

AUSTRALIA

PATENTS ACT 1990


NOTICE OF ENTITLEMENT

I, ALAIN DE GELIS, of 13, boulevard du Roi-Arthur, F-35740, Pace, France, being the applicant in respect of Application No. 81057/91, state the following:-

1. The person nominated for the grant of the patent has entitlement from the co-inventor, Christian de Gelis, by Assignment.

2. The person nominated for the grant of the patent is the applicant of the application listed in the declaration under Article 8 of the PCT.

3. The basic application listed in the declaration under Article 8 of the PCT is the first application made in a Convention country in respect of the invention.


.....
(Signature)


.....
(Date)

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- (57) Claim

1. A lath-type bedspring of the kind constituted by a succession of modules each comprising in its upper region at least one lath carried by a lower support mounted on a rigid longitudinal beam, said beam being fixed with respect to the ground, characterized in that the lower support and the at least one upper lath are linked together by a flexible connection member in order to allow relative movements between the at least one upper lath and the lower support, and in that the modules are separate from each other, so that their movements are independent.

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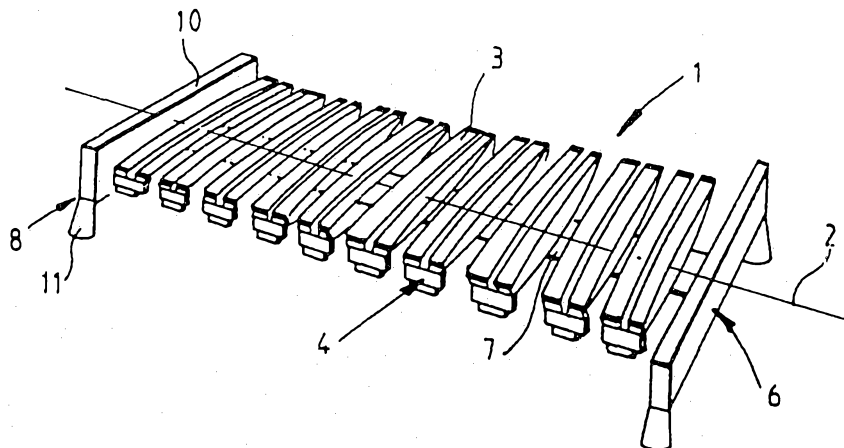
Avec rapport de recherche internationale.

Avant l'expiration du délai prévu pour la modification des revendications, sera republiée si de telles modifications sont reçues.

646271

(54) Title: BED BASE

(54) Titre: SOMMIER DE LITERIE



(57) Abstract

A slatted bed base comprising a series of units (13) each of which includes an upper slat (3) on a lower support (5) mounted on a rigid, central and longitudinal beam (7) which is fixed in relation to the floor. The lower support (5) and the upper slat (3) are connected by a flexible linking element (14) allowing relative movement between the support (5) and the slat (3). The units (13) are spaced apart so that they can move independently of each other.

(57) Abrégé

Sommier à lattes du genre constitué d'une succession de modules (13) chacun comportant supérieurement une latte (3) portée par un support inférieur (5) monté sur une poutre (7) longitudinale centrale rigide, et fixe par rapport au sol, caractérisé en ce que le support inférieur (5) et la latte (3) supérieure sont liés par un organe de liaison (14) souple afin de permettre les mouvements relatifs des éléments (3, 5) entre eux, et en ce que les modules (13) sont séparés les uns des autres de sorte que leurs mouvements soient indépendants.

PCT

BEDSPRING

The present invention relates to a bedspring.

A bedspring is a flexible portion of a bed, resting either within the bedstead or upon legs (such as divans or bed settees, ...), upon which the mattress is spread.

5 There are known spring-type bedsprings, formed of a wooden box-shaped frame having rigid transverse bars fitted with springs and covered with textile material; there are also known metallic bedsprings with a tensioned wire mesh or metallic lattice. There are further known bedsprings of
10 the type equipped with laths, comprising a series of flexible laths, usually constituted by several thin blades of beech wood. The laths are fixed by their ends onto a rigid frame, and they are often arched upwardly for increasing their flexibility range.

15 Lath-type bedsprings offer the advantage of being longer-lasting than spring-type bedsprings, since springs



gradually become weaker, while wooden laths retain their qualities.

However, lath-type bedsprings, as well as metallic bedsprings, have the drawback of presenting a more or less
5 increased stiffness in their portions located near the supporting frame or wooden box-shaped structure; the laths are fixed, in the same way as the metal lattice, to a wooden or metallic frame, and the fastening of the lath ends onto
10 this stationary frame makes it possible for said laths or said metal lattice to acquire the desired resilience. However, it is the central area of the surface formed by the laths or the wire mesh which is resilient, rather than their edges. This mechanical requirement represents therefore a drawback, since finally the bedspring is flexible
15 and pleasant, only in its middle portion.

