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(54) FIRE-RESISTANT GATE LEAF

(57) The present invention relates to a fire-resistant gate leaf (1) comprising at least two rectangular panel segments (2), each comprising a circumferential frame (21) made of longitudinal frame elements (211), on which fire-resistant sheathing panels (22) are fixed, with the panel segments (2) being pressed against each other by means of tension ties (3), which run transversely to the edges of the panel segments (2) pressed against each other in channels (4) formed within the internal spaces (23) of the circumferential frames (21) of the panel segments (2) between their fire-resistant sheathing panels (22) made of fireproof gypsum boards (41), whereby the tension ties (3) are fixed to the external longitudinal frame elements (218) of the outermost external panel segments (2).

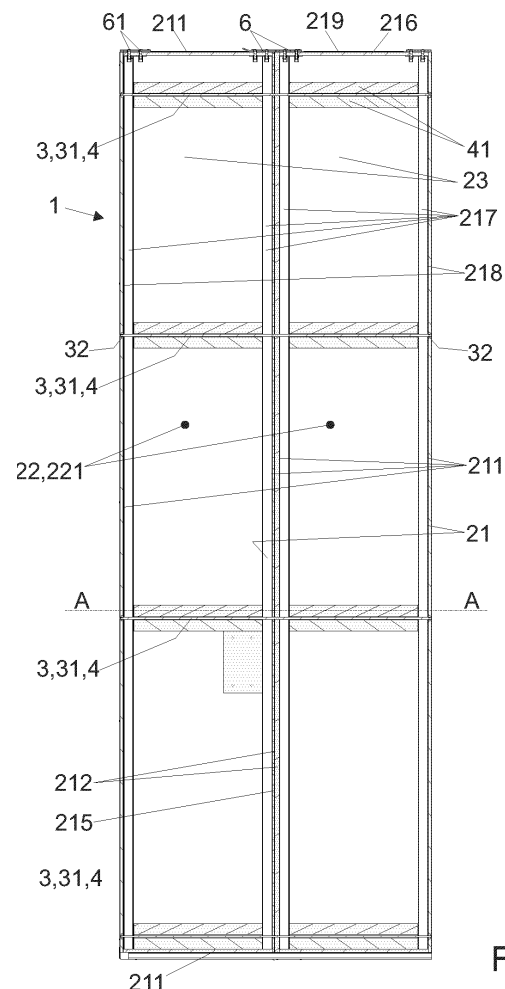
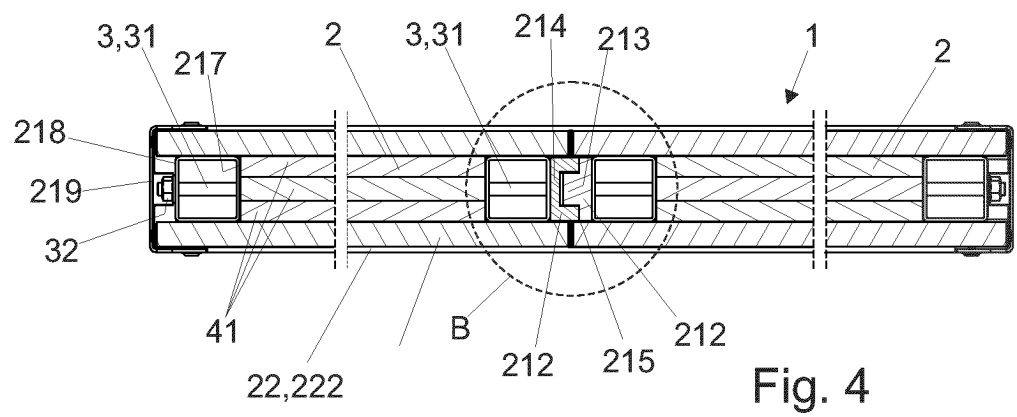


Fig. 2

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Description

[0001] The present invention relates to a fire-resistant gate leaf comprising a circumferential frame made of longitudinal frame members, on which fire-resistant sheathing panels are fixed.

Background of the Invention

[0002] Such fire-resistant gate leaves are well known from the state of the art. However, if such a gate leaf is to be of a large size, complications and difficulties arise in its manufacturing and in transporting it from the manufacturing site to the installation site.

[0003] It has been object of the present invention to provide a fire-resistant gate leaf devoid of such disadvantages.

