(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 169 425 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
26.04.2023 Bulletin 2023/17

(21) Application number: **22383009.2**

(22) Date of filing: **20.10.2022**

(51) International Patent Classification (IPC):
A47K 10/48 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
A47K 10/48

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(30) Priority: **20.10.2021 ES 202130982**

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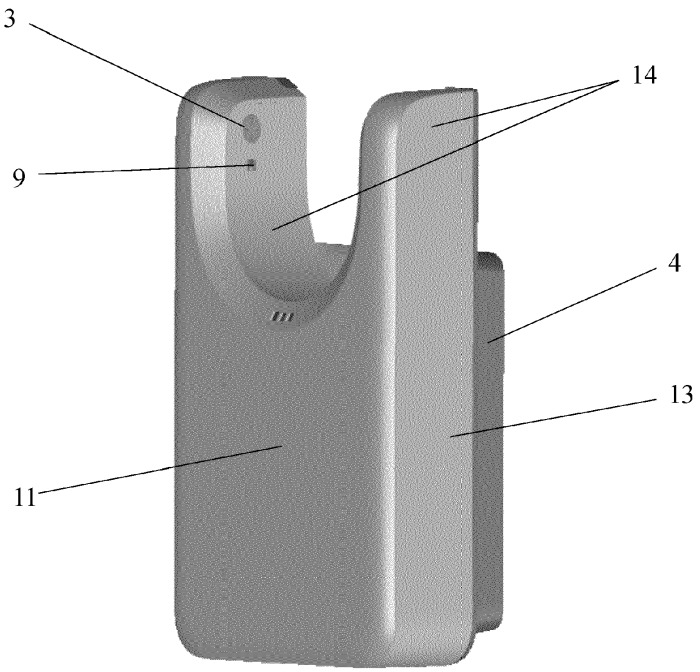
(54) **U-SHAPED HAND DRYER DEVICE**

(57) The present invention relates to a hand dryer device comprising a casing (1), a drying chamber (2) superiorly open formed in the upper portion of the same casing (1) configured for placing the hands of the user, aeration means provided for orienting an air flow rate towards an outlet located in the area of the drying chamber, and detection means for detecting the presence of the hands of the user in the drying chamber. The drying chamber (2) runs transversely from the front region to the rear region of the casing (1), said drying chamber being laterally delimited by two arms (14) facing each other, which extend vertically from the corresponding lateral regions, the drying chamber (2) having dimensions configured for the insertion of the two hands of the user from the front area of the casing (1). The air outlet is located on the internal face of the two arms (14), so that the air flow rate is laterally oriented towards the hands of a user.

FIG. 2



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Description

OBJECT OF THE INVENTION

[0001] The object of this application is the registration of a hand dryer device.

[0002] More specifically, the invention proposes the development of a hand drying device that allows the hands of a user to be introduced from the front portion of the device through a chamber that is superiorly open.

BACKGROUND OF THE INVENTION

[0003] The use of hand dryers for individual use in public and private places, open or closed premises, etc. is widely extended.

[0004] There are basically two main types of hand dryer devices on the market. One of them is the traditional machines (also called "hands under"), in which the user places their hands under the device and, on the other hand, and of more recent temporary expansion, the devices having a drying chamber for the user to introduce the hands from above (also called "hands in").

[0005] As positive aspects of the first type of devices, the user has no contact with the casing of the device and can clearly see the hands. However, as negative aspects, the water falls to the ground and can splash the user.

[0006] Within these devices, there are also low-speed devices that work mainly by means of heat and air flow rate, wherein the hands can be near or far from the device; and the high-speed ones that work through speed, have a lower flow rate and the air temperature is not so important, and the hands have to be closer to the machine for them to dry properly.

[0007] Moreover, with regard to "hands-in" type devices, in them users put their hands inside the device, normally from top to bottom, but also from front to back or at an angle, and they have as a positive aspect the fact that since water does not fall on the ground (it is not a 100% true statement, part of the water falls on the ground and there are models that do not have a tank and it does fall on the ground), the user is not splashed. However, as negative aspects, in order for them to work properly, the user must get their hands very close to the air outlets and contact between the hands and the device is very likely (usually the user does not want to touch the device due to hygiene reasons), and furthermore the hands are placed "inside" the device and are not visible to the user and therefore the user cannot visually appreciate if the hands are dry, so the feeling is created for the user of putting the hands inside a barely visible space that can be dirty and that is possibly going to be inadvertently touched, which is a circumstance that users reject, especially in the case of pandemics such as COVID.

[0008] Furthermore, the applicant is currently unaware of an invention that has all the features described in this specification.

DESCRIPTION OF THE INVENTION

[0009] The present invention has been developed with the aim of providing a hand dryer device that is configured as a novelty within the field of application and solves the previously mentioned drawbacks, further contributing other additional advantages that will be obvious from the description below.

