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(54) **Double-sided portable heater**

(57) It incorporates separate fastening grilles (1), means of heating (5) positioned between the fastening grilles (1) which are electrically actuated from a control panel (2) and which consists of a radiating plate (5) which has, on its two surfaces, tracks made in electro-resistant material configuring electrical resistances on each surface which radiate heat in opposite directions when current is applied thereto. It has a U-shaped base member (6) in whose central portion are positioned central (7) and lateral (8) perpendicular flanges which facilitate the fitting of the radiating plate (5), and footings (9) of the fastening grilles (1). It also has a sealing clamp (3) which perimetrically grips the fastening grilles (1) except by their base, thus establishing the sealing of the heater.

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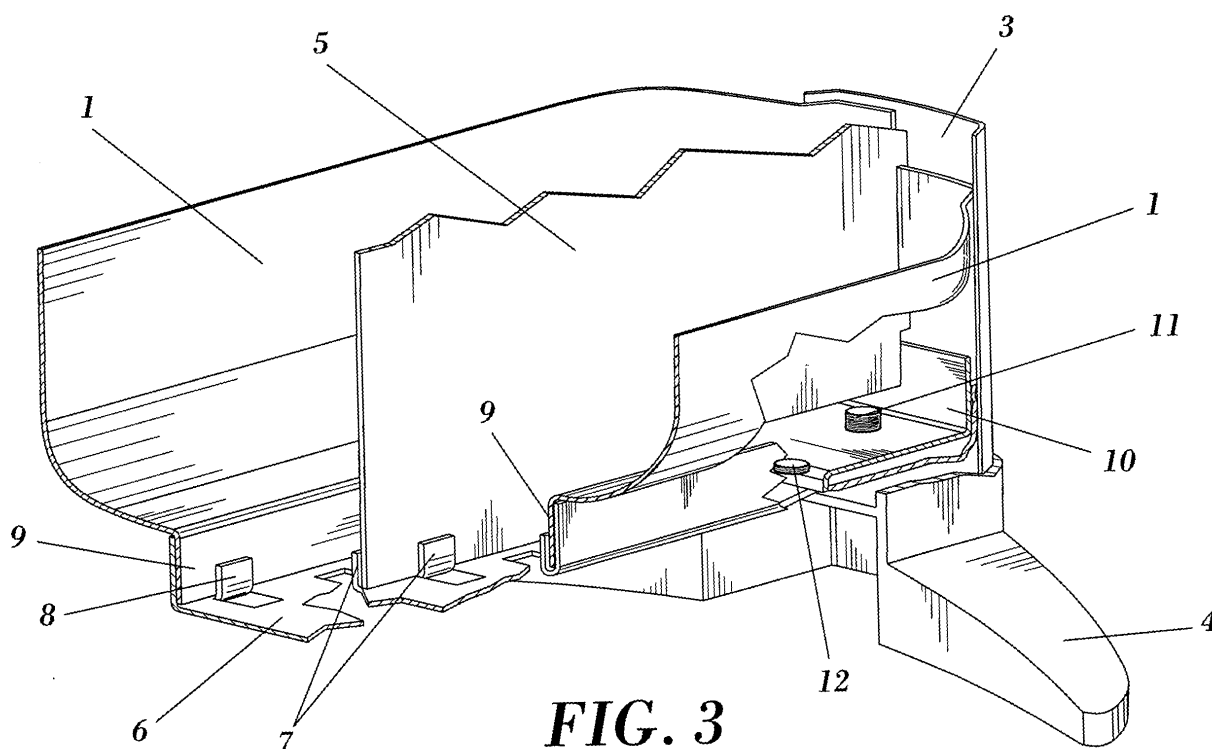


FIG. 3

Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a portable electric heater, of the type generally called radiating plate.

[0002] An object of the invention is a radiator of simple construction, of reduced cost, which aids the multidirectional distribution of heat, which occupies a reduced space and which integrates part of its characteristic elements, such as the protective grilles which avoid contact with the heat source as part of the chassis.

BACKGROUND OF THE INVENTION

[0003] There are multiple types of radiating plates on the market, some for portable use with wheels or legs, and others used for their static arrangement connected to the wall.

[0004] In a possible solution, a radiating element is constituted by one or several panels provided with a printed resistance on one of its surfaces.

