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(71) Applicant: **Fama Sofas, S.L.U.**
30510 Yecla (Murcia) (ES)

(72) Inventor: **Lopez Gil, Felix**
Yecla (ES)

(74) Representative: **Ballester Cañizares, Rosalia**
Ballester Intellectual Property SLP
Avda. de la Constitución 16, 1^o D
03002 Alicante (ES)

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(54) **DEVICE FOR REGULATING THE HARDNESS OF A SEAT**

(57) Device for regulating the hardness of a seat (10,20) comprising a plurality of flexible elements (11,21) located as the lower support for the seat cushion (10,20) and a rigid element or crosspiece (12), movable in such

a way that each working position exerts a different pressure from the rigid element (12) on the flexible support elements (11,21).

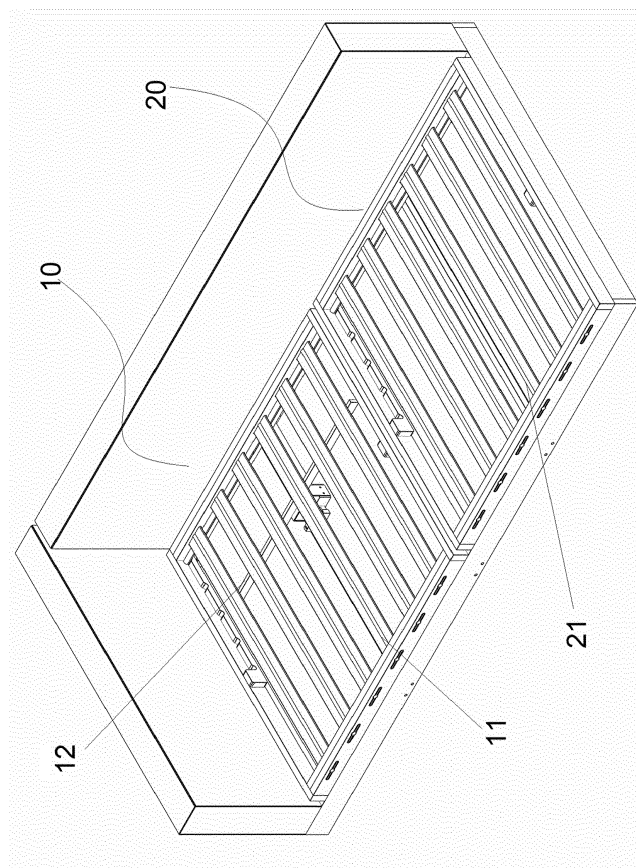


FIG. 1

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Description

Technical field

[0001] This invention relates to a device for regulating the hardness of the seat of a sofa in such a way that it can easily be adapted to the user's preferences.

State of the art

[0002] In the manufacture of sofas, a large number of innovations has been described, such as removable mechanisms, relaxation mechanisms, backrests that move forward to modify the depth, as well as many other options aimed at improving users' comfort. However, there is no known innovation that allows the hardness of the seat to be changed or regulated, other than changing the seat cushion itself. However, this implies offering each customer a choice between different seat hardness options. This solution involves huge complication on the production line, as the number of components required to manufacture them is multiplied.

[0003] It is well known that some users prefer a very soft seat while others like a much harder one. However, with use, seats tend to deform over time, losing hardness. Moreover, when the preference is for a very soft seat, the problem is that, over time, all very soft seating solutions end up degrading at a faster rate than hard seats, quickly becoming very uncomfortable.

[0004] A device that allows the hardness of the seat to be modified by the user him/herself and, therefore, avoids deformation of the seats due to their use is therefore required. This problem is solved by the device for regulating the hardness of a seat which is the object of this invention.

Explanation of the invention

[0005] As previously indicated, an object of this invention is a device for regulating the hardness of a seat. More specifically, an object of the invention is to enable each user to achieve an adapted degree of hardness quickly and easily. These objects are achieved with the device according to claim 1. Particular solutions of this invention are described in the dependent claims.

[0006] More specifically, the device for regulating the hardness of a seat recommended by this invention is characterised in that it comprises a plurality of first flexible elements as the lower support for the seat cushion and a rigid element, movable in a plurality of working positions in the part immediately below the plurality of flexible elements and in contact with them perpendicularly, such that each working position exerts a different pressure on the flexible support elements.

