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(54) **HAIR WRINGER**

(57) The invention relates to a device (10) configured to extract water from wet hair and configured to switch between a resting configuration and a closed configuration, the device (10) comprising: an upper support (11), a lower support (12), the lower support (12) being parallel to the upper support (11), and a binding element (13) configured to be fixed to the upper support (11) and to

the lower support (12), wherein the upper support (11) and the lower support (12) are angularly aligned in the resting configuration so that the binding element forms a channel (15), and the upper support (11) and the lower support (12) are angularly offset in the closed configuration so that the binding element closes the channel (15).

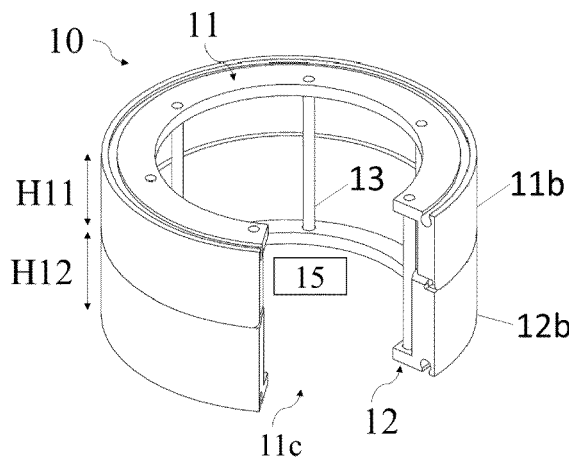


Fig 5A

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**Description****FIELD OF INVENTION**

[0001] The present invention relates to a device for extracting water from wet hair. More precisely, the present invention relates to a device grabbing and extracting water from hair.

**BACKGROUND OF INVENTION**

[0002] Drying hair is important. Indeed, the hair can absorb up to 45% of its weight in water. It is therefore essential to spin the hair without damaging it before drying at open air or with a device.

[0003] However, known hair drying devices and methods are not satisfactory.

[0004] Indeed, several hair drying methods use a device configured to drive hot air. However, hot air damages the scalp and opens the hair scales thus fragilizing the hair. Other methods use a device comprising heating elements which are directly applicable on the hair. However, heating elements, just like hot air, open the hair scales and thus fragilized the hair.

[0005] A purpose of the invention is to provide a device configured for drying hair without fragilizing it.

[0006] To this end, the invention relates to a device configured to extract water from wet hair comprising an upper support comprising an upper aperture, a lower support comprising a lower aperture, the lower aperture being parallel to the upper support; and a binding element comprising an elastically deformable material, the binding element being configured to be fixed to the upper support and to the lower support; wherein the device is configured to switch between a resting configuration and a closed configuration, the upper support and the lower support being angularly aligned in the resting configuration so that the binding element forms a channel between the upper aperture and the lower aperture, and the upper support and the lower support being angularly offset in the closed configuration so that the binding element closes the channel.

**SUMMARY**

[0007] This invention thus relates to a device configured to extract water from wet hair, the device comprising

- an upper support comprising an upper aperture;
- a lower support comprising a lower aperture, the lower support being parallel to the upper support; and
- a binding element comprising an elastically deformable material, the binding element being configured to be fixed to the upper support and to the lower support;

wherein the device is configured to switch between a resting configuration and a closed configuration,

the upper support and the lower support being angularly aligned in the resting configuration so that the binding element forms a channel between the upper aperture and the lower aperture, and the upper support and the lower support being angularly offset in the closed configuration so that the binding element closes the channel.

[0008] Indeed, the device allows the grabbing of the hair and the wringing of the hair by compression or by rotation. For example, the device allows to grab wet hair placed into the channel and to gently twist it to extract water without need of heating elements or hot air. The hair scales thus remain closed leading to hair which is not fragilized. According to another embodiment, the device allows to grab wet hair and to compress it to extract water without need of heating elements or hot air.

[0009] According to another advantageous embodiment, each of the upper support, the lower support and the binding element comprises a lateral opening, the lateral openings being aligned in the resting configuration thereby forming a lateral slit towards the channel.

[0010] Indeed, the lateral openings allows to facilitate the entry of the wet hair inside the channel.

[0011] According to another advantageous embodiment, each of the upper support and the lower support comprises a circumferential surface, each of the circumferential surfaces having a height configured so that the circumferential surface of the upper support rests on the circumferential surface of the lower support while maintaining a strain to the binding element in the resting configuration.

[0012] The circumferential surface improves leads to an ergonomic device easy to use with hands.

[0013] According to another advantageous embodiment, the binding element comprises at least three rubber bands, each rubber band comprising a first extremity fixed to the upper support and a second extremity fixed to the lower support, the rubber bands being twisted in the closed configuration.

[0014] According to another advantageous embodiment, the binding element is an elastic membrane comprising a first side fixed to the upper support and a second side, opposite to the first side, fixed to the lower support, the elastic membrane being twisted in the closed configuration.

[0015] According to another advantageous embodiment, the device further comprises a handle, either the upper support or the lower support being fixed to the handle.

[0016] Indeed, the handle allows a better holding of the device during the use.

[0017] Moreover, this allows to use the device using only one hand which is easier.

[0018] Furthermore, at least part of the actuator may be comprised in the handle allowing to reduce the size of the outer frame.

[0019] The device with the handle is thus ergonomic,

easy to use and has a size which allows its transportation.

**[0020]** According to another aspect of the invention, the device does not comprise a handle.

**[0021]** According to another advantageous aspect of the invention, the actuator is actioned manually or electrically.

**[0022]** According to another advantageous embodiment, the device further comprises an activator configured to action the actuator to switch between the resting configuration and the closed configuration.

**[0023]** Indeed, the use of one activator for one action of the rotatable inner element allows to the device to be easier to use because the user may specifically select the action to perform.

**[0024]** According to another advantageous embodiment, the handle is fixed to the lower support and wherein the actuator is actioned manually, the activator comprising a branch having a first extremity rotationally fixed to the handle and a second extremity cooperating with the upper support so that when the branch is pressed against the handle the device is switched to the closed configuration.

**[0025]** This allows to use the device with only one hand to grab the hair and to twist them.

**[0026]** According to another advantageous embodiment, the handle comprises a double-flux device.

**[0027]** This handle comprising a double-flux device is an integral part of the invention. The double flux device allows to improve the hair drying thanks to cold or hot air blowing and water sucking.

