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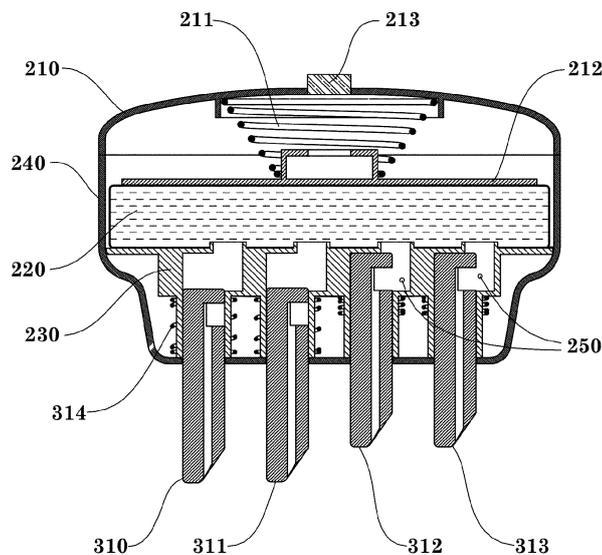
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(54) **A HAIR COLORING APPARATUS**

(57) The present invention relates to an apparatus for coloring hair comprising: (a) a housing, for holding the packing system of the coloring mixture, for coloring hair; (b) a lid, attached to said housing; (c) a power spring, located underneath said lid, for pressuring said packing system, within said housing, for squeezing the color mixture from said packing system; (d) a base having at least 2 compartments which receive and store some of said

squeezed color mixture from said packing system; and (e) at least 2 tines, each having a conduit fixed within, and each tine is independently movably connected, at its upper part, to said base, for combing said hair and dividing said hair strands into groups of the required width while at the same time distributing and applying said coloring mixture to said hair roots of said separated strands through said conduits, fixed within said tines.



**Fig.4**

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**Description****Technical Field**

[0001] The present invention relates to hair coloring apparatuses. More particularly, to a hair coloring apparatus in which the color mixture can be stored.

**Background**

[0002] The first step, for coloring hair, is to expose the roots of the hair strands that are to be colored. This is normally performed by using a comb, or other suitable device. Next, coloring the hair in a particular color is performed by using a separate brush or other suitable color applicator to apply a coloring agent, i.e. dye chemicals, to the roots and body of the selected strands of hair.

[0003] Separating and coloring of the hair requires to alternate between using the comb, then the brush. This can become cumbersome and inconvenient for the user as the user must repeatedly pick-up and set down the comb and brush. Furthermore, the constant switching of the comb and brush necessarily lengthens the total time spent on the coloring process. Moreover, the constant switching of the comb and brush makes the coloring of one's own hair, without the use of a stylist, difficult.

[0004] US 6260557 discloses a hair colorant applicator in the form of a hollow comb with a threaded receiver top that accepts standard plastic bottles of hair colorant in the inverted position. The teeth of the comb are in the form of tubes. A hollow conduit in each tube of the comb terminates in an orifice at the tip of each tube. Hair colorant flows from the bottle, through the body of the comb, through the conduits in the tubes, and exits the tips of the tubes. This applies the colorant at the base of hair near the scalp to maintain uniform hair coloring as the hair grows. As described, the user squeezes the bottle of colorant as it is applied to control the flow rate. Nevertheless, the disclosed applicator is inconvenient.

[0005] It would therefore be desired to propose a system void of these deficiencies.

**Summary**

[0006] It is an object of the present invention to provide an apparatus for coloring hair that combines a hair separating element and a color applicator in a single tool.

[0007] It is another object of the present invention to provide an apparatus for applying a coloring mixture to the hair roots single-handedly, independently and without assistance.

[0008] It is still another object of the present invention to provide a simple reusable apparatus, for coloring hair, that is not limited to a certain cartridge.

[0009] It is still another object of the present invention to provide an apparatus, for coloring hair efficiently, that requires minimal contact with the coloring chemicals and can be easily cleaned.

[0010] Other objects and advantages of the invention will become apparent as the description proceeds.