Summary of the Invention

[0004] The invention provides a fire-resistant gate leaf comprising at least two rectangular panel segments, each comprising a circumferential frame made of longitudinal frame elements on which fire-resistant sheathing panels are fixed, with the panel segments being pressed against each other by means of tension ties, which run transversely to the edges of the panel segments pressed against each other in channels formed within the internal spaces of the circumferential frames of the panel segments between their fire-resistant sheathing panels made of fireproof gypsum boards, whereby the tension ties are fixed to the external longitudinal frame elements of the outermost external panel segments.

[0005] Preferably the adjacent panel segments are pressed against each other by connecting frame elements of the circumferential frame in which corresponding tongue and groove are formed creating a tongue and groove joint between these adjacent panel segments, and the tension ties run transversely to this tongue and groove joint.

[0006] Preferably the tension ties are tie rods and the panel segments are pressed against each other preferably by means of clamping nuts screwed onto the threaded ends of at least two tie rods running transversely to the edges where the panel segments are pressed against each other, with the clamping nuts being pressed from the outside against the external longitudinal frame elements of the outermost external panel segments.

[0007] Preferably the tie rod may preferably comprise at least two component tension rods connected to each other by means of threaded coupling sleeves into which the threaded ends of the adjacent component tension rods are screwed.

[0008] Preferably in the internal space of the circumferential frame between the fire-resistant sheathing panels, there can be fireproof filling.

preferably the vertical longitudinal sides of the circumferential frame may comprise metal profile frame elements.

Furthermore, the other longitudinal frame elements may also preferably comprise profile frame elements.

[0009] The present invention provides the possibility of manufacturing the said panel segments conveniently and easily on-site and then transporting them, along with the other components, conveniently to the installation site, where they can be easily, quickly and reliably assembled to form a fire-resistant gate leaf according to the invention.

[0010] Furthermore, at the manufacturing site, it is possible to mass prefabricate a plurality of said panel segments of different widths, which can be assembled on-site to form fire-resistant leaves according to the invention with different total widths as desired in the specific cases; for example, with total widths from a specific series of type series.

[0011] Analogously, it is possible to manufacture a plurality of said component tension rods, which can be combined with each other to form tension rods for fire-resistant gate leaves according to the invention with different total widths as desired in the specific cases.

Brief description of drawings

[0012] The invention shall be described and explained below in reference to its preferred embodiments and in connection with the attached drawings wherein:

Fig. 1 shows an axonometric view of the first embodiment of the fire-resistant gate leaf according to the invention;

Fig. 2 shows a longitudinal cross-section of the fire-resistant gate leaf of Fig. 1 in the plane of the tension ties;

Fig. 3 shows an enlarged view of the corner area B of the section of Fig. 2;

Fig. 4 shows a cross-sectional view of the fire-resistant gate leaf of Fig. 1 along line A-A of Fig. 2,

Fig. 5 shows an enlarged view of the area of Fig. 4 comprising the connection of the panel segments;

Fig. 6 shows a longitudinal cross-section of the second embodiment of the fire-resistant gate leaf according to the invention analogous to the cross-section of the first embodiment of Fig. 2;

Fig. 7 shows an axonometric view of the third embodiment of the fire-resistant gate leaf according to the invention;

Figs. 8, 9 and 10 respectively show front, top and side views of the fire-resistant gate leaf of Fig. 7, and Fig. 11 shows an enlarged view of area C of the connection of the component tension rods.

Detailed description of preferred embodiment

[0013] Figures 1-5 illustrate a first embodiment of a fire-resistant gate leaf 1 according to the present invention. The gate leaf 1 comprises two rectangular panel segments 2 pressed against each other in coplanar manner.

[0014] Each of the panel segments 2 comprises a circumferential frame 21 made of longitudinal frame elements 211, on which fire-resistant sheathing panels 22 are fixed. The longitudinal frame elements 211 comprise longitudinal frame elements made of fireproof gypsum board 216, and additionally the vertical longitudinal sides of the circumferential frame 21 comprise metal profile frame elements 217 in the form of closed square tubular profiles. The circumferential surfaces of the circumferential frames 21 are protected by external circumferential metal shielding elements 219 made of suitably profiled metal sheet.

[0015] The fire-resistant sheathing panels 22 seal the spaces inside the circumferential frames 21, defining internal spaces 23. The fire-resistant sheathing panels 22 comprise fireproof gypsum boards 221 which are covered on the external side with metal sheets 222.