Lath-type bedsprings have been produced, in which the lath ends are mounted on the frame through the intermediary of springs. Such bedsprings are described, in particular, in EP-A-0 150 873 and CH-A-399 712. However,
20 on the one hand, the presence of a frame to which the laths are linked is further restricting the freedom of movement of the laths, and on the other hand the springs are made of metal and are blade-type springs or an equivalent, which restricts their longevity.

25 There has further been realized, in US-A-2 349 839, a lath-type bedspring in which the lath ends may move vertically without being mechanically linked by a spring mounted on a frame. It is formed of modules composed of a horizontal upper lath rigidly mounted on an arched lower
30 lath. The modules are linked to each other on the one hand by a central bottom beam upon which they come to rest, and on the other hand by three horizontal upper laths. However, the composition of this bedspring does not allow obtaining



satisfactory deformations, owing to the rigidity of the connections : the assembly forms a portion of a cylinder being practically non-deformable which can only oscillate to a very small extent about the beam.

5 The present invention has for its objective to overcome the above-mentioned drawbacks, and it has for its object a lath-type bedspring of the kind constituted by a succession of modules, each one comprising in its upper portion a lath carried by a lower support mounted
10 on a rigid longitudinal central beam being stationary in relation to the ground, characterized in that the lower support and the upper lath are linked by a flexible connecting member in order to allow relative movements of the elements between them, and in that the modules are
15 separate from each other, so that their movements are independent.

 According to a first aspect, the present invention consists in a lath-type bedspring of the kind constituted by a succession of modules each comprising in its upper
20 region at least one lath carried by a lower support mounted on a rigid longitudinal beam, said beam being fixed with respect to the ground, characterized in that the lower support and the at least one upper lath are linked together by a flexible connection member in order
25 to allow relative movements between the at least one upper lath and the lower support, and in that the modules are separate from each other, so that their movements are independent.



The bedspring according to the invention is further notable for the following preferred characteristics:

- the module comprises several identical upper laths for one lower support;
- 5 - the connecting member or satellite comprises a rigid non-deformable piece on which is mounted a socket or a ball-and-socket joint made of rubber, intended for slidably receiving and maintaining the lath or several laths, under which the end of the support is fastened by screwing;
- 10 - the span of the lower support is shorter than that of the upper lath or laths, and the socket of the linking member has the shape of an open loop intended for receiving and maintaining the upper lath while allowing for a relative displacement of the lath on the support;
- 15 - the lower support is constituted by two non-deformable rigid arms pivotally mounted on the beam about an horizontal axis and each provided with a spring or equivalent means which lifts the arms upwardly;
- 20 - the lower lath is constituted by opposite arms which extend laterally;



- the upper lath is a canvas web or a metallic lattice;
- the beam has a variable width, and the end of the arms describes a rectilinear edge so that the arms extending from each side thereof have a variable length;
- 5 - the beam comprises two parallel elements rigidly connected to each other by at least one crosspiece, each element carrying a plurality of arms extending from only one side towards the exterior;
- the beam is mounted on a bedstead defining a supporting
10 area having the same range of size as the bedspring.

The bedspring according to the invention thus comprises a succession of laths or groups of laths, the ends of which, being totally independent from each other, are no longer supported by and fixed to a rigid frame, but are
15 maintained by the ends of arms. The flexibility of these arms allows them to flex under the weight of a person.

The laths or groups of laths constituting the bedspring may then flex independently from each other and swivel about their own axis through the flexibility of the
20 ball-and-socket joints, thus ensuring the flexibility of the bedspring, not only in the vicinity of its axis of symmetry, but also at the lateral ends.

It can be seen that the invention is not limited to bedsprings formed of wooden laths, but also extends to bed-
25 springs with metallic surfaces, the laths being replaced by metal lattices of similar width, while the lower laths are replaced by blades, rods or the like.

For a better understanding of the invention, there is represented in the appended drawing a non-limitative
30 example of an embodiment of the bedspring in accordance with the invention, in which :



- Figure 1 is a diagrammatic perspective view of the bed-spring;
- Figure 2 is a diagrammatic perspective view of a lath-supporting module according to the invention;
- 5 Figure 3 is a schematic view of the transverse profile of the bedspring according to the invention;
- Figure 4 shows a vertical cross-section of a satellite;
- Figure 5 is a perspective view of a module equipped with a balancing torsion bar;
- 10 Figure 6 is a schematic view of the transverse profile of a modified embodiment of a lath-type bed-spring according to the invention;
- Figure 7 is a perspective view of a second variant embodiment of the bedspring in accordance with the invention;
- 15 Figure 8 is a schematic profile view of a third variant embodiment of the bedspring in accordance with the invention;
- Figure 9 is a schematic view showing from above a modified embodiment of a main beam of the bedspring in accordance with the invention;
- 20 Figure 10 is a schematic profile view of a fourth embodiment of the bedspring in accordance with the invention.

