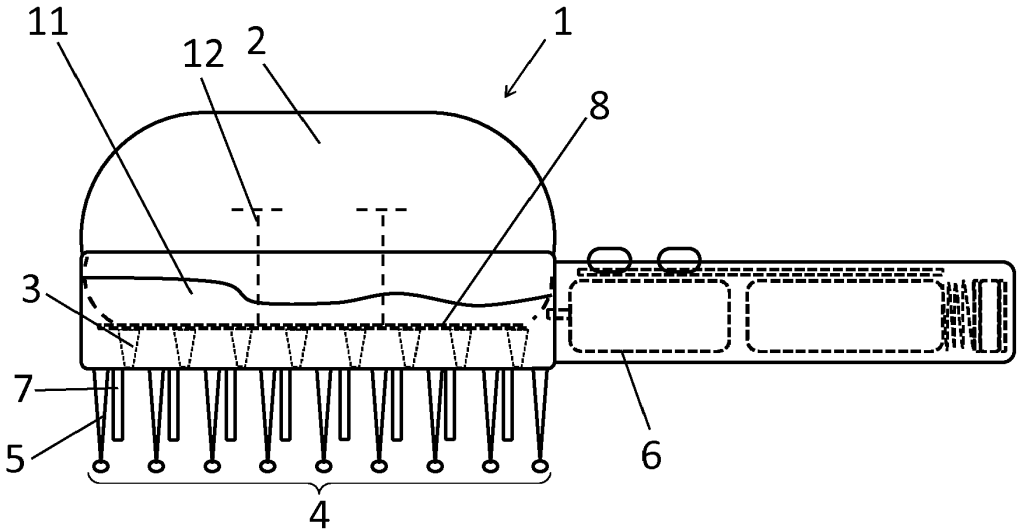

FIG 1

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Description

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention belongs to the field of distributing cosmetics, more particularly, to the field of distributing cosmetics in the hair.

BACKGROUND OF THE INVENTION

[0002] Many ways of applying hair products have been already disclosed in the state of art. The most common one is applying the product on the user's hand and then applying the product on the hair with their hand. Another way used in the cosmetic application is by means of a spray, which pulverizes the cosmetic product in the hair.

[0003] The problem found in these solutions is that the product is not uniformly distributed, the product does not reach hair and scalp uniformly and part of the product is wasted because the user does not know with accuracy the amount of product that should be used in each application, and does not have a way of reaching the hair and scalp directly.

SUMMARY OF THE INVENTION

[0004] The present invention provides a solution for the aforementioned problems, by a combing device according to claim 1. In dependent claims, preferred embodiments of the invention are defined.

[0005] In a first inventive aspect, the invention provides a combing device for combing hair, the device comprising,

a container suitable for housing some content, the container comprising holes arranged in a brushing zone of the container,

a plurality of teeth attached to the brushing zone of the container,

shaking means, suitable for causing a movement in the interior of the container, and

a triboelectric generator adapted for creating a triboelectric effect on the hair to be combed.

[0006] The combing device is adapted to spread the content of the container to the scalp and the hair. The content of the container leaves the container through the holes and said content is laid along the hair and the scalp.

[0007] Advantageously, the combing device allows a user to comb himself and to distribute the content of the container equally in each region of his hair. Advantageously, this equal distribution allows content saving. The combing device of the invention allows correct administration of the treatment along the hair and the scalp. Furthermore, the triboelectric effect prepares the hair for a better reception of the content of the container.

[0008] In a particular embodiment, the triboelectric generator achieves its aim by comprising a material with an electron affinity is lower than the electron affinity of hair, which is deemed to be around +45nC/J. In this scale, wool is considered to be the reference value (0 nC/J). Because of that, a material with an electron affinity between +40nC/J and -190nC/J is suitable for this aim. Electron affinity or charge affinity is considered as the charge transfer per unit of energy that is transferred when two bodies are rubbed against the other. Thus, any material with such an electron affinity will create a triboelectric effect in hair.

[0009] In a particular embodiment, the material comprised in the triboelectric generator comprises a polymer with an electron affinity which is comprised between -40nC/J and -190nC/J. In a further embodiment, this polymer is a vinyl polymer such as PVC.

[0010] In a particular embodiment, the triboelectric generator is comprised in the teeth themselves, because they are made of such a polymer.

[0011] The triboelectric generator generates a triboelectric effect in the hair to be combed. This effect prepares the hair to receive the content of the container, as it separates each hair from the others while contributing to adhere the material within the container to the hair due to differences in electrostatic charge.