[0005] Patent of invention ES 2 127 129, for example, includes a manufacturing process of this type of heating resistances printed by screen-printing. By means of this process a base plate is produced whereon one or more tracks of material constituting the resistance, which are isolated with a filling material, are printed by screen printing, then a second plate is fixed which is abutted by pressing or other techniques using heat to dry or cure it, during one or more phases of the process.

[0006] As an evolution of this manufacturing solution, certificate of addition ES 2 187 277 discloses a process based on using a single mica base plate whereon graphite or carbon are screen-printed forming resistant tracks, followed by an electro-resistant screen-print with graphite of the resistant tracks to then perform a screen-printing with silver of the connection areas of the resistant tracks in which area the electrical connections will be made to finally apply, also by screen-printing, a protective ink and an electrical insulation, only on the resistant tracks.

[0007] In another possible embodiment, the radiating element can consist of one or several aluminium profiles of flat constitution, provided with ribs and a central housing wherein a central resistance of those called metal clad is inserted.

[0008] Radiating plates are generally constituted by a radiating element which is located within a chassis which surrounds it, except on its front surface whereon a protective grille, complemented with controls, electrical connections and other fixing and support means, is located.

[0009] Some radiators heat both from the front part and from the rear part, for said purpose having independent radiating elements belonging to opposing apparatus joined together by their rear surface.

DESCRIPTION OF THE INVENTION

[0010] The double-sided portable heater proposed by this invention incorporates a single radiating plate which radiates heat from its front surface and its rear surface and consists of a chassis basically configured by separate protective grilles of the radiating plate in object to achieve a compact unit, of reduced size and constructive simplicity.

[0011] The heater is complemented with a sealing clamp, a base member, support elements, operating controls and electrical connections.

[0012] The radiating plate consists of a flat plate of rigid insulating heat-resistant material, for example micanite, wherein a track made in electro-resistant material, of carbon, silver, aluminium or others is incorporated on one of its surfaces, by screen-printing, projection or any other means, configuring an electrical resistance whereto an electrical current is applied at its ends to generate heat.

[0013] The same operation is performed on the opposite surface of the radiating plate, forming a track which shows the opposite alignment in correspondence with the free spaces of the track defined on the other surface, efficiently insulating in this way the electrical charge of one surface in relation to the other.

[0014] The electro-resistant tracks or circuit thus defined on both sides of the radiating plate emit heat in opposite directions once current is applied thereto.

[0015] The radiating plate is connected to the base member by its lower contour, free from active electrical parts. The base member consists of a U-shaped profile which has: central flanges perpendicular to the central portion of the U, defined by die-cutting on both sides of the middle line of said portion in spaced-out and opposite arrangement, being constituted by fastening elements between which the heating panel fits, and lateral flanges also perpendicular to the central portion and defined by die-cutting in the proximities of each one of the vertical ribs of the member, which define with them spaces wherein the footings of the fastening grille fits.

[0016] The fastening grilles, made in perforated plate, are found on both sides of the heating panel with their adjacent and opposite edges catching the radiating plate in its entire circumference with the exception of its base.

[0017] Surrounding the fastening grilles around its entire contour, with the exception of its base, are located a means of closure, preferably consisting of a sealing clamp which may be divided in two sectors to insert the control panel between both. The clamp has means of connection in its base which may consist of separate L-shaped profiles traversed by screws or tensors which tighten the clamp against the base member, making the clamp press against the circumference of the fastening grilles establishing the consequent tightening and positioning of the radiating plate, thus determining the reinforcement and stiffening of the heater.

[0018] The support legs of the heater are positioned associated to the base member, which provide stability

thereto and which may conceal the voltage systems of the heater.

DESCRIPTION OF THE DRAWINGS

[0019] To complement the description being made and with the object of helping towards a better understanding of the characteristics of the invention, in accordance with a preferred example of practical embodiment thereof, a set of figures is attached as an integral part of the description, wherein the following has been represented with an illustrative non-limitative character:

Figure 1.- Shows a front view of the double-sided portable heater.

Figure 2.- Shows a plan view of the heater.

Figure 3.- Shows a perspective view of the heater wherein several fracture lines have been represented to display its inside.

Figure 4.- Shows a detailed view of the heater which shows its interior, where the radiating plate, the tensor which connects the clamp to the base member, as well as the support legs of the heater have been represented.

Figure 5.- Shows a sectioned view of a detail according to the A-A plan of figure 4.

Figure 6.- Shows a sectioned view defined according to the B-B plan of figure 4.