25 From Figures 1-6, it can be seen that the bedspring 1 is of the lath type, namely that it is formed of semi-stiff longitudinal surface elements; these elements are intended for receiving a mattress and are generally disposed across the main axis 2 of the bed. The bedspring rests upon the floor through a stable and rigid bedstead forming a stationary structure or member upon which the

30 laths will come to rest.



According to the invention, the laths 3 are mounted in a floating fashion : their ends 4 are no longer resting upon a frame or some other traditional similar element which prevents any movement by the lath ends located on one same side; the laths are mounted on supports : they are linked to the ends 23 of arms 5 which are flexible, as well as the laths, which arms are mounted at their other end on the structure 6, which is fixed in respect of the ground.

Since the laths 3 and the arms 5 are flexible, when a force is applied to the end 4 of the lath, the arm supporting this lath flexes downwards together with this lath, along a height H, as shown in Figure 3, while opposing some resistance to the applied force F. When this force disappears, the arm rises again and will simultaneously cause the lath to rise again to its initial position.

According to the invention, the stationary structure or member comprises at least one beam 7 which extends over-all parallel to the longitudinal axis 2 of the bedspring, and approximately along the whole length of the bedspring between the ends thereof. The beam is mounted in non-removable fashion on the bedstead 8. In the example illustrated in Figure 1, the beam is made of a single integral rigid piece, and it is mounted on two crossbars 10 located on the ends and carrying the legs 11. In the modified embodiment of Figure 6, the beam comprises several rigid portions 12 hinged together about horizontal axes 20. One of the rigid portions, namely 12', is mounted on a support 9 constituting the bedstead.

The beam carries a plurality of flexible lower supports or arms 5 which extend from both sides of the beam. Preferably, they extend substantially across the beam axis 2, but any other disposition may be envisioned without departing from the scope of the invention.

In the first embodiment (Figures 1 to 5), the arms 5 are fastened to the ends 4 of the laths 3.

The bedspring is constituted of independent juxtaposed modules 13, each one of which comprises :

- at least one upper lath 3 (two laths in the example), and at least one lower lath 5 running across the full width of the bedspring ;
- two connecting members or connecting satellites 14, one at each end 4 of laths, intended for assembling together the lower lath or laths with the upper lath or laths.

10 The connection between the end of an arm 5 and the lath 3 is flexible : it is in fact necessary that this connection should not prevent the lath and the arm to come closer to each other as they do when flexing. For this purpose, each satellite 14 comprises an end piece 15 in
15 the form of a socket or of a ball-and-socket joint, made of rubber, intended for receiving the end of the upper or lower laths, or else of all the laths. However, in order to retain a certain firmness of the connection it is provided to mount the ends of the lower laths 5 onto a solid
20 piece 16, without any clearance or flexibility (as by screwing or otherwise), while the flexible ball-and-socket joints are mounted, for example, at the upper side of said solid piece, as shown in the Figures.

 The ball-and-socket joints 15 have two main functions
25 : the first one is to allow for some torsion of the element received therein (lath or arm) about its longitudinal axis, as illustrated by arrow "f" in Figure 4, the second function being to allow relative longitudinal movement of the elements, laths and arms, during the flexions : the laths
30 slide in respect of each other. The semi-rigid mounting of the satellite with the solid piece 16 interposed between the lower and upper laths also makes it possible to use the torsional flexibility of the module, as indicated by the arrow F.

35 The modules 13 are preferably disposed on the beam,

approximately at their middle, and perpendicularly, so that the beam is then forming the symmetry axis of the bedspring.

The modules 13 are also preferably evenly distributed along the beam, but it is possible, on the contrary, to provide an uneven distribution, for example a closer distribution at the levels having to sustain heavier stresses. It is further possible to use modules with variable characteristics (areas of the laths, intervals, strength ...), with constant intervals between the modules.

The lower lath 5 is mounted onto the beam 7 in such manner that the module is carried by the beam in a practically non-removable fashion (except for dismantling). The mounting is rigid and without any clearance : the lath portion 17 applied on the beam is stationary, regardless of the strains applied to the upper laths, that is to the bedspring. This feature is important since it ensures, without any complementary device, the general stability of the bedspring when an effort is applied to the end 4 of one or several laths.