**[0028]** According to another advantageous embodiment, the actuator is actioned electrically, the activator being powered by a battery.

**[0029]** Indeed, the use of an electrical actuator allows the device to be easier to use because the actuator is actioned by simple triggering of the activator(s).

**[0030]** Moreover, this leads to a device that can be used everywhere, without need of any electrical plug nearby.

**[0031]** In addition, this leads to a wireless device which avoid any problem of wire tangling or wire storage.

**[0032]** The use of a rechargeable battery is easier, cheaper and better for the environment because the user does not need to throw out discharged batteries and to buy new one.

**[0033]** According to another advantageous embodiment, the device further comprises an emergency stop system comprising a force sensor.

**[0034]** Indeed, this leads to a device which is safer to use.

**[0035]** According to another advantageous embodiment, the binding element comprises a slip-resistant material.

**[0036]** Indeed, the use of anti-slip material allows the use of less force applied to the hair to grab and maintain it during the twist. This leads to a reduction of the damaging to the hair.

**[0037]** The invention also relates to a system for hair

wringing, the system comprising a suction device cooperating the device described above so that the water extracted, in the closed configuration, from wet hair inserted into the channel of the device is sucked by the suction device.

**[0038]** The invention also relates to a method for hair wringing using the device described above, the method comprising the steps of:

- 10 - Placing at least two wet hairs inside the channel of the device in the resting configuration;
- Switching the device in the closed configuration by angularly offsetting the upper support relatively to the lower support to extract the water from the at least two wet hairs;
- 15 - Switching back the device in the resting configuration to release the wringed hair.

## DEFINITIONS

**[0039]** In the present invention, the following term has the following meanings:

**[0040]** "Hair wringing" refers to the action to dry wet hair by twisting at least two hairs with a sufficient force to extract water. In one embodiment, the action of drying wet hair includes twisting and compressing at least two hairs with a sufficient force to extract water.

## DETAILED DESCRIPTION

**[0041]** This invention relates to a system for hair wringing, the system comprising a suction device (20) cooperating a device (10) configured to extract water from wet hair so that the water (31) extracted from wet hair by the device (10) is sucked by the suction device (20).

**[0042]** In one embodiment, the hair is human hair. Eventually, the hair may belong to a hairy animal. In one embodiment, the device (10) is configured to extract water from wet hair while the hair is on the scalp of the user. Nevertheless, the device (10) may also be used to dry wet hair which has been cut from the user. In this case, the hair needs to be grouped and substantially aligned in order to anchor one extremity of the group of hair during the use of the device (10).

**[0043]** The device (10) represented in figures 1 to 10B comprises:

- an upper support (11);
- a lower support (12); and
- 50 - a binding element (13) comprising an elastically deformable material, the binding element being configured to be fixed to the upper support (11) and to the lower support (12). The binding element (13) preferably comprises a slip-resistant material. The slip-resistant material may be of any suitable material that respect the health and the environment and may be, in particular, nylon, latex, silicon, textile, elastic rubber material, elastomeric material or any material

than can mimic the skin.

**[0044]** Each of the lower support (12) and the upper support (11) preferably lie along a longitudinal plane. The lower support (12) and the upper support (11) may have a circular shape or other polygonal shape (square or octagonal for example). The upper support (11) has dimensions ranging from 1 centimeter to 30 centimeters, preferably from 15 centimeters to 5 centimeters. The lower support (12) has dimensions ranging from 1 centimeter to 30 centimeters, preferably from 15 centimeters to 5 centimeters. The lower support (12) and the upper support (11) have preferably the same dimensions. The dimensions of the supports are measured as the largest dimension along the longitudinal plane.

**[0045]** The upper support (11) and the lower support (12) comprise an aperture passing through the support perpendicularly to the longitudinal plane. More precisely, the upper support (11) comprises an upper aperture (11a) while the lower support (12) comprises a lower aperture (12a). The upper support (11) and the lower support (12) thus have a ring-like general shape and each of the supports has a central axis perpendicular to the longitudinal plane, an inner surface facing the central axis and an outer surface opposite to the inner surface. The aperture has of course dimensions lower than the dimensions of the support to which it belongs. The apertures may have dimensions ranging from 30% to 99% of the support to which it belongs, preferably from 70% to 95% of the support to which it belongs.

**[0046]** The lower support (12) is parallel to the upper support (11). In other words, the longitudinal plane of the lower support (12) is parallel to the longitudinal plane of the upper support (11). The two central axes are thus parallel. The lower aperture (12a) may be axially aligned with the upper aperture (11a) so that the central axis of the lower support (12) is aligned with the central axis of the upper support (11). But, in some embodiment, the lower aperture (12a) may be not aligned with the upper aperture (11a).

**[0047]** The device (10) is configured to switch between a resting configuration and a closed configuration.

**[0048]** In the resting configuration represented in figures 1A, 1B, 3A, 3B and 5A, the upper support (11) and the lower support (12) are angularly aligned so that the binding element forms a channel (15) between the upper aperture (11a) and the lower aperture (12a). The channel (15) has preferably a height, measured along one of the central axes, ranging from 1 centimeter to 20 centimeters. In the embodiment wherein the lower aperture (12a) is axially aligned with the upper aperture (11a), the channel (15) extends along the aligned central axes as represented in figures 1A and 3A. In the embodiment wherein the lower aperture (12a) is not aligned with the upper aperture (11a), the channel (15) extends along a channel axis defined by the position of the binding element (13) as explained hereafter. When using the device (10), the wet hair to be wringed are placed in the channel (15).

**[0049]** In the closed configuration represented in figures 2A, 2B, 4A, 4B and 5B, the upper support (11) and the lower support (12) are angularly offset so that the binding element closes the channel (15). Angularly offset means that considering, in the resting configuration, a first point on the upper support (11) and a second point on the lower support (12) aligned with the first point along one of the central axes, the first point and the second point are not aligned anymore when the device (10) is switched to the closed configuration. The wet hair placed into the channel in the resting configuration are thus pressed at the closing point of the channel. The water from the wet hair is thus extracted by compression applied by the binding elements. Once compressed, the wet hair may further be wringed by twisting the compressed hair. To do so, the device (10) may be rotated around a twisting axis parallel to the central axes. In other words, the upper support (11) and the lower support (12) are rotated together in the same direction. This leads to a twisting of the compressed hair allowing to extract further water.

