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(54) **Radiator for heating a room**

(57) The radiator for heating a room comprises a front radiant plate (2), a rear radiant plate (3), sides (4), and a circuit for a heat carrier fluid which extends in a compartment (6) delimited between the front plate (2), the rear plate (3) and the sides (4), at least one side (4) having at least one light source (21) associated with at least one light guide (22) exposed toward the outside of the radiator.

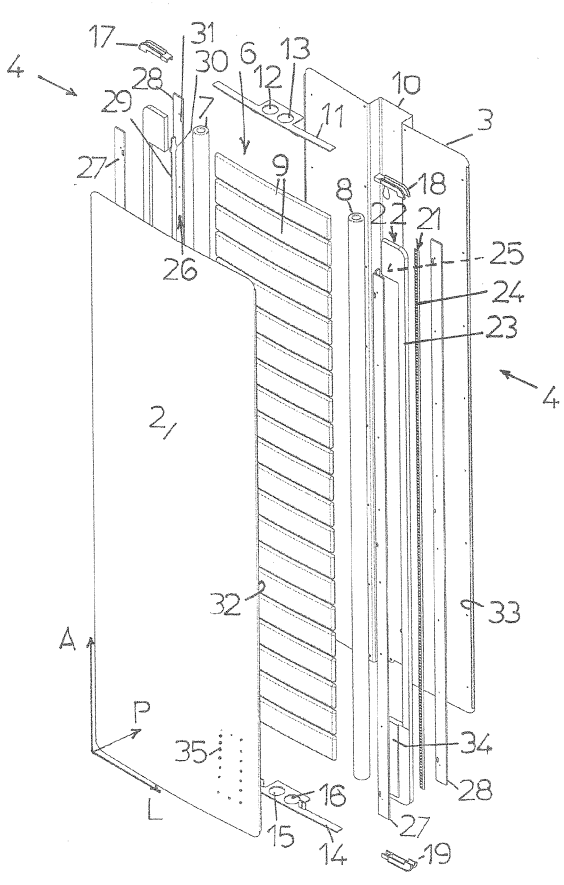


FIG 1

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Description

[0001] The present invention relates to a radiator for heating a room, particularly to a radiator for indoors.

[0002] There are known indoor radiators comprising a front radiant plate, a rear radiant plate and sides delimiting a compartment in which there is positioned a circuit for a heat carrier fluid and comprising a delivery manifold, a return manifold and a series of pipes connecting between the delivery manifold and the return manifold. Such radiators have a functionality limited exclusively to merely heating the room they are installed in.

[0003] The technical task that the present invention sets itself is thus to realize a radiator for heating a room of the type referred to above which has broader functionality.

[0004] The technical task, as well as these and other objects, according to the present invention, are achieved by realizing a radiator for heating a room comprising a front radiant plate, a rear radiant plate, sides, a circuit for a heat carrier fluid positioned in a compartment delimited between said front plate, said rear plate and said sides, characterized in that it has at least one light source associated with at least one light guide exposed toward the outside of the radiator.

[0005] Thanks to the provision of a specific lighting system, it is possible to easily discern the profile of the radiator even in the absence of external lighting and thus avoid tripping or impacts that can place a person's physical integrity at risk.

[0006] The radiator can be used as a source of lighting alternative or supplementary to an external light source, exploitable, for example, where the switch for turning on external light source is in an inconvenient, poorly accessible or remote position. The light beam can be guided in precisely located points in order to highlight the specific components of the radiator that must preferably be visible and identifiable also in the absence of external lighting, for example protruding and hence dangerous parts or adjustment elements or even purely aesthetic elements to be emphasized.

[0007] The light beam can be advantageously controlled by a suitable electronic controller which changes its colour depending on the temperature measured by a suitable temperature sensor incorporated in the radiator itself. In this manner, it will be possible to visually check the radiator's operating conditions without having to touch it, thus avoiding unpleasant burns.

[0008] Other features of the present invention are defined, moreover, in the subsequent claims.

[0009] Additional features and advantages of the invention will be more apparent from the description of a preferred but non-exclusive embodiment of the radiator for heating a room according to the invention, illustrated by way of non-restrictive example in the appended drawings, in which:

figure 1 shows an exploded view of the radiator;
figure 2 shows a view from above of the radiator;
figure 3 shows a perspective view of the radiator;
figure 4 shows a side view of the radiator; and
figure 5 shows a section view of the radiator according to the line 5-5 of figure 4. With reference to the aforementioned figures, there is shown a radiator for heating a room, in particular a room inside a building for civil use, indicated overall with the reference number 1.

