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(54) **METHOD OF PRODUCING VARIABLY-CONFIGURED FRAMES FOR CINEMA SEATS AND/OR
SIMILAR ELEMENTS AND THE FRAME THUS OBTAINED**

(57) The process for obtaining the frames allows producing frames comprising a small number of parts, integrally molded in plastic, such that each of these parts can have variable dimensions and configurations as each is obtained from a single mold consisting of a fixed

part, from which the greater part of the piece is obtained, and a second interchangeable part, the configuration of which can vary and which allows the various parts of the frame to leave the mold with the aesthetic appearance and dimensions suitable for each type of chair.

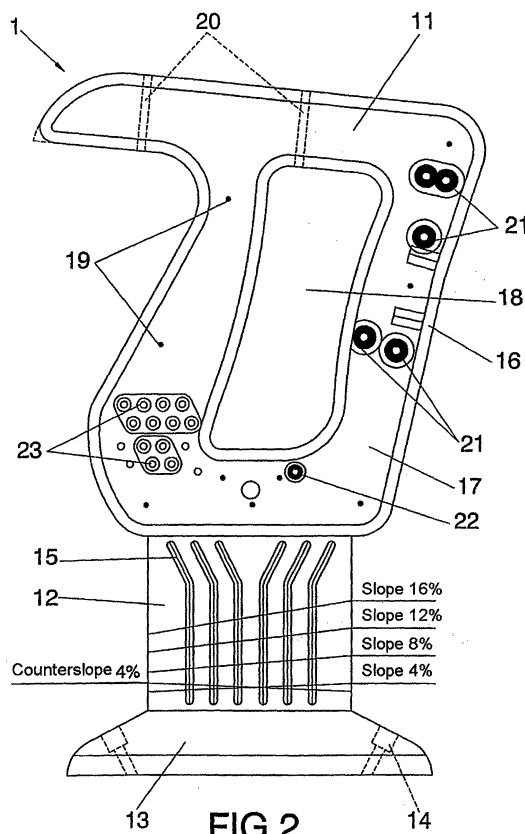


FIG.2

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Description

OBJECT OF THE INVENTION

[0001] The invention relates to a process for obtaining frames for cinema and theatre chairs and/or the like based on a small number of molded plastic parts allowing to produce chairs with a varying appearance and with support legs adapted to the height required for the chair as well as to the inclined plane of the floor on which they will be installed.

[0002] The frame obtained by the process described in this invention, as well as being easier to manufacture than traditional metal frames, is extremely easy to assemble, lighter and, also importantly, accepts the injection of polyurethane mass in which it will be embedded better than metal frames.

BACKGROUND OF THE INVENTION

[0003] Currently, chairs for cinemas, theatres and the like are formed from two metal frames that constitute the seat and the back, with dimensions and configuration adapted to those of the chair to be manufactured.

[0004] In turn, these metal frames consist of a metal frame to which a plurality of rods in the form of springs are welded.

[0005] The metal frames thereby configured are inserted and positioned in a mold and a polyurethane mass is injected on them which, upon cooling, adopts the shape of the mold, which naturally corresponds to that of the back and/or seat. Obviously, the metal frame is embedded in the polyurethane mass.

[0006] The next operation is that of upholstering the molded parts, i.e. the seat and the back.

[0007] The parts that form the seat and the back, after being upholstered, are mounted hinged to each other on sides that are in turn joined to the support legs and the shoes anchoring the chair to the floor.

[0008] The assembly comprising the sides, legs and anchoring shoes, as explained above, normally consists of independent parts that are welded or bolted to each other.

[0009] One of the drawbacks suffered by these sides, in addition to their construction based on several welded or bolted parts, is that they cannot be uniform as they must conform to the floor of the premises and to the variations in height of the chairs, which obviously complicates the chair manufacturing process, with the ensuing increased cost.

[0010] Spanish patent 9500068 describes a side for chairs and a solution for adapting it to the characteristics of the premises containing it. In this case the side itself, the leg and the anchoring shoe are made of metal parts bolted to each other.

[0011] In addition, Spanish patent 9801085 describes an improved process for upholstering seats and backs, by means of which the upholstery operation is integrated

in the polyurethane injection operation to provide an upholstery that is perfectly adapted to the outline of the molded part.

[0012] Thus, as seen in the description made of the state of the art for the manufacture of cinema chairs and the like, it is necessary on one hand to invest heavily in molds according to the range of chair models to be offered, as each model will require its own mold for the side and its own mold for the seat and back, and these in turn require their own frame.

[0013] Secondly, as regards the sides, their construction process is at best slow, as they are formed from independent parts that must eventually be joined by welding or bolts. In addition, however, these parts are not uniform but instead must conform to the inclination of the premises containing the chairs and the height of these chairs.

[0014] Finally, as mentioned above, as the seat and the back are formed on metal frames, in the polyurethane injection operation the metal frames hinder the expansion of the polyurethane so that a great amount of this product is required to obtain the molded parts.

DESCRIPTION OF THE INVENTION

[0015] The process object of the invention allows obtaining frames for cinema chairs, theatre chairs and the like from a small number of parts, as it eliminates the conventional metal frames and replaces them with plastic parts that can have variable dimensions and configuration. Additionally, the costly and complicated sides, legs and metal shoes are eliminated, as these are obtained integrated in a single plastic part with a variable configuration.

[0016] The plastic parts constituting the backs and seats have a strong frame or structure with transverse slats or bands acting as springs that also allow the polyurethane foam to pass from one side of the part to the other when it is injected on them.

[0017] Specifically, the plastic frame object of the invention consists of the combination of the following parts:

- A pair of sides integrating the leg and the support shoe, obtaining the assembly by molding plastic in a single piece.
- A back integrating, in the plastic molding process, transverse bands acting as elastic elements that replace the conventional springs.
- A seat integrating, in the plastic molding process, transverse bands acting as elastic elements that replace the conventional springs.
- Auxiliary parts, such as lids and armrests.