[0016] The adjacent panel segments 2 are pressed against each other by connecting frame elements 212 of the circumferential frame 21, which, in this embodiment of the present invention form the edge where the panel segments 2 are pressed.

[0017] A corresponding tongue 213 and groove 214 are formed in the connecting frame elements 212. When the tongue 213 is inserted into the groove 214, a tight tongue and groove joint 215 is formed between the adjacent panel segments 2. The connecting frame elements 212 can be made of fireproof gypsum board.

[0018] The panel segments 2 are pressed against each other and connected to each other by four tension ties 3. The tension ties 3 run parallel to each other and transversely as well as perpendicularly to the tongue and groove joint 215 between these panel segments 2.

[0019] The tension ties 3 are positioned in through channels 4 formed of fireproof gypsum boards 41 within the internal spaces 23 of the panel segments 2 between the fire-resistant sheathing panels 22.

[0020] In this embodiment of the present invention, the tension ties 3 are in the form of tension rods 31.

[0021] The tension rods 31 pass through the channels 4 within the internal spaces 23 and through the openings connected to the channels 4 in the internal longitudinal frame elements 211 and connecting frame members and through the openings in the external longitudinal frame elements 218.

[0022] Through the holes in the external longitudinal frame elements 218 on the outside of the circumferential frame 21 project the threaded ends of the tension rods 31, onto which the clamping nuts 32 are screwed.

[0023] The clamping nuts 32 are tightened with appropriate force on the tension rods 31 and pressed from the outside against the external longitudinal frame elements 218 of the outermost external panel segments 2 which fixes the panel segments 2 to each other and presses the connecting frame elements 212 together in the tongue and groove joint area 215.

[0024] The protruding threaded ends of the tension rods 31 and the clamping nuts 32 are located in a cir-

cumferential groove formed in the circumferential surface of the circumferential frame 21, ensuring that the leaf has flat circumferential surfaces.

[0025] On the upper circumferential surface of the panel segments 2 are fixed by means of fastening screws 61 running carriages 6, allowing the fire-resistant gate leaf 1 to be slidably positioned in the guides (not shown in the drawing), forming a sliding gate leaf. To facilitate sliding of the leaf 1, a handle 7 is installed in one of the panel segments 2.

[0026] Fig. 6 illustrates a second embodiment of the fire-resistant gate leaf 1, which is the gate leaf of Figs. 1-5, additionally comprising a fireproof filling 5 placed in the internal spaces 23 of the circumferential frames 21 between the fire-resistant sheathing panels 22.

[0027] Figures 7-11 illustrate a third embodiment of the fire-resistant gate leaf 1 according to the invention. In this embodiment, the leaf 1 comprises six panel segments 2 of different widths s1, s2, s3, assembled in such a way as to obtain the required total width S of the leaf 1. The construction of this third embodiment of the gate leaf 1 is essentially analogous to the first embodiment shown in Figs. 1-5. However, in this third embodiment the of the gate leaf 1, the tension rods 31 each comprise of two component tension rods 311. The internal threaded ends of the component tension rods 311 are screwed into the threaded coupling sleeves 312, thereby forming the tension rods 31 running across the entire width of the gate leaf 1.

[0028] The fire-resistant gate leaf can, for example, be used as a leaf of a sliding gate, in particular suspended on carriages as shown in the above embodiments, as a leaf of a swing gate, fixed, for example, on hinges, or as any other type of movable partition used to close openings in building partitions. In cases where the leaf is used in configurations other than a sliding gate, the embodiments (not shown in the figures) of the fire-resistant gate leaf according to the present invention, will obviously not include carriages, but will simply be fixed to hinge arrangements or other mounting arrangements.

[0029] The above embodiments of the present invention are therefore merely exemplary. The figures are not necessarily to scale and some features may be exaggerated or minimized. These and other factors however should not be considered as limiting the spirit of the invention, the intended scope of protection of which is indicated in appended claims.