**[0050]** Each of the upper support (11), the lower support (12) and the binding element (13) may comprise a lateral opening (11c, 12c, 13c). For the supports (11, 12), the lateral openings (11c, 12c) may be seen as a discontinuity of the support or a slot through the whole width of the support perpendicular to the longitudinal plane. In the embodiment wherein the supports have a circular shape, the presence of the lateral openings leads to supports in the form of a circle arc. The lateral openings preferably cover less than 60% of the surface of the supports. The lateral openings (11c, 12c, 13c) are aligned in the resting configuration thereby forming a lateral slit in the device (10) towards the channel (15). The slit thus extends along the central axes.

**[0051]** Each of the upper support (11) and the lower support (12) may comprise a circumferential surface (11b, 12b) as represented in figures 5A to 9. Each of the circumferential surfaces (11b, 12b) extends parallelly to the central axis and has a height, measured along the central axis, configured so that the circumferential surface (11b) of the upper support (11) rests on the circumferential surface (12b) of the lower support (12) while maintaining a strain to the binding element (13) in the resting configuration. This thus leads to a rigid device so that it stands alone when not maintained in hands. The user thus only needs to angularly offset one of the supports (11, 12) to switch towards the closed configuration and does not need to maintain the strain in the binding elements by gently pulling the two supports apart. The circumferential surfaces may have rough surface so that to improve the grip in the hands.

**[0052]** The device (10) may further comprise an actuator (17) configured to be actioned manually or electrically.

**[0053]** The device (10) may further comprise an actuator configured to action the actuator (17) to switch between the resting configuration and the closed configuration.

ration and/or to rotate the device (10) to twist and wring the compressed hair. In the embodiment wherein the actuator (17) is configured to be actioned, the actuator (17) may be an electrical system actioned electrically using, for example, a switch. This is advantageous since the use of a switch to action the actuator leads to a device (10) which is easier to use by a user because only one finger is needed to activate the switch. The activator may be powered by a battery, preferably a rechargeable battery. In this last embodiment, the device (10) may further comprise a waterproof removable cap to close the charging plug. This is advantageous because the waterproof cap can be closed during the use of the device (10) avoiding any humidity to enter into the charging plug during the use. This thus leads to a device (10) which is safer to use.

**[0054]** The actuator may comprise a force sensor. This is advantageous because this allows to automatically adapt the closing of the channel (15) as a function of the number of hairs placed inside the channel (15). Indeed, the force sensor may measure the force applied by the binding element (13) on the hair or the tension on the binding element (13) during hair grabbing or the compression of the hair and adapt the closing of the channel (15) as a function of the force measured. As the number of hairs placed inside the channel (15) increases, the angular shift between the upper support (11) and the lower support (12) is adapted to provide a compression or a twisting of the hair which is large enough to efficiently use the device (10) and extract water from the wet hair. The use of a force sensor is thus advantageous because it allows to avoid pressure damage which may be caused to the hair.

**[0055]** The device (10) may further comprise an emergency stop system. For example, an emergency switch activated by the user or by a pressure signal measured by a force sensor.

**[0056]** The system comprises a suction device (20). For example, when the device does not comprise lateral openings (11c, 12c, 13c), the suction device (20) is connected to the upper aperture (11a) or the lower aperture (12a) as shown in figure 8. In this last embodiment, the suction device (20) may be a vacuum cleaner, for example, a domestic vacuum cleaner. When the device comprises lateral openings (11c, 12c, 13c), the suction device (20) is preferably connected to the lateral openings (11c, 12c, 13c). The suction device (20) allows to extract the humidity or moisture from the channel (15). The suction device (20) may advantageously be configured to generate a double-flux air flow represented by the arrows in figure 8. Indeed, the wet air sucked from the channel (15) may be blown back to the channel (15). This allows to improve the hair drying thanks to the air blowing. Advantageously, the sucked air may be heated up before being blown back to the channel (15). This allows to reduce the humidity of the sucked air so that the air blown towards the hair may carry a new quantity of humidity away from the channel (15).

**[0057]** The different elements of the system (for example, the suction device, the turbine, the upper or lower support or the binding element) may be advantageously interchangeable so that when an element is defective, the entire system does not need to be thrown but only the defective element which is better for the environment.

**[0058]** The size of the device (10) may be small enough to be easily transportable. For example, the length of the device is lower than 30 centimeters, preferably lower than 25 centimeters. Moreover, the weight of the device (10) may also be small enough to be transportable. For example, the weight of the device is lower than 1 kilogram, preferably lower than 750 grams.

#### 15 The rubber bands embodiment

**[0059]** In a first embodiment, named the rubber bands embodiment and represented in figures 1A-B, 2A-B, 5A to 10B, the binding element (13) comprises at least three rubber bands, each rubber band comprising a first extremity fixed to the upper support (11) and a second extremity fixed to the lower support (12). The rubber bands are preferably positioned so that they do not intersect each other in the resting configuration. The rubber bands thus define the walls of the channel (15). The material of the rubber band may be any known material characterized by an elastic behavior.

**[0060]** In the embodiment wherein the supports have lateral openings, no rubber band may be fixed at the position of the lateral openings. The absence of rubber band at this position thus leads to the lateral opening (13c) in the binding element.

**[0061]** The switching from the resting configuration to the closed configuration is performed by applying a force to the upper support (11) or the lower support (12) so that they rotate around their central axis while the upper support (11) and the lower support (12) remains parallel to each other. The upper support (11) and the lower support (12) may be each rotated in opposite directions around their respective central axis.

**[0062]** In the closed configuration, the rubber bands are thus twisted around a central point to that the channel (15) is closed as represented in figures 2A and 2B. The wet hair placed into the channel (15) in the resting configuration are thus pressed on the twisting point so that the water is extracted by compression. When the hair is compressed, the whole device (10) may be rotated around a rotation axis parallel to the central axes of the support. The upper support (11) and the lower support (12) are thus rotated together in the same direction so that the compressed hair is twisted and wringed and the water is further extracted. The rotation of the device (10) may be continuous in one direction, discontinuous in one direction or alternative by successively twisting in one direction and the reverse direction. This embodiment thus allows compression of the hair in addition to torsion. This is advantageous because it allows the extraction of more water during the same period of use of the device

(10).