[0010] The radiator 1 comprises a front radiant plate 2, a rear radiant plate 3, sides 4, 4 preferably encased between the front radiant plate 2 and the rear radiant plate 3, and a circuit for a heat carrier fluid which extends in the compartment 6 delimited between the front radiant plate 2, the rear radiant plate 3 and the sides 4, 4.

[0011] The circuit of the heat carrier fluid in turn comprises a delivery manifold 7, a return manifold 8, and a series of pipes 9 connecting between the delivery manifold 7 and the return manifold 8.

[0012] The front plate 2 and the rear plate 3 have substantially the same exterior profile and the same size and are centred on top of one another in such a way that their perimeter edges are aligned in the direction of the depth P of the radiator 1.

[0013] The front radiant plate 2 is quadrangular and exhibits a slight curvature.

[0014] The rear radiant plate 3, besides also being quadrangular and exhibiting a slight curvature, is provided with a central recess 10 in which the delivery manifold 7 and the return manifold 8 are housed.

[0015] The recess 10 extends longitudinally for the entire height of the rear radiant plate 3. The radiator 1 is further provided with perimeter elements closing off the compartment 6, and in particular a small plate 11 covering the top side of the compartment 6 and provided with holes 12 and 13, respectively, for the passage of the delivery manifold 7 and return manifold 8, respectively, a small plate 14 covering the bottom side of the compartment 6 and provided with holes 15 and 16, respectively for the passage of the delivery manifold 7 and return manifold 8, respectively, and corner elements 17, 18, 19, 20 connecting between the plates 11 and 14 and the sides 4 and 5.

[0016] Preferably, the radiant plates 2, 3 are fixed directly to the connecting pipes 9, which thus also act as a supporting frame.

[0017] As the connecting pipes 9 are slightly curved, the front radiant plate 2 and the rear radiant plate 3 can initially be supplied flat and then bent directly when they are rested against the connecting pipes 9. In this manner, one can save the trouble of bending the front radiant plate 2 and rear radiant plate 3 prior to the application thereof to the connecting pipes 9.

[0018] Alternatively, if necessary, a dedicated frame can be provided to support the radiant plates 2, 3.

[0019] The radiator is of the type having dimensions in the direction of the width L and height A thereof that are

distinctly greater than the dimension in the direction of the depth P.

[0020] At least one of the sides 4, and in particular each side 4, has at least one light source 21 associated with at least one light guide 22, which is in turn exposed toward the outside of the radiator 1 so as to emit at least laterally a light beam. Lateral emission means the emission of a light beam in the direction L of the width of the radiator 1.

[0021] In particular, the light guide 22 comprises at least one longitudinal transparent element 23, whilst the light source 21 comprises a longitudinal string of LEDs 24. The transparent element can be coloured and is preferably made of polycarbonate, given the good resistance thereof to temperature gradients.

[0022] The transparent element 23 has a flat shape and, on a main flat face 25 thereof, has an indentation 40 with a shape matching that of the string of LEDs 24, where the string of LEDs 24 is housed in such a way as to be positioned flush with main flat face 25 of the transparent element 23.

[0023] The side 4 further comprises a box-like element 26, in which the transparent element 23 with the incorporated string of LEDs 24 is positioned.

[0024] The box-like body 26 has a flat front delimiting wall 27 fixed against the inner side of the front radiant plate 2, a flat rear delimiting wall 28 fixed against the inner side of the rear radiant plate 3, and a flat internal delimiting wall 29 which separates the front delimiting wall 27 and the rear delimiting wall 28 by a distance equal to the thickness of the transparent element 23.

[0025] The internal delimiting wall 29 is in a position that is set back toward the inside of the compartment 6 relative to the side perimeter edges of the radiant plates 2, 3 and is oriented so that it mainly lies in a plane in the direction of the depth P of the radiator 1.

[0026] The internal delimiting wall 29 is constructed in a piece that is separate from the front delimiting wall 27 and the rear delimiting wall 28, to which it is fixed by engaging specific tabs 30 in specific coupling seats 31.

[0027] The box-like body 26 thus generically has a "U-shaped" configuration and is completely encased between the front radiant plate 2 and the rear radiant plate 3.