List of reference numerals

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[0030]

1. fire-resistant gate leaf
2. panel segment
21. circumferential frame
211. longitudinal frame element
212. connecting frame element
213. tongue

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- 214. groove
- 215. tongue and groove joint
- 216. longitudinal frame element made of fireproof gypsum board
- 217. metal profile frame element
- 218. external longitudinal frame element
- 219. circumferential metal shielding element
- 22. fire-resistant sheathing panel
- 221. fireproof gypsum board
- 222. metal sheet
- 23. internal space
- 3. tension tie
- 31. tension rod
- 311. component tension rod
- 312. coupling sleeve
- 32. clamping nut
- 4. channel
- 41. fireproof gypsum board
- 5. fireproof filling
- 6. carriage
- 61. fastening screw
- 7. handle

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other, with the clamping nuts (32) being pressed from the outside against the external longitudinal frame elements (218) of the outermost external panel segments (2).

- 4. The fire-resistant gate leaf (1) according to Claim 3, **characterised in that** the tie rod (31) comprises at least two component tension rods (311) connected to each other by means of threaded coupling sleeves (312) into which the threaded ends of the adjacent component tension rods (311) are screwed.
- 5. The fire-resistant gate leaf (1) according to any of Claims 1-4, **characterised in that** the internal space (23) of the circumferential frame (21) between the fire-resistant sheathing panels (22) is provided with a fireproof filling (5).
- 6. The fire-resistant gate leaf (1) according to any of Claims 1-5, **characterised in that** the vertical longitudinal sides of the circumferential frame (21) comprise metal profile frame elements (217).

Claims

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- 1. A fire-resistant gate leaf (1) comprising at least two rectangular panel segments (2), each comprising a circumferential frame (21) made of longitudinal frame elements (211), on which fire-resistant sheathing panels (22) are fixed, with the panel segments (2) being pressed against each other by means of tension ties (3), which run transversely to the edges of the panel segments (2) pressed against each other in channels (4) formed within the internal spaces (23) of the circumferential frames (21) of the panel segments (2) between their fire-resistant sheathing panels (22) made of fireproof gypsum boards (41), whereby the tension ties (3) are fixed to the external longitudinal frame elements (218) of the outermost external panel segments (2).
- 2. The fire-resistant gate leaf (1) according to Claim 1, **characterised in that** adjacent panel segments (2) are pressed against each other by connecting frame elements (212) of the circumferential frame (21), in which corresponding tongue (213) and groove (214) are formed creating a tongue and groove joint (215) between these adjacent panel segments (2), and the tension ties (3) run transversely to this tongue and groove joint (215).
- 3. The fire-resistant gate leaf (1) according to Claim 1 or 2, **characterised in that** the tension ties (3) are tie rods (31) and the panel segments (2) are pressed against each other by means of clamping nuts (32) screwed onto the threaded ends of at least two tie rods (31) running transversely to the edges where the panel segments (2) are pressed against each