On another hand, stability is ensured by the base area of the bedstead : the spacing of the legs 11 will preferably be determined so that the area of sustentation may correspond to the bedspring area, particularly in the case of a single bed.

It can be seen that the bedspring in accordance with the invention is thus formed of a succession of upper laths 3 assembled in pairs into independent modules 13 resting upon a single bottom beam 7 to which they are held. The upper laths are represented as being arched upwardly, but they may just as well be rectilinear, since the flexibility of the connecting members allows the lath ends to move in-



wardly as well as outwardly. The modules are deformable, owing to the flexibility of the upper and lower laths, and this deformability ensures a flexible vertical movement over the whole length of the module, that is including the ends 4.

The bedspring may present numerous modified embodiments, without departing from the scope of the invention. For example :

1. The module may comprise different numbers of laths, for the upper laths 3 as well as the lower ones 5, for instance one upper lath for each lower one, or two for two, three for one or two, etc...
2. The upper laths comprise a stiffening device formed of a back-up lath 18 placed alongside their bottom face and held by two sliding rings 19 (Figure 3). When the rings 19 are brought more closely towards the centre of the lath, the contact of the back-up lath on the lath extends only over a small portion of the surface; when the rings are spaced apart, the contact of the back-up lath on the lath extends over a larger portion of the surface : the stiffening effect increases.
3. The variant of Figure 9 illustrates a device for stiffening the support arms : the beam which extends between the two longitudinal ends 40, 41 has an uneven width 43; it has, for instance, the shape of a narrow lozenge, formed of four half-beams 44 assembled by welding or otherwise. The end 23 of the arms describes a rectilinear edge 45 parallel to the beam axis 46. The arms will then have a variable load-carrying length 47, and thus a variable flexibility, which are at a maximum at the narrowest point of the beam, and at a minimum at the widest point of the beam. In the example shown, the flexibility of the bedspring decreases from the head portion 48 towards the centre 49.



4. The lower support may be constituted by two separate rigid and non-deformable arms 5', 5" pivotally mounted on the beam about an horizontal axis 50 (Figure 10). A spring 51 or any other equivalent device is mounted between the beam 7 (or the bedstead 8') and the arm for maintaining the arm against the lath and for achieving the flexibility of the mounting.
5. The beam may be composed of several rigid portions 12, 12' hinged together about horizontal axes 20 (Figure 6). One of the rigid portions is mounted on a support 9 forming the bedstead. This variant makes it possible to fold the bed upwards or to produce a bed which can be converted into a sofa ...
6. It is possible to provide on the lath or on the lower arms 5 a torsion bar 21, as shown in Figure 5. In fact, it has been seen that, according to the invention, a force applied to the end of a module will displace this end downwards along a height H; simultaneously, the opposite end will move slightly downwards along a height h. It is possible to force this opposite end to move along an equivalent height H for obtaining a permanently horizontally balanced bedspring by disposing a bar 21, the ends thereof 22 being gripped in the end pieces 16 of the connecting member; the bar is bent into a U-shape, being maintained but able to swivel freely on the beam in a sheath 32. When a satellite 14 moves downwards, the bar swivels, and this torsion is transmitted to the other end 4, which obliges the said end to move also downwards. In the Figure, the sheath is disposed on the lower lath, but it is foreseen to mount it on the beam, which makes it possible to have the avail of longer lever arms.
7. It is possible to provide support arms or a lower lath 5 being shorter than the upper lath or laths 3. In



this variant shown in Figure 8, the ends 23 of the lower lath press against the lower surface 24 of the upper lath. These ends are fitted into a flexible socket 25 which, in turn, is fixed to the upper lath, the flexibility of the socket allowing both laths to move during flexions. It is further provided to mount at the ends of the lower lath a connecting member with a ball-and-socket joint, as previously, but the portion receiving the upper lath or laths is rendered slidable by any means (yokes, collars, etc..) on the upper lath or laths. This variant is moreover contributing to the control of the stiffening to the extent where the arms 5 may have a variable length and therefore a relatively variable flexibility.

8. In the case of a double bed, this is formed of two identical elementary bedsprings 1, placed in parallel in a known manner. As a variant, there is further provided the following disposition : each one comprises a beam 7, but this beam may preferably be offset towards the bed centre, in respect of the symmetry axis 2 of its respective bedspring. In this case, the arms 5 do not have the same dimension on the two sides of the beam. This arrangement makes it possible to control the overall flexibility of the bedspring when two persons are lying down.

9. The invention also includes bedsprings which are not formed of laths 3, but rather of canvas webs 26 or of a wire mesh, as illustrated by Figure 7. In this variant, the stationary structure comprises a rigid frame 27 resting upon four legs 28 in a traditional manner. In this case, the bedspring comprises two beams 29 constituted by the two longitudinal sides of the frame and linked by a pair of cross members 33.



