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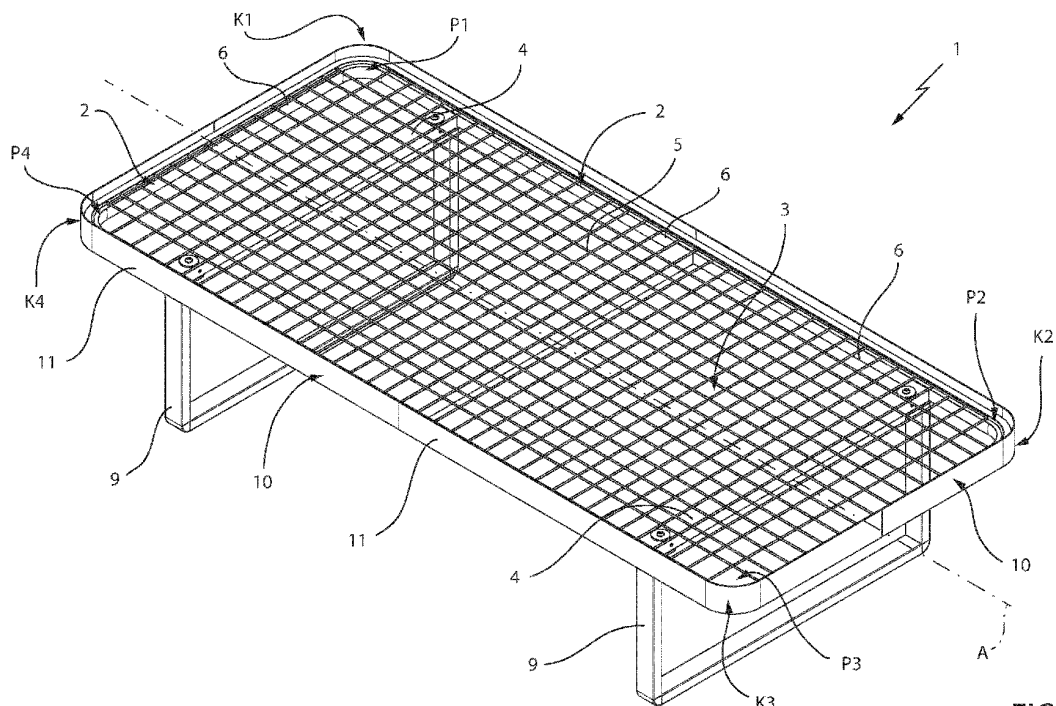
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(54) BED BASE FOR SHIP AND RELATIVE MANUFACTURING METHOD

(57) A bed base for ship (1) made of metal material comprising a support frame (2) that lies on a reference plane, a support surface (3) that is coupled to the support frame (2) so as to be parallel to said reference plane and is structured to support at least one mattress, an outer

plate-shaped containment frame (10) that is firmly coupled onto the outer side walls of the support frame (2) so as to surround the latter in an annular fashion. The outer plate-shaped containment frame (10) is arranged approximately orthogonal to said reference plane.

**FIG. 1****EP 4 005 915 A1**

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from Italian patent application no. 102020000028511 filed on November 26, 2020.

TECHNICAL FIELD

[0002] The present invention relates to a bed base for ship and to a relative manufacturing method.

[0003] In particular, the present invention relates to a bed base for ship which is particularly designed to be used inside boats such as cruise ships, military vessels or the like. The following disclosure will make explicit reference to this use without thereby losing generality.

STATE OF PRIOR ART

[0004] As is known, bed bases for ships intended for use on boats have a structure comprising a support frame, a support surface of the mattress integral with the support frame and a series of elements so-called mattress retainer that are integral with the frame and are structured to contain the mattress and act as handles for moving the bed base.

[0005] The need has arisen to be able to eliminate the presence of the traditional mattress retainer elements from bed bases for ships in order to provide aesthetically pleasing bed bases for ships, i.e. suitable for the furnishings of the cabins of modern design.

OBJECT OF THE INVENTION

[0006] The object of the present invention is to provide a bed base for ship and a method for manufacturing the same that meets the aforementioned requirements.

[0007] In accordance with this object, according to the present invention, a bed base for ship as defined in claim 1 and preferably, but not necessarily, in any one of the claims dependant thereon is provided.

[0008] In accordance with this object, a method for manufacturing a base bed for ship as defined in claim 7 and preferably, but not necessarily, in any one of the claims dependant thereon is further provided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The present invention will now be described with reference to the accompanying drawings, which illustrate a non-limiting example embodiment thereof, wherein:

- Figure 1 is a perspective view of a base bed for ship manufactured according to the principles of the present invention;

- Figure 2 is a side view, in section, of a part of the bed base for ship illustrated in Figure 1;

- Figures 3 to 9 illustrate as many operational steps of the method for manufacturing the bed base for ship illustrated in Figures 1 and 2.

PREFERRED EMBODIMENT OF THE INVENTION

[0010] With reference to Figure 1, reference numeral 1 indicates, as a whole, a bed base for ship which is particularly suitable to be used inside boats such as cruise ships, military vessels or the like.

[0011] The bed base for ship 1 comprises a support frame 2 and a support surface 3 designed to support a mattress (not illustrated). The support frame 2 and the support surface 3 are made of metal material, for example steel or the like. The support surface 3 is integral with the support frame.

[0012] According to a preferred embodiment shown in the accompanying figures, the support frame 2 has the shape of a quadrilateral. In the illustrated example, the support frame 2 preferably has an approximately rectangular shape. Furthermore, it is understood that the present invention is not limited to a rectangular support frame 2 but may envisage other shapes such as square, trapezoidal or the like.

[0013] According to a preferred exemplifying embodiment shown in Figure 1, the bed base for ship 1 has a reference axis A and comprises a series of preferably rectilinear metal rods or bars 4 with a substantially rectangular section that are arranged transverse to the longitudinal axis A.

[0014] According to a preferred exemplifying embodiment shown in Figure 1, the support surface 3 comprises a metal bed base 5 which is fixed perimetrically to the support frame 2, preferably but not necessarily resting on the underlying bars 4.

[0015] Preferably, the bars 4 have the two opposite ends fixed at the head, for example by welding, to the support frame 2, preferably to the inner side walls of the two sides of the support frame 2 parallel to the longitudinal axis A, whereas the metal base bed 5 can be fixed perimetrically to the support frame 2, at least on two parallel and opposite sides of the same, for example by welding.

[0016] According to a preferred exemplifying embodiment shown in the accompanying figures, the support frame 2 preferably comprises one or more tubular profiles 6 (cranes). The tubular profile(s) 6 extend along a longitudinal axis B and have a quadrangular, preferably rectangular section transverse to the same.