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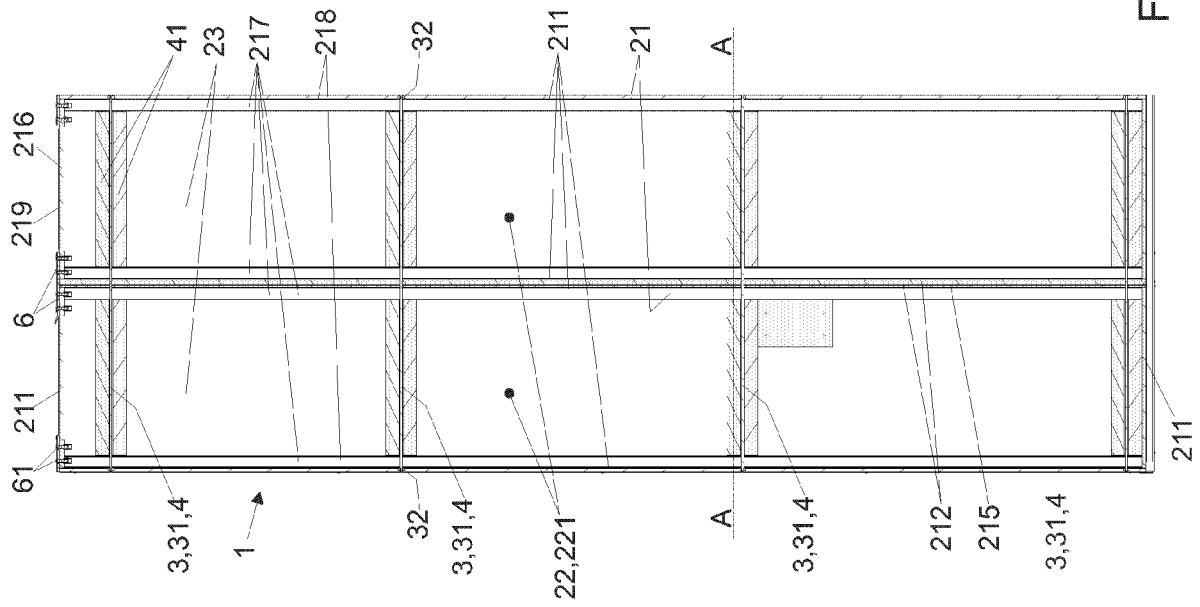
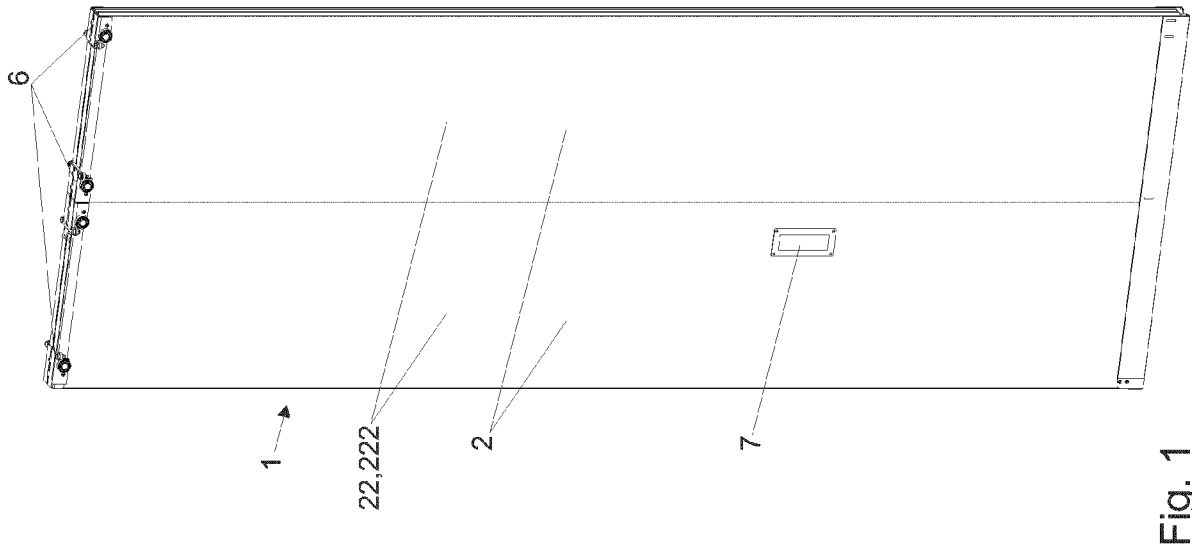
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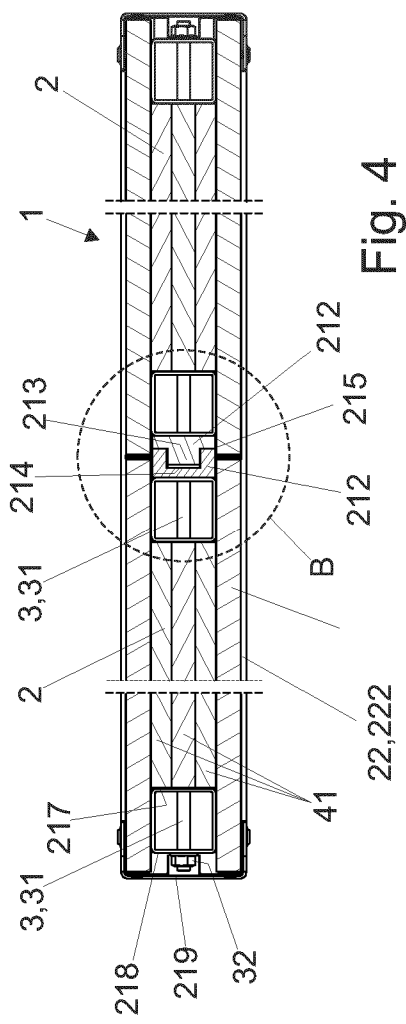


