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(54) Lighting body with quick-connect system

(57) A lighting body is described, in particular of the ceiling type, comprising a base (8; 408) designed to be fixed to a wall or ceiling and an inner part (300; 400) comprising a supporting body (5; 405) adapted to support a lamp; a lampholder (2) mounted in the supporting body (5; 405) and adapted to accommodate the electrical contacts of a lamp (7); an input terminal strip (3) designed to be connected to an electrical supply network; a printed circuit board (41) which integrates an electronic power supply. The printed circuit board (41) comprises: two input terminals (43) which are inserted into respective socket-contacts (31) of the input terminal strip (3) and four output terminals (45) which are inserted into respective socket-contacts (28) of the lampholder.

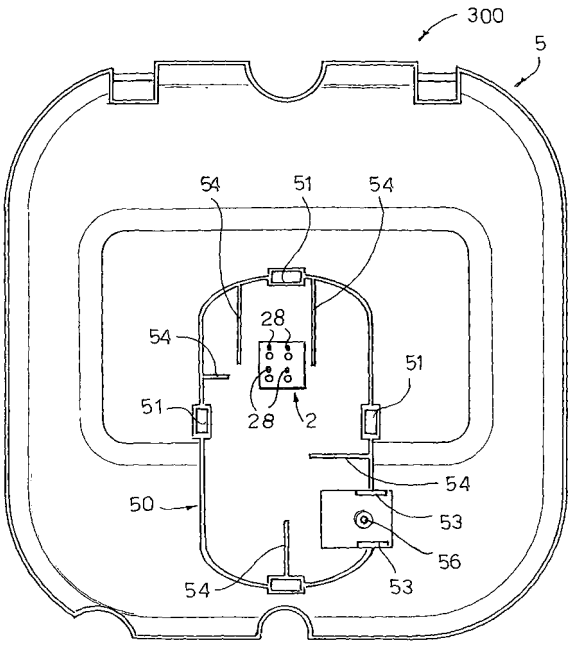
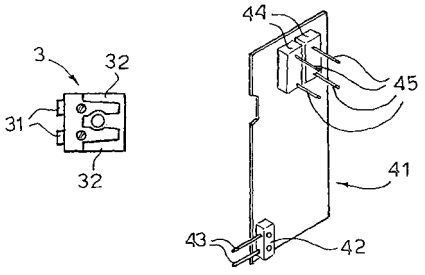


FIG.3



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Description

[0001] The present invention refers to a lighting body, in particular of the ceiling light type, with a quick-connect system.

[0002] Ceiling lights for fluorescent light bulbs are widely available on the market, particularly those for 2D lamps. Such a ceiling light consists of a lighting body which is usually formed of three parts: a base that allows fixing to the wall or ceiling; an inner part consisting of a supporting body on the rear face whereof the components for powering the light and the electrical connection cables are mounted and on the front face whereof the lamp is fixed by means of a lamp holder. Finally a transparent cover forms the front part of the lighting body to protect the lamp and allow the light to be diffused.

[0003] The term inner part of the lighting body is used herein to indicate the supporting body of the lamp and all the electrical components, and the wiring mounted therein.

[0004] Figure 1 shows the inner part of the lighting body according to the prior art from the rear, denoted as a whole with reference numeral 100 and provided with a magnetic ballast power supply system for the lamp.

[0005] The inner part 100 of the lighting body comprises a supporting body 1 of hard plastic, substantially square or rectangular in shape, with rounded corners. A lampholder 2 which protrudes in the front face of the lighting body to accommodate the electrical contacts of the lamp is mounted in the centre of the supporting body 1.

[0006] In the rear face of the supporting body 1, beneath the lampholder 2, is mounted an input terminal strip 3 designed to be connected to the electrical mains supply cables. Above the lampholder 2, on the other hand, is mounted a magnetic power supply (ballast) 4 which is secured with screws.

[0007] Again in the rear face of the body 1, to the side of the input terminal strip 3, a starter 5 is mounted and to the side of the ballast 4 an earth terminal 6 is mounted. Two supply cables 10, 11 go respectively from the input terminal strip 3 to the power supply 4 and to the lamp holder 2, while an ground cable 12 goes from the terminal strip 3 to the ground contact 6. A supply cable 13 connects the ballast 4 to the lampholder 2 and two supply cables 14 and 15 connect the starter 5 to the lampholder 2.

[0008] Such a solution with a magnetic power supply proves somewhat complex because of the presence of too many components and the complexity of the wiring (no fewer than six electrical cables (10-15)).

[0009] Also known to the market are lighting bodies with an electronic supply system whereof the inner part is illustrated in Figure 2 and denoted with reference numeral 200. The electronic power supply of the lamp in this case allows the known advantages compared with magnetic power supply to be achieved.

[0010] Hereinunder, like or corresponding elements to those already described are indicated with the same reference numerals and are not described in detail. The inner part 200 of the lighting body comprises an electronic power supply 40 secured by means of screws above the lampholder 2. In this case the starter is eliminated.

[0011] Two power supply cables 20 and 21 connect the input terminal strip 3 to the electronic power supply 40 and a ground cable 22 goes from the input terminal strip 3 to the ground contact 6. Four power supply cables 23, 24, 25 and 26 connect the output of the electronic power supply 40 to the lamp holder 2.

[0012] This solution also proves somewhat complex, since no fewer than seven electrical connection cables (20-26) must be provided in the rear face of the body 1.

[0013] Object of the present invention is to overcome the drawbacks of the prior art by providing a lighting body with a quick-connect system that is versatile, practical, cheap and easy to produce and assemble.

[0014] This object is achieved in accordance with the invention with the characteristics listed in appended independent claim 1.

[0015] Advantageous embodiments of the invention are apparent from the dependent claims.

[0016] The lighting body according to the invention comprises:

- a base adapted to be applied to a wall or ceiling, and
- an inner part comprising:
    - a supporting body adapted to be applied to the base;
    - a lampholder mounted in said supporting body and adapted to accommodate the electrical contacts of a lamp mounted on the front face of the supporting body;
    - a recess on the rear face of the supporting body wherein is inserted an input terminal strip designed to be connected to the mains electrical supply and a printed circuit board which integrates an electronic power supply.

[0017] The printed circuit board comprises:

- two input terminals which are inserted into respective socket-contacts of the input terminal strip, and
- four output terminals which are inserted into respect socket-contacts of the lampholder.

[0018] The advantages of the invention are obvious in that it allows all the electronics of the lamp to be mounted simply and immediately in the inner part of the lighting body, without carrying out any wiring and without leaving wires exposed.

[0019] Further characteristics of the invention will be made clearer by the detailed description that follows, referring to purely exemplifying and therefore non-limiting embodiments thereof, illustrated in the appended drawings, in which:

Figure 1 is a plan view, illustrating from the rear the

inner part of a lighting body with a magnetic power supply according to the prior art;

Figure 2 is a plan view, illustrating from the rear the inner part of a lighting body with an electronic power supply according to the prior art;

Figure 3 is a plan view, illustrating from the rear the inner part of a lighting body according to a first embodiment of the invention, with an input terminal strip and a printed circuit board which implements an electronic power supply shown exploded;

Figure 4 is a view of the inner part of the lighting body of Figure 3, with the circuit board and the input terminal strip assembled in the special recess;

Figure 5 is an enlarged plan view illustrating the inner face of a cover to close the recess of Figure 4;

Figure 6 is a view of the inner part of the lighting body of Figure 4, with the cover of Figure 5 mounted on the printed circuit board;

Figure 7 is a plan view illustrating the inner part of Figure 6, turned upside down and mounted on a base, in which a lamp has been mounted on the lampholder on the front face of the inner part;

Figure 8 is a side perspective view of the complete lighting body, showing a transparent cover mounted on the base so as to close the inner part;

Figure 9 is a plan view showing from the rear the inner part of the lighting body according to a second embodiment of the invention;

Figure 10 is a plan view illustrating the front face of the inner part of Figure 9;

Figure 11 is a plan view illustrating the inside of a base whereto the inner part of Figure 10 must be applied; and

Figure 12 is a plan view of the base of Figure 11 whereon the inner part of Figure 10 is applied.