[0017] According to a preferred embodiment shown in Figures 1 and 2, the support frame 2 comprises a single tubular profile 6 that preferably has four bends P_1 - P_4 . Preferably, the four bends P_1 - P_4 are approximately right-angled (i.e. 90°) and are shaped so as to have a radius of curvature R_2 at the relative vertices. The four bends

P_1 - P_4 are made at the respective four points of the tubular profile 6 that are intended to form the corners of the support frame 2.

[0018] In other words, the initially rectilinear profile 6 is preferably shaped substantially in the shape of a rectangle and the two opposite end (or head) portions are arranged adjacent to and facing each other. In the illustrated example, the support frame 2 is preferably monolithic and is preferably made from a single tubular profile 6.

[0019] The radius of curvature R_2 is preferably comprised between approximately 80 mm (millimetres) and approximately 100 mm, and more conveniently is equal to approximately 90 mm.

[0020] In addition, in the preferred embodiment of the invention, an end portion 6a of the tubular profile 6 with a pre-set length ℓ_1 preferably has a narrowing/bottleneck 7.

[0021] The length ℓ_1 is preferably comprised between approximately 40 mm and approximately 200 mm, and more conveniently is approximately equal to 70 mm.

[0022] More specifically, the end portion 6a is preferably subjected to a deformation process, such as for example a rolling or a pressing, which has the aim to locally reduce the transverse dimensions of the end portion 6a and obtain the narrowing 7 so that it is possible to insert/engage the end portion 6a inside the opposite and facing end portion 6b of the tubular profile 6 and form the support frame 2.

[0023] According to a preferred embodiment shown in Figure 2, the tubular profile 6 has a substantially rectangular, hollow cross-section preferably having at least one upper shoulder 8 which, in use, is designed to receive resting the support surface 3, so that the support surface 3 is positioned slightly recessed in and/or substantially flush with the support frame 2.

[0024] According to a preferred exemplifying embodiment shown in Figure 2, the tubular profile 6 has a height h_1 that is preferably comprised between approximately 20 mm and approximately 60 mm, and more conveniently is equal to approximately 40 mm.

[0025] It is further understood that the support frame 2 may have a shape different from a rectangular shape, such as for example square, trapezoidal or the like, and/or may comprise two or more tubular profiles 6.

[0026] In particular, in an alternative embodiment of the invention, the support frame 2 may comprise a pair of C-shaped tubular profiles 6 mutually fixed to each other at the head or four L-shaped tubular profiles 6 and mutually fixed to each other at the head.

[0027] In addition, the bed base for ship 1 is preferably provided with a plurality of legs/feet 9 for resting on the ground, which are firmly connected to the bars 4 and/or to the support frame 2.

[0028] According to the present invention, the bed base for ship 1 further comprises a plate-shaped/band-shaped containment frame 10, which is integral with the support frame 2 and is dimensioned so as to conveniently

carry out the function of mattress retainer. Preferably, the containment frame 10 is rigidly fixed, for example by welding, onto at least two outer sides of the support frame 2 and has at least a first bend K_1 - K_4 with a first predetermined radius of curvature R_1 at a relative corner of said containment frame 10.

[0029] In the following disclosure, explicit reference will be made without thereby losing generality to a containment frame 10 that is rigidly fixed, for example by welding, onto the four outer sides of the support frame 2.

[0030] According to a preferred exemplifying embodiment shown in Figures 1 and 2, the containment frame 10 slightly exceeds the outer dimensions of the perimeter of the support frame 2. The containment frame 10 is rigidly fixed to the outer side walls/sides of the support frame 2 so as to surround and laterally cover/coat the same.

[0031] The containment frame 10 can conveniently have a height h_2 comprised between approximately 50 mm and approximately 120 mm, preferably of approximately 70 mm.

[0032] According to a preferred exemplifying embodiment shown in Figures 1 and 2, the upper annular edge of the containment frame 10 protrudes vertically in a cantilever fashion over the support frame 2 and/or over the support surface 3 by a predetermined height d_1 .

[0033] The height d_1 can be comprised between approximately 10 mm and approximately 100 mm, and is preferably equal to approximately 25 mm.

[0034] The containment frame 10 has the technical effect of externally covering/masking the support frame 2 so as to improve the aesthetic appearance of the bed base for ship 1. A further technical effect of the containment frame 10 is that of carrying out the function of locking and lateral containment of the mattress, replacing the traditional mattress retainer elements. In fact, the support frame 2 prevents the mattress from moving during the pitching and rolling movements of the boat.

[0035] With reference to Figures 1 and 2, the containment frame 10 consists of one or more plate-shaped/band-shaped strips 11 made of metal material with a rectangular section of reduced thickness.

[0036] According to a preferred exemplifying embodiment shown in the accompanying figures, the containment frame 10 is formed by four plate-shaped strips 11 rigidly fixed onto the outer side walls of the support frame 2, for example by welding. The strips 11 are substantially shaped in the shape of an L and have respective bends K_1 - K_4 , preferably right-angled, with a radius of curvature R_1 .

[0037] According to a preferred embodiment shown in the accompanying figures, the strips 11 are rigidly fixed onto the outer side walls of the support frame 2 so that the relative bends K_1 - K_4 overlap the respective bends P_1 - P_4 of the tubular profile 6 forming the support frame 2.

[0038] According to a possible embodiment, the strips 11 can conveniently be fixed rigidly, for example by welding, to each other at the head.

[0039] The radius of curvature R_1 can be comprised

between approximately 60 mm and approximately 100 mm, preferably is equal to approximately 80 mm.

[0040] Preferably, the radius of curvature R_1 of the bends K_1 - K_4 can be smaller than the radius of curvature R_2 of the bends P_1 - P_4 .

[0041] According to a different embodiment, the containment frame 10 can comprise a single strip 11 provided with the four bends K_1 - K_4 so as to be substantially shaped in the shape of a rectangle.

[0042] According to a further different embodiment, the containment frame 10 can comprise a pair of strips 11, each of which is provided with two of the bends K_1 - K_4 and is C-shaped.

[0043] With reference to Figures 3 to 10, the method for manufacturing the bed base for ship 1 having the above-described structure will be described in the following.

[0044] The method for manufacturing the bed base for ship 1 object of the present invention essentially envisages the steps of:

- pre-arranging one or more preferably rectilinear tubular profiles 6 made of metal material that are intended to form the support frame 2;
- making, on the tubular profile(s) 6, one or more bends P_1 - P_4 with the radius of curvature R_2 at the points of the tubular profile(s) 6 that are intended to form the corners of the support frame 2;
- pre-arranging one or more plate-shaped strips 11 of an appropriate thickness made of metal material that are intended to form the containment frame 10;
- making at least one bend K_1 - K_4 with the radius of curvature R_1 on the plate-shaped strip(s) 11; and
- applying the plate-shaped strip(s) 11 onto the outer side walls of the support frame 2, so that the upper annular edge of the containment frame 10 protrudes in a cantilever fashion over the support frame 2 and/or the support surface 3.