Each beam carries a plurality of arms 30 which extend along only one side, namely the exterior side. The arms 30 are flexible, they are formed of rods or blades or the like. On the ends 31 thereof are provided hooks or equivalent means upon which the webs are mounted and tensioned.

These various modified embodiments are obviously non-limitative and may be, more particularly, combined between them without departing from the scope of the invention.

Finally, the invention may be carried out with surface elements being different both from the laths and from the tensioned canvas webs, particularly through the use of elements made of composite materials.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A lath-type bedspring of the kind constituted by a succession of modules each comprising in its upper region at least one lath carried by a lower support mounted on a rigid longitudinal beam, said beam being fixed with respect to the ground, characterized in that the lower support and the at least one upper lath are linked together by a flexible connection member in order to allow relative movements between the at least one upper lath and the lower support, and in that the modules are separate from each other, so that their movements are independent.

2. A bedspring according to claim 1, characterized in that the module comprises several identical upper laths for one lower support.

3. A bedspring according to claim 2, characterized in that the connecting member or satellite comprises a non-deformable rigid piece on which is mounted a socket or ball-and-socket joint made of rubber, intended for slidably receiving and maintaining the lath or laths, and under which is screwed the end of the support.

4. A bedspring according to claim 3, characterized in that the span of the lower support is shorter than that of the upper lath or laths and the socket of the connecting member has the shape of an open loop intended for receiving and maintaining the upper lath while allowing for a relative displacement of the lath on the support.



5. A bedspring according to any one of claims 1 or 2, characterized in that the lower support is constituted by opposite arms which extend laterally.

6. A bedspring according to any one of claims 1 or 2, characterized in that the at least one upper lath is a canvas web or a metallic lattice.

7. A bedspring according to claim 5, characterized in that the lower support is constituted by two non-deformable rigid arms pivotally mounted on the beam about an horizontal axis and each provided with a spring
5 or equivalent means which lifts the arms upwardly.

8. A bedspring according to claim 5, characterized in that the beam has a variable width, and the end of the arms describes a rectilinear edge so that the arms which extend from each side thereof have a variable length.

9. A bedspring according to claim 5, characterized in that the beam comprises two parallel elements rigidly connected to each other by at least one crosspiece, each one carrying a plurality of arms extending over only one
5 side towards the exterior.