[0028] In a variant embodiment of the box-like body 26, the internal wall 29, the rear delimiting wall 28 and the front delimiting wall 27 can be made in one piece by moulding a plastic material or using a common extruded profile of aluminium or the like.

[0029] The free longitudinal side edge of the front delimiting wall 27 abuts against the inner side of a perpendicular flap 32 of the side perimeter edge of the front radiant plate 2, and the free longitudinal side edge of the rear delimiting wall 28 abuts against the inner side of a perpendicular flap 33 of the side perimeter edge of the rear radiant plate 3.

[0030] The flaps 32, 33 have a width equal to the thickness of the front and rear delimiting walls 27, 28 so that they conceal them completely.

[0031] As the distance separating the flaps 32, 33 is equal to the thickness of the flat transparent element 23, the box-like body 26 is completely concealed from view, whereas the outer longitudinal side edge of the transparent element 23 positioned flush with the flaps 32, 33 on the side 4 remains exposed.

[0032] Preferably, at least one portion 34 of the transparent element 23 extends outside the box-like body 26, but in a position that is set back inside the compartment 6 relative to the box-like body 26.

[0033] The portion 34 directly faces an area of the front radiant plate 2 having at least one incision 35 passing through the wall thickness thereof.

[0034] Preferably, the portion 34 has a thickness increased by an entity equal to the thickness of the front delimiting wall 27 of the box-like body 26 in order to ensure extended surface contact with the front radiant plate 2.

[0035] In this case, the transparent element 23 assures not only lateral lighting of the radiator 1, but also backlighting of the incision 35, with which an aesthetic or also a functional value can be associated.

[0036] In particular, a temperature sensor connected to an electronic controller of the light source can be provided in order to change the colour of the light beam emitted depending on the temperature measured.

[0037] Moreover, a presence sensor (or sensor for detecting the passage of a person) can be incorporated in the lower part of the radiator so as to activate the lighting system to provide courtesy lighting for a time previously set on the control panel of the radiator or via a remote controller. In this manner, it is possible to ensure minimum lighting for safe movements without creating a night-time disturbance or make it easier to reach the switch for turning on the main lighting of the room. The radiator thus conceived is susceptible of numerous modifications and variants, all falling within the scope of the inventive concept; moreover, all the details may be replaced with other technically equivalent ones.

[0038] In practice, all of the materials used, as well as the dimensions, can be any whatsoever according to need and the state of the art.

Claims

1. A radiator (1) for heating a room comprising a front radiant plate (2), a rear radiant plate (3), sides (4), and a circuit for a heat carrier fluid which extends in a compartment (6) delimited between said front plate (2), said rear plate (3) and said sides (4), **characterized in that** at least one side (4) has at least one light source (21) associated with at least one light guide (22) exposed toward the outside of the radiator.

2. The radiator (1) for heating a room according to claim 1, **characterized in that** said light guide (22) comprises at least one longitudinal transparent element

(23), and said light source (21) comprises a longitudinal string of LEDs (24).

3. The radiator (1) for heating a room according to the preceding claim, **characterized in that** said string of LEDs (24) is housed in an indentation with a mating shape fashioned along said transparent element (23).

4. The radiator (1) for heating a room according to any preceding claim, **characterized in that** said transparent element (23) is flat.

5. The radiator for heating a room according to any one of claims 2 to 4, **characterized in that** said longitudinal transparent element (23) is housed in a box-like body (26) completely encased between said front radiant plate (2) and said rear radiant plate (3).

6. The radiator (1) for heating a room according to the preceding claim, **characterized in that** said box-like body (26) is "U" shaped".

7. The radiator (1) for heating a room according to either of claims 5 and 6, **characterized in that** said front radiant plate (2) and said rear radiant plate (3) have perpendicular flaps (32, 33) at the side perimeter edges thereof which conceal said box-like body (26).

8. The radiator (1) for heating a room according to the preceding claim, **characterized in that** the distance between said flaps (32, 33) is equal to the thickness of said flat transparent element (23).

9. The radiator (1) for heating a room according to any preceding claim, **characterized in that** said transparent element (23) directly faces at least one area of said front radiant plate (2) having at least one incision (35) passing through the wall thickness thereof.

10. The radiator (1) for heating a room according to any one of claims 2 to 9, **characterized in that** said transparent element (23) is made of polycarbonate.