[0007] The flexible elements can be configured -in two practical, non-limiting embodiments- in elastic straps and/or flexible plastic suspension slats. In the state of the art, plastic parts exist for joining the slats of settees and mattress bases which, by joining them together, can

slightly increase or reduce the hardness of the suspension, but the difference in hardness achieved is minimal, whereas, thanks to this invention, it is possible to achieve extreme differences in hardness.

[0008] The rigid element is configured as a bar that exerts pressure on the lower part of the flexible elements (either straps or slats) such that, as it moves or changes position, it causes a change to the hardness of the seat. This rigid element can be motorised, or it can be an element that can be moved manually between predefined positions, which, in the tests performed, makes it possible to go from 100% flexibility of the flexible elements -in other words, without the rigid element exerting any action or force on the flexible elements- to 30% or 40% of the original flexibility of said elements, for example, by placing the rigid element in a centred position with respect to the flexible elements that constitute the support of the seat cushion.

[0009] In this way, within the same sofa, each user can regulate the hardness of his/her seat, and different types of hardness, harder or softer, can coexist in the same sofa. This choice of hardness is totally reversible. In addition, thanks to the invention, the problem generated by all the very soft seat options on the market, which end up deforming and losing volume, since this problem totally disappears thanks to this invention, due to the fact that the hardness of the seat is provided by the device of the invention and not by the softness of the foam which, with use, always ends up deforming and losing volume.

Brief explanation of the drawings

[0010] In order to supplement this description and for the purpose of helping with a better understanding of the characteristics of the invention, said description is accompanied by, as an integral part of it, a set of drawings in which the following is shown for illustrative and non-limiting purposes:

Figure 1 - Shows a perspective view of the device of the invention.

Figure 2 - Shows a lower view of the device of the invention.

Figure 3 - Shows a plan view of the device of the invention.

Figure 4 - Shows an isolated view of a second practical embodiment

Figure 5 - Shows a plan view of the second practical embodiment of figure 4

Explanation of one embodiment of the invention

[0011] As can be seen in figure 1, the sofa comprises two seat modules (10, 20) where the seat cushions themselves will be located. In both seats (10,20), it can be seen how they are configured by a plurality of flexible elements (11,21), which, in this practical embodiment are flexible plastic slats, they could also be flexible straps.

These flexible elements (11,21) are arranged transversally with respect to the seat, in other words, they have the same maximum length as the seat and are configured as the lower support for the cushions that makes up said seat, as indicated above.

[0012] In a first practical embodiment, shown in the first seat (10) which is located to the left of the sofa, a motorised rigid element (12) is arranged perpendicularly to the flexible elements (11) configured in an embodiment that is in contact with the lower surface of the flexible elements (11) and configured to exert pressure on said flexible elements during their displacement.

[0013] The rigid element (12) is movable from a first working position, wherein the rigid element (12) is fully retracted into the internal part of the seat (i.e., the part closest to the backrest) and wherein it exerts no pressure on the flexible elements (11) to a second working position, wherein the rigid element (12) is in a closed centred position with respect to the length of the flexible elements (11), such that it exerts a maximum pressure on said flexible elements (11) and consequently increasing the sensation of seat hardness.

[0014] In this first practical embodiment, the rigid element (12) moves on an axis (13) arranged in the middle of the seat which is operated manually by means of a motor (14) and which, due to its backwards to forwards movement, and vice versa, manages to regulate the flexibility of the flexible elements (11) and, therefore, their hardness.

[0015] On the right-hand side of figures 1 to 3 and in more detail in figures 4 and 5, a second practical embodiment can be seen, more specifically, in the second seat (20). In this case, the flexible elements (21) are located identically to those of the first embodiment, but there is no motorised axis, but two guides (22 and 23) are simply positioned on both sides of the seat, facing each other and in parallel. Each of the aforementioned guides (22,23) has a plurality of housings (24) suitable for manually receiving a rigid element or crosspiece (12) in the housings (24), depending on the hardness required, by manually positioning the bar between a first working position, wherein the rigid element will be more to one side, or in any other more centred working position and defined by each pair of housings (24) facing each other.

