(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 528 044 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
26.03.2025 Bulletin 2025/13

(21) Application number: **24198138.0**

(22) Date of filing: **03.09.2024**

(51) International Patent Classification (IPC):
E04B 2/82 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
E04B 2/827

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(30) Priority: **19.09.2023 IT 202300003834 U**
09.05.2024 IT 202400010411

(71) Applicant: **Polloni, Elisa**
35125 Padova (IT)

(72) Inventor: **Polloni, Elisa**
35125 Padova (IT)

(74) Representative: **Modiano, Micaela Nadia et al**
Modiano & Partners
Via Meravigli, 16
20123 Milano (IT)

(54) **MOVABLE AND MODULAR WALL**

(57) A wall (10; 110) comprising a lattice-like structure (12; 112). The wall (10; 110) comprises movement means (13; 113) for moving the structure (12; 112).

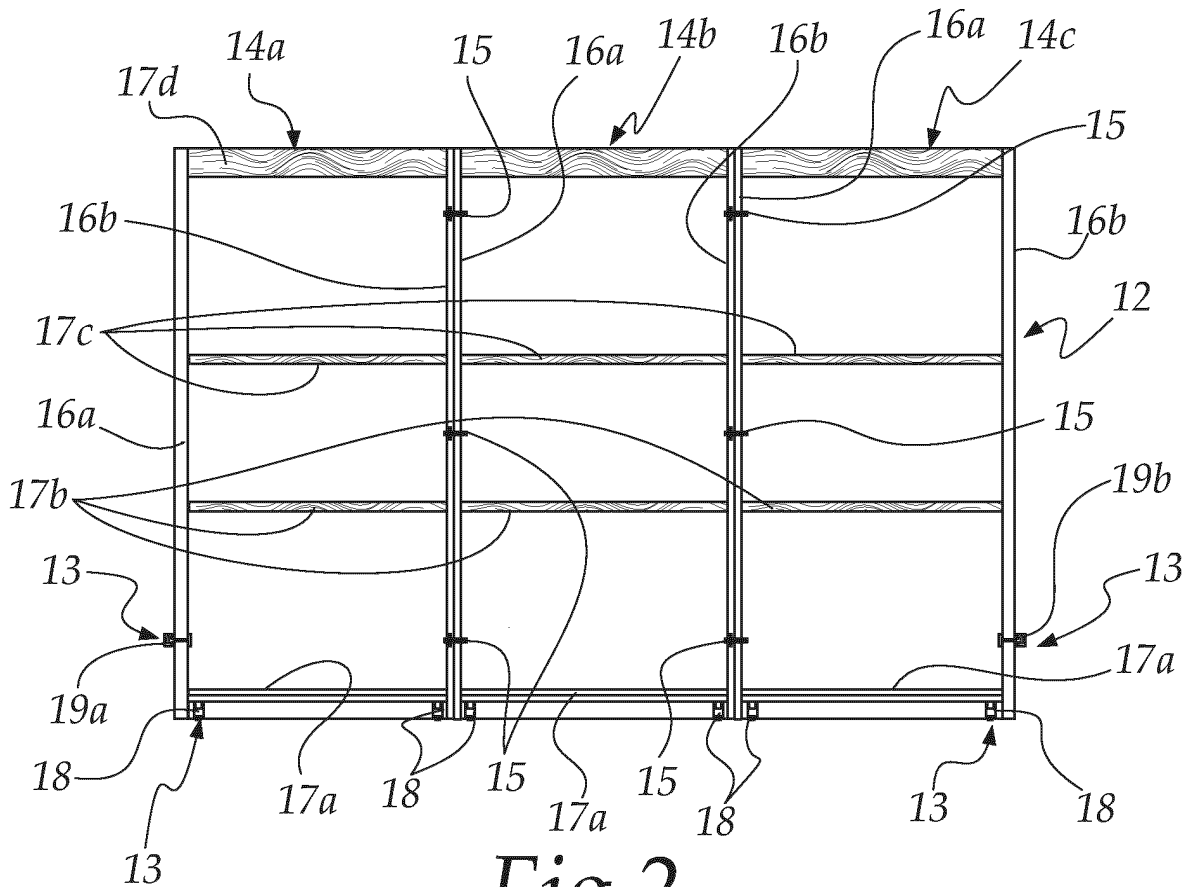

Fig.2

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Description

[0001] The present invention relates to a wall for residential, commercial, office or production use.

[0002] Nowadays, people find themselves spending more and more time in shared living spaces, even small in size and with a limited number of rooms, in which several functions and activities must be carried out simultaneously.

