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(54) COLLAPSIBLE FURNITURE BODY AND CORRESPONDING ITEM OF FURNITURE

(57) A collapsible furniture body (1) of an item of furniture for storing objects comprises a bottom (2), a ceiling (3) opposing the bottom, and a pair of sidewalls (4, 5) opposing each other and connecting the bottom (2) and the ceiling (3) with each other. Each sidewall (4, 5) is hingedly connected to the bottom (2) and the ceiling (3) by means of respective hinged connections (6) defining respective pivot axes (X-X) parallel to one another, so that the furniture body (1) may take on an erected configuration, in which the sidewalls (4, 5) are substantially perpendicular to the bottom (2) and the ceiling (3), or a collapsed configuration, in which the sidewalls (4, 5) are substantially parallel to the bottom (2) and the ceiling (3). The bottom (2) and the ceiling (3) comprise a receiving groove (7) for each sidewall (4, 5). Each receiving groove (7) longitudinally extends along a direction parallel to said pivot axes (X-X) and in the erected configuration of the furniture body (1) removably receives an edge portion of a sidewall (4, 5) adjacent to the bottom (2) or the ceiling (3), substantially preventing lateral tilting of the sidewall (4, 5). The hinged connections (6) are configured so as to allow a relative translation between the sidewalls (4, 5) and the bottom (2) and ceiling (3) along a direction perpendicular to the bottom (2) and the ceiling (3) for engaging and disengaging the sidewalls (4, 5) into/from the respective receiving grooves (7).

An item of furniture for storing objects comprising the furniture body (1) is also described.

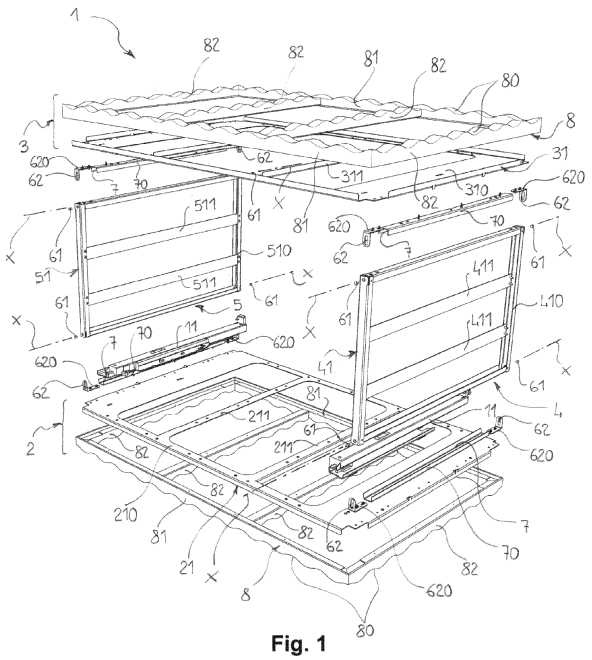

Fig. 1

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Description

[0001] The present invention generally falls within the field of pre-assembled furniture. In particular, the invention relates to a furniture body with a collapsible structure and a corresponding item of furniture for storing objects. The furniture body and the item of furniture of the invention find a preferred, although not exclusive, use for setting up modular kitchens.

[0002] Usually, furniture for storing objects, such as, for example, cabinets, sideboards, dressers, shelf units, or the like, is marketed either in a pre-assembled condition or in a condition at least partially to be assembled. In the first case, the furniture is supplied in a substantially ready-to-use configuration, and no effort is required of the end user or retailer to assemble it. However, assembled furniture often has significant overall dimensions, and this negatively affects the product logistics and associated costs. In the second case, on the other hand, it is possible to reduce, even significantly, the overall dimensions of the furniture for storing and/or transporting the same, for example, by arranging the parts to be assembled in such a way as to obtain flat packages, which allows the product logistics to be optimized and related costs to be reduced. However, assembly by the end user or retailer is often labor-intensive and time-consuming, and not infrequently requires the involvement of several people at the same time and/or the use of suitable tools.

[0003] In an attempt to combine the advantages of the two solutions mentioned above while avoiding as much as possible their respective drawbacks, furniture, and in particular furniture for storing objects, having a collapsible structure has been developed. In this case, the main parts of the furniture are connected to each other to form an articulated structure, which may take on a generally flat, collapsed configuration, which is convenient for transporting the furniture, e.g., for marketing or subsequently relocating the same, as well as for storing the furniture in a non-use condition, or an erected or expanded configuration, corresponding to the use condition of the furniture. The operations required to "assemble" the furniture, in particular to bring it from the collapsed configuration to the erected configuration and lock it in this configuration, and to "disassemble" the furniture, in particular to unlock it from the erected configuration and bring it from this configuration to the collapsed configuration, are generally simpler and faster than a complete assembly/disassembly.

[0004] For example, EP 3 595 489 B1 describes an articulated, collapsible cabinet frame that can take on a collapsed form or an expanded form. The cabinet frame includes a first side frame and a second side frame, each including a front corner post, a rear corner post, and a plurality of cross members extending between the front corner post and the rear corner post. The cabinet frame further includes an upper front cross member and a lower front cross member respectively hinged to the first side frame and the second side frame at the front of the cabinet frame, and an upper rear cross member and a lower rear cross member respectively hinged to the first side frame and the second side frame at the back of the cabinet frame. For locking the cabinet frame in the expanded form, locking screws, bolt pins, or other fastening means are required, which have to be inserted in holes provided at each articulation point between the side frames and the front and rear cross members.

[0005] In view of the above, the main object of the present invention is to provide an improved collapsible furniture body for an item of furniture for storing objects, which can be erected and collapsed particularly easily and quickly, by a single person and without the need to use additional fastening means and/or assembly tools.

[0006] Another object of the invention is to provide a collapsible furniture body having the above-mentioned features that can also be manufactured easily and at competitive costs.

[0007] According to the invention, these objects are achieved by a collapsible furniture body having the features stated in claim 1.

[0008] In particular, the invention relates to a collapsible furniture body of an item of furniture for storing objects, comprising a bottom, a ceiling opposing the bottom, and a pair of sidewalls opposing each other and connecting the bottom and the ceiling with each other. Each sidewall is hingedly connected to the bottom and the ceiling by means of respective hinged connections defining respective pivot axes parallel to one another, so that the furniture body may take on an erected configuration, in which the sidewalls are substantially perpendicular to the bottom and the ceiling, or a collapsed configuration, in which the sidewalls are substantially parallel to the bottom and the ceiling. The bottom and the ceiling comprise a receiving groove for each sidewall, and each receiving groove longitudinally extends along a direction parallel to said pivot axes and in the erected configuration of the furniture body removably receives an edge portion of a sidewall adj acent to the bottom or the ceiling, substantially preventing lateral tilting of the same sidewall. The hinged connections are configured so as to allow a relative translation between the sidewalls and the bottom and ceiling along a direction perpendicular to the bottom and ceiling for engaging and disengaging the sidewalls into/from the respective receiving grooves.

[0009] Advantageously, the locking of the collapsible furniture body according to the invention in the erected configuration is ensured by the removable coupling between the edge portions of the sidewalls that are adjacent to the bottom and the ceiling and the receiving grooves especially provided in or at the bottom and in or at the ceiling to receive such edge portions. Thus, no additional fastening means, such as screws, pins, or the like, to be applied and removed every time the furniture body is to be erected or collapsed are required in order to lock and stably maintain the collapsible furniture body of the invention in the erected configuration.

[0010] The engagement and disengagement of the

edge portions of the sidewalls in/from the respective receiving grooves are advantageously made possible by the special configuration of the hinged connections between them and the bottom and ceiling of the furniture body, which not only allow a pivotal rotation between the parts, but also a relative translation along a direction substantially perpendicular to the bottom and ceiling.

[0011] To erect the furniture body, the user is only required to grasp one of the ceiling and the bottom and to rotate it, at the same time lifting it slightly, relative to the other, until the sidewalls are brought to a vertical position, perpendicular to the bottom and the ceiling. Once the erected configuration is reached, the edge portions of the sidewalls adjacent to the bottom and the ceiling face vertically to their respective receiving grooves, and engagement with them occurs automatically, by gravity, when the user releases the ceiling or the bottom. Conversely, to collapse the furniture body, the user is only required to lift one of the ceiling and the bottom so as to move them away from each other for disengaging the sidewalls from their respective receiving grooves, and then to rotate the ceiling or the bottom in the opposite direction relative to that of the erection, until the collapsed, substantially flat, configuration is achieved.

[0012] Thus, the collapsible furniture body of the invention can be erected and collapsed very easily and quickly, with particularly ergonomic and intuitive movements, by one person alone, without the use of assembly tools and/or additional fastening means.

[0013] Moreover, as it will become more apparent also from the description of preferred embodiments of the invention, the structural and functional features described above can be implemented through simple constructive solutions, which allow the furniture body of the invention to be manufactured easily, even in series, and at low cost.

[0014] In particular, according to a preferred embodiment of the furniture body, each hinged connection comprises a pair of pin elements associated with a sidewall and extending from longitudinally opposite sides of an edge portion thereof adjacent to the bottom or the ceiling along the pivot axis of the hinged connection, and a pair of guiding slots for the pin elements associated with the bottom or the ceiling and longitudinally extending along a direction perpendicular to the bottom or the ceiling. This construction allows the desired functional features of the hinged connection to be obtained by means of a particularly simple and robust structure.

[0015] Conveniently, to make the manufacturing of the bottom and ceiling easier, the guiding slots may be formed in a leg of respective generally L-shaped members associated, preferably removably associated, with the bottom or the ceiling.

[0016] Preferably, each receiving groove has a cross section having a shape substantially conjugated with the shape of an outer profile of the edge portion of the sidewalls received in the receiving groove. This helps to increase the stability of the furniture body in the erected configuration. Conveniently, still to make the manufacturing of the bottom and ceiling easier, each receiving groove may be defined by a profile element associated with the bottom or the ceiling at an inner face thereof. However, the possibility of forming the receiving grooves directly in the bottom and ceiling is not excluded.

[0017] Preferably, the bottom and the ceiling comprise a respective framework made of a single piece and preferably plate-shaped.

[0018] Preferably, the sidewalls comprise a respective assembled framework.

[0019] Both the plate-shaped frames made of a single piece of the bottom and the ceiling and the assembled frames of the sidewalls conveniently comprise a peripheral frame and at least one cross piece.

[0020] Preferably, the frameworks of the bottom and the ceiling and the frameworks of the sidewalls are respectively equal to each other.

[0021] Preferably, the furniture body substantially has top-bottom symmetry.

[0022] Preferably, at least one of the bottom and the ceiling comprises a coupling portion projecting from an outer face thereof for coupling the furniture body to further furniture bodies or components of a modular furniture system. The coupling portion comprises at least one, preferably substantially straight, first segment extending in a first direction of longitudinal development, and at least one, preferably substantially straight, second segment extending in a second direction of longitudinal development crossing the first direction of longitudinal development. The at least one first segment and the at least one second segment comprise respective shaped coupling profiles made of mutually alternated recesses and projections, having a periodic outline in the respective direction of longitudinal development. Advantageously, it is thus possible to use the furniture body of the invention to build a module for modular furniture systems which can be assembled and disassembled particularly easily and quickly, even by one person alone, without the need for special skills or knowledge. In particular, by providing a coupling portion with the above-mentioned features, the furniture body can be assembled with and secured to other correspondingly configured furniture bodies or components of a modular furniture system without the need for additional fastening means and/or the use of assembly tools. In fact, the form fit between the periodic shaped profile of the coupling portion of the furniture body with a mating periodic shaped profile of a corresponding coupling portion of another furniture body or component, which is achieved as they are mutually stacked, automatically ensures mutual anchoring with respect to displacements in the coupling plane. In addition, lateral anchoring of side-by-side furniture bodies can also be easily obtained by appropriately staggering the stacked furniture bodies.

[0023] Moreover, by appropriately arranging the coupling portion on the outer face of the bottom and/or ceiling of the furniture body, and/or the at least two segments forming the coupling portion relative to each other, it is

possible to combine and secure two stacked modules with each other according to multiple relative arrangements, and thus to achieve in a flexible way a wide range of configurations for the modular furniture system, from simpler ones having a straight plan to more complex ones having a broken or branched plan due to the presence of corners, peninsulas, etc.

[0024] As a general rule, any profile shape with a periodic pattern may be considered for the shaped coupling profiles, as long as it is free of undercuts, to allow coupling with a mating coupling profile by simple vertical stacking.

[0025] According to a preferred embodiment, the shaped coupling profiles of the at least one segment and the at least one second segment of the coupling portion are wave-shaped profiles. This profile shape advantageously avoids the presence of sharp edges, which may be damaged or break over time, thus making the coupling less stable. Moreover, the wave shape promotes a distribution throughout the whole coupling profile of normal stresses due to the weight of stacked furniture bodies.