2. The regulating device according to claim 1 wherein the rigid element or crosspiece (12) moves on an axis (13) arranged in the middle area of the seat which is operated mechanically by means of a motor (14) configured to move the rigid element between the plurality of working positions to exert a different pressure from the rigid element (12) on the flexible support elements (11).

3. The regulating device according to claim 1 or 2 comprising two guides (22,23) on both sides of the seat, facing each other and in parallel, wherein each of the aforementioned guides (22,23) has a plurality of housings (24) suitable for receiving the rigid element or crosspiece (12) and wherein each pair of opposing housings (24) define a working position to exert different pressure from the rigid element (12) on the flexible support elements (21); said rigid element or crosspiece (12) being movable manually between the different positions defined by each pair of opposing housings.

Claims

1. Device for regulating the hardness of a seat (10,20) **characterised in that** it comprises a plurality of first flexible elements (11,21) located as the lower support for the seat cushion (10,20) and a rigid element or crosspiece (12), movable between a plurality of working positions in the part immediately below the plurality of flexible elements (11,21) and in contact with them perpendicularly, such that each working position exerts a different pressure from the rigid element (12) on the flexible support elements (11,21).

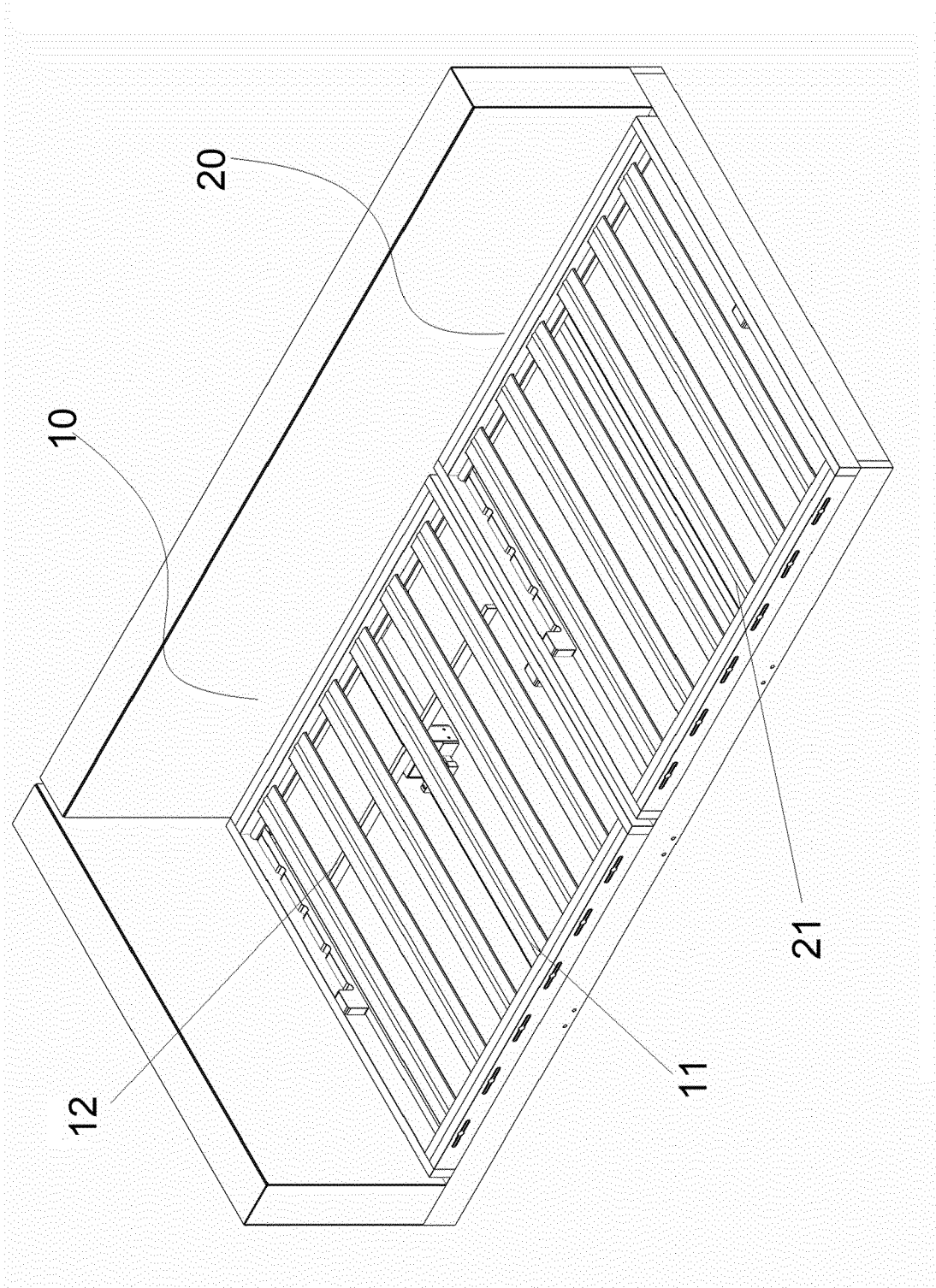


FIG.1

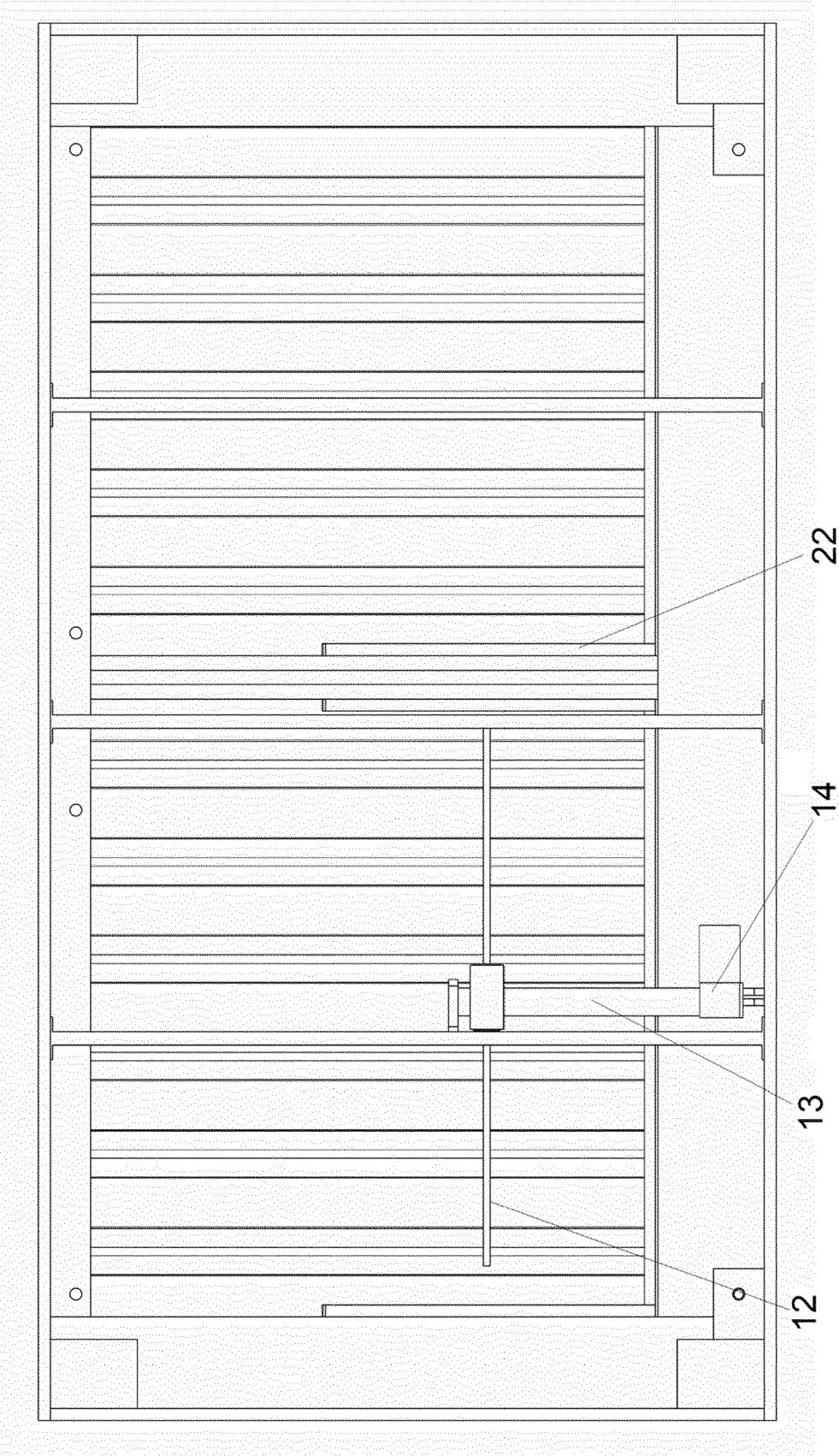


FIG.2

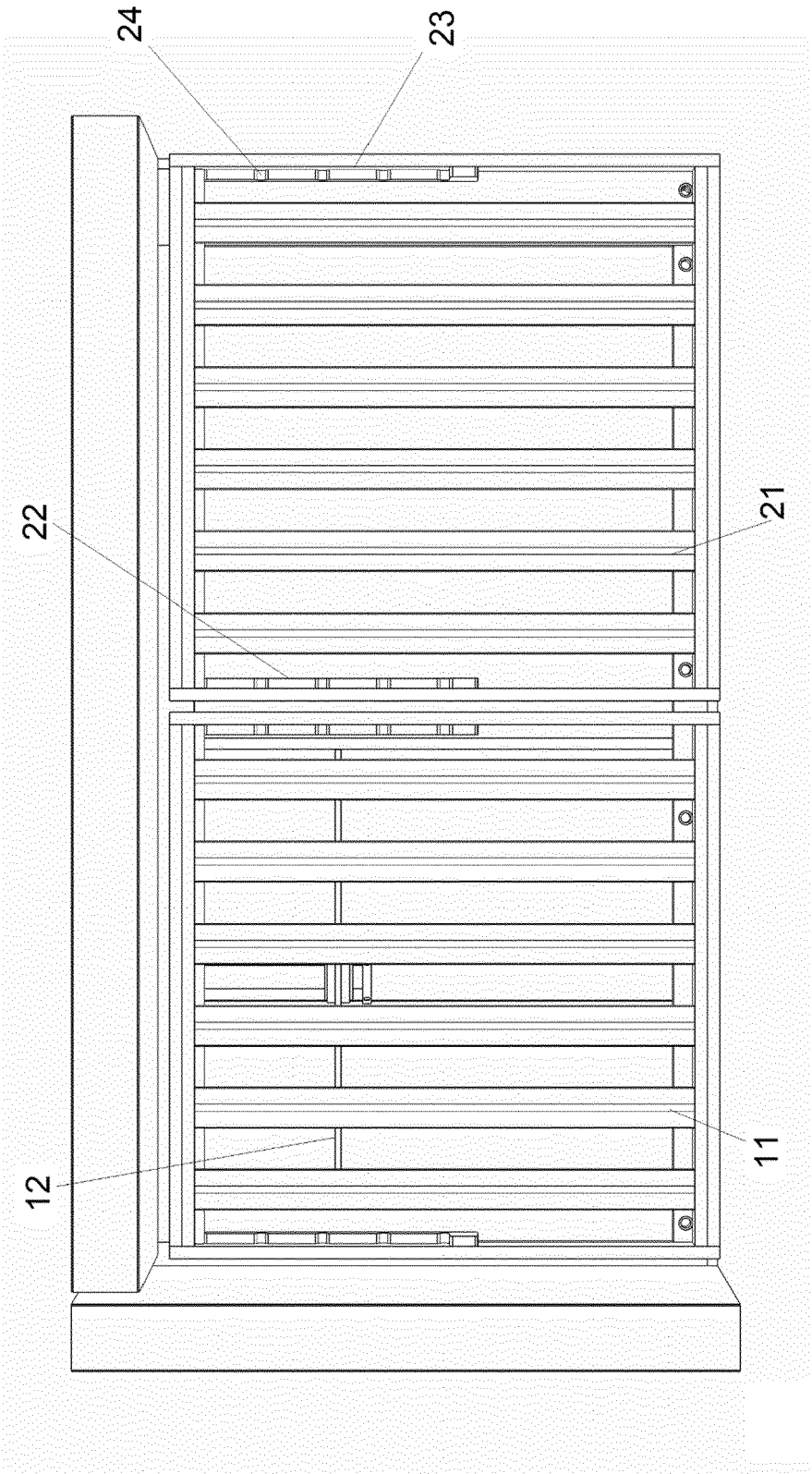


FIG.3

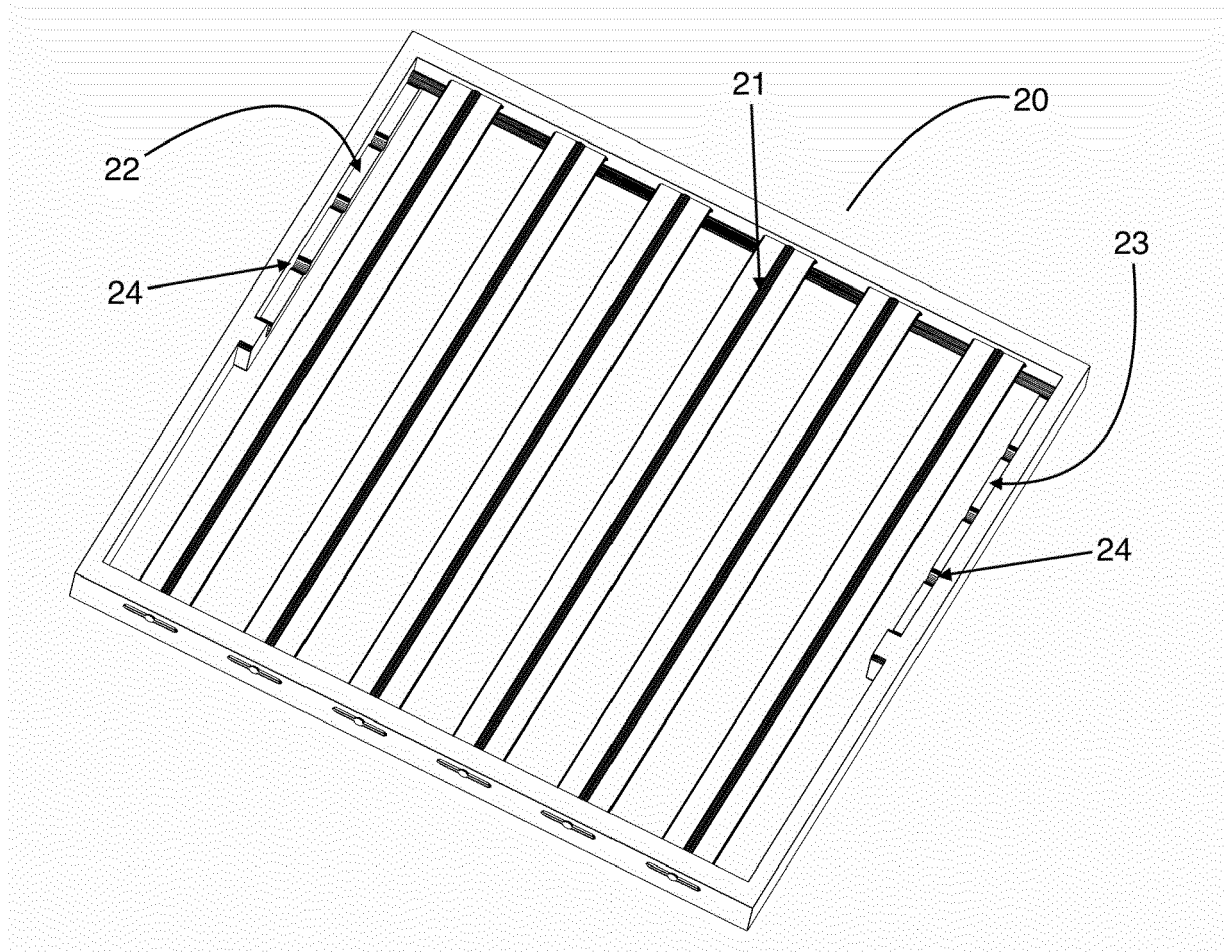


FIG.4

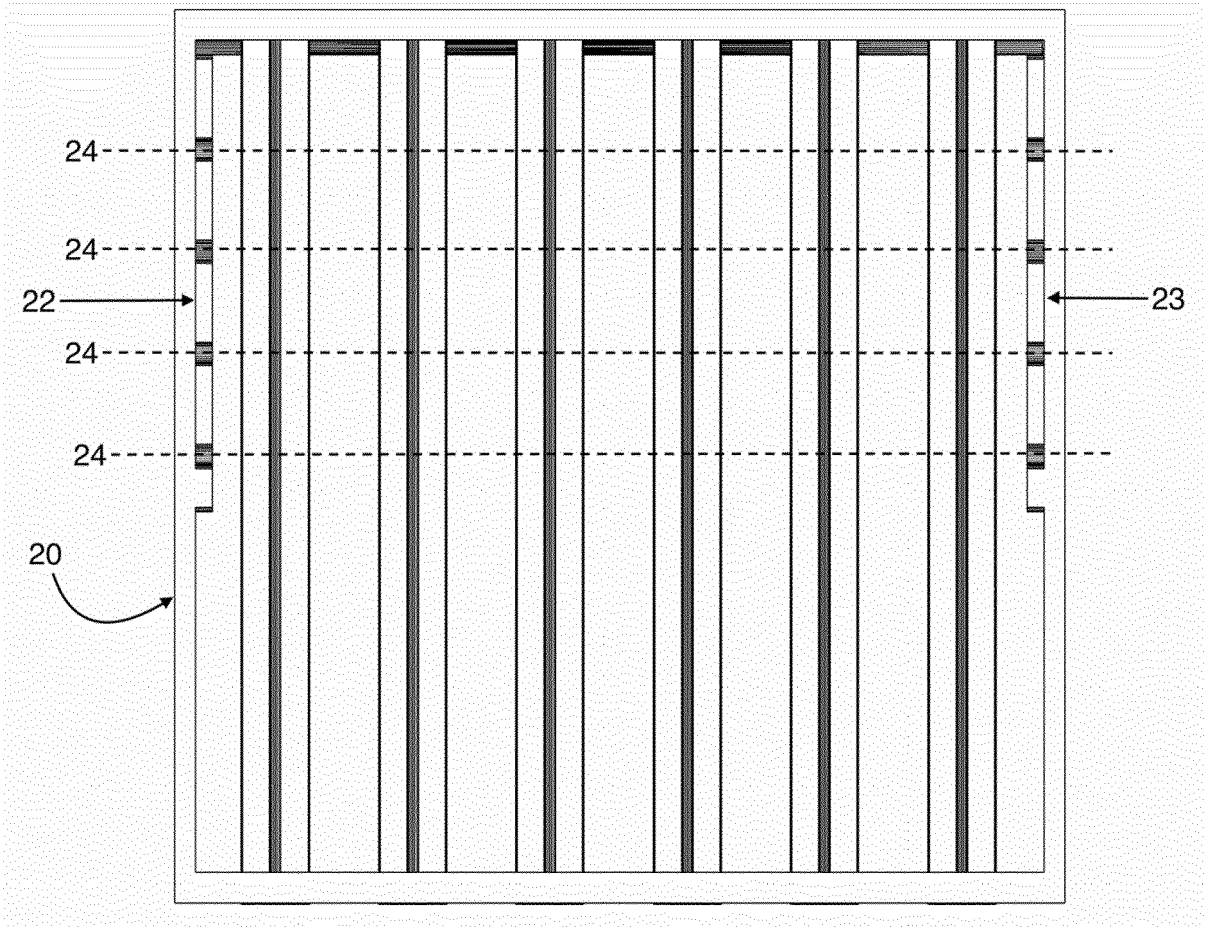


FIG.5



EUROPEAN SEARCH REPORT

Application Number

EP 22 38 2131

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)
			A47C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		1 August 2022	Kus, Slawomir
CATEGORY OF CITED DOCUMENTS		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	
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			

EPO FORM 1503 03.82 (P04C01)

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ON EUROPEAN PATENT APPLICATION NO.**

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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01-08-2022

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