[0020] A first embodiment of the lighting body according to the invention is described with the aid of Figures 3-8.

[0021] With reference for now to Figures 3 and 4, the inner part of the lighting body, denoted as a whole with reference numeral 300 is illustrated.

[0022] The inner part 300 of the lighting body comprises a supporting body 5, substantially square or rectangular in shape with rounded corners. The supporting body 5 has in a central position a through hole in which is fixed a lampholder 2 of a traditional type. The lampholder 2 has at the front seats adapted to accommodate the electrical contacts of a lamp 7 (shown in Figure 7) disposed on the front face of the supporting body 5.

[0023] The lampholder 2 has at the rear socket-contacts 28 adapted to receive the electrical contact terminals.

[0024] In the rear face of the body 5, around the lampholder 2, is formed a seat or recess defined by a frame 50, substantially rectangular in shape, with the corners and the short sides rounded. The frame 50 is shaped so that the lampholder 2 is disposed near a short side of the frame.

[0025] On the frame 50 are formed four slot-like seats 51, disposed at the centre of each side of the frame. A parallelepiped shaped supporting block 52 adapted to accommodate the input terminal strip 3 is formed on one long side of the frame 50, near the short side furthest from the lampholder 2. The block 52 has two side tongues 53 which engage on two lateral protrusions 32 of the input terminal strip 3, and a central pin 56 which engages in a central hole of the terminal strip 3, so as to be able to firmly lock the terminal strip 3 on the block 52. The input terminal strip 3 is designed to be connected to the mains supply network. It should be noted that the input terminal strip 3 comprises two socket-contacts 31 adapted to receive contact terminals with a rectangular section.

[0026] From the frame 50 departs a plurality of dividing walls 54 at right angles to the sides of the frame 50. The dividing walls 54 are step-shaped so as to define a supporting surface for a printed circuit board 41, substantially rectangular in shape, in which is integrated an electronic power supply, per se known, and therefore not described. Thus, the circuit board 41 is kept at a distance from the bottom of the seat defined by the frame 50.

[0027] On the printed circuit board 41, near a corner of the board, is mounted an input terminal strip 42 provided with two metal terminals 43 which protrude outward along a plane parallel to that of the board 41. The input terminals 42 are inserted in the socket-contacts 31 of the input terminal strip 3.

[0028] Again on the board 41, near short side thereof furthest from the input terminal strip 42 are mounted two output terminal strips 44 each provided with two terminals 45 which protrude at right angles with respect to the plane of the board 41.

[0029] As shown in figure 4, the circuit board 41, possibly pre-assembled with the input terminal strip 3, is rotated and the four output terminals 45 of the board insert into the four socket contacts 28 of the lampholder 2. Thus, the board 41 is disposed in the seat defined by the frame 50 supported by the ribs 54 and the input terminal strip 3 is disposed on the supporting block 52. This operation is immediate and does not require any wiring.

[0030] As shown in figures 5 and 6, to cover the board 41 a cover 6 has been devised having essentially the same perimeter as the frame 50 and a rectangular window opening 60 to coincide with the input terminal strip 3. The cover has along its perimeter four tongues 61 adapted to engage, in a snap-coupling relationship, in the slots 51 of the frame of the body 5. The cover 6 also has perforated cylindrical tangs 62 disposed so as to abut on the board 41, near its four corners.

[0031] As shown in figure 7, the inner part 300 of the lighting body is mounted, by means of screws 88 on a base 8 adapted to be fixed to a wall or ceiling. A lamp 7 is mounted in the lampholder 2 and disposed on the front face of the body 5.

[0032] The base 8 has a peripheral frame 80 provided with a groove adapted to be engaged by the perimeter

of a transparent cover 9 (shown in figure 8) which covers the lamp 7 and the inner part 300 of the lighting body. Holes 81 for fixing to the transparent cover 9 are provided in the frame 80 of the base 8.

[0033] It should be noted that in this embodiment the lampholder 2, the board 41, the input terminal strip 3, and the cover 6 are snap assembled without the use of screw means.

[0034] In figures 9-12 a second embodiment of the invention is described, wherein the base 408 and the body 405 of the inner part 400 of the lighting body have a different shape, whilst the closing cover has been eliminated.

[0035] In this case the inner part 400 of the lighting body comprises a body 405 of smaller size provided with a through hole in which is inserted the lampholder 2. As shown in figure 10, a seat 454 which makes the lampholder 2 accessible is formed in the front face of the body 405.

[0036] The body 405 has a peripheral frame 450 provided with snap-coupling protrusions 451. In the inner face of the body 405 are formed snap-coupling tangs 452 and positioning elements 455 whereon the circuit board 41 abuts with the terminals 45 (not visible) engaged in the socket-contacts of the lampholder 2 and the terminals 43 engaged in the socket-contacts of the input terminal strip 3. A window opening 453 is formed in the body 405 to coincide with the input terminal strip 3.

[0037] As shown in figure in 11, the base 408 comprises a peripheral frame 480 provided with slots 481 for engagement with the frame of a transparent cover and peripheral holes 482 to receive means for fixing to a wall or ceiling.

[0038] A frame 483 which defines a seat adapted to accommodate the circuit board 41 is formed in the inner surface of the base 408. Slots 484, adapted to receive, in a snap coupling relationship, the protrusions 451 of the frame 450 of the body 405, are formed in the frame 483. Tangs 486, adapted to engage with the tangs 452 formed in the body 405, are formed in the seat defined by the frame 483 to receive other means of fixing to a wall for ceiling. Furthermore the frame 483 is interrupted by a seat 485 provided with two side tongues 487 to block the input terminal strip 3.

[0039] In this manner, as shown in figure 12, when the inner part 400 is mounted in the base 408, the circuit board 41 remains protected between the base 408 and the body 405, and the lampholder 2 and the input terminal strip 3 are accessible because they are situated respectively in the seat 454 and in the window opening 453 of the body 405.

[0040] It should be noted that in this embodiment the lampholder 2, the board 41, the input terminal strip 3, and the supporting body 405 are snap assembled without the use of screw means.

[0041] Numerous changes and modifications of detail within the reach of a person skilled in the art can be made to the present embodiments of the invention without thereby departing from the scope of the invention as set forth in the appended claims.

Claims

1. A lighting body comprising a base (8; 408) adapted to be fixed to a wall or ceiling and containing an inner part (300; 400) comprising:

   - a supporting body (5; 405) having a front face on which is housed a lamp (7) and a rear face in which are housed the components for the power supply to the lamp;
   - a lampholder (2) mounted in said supporting body (5; 405) and adapted to receive the electrical contacts of the lamp (7);
   - an input terminal strip (3) designed to be connected to a mains electrical supply;
   - a printed circuit board (41) which integrates an electronic power supply, **characterised in that** said printed circuit board (41) comprises:
   - input terminals (43) adapted to be inserted in respective socket-contacts (31) of the input terminal strip (3), and
   - output terminals (45) adapted to be inserted in respective socket-contacts (28) of said lampholder (2).