**[0063]** When the applied force is released, the device returns to the resting configuration thanks to the elasticity of the binding element (13) to release the wringed hair.

The elastic membrane embodiment

**[0064]** In a second embodiment, named the elastic membrane embodiment and represented in figures 3A, 3B, 4A and 4B, the binding element (13) is an elastic membrane. The membrane has preferably a rectangular shape so that it comprises a first side and a second side, opposite to the first side. The material of the membrane may be any known material characterized by an elastic and flexible behavior. The material may be waterproof.

**[0065]** The first side is fixed to the upper support (11) whereas the second side is fixed to the lower support (12). The length of the first side and the second side thus corresponds to the circumference of the upper support and the lower support, respectively.

**[0066]** In the embodiment wherein the supports have lateral openings, the length of the first side and the second side corresponds to the length of the circle arc formed by the supports. The first side and the second side cannot be attached at the position of the lateral openings. In other words, the elastic membrane is only positioned between the upper and the lower circle arcs. The absence of elastic membrane at the position of the lateral openings (11c, 12c) of the supports (11, 12) thus leads to the lateral opening (13c) in the binding element.

**[0067]** The switching from the resting configuration to the closed configuration is performed by applying a force to the upper support (11) or the lower support (12) so that they rotate around their central axis while the upper support (11) and the lower support (12) remains parallel to each other. They are thus rotated around their central axis. The upper support (11) and the lower support (12) may be each rotated in opposite directions around their respective central axis.

**[0068]** In the closed configuration, the elastic membrane is twisted around a central point so that the channel (15) is closed as represented in figures 4A and 4B. The wet hair placed into the channel (15) in the resting configuration are thus pressed on the twisting point so that the water is extracted by compression. When the hair is compressed, the whole device (10) may be rotated around a rotation axis parallel to the central axes of the support. The upper support (11) and the lower support (12) are thus rotated together in the same direction so that the compressed hair is twisted and wringed and the water is further extracted. The rotation of the device (10) may be continuous in one direction, discontinuous in one direction or alternative by successively twisting in one direction and the reverse direction. This embodiment thus allows compression of the hair in addition to torsion. This is advantageous because it allows the extraction of more water during the same period of use of the device (10).

**[0069]** When the applied force is released, the device returns to the resting configuration thanks to the elasticity of the binding element (13) to release the wringed hair.

5 The multi-functional handle

**[0070]** A handle (16), as represented in figures 6, 7 and 9, may be fixed to either the upper support (11) or the lower support (12). The handle (16) preferably extends perpendicularly to the central axis. Preferably, when the handle (16) is present, the device (10) comprises the circumferential surfaces (11b, 12b) so that the device (10) is advantageously maintained by the user with one hand without necessity to maintain the support (11, 12) not fixed to the handle (16). Moreover, at least part of the actuator may be comprised in the handle (16). The handle may be shaped as a cylinder or a rectangular parallelepiped with, optionally, rounded corners. The size of the handle (16) may be small enough to be ergonomic and transportable. For example, the length of the handle (16) ranges between 10 centimeters and 20 centimeters, preferably between 12 centimeters and 16 centimeters. The thickness of the handle may be chosen to provide a good holding in the hand. For example, the thickness of the handle (16) ranges between 2 centimeters and 6 centimeters, preferably between 3 centimeters and 5 centimeters. The handle (16) may be made of plastic, metal or other suitable material that respect the health and the environment.

**[0071]** The handle is preferably a multi-functional handle so that, in addition to the handling function, the handle improves the use of the device (10).

**[0072]** In a first embodiment represented in figure 7, the handle (16) is fixed to the lower support (11) and the actuator (17) is actioned manually. The activator comprises a branch (18) having a first extremity rotationally fixed to the handle (16) and a second extremity cooperating with the upper support (11) so that when the branch (18) is pressed against the handle (16) the device (10) is switched to the closed configuration by the rotation of the upper support (11) around its central axis with respect to the lower support (12). For example, the activator works as a rack-and-pinion. This manual use is advantageous because the device (10) does not consume energy during its use. This is thus better for the environment.

**[0073]** In a second embodiment, the multi-functional handle (16) may comprise a double-flux device as represented in figure 9. The double-flux device is configured to extract the humidity or moisture by sucking air from the channel (15) and to flow back the sucked air to the channel (15). This allows to improve the hair drying thanks to the air blowing. Therefore, holes may be disposed through the circumferential surface (11b, 12b) to which the handle (16) is fixed so that air may be sucked from the channel (15) to the handle (16).

**[0074]** In the second embodiment, the double flux device comprises the following elements disposed within the multi-functional handle (16): a water reservoir (21)

and a turbine (20a), preferably an electric turbine, comprising a center tube (25) disposed within the water reservoir (21). Preferably, the turbine (20a) works using the cyclone effect. The first (incoming) air flux (34) enters the water reservoir (21) on its side and in a tangential direction and rotates (32) along the inner walls of the water reservoir (21) before being sucked (33) through the center tube (25) to the turbine (20a). The water drops (31) in the air are plated to the walls of the water reservoir (21) thanks to the centrifugal effect and flow towards the bottom of the water reservoir (21) by gravity, the bottom of the water reservoir (21) being placed below the lower support (12) when using the device (10). The sucked air is then blown back to the channel (15) towards the hair placed inside the channel (15) thanks to the second air flux (30) flowing along the duct (22).

**[0075]** The multi-functional handle (16) may advantageously further comprise a heater (26), preferably an electronic heater. The heater is advantageously disposed between the water reservoir (21) and the duct (22). The turbine (20a) thus sucks humid air from the channel (15), through the water reservoir (21) and blows it back into the channel (15) through the heater (26) and the duct (22). The heater (26) provides heat to the air so that the temperature of the air passing through it is increased. This advantageously allows to extract more humidity from the flowing air before reaching the channel (15).

**[0076]** In a third embodiment, the multi-functional handle (16) may comprise a rotating element (24) configured to switch the device (10) between the resting configuration and the closed configuration and/or to rotate the device (10) to twist and wring the compressed hair. For example, the rotating element (24) is the actuator (17) configured to be actioned electrically as described hereabove. The rotating element (24) may thus comprise a first rotary motor configured to rotate the upper support (11) (the lower support being fixed to the handle (16)) and a second rotary motor configured to rotate the device (10) (i.e., the upper support (11) and the lower support (12) in the same direction).