[0011] The present invention relates to an apparatus for coloring hair comprising: (a) a housing, for holding the packing system of the coloring mixture, for coloring hair; (b) a lid, attached to said housing; (c) a power spring, located underneath said lid, for pressuring said packing system, within said housing, for squeezing the color mixture from said packing system; (d) a base having at least 2 compartments which receive and store some of said squeezed color mixture from said packing system; (e) at least 2 tines, each having a conduit fixed within, and each tine is independently movably connected, at its upper part, to said base, for combing said hair and dividing said hair strands into groups of the required width while at the same time distributing and applying said coloring mixture to said hair roots of said separated strands through said conduits, fixed within said tines; and (f) wherein each of said tines has a spring, for pushing it downwards, and wherein said conduit openings are aligned with their said respective base compartments for allowing said color mixture to flow from said packing system, pressured by said power spring, through the said compartments and through said conduits to the tips of said tines and onto said hair when said tines tips are pressed from below by said hair.

[0012] Preferably, the tip of each tine has an oblique cut.

[0013] In one embodiment, the apparatus is disposable.

[0014] In one embodiment, the apparatus is reusable.

[0015] In one embodiment, the apparatus also comprises holes in the housing for better washing the parts of the apparatus.

[0016] Preferably, the apparatus further comprising a trigger for locking the power spring, in a compressed state, and for releasing the power spring, from a compressed state to a released state, when it is set for operation.

[0017] Preferably, the tines can move, in relations to the base, in vertical movements up and down, in rotational movements at different angles in relations to the surface of the head, or in a combination of the above movements.

**Brief Description of the Drawings**

[0018] The accompanying drawings, and specific references to their details, are herein used, by way of example only, to illustratively describe some of the embodiments of the invention.

[0019] In the drawings:

- Fig. 1 is a diagram, from in isometric view, of the apparatus, for coloring hair, according to an embodiment of the invention.
- Fig. 2 is a diagram of the apparatus, for coloring hair, above a head, for displaying the use of the apparatus.

- tus, according to an embodiment of the invention.
- Fig. 3 is a diagram of an exploded view of the apparatus, for coloring hair, according to an embodiment of the invention.
  - Fig. 4 is a diagram, of a section cut, of the apparatus, for coloring hair, according to an embodiment of the invention.

### Detailed Description

**[0020]** The terms of "front", "rear", "down", "up", "bottom", "upper", "horizontal", "vertical", "right", "left" or any reference to sides or directions are used throughout the description for the sake of brevity alone and are relative terms only and not intended to require a particular component orientation.

**[0021]** Fig. 1 is a diagram, from in isometric view, of the apparatus, for coloring hair, according to an embodiment of the invention. The apparatus 100 has a casing 200 for, inter alia, holding the coloring mixture, for coloring hair, and a comb like bottom part, for distributing the coloring mixture onto the hair of a user. Thus, the user can hold the apparatus 100 in one hand and comb his hair while applying the color onto his hair through the tines 310-313 of the comb like bottom part, where the tines 310-313, as will be described in relations to Fig. 4, can act as nozzles for distributing the coloring mixture onto the hair.

**[0022]** Fig. 2 is a diagram of the apparatus, for coloring hair, above a head, for displaying the use of the apparatus, according to an embodiment of the invention. As described in relations to Fig. 1, the user can hold the apparatus 100 in one hand and comb his hair, with light pressure on his head, while applying the color onto the hair through the tines of the apparatus 100. As depicted, the tines are designed to be pushed upwards in relations to the apparatus 100 in order to fit the contour of the head when combing the hair and applying force on the apparatus. Thus, the apparatus 100 can be used to comb the hair and divide the hair strands into groups of the required width while at the same time applying the color onto the hair strands.