[0003] Home is a place that may initially be inhabited by a couple, which may turn into a family composed of three or more individuals, which only returns to be a couple again over the years.

[0004] Therefore, home is a place in constant transformation and with needs that may change continuously over the years.

[0005] Moreover, in recent times the concept of working from home is becoming more and more widespread and many people therefore need to recreate a space within their own home in which they can work for hours during work-from-home days.

[0006] This entails needs for different spaces within the home, even in the course of a single day.

[0007] The need is therefore felt to find a solution that allows the spaces at home to be used dynamically, varying the volumes of the rooms as required.

[0008] The aim of the present invention is to provide a wall that is able to meet the above-mentioned needs.

[0009] Within this aim, an object of the invention is to provide a wall that can be moved as required within the room in which it is used.

[0010] A further object of the invention is to provide a wall that can be moved easily and without difficulty if needed.

[0011] Another object of the invention is to provide a wall that can be equipped easily and quickly according to the requirements and in which the equipment can be changed as required.

[0012] A further object of the invention is to provide a wall that can be installed in any type of room in which it is used.

[0013] A further object of the invention is to provide a wall that can be installed in any building, in particular in the outer perimeter of the building, allowing to have, for example, a larger terrace in summer and a larger living room in winter.

[0014] A still further object of the present invention is to provide a wall that meets the above-mentioned requirements in a manner that is alternative to any existing solutions.

[0015] Not least object of the invention is to provide a wall that is highly reliable, relatively easy to provide and at competitive costs.

[0016] This aim, as well as these and other objects that will become better apparent hereinafter, are achieved by a wall, comprising a lattice-like structure, said wall being characterized in that it comprises means for moving said structure.

[0017] Further characteristics and advantages of the invention will become better apparent from the description of some preferred but not exclusive embodiments of the wall according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a front view of a wall according to the invention, in a first embodiment;
Figure 2 is a sectional front view of the wall of Figure 1;
Figure 3 is a sectional top view of the wall of Figure 1 in an application of use;
Figure 4 is a sectional side view of the wall of Figure 1;
Figure 5 is a side view of the wall of Figure 1;
Figure 6 is a front view of a wall according to the invention in a second embodiment.

[0018] With reference to the figures, a wall according to the invention, in a first embodiment, is generally designated by the reference numeral 10.

[0019] The wall 10 comprises:

- a lattice-like structure 12 for supporting two opposite vertical surfaces 11a, 11b,
- said vertical surfaces 11a, 11b.

[0020] In the present description, the expressions "vertical", "horizontal", "upper", "lower", "below", "laterally", "frontally", etc., refer to the orientation for use of the wall, which corresponds to the one shown in the figures.

[0021] In other embodiments, the wall according to the invention comprises only the lattice-like structure and/or the lattice-like structure with only one vertical surface.

[0022] In other embodiments, not shown in the figures, the wall according to the invention does not have a lattice-like structure but is formed by one or more panels.

[0023] One of the particularities of the wall 10 is that it comprises movement means 13 for moving the structure 12.

[0024] Advantageously, the structure 12 is made of:

- wood,
- and/or glass,
- and/or paper-like material,
- and/or concrete,
- and/or plastic material,
- and/or composite material, such as a glass fiber reinforced polymeric matrix (GFRP, glass fiber reinforced polymers, or CFRP, carbon fiber reinforced polymers), and/or fiberglass reinforced plastic,
- and/or bamboo,
- and/or metallic material such as steel and/or aluminum and/or titanium and/or 7000 aluminum alloy such as the one known by the trade name "Ergal",
- and/or nanotechnology.

[0025] The structure 12 comprises one or more modules 14a, 14b, 14c, which are mutually fixed by means of pins/bolts 15.

[0026] Such modules 14a, 14b, 14c each comprise:

- two vertical parallel posts 16a, 16b,
- and a plurality of parallel cross-members 17a, 17b, 17c, 17d, extending between said posts 16a, 16b, at right angles thereto.

[0027] It should be noted that the use of modules 14a, 14b, 14c allows to provide walls of different sizes according to requirements and to adapt the structure 12 to the room in which the wall 10 is used.

[0028] The movement means 13 for moving the structure 12 comprise at least one slider 19a, 19b.

[0029] In the example shown in the figures, the movement means 13 comprise two sliders 19a, 19b, each:

- fixed laterally to the structure 12, to a respective post 16a, 16b, which corresponds to an end post of the structure 12,
- adapted to slide on a corresponding horizontally extended rail, not shown in the figures, which is fixed to a corresponding transverse wall.