[0010] It is therefore an object of the present invention to provide a hand dryer device comprising a casing defined by a front region, a rear region and two lateral regions, a drying chamber superiorly open formed in the upper portion of the same casing configured for the insertion of the hands of a user, aeration means provided for orienting an air flow rate towards an outlet located in the area of the chamber, and detection means for detecting the presence of the hands of the user in the drying chamber.

[0011] In particular, the invention is characterised in that the drying chamber runs from the front region to the rear region of the casing, the drying chamber being laterally delimited by two arms facing each other, which extend vertically from the corresponding lateral regions, the drying chamber having dimensions for the insertion of both hands together from the front area of the casing (and not only from the upper portion as in currently known hand dryers), in which the air outlet is located on the internal face of the two arms that extend so that the air flow rate is laterally oriented towards the hands of a user. Thus, the distance between the two arms is such that the hands of the user can be inserted frontally.

[0012] Due to these features, the hands of a user can be positioned in the drying area either from top to bottom (vertically), or from outside inwards (horizontally) or in any combination of both without touching the casing of the device during the positioning of the hands and away from the walls of the same device, or during the drying process.

[0013] The hand dryer device of the present invention allows the user to see their hands while drying them, that the water does not fall to the ground, further preventing it from splashing on the user during the drying operation, and it is high-speed but allows the hands to be farther away from the device and thus prevent contact with the same device, and hands do not have to be introduced inside a closed-looking compartment.

[0014] The feeling of putting the hands "inside something", of which the state of cleanliness is unknown, is something that is not usually desired by the user. In the device of the proposed invention, the hands are not placed "inside anything", but rather users see where they put their hands, and it would not be a "hands in" but neither would it be a "hands under" of those initially referred to.

[0015] Therefore, the aim of this novel arrangement is to combine the positive aspects of the two main known types of hand dryer devices.

[0016] Additionally, the device of the invention may in-

clude water evacuation means intended for evacuating water from the hands of the user.

[0017] Preferably, the water evacuation means comprise a cage or extension located on the rear face of the casing of the device, which has a sunken section having at its bottom at least one drainage outlet linked to a water evacuation conduit.

[0018] Advantageously, the air outlet is defined by two holes facing each other, each of the holes being in a respective arm.

[0019] According to a preferred embodiment of the invention, the aforementioned aeration means comprise a body that forms two nozzles that extend from a lower portion that can be coupled to air propulsion means, each of which has a final ending that is inclined with respect to a horizontal plane, such that the outlet flow exiting through the air outlets is oriented downwards, and also in such a way that the air can be projected in the direction of the wall or support surface where the dryer is mounted, minimising water splashes to the ground from the hands of the user. To ensure that the hands are dried correctly and efficiently, and also that the user is not splashed, these nozzles have been designed so that they conduct the air so that the air jets hit the hands.

[0020] Preferably, the detection means comprise at least one infrared sensor located on the internal face of one of the arms.

[0021] The ease of cleaning is another of the advantages of the device of the invention, since as there is no "inside", there are fewer points of difficult access or interstices to be cleaned.

[0022] Thus, the device described represents an innovative structure with structural and constituent features heretofore unknown for its intended purpose, reasons which, taken together with its usefulness, provide it with sufficient grounds for obtaining the requested exclusivity privilege.

[0023] Other features and advantages of the dryer device of the present invention will be evident in light of the description of a preferred, but not exclusive, embodiment which is illustrated by way of a non-limiting example in the drawings which are attached, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

[0024]

Figure 1 is a frontal elevated view of a first embodiment of the hand dryer device according to the present invention;

Figure 2 is a front perspective view of the embodiment shown in figure 1;

Figure 3 is a rear perspective view of the drying device shown in figures 1 and 2;

Figure 4 is a detailed perspective view of an upper portion of the device of the invention;

Figure 5 is an additional perspective detail view of the upper portion of the device of the invention;

Figure 6 is a schematic front view where a portion of the inside of the casing of the device can be seen where the aeration means are shown;

Figure 7 is a detailed perspective view of the internal portion of the dryer device of the invention; and

Figure 8 is a schematic front elevation and plan view of the hand dryer device where the direction of positioning of the hands of a user is indicated by means of arrows.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0025] In light of the aforementioned figures, and in accordance with the adopted numbering, one may observe therein a preferred exemplary embodiment of the invention, which comprises the parts and elements indicated and described in detail below.