[0045] In other words, the method for manufacturing the bed base for ship 1 object of the present invention envisages fixing/positioning the plate-shaped strip(s) 11 on the lateral sides of the support frame 2, so that the upper annular edge of the containment frame 10 protrudes vertically in a cantilever fashion over the horizontal lying plane of the support frame 2.

[0046] With reference to Figure 3, the method for manufacturing the bed base for ship 1 preferably envisages, prior to the step of making the bends P_1 - P_4 on the tubular profile(s) 6, the step of making the narrowing/bottleneck 7 on the end portion 6a of the tubular profile 6.

[0047] In particular, in the preferred embodiment of the invention, the step of making the narrowing on the end portion 6a of the tubular profile 6 preferably envisages the step of deforming, by rolling or pressing, the end portion 6a of the tubular profile 6 so as to locally compress/reduce the transverse dimensions of the end portion 6a.

[0048] With reference to Figures 4 and 5, the step of

making the bends P_1 - P_4 on the tubular profile(s) 6 preferably envisages the step of positioning the tubular profile(s) 6 by means of a preferably pneumatically operated bending machine (or pipe bending machine) 100 that is structured to make the bends P_1 - P_4 .

[0049] The bending machine 100 can comprise, for example, a bending die 101 that has a curved lateral side that has a radius substantially equal to the radius of curvature R_2 ; and a preferably pneumatically operated bending member 102 that is structured to rotate a portion of the tubular profile 6 at least by an angle substantially equal to 90° so as to make one of the bends P_1 - P_4 .

[0050] In the preferred embodiment of the invention, the method envisages pre-arranging preferably a single rectilinear tubular profile 6 and making the four bends P_1 - P_4 on the rectilinear tubular profile 6 so as to shape the tubular profile 6 substantially in the shape of a rectangle.

[0051] With reference to the preferred embodiment of the invention illustrated in Figure 6, after making the bends P_1 - P_4 on the tubular profile 6, the method further comprises the step of drawing closer and engaging the narrowing portion 6a inside the opposite and facing end portion 6b of the bent tubular profile 6. The method further comprises the step of rigidly joining/fixing, for example by welding, the two end portions 6a and 6b of the tubular profile 6 engaged with each other so as to obtain the support frame 2.

[0052] With reference to Figures 7 and 8, the method further comprises the step of pre-arranging four plate-shaped strips 11 that are intended to form the containment frame 10.

[0053] The method further comprises the step of making the right-angled bends K_1 - K_4 with the radius of curvature R_1 on the plate-shaped strips 11 so as to shape each strip 11 substantially in the shape of an L.

[0054] In the illustrated example, the step of making the bends K_1 - K_4 on the plate-shaped strips 11 preferably envisages the step of positioning the strips 11 on a preferably pneumatically or electrically operated bending machine 200 and making the bends K_1 - K_4 on the plate-shaped strips 11 by means of the same.

[0055] According to a possible embodiment, the bending machine 200 can be provided with: a bending roller 201 and at least one bending member 202. The bending roller 201 can have a radius substantially equal to the radius of curvature R_1 . The bending member 202 can be pneumatically or electrically operated and be structured to rotate a portion of the plate-shaped strip 11 by an angle substantially equal to 90° so as to make the right-angled bends K_1 - K_4 .

[0056] With reference to Figure 10, the method for manufacturing the bed base for ship 1 preferably envisages, after bending the plate-shaped strip(s) 11, the step of rigidly fixing, for example by welding, the plate-shaped strip(s) 11 onto the lateral sides of the support frame 2 so as to obtain the containment frame 10.

[0057] More specifically, the step of rigidly fixing the

plate-shaped strip(s) 11 onto the lateral sides of the support frame 2 preferably envisages the steps of:

- pre-arranging a moulder (or template) frame 300 that is provided with at least a plurality of first locking members (not visible in the figures) designed to firmly hold the support frame 2 and a plurality of second locking (or clamping) members 301 designed to firmly hold the strips 11 in a pre-set position in abutment against the outer side walls of the support frame 2, or more precisely of the tubular profile 6;
- arranging and rigidly locking the support frame 2 or, more precisely, the previously bent tubular profile 6, on the moulder frame 300;
- arranging and locking the strips 11 in the pre-set position in abutment against the outer side walls of the support frame, or more precisely of the tubular profile 6;
- rigidly fixing, for example by welding, the plate-formed strips 11 onto the support frame 2 so as to obtain the containment frame 10.

[0058] In addition, the moulder frame 300 preferably also comprises: an electrically or pneumatically operated welding assembly 302 (only partially illustrated in Figure 9); and an electronic control apparatus (not visible in the figures) that is designed to control/drive the welding assembly 302 based on pre-set algorithms and/or based on electrical detection signals from a plurality of sensors positioned/distributed over the welding assembly 302 so as to perform the pre-set welds on the bed base for ship 1.

[0059] The technical effects obtained thanks to the use of a moulder frame 300 specifically structured to receive and rigidly lock the support frame 2 and the strip (s) 11 are those of: ensuring the correct positioning/support of the L-shaped strip(s) 11 on the outer side walls of the support frame 2, or more precisely of the tubular profile 6; and allowing compensating any manufacturing tolerances of the bends P_1 - P_4 of the support frame 2, or more precisely of the tubular profile 6.

[0060] More specifically, it can occur that the actual radius of curvature of the bends P_1 - P_4 of the support frame 2 deviates from the nominal dimensions, i.e. it is smaller or greater than the radius of curvature R_2 .

[0061] The positioning of the strips 11 by means of the moulder frame 300 allows arranging the strips 11 with extreme precision in abutment against the outer side walls of the support frame 2, or more precisely of the tubular profile 6, potentially also slightly deforming the strips 11 so as to compensate any manufacturing tolerances of the bends P_1 - P_4 of the support frame 2, or more precisely of the tubular profile 6.

[0062] More specifically, the moulder frame allows pressing the strips 11 with force against the outer side walls of the support frame 2 so that the strips 11 correctly adhere to the outer side walls of the support frame 2, and further have the heads respectively in abutment against each other.

[0063] This way, the welding of the strips 11 onto the outer side walls of the support frame 2 is considerably simpler and more precise, and allows obtaining a containment frame 10 with a regular and homogeneous outer surface, lacking discontinuities between the strips 11.

[0064] With reference to the preferred embodiment of the invention illustrated in Figure 9, the method preferably envisages the step of positioning the four L-shaped plate-shaped strips 11 in abutment against the side walls of the support frame 2 so that each bend K_1 - K_4 of the strips 11 substantially overlaps a respective bend P_1 - P_4 of the support frame 2, or more precisely of the tubular profile 6.