[0030] In other embodiments, not shown in the figures, the wall according to the invention comprises one or two sliders that are:

- fixed laterally to the structure 12
- adapted to slide on a corresponding horizontally extended rail, which is fixed to the wall.

[0031] In other embodiments, not shown in the figures, the wall comprises one or more sliders that are fixed:

- in an upper and/or lower region with respect to the structure 12,
- or in an upper region and to at least one side of the structure 12,
- or in a lower region and to at least one side of the structure 12.

[0032] The sliders 19a, 19b, are, for example, of the rolling pivot type with single or double ball bearings, and/or magnetic levitation.

[0033] Such sliders are for example those known under the trade name "Rollon Compact Rail NSW43-4a/4b" of the company ROLLON SPA, based in Vimercate (MB), Italy.

[0034] The rail is, for example, of the type with a C-shaped cross-section and a convex profile.

[0035] Such a rail is, for example, the one known by the trade name 'Rollon TLC43/ULC43' by the company ROLLON SPA, based in Vimercate (MB), Italy.

[0036] In this way, the wall 10 can slide in a direction perpendicular to its plane of arrangement, causing a variation of the volumes within the room in which it is used.

[0037] In the example shown in the figures, the sliders 19a, 19b, are four, two for each end post 16a, 16b of the structure 12, and are fixed to the respective post 16a, 16b, by means of a plate 21, which is substantially cross-shaped and shown in Figure 5, on the side wall 20 of the respective post 16a, 16b.

[0038] In other embodiments, not shown in the figures, the sliders may be in a different number, for example only one.

[0039] Such plate 21, for example made of steel, is coplanar with respect to the side wall 20 and is fixed to it by means of screws and/or bolts and/or adhesive bonding, not shown in the figures.

[0040] The plate 21 has two vertical wings 22c, 22d, and two horizontal wings 22a, 22b, to which respective sliders 19a, 19b are fixed proximate to/at its ends.

[0041] The size of each of the vertical wings 22c and 22d may vary according to the requirements.

[0042] It should be noted that depending on the loads and/or the geometry of the wall, the plate 21 and the movement means 13 can be fixed at different heights of the side wall 20.

[0043] Advantageously, the movement means 13 for moving the supporting structure 12 may comprise one or more wheels 18 associated below the structure 12.

[0044] In the embodiment shown in the figures, the wall 10 comprises two wheels 18 for each module 14a, 14b, 14c, which are fixed to the respective lower crossmember 17a, below the latter.

[0045] Such wheels 18 are concealed from view:

- laterally by the presence of the posts 16a, 16b,
- frontally by the presence of the surfaces 11a, 11b.

[0046] The surfaces 11a, 11b are formed by one or more panels, for example panels made of:

- plasterboard,
- and/or medium density fiberboard (MDF),
- and/or oriented strand board (OSB),
- and/or wood,
- and/or glass/mirrors,
- and/or paper-like material,
- and/or concrete,
- and/or plastic material,
- and/or composite material, such as CFRP and/or GFRP,
- and/or bamboo,
- and/or metallic material such as steel and/or aluminum and/or titanium and/or 7000 aluminum alloy such as the one known by the trade name "Ergal",
- and/or nanotechnology,
- and/or panels for energy production.

[0047] In other embodiments not shown in the figures, the surfaces 11a, 11b, can be equipped with shelves

and/or wall-mounted units.

[0048] In other embodiments, the wall 10 may have through openings/holes for doors and/or windows.

[0049] In the latter case, the wall 10 may also comprise door and/or window leaves for closing the respective openings/holes.

[0050] For the sliding of the wall 10, a thrust in the sliding direction is required which may be:

- manual, by the user,
- artificial, by means of mechanical and/or hydraulic and/or electrical actuators.

[0051] The use of the wall 10 is as follows.

[0052] When it is necessary to move the wall 10 to vary the volumes of the room in which it is used, it is sufficient to impart a force, in a direction perpendicular to the plane of arrangement of the wall, to produce the sliding of the sliders 19a, 19b on the respective rails and the movement of the wheels 18 on the floor, if any.

[0053] Figure 6 shows a second embodiment of a wall according to the invention, generally designated by the reference numeral 110.

[0054] In this embodiment, the elements that correspond to the elements of the first embodiment, described above, have been designated by the same numerals increased by 100.

[0055] The wall 110 comprises a lattice-like structure 112.

[0056] In other embodiments, not shown in the figures, the wall 110 comprises one or more vertical surfaces, similarly to the first embodiment.