Fig. 4

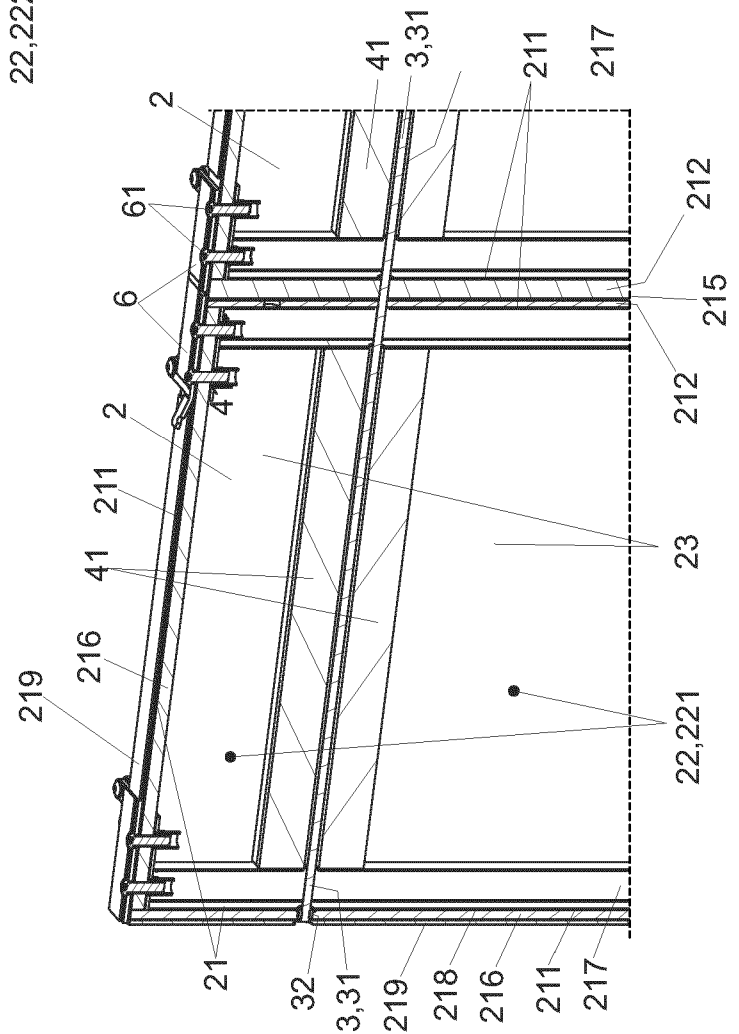


Fig. 3

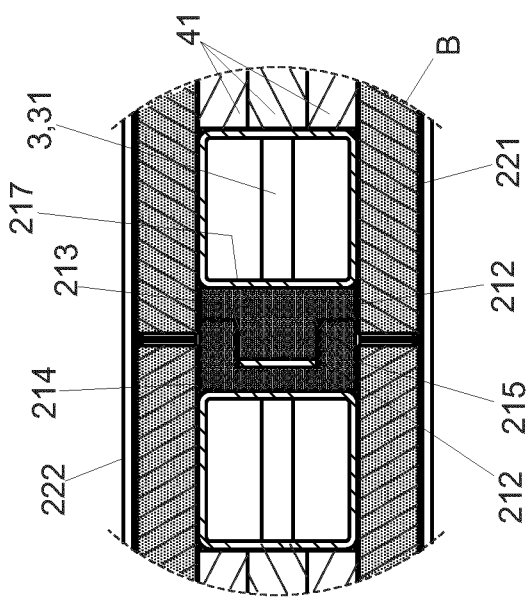