[0026] Preferably, the shaped coupling profiles of the at least one first segment and the at least one second segment of the coupling portion are equal to each other. This helps to broaden the range of possible combinations of the furniture bodies, as well as to make their manufacture easier. Preferably, the recesses and protrusions of the shaped coupling profiles have a mutually symmetrical shape.

[0027] Preferably, the directions of longitudinal development of the at least one first segment and the at least one second segment of the coupling portion are orthogonal to each other. This arrangement advantageously makes the combination of furniture bodies according to orthogonal directions, to build modular furniture systems having corners and/or peninsulas, easier.

[0028] Conveniently, the at least one first segment and the at least one second segment of the coupling portion may be arranged mutually in contact with each other, in particular at respective ends, so as to form a single continuous coupling portion. Alternatively, the at least one first segment and the at least one second segment may be arranged mutually apart, so as to form a discrete coupling portion.

[0029] Preferably, the coupling portion is located at least partially at perimeter edges of the bottom and/or ceiling of the furniture body. This makes it easier to check the coupling of the furniture bodies while assembling a modular furniture system. Furthermore, if the section of coupling portion that is located along a perimeter edge is intended to remain visible in the assembled modular furniture system, it can advantageously contribute to the aesthetic features of the modular furniture system through the shape of the coupling profile.

[0030] Preferably, the coupling portion is attached to the outer face of the bottom and/or ceiling of the furniture body. This advantageously allows the coupling portion to be manufactured separately from the furniture body components and, if removably attached, also to be subsequently replaced, possibly partially, in case of damage or wear.

[0031] Preferably, both the bottom and the ceiling of the furniture body comprise a coupling portion protruding from a respective outer face, for coupling the module to further modules or components of the modular furniture system. In this case, the coupling portions of the bottom and the ceiling may conveniently have a same configuration, in particular they may have the same shape of the coupling profile and the same arrangement on the outer face. Conveniently, the furniture body may comprise at least one removable covering panel fitted to one or both of the sidewalls and/or to a back side thereof.

[0032] If necessary, the furniture body may comprise auxiliary, possibly removable, stiffening means suitable for increasing its stability, e.g., in the form of one or more stiffening crosses connecting with each other the bottom and ceiling or the two sidewalls of the furniture body at the back side of the furniture body.

[0033] Conveniently, the furniture body may also comprise at least one pair of guide rails for a drawer. The invention also relates to an item of furniture for storing objects comprising a furniture body having one or more of the previously described features in the erected configuration, and at least one drawer slidably received in the furniture body.

[0034] Preferably, the drawer has a collapsible structure.

[0035] The furniture body and the item of furniture of the invention may advantageously be marketed as a kit of parts, comprising the furniture body and, if provided, the at least one drawer, in a collapsed configuration.

[0036] The furniture body and the item of furniture of the invention may conveniently be used as modules for building different modular furniture systems, especially modular kitchens. Further features and advantages of the invention shall become more apparent from the following detailed description of preferred embodiments thereof, made hereafter, for indicating, and thus non-limiting, purposes, with reference to the accompanying drawings, in which:

- Fig. 1 is a schematic exploded perspective view of a preferred embodiment of a furniture body according to the invention;
- Fig. 2 is a schematic front perspective view of the furniture body of Fig. 1, in the erected configuration;
- Figs. 3a and 3b are schematic perspective views of a detail of the furniture body in Fig. 2 at a hinged connection, respectively from the outside and the inside of the furniture body;
- Fig. 4 is a schematic longitudinal sectional view of the furniture body in Fig. 2;
- Fig. 5 is a schematic cross-sectional view of the furniture body in Fig. 2;
- Fig. 6 is a schematic plan view of the furniture body in Fig. 2;
- Fig. 7 is a schematic plan view of the outward-facing

face of a framework of the ceiling or the bottom of the furniture body in Fig. 2;

- Fig. 8 is a schematic perspective view of the furniture body in Fig. 2, in the collapsed configuration;
- Fig. 9 is a schematic perspective view of the furniture body in Fig. 2, showing a transition configuration between the collapsed configuration and the erected configuration;
- Fig. 10 is a schematic perspective view of the furniture body in Fig. 2, showing a further transition configuration between the collapsed configuration and the erected configuration;
- Fig. 11 is a schematic perspective view of a detail in Fig. 10 at a hinged connection;
- Fig. 12 is a schematic perspective view of the furniture body of Fig. 2 provided with covering panels at the sidewalls and the back side and with a stiffening cross at the back side;
- Fig. 13 is a schematic perspective view of a preferred embodiment of a module for a modular furniture system, comprising a furniture body according to the invention;
- Fig. 14 is a schematic side view of the module in Fig. 13, wherein the covering panel of the corresponding sidewall has been removed;
- Fig. 15 is a schematic perspective view of a drawer of the module in Fig. 13, in an erected configuration;
- Fig. 16 is a schematic perspective view of the drawer in Fig. 15, in a collapsed configuration;
- Fig. 17 is a schematic perspective view of the drawer in Fig. 15, showing a transition configuration between the collapsed configuration and the erected configuration;
- Figs. 18a,b, 19a,b, 20a,b and 21a,b are schematic front and, respectively, plan views of examples of modular furniture systems which can be obtained by combining several modules respectively comprising a furniture body according to the invention.

[0037] Figs. 1-5 show a preferred embodiment of a furniture body according to the present invention, generally indicated by reference numeral 1.

[0038] The body 1 comprises a bottom 2, a ceiling 3 opposing the bottom 2, and two sidewalls 4, 5 opposing each other, which connect the bottom 2 and the ceiling 3 to each other. As apparent particularly from Figs. 2, 4 and 5, the bottom 2 and the ceiling 3 have a rectangular shape and are substantially parallel to each other, and the sidewalls 4, 5 also have a rectangular shape and are substantially parallel to each other, so that the body 1 has a substantially parallelepiped shape.

[0039] The bottom 2 and the ceiling 3 comprise respective frameworks 21 and 31. As better seen in Figs. 1 and 7, the frameworks 21 and 31 are preferably made of a single piece and have a preferably plate-shaped, flat structure. In particular, each framework 21, 31 may be conveniently made from a metal sheet, particularly a sheet of a light metal, e.g., aluminum or alloys thereof, by cutting and shaping operations, performed in a known manner.

[0040] The frameworks 21 and 31 comprise respective perimeter frames 210, 310 and respective cross pieces 211, 311. The number of crosspieces 211, 311 may be freely chosen according to the specific structural and functional needs, in particular it may be different based on to the plan dimensions of body 1.

[0041] The sidewalls 4, 5 comprise respective frameworks 41 and 51. Frameworks 41 and 51 are preferably made of individual profile elements assembled together in a fixed or removable manner, and have a preferably flat structure. Conveniently, also the frameworks 41 and 51 may be made of metal, particularly a light metal, such as aluminum or alloys thereof.

[0042] The frameworks 41 and 51 comprise respective perimeter frames 410, 510 and respective cross members 411, 511. At least the perimeter frames 410, 510 may be formed from sections of a same profile element, preferably having a C-shaped cross-section. The number of cross members 411, 511 may be freely chosen according to the specific structural and functional needs, in particular it may be different based on the height dimensions of the body 1. Preferably, the frameworks 21 and 31 of the bottom 2 and the ceiling 3, and frameworks 41 and 51 of the sidewalls 4 and 5 are equal to each other, respectively, and the structure of the body 1 as defined by these elements preferably has top-bottom symmetry.

[0043] The bottom 2 and the ceiling 3 are provided with respective coupling portions 8 protruding from the outer faces of the respective frames 21, 31, for coupling the body 1 to further bodies or components of a modular furniture system, as described in more detail below with reference to Figs. 18a,b, 19a,b, 20a,b, and 21a,b.

[0044] Each coupling portion 8 comprises first straight segments 81, extending linearly in a first direction of longitudinal development, and second straight segments 82, extending linearly in a second direction of longitudinal development, orthogonal to the first direction of longitudinal development. The first segments 81 and the second segments 82 comprise, at their distal portions relative to the outer faces of the frameworks 21, 31, shaped coupling profiles 80 made of mutually alternating recesses and projections, having a periodic course in the direction of longitudinal development of the respective segment 81 or 82.

[0045] The coupling portions 8 of the bottom 2 and the ceiling 3 have a same configuration, in particular they have the same mutual arrangement of the respective segments 81, 82, and the same shape of the coupling profiles 80.

[0046] As apparent in particular from Figs. 1 and 6, in the preferred embodiment shown herein, the first segments 81 and the second segments 82 of the coupling portions 8 are mutually arranged to replicate the basic shape of the frameworks 21, 31. In particular, two first segments 81 and two second segments 82 form frames

that run along the perimeter frames 210, 310 of the frameworks 21, 31, preferably at the outer edge thereof, and two additional second segments 82 run along the cross members 211, 311 of the frameworks 21, 31. The aforementioned segments 81 and 82 are preferably arranged in contact with one another, so that the respective coupling portions 8 have a continuous structure. However, coupling portions 8 having a broken structure, in which at least some of their segments 81 and 82 are arranged spaced apart from one another, are not excluded.

[0047] The coupling portions 8 are preferably made as separate components, attached, preferably removably, to the frameworks 21, 31. In the case where the coupling portions 8 have a continuous structure, although not made of a single piece, it may be advantageous to first form such a continuous structure by permanently joining the segments 81, 82 together according to the desired arrangement, and then to attach this structure as a whole to the frameworks 21, 31, as shown in Fig. 1.

[0048] The shaped coupling profiles 80 of the segments 81, 82 forming each coupling portion 8 are preferably equal to each other and are preferably configured as wave-shaped profiles. The recesses, i.e., troughs, and projections, i.e., crests, of the coupling profiles 80 preferably have a mutually symmetrical shape. However, the possibility of using other profile shapes having a periodic course is not excluded, provided that they do not have undercuts, so as to allow coupling with a mating coupling profile by simple vertical stacking, such as, for example, trapezoidal, triangular, or square profiles.

[0049] The coupling portions 8 are preferably made of wood. In this case, the coupling portions 8 may be obtained by cutting to length sections, corresponding to the segments 81, 82 forming the coupling portions 8, from laths having the desired shaped coupling profile 80, and then applying these sections to the outer faces of the frameworks 21, 31 individually or as a single piece, after joining, for example by gluing, the sections themselves according to the desired arrangement. Alternatively, the coupling portions 8 could also advantageously be made of plastic material. In this case, the coupling portions 8 may be made directly in a single piece, for example by conventional injection molding processes.

[0050] In the preferred embodiment shown herein, the body 1 comprises at least one pair of guide rails 11 for a drawer, preferably applied to the bottom 2. Alternatively or additionally, pairs of guide rails for drawers could be applied to the sidewalls 4, 5 and/or the ceiling 3.

[0051] As shown in Fig. 12, the body 1 may conveniently be provided with removable covering panels 12 fitted to the sidewalls 4, 5 and the back side.

[0052] Also shown in Fig. 12 is a removable stiffening cross 13 arranged between the bottom 2 and the ceiling 3 at the back side of the body 1, which is useful for increasing the stability of the body 1.

[0053] The body 1 has a collapsible structure. In particular, each sidewall 4, 5 is connected to the bottom 2 and the ceiling 3 by means of respective hinged connections 6 defining respective pivot axes X-X parallel to one another, such that the body 1 may take on an erected configuration, shown in Figs. 2, 4 and 5, in which the sidewalls 4, 5 are substantially perpendicular to the bottom 2 and the ceiling 3, or a collapsed configuration, shown in Fig. 8, in which the sidewalls 4, 5 are substantially parallel to the bottom 2 and the ceiling 3.

[0054] The hinged connections 6 preferably have the same structure. As apparent in particular from Fig. 1 and, in more detail, from Figs. 3a and 3b - where, for better visibility, the ceiling 3 is shown without the respective coupling portion 8 -, each hinged connection 6 comprises a pair of pin elements 61 and a pair of guiding slots 62 for the pin elements 61. The pin elements 61 are associated with the sidewalls 4, 5 and extend from longitudinally opposed sides of edge portions thereof adjacent to the bottom 2 or the ceiling 3, along the respective pivot axis X-X. The guiding slots 62 are associated with the bottom 2 and the ceiling 3 and longitudinally extend in a direction perpendicular to the bottom 2 and the ceiling 3. This particular structure of the hinged connections 6 allows both a relative rotation between the sidewalls 4, 5 and the bottom 2 and the ceiling 3 as in an articulated parallelogram, which is necessary to change from the erected to the collapsed configuration and vice versa, and a relative translation between the sidewalls 4, 5 and the bottom 2 and the ceiling 3 along a direction perpendicular to the latter, which is advantageous for engaging, i.e., locking, and disengaging, i.e., unlocking, the sidewalls 4, 5 relative to the bottom 2 and the ceiling 3, as described in detail hereinafter with reference to Figs. 8-11.