[0057] In further embodiments, not shown in the figures, the wall 110 does not have a lattice-like structure but is formed by one or more panels.

[0058] The structure 112 is composed of one or more modules 114a, 114b, 114c, 114d, 114e, mutually fixed by means of pins/bolts 115 and/or welding.

[0059] The modules 114a, 114b, 114c, 114d, 114e each comprise:

- two vertical parallel posts 116a, 116b,
- and a plurality of parallel crossmembers 117a, 117b, 117c, 117d, extending between said posts 116a, 116b, at right angles thereto.

[0060] In this embodiment, the structure 112 comprises braces 130, each extending between two opposite posts 116a, 116b, and/or crossmembers 117a, 117b, 117c, 117d, 117e of a corresponding module 114a, 114b, 114c, 114d, 114e.

[0061] In other embodiments, not shown in the figures, the structure 112 is at least partially solid in at least some of the spaces comprised between the posts 116a, 116b and/or the crossmembers 117a, 117b, 117c, 117d, 117e.

[0062] In the present description, the expression "the structure is at least partially solid" means that the space between the posts and/or crossmembers is at least partially occupied by structural and/or insulating and/or aesthetic material (ornamental motifs, transparent elements, etc.), or other structural elements.

[0063] The wall 110, according to the invention, and therefore the structure 112, have one or more through openings/holes for windows and/or doors.

[0064] In the embodiments shown in the figures, the wall 110 has a through opening 131, adapted to form a passage.

[0065] The opening 131 is delimited:

- laterally by two of the modules, respectively a first lateral module 114b and a second lateral module 114b,
- in an upward region by an upper module 114e.

[0066] The upper module 114e has a smaller vertical extension than the lateral modules 114b and 114c.

[0067] The opening 131 can be closed by a door leaf, not shown in the figures.

[0068] Similarly, in other embodiments, not shown in the figures, in which the wall according to the invention has one or more window openings, said openings are formed by respective upper and lower lateral modules and can be closed by window leaves.

[0069] In practice it has been found that the invention achieves the intended aim and objects, providing a wall which can be moved as required within the room in which it is used.

[0070] The invention provides a wall that can be easily and quickly equipped according to the requirements and in which the equipment can be changed as needed.

[0071] Moreover, the invention provides a wall that can be moved easily and quickly if necessary.

[0072] Furthermore, the invention provides a wall that can be installed in any type of room.

[0073] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may furthermore be replaced with other technically equivalent elements.

[0074] In practice, the materials used, so long as they are compatible with the specific use, as well as the contingent shapes and dimensions, may be any according to the requirements and the state of the art.

[0075] The disclosures in Italian Utility Model Application N. 202023000003834 and in Italian Patent Application No. 102024000010411 from which this application claims priority are incorporated herein by reference.

[0076] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A wall (10; 110), comprising a lattice-like structure (12; 112), said wall being **characterized in that** it comprises movement means (13; 113) for moving said structure (12; 112).

2. The wall (10; 110) according to the preceding claim, **characterized in that** said structure (12; 112) supports one or more vertical surfaces (11a, 11b) of the wall.

3. The wall (10, 110) according to any one of the preceding claims, **characterized in that** said structure (12, 112) comprises one or more modules (14a, 14b, 14c; 114a, 114b, 114c, 114d, 114e).

4. The wall (10, 110) according to claim 3, **characterized in that** said modules (14a, 14b, 14c; 114a, 114b, 114c, 114d, 114e) each comprise:

   - two vertical parallel posts (16a, 16b; 116a, 116b),
   - and a plurality of parallel crossmembers (17a, 17b, 17c, 17d; 117a, 117b, 117c, 117d, 117e) extending between said parallel posts (16a, 16b; 116a, 116b), at right angles thereto.

5. The wall (10, 110) according to one or more of the preceding claims, **characterized in that** said structure (12; 112) is made of:

   - wood,
   - and/or glass,
   - and/or paper-like material,
   - and/or concrete,
   - and/or plastic material,
   - and/or composite material,
   - and/or bamboo,
   - and/or metallic material.

6. The wall (10; 110) according to one or more of the preceding claims, **characterized in that** said movement means (13; 113) for moving said structure (12; 112) comprise at least one slider (19a, 19b; 119a, 119b):

   - fixed to said structure (12; 112),
   - adapted to slide on a corresponding horizontally extended rail.

7. The wall (10; 110) according to one or more of the preceding claims, **characterized in that** said at least one slider (19a, 19b; 119a, 119b) is of the rolling pivot type with single or double ball bearings, and/or magnetic levitation.

