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(54) **BED BASE**

(57) A bedspring is described for supporting a mattress, comprising a perimeter frame, a mesh or grid, central to and integral with the frame, to support the mattress, and a containment member movable between a first position, in which one free end thereof protrudes orthogonally with respect to the upper surface of the mesh or grid to form at the frame a containment obstacle for the mattress, and a second position in which said free end does not protrude with respect at the upper surface of the mesh or grid.

To automatize the motion of the containment member, there are provided thrust means or a thrust member for applying to the containment member a force or a torque that pushes it towards at least one of said positions.

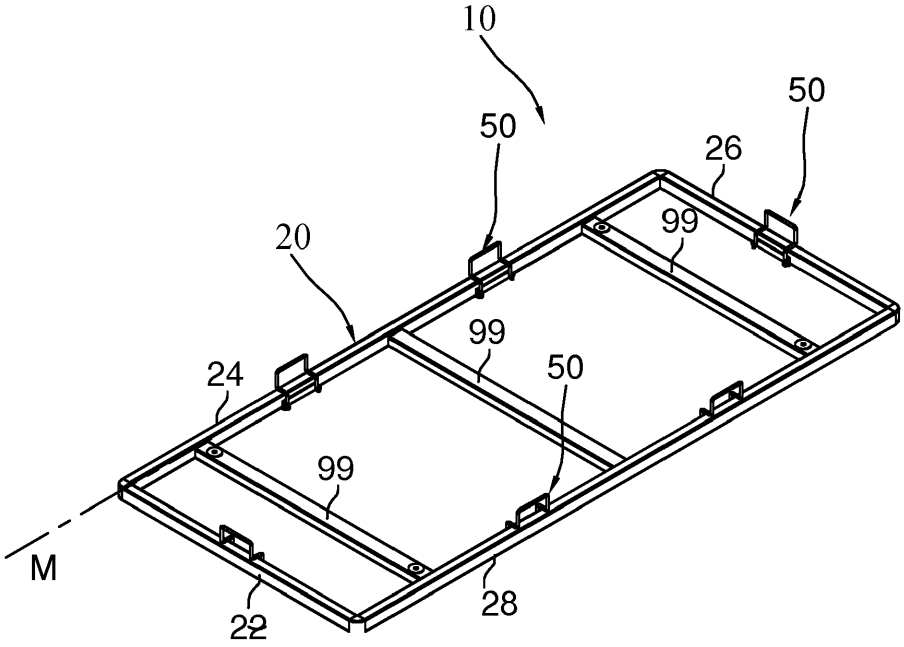

Fig. 2

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Description

[0001] The invention refers to an improved bedspring, in particular to be mounted on a ship's cot or berth.

[0002] To set up ship beds, taken as an example here, it is known to produce a particular bedspring to support the mattress. The bedspring comprises a perimetral, usually rectangular, frame which frames a mesh or grid on which the mattress rests. Containment arches for the mattress are mounted on opposite sides of the frame. Each arch is foldable and retractable: by rotating it can lift from the bedspring to form an obstacle for the mattress (like a fence), and can flatten itself on the bedspring so as not to protrude and not create bulk during transport.

[0003] A problem with these arches is that they often accidentally end up in the unwanted position during cleaning or maintenance.

[0004] The main object of the invention, defined in the attached claims in which the dependent ones define advantageous variants, is to improve this state of the art. Particular object is to produce a bedspring for bed with improved functionality.

[0005] At least one object is achieved by a bedspring for supporting a mattress, comprising:

- a perimeter frame,
- a mesh or grid, integral with and central to the frame, for supporting the mattress,

    - a movable containment member which is connected to the frame and
      configured to move between a first position, in which one free end thereof protrudes orthogonally with respect to the upper surface of the mesh or grid (where the mattress rests) for forming a containment obstacle for the mattress at the frame, and a second position in which said free end does not protrude with respect to the upper surface of the mesh or grid.

[0006] Thrust means or a thrust member are provided on the bedspring for applying to the containment member a force or torque which pushes it towards at least one of said positions.