10. A lath-type bedspring, substantially as herein described with reference to any one of the accompanying drawings.

DATED this 1st Day of December, 1993

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of SHELSTON WATERS



FIG. 1

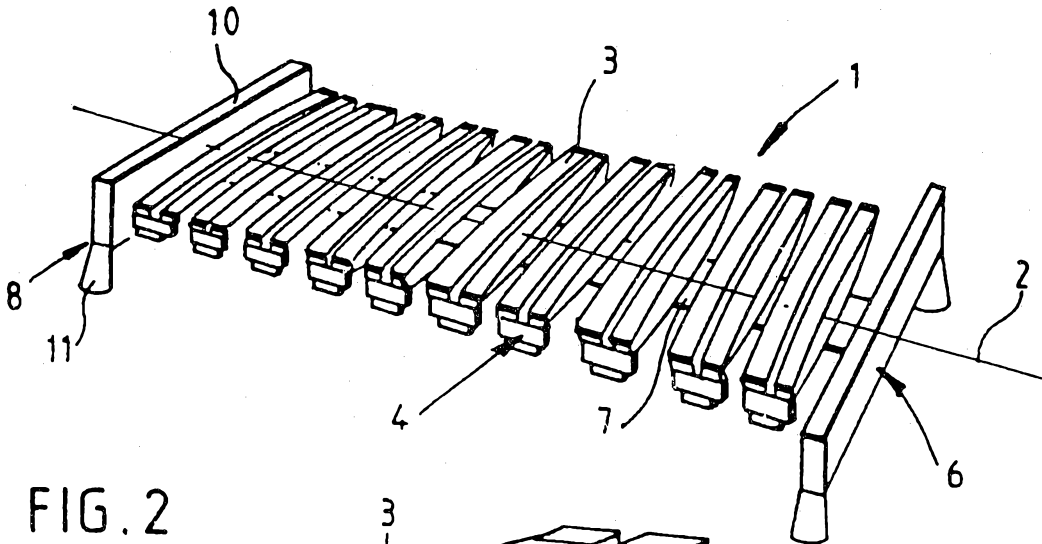


FIG. 2

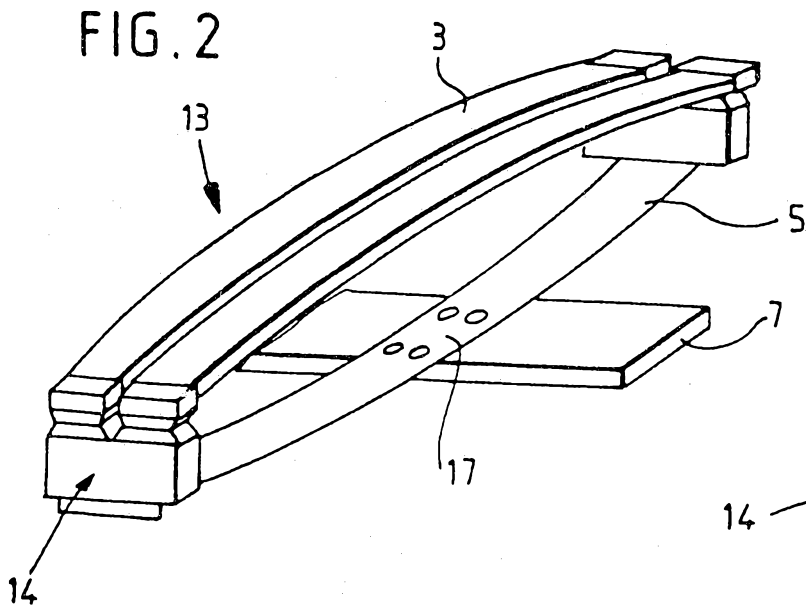


FIG. 4

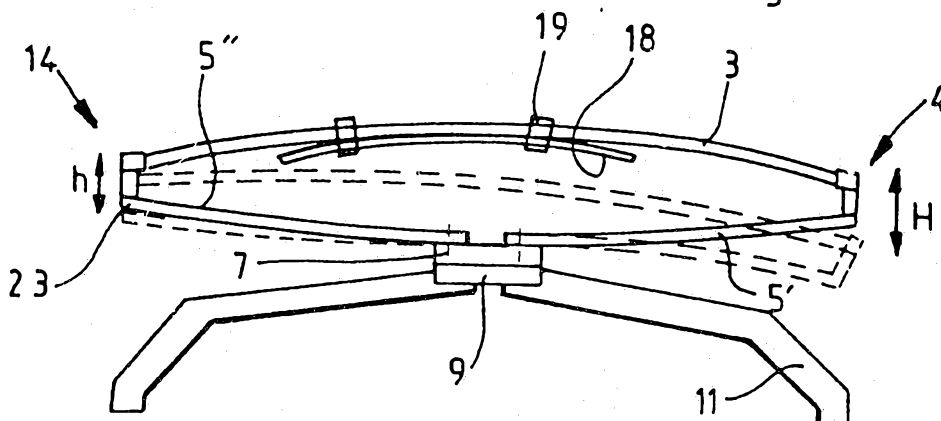
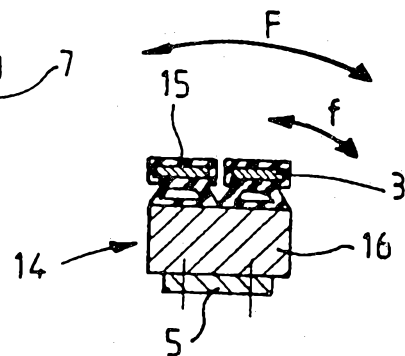