8. The wall (10) according to one or more of the preceding claims, **characterized in that** it comprises four sliders (19a, 19b), two for each of said posts (16a, 16b), which defines an end post (16a, 16b) of said structure (12), said sliders (19a, 19b) being fixed to the respective one of said posts (16a, 16b) by means of a plate (21) on a side wall (20) of the respective one of said posts (16a, 16b).

9. The wall (10) according to one or more of the preceding claims, **characterized in that** said plate (21) has two vertical wings (22c, 22d) and two horizontal wings (22a, 22b), to which respective sliders (19a, 19b) are fixed proximate to/at to its ends.

10. The wall (10, 110) according to one or more of the preceding claims, **characterized in that** said movement means (13; 113) for moving said structure comprise one or more wheels (18; 118) associated in a lower region with said structure (12; 112).

11. The wall (110) according to one or more of the preceding claims, **characterized in that** said structure (112) comprises one or more braces (130), each of said one or more braces (130) extending between two opposite posts of said posts (116a, 116b), and/or said crossmembers (117a, 117b, 117c, 117d, 117e) of a respective one of said modules (114a, 114b, 114c, 114d).

12. The wall (110) according to one or more of the preceding claims, **characterized in that** said structure (112) is at least partially solid in at least one of the spaces comprised between said posts (116a, 116b) and/or said crossmembers (117a, 117b, 117c, 117d, 117e).

13. The wall (10; 110) according to one or more of the preceding claims, **characterized in that** said surfaces (11a, 11b) are formed by one or more panels.

14. The wall (10; 110) according to one or more of the preceding claims, **characterized in that** at least one of said surfaces (11a, 11b) is equipped with at least one shelf and/or one wall-mounted unit.

15. The wall (10; 110) according to one or more of the preceding claims, **characterized in that** it comprises one or more through openings/holes (131) for doors and/or windows.

16. The wall (10) according to one or more of the preceding claims, **characterized in that** it is provided with mechanical and/or hydraulic and/or electrical actuators for generating a thrust in the sliding direction of said wall (10).

17. A wall, comprising one or more panels, **characterized in that** it comprises movement means /13; 113)

for its movement.