Figure 7.- Shows a view of the connection between clamp, fastening grilles and radiating plate.

PREFERRED EMBODIMENT OF THE INVENTION

[0020] Next, and with reference to the figures, a preferred embodiment of the double-sided portable heater which constitutes the object of this invention is described.

[0021] As can be seen in figures 1 and 2 the heater incorporates separate fastening grilles (1), a control panel (2), means of closure (3) of the fastening grilles (1), support legs (4) and, as is observed in figure 3, means of heating (5) positioned between the fastening grilles (1) which is electrically actuated from the control panel (2) to radiate heat.

[0022] The means of heating (5) depicted in figure 3 consists of a radiating plate (5) which has, on its two surfaces, tracks made in electro-resistant material configuring electrical resistances on each surface which radiate heat in opposite directions when current is applied thereto.

[0023] Figures 1 to 3 also show that the heater has a U-shaped base member (6) in whose central portion central perpendicular flanges (7) are positioned, defined by

die-cutting on both sides of the middle line of said central portion in spaced-out and opposite arrangement between which the radiating plate (5) fits, as can be seen in figure 5, and lateral flanges (8) also perpendicular to the central portion and defined by die-cutting in the proximities of each one of the vertical ribs of the base member (6), which define with them spaces wherein footings (9) of the fastening grilles (1) fit.

[0024] On the other hand, the means of closure (3) consists of a sealing clamp (3) which perimetrically grips the fastening grilles (1) except by their base, and is provided at its ends with means of connection (10, 11) which connects the sealing clamp (3) to the base member (6), establishing the sealing of the heater with the fastening grilles (1), which are opposite and catch, with their edges, the radiating plate (5) in its entire circumference with the exception of its base, as represented in figure 7.

[0025] Figures 3 and 4 show that the means of connection (10, 11) of the sealing clamp (3) to the base member (6) consists of separate L-shaped profiles (10) defined at the ends of the sealing clamp and screws (11) which connect the sealing clamp (3) to the base member (6) determining the reinforcement and stiffening of the heater.

[0026] The sealing clamp (3) may be divided in two sectors, the control panel (2) being inserted between both sectors, as represented in figure 1.

[0027] Furthermore, figure 4 shows that the support legs (4) are connected to the base member (6) by means of connecting screws (12).

Claims

1. Double-sided portable heater which incorporates separate fastening grilles (1), a control panel (2), means of closure (3) of the fastening grilles (1), support legs (4), means of heating (5) positioned between the fastening grilles (1) which is electrically actuated from the control panel (2) to radiate heat, **characterized in that:**

- the means of heating (5) consists of a radiating plate (5) which has, on its two surfaces, tracks made in electro-resistant material configuring electrical resistances on each surface which radiate heat in opposite directions when current is applied thereto.

- and **in that** it has a U-shaped base member (6) in whose central portion central perpendicular flanges (7) are positioned, defined by die-cutting on both sides of the middle line of said central portion in spaced-out and opposite arrangement between which the radiating plate (5) fits, and lateral flanges (8) also perpendicular to the central portion and defined by die-cutting in the proximities of each one of the vertical ribs of the base member (6), which define with them

spaces wherein footings (9) of the fastening grilles (1) fit.

2. Double-sided portable heater according to claim 1, **characterized in that** the means of closure (3) consists of a sealing clamp (3) which perimetrically grips the fastening grilles (1) except by their base, and is provided at its ends with means of connection (10, 11) which connects the sealing clamp (3) to the base member (6), to establish the sealing of the heater with the fastening grilles (1), which are opposite and catch, with their edges, the radiating plate (5) in its entire circumference with the exception of its base.
3. Double-sided portable heater according to claim 2, **characterized in that** the means of connection (10, 11) of the sealing clamp (3) to the base member (6) consists of separate L-shaped profiles (10) defined at the ends of the sealing clamp (3) and screws (11) which connect the sealing clamp (3) to the base member (6) determining the reinforcement and stiffening of the heater.
4. Double-sided portable heater according to claim 1, **characterized in that** the sealing clamp (3) is divided in two sectors, the control panel (2) being inserted between both sectors.