[0007] Thanks to the thrust means or member, the containment member is autonomously moved towards, or remains in, one of said positions, thus its accidental unwanted positions are avoided. Besides, there is the benefit that the containment member is able to self-position, and one doesn't need to bend down to move it.

[0008] Generally speaking, the containment member can be advantageously applied to any bedspring for mattress, in particular those that require less space during transport.

[0009] Another example of the use of this system occurs in the case in which two single bed bedsprings according to the invention are placed side by side to obtain a king-size bed. Then the containment members along the adjacent sides of the two bed bedsprings can be lowered, to have useful space to contain a king-size bed mattress.

[0010] The containment member is mounted on the frame to translate and/or rotate with respect to it. Preferably, the containment member is only hinged on the frame to only rotate with respect to it.

[0011] In said second position the containment member may be arranged for example:

substantially flush with the top (in use) surface of the mesh or grid, and/or
in a position angularly opposite to the first position .

[0012] Preferably said thrust means or member are configured for applying to the containment member a force or torque which pushes it towards at least one of said positions and keeps it in that position, for greater convenience and stability of use.

[0013] In a variation, said thrust means or member comprise or consist of elastic means or an elastic member, e.g. a spring (e.g. coil- or cup-shaped) or an elastic cord.

[0014] In a variation, said thrust means or member comprise or consist of an anchoring member integral with the frame to which the containment member is coupled, e.g. hinged. In particular, the anchoring member is flexible and adapted to apply, thanks to an elastic deformation of an elastically flexible portion thereof, an elastic force or torque to the containment member, the containment member being hinged to the elastically flexible portion and/or or sliding on the elastically flexible portion to receive the force or torque from it.

[0015] In another preferred variant, the bedspring comprises an anchoring member, integral with the frame, to which the containment member is coupled, e.g. hinged, and said thrust on means or member are adapted to move the containment member relative to the anchoring member.

[0016] In particular, said anchoring member comprises or consists of two parts, e.g. fins, which protrude from the frame to which the containment member is hinged and on which the containment member can slide, the parts being in particular relatively oriented so as to lie on imaginary planes which diverge from or converge towards the center of the frame.

[0017] More specifically, the bedspring comprises a plate which is fixed to the frame and comprises two ends curved to respectively create said two parts.

[0018] In a preferred variant the containment member is filiform, and e.g. folded in space to form the edges of a barrier for the mattress.

[0019] In a preferred variant, the containment member is adapted so that in the first position a portion thereof abuts against the frame, preventing the continuation of the movement of the containment member.

[0020] Another improvement is achieved if the bedspring comprises an obstacle means or member for me-

chanical interference against the containment member in order to maintain the containment member in one or more angular positions. For maximum practicality and compactness, said obstacle means or member are provided or mounted or integrated on said thrust means or member. Thus, stable or quasi-stable positions can be determined for the containment member along its stroke, e.g. an angular stroke, avoiding the unwanted precaution of having to fix it or put it back in place.

[0021] Preferably, the obstacle means or member comprise or consist of a point of increased friction or resistance to the motion of the containment member. Said point is for example placed along the stroke of the containment member. Said point, which may be an obstacle or work by opposition of parts, is easily producible and gives positional precision.

[0022] More preferably said point is placed on or in said elastic portion.

[0023] As most preferred embodiments said point comprises or consists of

a recess, such as a notch or a seat, or a relief, such as for example a cusp or a tooth; and/or
a member protruding towards the containment member, in particular towards a segment thereof which slides on said protruding parts or fins.

[0024] Said protruding member is for example raised substantially orthogonally with respect to one of said planes or extends towards the rotation axis of the containment member.

[0025] In particular, said protruding member is a curved portion of one of said protruding parts or fins, wherein the curvature is directed towards a direction substantially orthogonal with respect to one of the planes P1, P2 and/or towards the rotation axis of the containment member.