**[0023]** As described in relations to Figs. 1-2, when using the apparatus for coloring hair, the tines 310-313 of the apparatus are used to comb the hair and divide the hair strands into groups of the required width while at the same time distributing and applying the coloring mixture, e.g. dye chemicals, to the hair roots of the separated strands through the conduits, each fixed within each tine. The supply of the coloring mixture is carried out due to contact and pressure from the hair of the head with the bottom contact parts of the tines during the process of combing. Each tine is individually connected, at its upper part, to a soft spring made of metal or other material that provides elasticity, for applying vertical force downwards, as will be described later in relations to Fig. 4. Each of the tine, 310-313, is constructed to release the color mixture only when pressure is applied to its bottom tip, and

to stop when the physical contact with the tip is interrupted. Thus, the physical contact between the tines and the hair, on the head, is where, approximately, the dye is being applied. Thus, when moving the tines over the unevenness shape of the head only the tines that come into direct contact with the hair release color onto the hair. In some embodiments, after applying the color onto the hair, it is enough just to comb the hair with a comb. This can be done very easily, as the hair is not tangled, as in the typical method of coloring with a comb and brush.

**[0024]** In one embodiment, long hair can be collected in a non-tight bun and colored according to the above.

**[0025]** Fig. 3 is a diagram of an exploded view of the apparatus, for coloring hair, according to an embodiment of the invention. The lid 210 may be made of plastic or any other rigid material. The lid 210 may be detachable from the housing 240 or may be formed as one piece together with the housing 240, for forming the casing. The housing 240 may be made of plastic or any other rigid material and is used for holding the packing system of the coloring mixture, for coloring hair. A power spring, such as spring 211, may be attached to the lid 210, for applying pressure to the membrane 212. The power spring 211 may be a metal spring, or any other pressure transferring element, which can apply pressure to the membrane 212. The membrane 212 can have a detachable or non-detachable connection with the power spring 211. The power spring 211 and the membrane 212 can have a detachable or permanent connection. In one embodiment, the power spring 211 may have two states: a compressed state or a released state. In one embodiment, a trigger 213 may also be connected to the membrane 212, and/or to the power spring 211, for locking the power spring 211, in a compressed state, and for releasing the power spring 211, from a compressed state to a released state, when it is set for operation. The trigger 213 can have a threaded, bayonet or any other known locking connection, for controlling the lock and release of the power spring 211. When the trigger 213 releases the membrane 212, and the power spring 211, the power spring 211 is released to exert pressure on the membrane 212 which pressures the packing system 220 for squeezing its contents out. In some embodiments, the membrane 212 may be a part of the packing system 220. In other embodiments, the membrane 212 may be a separate part form the packing system 220. The membrane 212 can have a detachable or non-detachable connection with the power spring 211.

**[0026]** In one embodiment the packing system 220, as described in relations to Fig. 3, may comprise a mixture of oxidizer and dye, or may comprise any other known dye chemicals, coloring agent, or any other known color mixture, for coloring hair. The packing system 220 is made of a material that is strong but easily deformable for ensuring easy mixing of the coloring mixture in the closed packing system 220, on one hand, as well as ensuring the necessary deformation of the packing system 220 when it is emptied during operation, on the other

hand. In one embodiment, the packing system 220 can be made in the form of an "accordion" along the perimeter, for ensuring uniform deformation. In one embodiment the packing system 220 can be filled with a mixture of oxidant and dye already prepared. In another embodiment, the packing system 220 may contain one component, e.g. an oxidizing agent, to which a second component, e.g. a coloring agent, will be added and mixed before coloring the hair. In another embodiment, the packing system 220 may contain more than one component separated by a mechanical clamp, or any other barrier, where prior to use, the barrier, e.g. the clamp, is removed and both components are easily mixed, which ensures that the user has either minimal contact with chemicals or no contact with the chemicals altogether. The bottom part of the packing system 220 may have one or more holes, according to the number of tines in the bottom of the apparatus. The location of the holes in the packing system 220 may approximately correspond to the location of the tines for supplying the coloring composition to the conduits of the tines 310-313, through which the coloring composition is delivered to the hair roots. In one embodiment, the base 230 may have pokes protruding from the base 230 for poking the packaging system 220 approximately where the tines are located for supplying the coloring composition to the conduits of the tines 310-313, through which the coloring composition is delivered to the hair roots.