2. A lighting body according to claim 1, **characterised in that** said input terminals (43) and output terminals (45) protrude with respect to the board (41) so as to be able to ensure the connection with the lampholder (2) and the input terminal strip (3).

3. A lighting body according to claim 1 or 2, **characterised in that** said supporting body (5; 405) has on its rear face a frame (50; 450) around said lampholder (2) defining a seat adapted to accommodate said circuit board (41).

4. A lighting body according to claim 3, **characterised in that** positioning means (454; 455) adapted to support the circuit board (41) at a distance from the bottom of the seat are provided in said seat defined by said frame (50; 450).

5. A lighting body according to claim 3 or 4, **characterised in that** a supporting block (52) adapted to accommodate said input terminal strip (3) is provided in said frame (50).

6. A lighting body according to claim 5, **characterised in that** said supporting block (52) has a pair of lateral tongues (53) that engage in lateral protrusions (32) of said input terminal strip.

7. A lighting body according to any one of claims 3 to

6, **characterised in that** it comprises a cover (6) adapted to be mounted on said frame (50) to cover said circuit board (41).

8. A lighting body according to claim 7, **characterised in that** said cover (6) has tongues (61) which engage in slots (51) formed in said frame.

9. A lighting body according to claim 7 or 8, **characterised in that** said cover (6) has a window opening (60) for passage of said input terminal strip (3).

10. A lighting body according to any one of claims 7 to 9, **characterised in that** said cover (6) comprises positioning elements (62) adapted to abut against said circuit board (41) to keep it locked in position so as to ensure correct insertion and electrical contact of the terminals of the electronic board with the sockets of the lampholder (2) and of the input terminal strip (3).

11. A lighting body according to any one of claims 1 to 6, **characterised in that** said base (408) comprises a frame (483) defining a seat adapted to accommodate said circuit board (41) and said supporting body (405) has engagement means (451) adapted to snap engage with matching engagement means (484) formed in said base, so as to enclose the board (41) between the base (408) and the supporting body (405).

12. A lighting body according to claim 11, **characterised in that** a seat (485) to accommodate said input terminal strip (3) is formed in said seat of the base (408) and a window opening (453) is formed in said supporting body (405) to make said input terminal strip (3) accessible.

FIG. 1
PRIOR ART

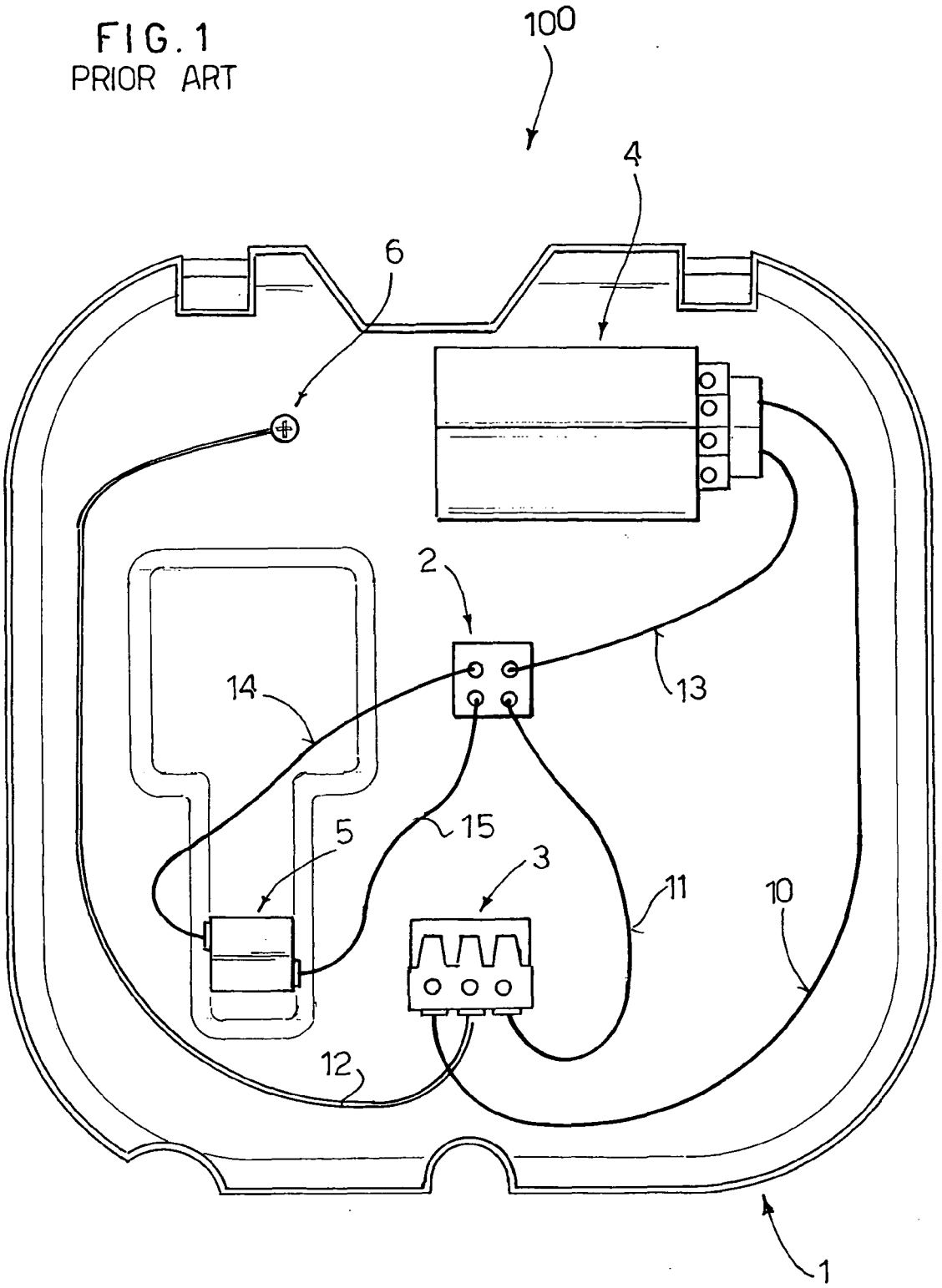
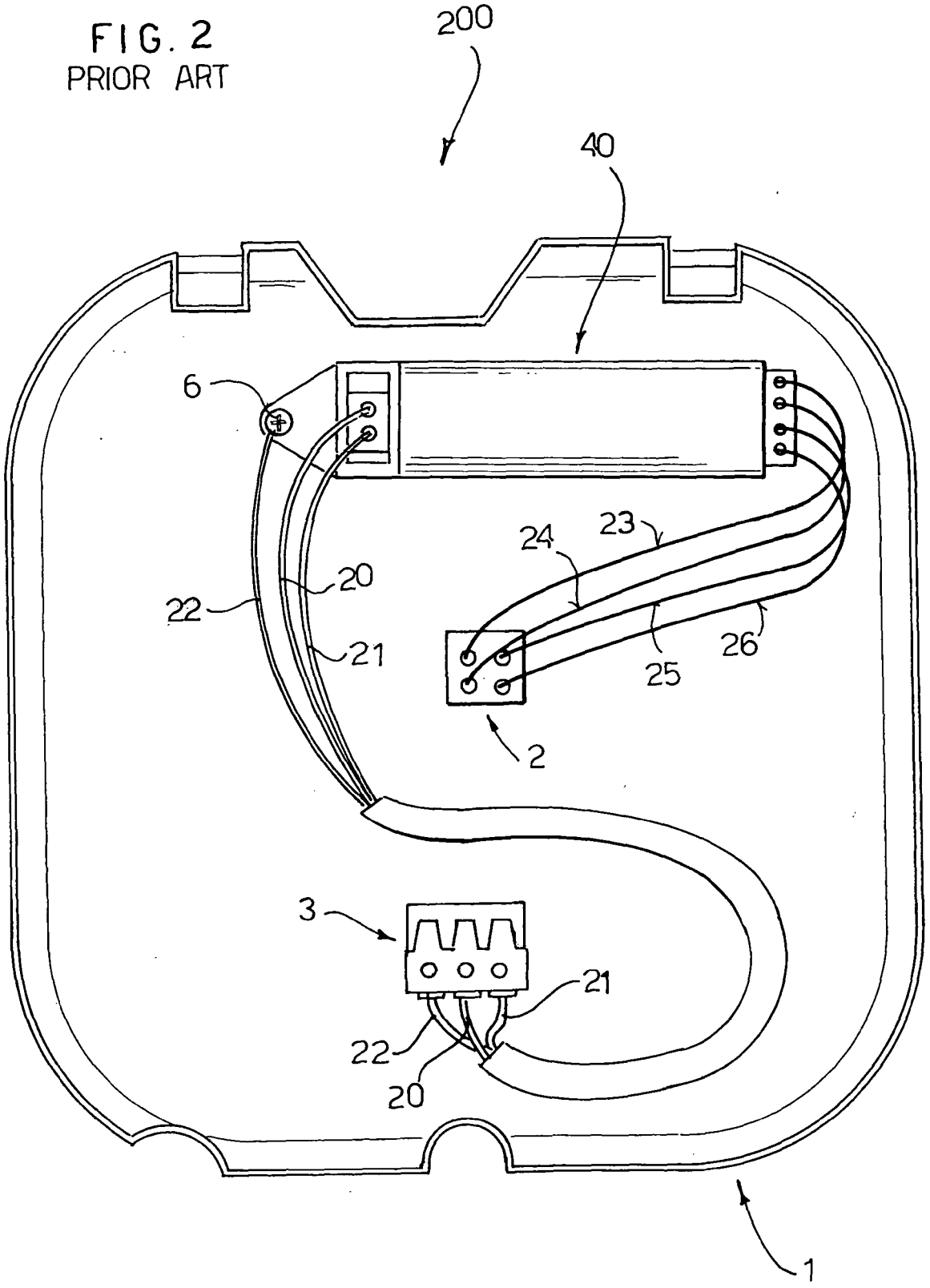