[0026] One embodiment of the hand dryer device essentially comprises a casing (1), made for example of an injection mouldable plastic material, which is defined by a front region (11), a rear region (12) and two lateral regions (13), a drying chamber (2) superiorly open that is formed in the upper portion of the casing itself (1) configured for the insertion of the hands of a user, aeration means provided for orienting an air flow rate towards an outlet located in the area of the drying chamber (2), and detection means for detecting the presence of the hands of the user in the drying chamber (2).

[0027] With particular reference to the drying chamber (2), the same runs transversely from the front region to the rear region of the casing, the drying chamber (2) being laterally delimited by two arms (14) facing each other, and presenting a U-shaped general geometry as can be seen in the figures.

[0028] According to this, the two arms (14) extend vertically from the corresponding lateral regions, the drying chamber having dimensions for the insertion of the two hands from the front area of the casing (1), wherein the air outlet is located on the internal face of the two arms (14) that extend parallel to each other, internally defining a curvature area, in such a way that the air flow rate is laterally oriented towards the hands of a user.

[0029] As can be seen in this particular embodiment, the air outlet of the drying device is defined by two outlet holes (3) facing each other, each of the outlet holes (3) being in a respective arm (14).

[0030] Advantageously, the device includes water evacuation means for removing water coming from the hands of the user. These water evacuation means comprise a cage (4) located on the rear region (12) of the casing (1), which has a sunken section (5) superiorly with a curved-concave shape having at its bottom at least one drainage outlet (6) (a through hole) linked with a water evacuation conduit (not shown).

[0031] Now, with particular reference to the aeration means, they comprise a body that forms two nozzles (7) that extend from a lower portion (8) that can be coupled to air propulsion means, each of which having a final

ending that is inclined with respect to a horizontal and vertical plane, such that the outlet flow exiting through the outlets is projected downwards and slightly towards the rear portion of the casing (1) where the water evacuation means are located, as shown represented by means of arrows in figure 6.

[0032] Thus, the orientation of the air outlet can also be towards a wall area on which the drying device is mounted in order to minimise water splashes. The aeration means may include a thermal resistor that provides a heated air flow.

[0033] The detection means comprise a pair of infrared sensors (9) located on the internal face of each of the arms (14) or extensions of the lateral regions (13), so that when they detect the presence of hands on the area of the drying chamber, the aeration means are automatically activated. It should be mentioned that the sensors (9), together with the aeration means, are linked to each other through a control unit that governs the operation of the dryer device.

[0034] As can be seen in Figure 8, the distance (d) between the two arms is such that the hands of the user can be inserted frontally side by side, as represented with the arrows (f).

[0035] Next, the operation of the drying device described above is explained. When users introduce their hands into the drying chamber (2) from the front portion of the device (so that they can see the position of the hands inside the drying chamber at all times), the sensors (9) detect their presence and activate an electric motor that drives a fan. By activating the fan, an air flow rate captured by an air intake (10) is introduced at a previously determined speed in the equipment that makes up the aeration means, so that it passes through the inside of the two nozzles (7) in the direction of the outlet holes (3).

[0036] The details, shapes, dimensions and other accessory elements, used to manufacture the drying device of the invention, may be suitably substituted for others which do not depart from the scope defined by the claims which are included below.

Claims

1. A hand dryer device comprising a casing (1) defined by a front, rear region and two lateral regions, a drying chamber (2) superiorly open formed in the upper portion of the same casing (1) configured for the insertion of the hands of a user from the front region of the same casing (1), aeration means provided for orienting an air flow rate towards an outlet located in the area of the drying chamber, and detection means for detecting the presence of the hands of the user in the drying chamber, **characterised in that** the drying chamber (2) runs transversely from the front region to the rear region of the casing (1), said drying chamber (2) presenting a U-shaped general geometry and the same drying chamber (2) being laterally delimited by two arms (14) facing each other, which extend vertically from the corresponding lateral regions, the drying chamber (2) having dimensions configured for the insertion of the two hands of the user from the front area of the casing (1), wherein the air outlet is located on the internal face of the two arms (14) that extend in such a way that the air flow rate is laterally oriented towards the hands of a user.

2. The hand dryer device according to claim 1, **characterised in that** it includes water evacuation means intended for evacuating water from the hands of the user.

3. The hand dryer device according to claim 2, **characterised in that** the water evacuation means comprise a cage (4) located on the rear face (12) of the casing (1), which has a sunken section (5) having at its bottom at least one drainage outlet linked to a water evacuation conduit.

4. The hand dryer device according to any of the preceding claims, **characterised in that** the air outlet is defined by two outlet holes (3) facing each other, each of the outlet holes (3) being in a respective arm (14).

5. The hand dryer device according to any of the preceding claims, **characterised in that** the aeration means comprise a body that forms two nozzles that extend from a lower portion that can be coupled to air propulsion means, each of which having a final ending that is inclined with respect to a horizontal plane, such that the outlet flow exiting through the air outlets is oriented downwards.