[0065] In addition, the method preferably envisages the step of firmly holding each strip 11 in the pre-set position by means of the locking members 301 of the moulder frame 300.

[0066] With reference to Figure 9, the method preferably envisages the step of rigidly fixing the four plate-shaped strips 11 onto the side walls of the support frame 2, or more precisely of the tubular profile 6, for example by welding. In the illustrated example, the method further preferably envisages the step of rigidly fixing the plate-shaped strips 11 to each other, for example by welding the strips 11 to each other at the head.

[0067] The advantages associated with the introduction of the above-described method for manufacturing the bed base for ship 1 are considerable.

[0068] Firstly, the bed base for ship 1, thanks to the presence of the containment frame 10, is able to firmly hold the mattress positioned on the support surface 3 so as to prevent the mattress from making undesired movements during the rolling and pitching movements of the boat.

[0069] In addition, the pre-arrangement of the moulder frame 300 allows the L-shaped strips 11 to correctly adhere to the outer side walls of the support frame 2 and allows compensating any manufacturing tolerances of the bends P_1 - P_4 of the support frame 2, or more precisely of the tubular profile 6, so as to obtain a containment frame 10 with a homogeneous and regular outer surface, i.e. lacking discontinuities between the strips 11.

[0070] Finally, it is evident that modifications and variants can be made to the support frame and to the method for manufacturing the support frame described and illustrated in the foregoing without thereby departing from the scope of protection of the present invention.

Claims

1. A bed base for ship (1) made of metal material comprising:

- a support frame (2) that lies on a reference plane,
- a support surface (3) that is coupled to said support frame (2) so as to be parallel to said reference plane and is structured to support at

least one mattress,
 - an outer plate-shaped containment frame (10)
 that is firmly coupled onto the outer side walls
 of the support frame (2) so as to surround the
 latter on at least two sides,

said outer plate-shaped containment frame (10) is
 arranged approximately orthogonal to said reference
 plane and has at least a first bend (K_1 - K_4) having a
 first prefixed radius of curvature (R_1) at a relative
 corner of said support frame (2).

2. The bed base for ship according to claim 1, wherein
 said outer plate-shaped containment frame (10) has
 an annular upper containment portion that protrudes
 in a cantilever fashion over said support frame (2)
 and/or over said support surface (3) and is designed
 to surround and at least partially contain said mat-
 tress in order to prevent it from moving on said sup-
 port surface (3).

3. The bed base for ship according to claim 2, wherein
 said outer plate-shaped containment frame (10) con-
 sists of one or more plate-shaped strips (11) made
 of metal material that have one or more first bends
 (K_1 - K_4) having said first pre-set radius of curvature
 (R_1) at respective corners of said containment frame
 (10).

4. The bed base for ship according to claim 2 or 3,
 wherein said support frame (2) and said outer plate-
 shaped containment frame (10) have an approxi-
 mately rectangular shape; said outer plate-shaped
 containment frame (10) comprises four plate-shaped
 strips (11) made of metal material shaped so as to
 have said first bends (K_1 - K_4) that have said first pre-
 set radius of curvature (R_1) and are made at the re-
 spective four corners of said outer plate-shaped con-
 tainment frame (10).

5. The bed base for ship according to any one of the
 preceding claims, wherein said strips (11) are weld-
 ed onto the outer sides of said support frame (2).

6. The bed base for ship according to any one of the
 claims 2 to 5, wherein said annular upper portion
 protrudes in a cantilever fashion in a substantially
 vertical direction over said support frame (2) and/or
 over said support surface (3) by a pre-set height (d_i)
 comprised between approximately 10mm and ap-
 proximately 100mm.

7. A method for manufacturing a bed base for ship (1)
 made of metal material as defined in any one of the
 preceding claims comprising the steps of:

- pre-arranging a support frame (2) that lies on
 a reference plane,

- firmly coupling a support surface (3), that is
 structured to support at least one mattress, to
 said support frame (2) so as to be parallel to said
 reference plane,

- coupling said plate-shaped strips (11) made of
 metal material onto the outer side walls of the
 support frame (2) so as to surround the latter on
 at least two sides in order to form said outer
 plate-shaped containment frame (10).

8. The method according to claim 7 comprising the step
 of coupling said plate-shaped strips (11) made of
 metal material onto the outer side walls of the support
 frame (2) in order to form an outer plate-shaped con-
 tainment frame (10) that has an annular upper con-
 tainment portion that protrudes in a cantilever fash-
 ion over said support frame (2) and/or over said sup-
 port surface (3) and is designed to surround and at
 least partially contain said mattress in order to pre-
 vent it from moving on said support surface (3).

9. The method according to claim 8, wherein said an-
 nular upper portion protrudes in a cantilever fashion
 in a substantially vertical direction over said support
 frame (2) and/or said support surface (3) by a pre-
 set height (d_i) comprised between approximately
 10mm and approximately 100mm.

10. The method according to claims 8 or 9, comprising
 the step of bending said plate-shaped strips (11)
 made of metal material thus forming a plurality of
 first bends (K_1 - K_4) with a first pre-set radius of cur-
 vature (R_1) at the corners of said outer plate-shaped
 containment frame (10).

11. The method according to claim 10, wherein said sup-
 port frame (2) and said outer plate-shaped contain-
 ment frame (10) have an approximately rectangular
 shape,
 said method comprising the step of prearranging four
 strips (11), making on the four strips respective said
 first bends (K_1 - K_4) according to said first radius of
 curvature (R_1) wherein each first bend is made at a
 relative corner of said outer plate-shaped contain-
 ment frame (10).

12. The method according to any one of the claims 7 to
 11 comprising the steps of:

- pre-arranging at least one rectilinear tubular
 profile (6) made of metal material,
 - making, on said tubular profile (6), a series of
 second bends (P_1 - P_4) having a second radius
 of curvature (R_2) in order to form said support
 frame (2),
 - making, on said strips (11), relative said first
 bends (K_1 - K_4) having said first radius of curva-
 ture (R_1),

- fixing said bent strips (11) onto the outer side walls of the tubular profile (6) of said support frame (2) so that said second bends (P_1 - P_4) are arranged on the respective first bends (K_1 - K_4) .

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13. The method according to claim 12, wherein said first radius of curvature (R_1) is equal to approximately 80mm and/or said second radius of curvature (R_2) is equal to approximately 90mm and/or said first radius of curvature (R_1) is less than said second radius of curvature (R_2).

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14. The method according to any one of the claims 7 to 13, comprising the steps of:

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- pre-arranging a moulder frame (300) that is provided with at least a plurality of first locking members and with a plurality of second locking members (301);

- arranging said support frame (2) on said moulder frame (300),

- actuating said first locking members in order to firmly hold said support frame (2) on said moulder frame (300)

- arranging said plate-shaped strips (11) in a predetermined position in abutment against the outer side walls of said support frame (2),

- actuating said second locking members (301) in order to firmly hold said plate-shaped strips (11) in a predetermined position in abutment against the outer side walls of said support frame (2),

- rigidly fixing said strips (11) onto said support frame (2), in order to obtain said containment frame (10).