**[0077]** The first, second and third embodiments may be coupled together. For example, the multi-functional handle (16) may comprise the manual actuator (17) working with the rack-and-pinion to angularly offset the upper and lower supports (11, 12), the double-flux device to dry the wet hair (with or without the heater (26)) and the rotating element (24) to rotate the device (10) to wring the hair.

**[0078]** In the embodiments wherein the multi-functional handle (16) comprises electronic elements such as the rotating element (24) or the double-flux device, the handle (16) may further comprise a battery, preferably a rechargeable battery as described hereabove, configured to power these elements.

**[0079]** Advantageously, the multi-functional handle (16) may be reversibly fixed to the device (10). This allows to detach the handle (16) to use the device (10) alone or to attach the handle (16) to the device (10) to use the

multifunctional system formed by the device (10) and the multi-functional handle (16). Advantageously, the multi-functional handle (16) may also be configured to be reversibly attached to other devices than the device for extracting water of the invention. For example, the multi-functional handle (16) may be attached to a side of a cylindrical element comprising a channel wherein the hair is disposed. The hair is thus simply dried by the double-flux device of the multi-functional handle (16).

## BRIEF DESCRIPTION OF THE DRAWINGS

### [0080]

**Figures 1A-1B** are a combination of schematic representations of the device in the rubber bands embodiment in the resting configuration. **Fig. 1A** shows a side view of the device whereas **Fig. 1B** shows a top view of the device.

**Figures 2A-2B** are a combination of schematic representations of the device in the rubber bands embodiment in the closed configuration. **Fig. 2A** shows a side view of the device whereas **Fig. 2B** shows a top view of the device.

**Figures 3A-3B** are a combination of schematic representations of the device in the elastic membrane embodiment in the resting configuration. **Fig. 3A** shows a side view of the device whereas **Fig. 3B** shows a top view of the device.

**Figures 4A-4B** are a combination of schematic representations of the device in the elastic membrane embodiment in the closed configuration. **Fig. 4A** shows a side view of the device whereas **Fig. 4B** shows a top view of the device.

**Figures 5A-5B** are a combination of schematic representations of a top view of the device in the rubber bands embodiment with circumferential surfaces. **Fig. 5A** shows the resting configuration whereas **Fig. 5B** shows the closed configuration.

**Figure 6** shows a top view of the device in the rubber bands embodiment in the resting configuration with circumferential surfaces, the device comprising a handle.

**Figure 7** shows a top view of the device in the rubber bands embodiment in the resting configuration with circumferential surfaces, the device comprising a handle and a manual actuator.

**Figure 8** shows the system comprising the device in the rubber bands embodiment in the resting configuration with circumferential surfaces and a suction device.

**Figure 9** shows a side view of the system comprising the device in the rubber bands embodiment in the resting configuration with circumferential surfaces and a suction device in the handle.

**Figures 10A-10B** are a combination of schematic representations of the method of the invention. **Fig. 10A** shows the first step of placement of the hair inside the open channel whereas **Fig. 10B** shows the second step of wringing the hair by closing the channel.

### Claims

1. A device (10) configured to extract water from wet hair, the device (10) comprising:
  - an upper support (11) comprising an upper aperture (11a);
  - a lower support (12) comprising a lower aperture (12a), the lower support (12) being parallel to the upper support (11); and
  - a binding element (13) comprising an elastically deformable material, the binding element being configured to be fixed to the upper support (11) and to the lower support (12);
 wherein the device (10) is configured to switch between a resting configuration and a closed configuration, the upper support (11) and the lower support (12) being angularly aligned in the resting configuration so that the binding element forms a channel (15) between the upper aperture (11a) and the lower aperture (12a), and the upper support (11) and the lower support (12) being angularly offset in the closed configuration so that the binding element closes the channel (15).
2. The device (10) according to claim 1, wherein each of the upper support (11), the lower support (12) and the binding element (13) comprises a lateral opening (11c, 12c, 13c), the lateral openings (11c, 12c, 13c) being aligned in the resting configuration thereby forming a lateral slit towards the channel (15).
3. The device (10) according to claim 1 or 2, wherein each of the upper support (11) and the lower support (12) comprises a circumferential surface (11b, 12b), each of the circumferential surfaces (11b, 12b) having a height configured so that the circumferential surface (11b) of the upper support (11) rests on the circumferential surface (12b) of the lower support (12) while maintaining a strain to the binding element (13) in the resting configuration.
4. The device (10) according to any one of claims 1 to 3, wherein the binding element (13) comprises at least three rubber bands, each rubber band comprising a first extremity fixed to the upper support (11) and a second extremity fixed to the lower support (12), the rubber bands being twisted in the closed configuration.
5. The device (10) according to any one of claims 1 to 3, wherein the binding element (13) is an elastic membrane comprising a first side fixed to the upper support (11) and a second side, opposite to the first side, fixed to the lower support (12), the elastic membrane being twisted in the closed configuration.
6. The device (10) according to any one of claims 1 to 5 further comprising a handle (16), either the upper support (11) or the lower support (12) being fixed to the handle (16).
7. The device (10) according to any one of claims 1 to 6 further comprising an actuator (17) configured to be actioned manually or electrically.
8. The device (10) according to any one of claims 1 to 7 further comprising an activator configured to action the actuator (17) to switch between the resting configuration and the closed configuration.
9. The device (10) according to claim 7 depending on claim 6, wherein the handle (16) is fixed to the lower support (11) and wherein the actuator (17) is actioned manually, the activator comprising a branch (18) having a first extremity rotationally fixed to the handle (16) and a second extremity cooperating with the upper support (11) so that when the branch (18) is pressed against the handle (16) the device (10) is switched to the closed configuration.
10. The device (10) according to any one of claims 7 to 9, wherein the handle (16) comprises a double-flux device.
11. The device (10) according to claim 7, wherein the actuator (17) is actioned electrically, the activator being powered by a battery.
12. The device (10) according to any one of claims 1 to 11, further comprising an emergency stop system comprising a force sensor.
13. The device (10) according to any one of claims 1 to 12, wherein the binding element (13) comprises a slip-resistant material.
14. A system for hair wringing, the system comprising a suction device (20) cooperating the device (10) according to any one of claims 1 to 13 so that the water (31) extracted, in the closed configuration, from wet



hair inserted into the channel (15) of the device (10) is sucked by the suction device (20).