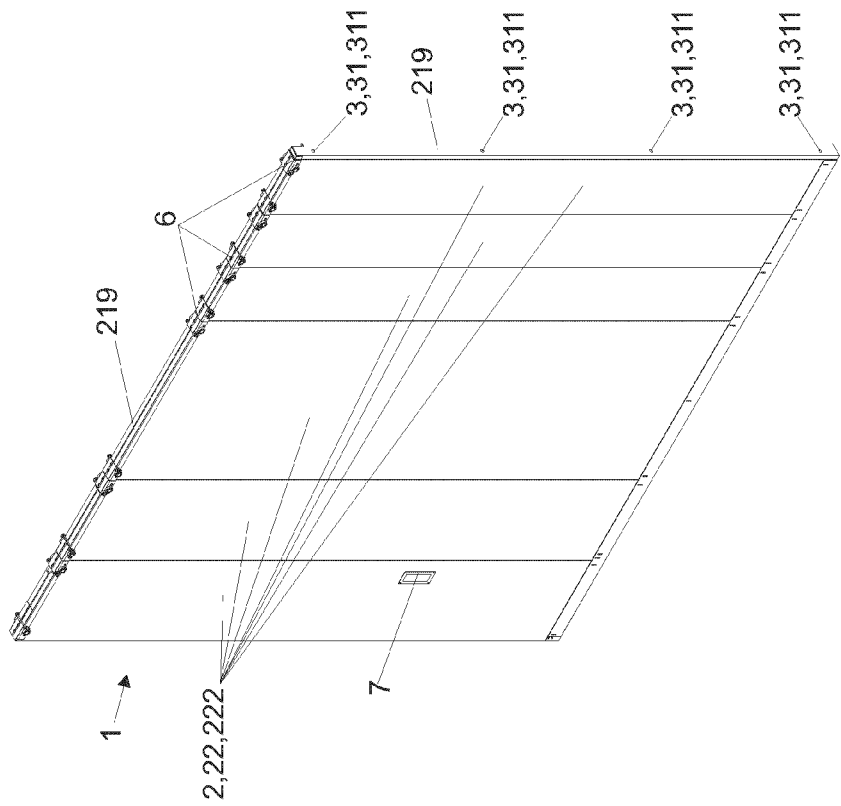
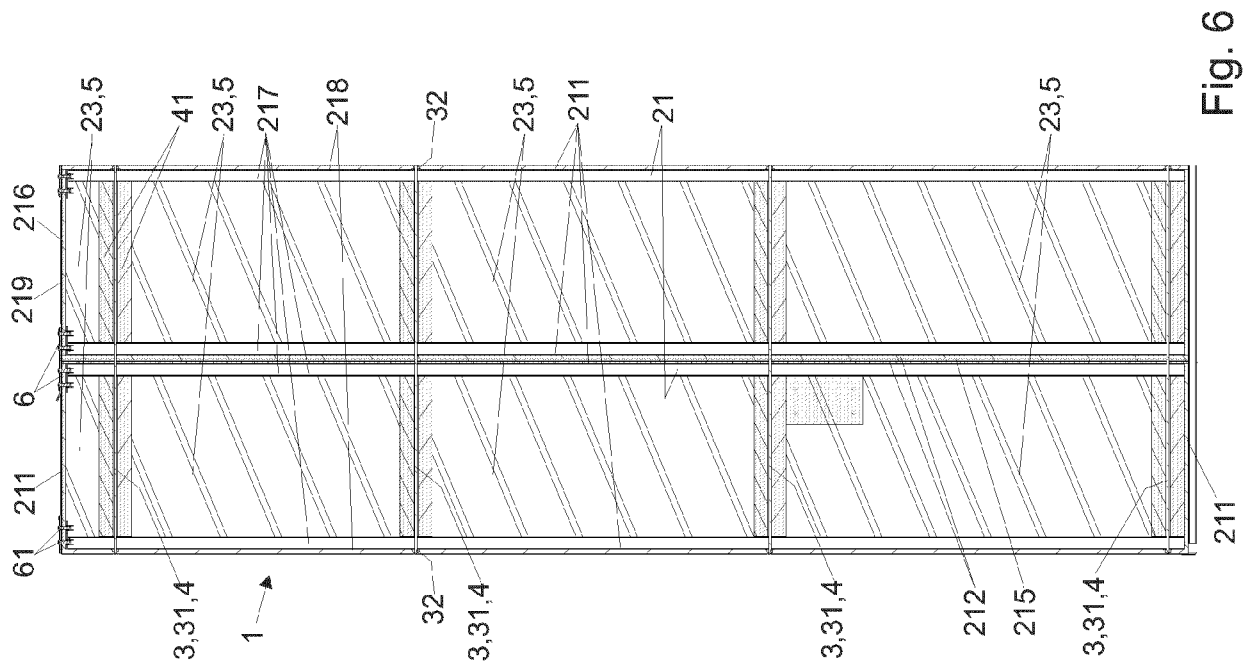