FIG. 2
PRIOR ART



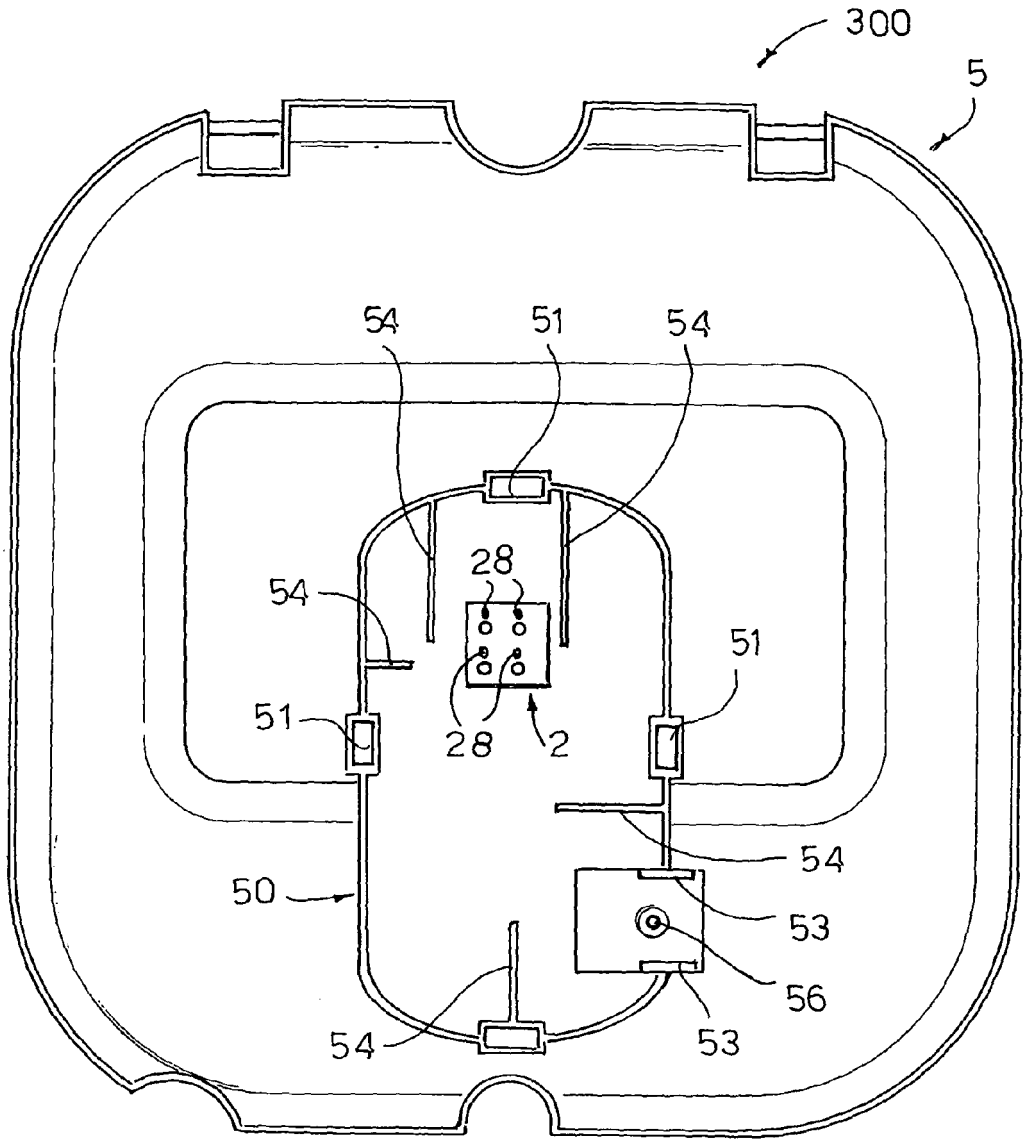

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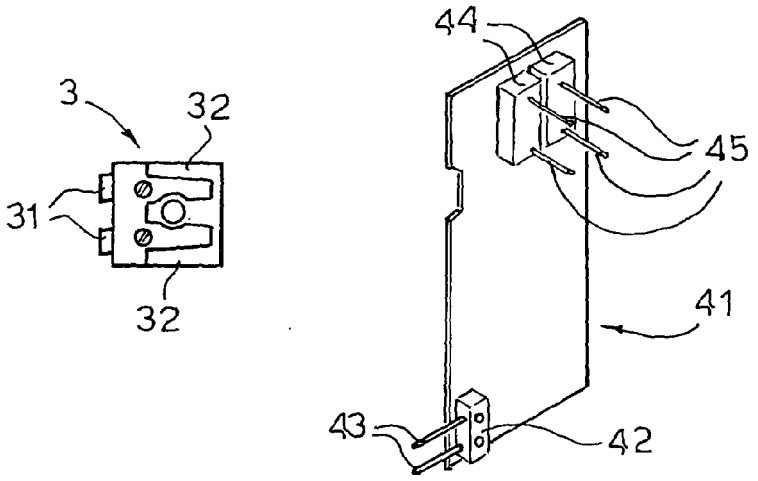
FIG.3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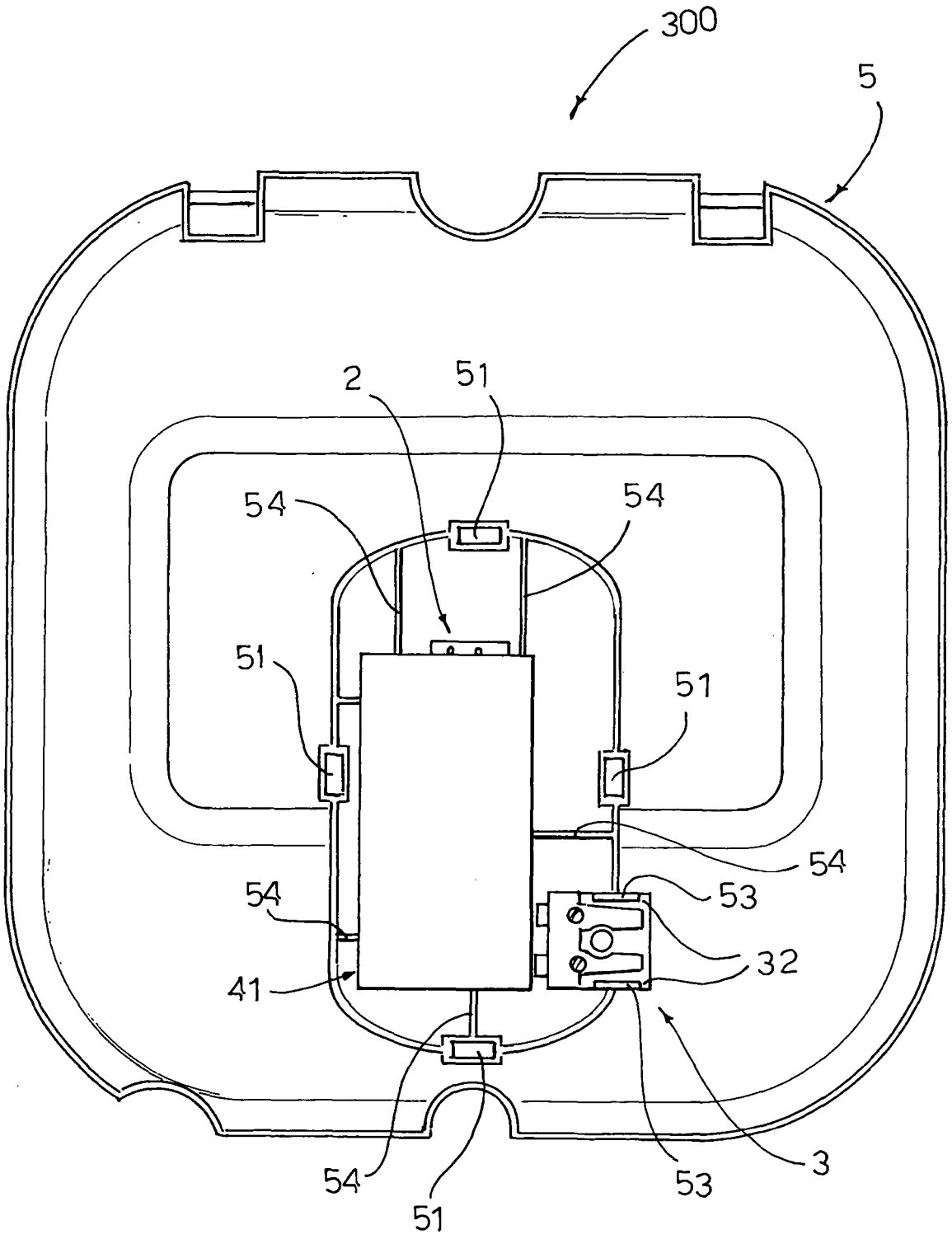