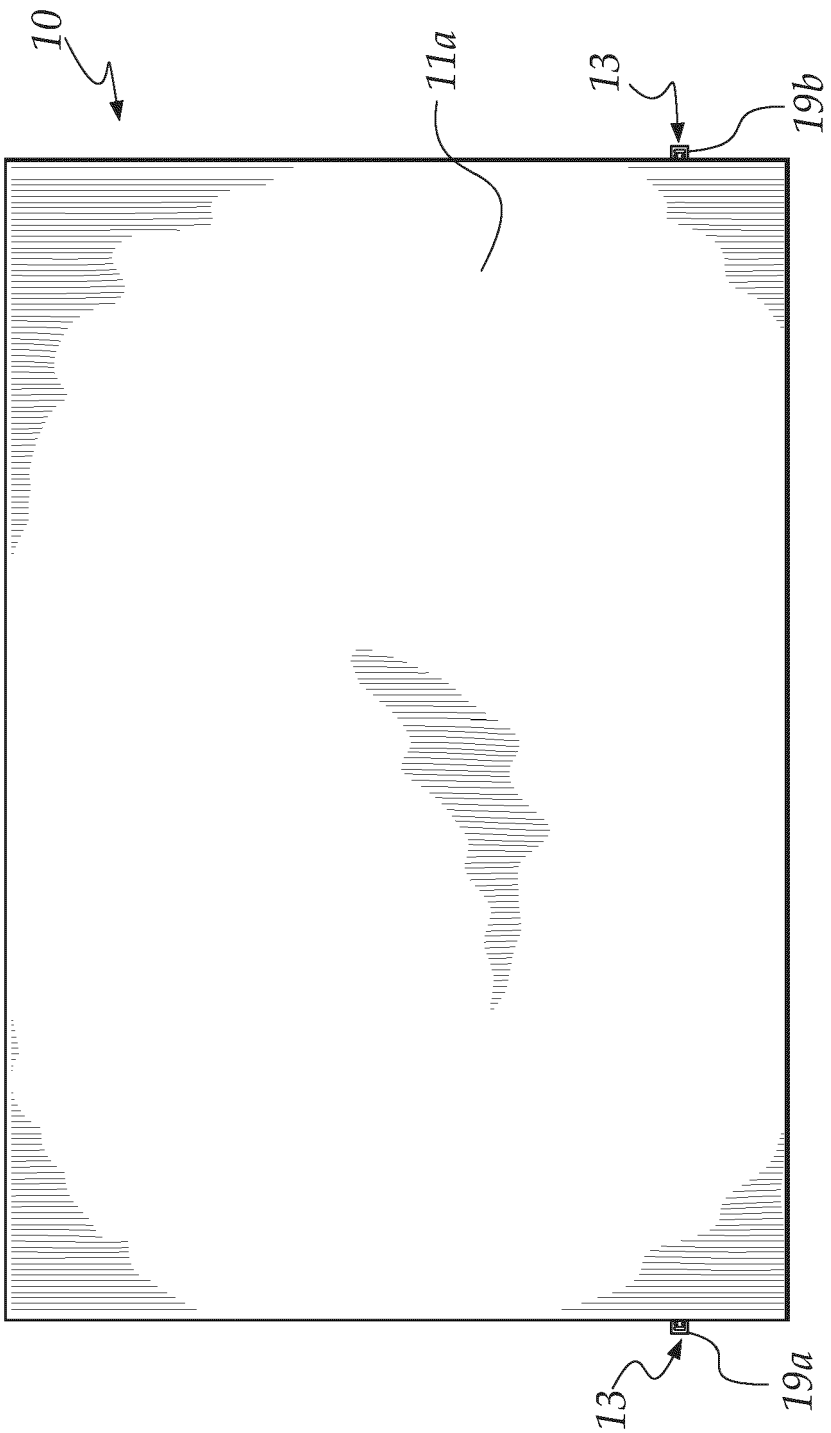

Fig.1

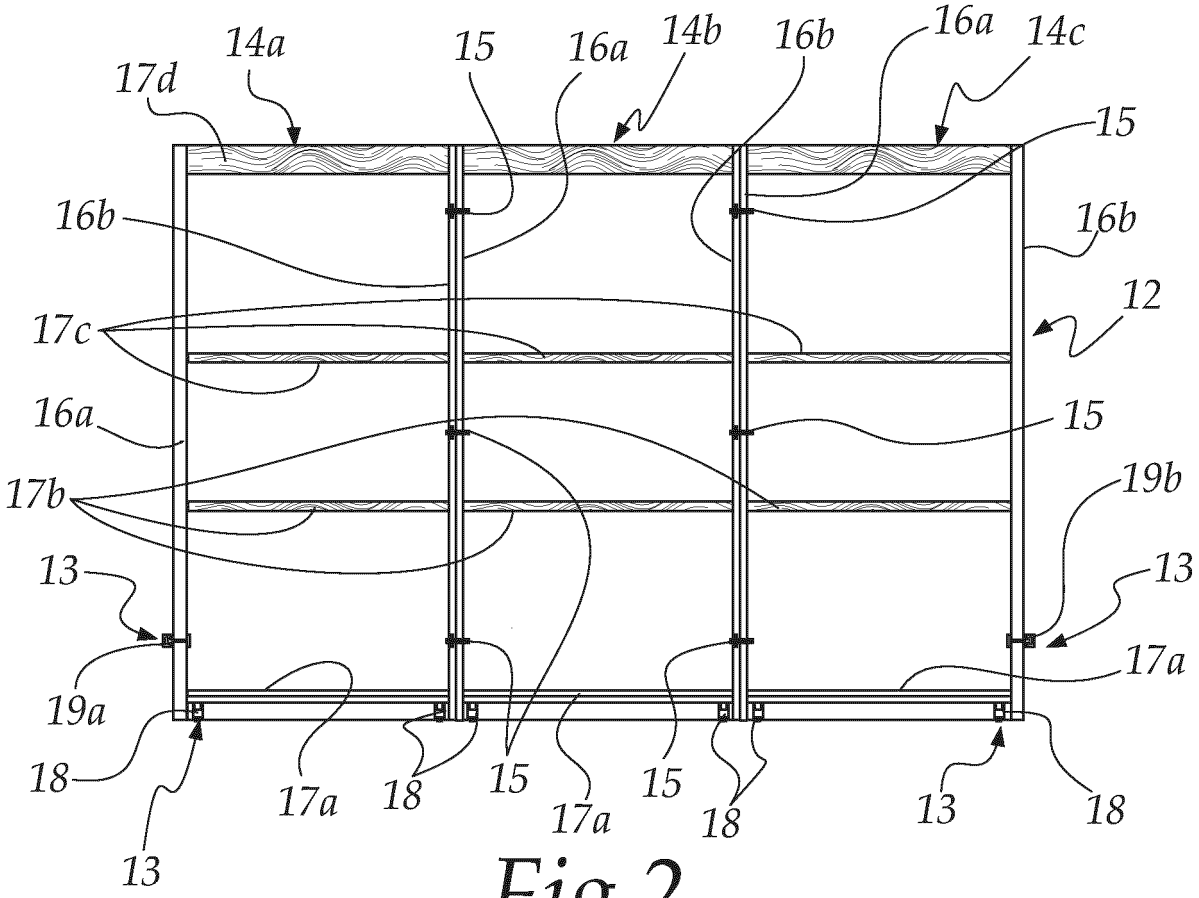
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