[0012] In other embodiments, the triboelectric generator is located surrounding the brushing zone of the combing device. This configuration provides the advantage that the triboelectric effect is induced in the hair regardless the direction of the combing action.

[0013] In a particular embodiment, the container further comprises a covering structure movable between a first position and a second position, and further adapted to

cover the holes of the container, when the covering structure is in a first position, and

uncover the holes of the container, when the covering structure is in a second position.

[0014] When the covering structure is in its first position, it covers the holes and as a consequence, the content of the container cannot exit the container. When the covering structure is in its second position, the holes are uncovered and the content of the container can exit the container through the holes. Advantageously, said covering structure allows spreading the content of the container only when desired by the user, thus saving the content of the container. In some embodiments, the covering structure is a sheet. In particular embodiments, this sheet is located inside the container over the holes; in other embodiments the sheet is located outside the container. Different configurations are also possible.

[0015] In a particular embodiment, the shaking means are synchronized with the covering structure, so that when shaking means are activated, the covering structure is moved to the second position and when shaking means are deactivated, the covering structure is released to the first position.

[0016] In this embodiment, when the user activates the shaking means to apply the product, said shaking means move the covering structure, preferably a sheet inside the container, to the second position, where the covering

structure unblocks the holes of the container, so that the content of the container can leave the container through said holes. When the user deactivates the shaking means, said shaking means move the covering structure to the first position inside the container, where the covering structure blocks the holes of the container.

[0017] In a particular embodiment, the container further comprises a spring attached to the covering structure and to the container, wherein the spring is arranged to force the covering structure to be in its first position.

[0018] In this embodiment, the shaking means are configured to move the covering structure to the second position when they are activated, by applying a force which overcome the force produced by the spring. When the user deactivates the shaking means, the shaking means release their force, and the spring moves the covering structure back to the first position, thus covering the holes. Advantageously, this embodiment allows a simple configuration of the device.

[0019] In a particular embodiment, the diameters of the holes of the container are between 0.3 mm and 3 mm. Advantageously, this size of the holes allows the content inside the container to leave the container without blocking the holes. In a more particular embodiment, the diameters of the holes of the container are between 0.5 mm and 0.8 mm. Diameters between 0.5 mm and 0.8 mm are especially suitable when the content comprises keratin fibers.

[0020] In a particular embodiment, the holes are tapered, to ease their filling.

[0021] In a particular embodiment, the shaking means comprise a vibration motor which causes the container to vibrate. Advantageously, these vibrations avoid the obstruction of the holes if the content of the container is solidified or irregular.

[0022] The shaking means are adapted for causing the content of the container to move, avoiding the content from being stuck in the holes of the container, and letting said content to leave the container in a more uniform way. Advantageously, this solves the problem that arises when the action of gravity during the combing is not effective to distribute the content of the container uniformly, for example when combing the sides of the head. This is also useful when the content of the container is very compact and there is need to shake the container to move the content so that it is uniformly distributed along the hair.

[0023] In different embodiments, the shaking means comprise means for causing an airflow inside the container. As a consequence, the content of the container is stirred by said airflow.

[0024] In a particular embodiment, the container comprises container divisions.

[0025] In a particular embodiment, the container contains keratin fibers.

[0026] In a particular embodiment, the container is detachable.

[0027] In a particular embodiment, the container is refillable.

[0028] All the features described in this specification (including the claims, description and drawings) and/or all the steps of the described method can be combined in any combination, with the exception of combinations of such mutually exclusive features and/or steps.

DESCRIPTION OF THE DRAWINGS

[0029] These and other characteristics and advantages of the invention will become clearly understood in view of the detailed description of the invention which becomes apparent from a preferred embodiment of the invention, given just as an example and not being limited thereto, with reference to the drawings.

Figures 1 This figure shows a particular embodiment of a combing device according to the invention.

Figures 2 This figure shows an alternative embodiment of a combing device according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0030] Figure 1 shows a particular embodiment of a combing device (1) according to the invention. This combing device (1) comprises:

- a container (2) suitable for housing some content (11), the container (2) comprising holes (3) arranged in a brushing zone (4) of the container (2),
- a plurality of teeth (5) attached to the brushing zone (2) of the container,
- shaking means (6), suitable for causing a movement in the interior of the container (2), and
- a triboelectric generator (7), for creating a triboelectric effect on the hair to be combed.

[0031] In the embodiment of this figure, the triboelectric generator (7) comprises a vinyl polymer such as PVC, with an electron affinity around -100nC/J. This triboelectric generator (7) is capable to cause a triboelectric effect on the hair when the teeth (5) of the combing device (1) make contact with the hair. In this particular embodiment, the triboelectric generator (7) comprise PVC elements, which are arranged in the brushing zone (4), next to the teeth (5).