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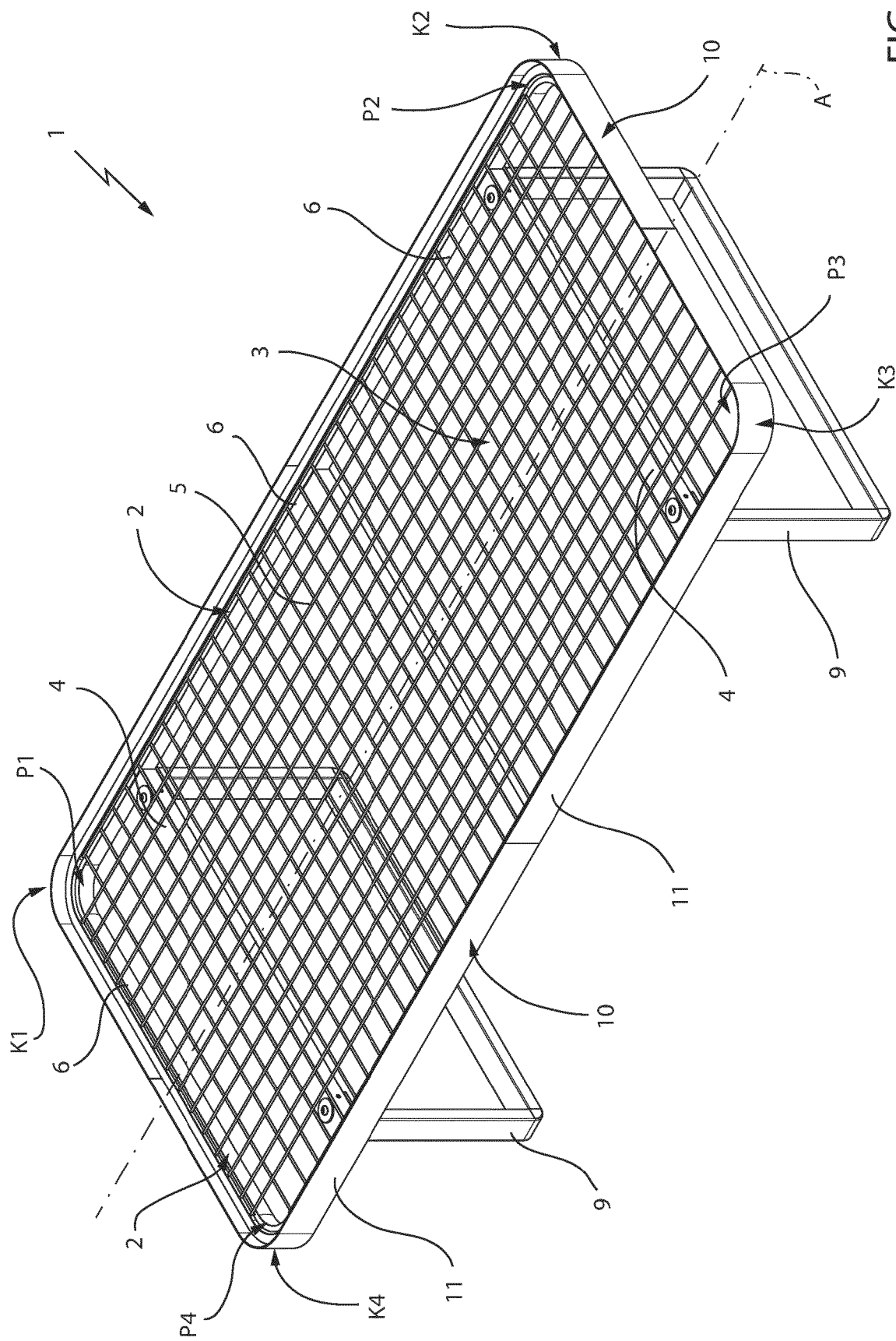