FIG. 4

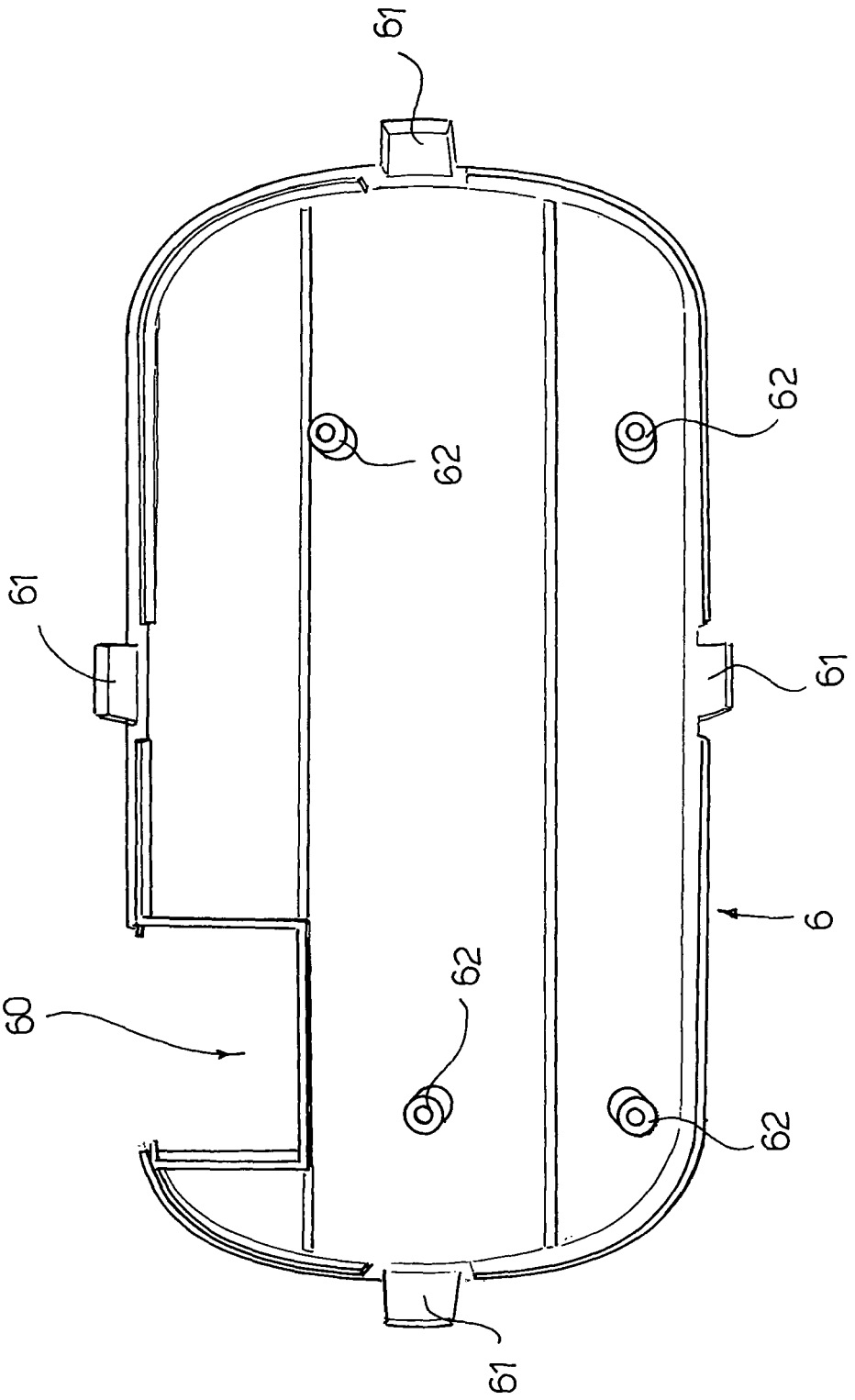

FIG. 5

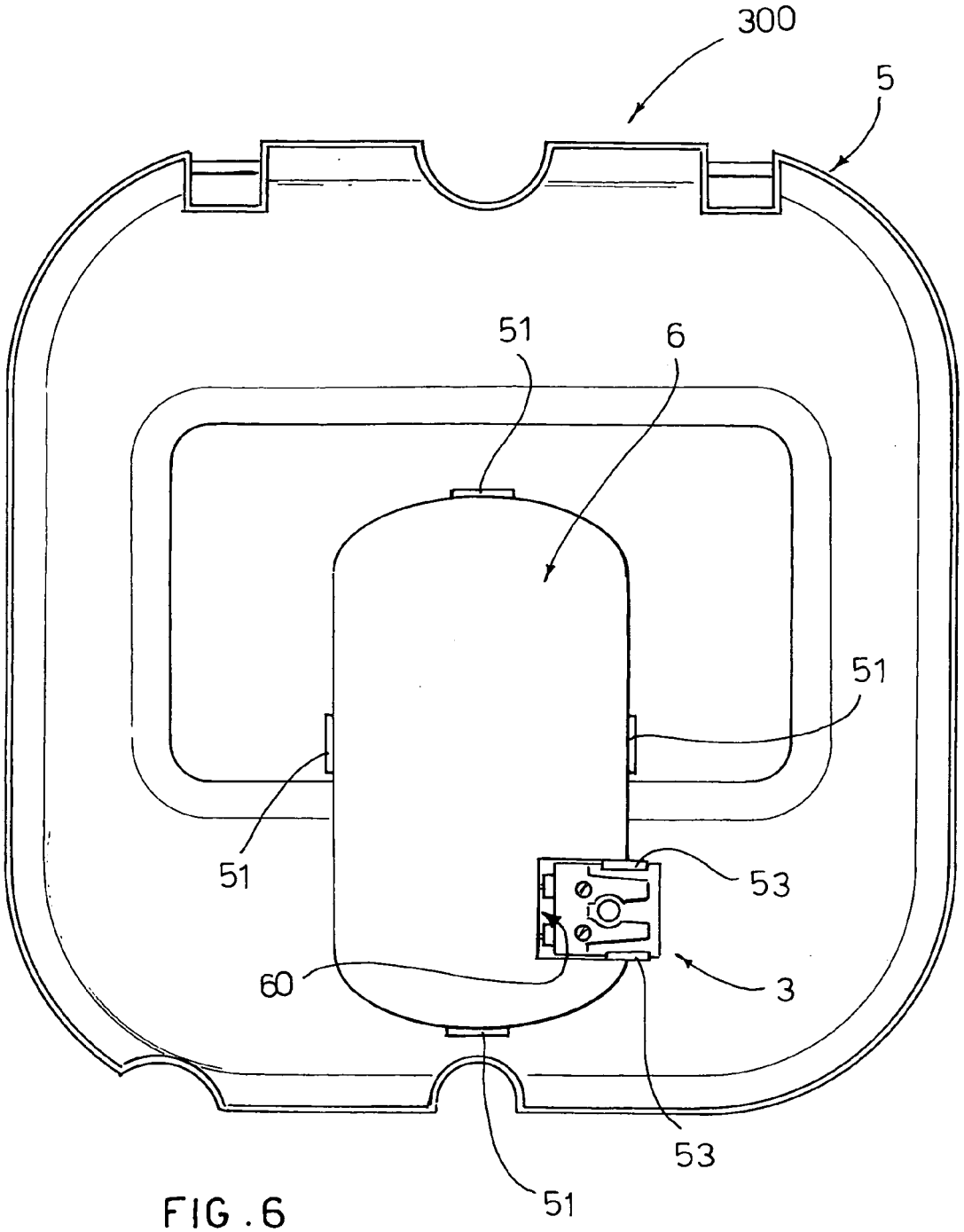

FIG. 6