[0018] In addition, the parts constituting the frame in-

corporate in the molding process means for a fast attachment of the various accessories, such as the seat hinging and swiveling mechanisms, the back, seat and sides lids or the armrests, thereby simplifying the assembly of these elements as there is no need for screws or other attachment means.

[0019] A fundamental characteristic of the process object of the invention relates to the fact that in order to obtain the basic parts of the frame, this is the sides, backs and seats, a mould is used having a fixed part in which the invariant part of the piece is conformed, and a complementary interchangeable part in which the aesthetic variations are conformed. In this way, maintaining the same larger part of the mold it is possible to obtain variable configurations of these parts, backs, seats and sides.

[0020] Specifically, it is possible to obtain from a single mold different sides integrating legs of different length and shoes with different inclinations, thereby conforming to the different heights required of the seat and the various inclinations of the floor. For this purpose, the fixed part of the mold corresponds to the body of the side common to all parts, while the leg and the shoe are obtained according to the configuration of the interchangeable part of the mold.

[0021] Similarly, it is possible to make backs with different lengths and/or configurations using a single mold, this is, without requiring a different mold for each type of back, thereby greatly reducing the cost of manufacturing the backs. In this case the lower part of the backs common to all backs shall correspond to the fixed part of the mold, while the top part will have a variable configuration according to the interchangeable part of the mold employed.

[0022] As relates to the seats, these generally have a common configuration for all chairs, but if it is necessary to produce seats with different aesthetic configurations it is possible to use, as for the backs and sides, a mold having a fixed part and an interchangeable part.

[0023] Naturally, all parts comprising the frame incorporate ribs and reinforcements that can provide the frame with a strength similar to that of a frame made from metal parts.

[0024] As mentioned above, the plastic frame obtained according to the process of the invention presents numerous advantages compared to those currently used, such as the following:

- It is easier to manufacture and does not require the conventional assembly operations, for example for the springs, legs and shoes, also reducing the time required to assemble other accessories such as the lids.
- As there are no metal elements, the weight of the frame is considerably lower.
- As it is made entirely of plastic, which is a good con-

ductor of polyurethane, consumption of the latter material is lower than with conventional metal frames.

- 5 - It is possible to obtain greater precision in the measurements and finishings required.
- It does not have to be cleaned or degreased before injecting the polyurethane.
- 10 - As it is made entirely of plastic, the linings can be nailed or stapled from the rear without requiring intermediate parts.
- 15 - As it is made entirely of plastic, it is possible to obtain the backs and cushions without having to inject the polyurethane in the corresponding mold, as it is possible to glue and staple on the frame a previously expanded foam lining. Thus, the frame can be used to manufacture chairs even in installations lacking the means required for molding.

DESCRIPTION OF THE DRAWINGS

- 25 **[0025]** To complement the description being made and in order to aid a better understanding of the characteristics of the invention, a set of drawings is accompanied as an integral part of the present descriptive memory, where for purposes of illustration and in a non-limiting sense the following is shown:

Figure 1 shows an exploded view of all the parts constituting the frame, including the accessory elements.

Figure 2 shows a side illustrating various possibilities for the height of the leg and inclination of the shoes, which can be obtained by the process object of the invention.

Figure 3 shows a schematic representation of the mould used to obtain sides, formed by a fixed part and an interchangeable part.

Figure 4 shows a series of different configurations for the interchangeable part of the mold for obtaining the sides.

Figure 5 shows two possible configurations for the back that can be obtained by the process of the invention, these backs integrating the elastic bands acting as springs and the attachment means for the various accessories.

Figure 6 shows a seat obtained in a single part according to the process object of the invention, integrating the elastic bands acting as springs, as well as the recesses and remaining elements needed to

integrate the swiveling shaft and folding springs.

Figure 7 shows a perspective view of a finished chair, showing in a section provided for such purpose the polyurethane layers in which the parts of the frame constituting the back and the seat are embedded.

PREFERRED EMBODIMENT OF THE INVENTION

[0026] The frame object of the invention, as shown in figure 1, mainly comprises a pair of sides (1), a seat (2) and a back (3), the frame being completed by the corresponding closing lids (4)(5)(6) and (7), as well as other auxiliary elements such as the armrests (8).

[0027] All the parts are integrally made of plastic, in opposition to those currently manufactured from metal, and can present several aesthetic configurations, as shown in figures 2, 3, 4 and 5, to conform to the different requirements.

[0028] For this purpose, the sides (2), backs (3) and seats (4) are each made from a single mold comprising a fixed part (9), which corresponds to the greater part of the piece to be obtained, and an interchangeable part (10), such that according to the configuration of this interchangeable part (10) pieces can be obtained with different shapes and/or dimensions.

[0029] As can be seen in figure (2), the side for chairs object of the invention consists of a monoblock body obtained by molding, integrally in plastic, in which three well-differentiated parts are distinguished, corresponding to: a body or side itself (11), a leg (12) and a support shoe (13). The support shoe (13) has a trapezoidal configuration and is widened compared to the intermediate part or leg (12), having orifices (14) slightly inclined to secure the chair to the floor and which are closed by the conventional plugs.

[0030] The intermediate part or leg (12) is approximately straight and is provided on both sides with a plurality of ribs (15) to stiffen the structure.

[0031] As regards the upper part or body (11) of the side, it defines a peripheral profile (16) with an inner core (17) in which a large window or hollowing (18) is established that is approximately concentric to the general outline of the body (11), lightening the side. The body (11) also presents a number of orifices (18) for a fast coupling of the lids (4) and (5), which for this purpose are provided with lugs (19), as well as with orifices (20) for attaching the armrests (8).

[0032] In addition to the aforementioned characteristics, the body (11) of the side is provided with housings (21) for the corresponding back (3), these housings being arranged to allow assembling the back (3) with various inclinations as desired. It also has housings (22) through which the swiveling shafts for the seats (2) are transversally inserted, as well as a number of orifices (23) disposed on the front part of the body (11) offset in height and separation to allow assembling the seat (2)

in a fixed position (so that it cannot swivel) but allowing it to be disposed with different inclinations with respect to the ground.