FIG. 1

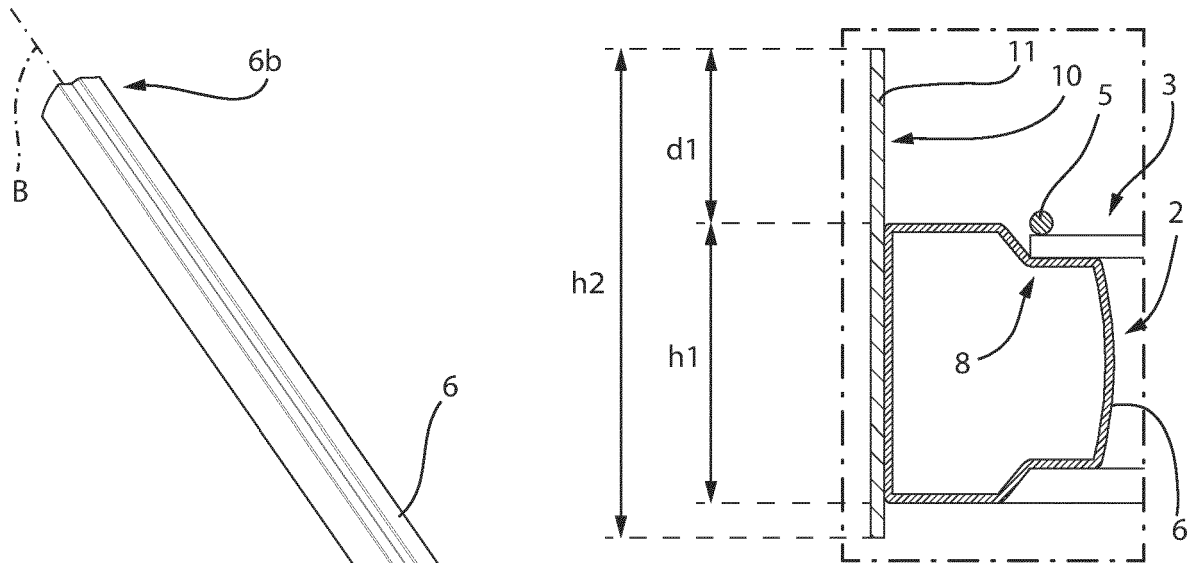
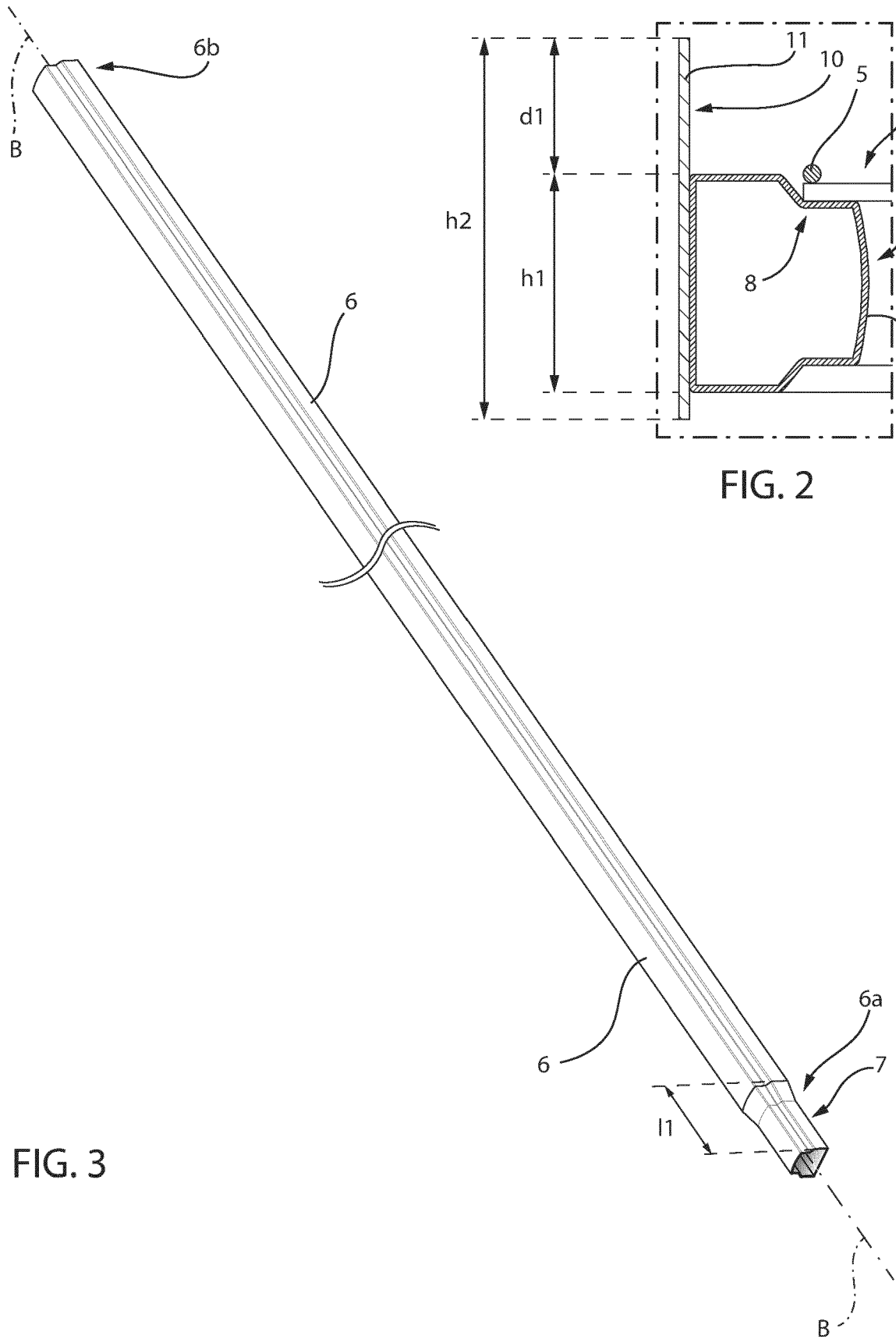