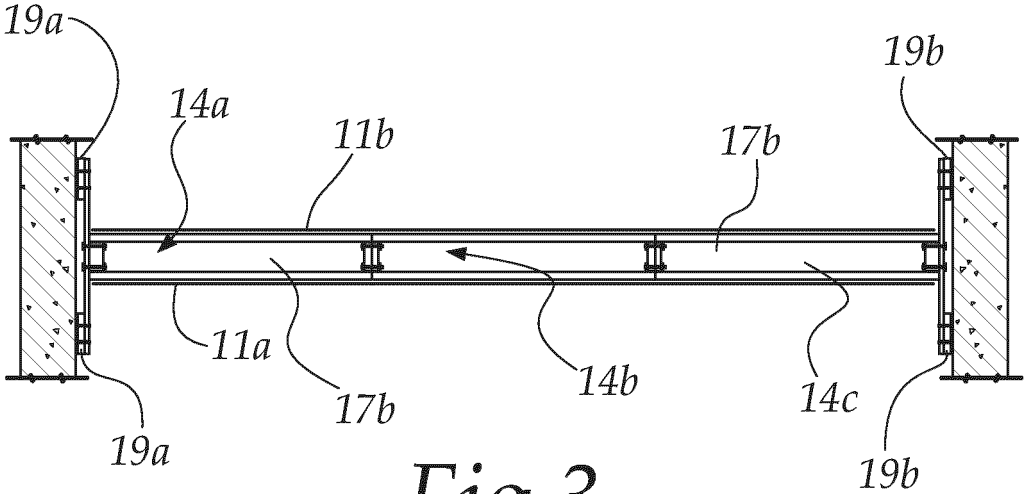
Fig.2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19b
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14c
17b
19a
19b