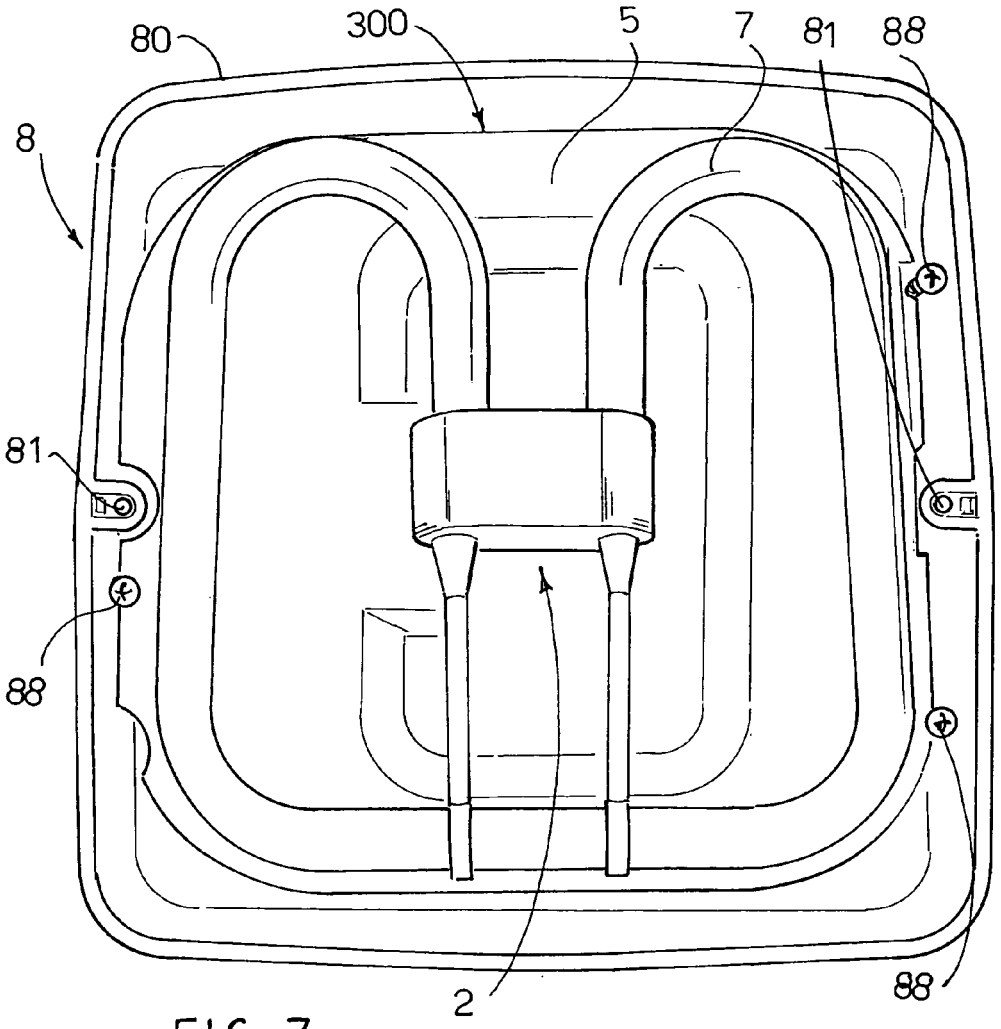

FIG. 7

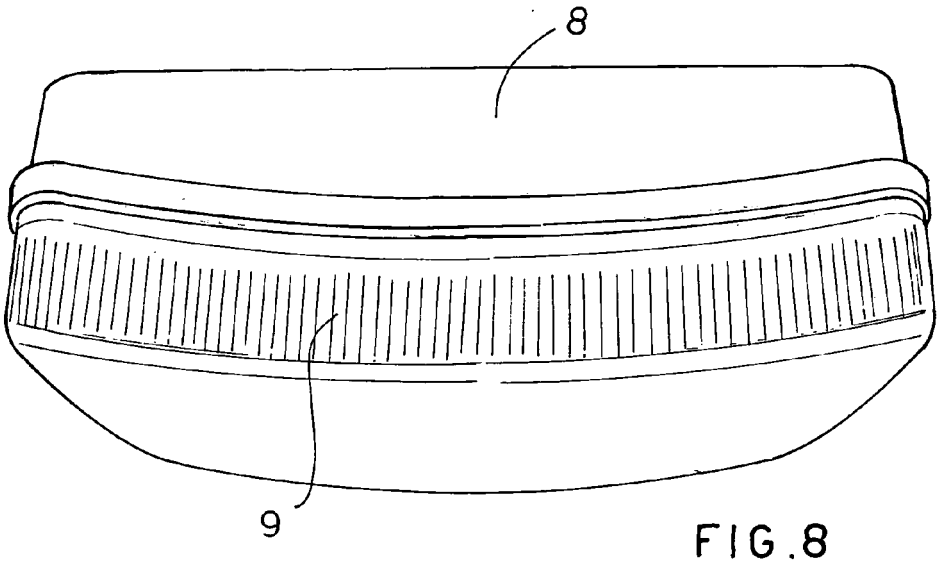

FIG. 8

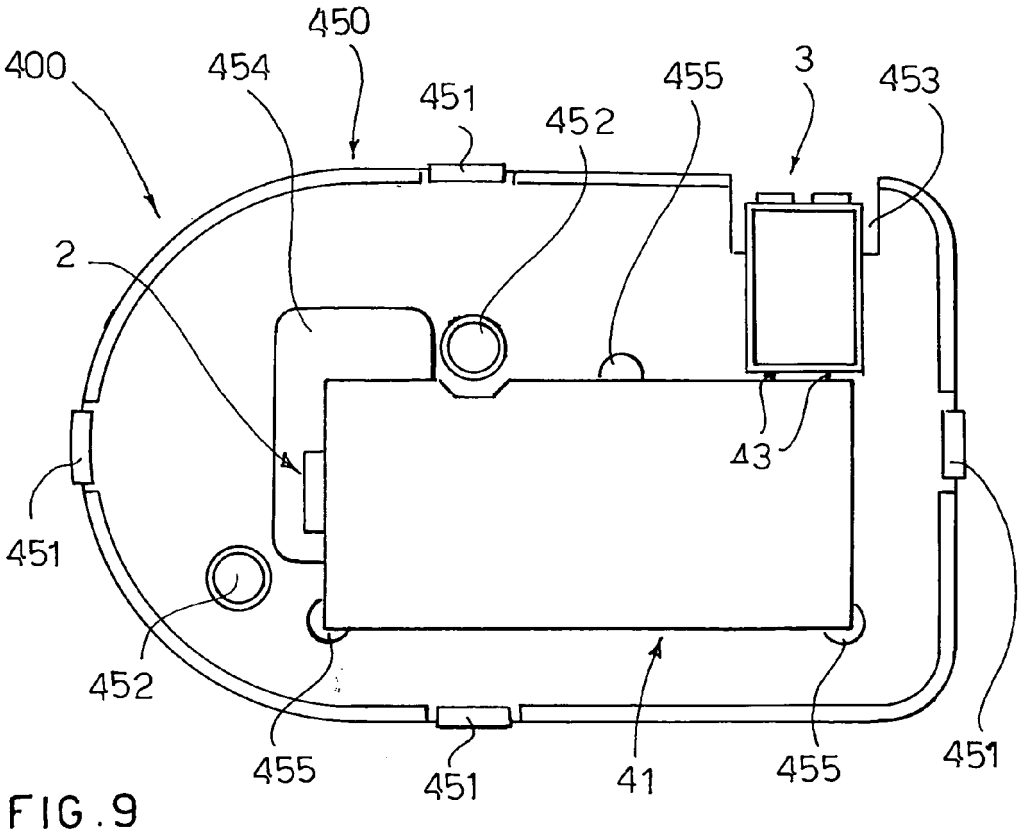