[0026] Said protruding member may be a member fixed to one of said protruding parts or fins or a portion of said protruding part or fin curved as defined above.

[0027] Another aspect of the invention is a ship equipped with one or more of said bedsprings.

[0028] Another aspect of the invention is a method of setting up, wherein one or more of the said bedsprings is installed on a ship.

[0029] The advantages of the invention will be even clearer from the following description of a preferred system, wherein

- Fig. 1 shows a three-dimensional view of a bedspring for bed;
- Fig. 2 shows the bedspring in Fig. 1 in a three-dimensional view without a central grid;
- Fig. 3 and 4 show, in an enlargement of Fig. 2, two operational configurations of a containment member;
- Fig. 5 shows a schematic view of a geometry of the bedspring in Fig. 1;
- Fig. 6 and 7 show variants for the bedspring of Fig. 1.

[0030] In the figures equal elements are indicated by equal numbers, and in order not to crowd the drawings sometimes only some numbers are indicated.

[0031] The bedspring 10 comprises a perimeter frame 20 formed of four uprights 22, 24, 26, 28 (numbered clockwise), which for example are tubular structures. In the example the frame 20 is rectangular (but not necessarily); and the uprights 24, 28 are the long sides of the frame 20,

[0032] A mesh or grid 40 is mounted integrally with the center of the frame 20 to support a mattress (not shown). Preferably there are beams 99 fixed between the uprights 24, 28 to facilitate the support of the mesh or grid 40.

[0033] On at least one of the uprights 22, 24, 26, 28, and/or on at least two opposite uprights chosen among the uprights 22, 24, 26, 28, are mounted one or more containment members 50. However, the arrangement and number of the containment members 50 is not essential.

[0034] One or each member 50 is e.g. filiform, in particular formed of a segment of metal or plastic rod, folded or curved to form a sort of three-dimensional step.

[0035] In the preferred embodiment, the member 50, starting from the center towards its ends, comprises:

a linear segment 52 extending along an X axis,
two equal linear segments 54 which extend respectively from the ends of the segment 52 along a Y1 axis orthogonal to the X axis,
two equal linear segments 56 which extend respectively from the ends of the segments 54 along a Z axis orthogonal to the plane containing the X and Y1 axes,
two equal linear segments 58 which extend respectively from the ends of the segment 56 along a Y2 axis parallel to the plane containing the X and Y1 axes,
two hooked terminations 60, placed at the ends of the segments 58, which diverge with respect to the segment 52 along directions which are opposite and parallel to the X axis.

[0036] The containment member 50 can also be more massive than illustrated, e.g. formed of flat pieces, such as sheets or blocks, which extend respectively to fill the space between the two segments 54, and/or between the two segments 56, and/or between the two segments 58,

[0037] The hooked terminations 60 are rotatably inserted into respective holes 72 provided in two parts protruding on/from the upright 24, 28. These protruding parts are for example two fins 70 which protrude from the surface of an upright (e.g. 24, 28) which faces towards the opposite upright (e.g. 28, 24), i.e. they protrude from the internal perimeter of the frame 20.

[0038] The fins 70 belong to a sheet metal plate 80

fixed on one of the uprights 22, 24, 26, 28. Or the protruding parts are curved tabs made by cutting the body of an upright 22, 24, 26, 28, which in this case is necessarily hollow, or bushes may be fixed to an upright 22, 24, 26, 28. The hooked terminations 60 are inserted into the cavities of the bushings or into holes provided in the fins.

[0039] The protruding parts are distant from each other approximately as much as the length of the segment 52 to snugly accommodate the member 50 in the middle.

[0040] From what has been described, it follows that the member 50 is hinged to the protruding parts (and to the upright to which it belongs) about a W axis parallel to the X axis and parallel to a longitudinal M axis relative to the length of the upright to which that member 50 is hinged.

[0041] The member 50 is configured to rotate by 90 degrees about the W axis to take itself to a first position (Fig. 4) or a second position (Fig. 3).