Fig. 5



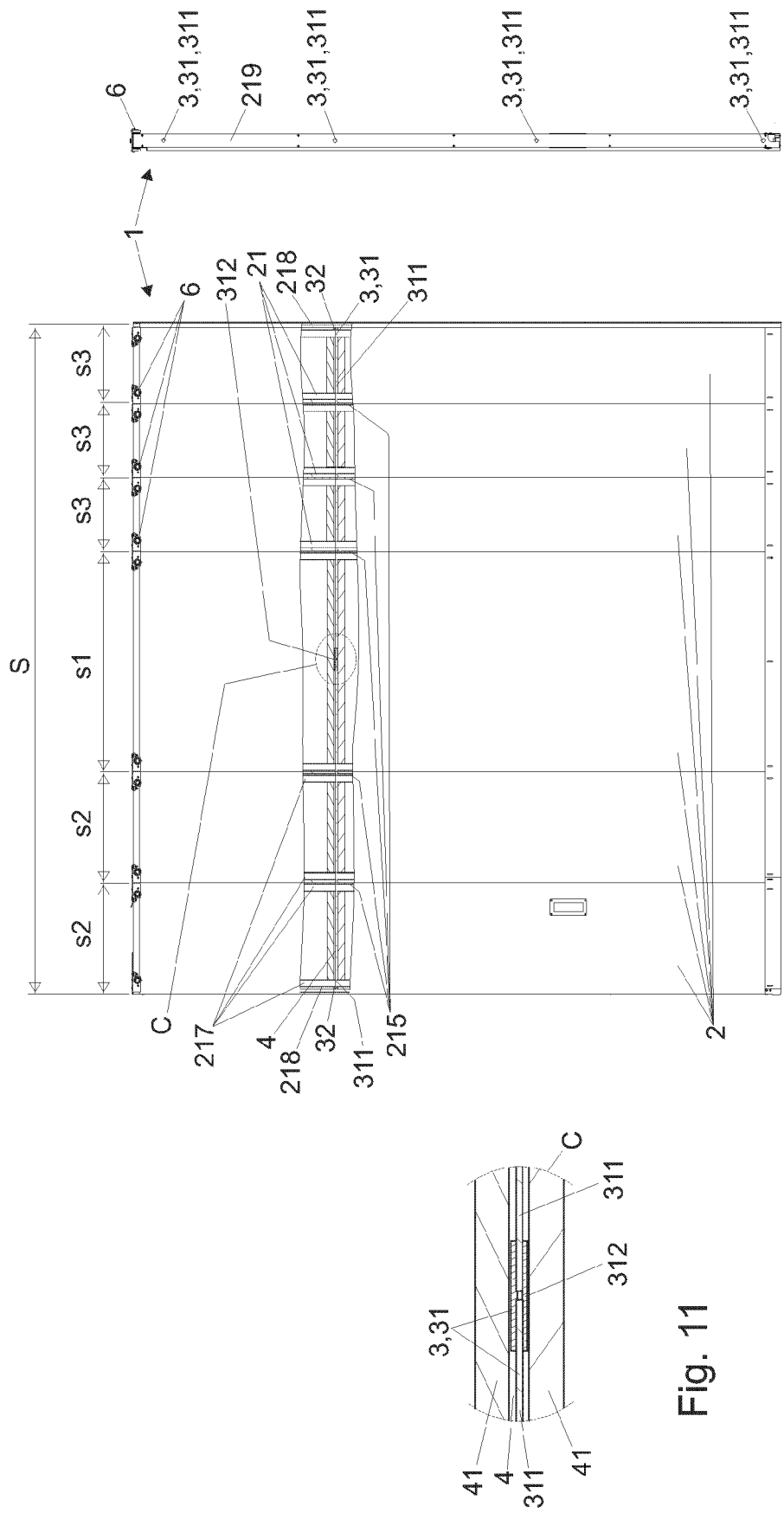


Fig. 8

Fig. 10

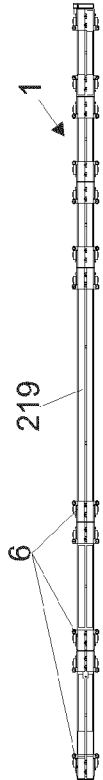


Fig. 9

Fig. 11



EUROPEAN SEARCH REPORT

Application Number

EP 24 20 0699

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	GB 2 556 071 A (HOME DECOR GB LTD [GB]) 23 May 2018 (2018-05-23) * figures 1-10 * -----	1 - 6	
			TECHNICAL FIELDS SEARCHED (IPC)
			E06B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		17 December 2024	Cobusneanu, D
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