**15.** A method for hair wringing using the device (10) according to any one of claims **1** to **13**, the method comprising the steps of: 5

- Placing at least two wet hairs (30) inside the channel (15) of the device (10) in the resting configuration; 10
- Switching the device (10) in the closed configuration by angularly offsetting the upper support (11) relatively to the lower support (12) to extract the water from the at least two wet hairs;
- Switching back the device (10) in the resting configuration to release the wringed hair. 15

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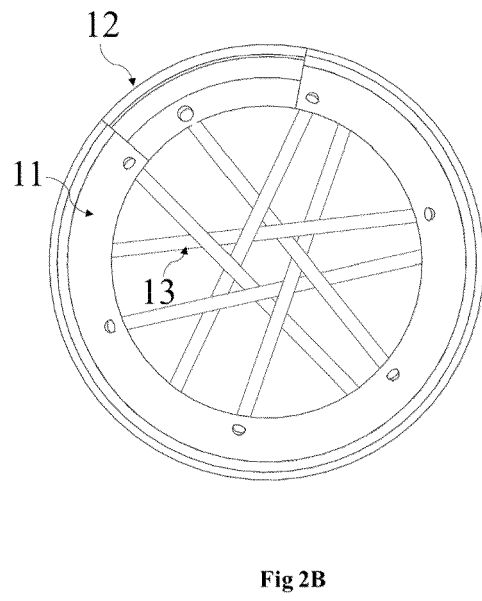
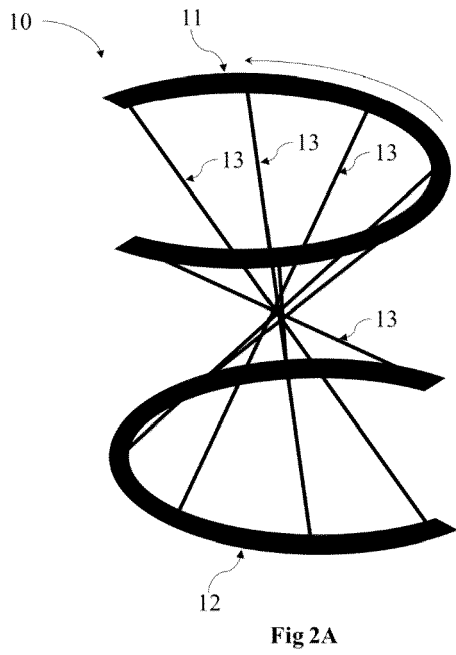
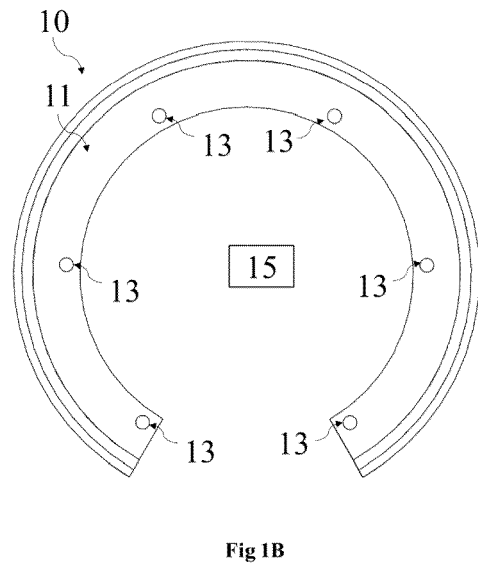
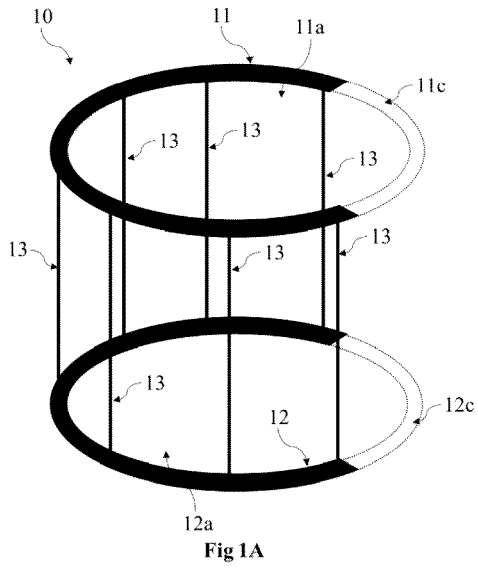
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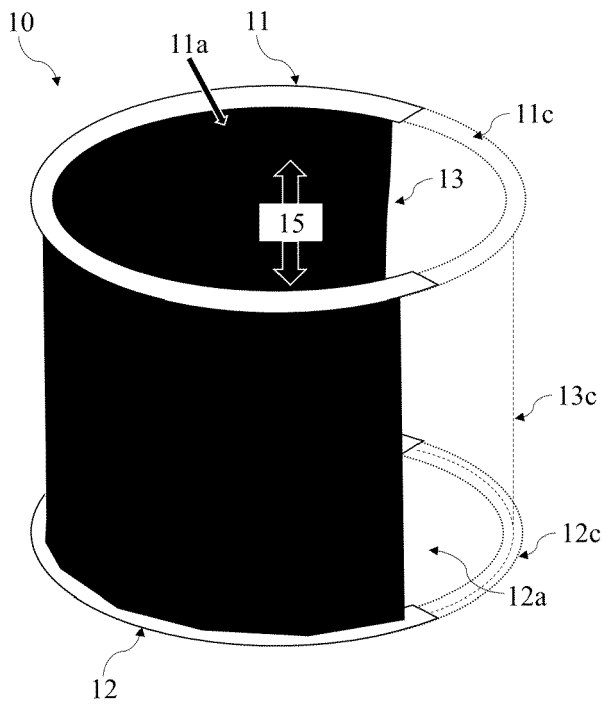