[0042] In the first position the free end of the member 50, i.e. substantially the assembly of the segments 52, 54, protrudes orthogonally with respect to the lying plane of the mesh or grid 40. The segments 56, 58 now rest on the respective upright to which they are hinged, and the Y1, Y2 axes have rotated by 90 degrees placing themselves orthogonal to the lying plane of the mesh or grid 40.

[0043] In the first position the segments 52, 54 are erected on the upright to which the member 50 is hinged, and form a containment obstacle for the mattress to prevent it from moving from the center of the mesh or grid 40 towards the outside.

[0044] In the first position the segments 56, 58, which form a right angle between each other, have rested on the sides of the upright to which the member 50 is hinged, forming a stable support base for the member 50 on such upright and preventing a further rotation about the W axis. Preferably the cross-section of the upright to which the member 50 is hinged is polygonal, to offer the segments 56, 58 a flat support surface.

[0045] In the second position the member 50 remains flush with the upper surface of the mesh or grid 40. The lying plane of the X-Y1 axes is parallel to the lying plane of the mesh or grid 40, i.e. the segments 52, 54 rest on top of the mesh or grid 40 and the other segments are under the mesh or grid 40. Or, if the mesh is absent or has fairly large meshes, in the second position the member 50 has rotated by 180 degrees about the W axis with respect to the first position, that is, the lying plane of the X-Y1 axes is again orthogonal to the lying plane of the mesh or grid 40 (looking Fig. 3, the member 50 rotates clockwise by additional 90 degrees about the W axis).

[0046] The bedspring 10 comprises a thrust means or member for applying to the containment member 50 a force or torque that pushes it towards, and preferably keeps it in, at least one of said two positions, in particular the first. Such means are preferably made without adding other components and exploiting the elastic reaction of said protruding parts.

[0047] For this purpose, the holes 72 are on respective surfaces 74 of the protruding parts which do not lie on parallel planes but on imaginary planes P1, P2 which converge towards the center of the bedspring 10 or frame 20. Fig. 5 shows the planes P1, P2 in the case of a containment member 50 mounted on the upright 24. In this way the surfaces 74 touch and interfere with the relevant segment 58. As a result of the convergent geometry of the surfaces 74, as the segments 58 lower passing from the first position to the second position they undergo an antagonistic force created by the elastic reaction of the surfaces 74 (and the fins 70) which are forcibly moving apart. The surfaces 74 (and the fins 70) then tend to move closer towards each other to return to the configuration assumed in the absence of effort and push the segments 58 backwards to return them to the first position.

[0048] The effect is pronounced with the fins 70, which are elements that can easily be provided with a lot of flexibility, e.g. by building them out of metal. The tip of the fins 70 touches and interferes with the relevant segment 58, and from this the aforementioned counteracting force is generated.

[0049] Said thrust means or member may be made also to apply to the containment member 50 a force or torque which pushes it selectively towards both said two positions. For this purpose, said thrust means or member are, for example, structured to generate the counteracting force only when the member 50 is halfway through the angular stroke between the first and second position. The force thus acts to push the member 50 towards the origin or destination of its angular stroke. For this purpose it is possible, for example, to orient the planes P1, P2 to generate a counteracting force only when the member 50 is halfway its angular stroke between the first and second positions.

[0050] In a variant the planes P1, P2 are diverging towards the center of the frame 20. Then for example the member 50 has the terminations 60 facing towards each other and is hinged on the external sides of the fins 70 or of said protruding parts.

[0051] In a variant, one or each of the fins 70 or of said protruding parts is improved by replacing at least one of them with the fins or protruding parts 170a or 170b, see. Fig. 6, which envisage an obstacle means or member for mechanical interference against the member 50. While in figures 1-5 the perimeter edge of the fins 70 or of said protruding parts was smooth, to facilitate a sliding of the member 50, that of the fins 170a, 170b is indented. For comparison sake, Fig. 6 shows a view with the profile of the fins 70, 170 (looking in Fig. 4 along the W axis).