6. The hand dryer device according to any of the preceding claims, **characterised in that** the aeration means comprise a body that forms two nozzles that extend from a lower portion that can be coupled to air propulsion means, each of which having a final ending that is inclined with respect to a horizontal and vertical plane, such that the outlet flow exiting through the air outlets is oriented downwards and towards the rear side of the casing (1).

7. The hand dryer device according to claim 1, **characterised in that** the detection means comprise at least one infrared sensor (9) located on the internal face of one of the arms (14).

8. The hand dryer device according to any of the preceding claims, **characterised in that** it is enabled for its installation and positioning on a wall.

9. The hand dryer device according to claim 8, **characterised in that** it is enabled for its installation and

positioning on a wall in the rear region of the casing (1).

FIG. 1

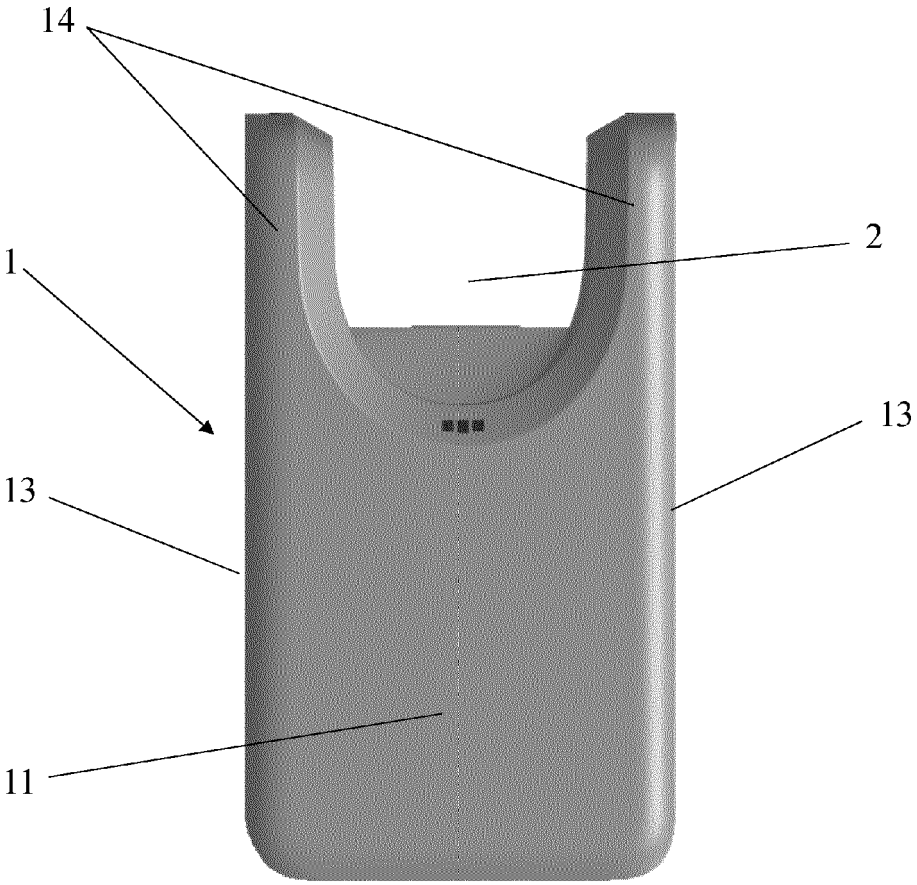


FIG. 2

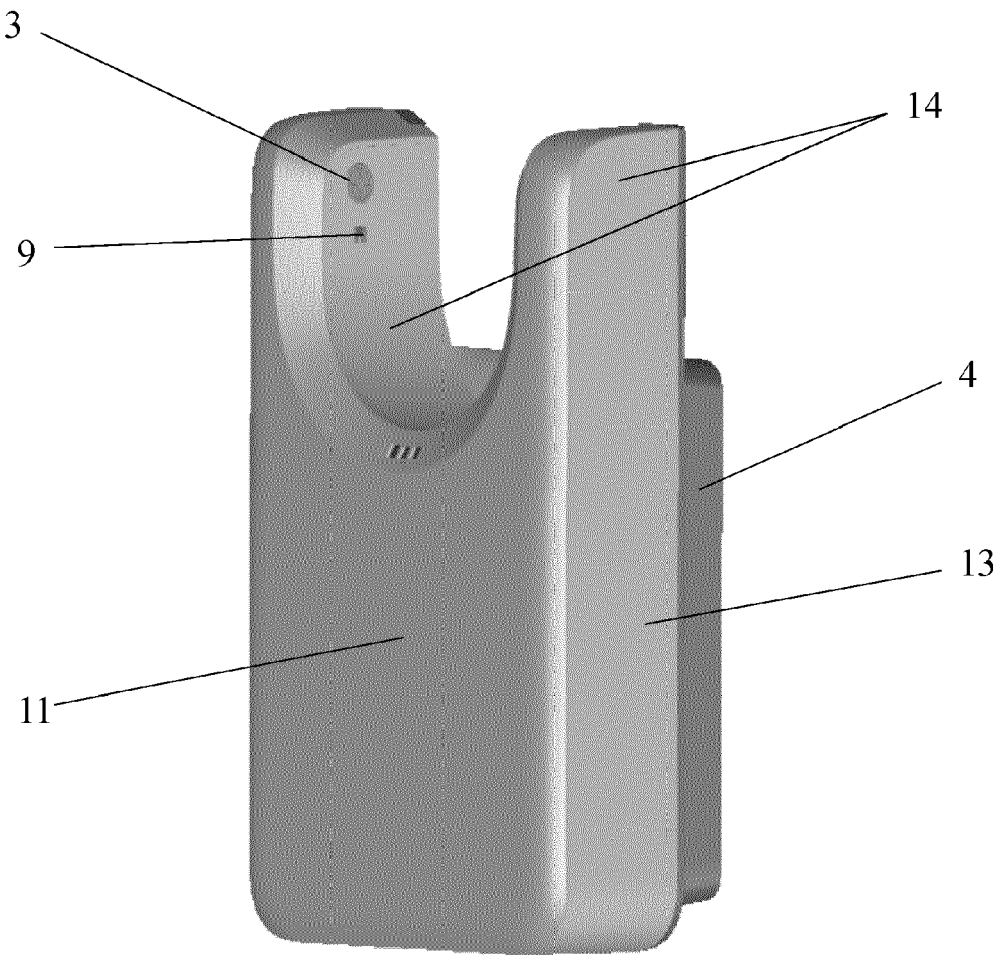


FIG. 3

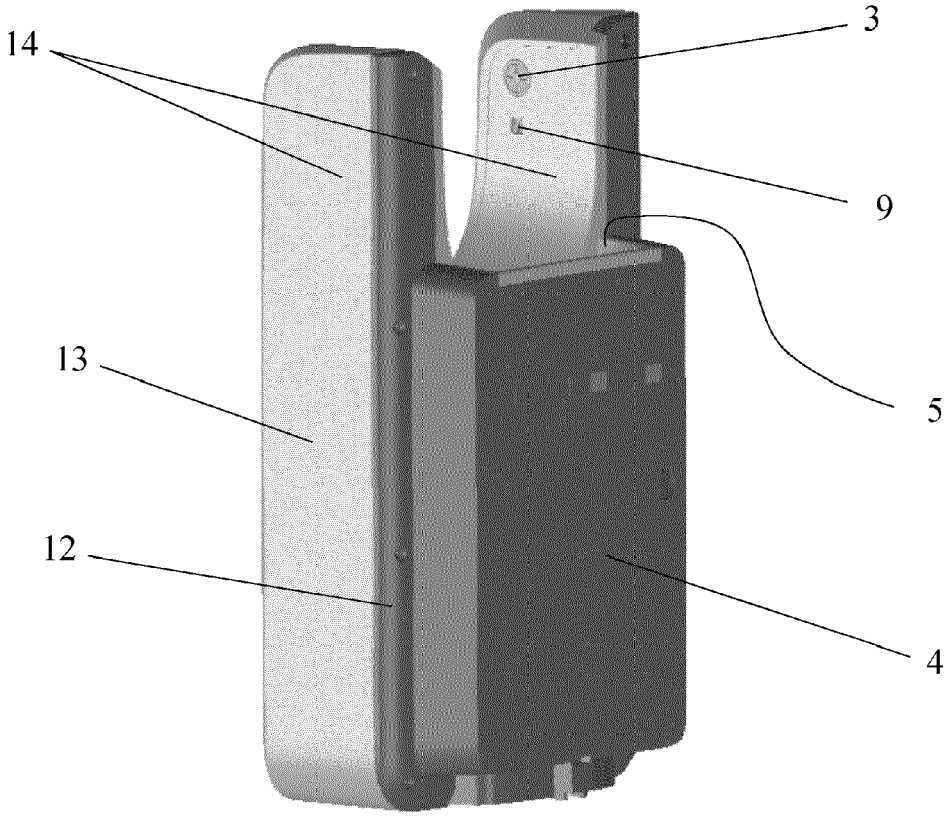


FIG. 4

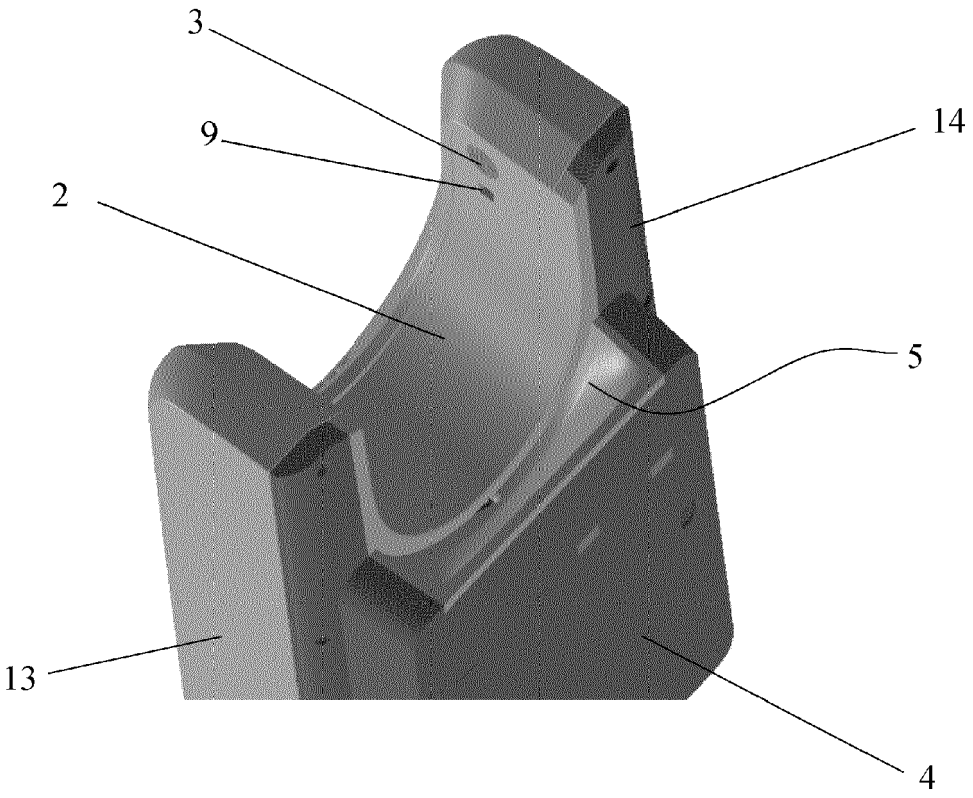


FIG. 5