400
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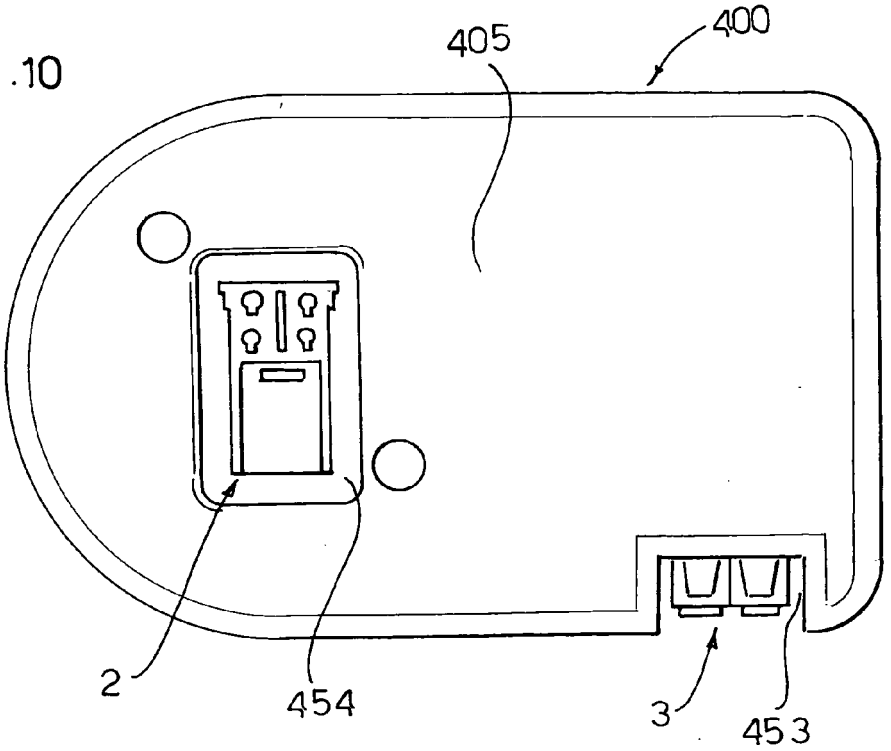
FIG. 9