[0033] As previously stated, the described side is obtained by molding in a single piece, for which, as shown in figure 3, a single mold is used composed of a fixed part (9) and an interchangeable part (10) so that the fixed part (9) will configure the body (11) of the side that is common to all, while the interchangeable part (10) corresponds to the leg (12) and the anchoring shoe (13), so that depending on the configuration of the interchangeable part (10) the leg (12) will be longer or shorter, and the shoe (13) will be more or less inclined, so that with the same mold it is possible to obtain directly sides with different inclinations to adapt to the different inclinations of the floor, as well as having a greater or lesser height to leave the seat at the desired distance from the floor.

[0034] Figure 4 clearly shows different configurations of the interchangeable part (10) with which sides with different configurations can be obtained directly.

[0035] Figure 5 shows a back (3), also made entirely of plastic and obtained by molding a single piece, composed of a support or peripheral frame (24) and a series of longitudinal bands or strips (25) that give the back the elasticity provided by the springs in conventional frames.

[0036] The peripheral frame (24) has a series of longitudinal ribs (26), concentric and peripheral, intended to provide the back with the required stiffness and strength, while the transverse bands (25) are provided with ribs (27), transverse and longitudinal, intended to provide the aforementioned bands (25) with a sufficient stiffness yet maintaining the required elasticity.

[0037] Also obtained in the molding operation of the back (3) are the cylindrical supports or bushings (28), in correspondence with the profile of the frame (24) with which the brackets (29) will be attached in the housings (21) of the sides (1), supporting and stopping the seat (2) of the chair and a series of orifices (30) disposed on the rear of the frame (24) with which the rear lid (7) is attached.

[0038] The back (3) is obtained from a single mold, constituted by a fixed part and an interchangeable part, the fixed part corresponding to the lower and central part of the back that is common to all backs, while the interchangeable part is meant to obtain the upper part of the back, which can therefore have different lengths and/or configurations, as shown in the discontinuous lines of figure 5.

[0039] Finally, figure 6 shows a seat obtained according to the process of the invention that is constituted, as is the back, by a peripheral frame (31) and a series of transverse bands (32) that act as springs, obtaining the assembly by molding plastic in a single mold.

[0040] The seat also incorporates bushings (32) obtained in the molding operation of the seat itself, in which pins are housed that act as rotation and swiveling shafts,

and which on their other end are inserted in the housings (22) of the sides (1).

[0041] The frames (31) of the seats also present housings (34) for assembling the rear closure lid (6), which will be provided for such purpose with the corresponding lugs (35).

[0042] The seats (2) normally have a configuration common to all chairs, but if it is necessary to obtain seats (2) with different appearance it is possible to use, as with the sides (1) and backs (3), moulds with a fixed part and an interchangeable part.

Claims

1. Process for obtaining frames with a variable configuration for cinema chairs, theatre chairs or the like and the frame thereby obtained, **characterized in that** all the parts, including the main parts, this is the back, seat and sides, are made of a plastic material and obtained by molding, preferably in molds comprising a fixed part and a variable part, the fixed part of the mold conforming the invariant part of the piece and the variable part of the mold conforming the different aesthetic variations.
2. Process for obtaining frames with a variable configuration for cinema chairs, theatre chairs or the like and the frame thereby obtained, according to claim 1, **characterized in that** the sides (1) of the frame are obtained by molding plastic, using a single mold for all possible sides, the mold having a fixed part (9) with a configuration corresponding to the body (11) of the side (1) that is common to all sides, and an interchangeable part (10) with which the leg (12) and the support shoe (13) are obtained such that, according to the configuration of the interchangeable part of the mold (10), sides (1) with legs (12) of different lengths and shoes (13) with different inclinations are obtained.
3. Process for obtaining frames with a variable configuration for cinema chairs, theatre chairs or the like and the frame thereby obtained, according to claim 1, **characterized in that** the backs (3) of the frame are obtained by molding plastic, using a mold having a fixed part with which the lower and central segment of the back is obtained, which is common to all, while the interchangeable part is meant to obtain the upper part of the back with different configurations or finishes.
4. Process for obtaining frames with a variable configuration for cinema chairs, theatre chairs or the like and the frame thereby obtained, according to claims 1 and 2, **characterized in that** the seats (2) of the frame are obtained by molding plastic, using a single mold for all types of seats, the mold optionally

having a fixed part and an interchangeable part.

5. Frame for cinema chairs and/or the like, **characterized in that** it comprises:
 - a) A pair of sides (4) made of plastic material, incorporating the body (11) or side itself, the leg (12) and the support shoe (13),
 - b) A back (3) made of plastic material having a strong frame and transverse bands (25) that act as elastic elements.
 - c) A seat (2) made of plastic material, having a strong frame and transverse bands (32) that act as elastic elements.
 - d) Complementary parts such as lids (4),(5),(6) and (7) and armrests (8),

such that all parts that form the frame integrate means for a fast attachment of the various accessories and for the hinging and swiveling means for the seat, the back, seat and sides closure lids or for the armrests, thereby simplifying the assembly of these elements as no screws or other means of attachment are required.
6. Frame for cinema chairs and/or the like, according to claim 5, **characterized in that** the body (11) of the side (1) comprises a peripheral profile (16) with an inner core (17) in which a large opening or hollowing (18) is established, approximately concentric to the general outline of the body (11), which provides a lightening of the side, having a number of orifices (18) for a fast coupling of the lids (4) and (5), which for this purpose shall be provided with lugs (19), as well as orifices (20) for fastening the armrests (8), the body (11) of the side also having housings (21) for anchoring the corresponding back (3), these housings being distributed in order to allow assembling the back (3) with various inclinations, and housings (22) through which are transversally inserted the swiveling shafts for the seats (2), a number of orifices (23) also disposed in the front part of the body (11), offset in height and separation, to allow assembling the seat (2) in a fixed position (so that it cannot swivel), yet allowing it to be disposed in different inclinations with respect to the ground.
7. Frame for cinema seats and/or the like, according to claims 5 and 6, **characterized in that** the anchoring shoe (13) incorporates housings (14), slightly inclined with respect to the support surface of the shoe (13), for anchoring the side to the floor, the housings being closed by plugs that prevent entry of dust and foreign elements.