[0052] The fin 170a has a notch 190a to accommodate the edge of the member 50, in particular of the segment 58, to stabilize the angular position of the member 50 when erect (to contain the mattress). Alternatively or in combination, the fin 170a has a notch 190b to accommodate the edge of the member 50, in particular of the segment 58, to stabilize the position of the lowered member 50. The notch 190b may be angularly located ahead

90 and/or 180 degrees of rotation about the W axis (i.e. diametrically opposite to the notch 190a).

[0053] To stabilize the angular position of the member 50, the fin 170b has instead various notches 190c to accommodate the edge of the member 50 or the segment 58. The notches 190c are distributed on the edge of the fin 170b with variable or constant angular pitch. The fin 170b allows the member 50 to be kept stationary in various intermediate angular positions between the first and second positions. The number of notches 190c may vary.

[0054] In a variant, the fins 70, 170a, 170b or said members, see fin 270 in Fig. 7, can still be improved. The fin 270 comprises a different obstacle means or member for maintaining the member 50 in one or more angular positions. Such means or member is a projection 272 facing the member 50, in particular facing the segment 58. For example, the projection 272 is raised substantially orthogonally with respect to one of the planes P1, P2 so as to intercept the member 50 and/or the segment 58. The projection 272 may be an member fixed to the fin or a portion of the fin itself curved towards the W axis or curved towards a direction substantially orthogonal to one of the planes P1, P2. The curvature is towards the direction by which the curved portion interferes with the rotation of the member 50 .

[0055] Then the projection 272 is arranged as a direct obstacle along the stroke of the member 50. In order for the member 50 to overcome the fin 272, it is necessary to apply a greater force to it to flex the fins 272 more. This resistance defines privileged angular positions for the member 50.

Claims

1. Bedspring for supporting a mattress, comprising:

- a perimeter frame,
- a mesh or grid, central to and integral with the frame, to support the mattress,
- a containment member which is

  connected to the frame and
  configured to move between a first position, in which one free end thereof protrudes orthogonally with respect to the upper surface of the mesh or grid to form at the frame a containment obstacle for the mattress, and a second position in which said free end does not protrude with respect at the upper surface of the mesh or grid,

- thrust means or a thrust member for applying to the containment member a force or a torque that pushes it towards at least one of said positions.

2. Bedspring according to claim 1, wherein the containment member is hinged on the frame to only rotate with respect to it.

3. Bedspring according to claim 1 or 2, wherein said thrust means or member are configured for applying to the containment member a force or torque which pushes it towards at least one of said positions and maintains it in that position.

4. Bedspring according to any preceding claim, wherein said thrust means or member comprise or consist of elastic means or an elastic member.

5. Bedspring according to any preceding claim, wherein said thrust means or member comprise or consist of an anchoring member integral with the frame to which the containment member is coupled.

6. Bedspring according to claim 4 or 5, wherein the anchoring member is flexible and adapted to apply, thanks to an elastically flexible portion thereof, an elastic force or torque to the containment member.