Fig 3A

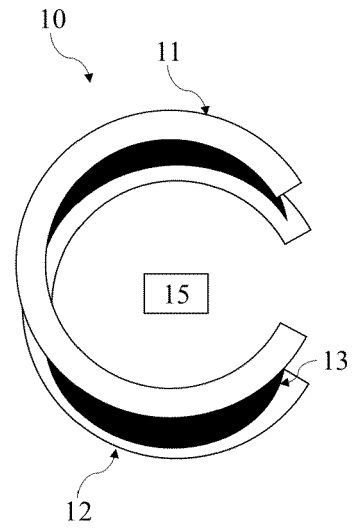


Fig 3B

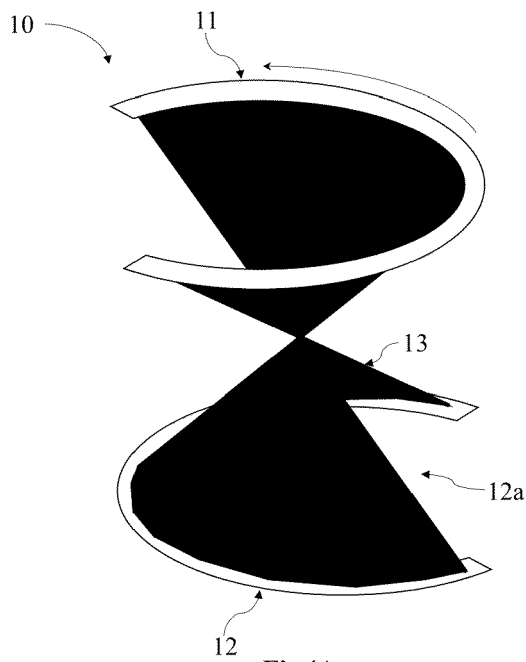


Fig 4A

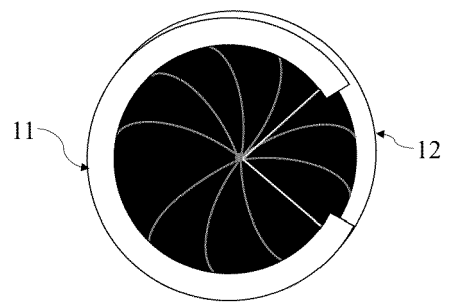


Fig 4B

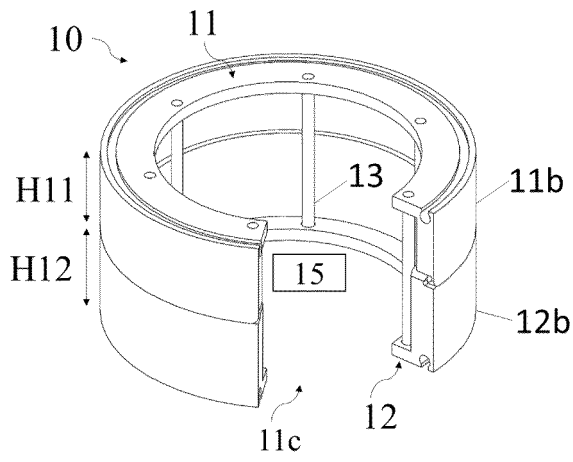


Fig 5A

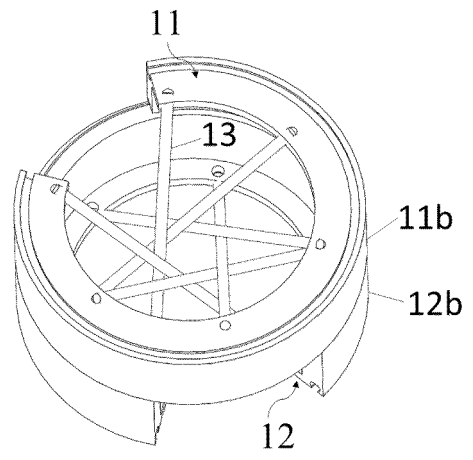


Fig 5B

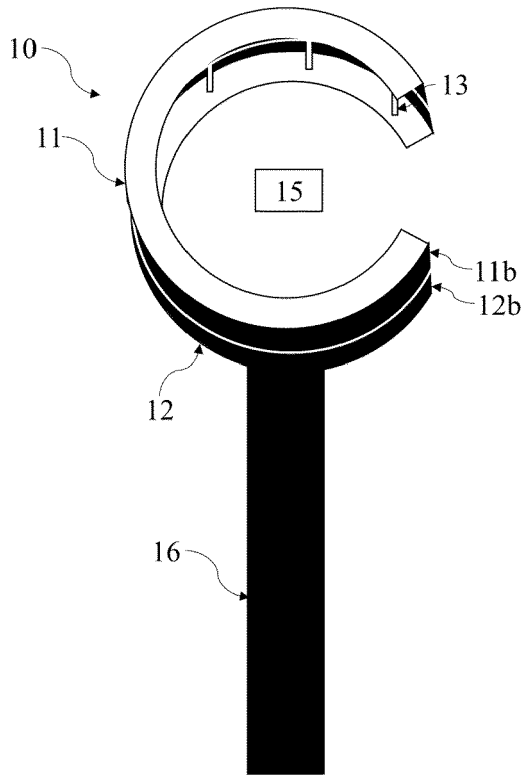


Fig 6

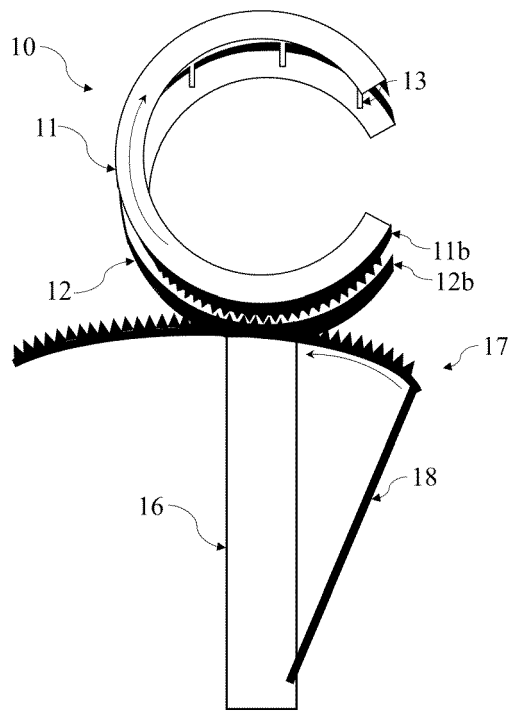


Fig 7

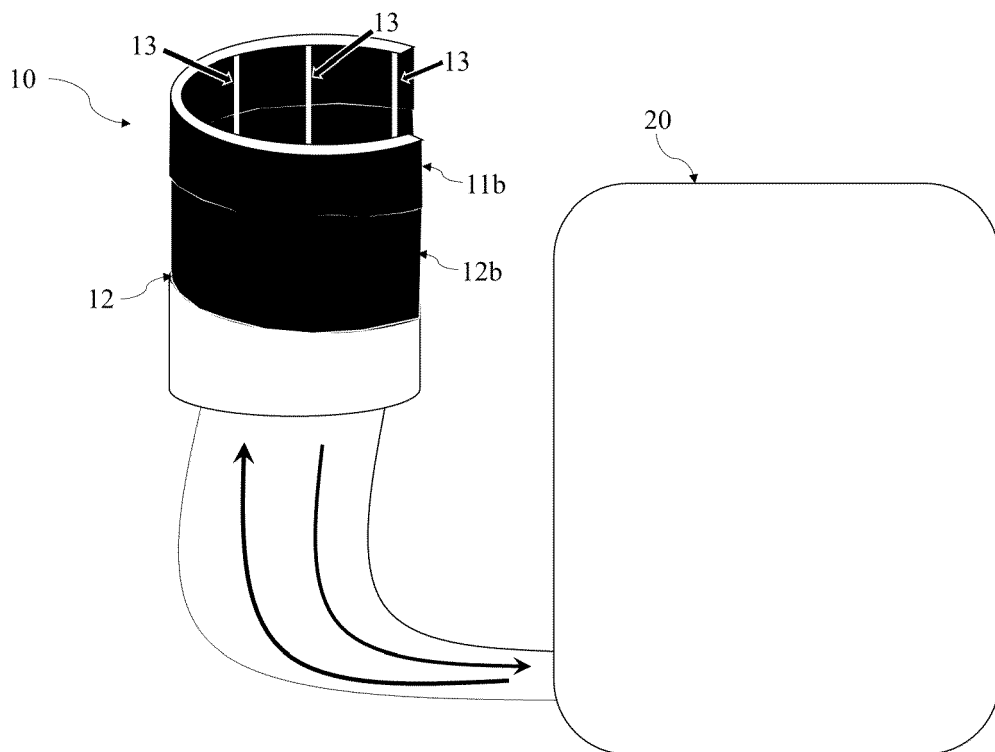


Fig 8

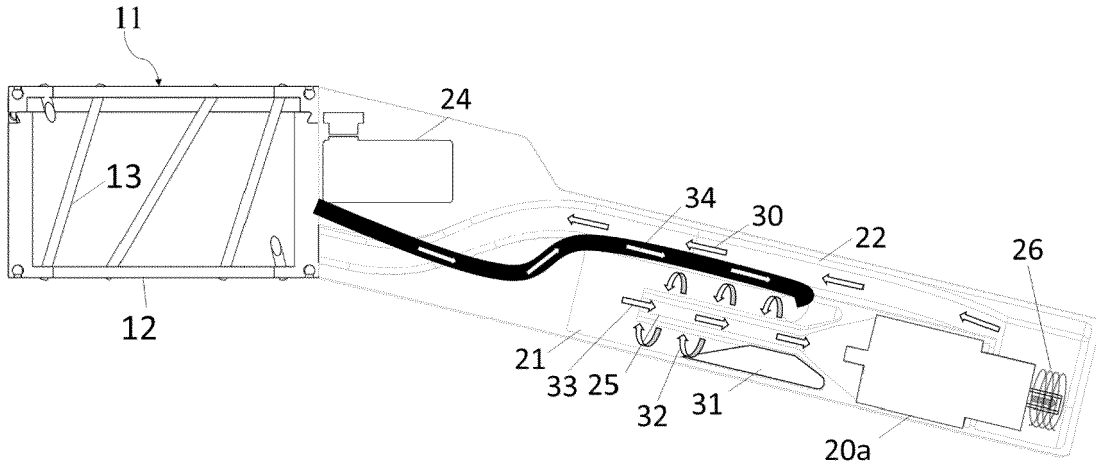