8. Frame for cinema seats and/or the like, according to claim 5, **characterized in that** the back (3) is comprised of a support or peripheral frame (24) and a number of longitudinal bands or strips (25) that give the back the elasticity provided by the springs in conventional frames, the peripheral frame (24) having a number of longitudinal ribs (26), this is, concentric and peripheral, meant to provide the back with the necessary stiffness and strength, while the transverse bands (25) have transverse and longitudinal ribs (27) to provide the aforementioned bands (25) with the sufficient stiffness while maintaining the required elasticity, such that in the molding operation of the back (3) cylindrical supports or bushings (28) are obtained in correspondence with the sides of the profile of the frame (24) with which it shall be attached in the housings (21) of the sides (11), as well as brackets (29) acting as a support and stop for the seat (2) of the chair and a number of orifices (30) disposed in the rear part of the frame (24) by which the rear lid (7) is secured.
9. Frame for cinema seats and/or the like, according to claim 5, **characterized in that** the seat (2) is comprised of a peripheral frame (31) and a number of transverse bands (32), incorporating in the seat molding process the bushings (33) in which are housed the pins acting as rotation and swiveling elements which, on the other side, are inserted in the housings (22) of the sides (1), also such that the frames (31) of the seats are additionally provided with housings (34) for assembling the rear closure lids (6), which are provided for such purposes with the corresponding lugs.