11. The radiator (1) for heating a room according to any preceding claim, **characterized in that** said circuit comprises a delivery manifold (7), a return manifold (8) and a series of pipes (9) connecting between the delivery manifold (7) and the return manifold (8).

12. The radiator (1) for heating a room according to any one of claims 2 to 11, **characterized in that** said transparent element (23) is positioned flush with the side perimeter edge of the front radiant plate (2) and of the rear radiant plate (3).

13. The radiator (1) for heating a room according to any one of claims 11 to 12, **characterized in that** said connecting pipes (9) act as a supporting frame for said front radiant plate (2) and said rear radiant plate (3).

14. The radiator (1) for heating a room according to any preceding claim, **characterized in that** it has a temperature sensor connected to an electronic controller of said light source in order to change the colour of the light beam emitted depending on the measured temperature.

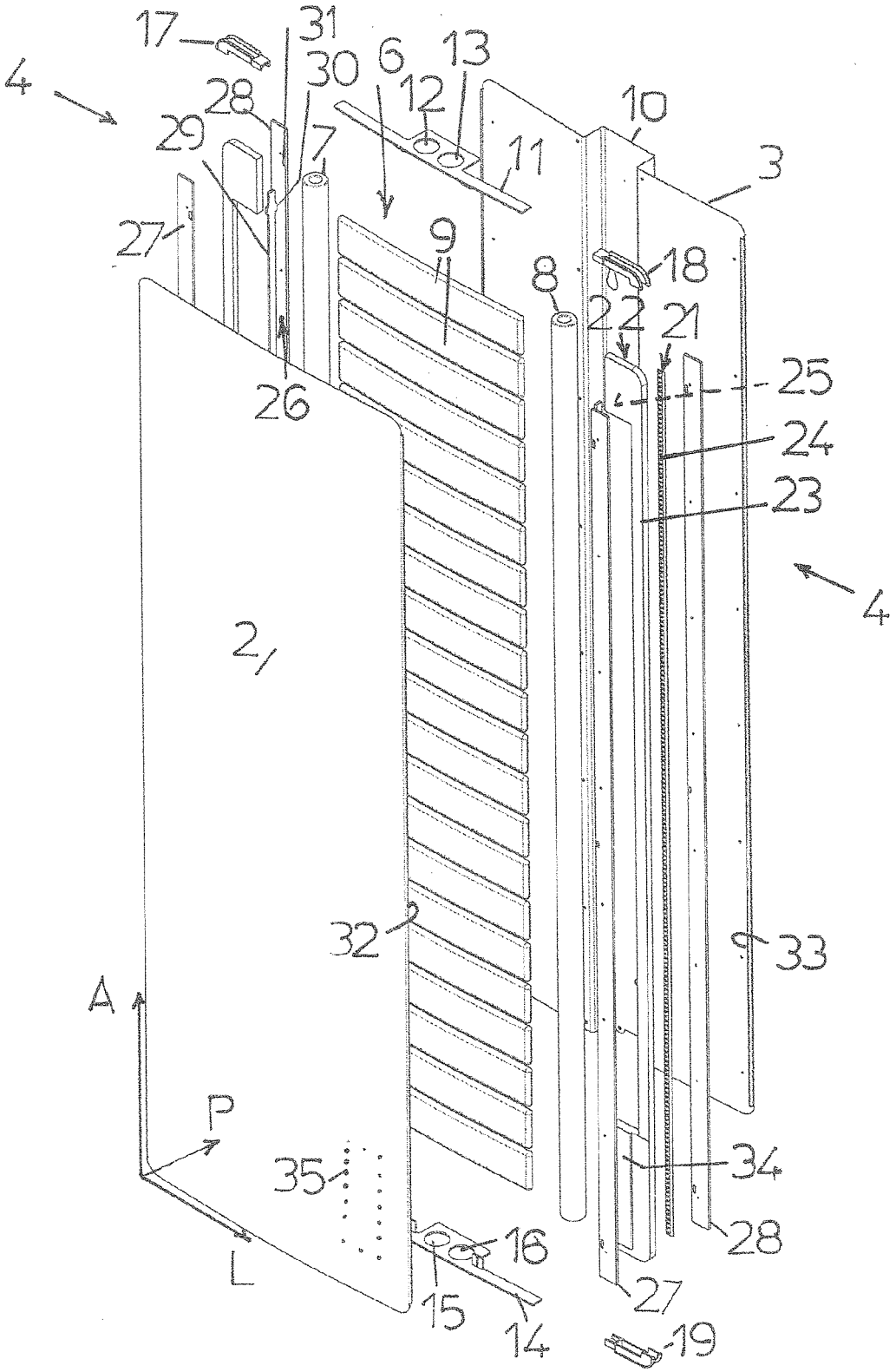

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FIG 1

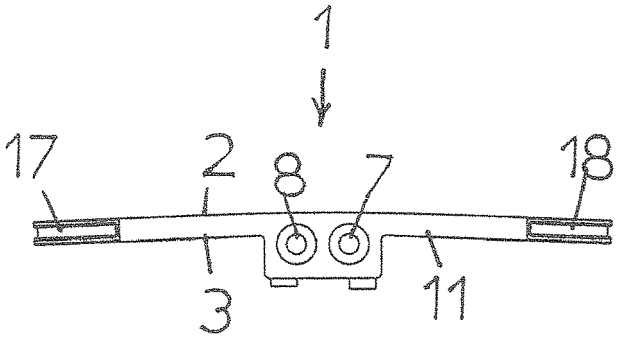


FIG 2