Fig.3

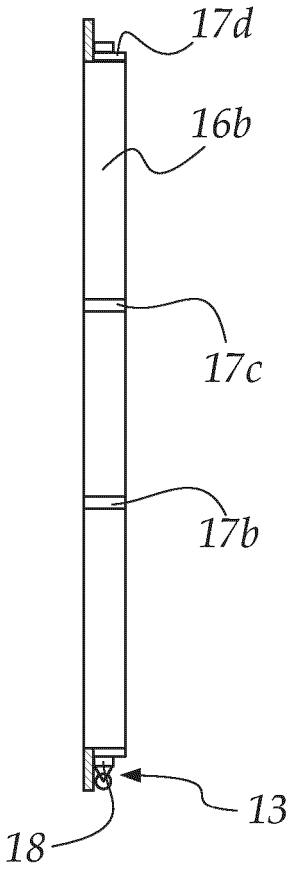


Fig.4

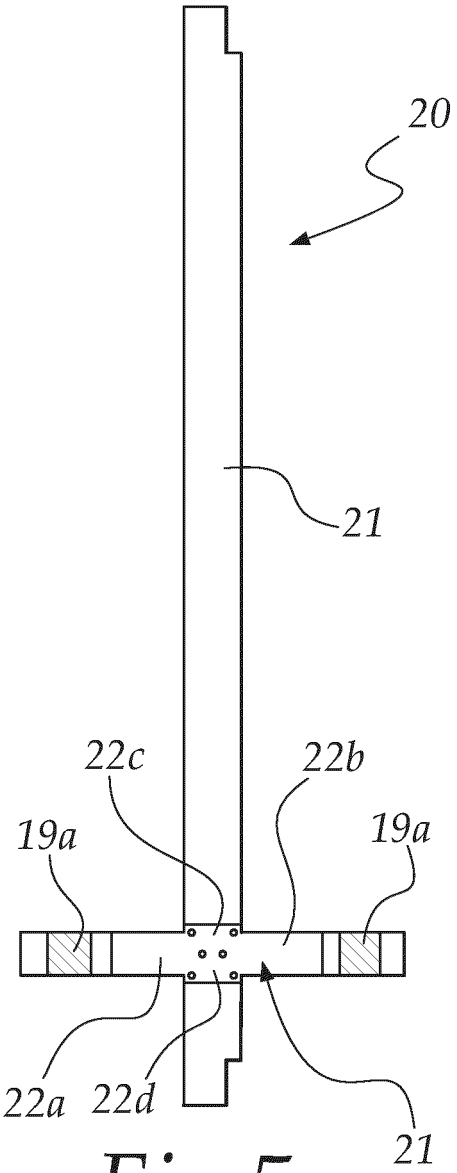
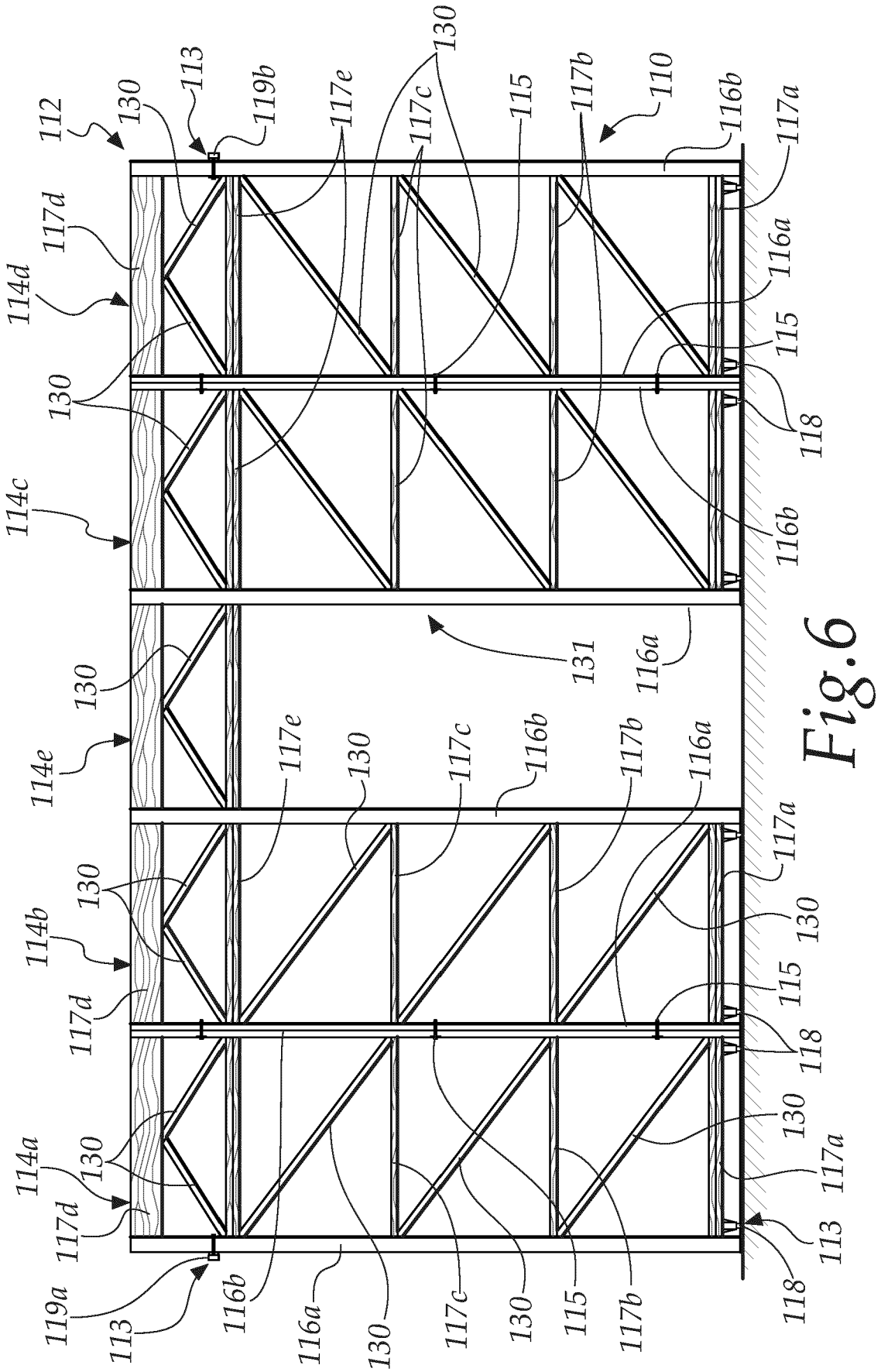


Fig.5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117b

Fig.6

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EUROPEAN SEARCH REPORT

Application Number
EP 24 19 8138

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 January 2025	López-García, G

CATEGORY OF CITED DOCUMENTS

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16-01-2025

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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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