[0055] In more detail, each pin element 61 is associated with the frameworks 41, 51 of the sidewalls 4, 5 at corners of the respective perimeter frames 410, 510 preferably so as to project toward the inner, concave side of the C-shaped profile of the perimeter frames 410, 510 themselves (Fig. 3b). The pin elements 61 are associated with the frames 41, 51 preferably in a removable manner, such as by means of a retaining washer 611. Alternatively, the pin elements 61 may be fixedly associated with the frameworks 41, 51, e.g., by welding.

[0056] Each guiding slot 62 is preferably formed into a leg of a respective L-shaped element 620 separate from the frameworks 21, 31 of the bottom 2 and the ceiling 3, respectively, and associated therewith at corners of the respective perimeter frames 210, 310. The L-shaped elements 620 are associated with the frameworks 21, 31 preferably in a removable way, e.g., by means of screws 621 (Figs. 3a, 3b). Alternatively, the L-shaped elements 620 may be fixedly associated with the frameworks 21, 31, e.g., by welding or riveting.

[0057] In the erected configuration of the body 1, the legs of the L-shaped elements 620 comprising the guiding slots 62 are accommodated longitudinally in the concave portion of the vertical C-shaped profile elements of the perimeter frames 410, 510 of frameworks 41, 51 (Fig. 3b). In such vertical profile elements, at least one longi-

tudinal slit is suitably formed at the hinged connections 6, which allows the legs of the L-shaped elements 620 where the guiding slots 62 are formed to rotate and take on a laterally inclined position relative to the vertical profile elements themselves, and thus the sidewalls 4, 5 to pivot unconstrained relative to the bottom 2 and the ceiling 3 upon changing from the erected to the collapsed configuration, and vice versa, of the body 1. Fig. 3a shows, by way of example, one of such longitudinal slits, indicated by reference numeral 4101, in one of the vertical C-shaped profile elements of the perimeter frame 410 of the framework 41 of sidewall 4.

[0058] The locking of the body 1 in the erected configuration is ensured by the removable coupling between edge portions of the sidewalls 4, 5 that are adjacent to the bottom 2 and the ceiling 3 and receiving grooves 7 especially provided in or at the bottom 2 and in or at the ceiling 3 to receive said edge portions. No separate fastening means, such as screws, pins, or the like, to be applied and removed every time the furniture body 1 is erected or collapsed, are required to secure and stably maintain the body 1 in the erected configuration.

[0059] As better seen in Figs. 1, 2, 3a, and 3b, each receiving groove 7 extends longitudinally in a direction parallel to the pivot axes X-X of the hinged connections 6 and, in the erected configuration of body 1, removably receives a portion of the perimeter frame 410, 510 of the framework 41, 51 of one of the sidewalls 4, 5 that is adjacent to the bottom 2 or ceiling 3, substantially preventing lateral tilting of the sidewall 4 or 5 itself. Preferably, the receiving grooves 7 have a cross-sectional shape conjugated with the shape of the outer cross-sectional profile of the portion of the perimeter frame 410, 510 of the framework 41, 51 respectively received therein, i.e., in the preferred embodiment illustrated herein, a generally C-shape. Conveniently, each receiving groove 7 is defined by a respective profile element 70 associated, preferably removably associated, with the frameworks 21, 31 of the bottom 2 and the ceiling 3, at an inner face thereof. However, the possibility of forming the receiving grooves 7 directly into the frameworks 21, 31, for example, by a drawing operation performed during the manufacturing process of the frameworks 21, 31 themselves, is not excluded.

[0060] Figs. 8-11 show subsequent steps to erect the body 1 and lock it into the erected configuration. Starting from the collapsed, flat configuration of the body 1, shown in Fig. 8, a user or fitter grasps, for example, the ceiling 3 and rotates it with respect to bottom 2 away from the latter, as shown in Fig. 9 by arrow E, until the sidewalls 4, 5 are brought to a vertical position, perpendicular to the bottom 2 and the ceiling 3.

[0061] Simultaneously with this rotation, the user or fitter also slightly lifts the ceiling 3 relative to the bottom 2. Due to the special design of hinged connections 6, which allow not only a relative rotation between bottom 3, sidewalls 4, 5, and ceiling 2, but also a relative translation between these components along a direction perpendicular to the bottom 2 and the ceiling 3, the lifting also results in a mutual spacing, in a direction perpendicular to the bottom 2 and the ceiling 3, between each of the sidewalls 4, 5, and the bottom 2 and the ceiling 3 themselves.

[0062] Once the erected configuration is reached, the edge portions adjacent to the bottom 2 and the ceiling 3 of the perimeter frameworks 41, 51 of the sidewalls 4, 5 are vertically facing the respective receiving grooves 7 of the bottom 2 and the ceiling 3, but are not yet engaged with them, as shown in Figs. 10 and 11. In particular, in this condition the pin elements 61 of the hinged connections 6 are located in the respective guiding slots 62 at a distal position relative to the inner face of the bottom 2 or the ceiling 3 (Fig. 11).

[0063] At this point, the user or fitter may drop the ceiling 3, whereby the sidewalls 4, 5 automatically, by gravity, vertically engage the respective receiving grooves 7 of the bottom 2 and the ceiling 3, thus causing the body 1 to be locked in the erected condition (Fig. 2-5). In this condition, the pin elements 61 of the hinged connections 6 are located in their respective guiding slots 62 at a proximal position relative to the inner face of the bottom 2 or the ceiling 3 (Fig. 3b).

[0064] Once the body 1 is locked in the erected configuration, auxiliary components, such as the covering panels 12 and the stiffening cross 13, may be fitted to it.

[0065] To collapse the body 1, it is only required to perform the steps described above in reverse order. In particular, the user or fitter shall raise the ceiling 3 slightly, so as to disengage the sidewalls 4, 5 from the respective receiving grooves 7 at the bottom 2 and the ceiling 3, and then rotate ceiling 3 in a direction opposite to that of the erection, until the sidewalls 4, 5 are brought to a position parallel to the bottom 2 and the ceiling 3, corresponding to the collapsed, flat configuration of the body 1.

[0066] Figs. 13 and 14 show a preferred embodiment of a module 10 of a modular furniture system for storing objects, comprising the body 1 described above. The module 10 also comprises a drawer 9 slidably received in the body 1, as apparent particularly from the side view of Fig. 14, in which the covering panel 12 of one of the sidewalls 4, 5 has been removed.

[0067] The drawer 9, separately shown in Figs. 15-17, has a collapsible structure. In particular, the drawer 9 comprises a rectangular or square bottom 90, a front wall 91, a back wall 92, and a pair of lateral walls 93, 94. Each of the walls 91, 92, 93, and 94 is hinged to the bottom 90 at a respective side thereof, such that it can be pivotally rotated between an erected position, substantially perpendicular to the bottom 90, and a collapsed position, substantially parallel to the bottom 90. In the collapsed, substantially flat configuration of the drawer 9 (Fig. 16), the front wall 91 and the back wall 92 are folded onto a face of the bottom 90, while the two lateral walls 93, 94 are folded onto the opposite face of the bottom 90. In the erected configuration of the drawer 9 (Fig. 15), the walls 91, 92, 93, and 94 are secured to each other in the erected

position by releasable joints at their respective adjacent sides, without the need for additional fastening means.

[0068] According to alternative embodiments, not shown, the module 10 may include more than one drawer 9, or even be without drawers. In the latter case, the module 10 could comprise one or more shelves and/or dividers arranged, preferably removably, inside the body 1, and/or one or more closing doors affixed, preferably removably, to the front of the body 1. Alternatively, the module 10 could also consist of the body 1 alone.

[0069] Modules 10 of this kind are suitable for building a variety of modular furniture systems for storing objects, particularly modular kitchens. In particular, thanks the coupling portions 8 provided at the bottom 2 and the ceiling 3 of the body 1 as described above, the modules 10 may be assembled and secured to one other and to other correspondingly configured components of a modular furniture system particularly easily, without the need for additional fastening means and/or the use of assembly tools, and flexibly. For this use, modules 10 may have different, preferably standard, sizes, e.g., they may be 30 / 60 / 90 cm wide, 20 / 40 cm high, and 60 cm deep, and/or may have different functional configurations, e.g., drawer units, shelf units, units with or without doors, etc.

[0070] Figs. 18a,b, 19a,b, 20a,b, and 21a,b show examples of modular furniture systems 100a-d that may be obtained by combining multiple modules 10. The modular furniture systems 100a-d shown comprise, in addition to the modules 10, a top covering panel 101 or countertop and a base 102, possibly provided with support feet. Both the top covering panel 101 and the base 102 may be made of several parts, as shown in the figures, or as a single piece. In any case, the top covering panel 101 and the base 102 comprise respective coupling portions configured similarly to the coupling portions 8 previously described in relation to the body 1, for coupling with the ceiling 3 or bottom 2 of the bodies 1 of the modules 10.

[0071] In particular, Figs. 18a and 18b show a modular furniture system 100a having a straight linear plan, in which vertically stacked modules 10 are staggered in the horizontal direction. In this way, each module 10 is locally secured both vertically and horizontally to all modules 10 adjacent to it.

[0072] Figs. 19a and 19b show another modular furniture system 100b with a straight linear plan, in which, however, vertically stacked modules 10 are not staggered in the horizontal direction, i.e., they form mutually independent vertical columns. In this case, the constraint in the horizontal direction between the modules 10 and the necessary stability of the modular furniture system 100b are nevertheless ensured by the presence of the top covering panel 101 and the base 102.

[0073] Figs. 20a and 20b show a modular furniture system 100c with a broken linear plan, in which some modules 10 are assembled together horizontally according to mutually orthogonal directions to form angles.

[0074] Finally, Figs. 21a and 21b show a modular furniture system 100d configured as an island.

[0075] A module 10 comprising a furniture body 1 according to the present invention, either in the functional configuration shown Fig. 13 or in other functional configurations, may advantageously be employed also as a stand-alone item of furniture. In this case, the module 10 is preferably provided with a respective countertop or top covering panel at the ceiling 3 of the body 1 and a respective base at the bottom 2 of the body 1, in the same way as described above for the modular furniture systems 100a-d.

[0076] The module or the item of furniture 10 may conveniently be marketed as a kit of parts comprising the body 1 and the drawer 9, both in a collapsed, flat configuration. The kit of parts could also include auxiliary components of the body 1, such as, for example, the removable covering panels 12 and the removable stiffening cross 13, and/or other components of the module or item of furniture 10, possibly alternative to the drawer 9, such as shelves, dividers, closing doors, a top covering panel, and/or a base.

Claims

1. Collapsible furniture body (1) of an item of furniture (10) for storing objects, comprising a bottom (2), a ceiling (3) opposing the bottom, and a pair of sidewalls (4, 5) opposing each other and connecting the bottom (2) and the ceiling (3) with each other,

   wherein each sidewall (4, 5) is hingedly connected to the bottom (2) and the ceiling (3) by means of respective hinged connections (6) defining respective pivot axes (X-X) parallel to one another, so that the furniture body (1) may take on an erected configuration, in which the sidewalls (4, 5) are substantially perpendicular to the bottom (2) and the ceiling (3), or a collapsed configuration, in which the sidewalls (4, 5) are substantially parallel to the bottom (2) and the ceiling (3),
   wherein the bottom (2) and the ceiling (3) comprise a receiving groove (7) for each sidewall (4, 5),
   wherein each receiving groove (7) longitudinally extends along a direction parallel to said pivot axes (X-X) and in the erected configuration of the furniture body (1) removably receives an edge portion of a sidewall (4, 5) adjacent to the bottom (2) or the ceiling (3) substantially preventing lateral tilting of the sidewall (4, 5),
   wherein the hinged connections (6) are configured so as to allow a relative translation between sidewalls (4, 5) and bottom (2) and ceiling (3) along a direction perpendicular to the bottom (2) and the ceiling (3) for engaging and disengaging the sidewalls (4, 5) into/from the respective receiving grooves (7).

2. Furniture body (1) according to claim 1, wherein each hinged connection (6) comprises a pair of pin elements (61) associated with a sidewall (4, 5) and extending from longitudinally opposite sides of an edge portion thereof adjacent to the bottom (2) or the ceiling (3) along the pivot axis (X-X) of the hinged connection (6), and a pair of guiding slots (62) for the pin elements (61) associated with the bottom (2) or the ceiling (3) and longitudinally extending along a direction perpendicular to the bottom (2) or the ceiling (3).