**[0027]** In one embodiment, the packing system 220, as described in relations to Fig. 3, is hermetically sealed to the base 230. Connection between the packing system 220 and the base 230 can be made by mechanical means or adhesive means. In another embodiment, the apparatus may be disposable where the packing system 220 and the base 230 may be made as one-piece. In another embodiment, the apparatus may be reusable and the connection of the packing system 220 and the base 230 may be made by mechanical means or adhesive means. In one embodiment, the base 230 is a separate assembly unit from the Housing 240. In another embodiment, the base 230 is a part of the Housing 240. In one embodiment, the base 230 is part of the packing system 220. The tines 310-313 are each movably connected, at their upper part, to the base 230 and have a soft spring, such as spring 314, at their upper part for elasticity applying vertical force downwards for each tine individually.

**[0028]** In one embodiment, a tightness between the Base 230 and the tines 310-313 is achieved by manufacturing accuracy and by the correct choice of materials for the manufacture of these parts. For example, the base 230 can be made of PP (polypropylene) and the tines can be made of PE (polyethylene).

**[0029]** Fig. 4 is a diagram, of a section cut, of the apparatus, for coloring hair, according to an embodiment of the invention. As described in relations to Fig. 3, when released, the power spring 211 exerts pressure on the membrane 212 and on the packing system 220 for squeezing its contents, e.g. the color mixture, out. The

packaging system 220 has holes at its bottom corresponding to the bottom compartments of the base 230, such as compartments 250, which receive and store some of the squeezed color mixture for feeding it to the conduits in the tines 310-313. Nevertheless, the opening of conduits in the tines 310-313 are aligned to allow the flow from the compartments only when the tines are pressed from below. Thus, as depicted, the tines 312-313 are pressed from below and thus their conduit openings are aligned with their respective compartments 250 for allowing the color mixture to flow from the packing system 220 through the compartments through the conduits to the tips of the tines and onto the hair of the user. However, the openings of the conduits of tines 310-311, which are unpressed, are unaligned with their compartments and thus no color mixture can flow through them. As described before each of the tines is held by a spring, such as spring 314, or any other pressure element, which pushes the tine downwards. Thus, each of the tines is pushed downwards until it is pressed upwards, by the head of the user, when the user combs his hair with the apparatus.

**[0030]** In one embodiment, the tines are ergonomically shaped. The tip of each tine has an oblique cut, which ensures effective separation of the hair into strands. In this embodiment, the area of contact of the tines with the head is large enough so that their contact and movement along the contour of the head does not cause discomfort. The outlet of the conduit, which is located on the beveled plane, of each tine, can ensure the free release of the color mixture and its application directly to the hair roots, and not to the scalp.

**[0031]** In some embodiment, the number, shape, and form of tines may vary. In some embodiments, there may be one or more rows of tines. In some embodiments, for a smoother movement of the tines along the cylinders of base, O-rings of various materials can be added.

**[0032]** In one embodiment, a reusable design may be used having easy to disassemble and assemble part, as the described parts can be quite large and durable. In some embodiments, all disassembled parts of the apparatus can be washable both under running water and in the dishwasher. In one embodiment, holes may be provided in the housing of the invention for better washing the parts of the apparatus. In one embodiment, the parts can be securely stored in the same housing, until re-assembly and use.

**[0033]** In one embodiment, the apparatus may be used with simple interchangeable bags for functional mixtures, where the invention is not limited to a particular packing system or manufacturer of the necessary mixtures. In some embodiments the packing systems can also be reusable.

**[0034]** In one embodiment, the apparatus may be used to apply care and/or treatment products to the scalp and hair.

**[0035]** In some embodiments, each of the tines has a soft spring, at its upper part between the tine and the

base, for elasticity for each tine individually, where each of the tines can move, in relations to the base, in vertical movements up and down, in rotational movements at different angles in relations to the surface of the head, or in a combination of the above movements.

**[0036]** While the above description discloses many embodiments and specifications of the invention, these were described by way of illustration and should not be construed as limitations on the scope of the invention. The described invention may be carried into practice with many modifications which are within the scope of the appended claims.