[0032] In a further embodiment, not shown in the figures, the triboelectric generator (7) is located surrounding the brushing zone (4) of the combing device (1), so that the triboelectric effect is induced regardless the direction of the combing action, and before the teeth (5) of the combing device (1) make contact with the hair.

[0033] In a particular embodiment, a polymer, such as a plastic, is chosen, because of its electron affinity, which is higher than the average for human hair.

[0034] In order to prevent the content (11) contained in the container (2) to exit the container (2) when the container (2) is filled with some content (11), a covering

structure (8) is provided inside the container (2). This covering structure is adapted to be movable between a first position, then covering the holes (3) of the container (2), and a second position, then uncovering the holes (3) of the container (2). In this particular embodiment, the covering structure (8) is a metal sheet driven by a spring, in such a way that the spring is arranged to force the covering structure (8) to be in its first position. If nothing acts over the spring, the covering structure is located in its first position, thus covering the holes (3) of the container (2), and preventing the content (11) from exiting the container (2).

[0035] In this particular embodiment, the shaking means (6) are also connected to the covering structure (8) in the following way:

when said shaking means (6) are activated, they act on the covering structure (8), moving it to the second position against the force of the spring and,
when said shaking means (6) are deactivated, they release the covering structure (8) so that it returns to the first position.

[0036] In this particular embodiment, the holes (3) are tapered, i.e., they are provided in a funnel shape, so that the hole (3) is wider inside the container (2) and is narrower outside the container (2).

[0037] In this particular embodiment, the shaking means (6) comprise a vibration motor. This vibration motor is placed next to the container, and when it is activated, it causes the container (2) to vibrate. When the content (11) is inside the container, the shaking means prevent the content (11) from being stuck in the holes (3), causing the content (11) to exit uniformly by the holes (3).

[0038] In an alternative embodiment, shown in figure 2, the shaking means (6) comprise a fan, placed inside the container. When the fan is activated, the fan causes the content (11) inside the container to move by the airflow generated by the fan, thus preventing the content (11) from being stuck in the holes (3), causing the content (11) to exit uniformly by the holes (3).

Claims

1. Combing device (1) for combing hair, the device (1) comprising,
   a container (2) suitable for housing some content (11), the container (2) comprising holes (3) arranged in a brushing zone (4) of the container (2),
   a plurality of teeth (5) attached to the brushing zone (4) of the container (2),
   shaking means (6), suitable for causing a movement in the interior of the container (2), and
   a triboelectric generator (7) adapted for creating a triboelectric effect on the hair to be combed.

2. Combing device (1) according to claim 1, wherein the triboelectric generator (7) comprises a material with an electron affinity which is comprised between +40nC/J and -190nC/J.

3. Combing device (1) according to any of preceding claims, wherein the material comprised in the triboelectric generator (7) comprises a polymer with an electron affinity which is comprised between -40nC/J and -190nC/J.

4. Combing device (1) according to any of preceding claims, wherein the container (2) further comprises a covering structure (8) movable between a first position and a second position, and further adapted to cover the holes (3) of the container (2), when the covering structure (8) is in a first position, and uncover the holes (3) of the container (2), when the covering structure (8) is in a second position.

5. Combing device (1) according to the preceding claim wherein the shaking means (6) are synchronized with the covering structure (8), so that when the shaking means (6) are activated, the covering structure (8) is moved to the second position and when the shaking means (6) are deactivated, the covering structure (8) is released to the first position.

6. Combing device (1) according to any claim 4 or 5, wherein the container (2) further comprises a spring attached to the covering structure (8) and to the container (2), wherein the spring is arranged to force the covering structure (8) to be in its first position.

7. Combing device (1) according to any of previous claims, wherein the diameters of the holes (3) of the container are between 0.3 mm and 3 mm.

8. Combing device (1) according to the previous claim, wherein the diameters of the holes of the container are between 0.5 mm and 0.8 mm.

9. Combing device (1) according to any of previous claims, wherein the holes (3) are tapered, to ease their filling.

10. Combing device (1) according to any of the previous claims, wherein the shaking means (6) comprise a vibration motor which causes the container (2) to vibrate.

11. Combing device (1) according to any of the previous claims, wherein the shaking means (6) comprise means for forcing an airflow inside the container (2).

12. Combing device (1) according to any of the previous claims, wherein the container (2) comprise container divisions (12).