Fig 9

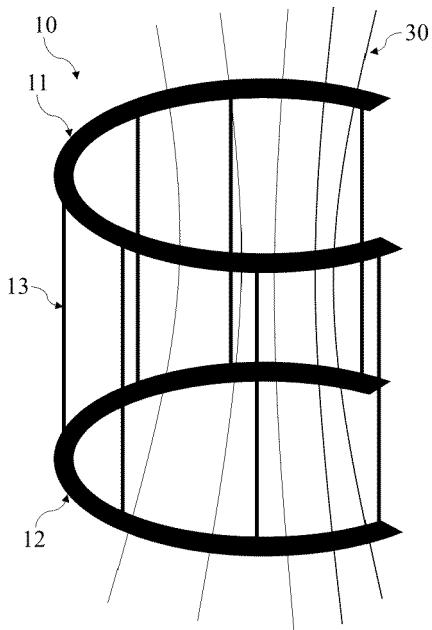


Fig 10A

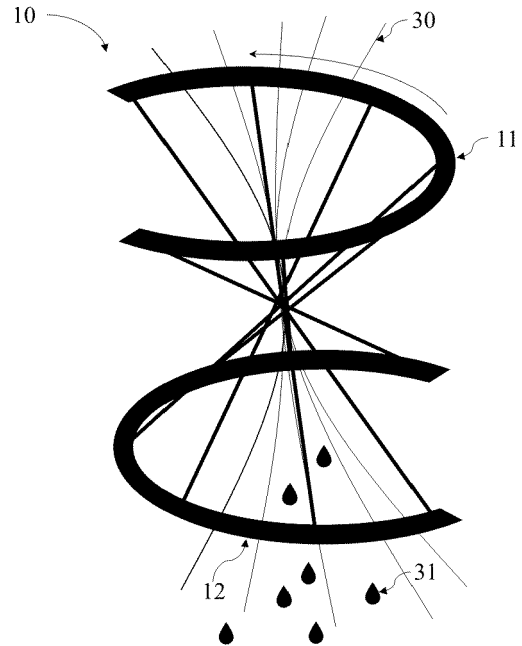


Fig 10B



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			TECHNICAL FIELDS SEARCHED (IPC)
			A45D
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>30 October 2023</b>	Examiner <b>Dinescu, Daniela</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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