FIG. 2

FIG. 3



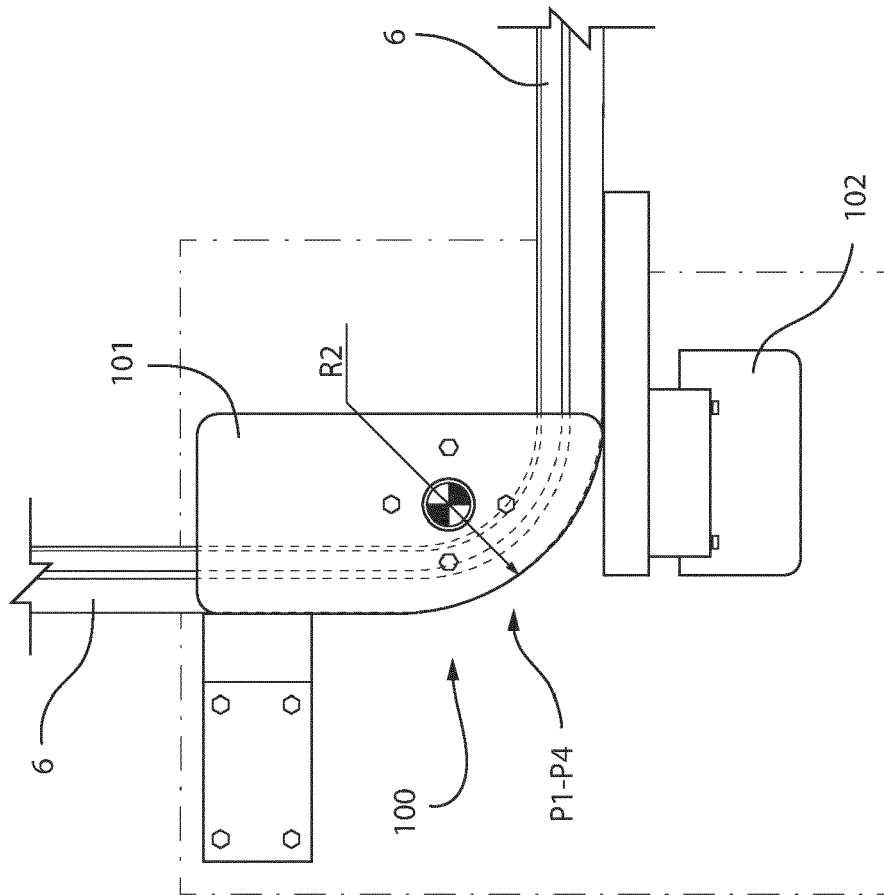


FIG. 5

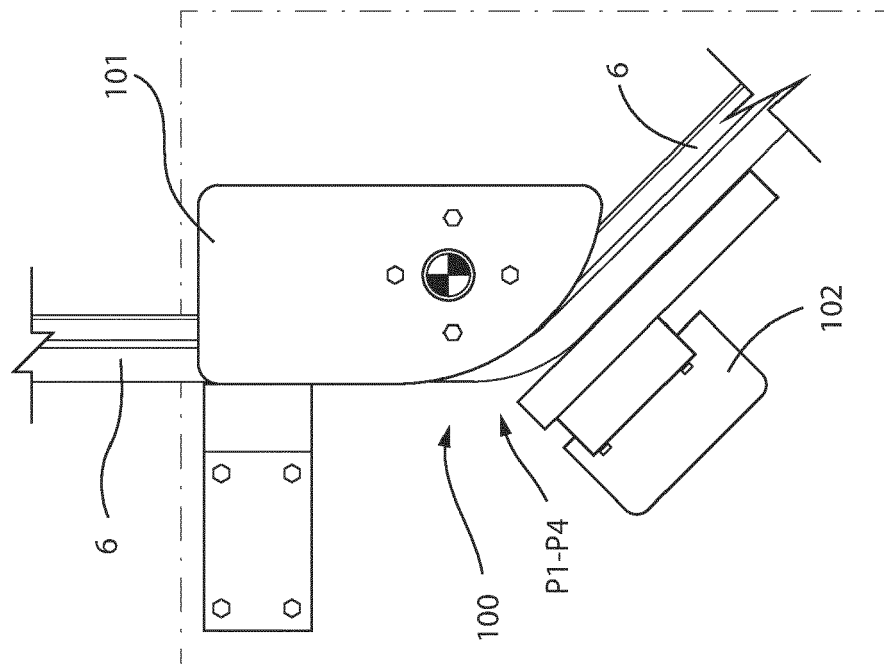


FIG. 4

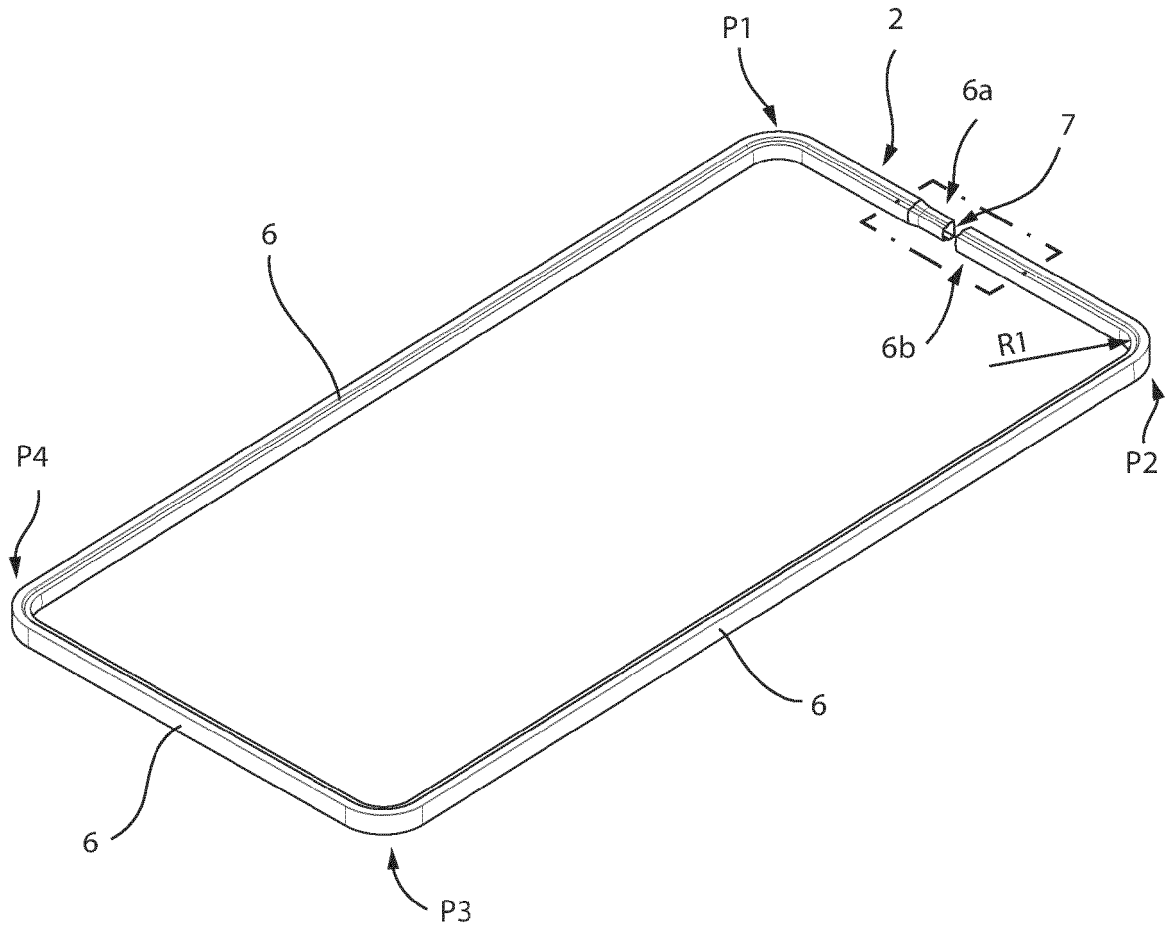
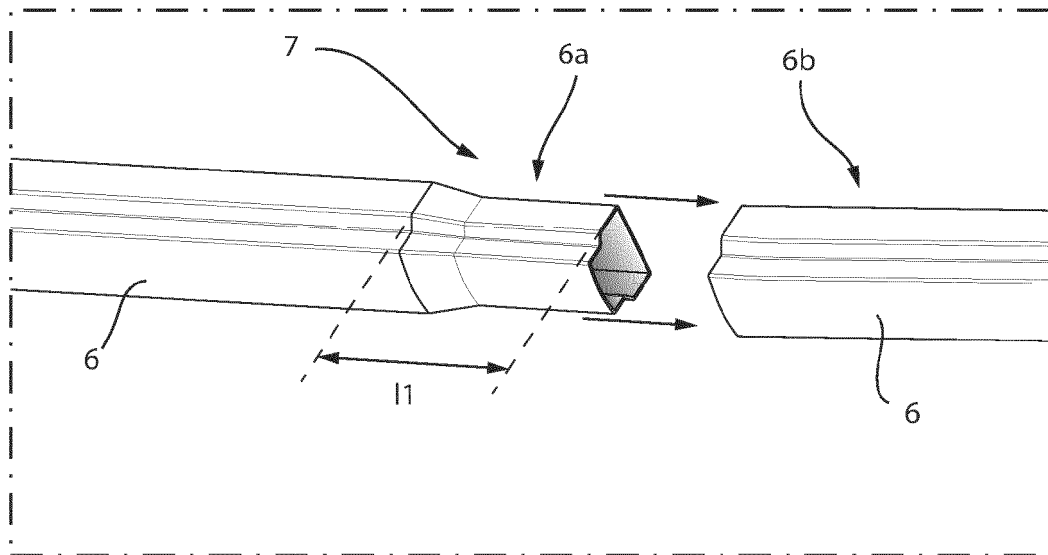