3. Furniture body (1) according to claim 2, wherein the guiding slots (62) are formed in a leg of respective L-shaped members (620) associated, preferably removably associated, with the bottom (2) or the ceiling (3).

4. Furniture body (1) according to any one of the previous claims, wherein each receiving groove (7) has a cross section having a shape conjugated with the shape of an outer profile of the edge portion of the sidewalls (4, 5) received in the receiving groove (7).

5. Furniture body (1) according to any one of the previous claims, wherein each receiving groove (7) is defined by a profile element (70) associated with the bottom (2) or the ceiling (3) at an inner face thereof.

6. Furniture body (1) according to any one of the previous claims, wherein the bottom (2) and the ceiling (3) comprise a preferably plate-shaped framework (21, 31) made of a single piece.

7. Furniture body (1) according to any one of the previous claims, wherein the sidewalls (4, 5) comprise an assembled framework (41, 51).

8. Furniture body (1) according to any one of the previous claims, wherein at least one of the bottom (2) and the ceiling (3) comprises a coupling portion (8) projecting from an outer face thereof for coupling the furniture body (1) to further furniture bodies or components (101, 102) of a modular furniture system (100a-d), wherein the coupling portion (8) comprises at least one first segment (81) extending in a first direction of longitudinal development, and at least one second segment (82) extending in a second direction of longitudinal development crossing the first direction of longitudinal development, and wherein the at least one first segment (81) and the at least one second segment (82) comprise respective shaped coupling profiles (80) made of mutually alternated recesses and projections, having a periodic outline in the respective direction of longitudinal development.

9. Furniture body (1) according to claim 8, wherein the shaped coupling profiles (80) are wave-shaped profiles.

10. Furniture body (1) according to any one of the previous claims, comprising at least one removable covering panel (12) fitted to the sidewalls (4, 5) and/or to a back side of the furniture body.

11. Furniture body (1) according to any one of the previous claims, further comprising at least one pair of guide rails (11) for a drawer (9).

12. Item of furniture (10) for storing objects comprising a furniture body (1) according to any one of the previous claims in an erected configuration and at least one drawer (9) slidably received in the furniture body (1).

13. Item of furniture (10) according to claim 12, wherein the drawer (9) has a collapsible structure.

14. Kit of parts of an item of furniture (10) for storing objects comprising a furniture body (1) according to any one of claims 1 to 11 in a collapsed configuration.

15. Kit of parts according to claim 14, further comprising at least one drawer (9) having a collapsible structure, in a collapsed configuration.

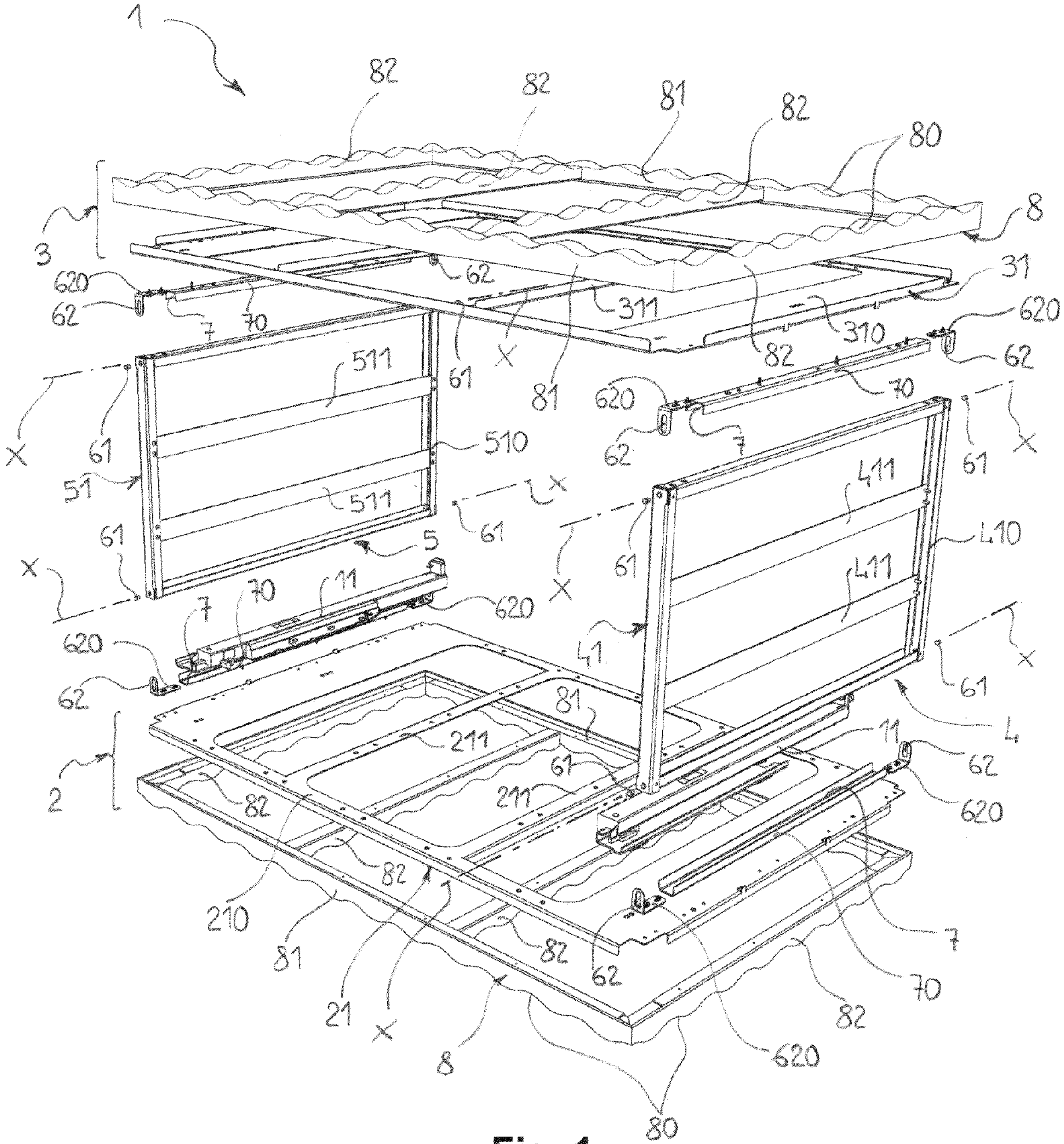
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Fig. 1

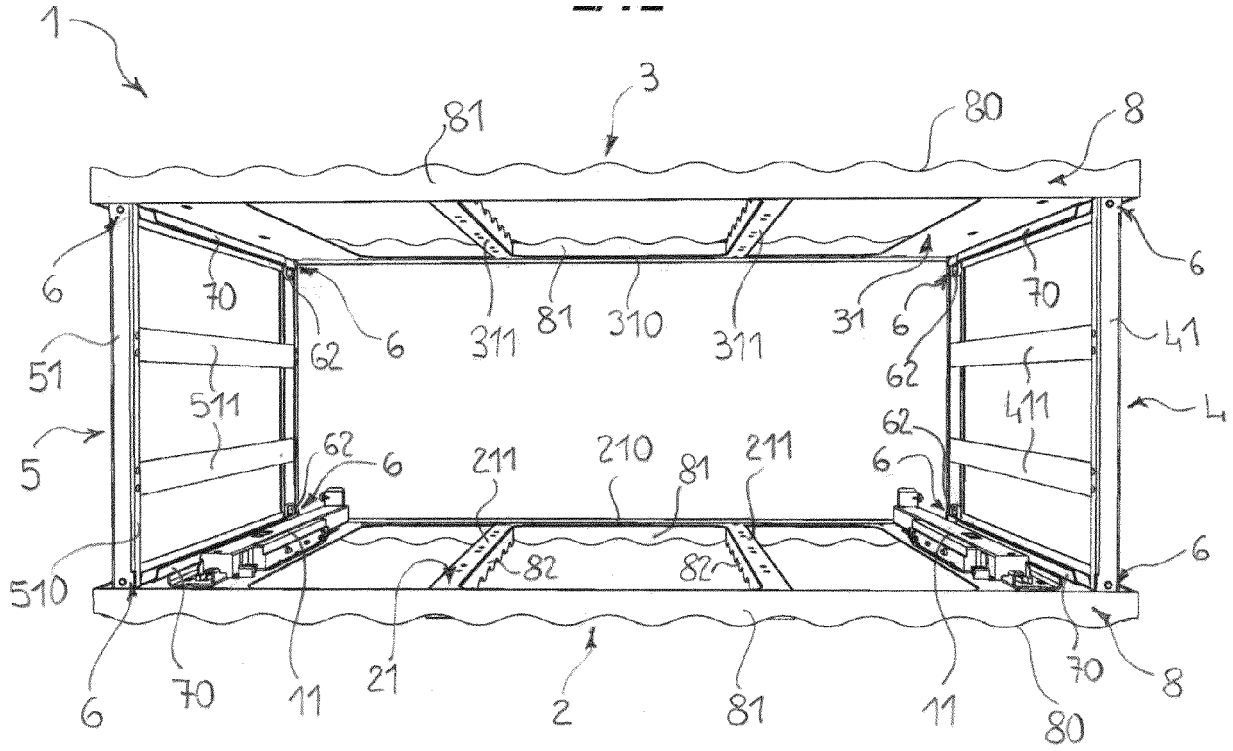

Fig. 2

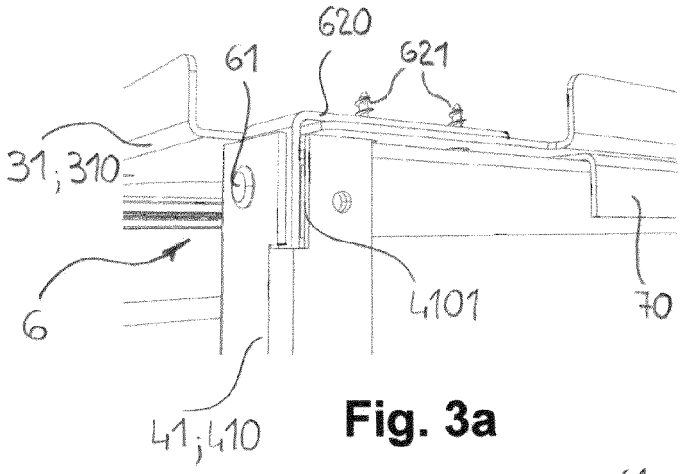

Fig. 3a

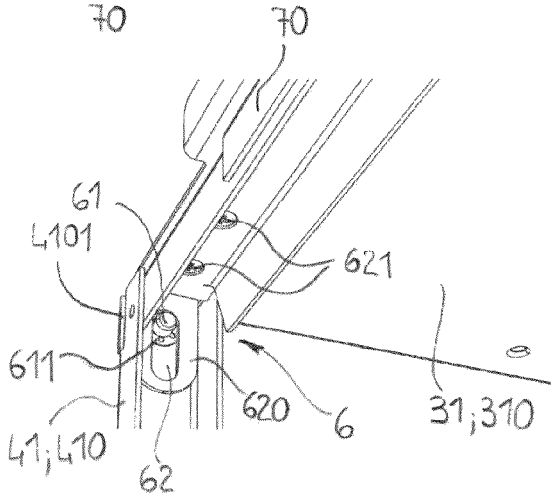

Fig. 3b

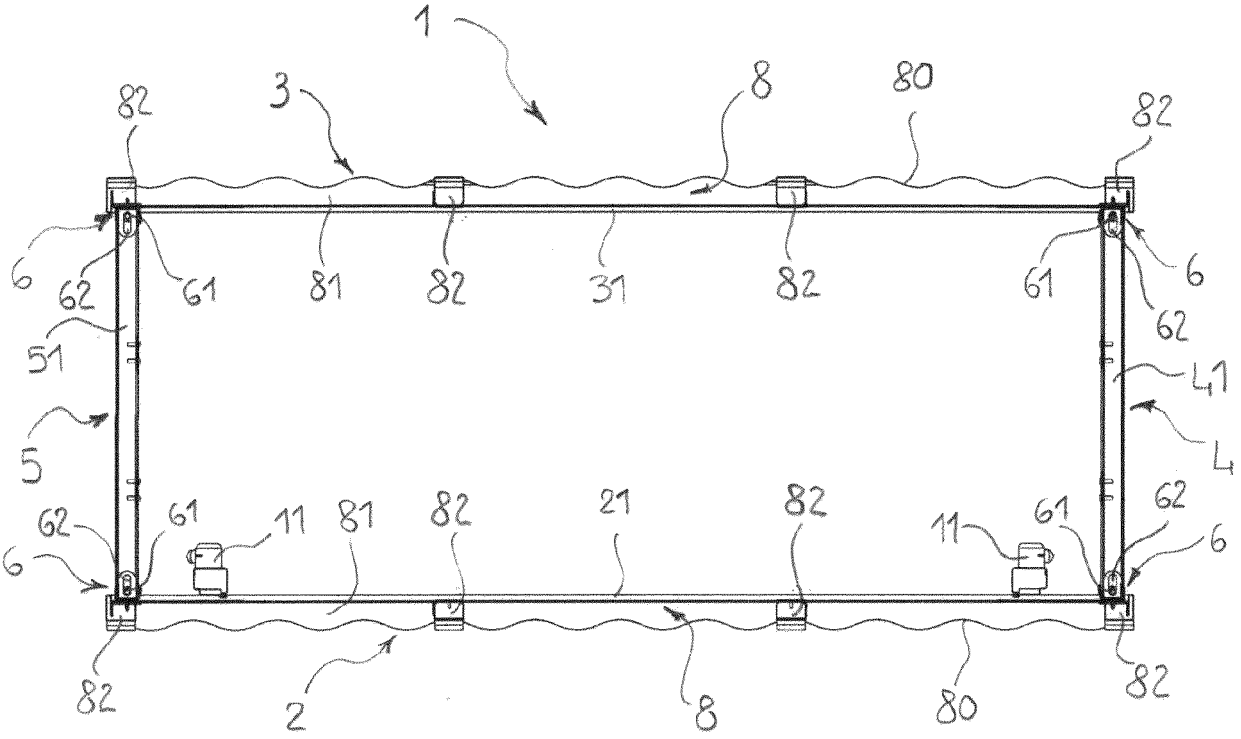
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Fig. 4