## Claims

1. An apparatus for coloring hair comprising:

a housing, for holding the packing system of the coloring mixture, for coloring hair;

a lid, attached to said housing;

a power spring, located underneath said lid, for pressuring said packing system, within said housing, for squeezing the color mixture from said packing system;

a base having at least 2 compartments which receive and store some of said squeezed color mixture from said packing system;

at least 2 tines, each having a conduit fixed within, and each tine is independently movably connected, at its upper part, to said base, for combing said hair and dividing said hair strands into groups of the required width while at the same time distributing and applying said coloring mixture to said hair roots of said separated strands through said conduits, fixed within said tines; and

wherein each of said tines has a spring, for pushing it downwards, and wherein said conduit openings are aligned with their said respective base compartments for allowing said color mixture to flow from said packing system, pressured by said power spring, through the said compartments and through said conduits to the tips of said tines and onto said hair when said tines tips are pressed from below by said hair.

2. An apparatus according to claim 1, where the tip of each tine has an oblique cut.

3. An apparatus according to one of claims 1 and 2, where the apparatus is disposable.

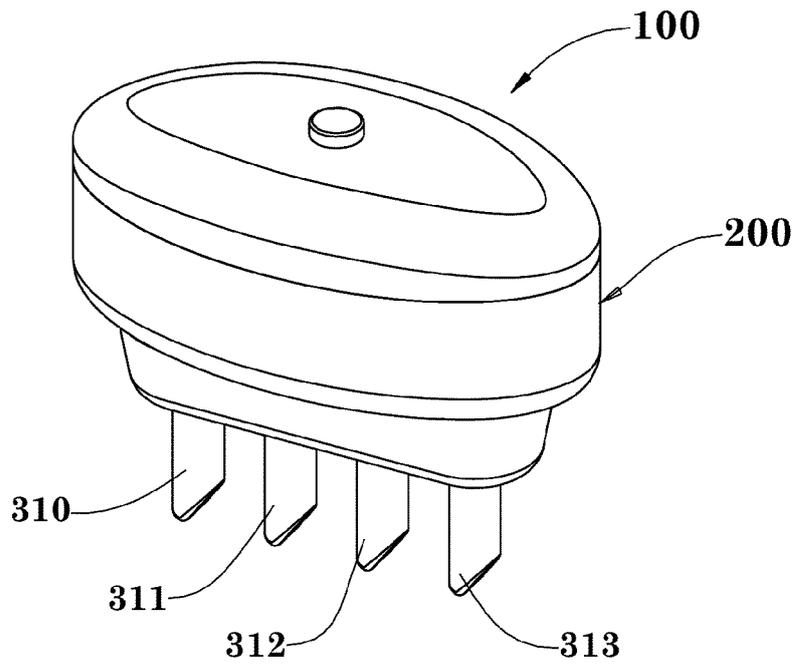
4. An apparatus according to any one of claims 1 to 3, where the apparatus is reusable.

5. An apparatus according to claim 4, where the apparatus also comprises holes in the housing for better

washing the parts of the apparatus.

6. An apparatus according to any one of claims 1 to 5, further comprising a trigger for locking the power spring, in a compressed state, and for releasing the power spring, from a compressed state to a released state, when it is set for operation.

7. An apparatus according to any one of claims 1 to 6, where each of the tines can move, in relations to the base, in vertical movements up and down, in rotational movements at different angles in relations to the surface of the head, or in a combination of the above movements.