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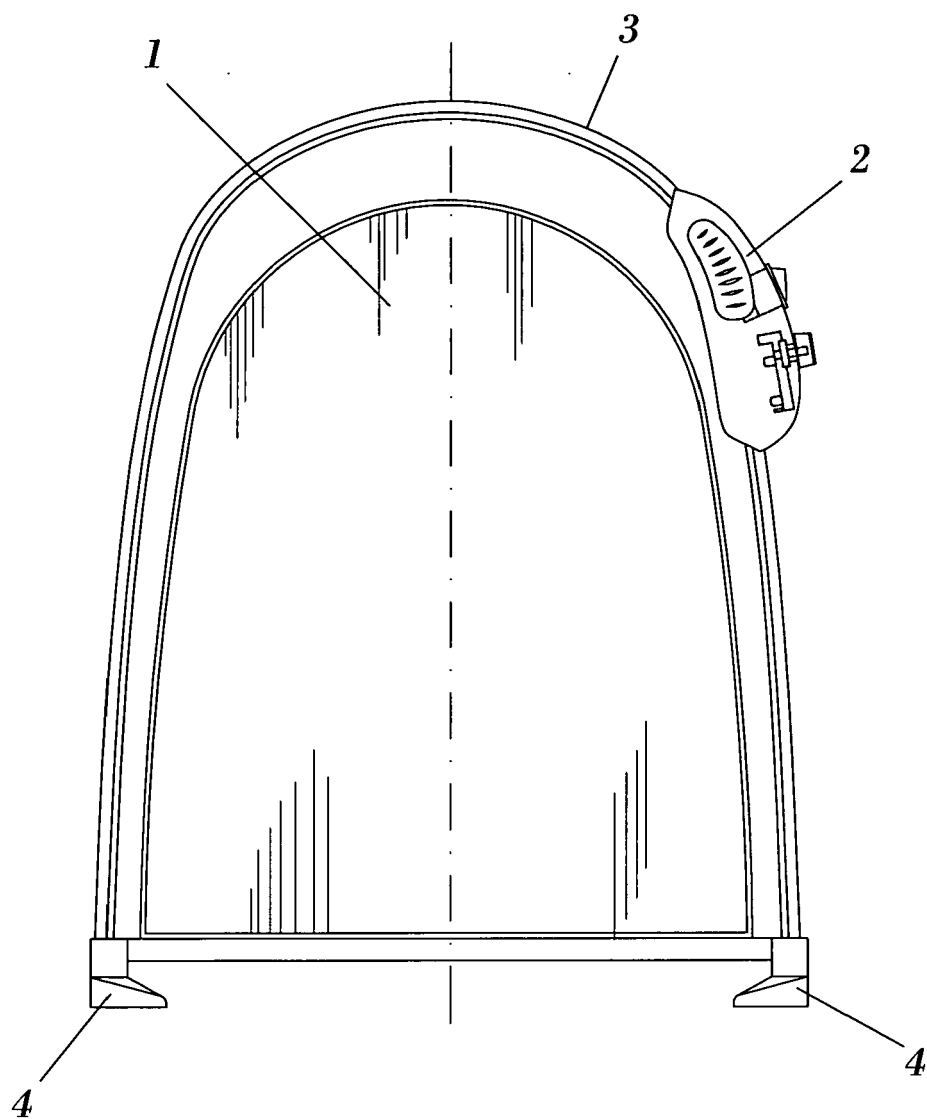