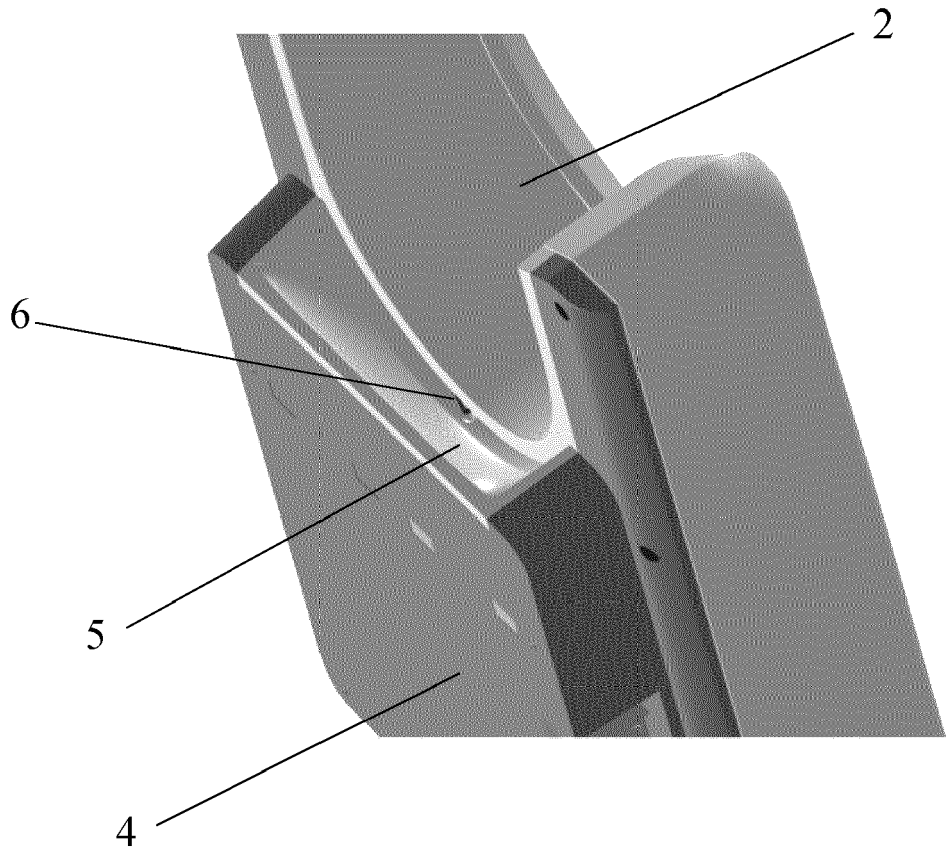


FIG. 6

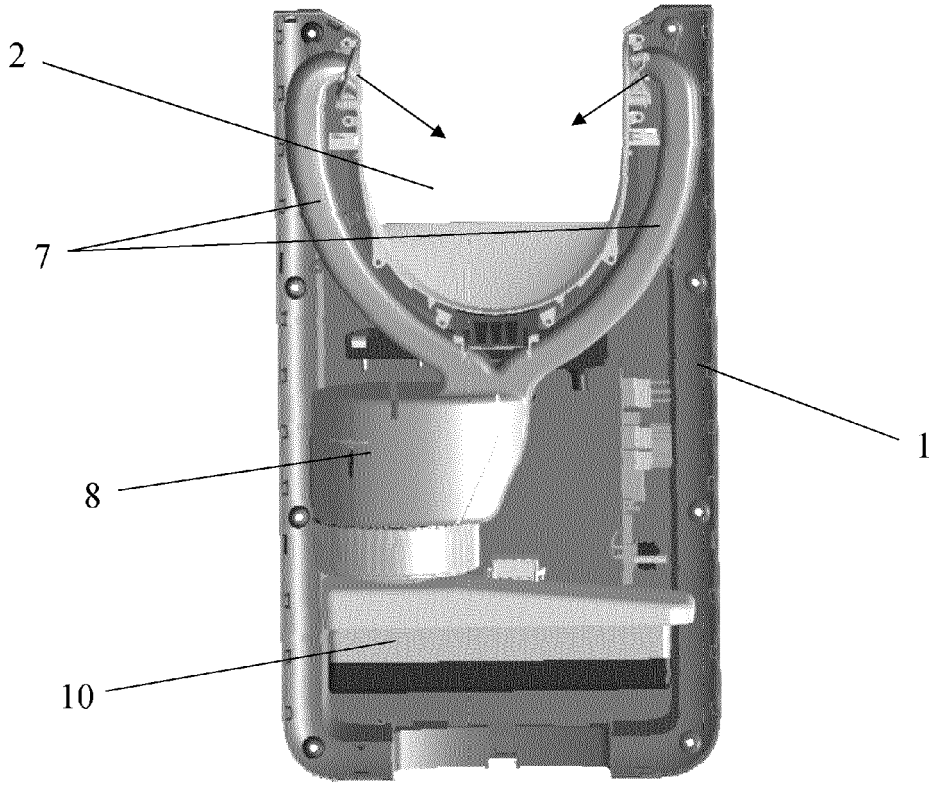


FIG. 7

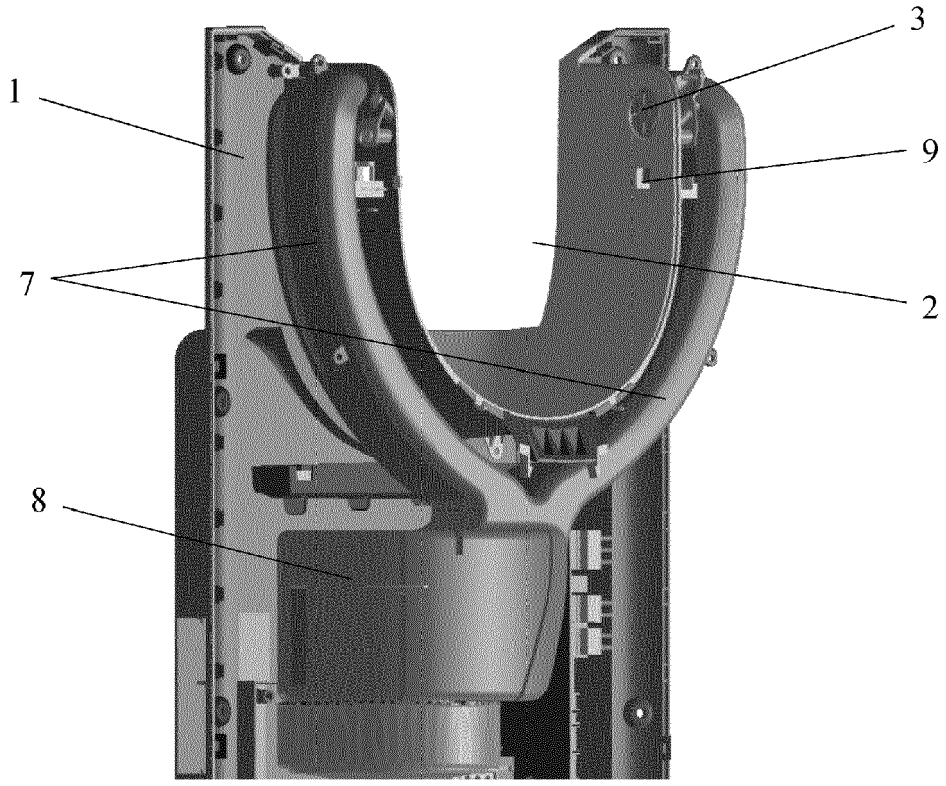
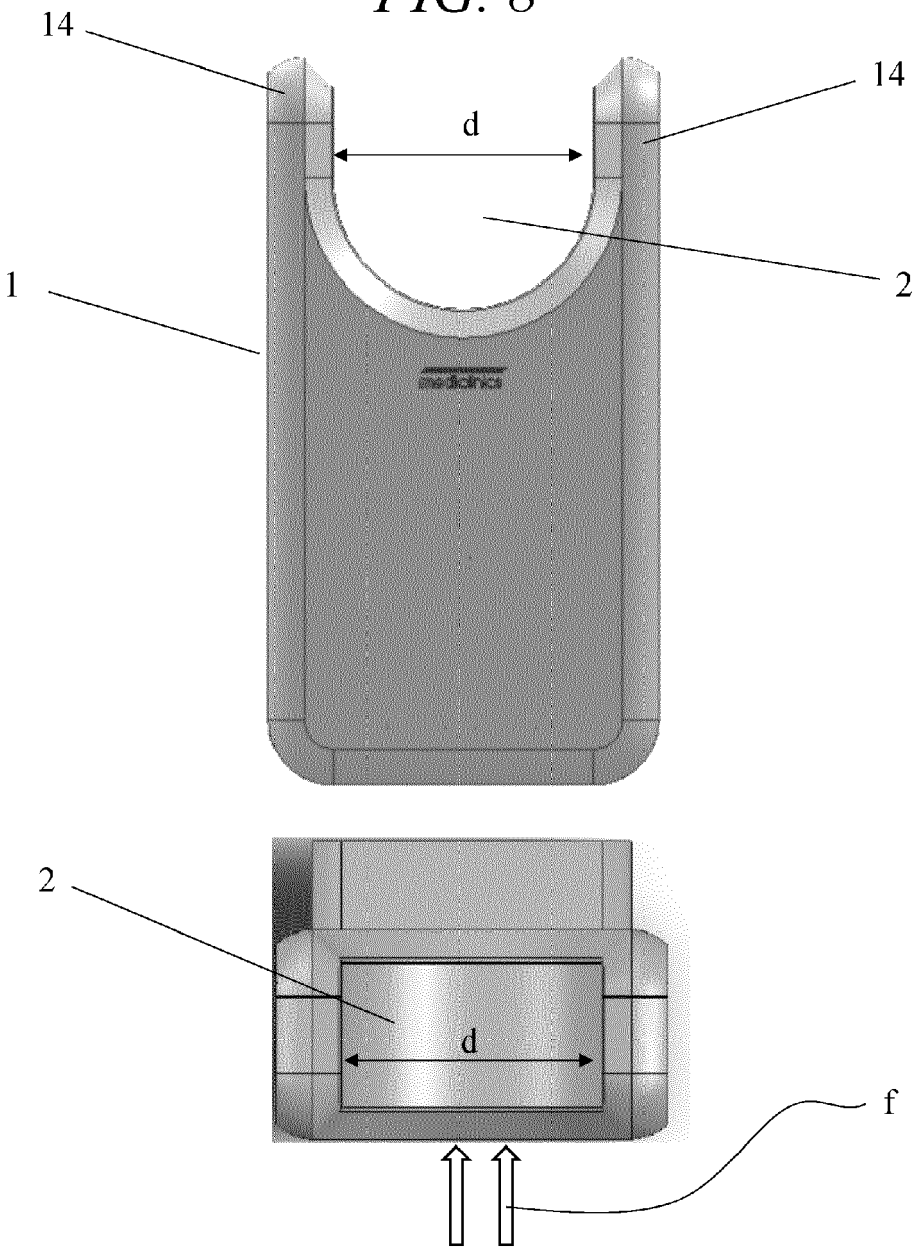


FIG. 8



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EUROPEAN SEARCH REPORT

Application Number
EP 22 38 3009

DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	* claims 1-3; figures 1-2 *	6	
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Y	* paragraph [0028]; claims 1-19; figures 1-20 *	6	
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Y	* claims 1-11; figures 1-6 *	6	

TECHNICAL FIELDS SEARCHED (IPC)

A47K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 February 2023	Oliveras, Mariana

CATEGORY OF CITED DOCUMENTS

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