FIG. 6

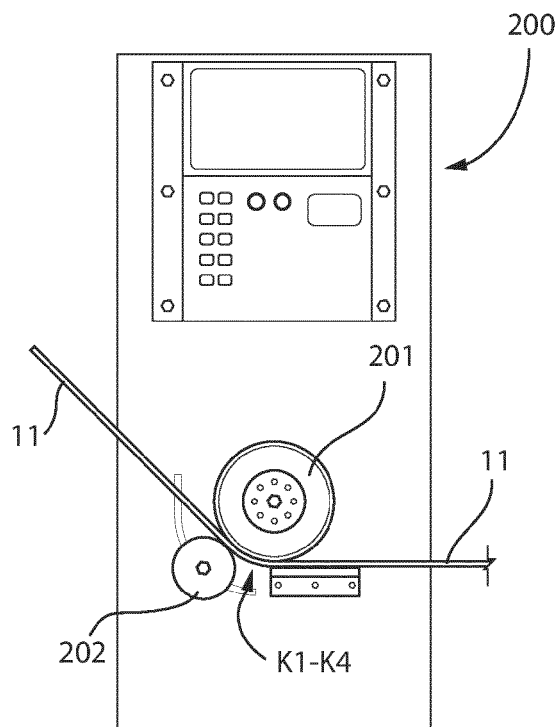


FIG. 7

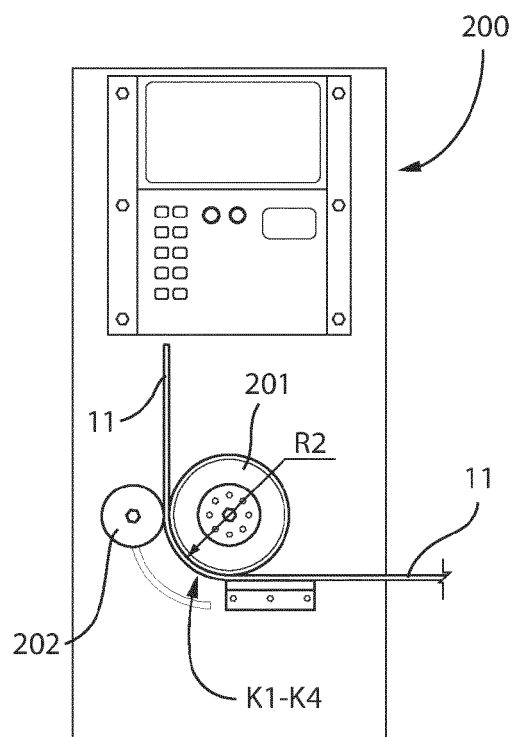


FIG. 8

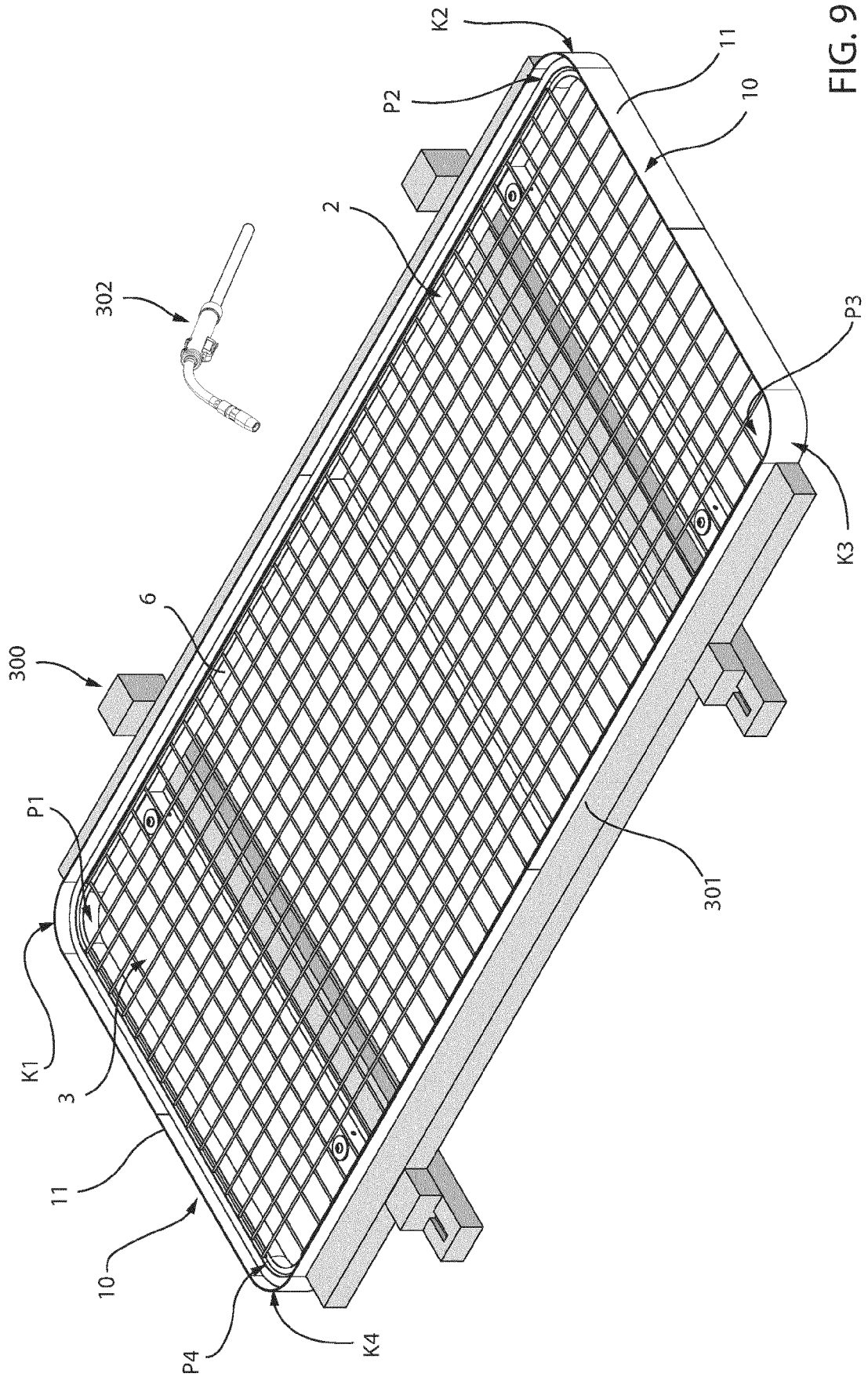


FIG. 9



EUROPEAN SEARCH REPORT

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			B63B B63J
Place of search		Date of completion of the search	Examiner
The Hague		14 April 2022	Kis, Pál
CATEGORY OF CITED DOCUMENTS 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 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			

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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.
The members are as contained in the European Patent Office EDP file on
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14-04-2022

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REFERENCES CITED IN THE DESCRIPTION

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