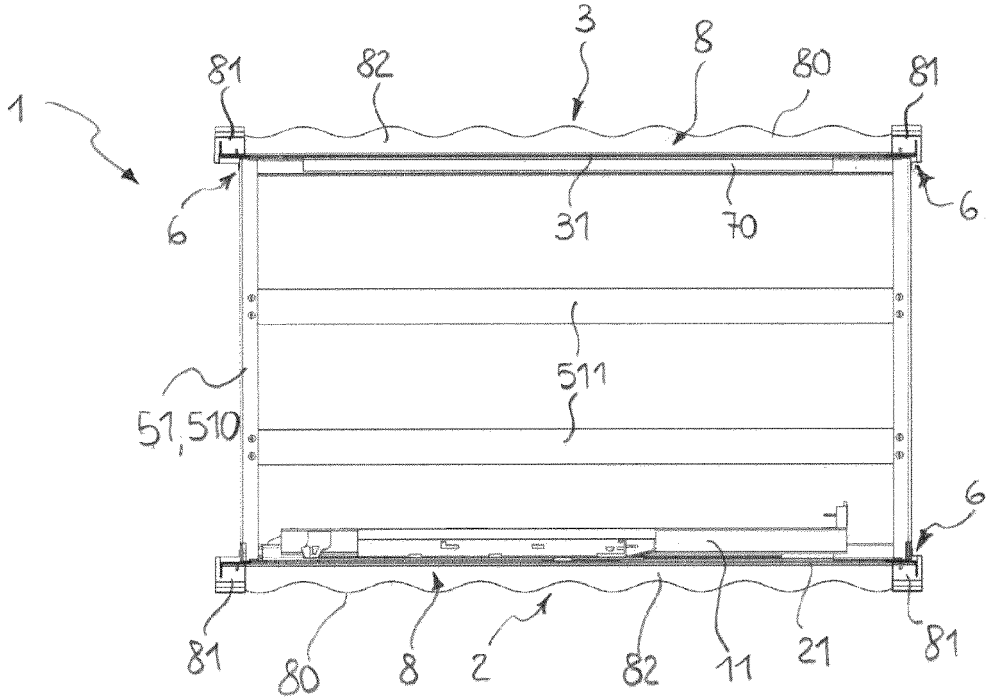
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Fig. 5

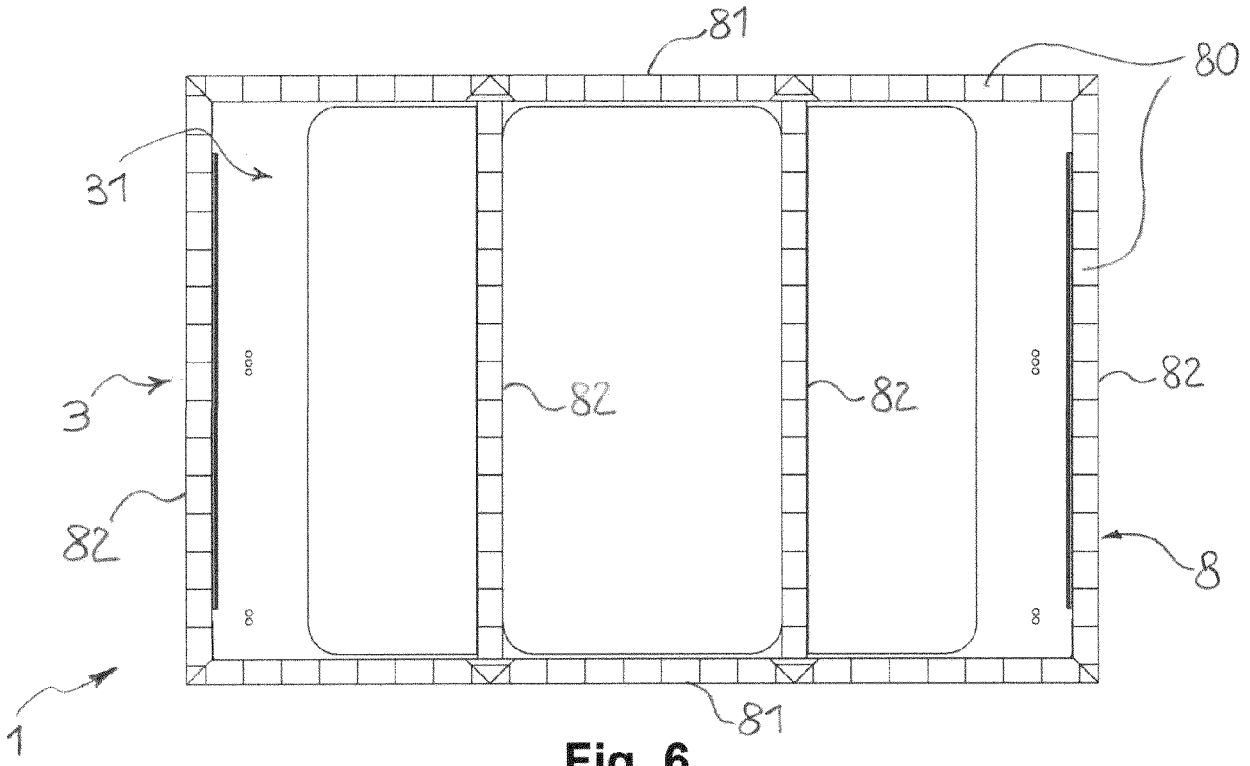

Fig. 6

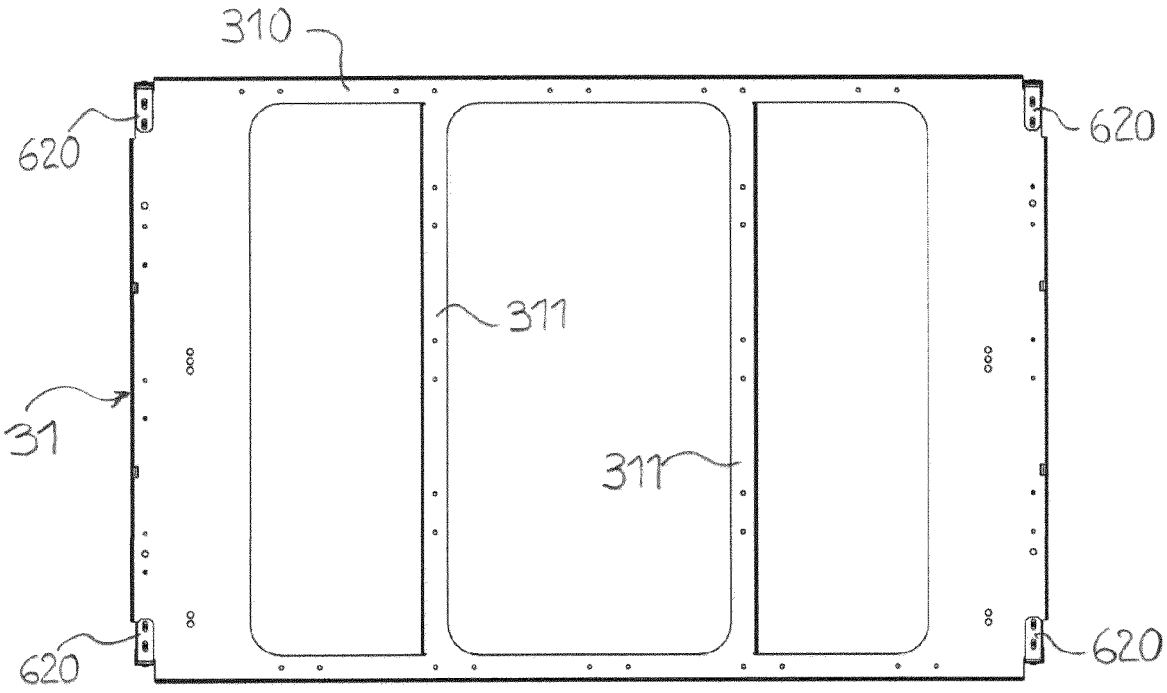

Fig. 7

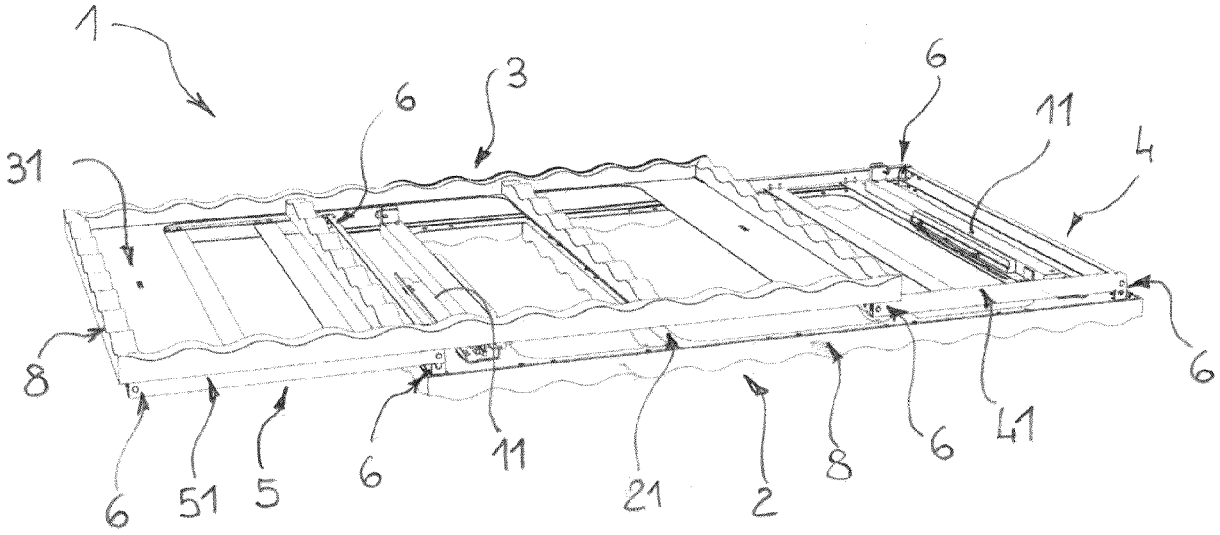
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Fig. 8