13. Combing device (1) according to any of the previous claims, wherein the container (2) contain keratin fibers.

14. Combing device (1) according to any of the previous claims, wherein the container (2) is detachable.

15. Combing device (1) according to any of the previous claims, wherein the container (2) is refillable.

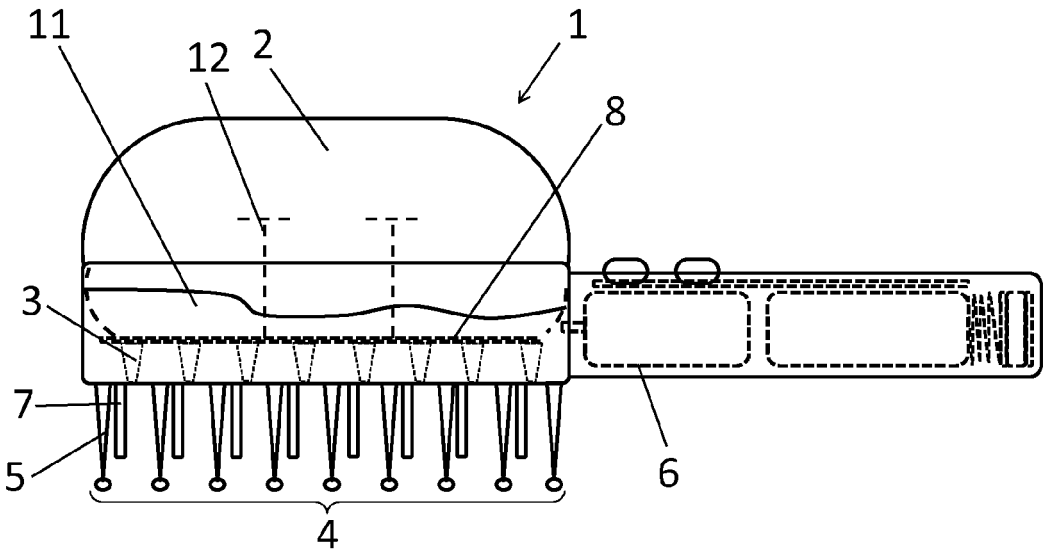

FIG 1

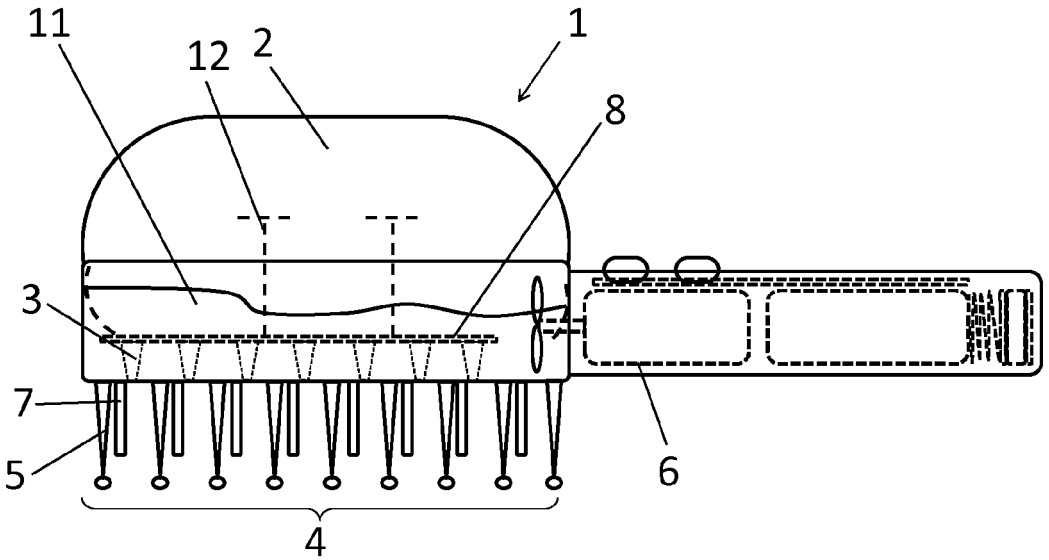

FIG 2

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EUROPEAN SEARCH REPORT

Application Number
EP 14 38 2510

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2007/077647 A1 (KIKUBOSHI CORP [JP]; TAKEHANA MIKI [JP]) 12 July 2007 (2007-07-12) * abstract * * figures *	1-3, 7-10, 12-15	INV. A45D24/22
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A	US 2 270 529 A (SAMUEL KIRSCHENBAUM) 20 January 1942 (1942-01-20) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (IPC)

A45D
A46B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	22 June 2015	Zetzsche, Brigitta

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 14 38 2510

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22-06-2015

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