FIG. 1

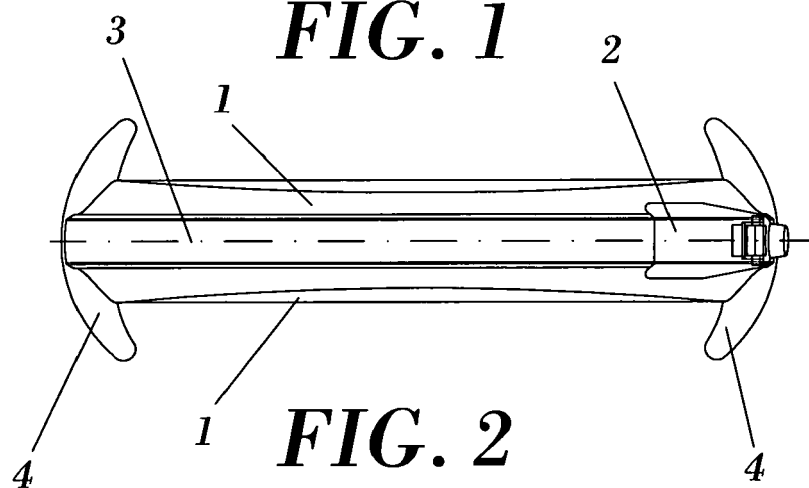


FIG. 2

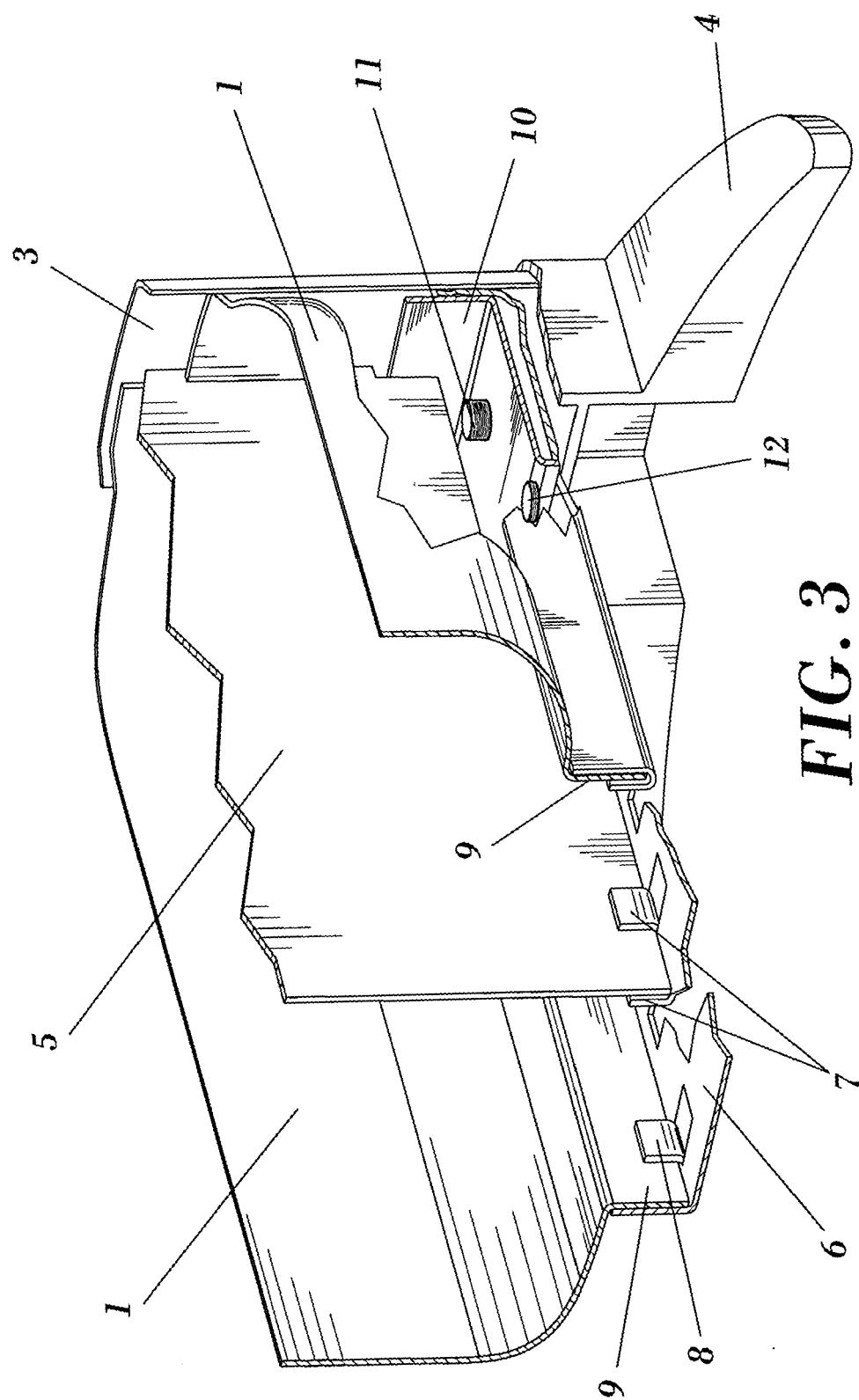


FIG. 3

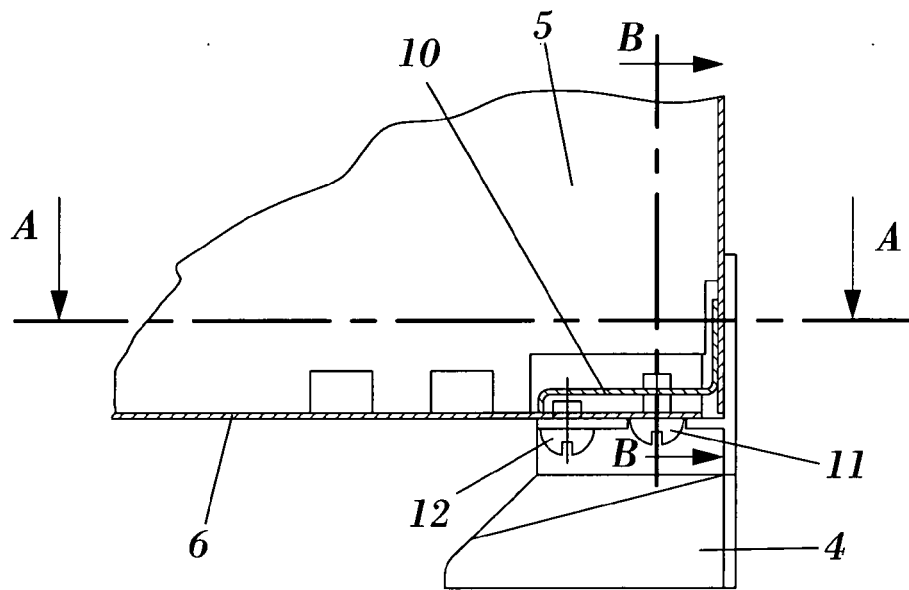


FIG. 4

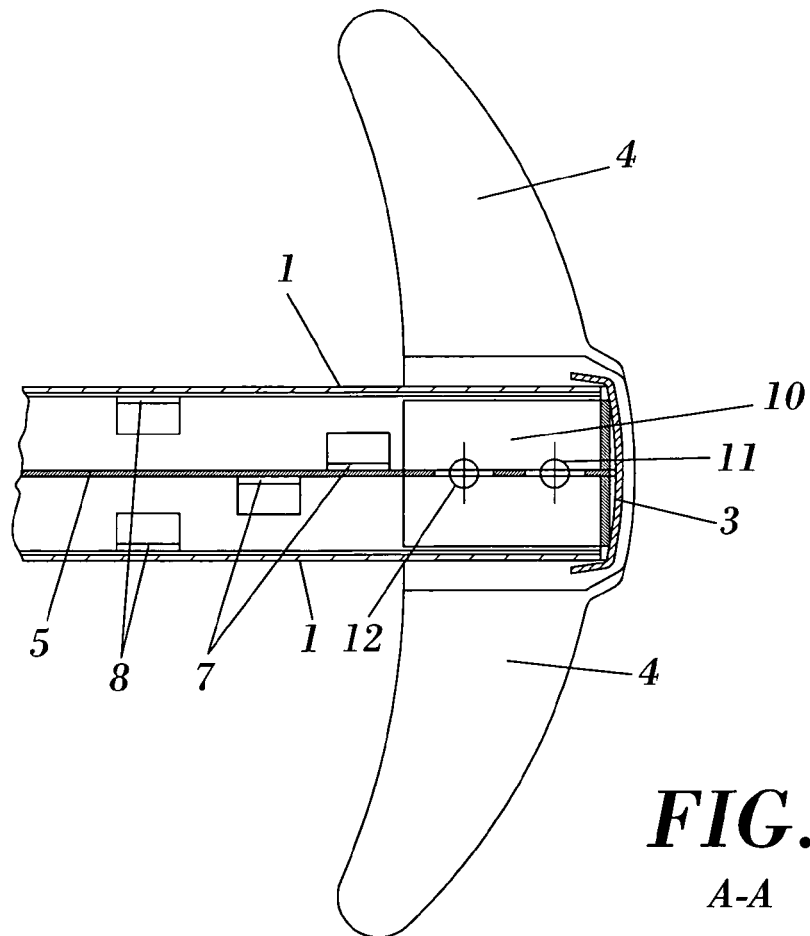


FIG. 5
A-A

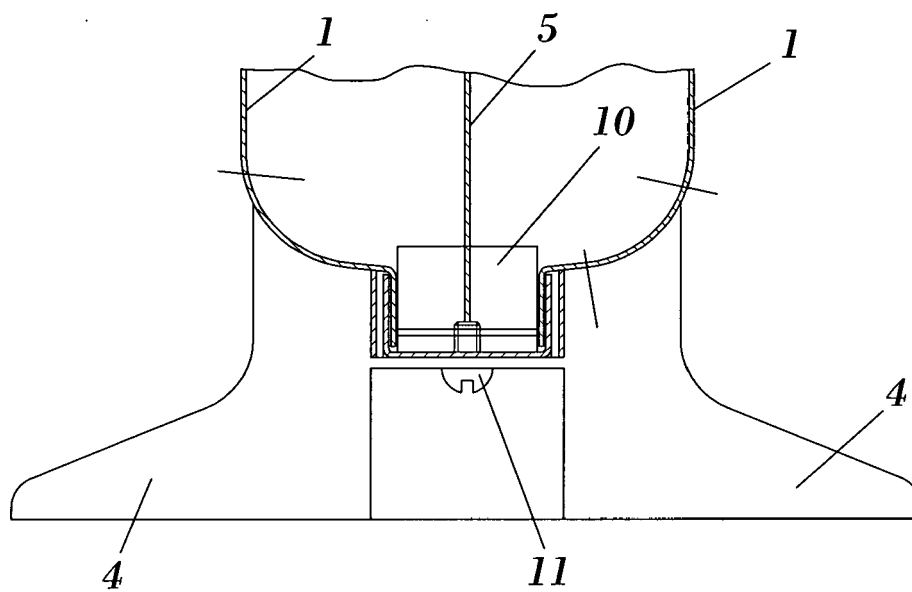


FIG. 6
B-B

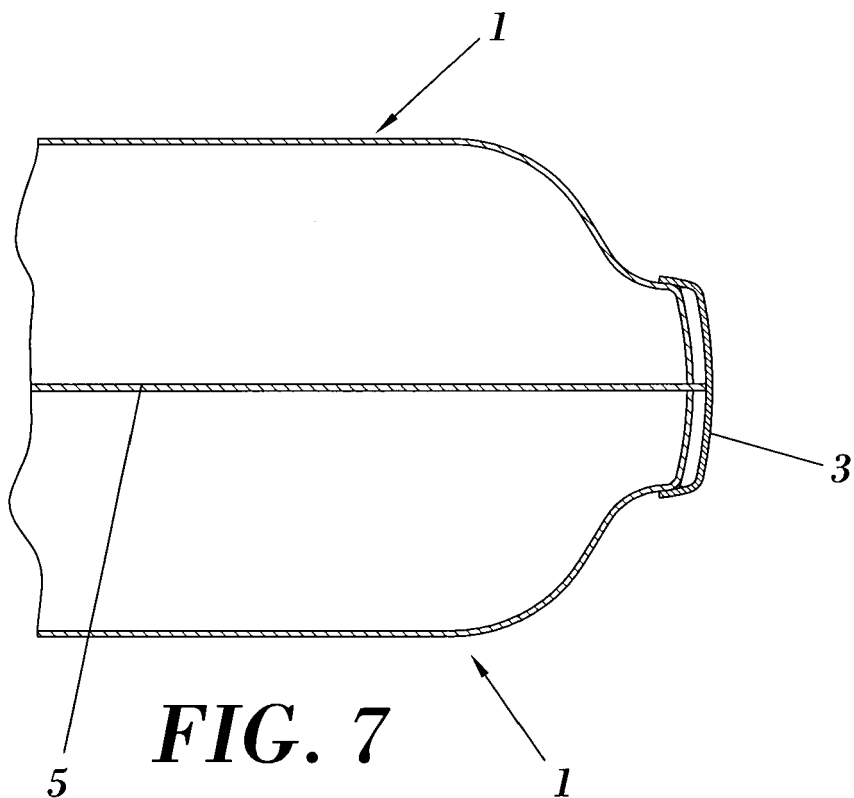


FIG. 7



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	US 3 767 895 A (NEEDHAM R) 23 October 1973 (1973-10-23) * the whole document *	1	INV. F24C7/06 F24C15/08
A	US 2005/175329 A1 (HUANG CHUAN-PAN [TW] ET AL) 11 August 2005 (2005-08-11) * abstract *	1	
A	EP 0 383 642 A (AIRELEC IND [FR]) 22 August 1990 (1990-08-22) * figure 1 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			F24C F24H
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 March 2007	Examiner Arndt, Markus
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			

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

EP 06 38 0318

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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27-03-2007

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- ES 2187277 [0006]