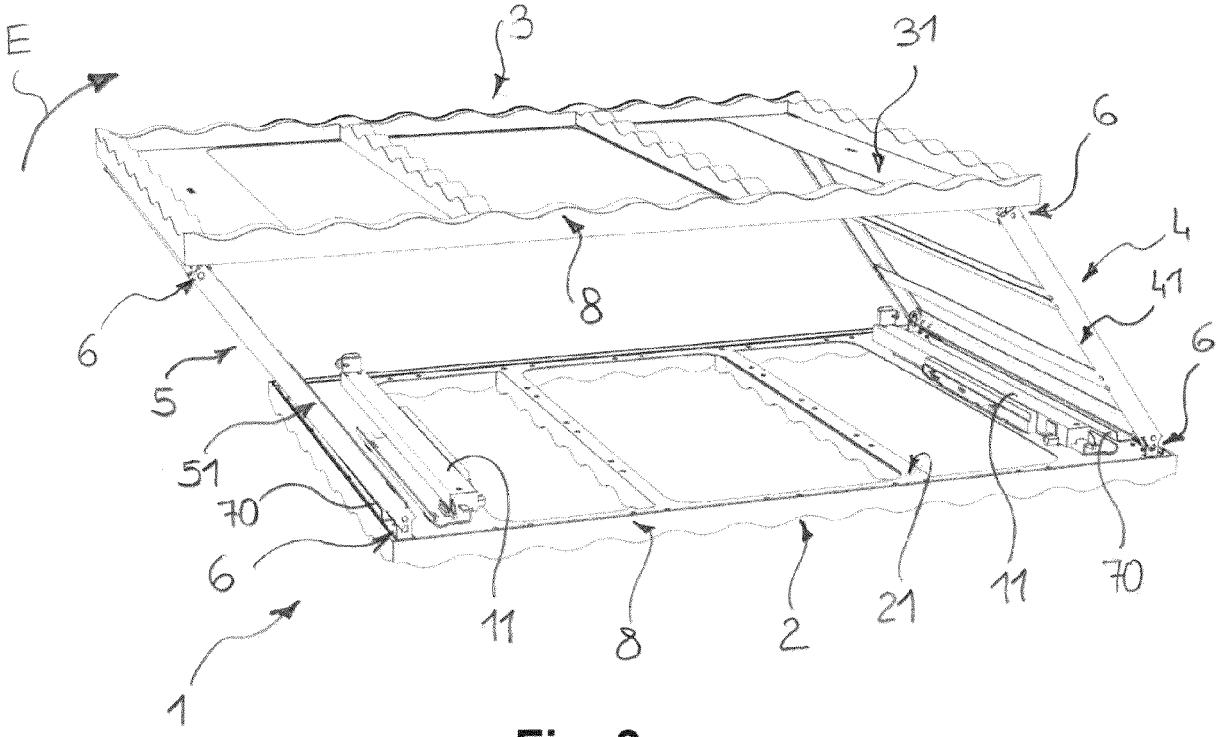
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Fig. 9

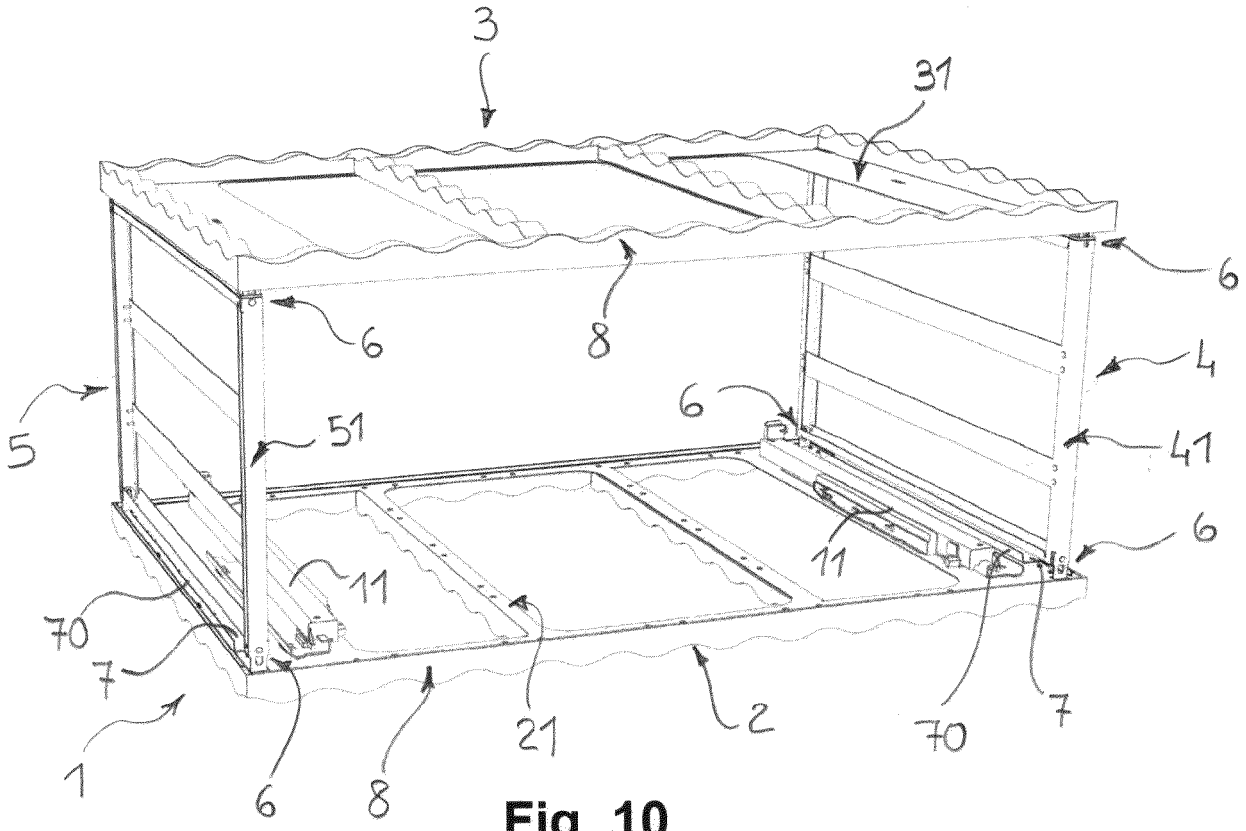
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Fig. 10

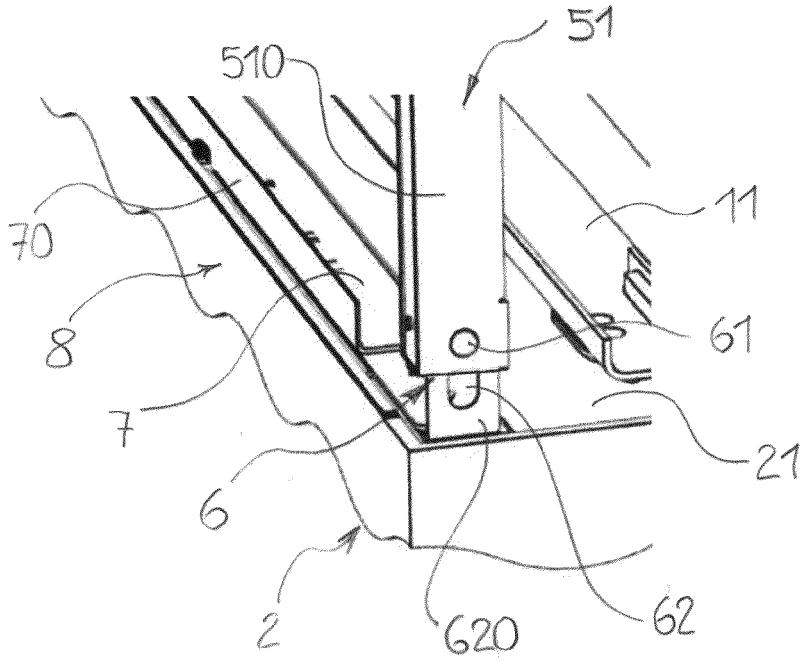
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Fig. 11