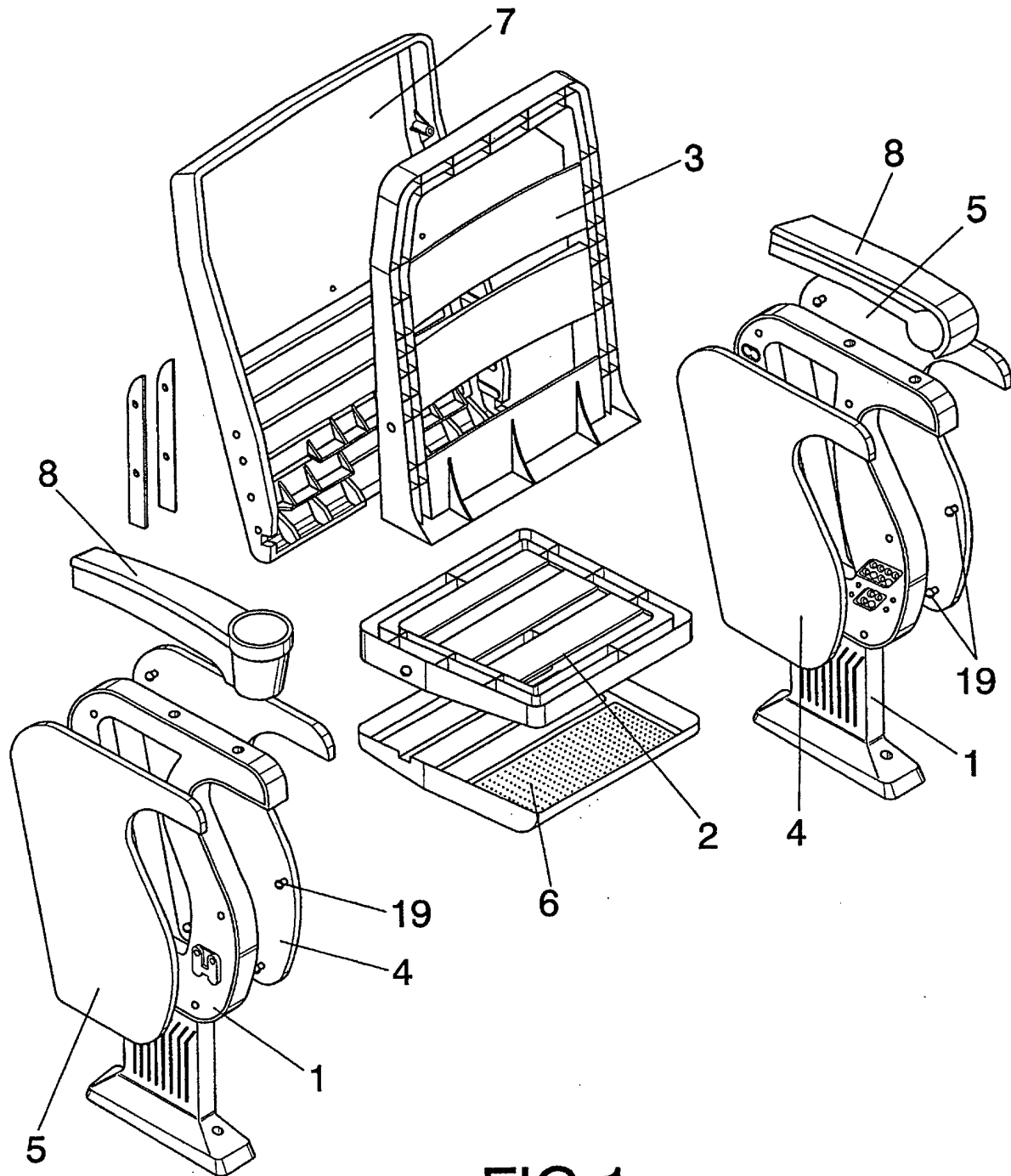


FIG.1

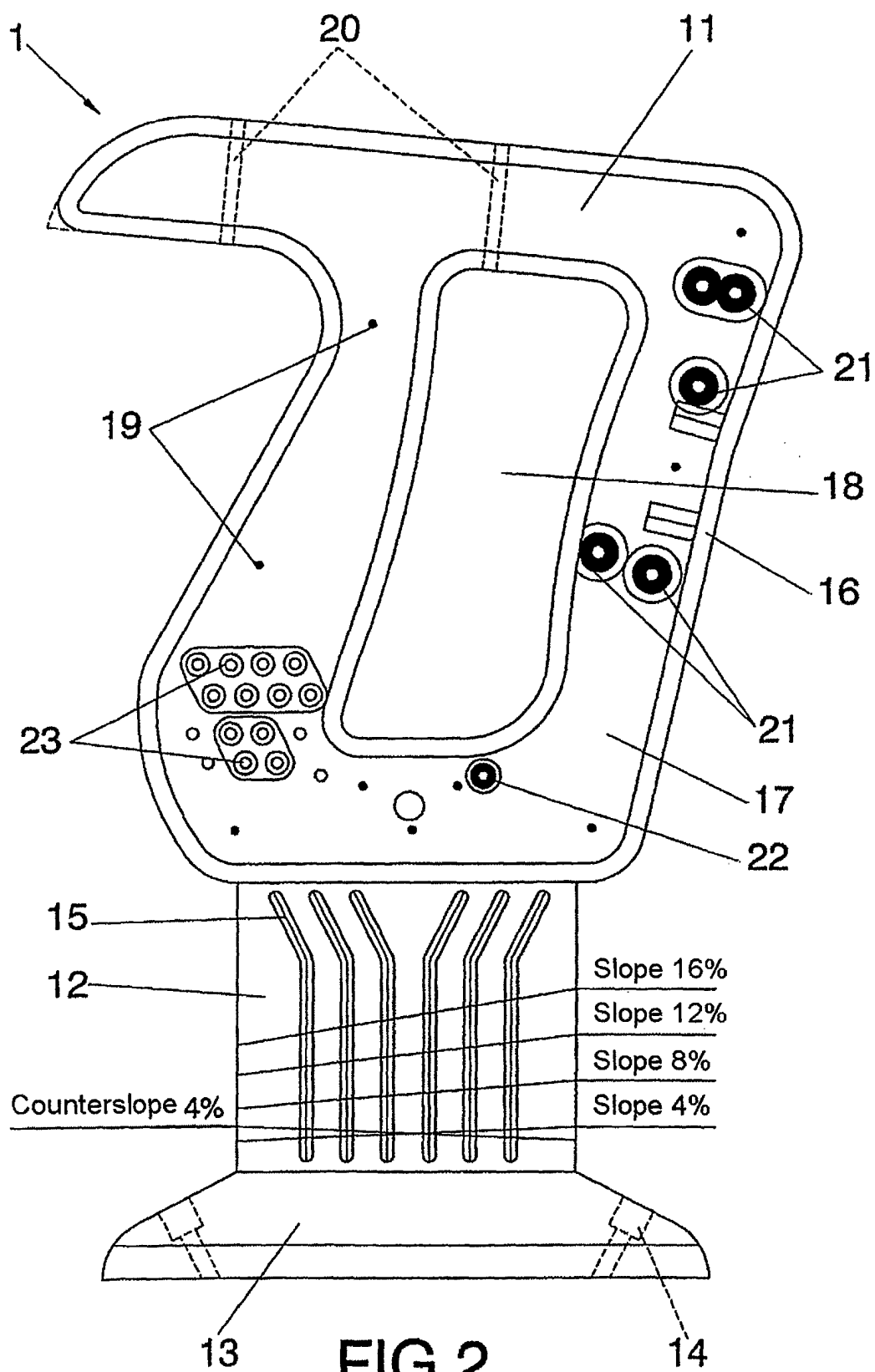


FIG.2

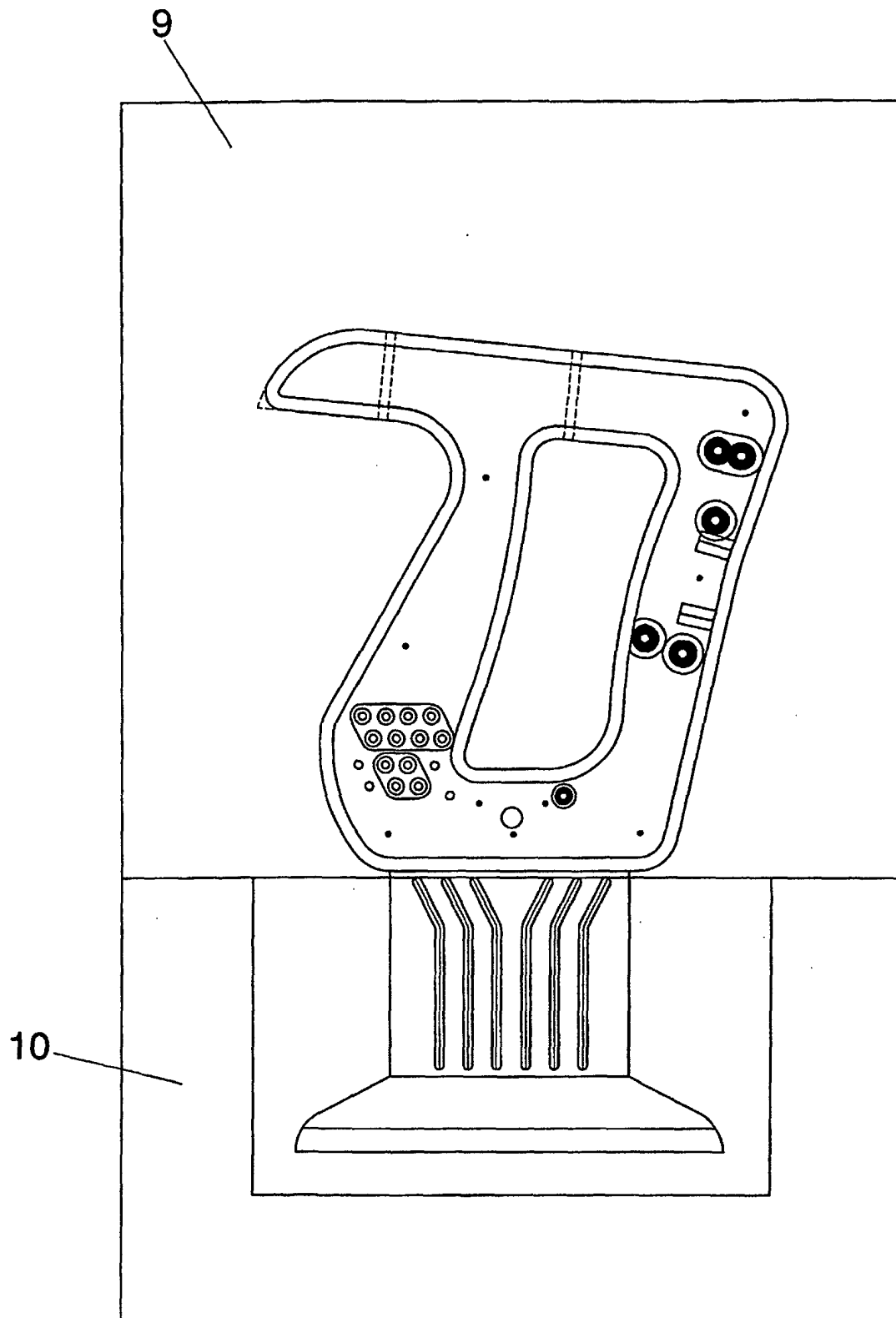


FIG.3

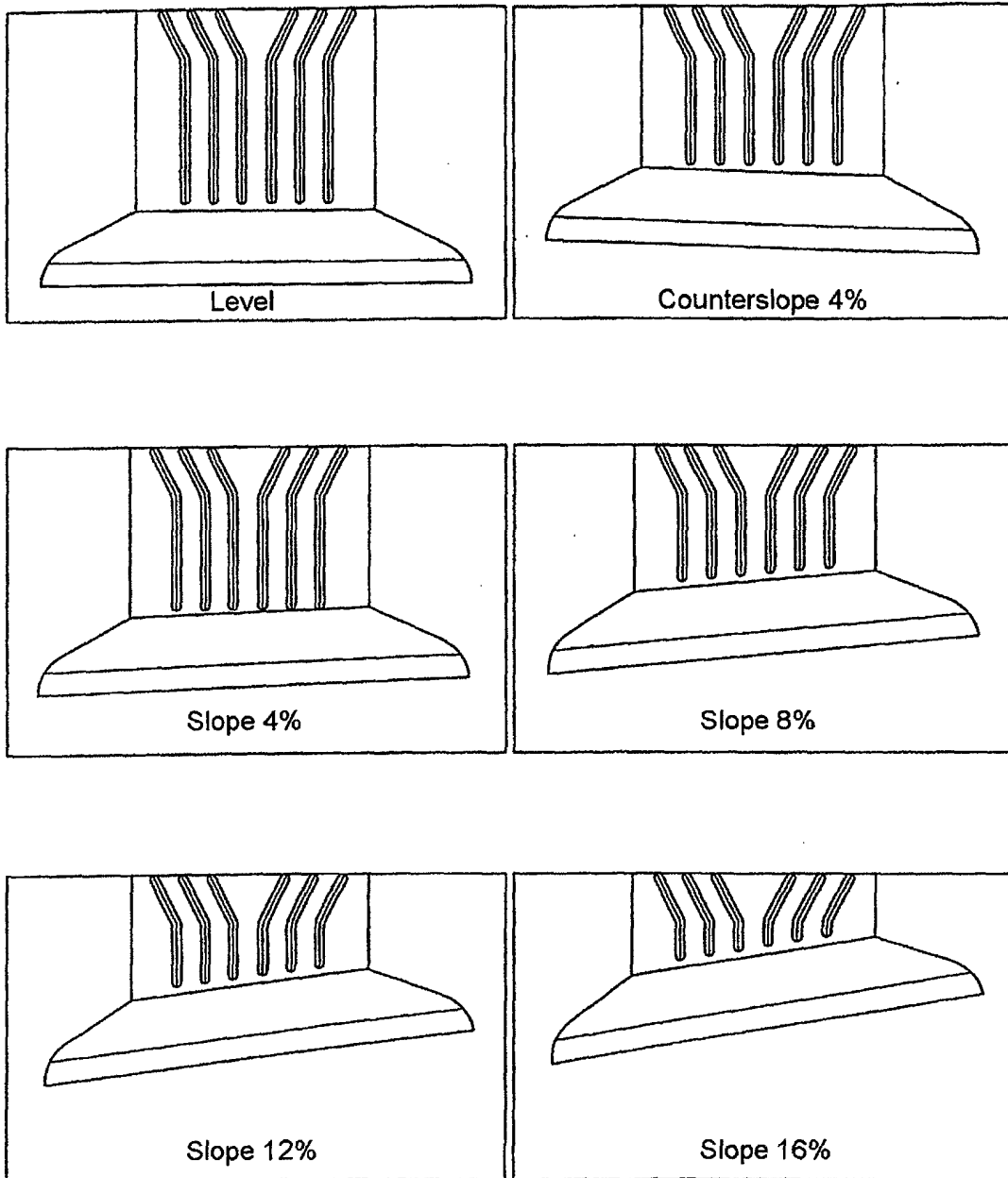


FIG.4

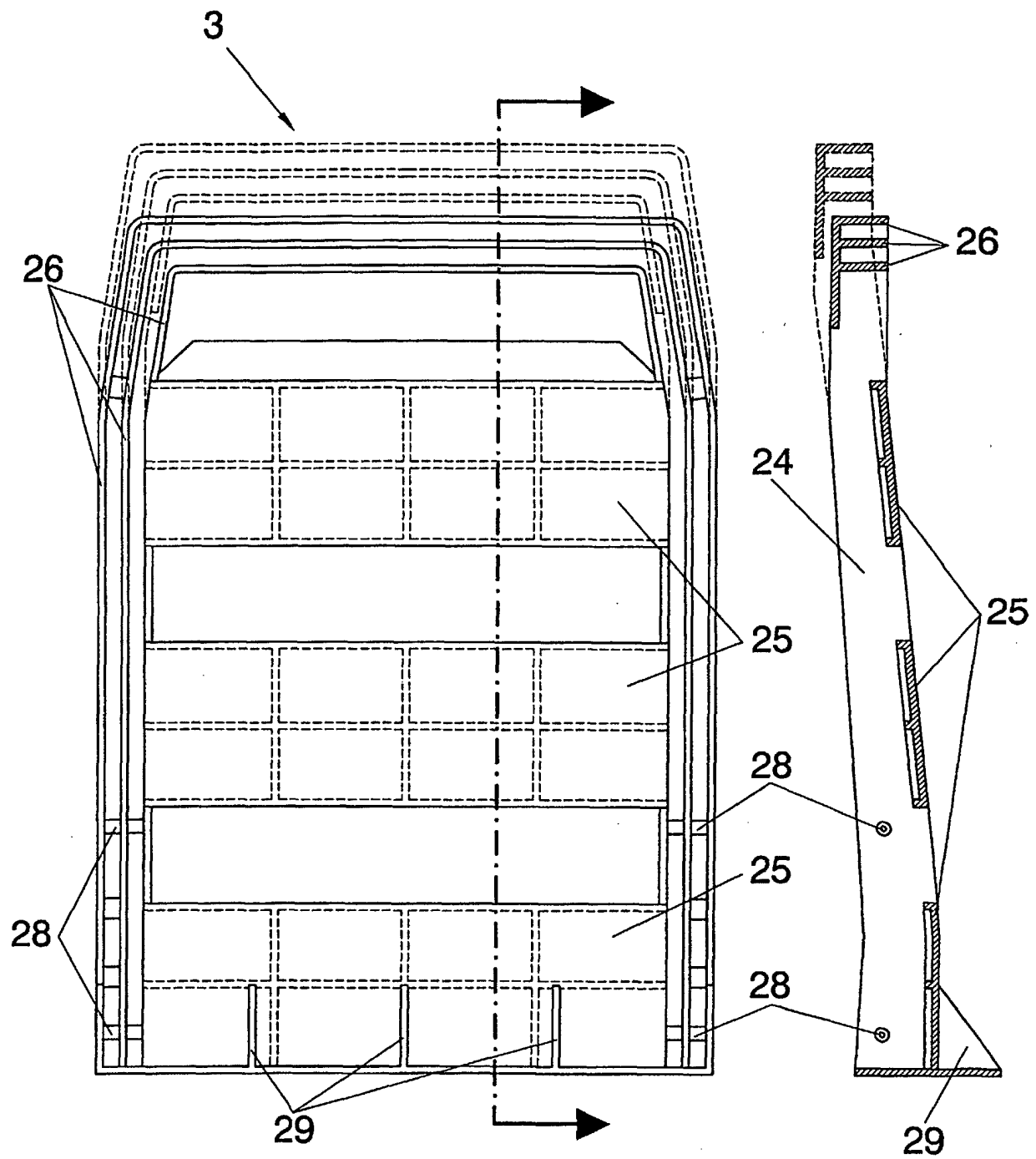


FIG.5

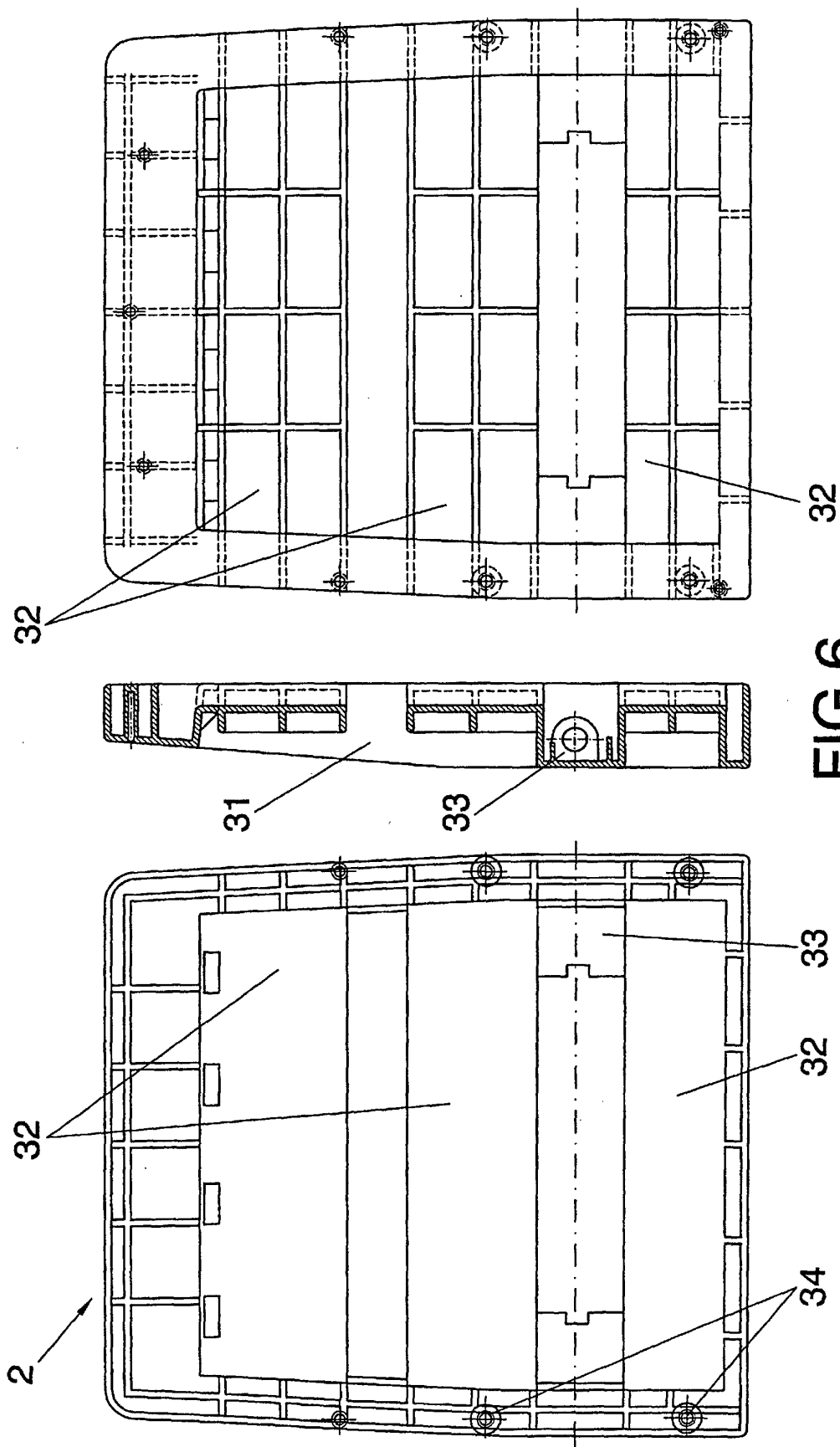


FIG.6

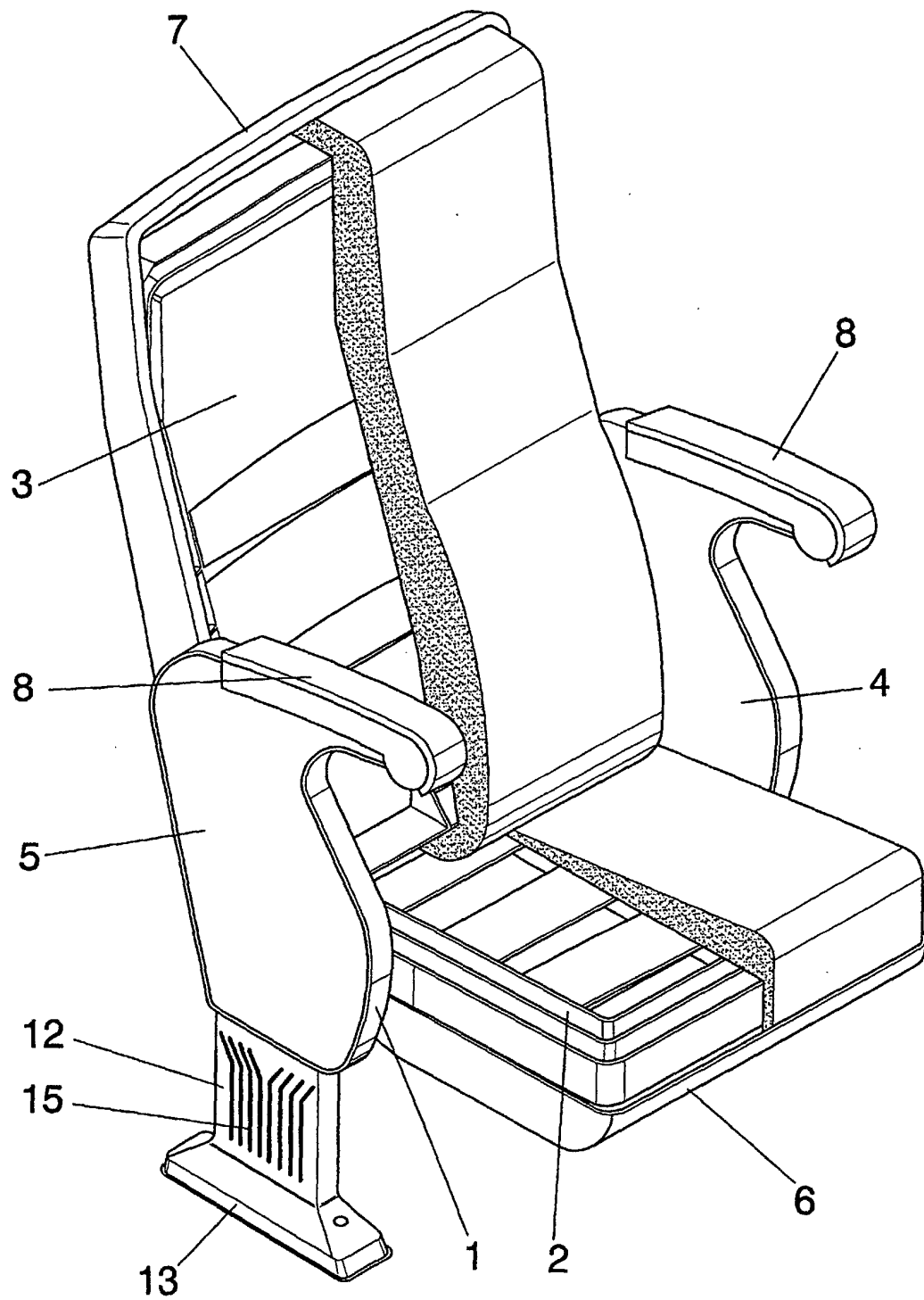


FIG.7

INTERNATIONAL SEARCH REPORT

International a

PCT/ES 01/00285

A. CLASSIFICATION OF SUBJECT MATTER		
Int.Cl.7 A47 C 1/12, A47C 7/20		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
Int.Cl.7 A47C		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
EPODOC, WPIL, MISTRAL, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3655239-A (AGOSTI) 11-04-1972 column 2, line 72 -column 4, line 69, figures	1,5,7
A	ES 254966-U (INDUSTRIAS FIGUERAS) 1-5-1981 the whole document	1,5,7
A	US 5951110-A (CONER ET AL) 14-9-1999 column 3, line 33, column 9 -line 17; figures	3,8
A	US 3747978-A (BARECKI) 24-7-1973 column 3, line 3, column 4 -line 52; figures	5,7
A	ES 2120315-A (EURO SEATING) 16-10-1998 the whole document	6-7
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
11 December 2001 (11.12.01)		22 January 2002 (22.01.02)
Name and mailing address of the ISA/ SPTO		Authorized officer
Facsimile No.		Telephone No.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Ap.

PCT/ES 01/00285

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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ES2120315	16-10-1998		

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