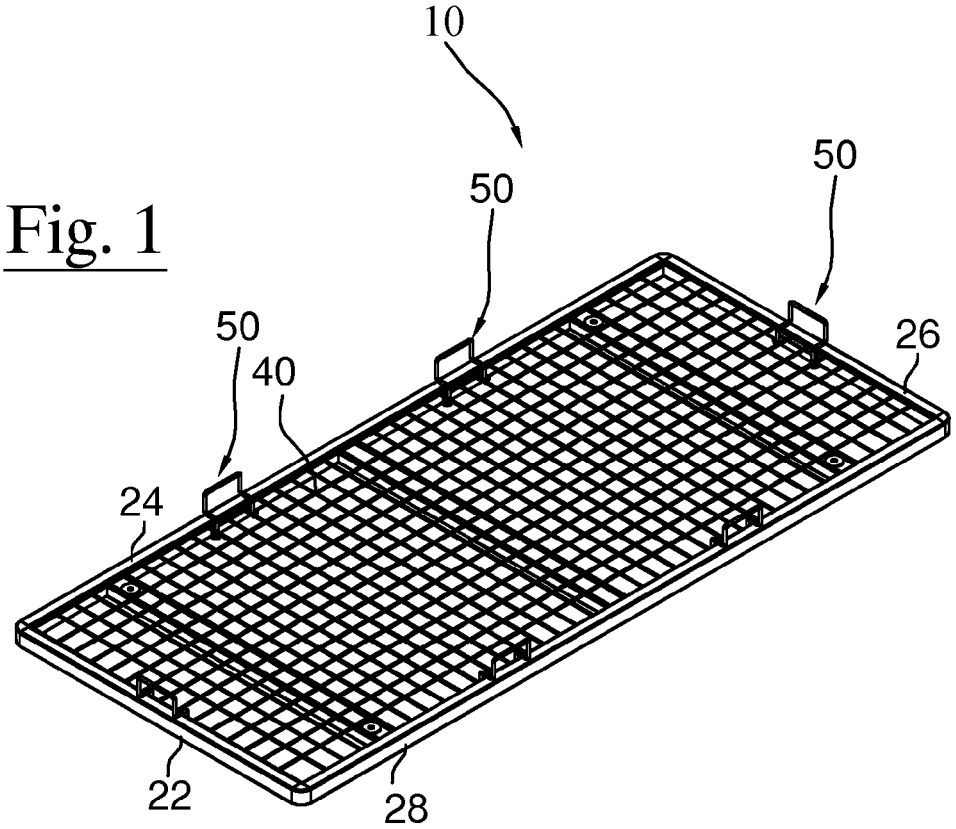
7. Bedspring according to claim 6, wherein the anchoring member comprises or consists of two parts projecting from the frame to which the containment member is hinged, the parts being relatively oriented so as to lie on imaginary planes which diverge or converge towards the center of the frame.

8. Bedspring according to claim 2 and any preceding claim, comprising mechanical interference obstacle means or a mechanical interference obstacle member for maintaining the containment member in one or more angular positions, said mechanical interference means or member being provided on said thrust means or member.

9. Bedspring according to claim 8, wherein said obstacle means or member comprise or consist of a point of increased friction for the containment placed along a stroke of the containment member.

10. Bedspring according to claim 6 and 9, wherein said point comprises or consists of a relief or a recess made on said elastic portion.