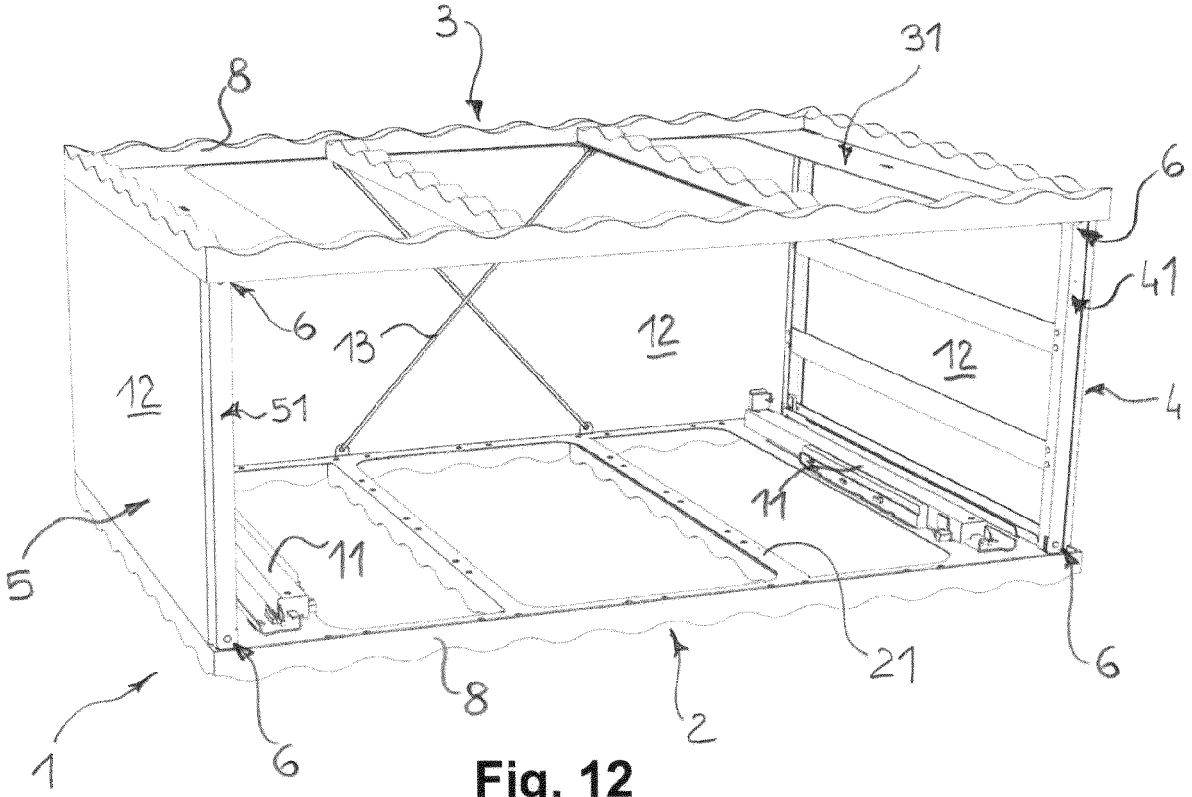

Fig. 12

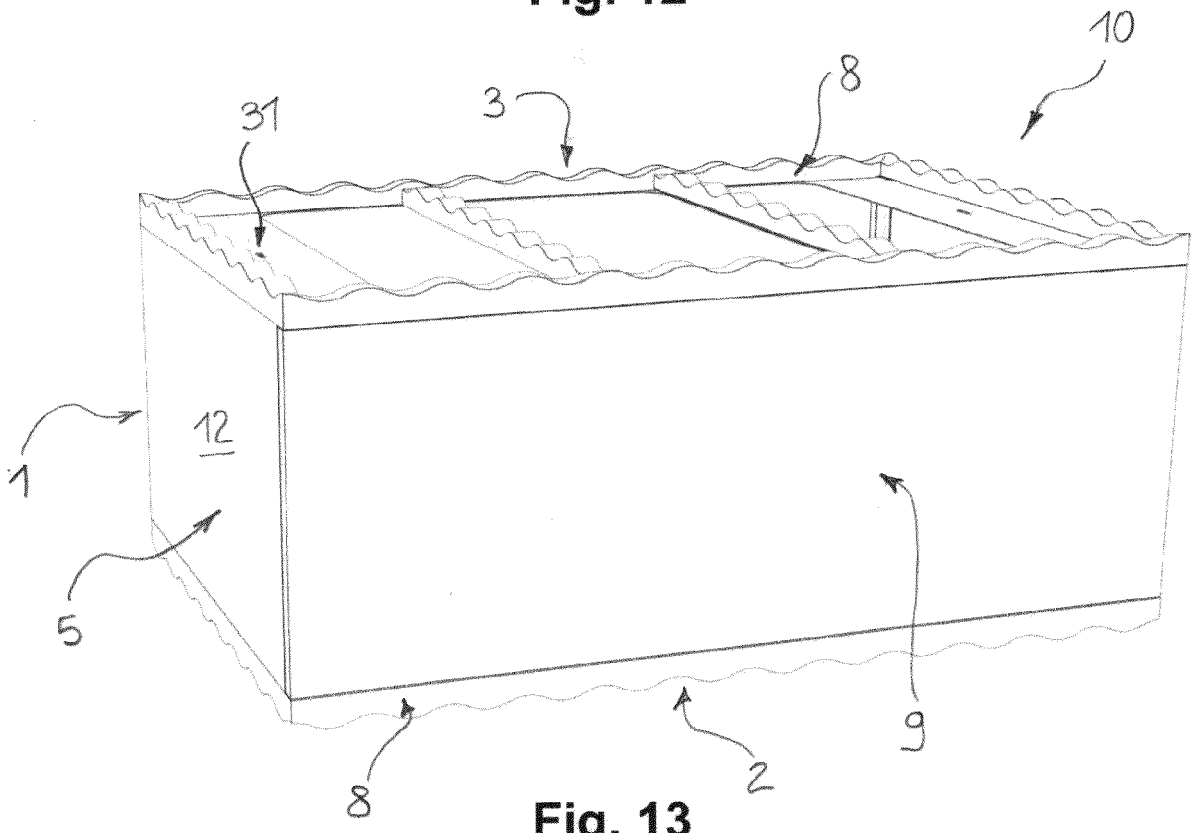

Fig. 13

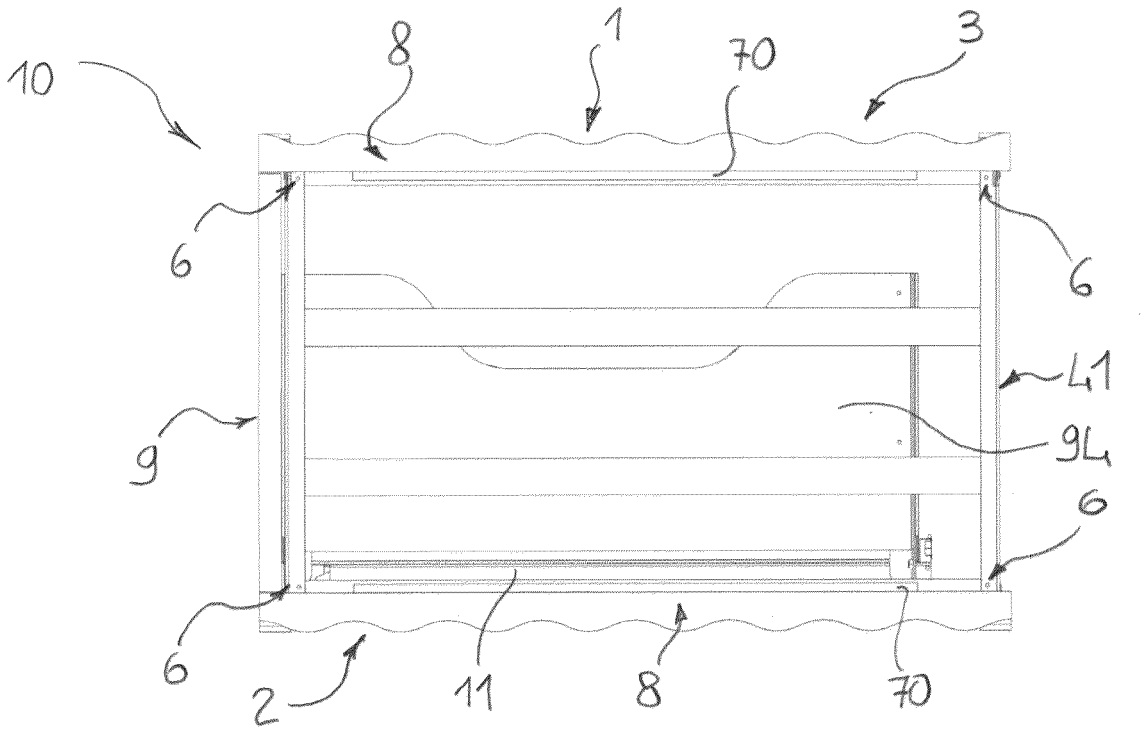

Fig. 14

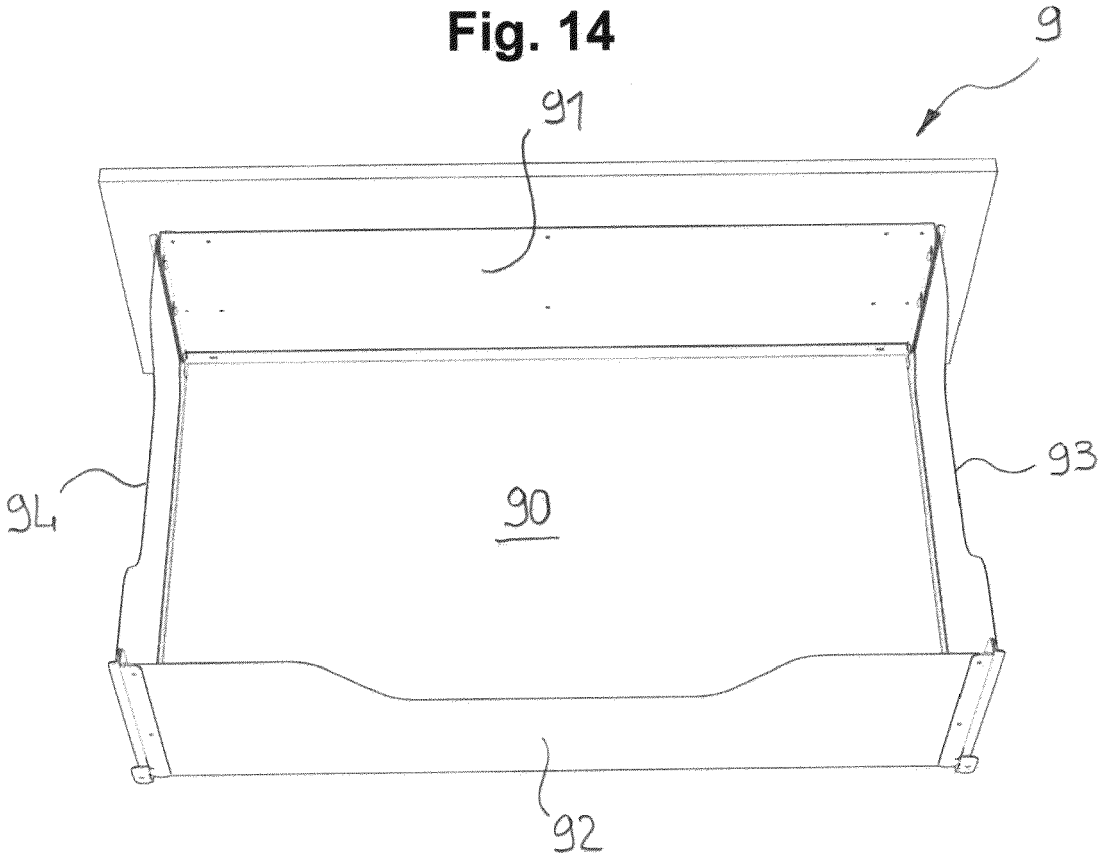

Fig. 15

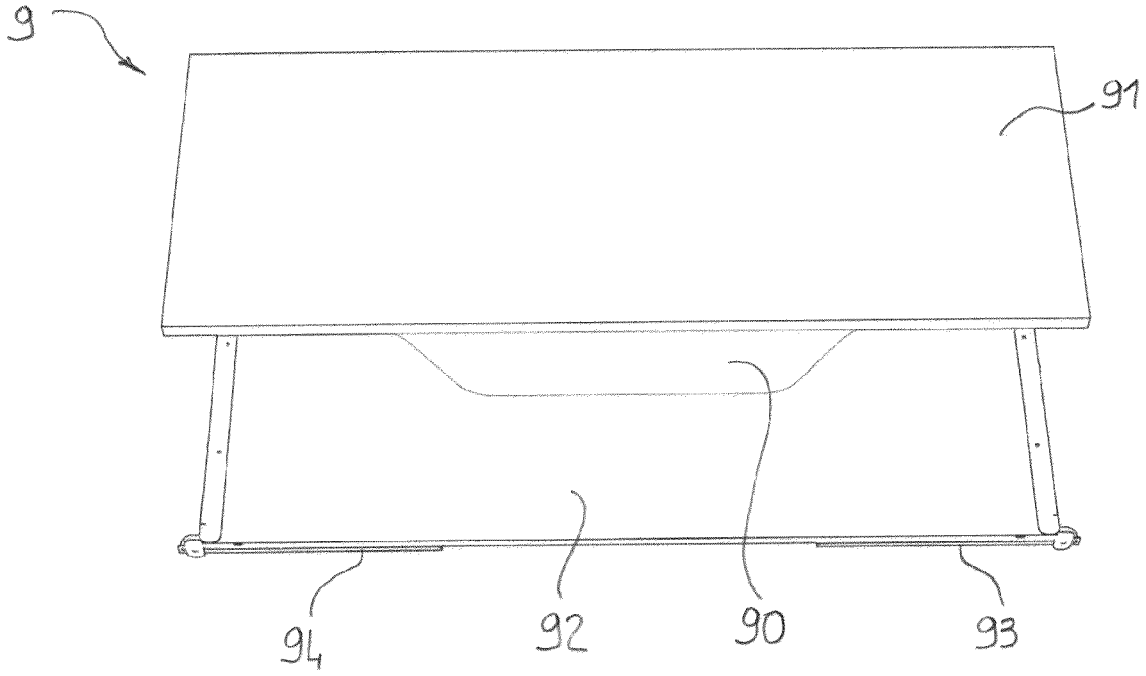

Fig. 16

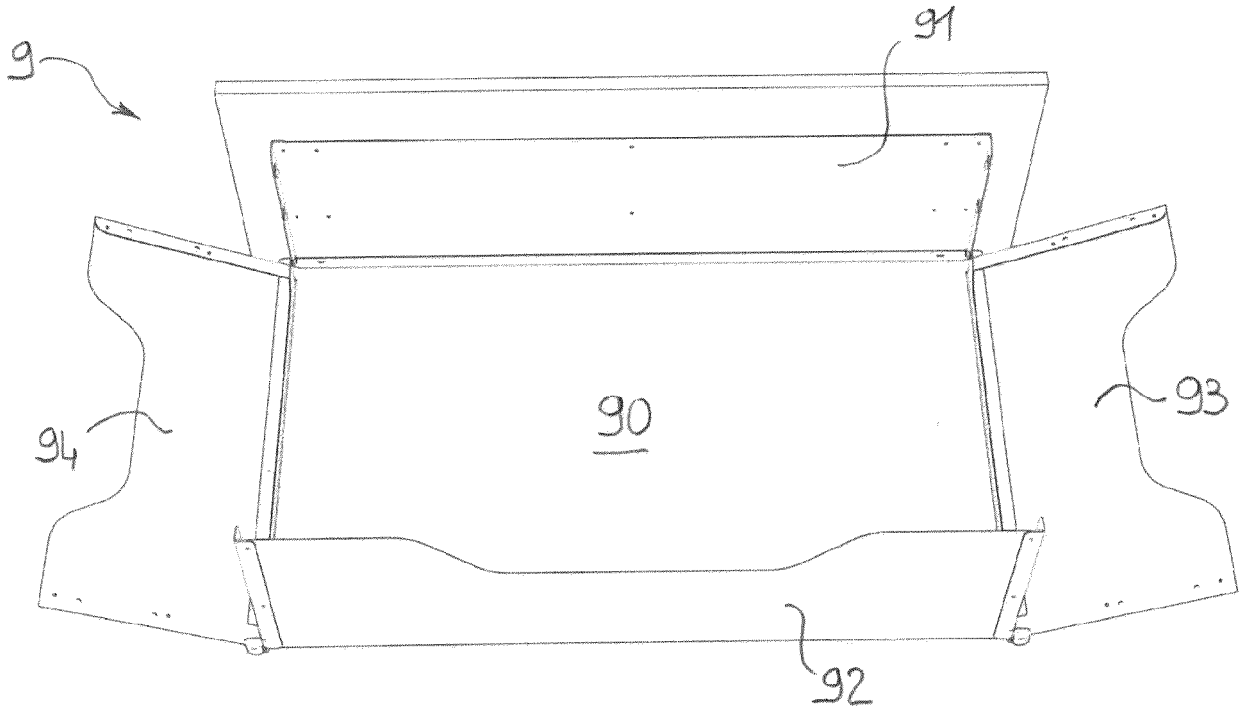

Fig. 17

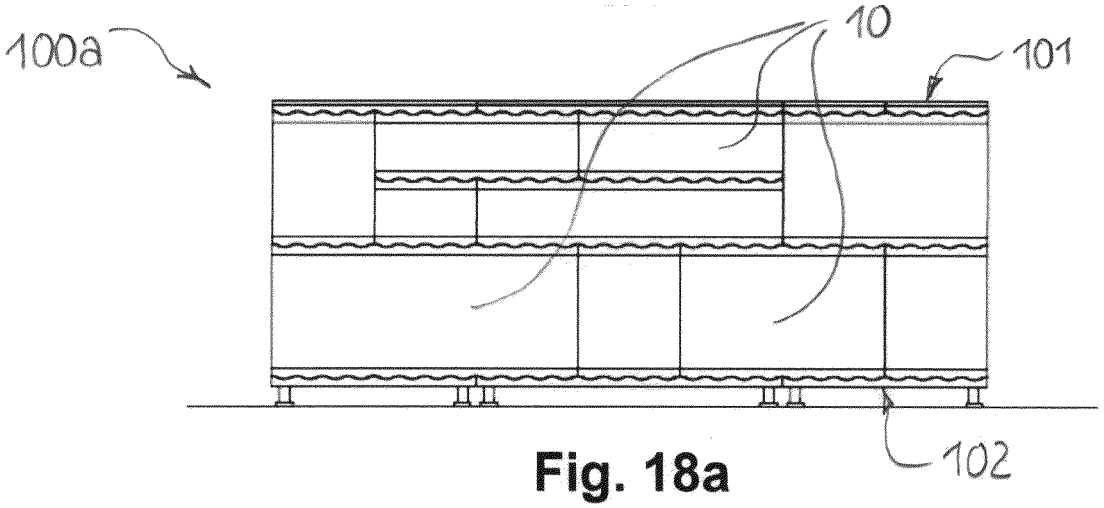

Fig. 18a

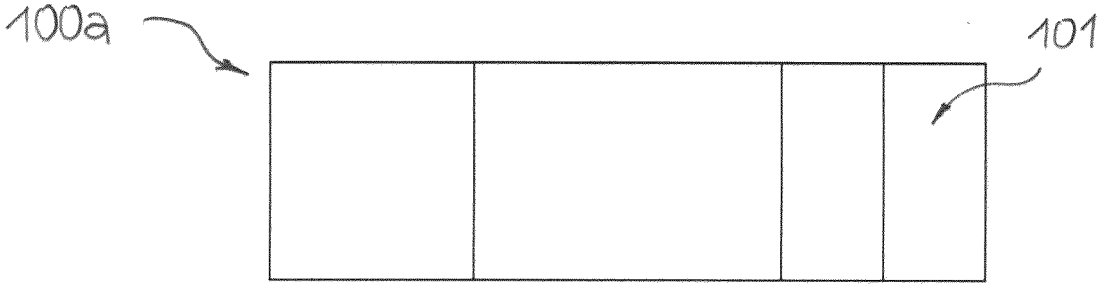

Fig. 18b

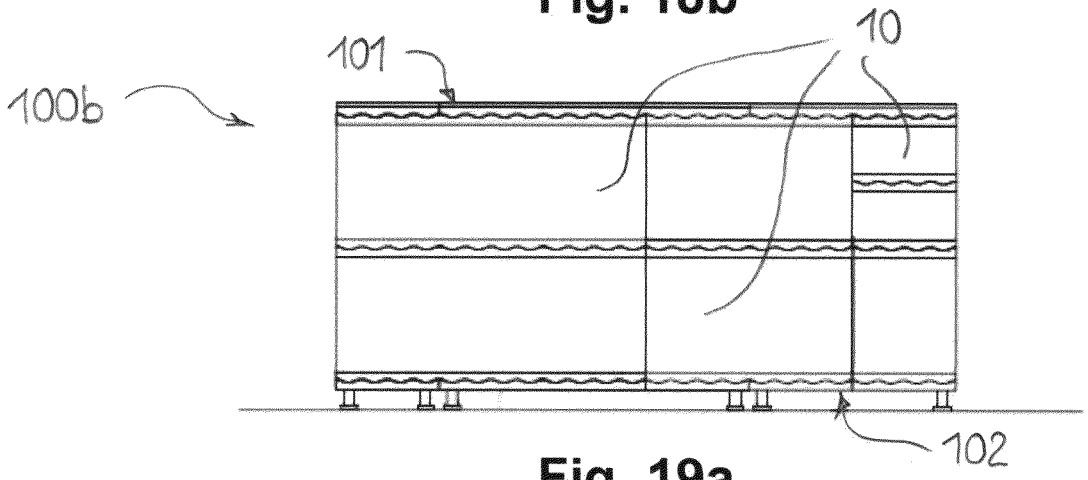

Fig. 19a

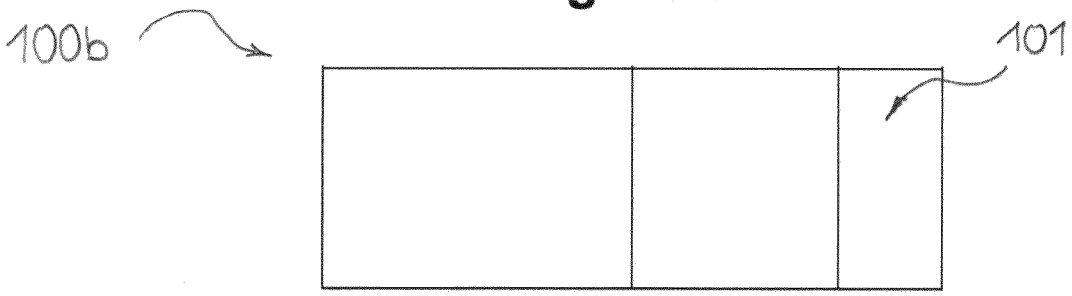

Fig. 19b

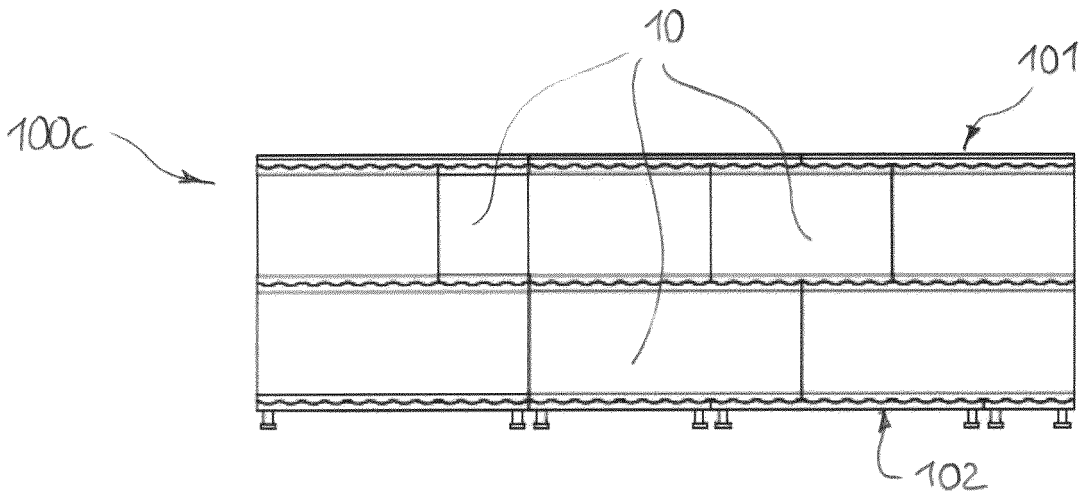

Fig. 20a

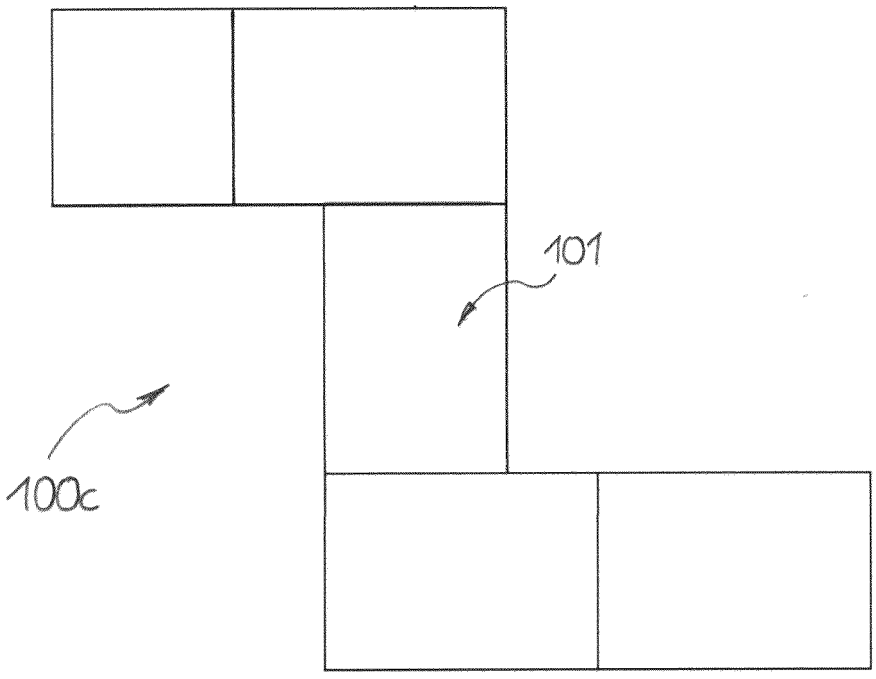

Fig. 20b

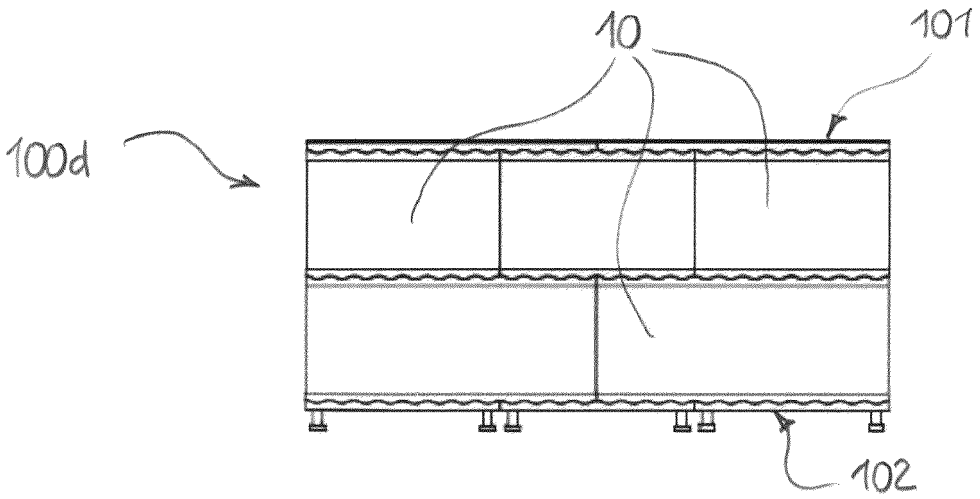

Fig. 21a

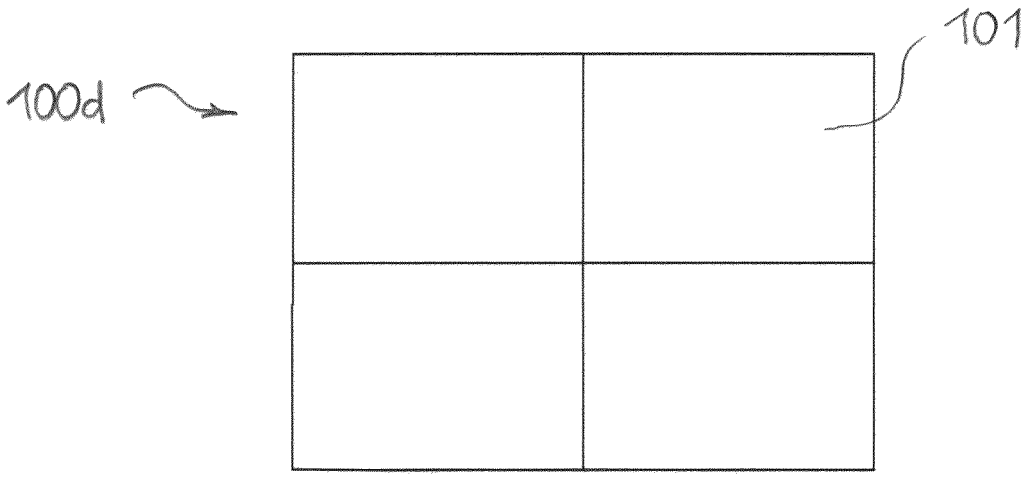

Fig. 21b

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EUROPEAN SEARCH REPORT

Application Number
EP 23 16 6971

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2007/051720 A1 (CHEN HENRY [TW]) 8 March 2007 (2007-03-08) * paragraph [0005] - paragraph [0035]; figures 1-13 * -----	1-15	INV. A47B43/00 A47B87/02 A47B67/00 A47B67/04 B65D6/18
			TECHNICAL FIELDS SEARCHED (IPC) A47B B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 August 2023	Kohler, Pierre

CATEGORY OF CITED DOCUMENTS

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16-08-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007051720 A1	08-03-2007	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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Patent documents cited in the description

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