**Fig.1**



**Fig.2**

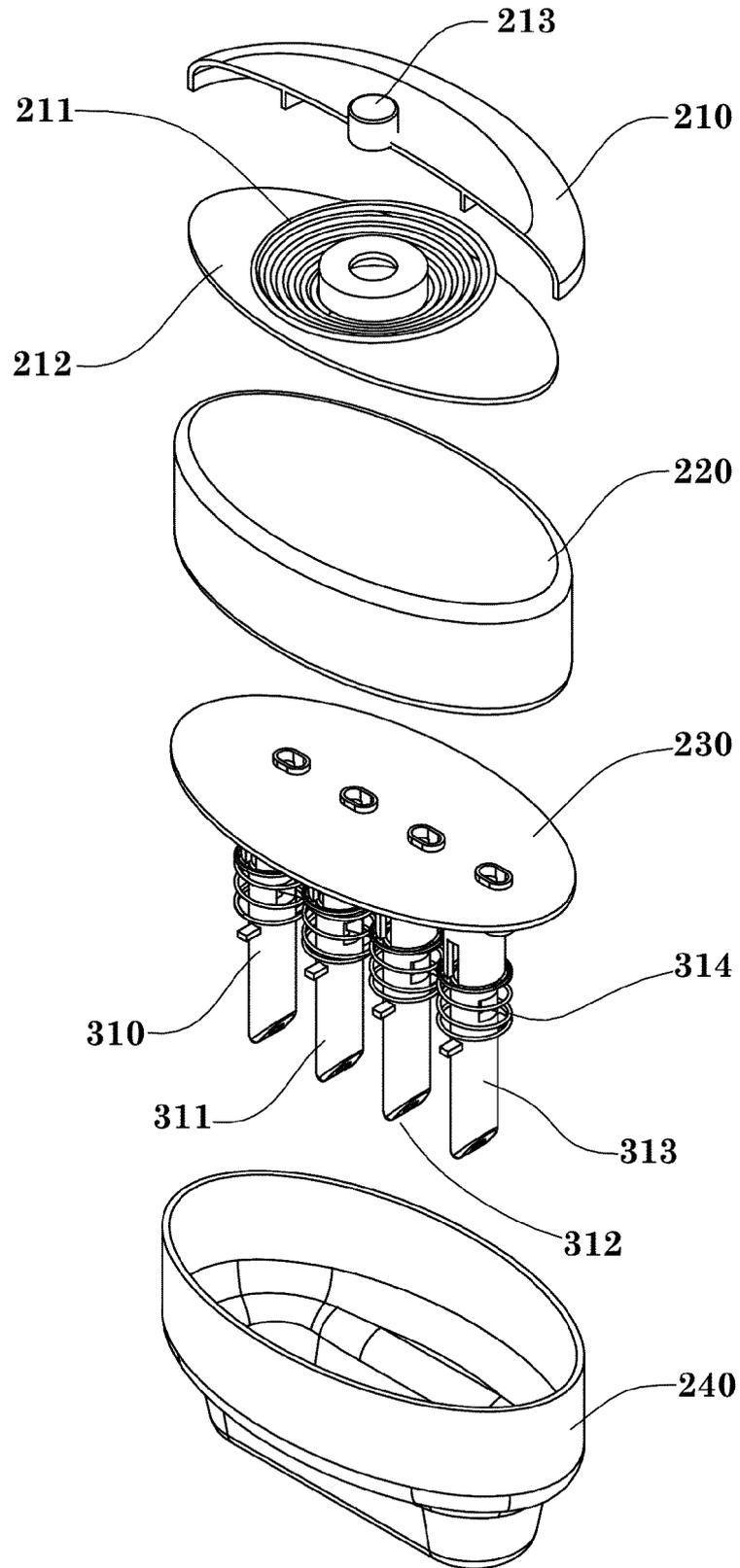


Fig.3

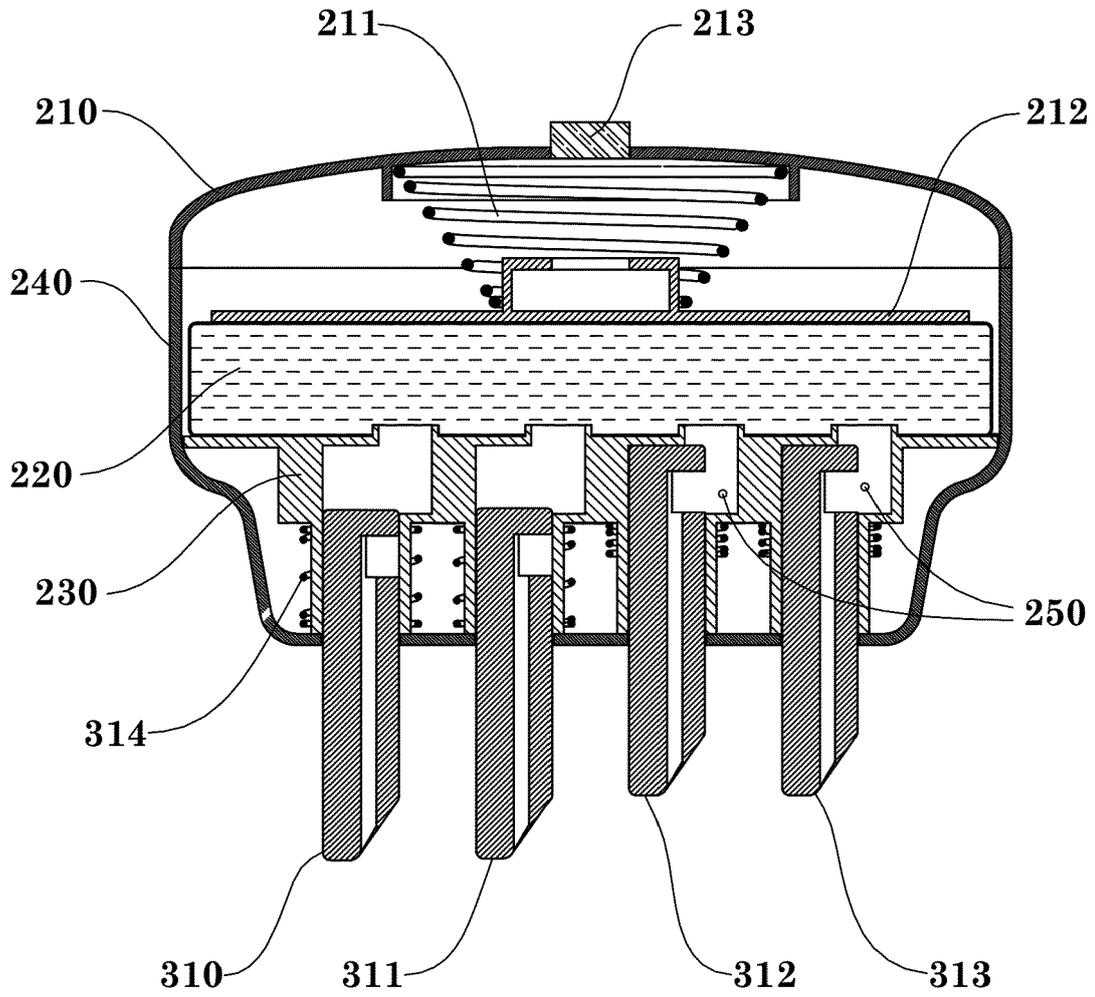


Fig.4



EUROPEAN SEARCH REPORT

Application Number  
EP 23 15 8671

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	<b>KR 2020 0142739 A (BW KOREA CO LTD [KR])</b> 23 December 2020 (2020-12-23) * the whole document * -----	1-7	<b>INV.</b> <b>A45D19/02</b> <b>A45D24/22</b> <b>A46B11/00</b>
A	<b>CN 105 831 953 A (HAO GAOSHAN)</b> 10 August 2016 (2016-08-10) * the whole document * -----	1	
A,D	<b>US 6 260 557 B1 (YARBROUGH CHRISTINE [US])</b> 17 July 2001 (2001-07-17) * abstract; figure 9 * -----	1	
			<b>TECHNICAL FIELDS SEARCHED (IPC)</b>  <b>A45D</b> <b>A46B</b>
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>12 July 2023</b>	Examiner <b>Nicolás, Carlos</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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12-07-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
<b>KR 20200142739 A</b>	<b>23-12-2020</b>	<b>NONE</b>	
<b>CN 105831953 A</b>	<b>10-08-2016</b>	<b>NONE</b>	
<b>US 6260557 B1</b>	<b>17-07-2001</b>	<b>NONE</b>	

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

**REFERENCES CITED IN THE DESCRIPTION**

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