Fig. 1



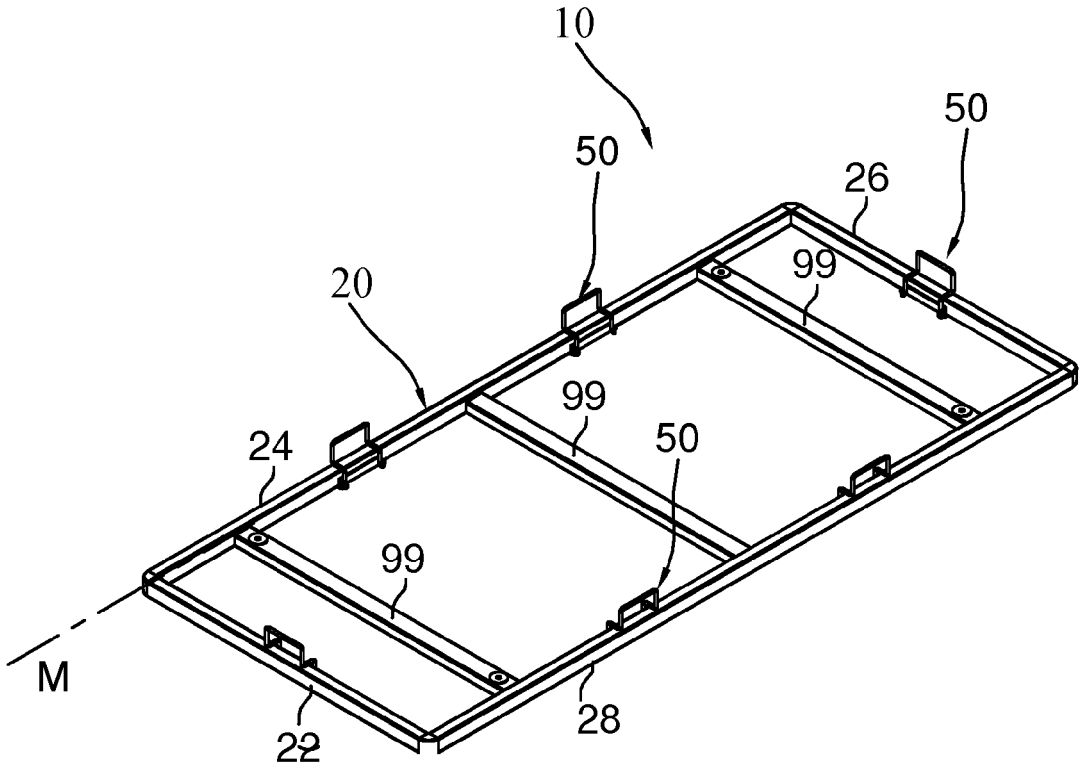
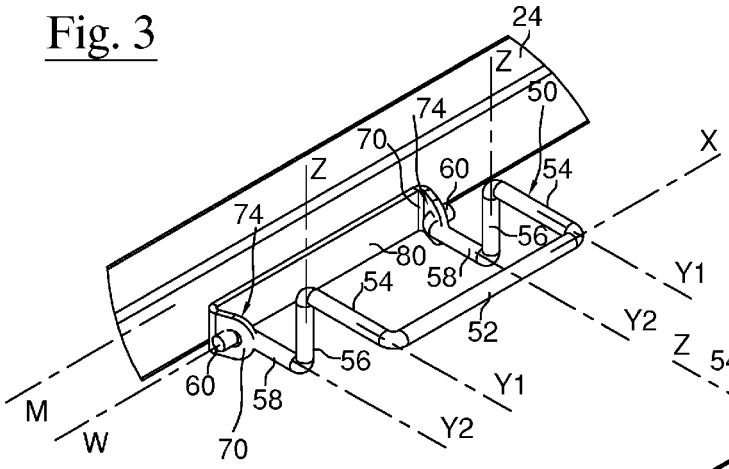