FIG. 3

FIG. 5

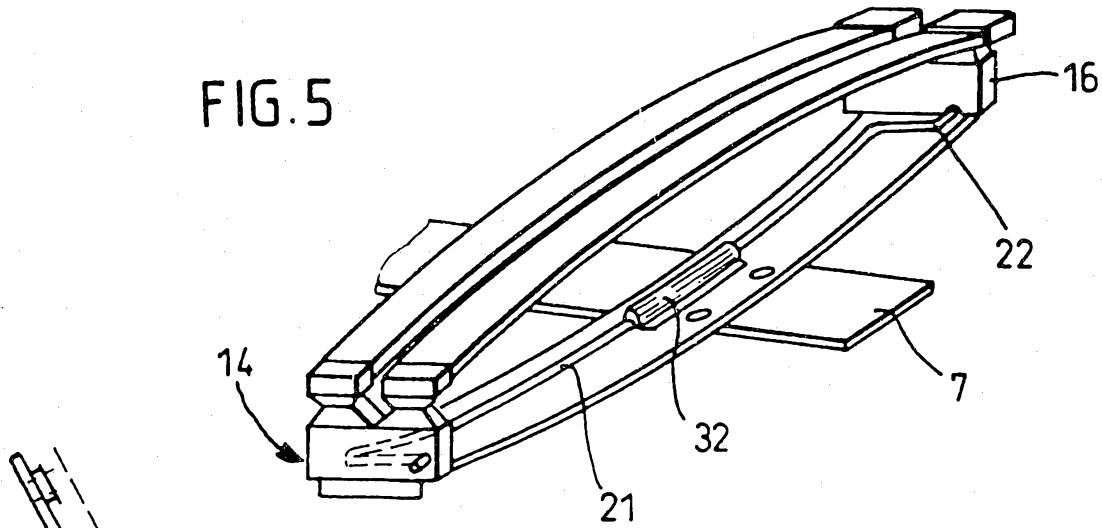


FIG. 6

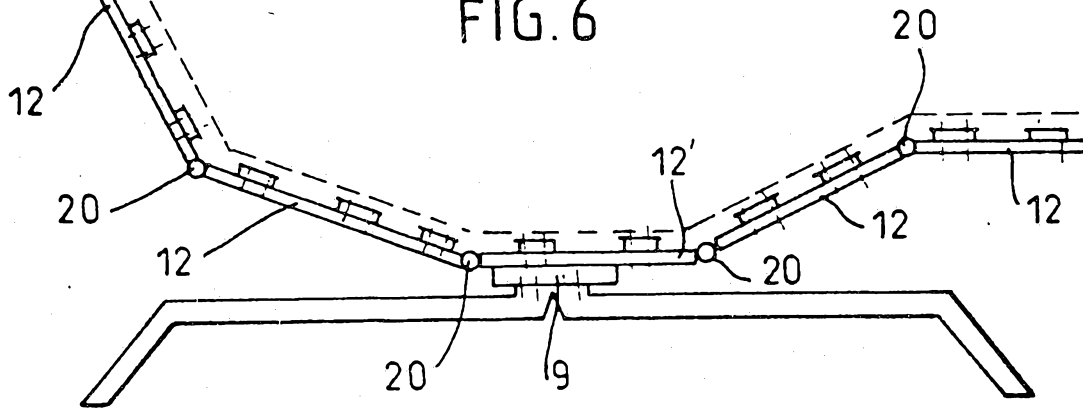


FIG. 10

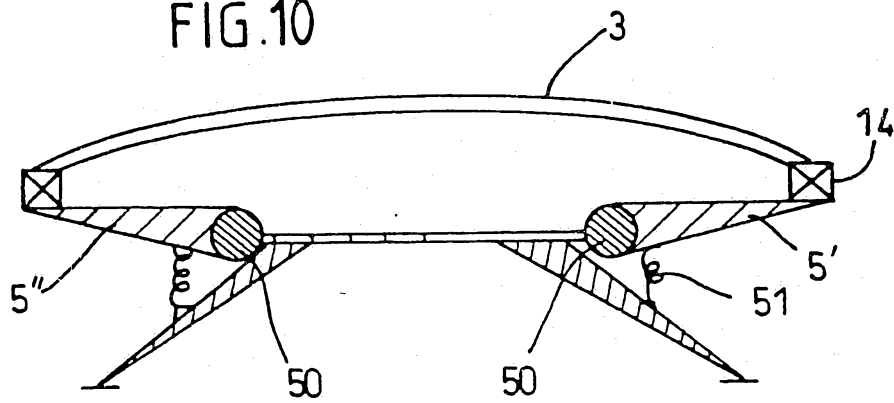


FIG. 7

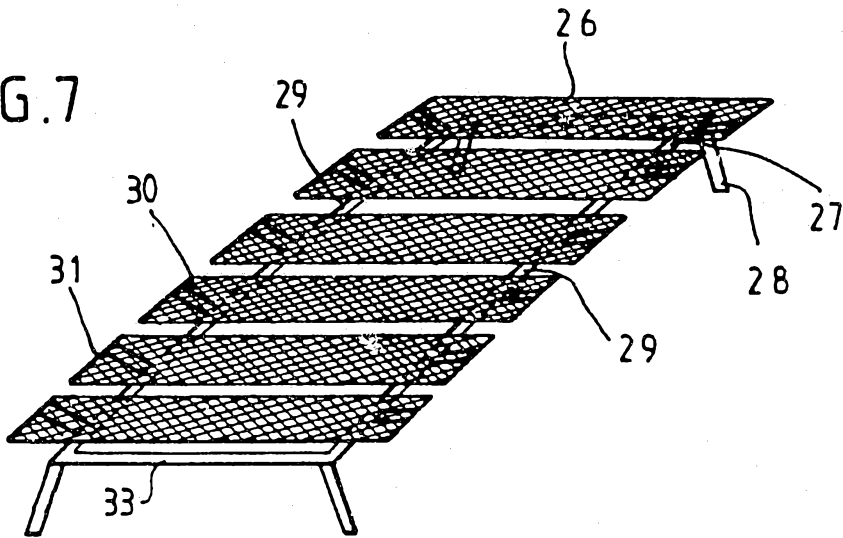


FIG. 8

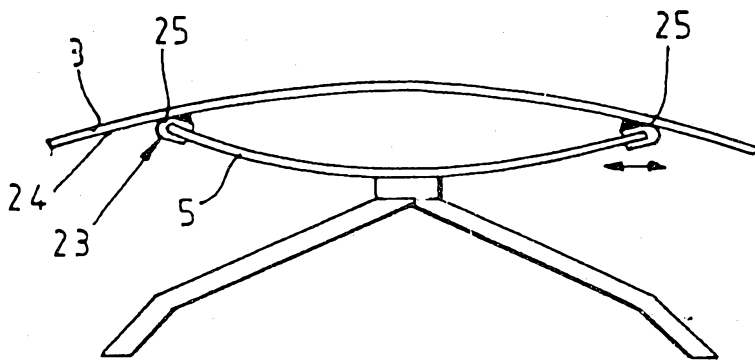
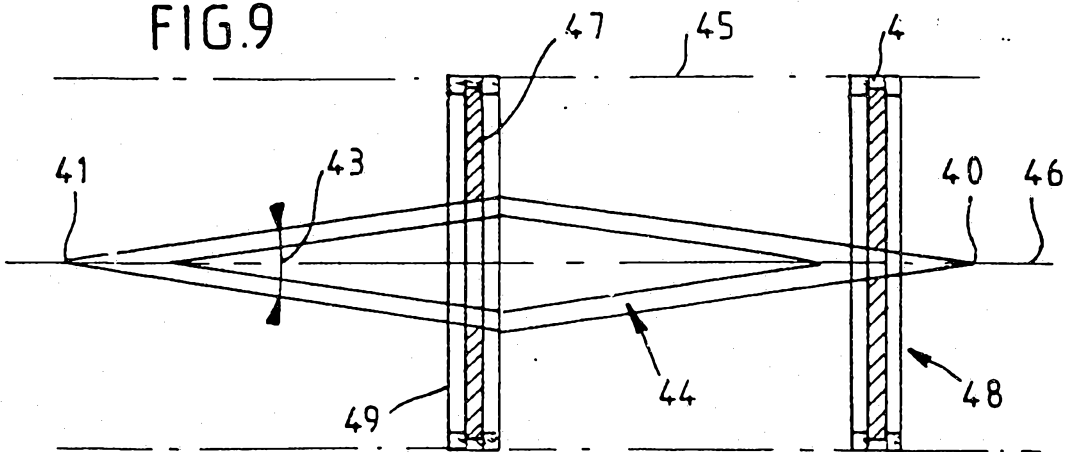


FIG. 9



INTERNATIONAL SEARCH REPORT

International Application No PCT/FR 91/00511

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl.5	A 47 C 23/06	A 47 C 23/30 A 47 C 31/12
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl.5	A 47 C	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category ¹⁰	Citation of Document ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
Y	US.A.2414978 (RICHARDSON) 23 January 1947. see column 2, lines 25-49; column 3, line 27 - line 31; figures 1-3.6	1
A	---	3
Y	CH.A.379712 (FELBER) 31 August 1964. see the whole document	1
A	---	1.2
A	EP.A.0150673 (INDUSTRIE EN HANDELSMIJ RIVIERA B.V.) 7 August 1985. see abstract; figures	1-3
A	DE.U.3803805 (PLANETE HAUSGERÄTE GmbH & CO. ELEKTROTECHNIK KG) 31 August 1989. see page 7, paragraph 9 - page 8, paragraph 3; page 8, paragraph 5; figures	5-7
A	FR.A.782792 (CHOUMATCHER) 12 June 1935 see page 1, line 30 - page 2, line 19; figures	---
A	FR.A.2196134 (HEDREUL-TANOUARN) 13 March 1974. see page 2, paragraph 2- paragraph 3; figures	---
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"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</p> <p>"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"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.</p> <p>"Z" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
9 October 1991 (09.10.91)	5 November 1991 (05.11.91)	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE		

ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.

FR 9100511
SA 49176

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 29/10/91. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 2414978		None	
CH-A- 379712		None	
EP-A- 0150873	07-08-85	NL-A- 8400147 DE-A- 3562862 DE-U- 8500644	01-11-84 30-06-88 11-07-85
DE-U- 8809806	31-08-89	None	
FR-A- 782792		None	
FR-A- 2196134	15-03-74	None	