FIG. 10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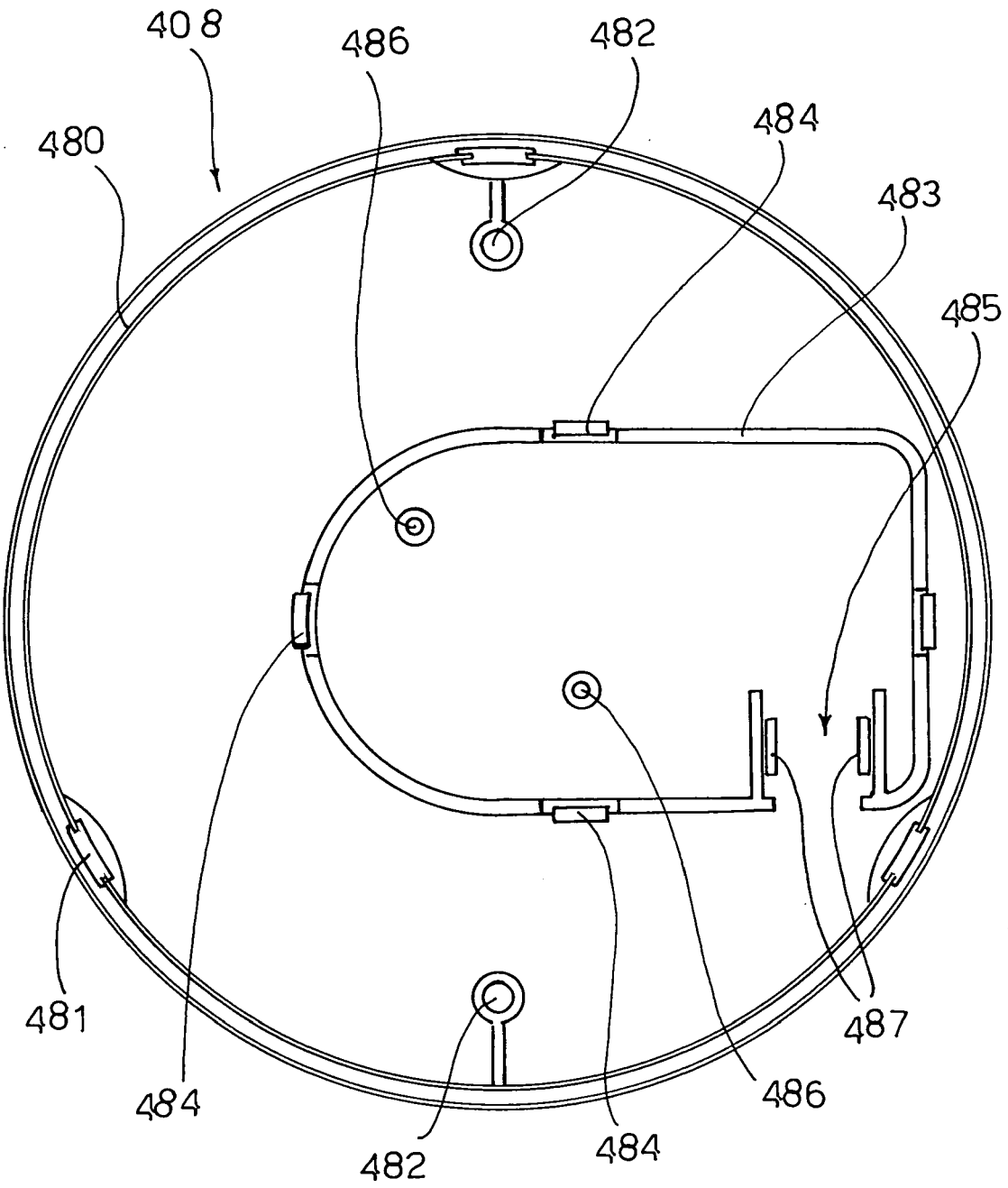

FIG. 11

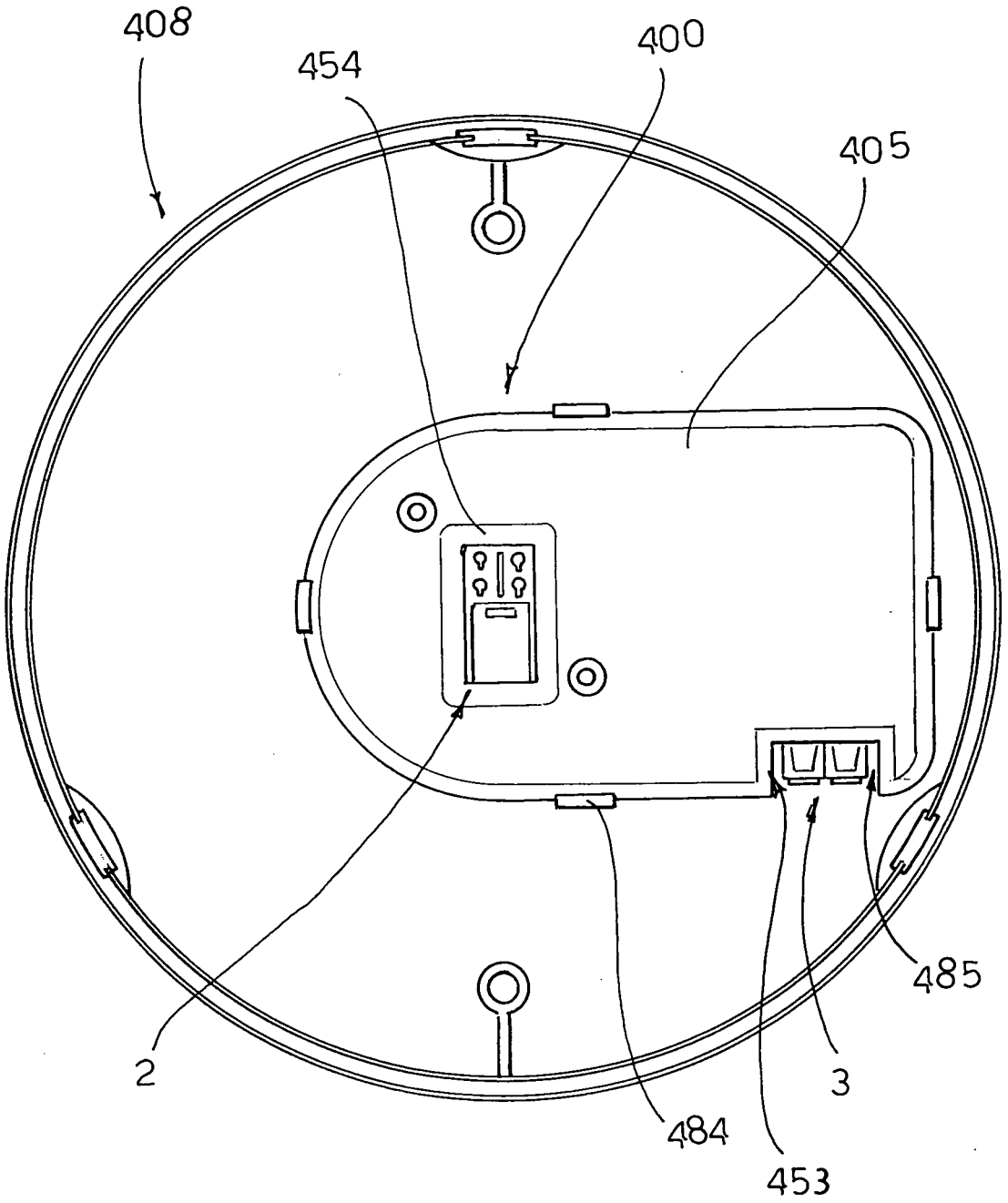

FIG. 12

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 42 5505

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 825 688 A (VOSSLOH SCHWABE GMBH [DE]) 25 February 1998 (1998-02-25) * column 2, line 40 - column 8, line 22; figures 1-4 *	1-3	INV. F21V23/02
Y		7,8	

X	US 6 164 797 A (CRANE ROY B [US] ET AL) 26 December 2000 (2000-12-26) * column 2, line 18 - column 4, line 2; figures 1-6 *	1,2	
A		3-12	

Y	WO 97/27654 A (MOTOROLA INC [US]) 31 July 1997 (1997-07-31) * page 3, line 5 - page 7, line 8; figures 1-5 *	7,8	

TECHNICAL FIELDS SEARCHED (IPC)
F21V
H01R

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	13 November 2007	Arboreanu, Antoniu

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 42 5505

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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13-11-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0825688 A	25-02-1998	AT 221263 T	15-08-2002
		DE 29614406 U1	17-10-1996
		DK 825688 T3	28-10-2002
		ES 2177863 T3	16-12-2002
		PT 825688 T	29-11-2002
US 6164797 A	26-12-2000	CA 2277527 A1	17-02-2000
WO 9727654 A	31-07-1997	WO 9727653 A1	31-07-1997
		US 5662234 A	02-09-1997

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