Fig. 2

Fig. 3



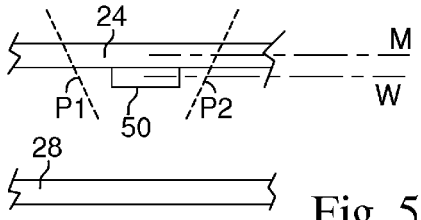


Fig. 5

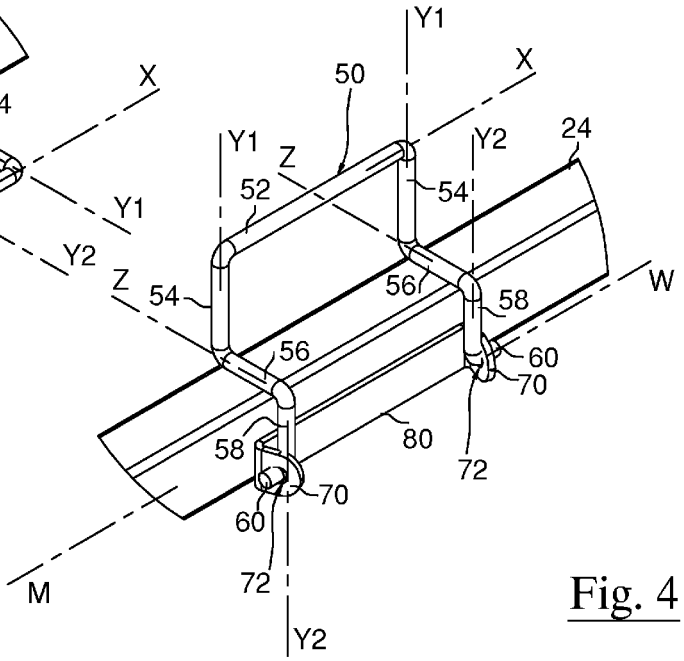


Fig. 4

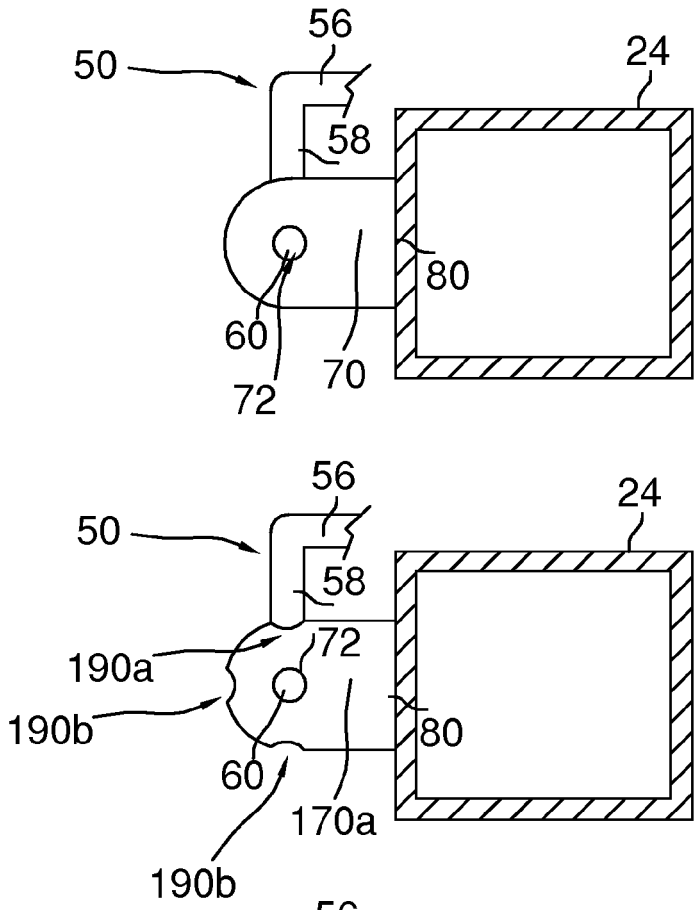

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Fig. 6

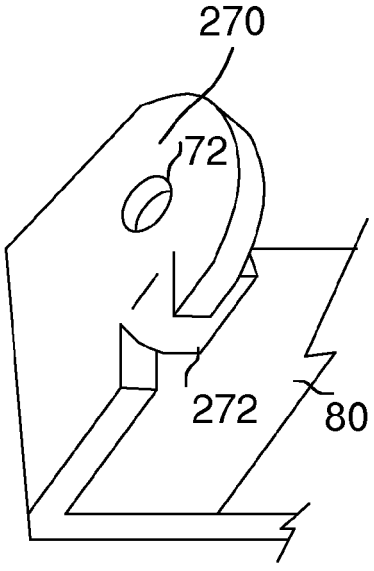
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Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 23 18 9937

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	US 2 198 982 A (MARY TWOMEY NORA) 30 April 1940 (1940-04-30) * figures 1-3 *	1-4,8,9	INV. A47C21/02
X	US 1 371 098 A (JONES MARIANA T) 8 March 1921 (1921-03-08) * figures 1, 2, 5 *	1-3,5,8,9	
X	US 1 045 563 A (KEYES JAMES T [US]) 26 November 1912 (1912-11-26) * figures 1-4 *	1-3,5,8,9	
X	US 668 884 A (ROMAINE HATTIE L [US]) 26 February 1901 (1901-02-26) * figures 1, 2 *	1-6,8,9	

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	12 December 2023	Linden, Stefan

CATEGORY OF CITED DOCUMENTS

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12-12-2023

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US 1371098 A	08-03-1921	NONE	
US 1045563 A	26-11-1912	NONE	
US 668884 A	26-02-1901	NONE	

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