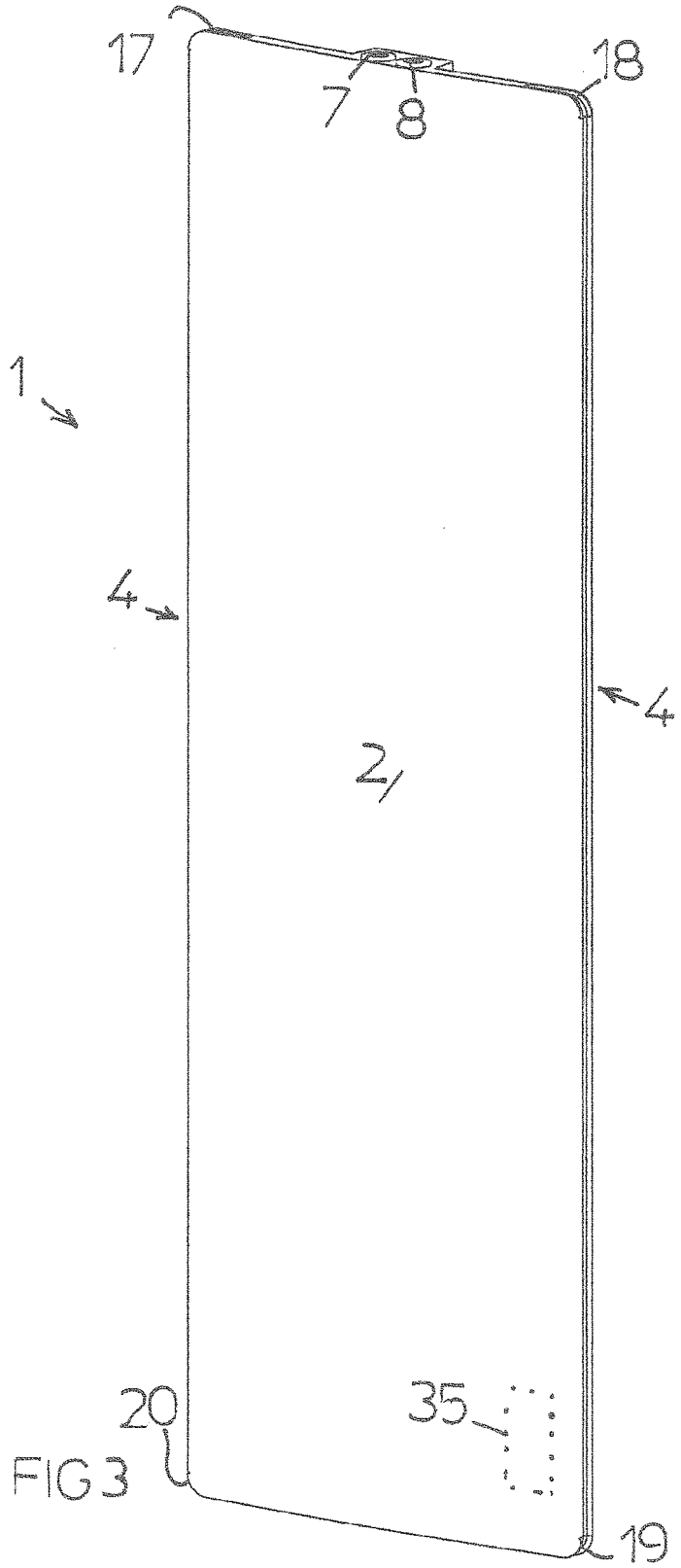


FIG 3

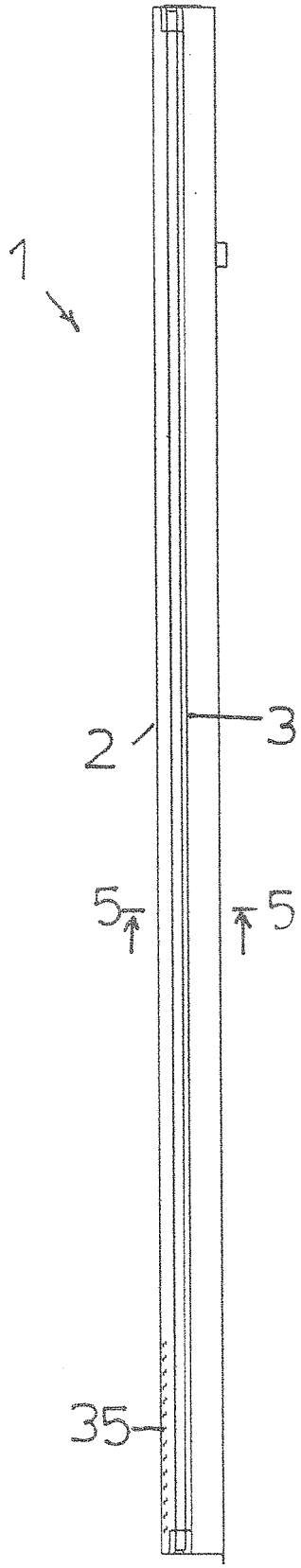


FIG 4

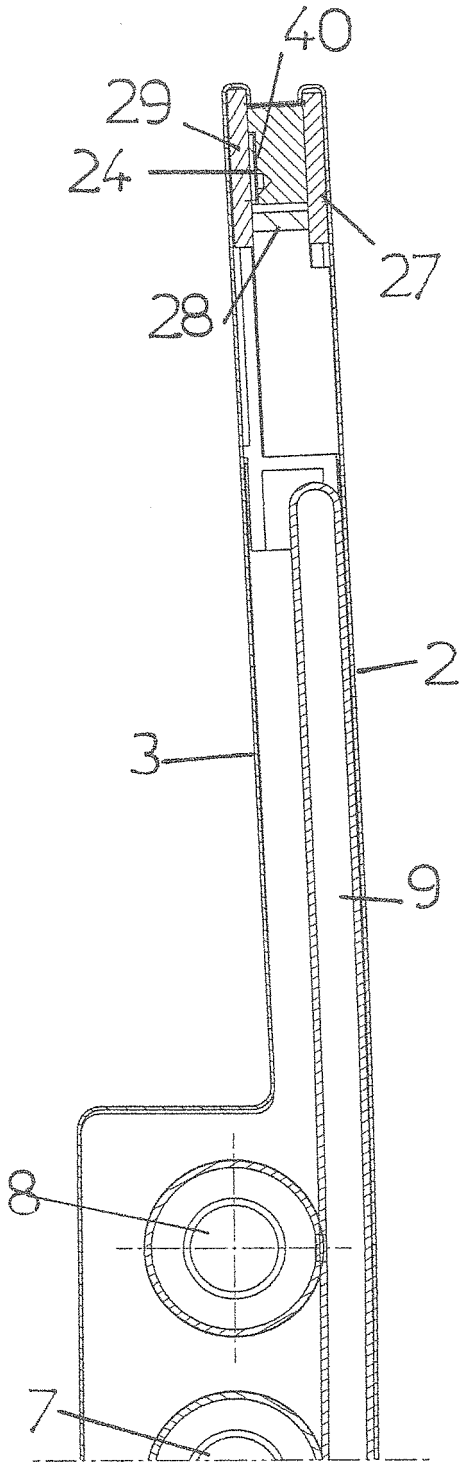


FIG 5

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EUROPEAN SEARCH REPORT

Application Number
EP 14 15 8480

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

F24D
F21V

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	2 June 2014	Degen, Marcello

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 14 15 8480

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02-06-2014

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