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(54) Access door for gates

(57) The invention relates to an access door for gates in general, wherein the hinges for connecting the leaf (2, 2') to the panels (1, 1') of the gate are fixed to sections (3,4; 3',4') arranged along respective edges.

Advantageously these sections have a box-shaped portion to which the hinges are fixed and, according to a preferred embodiment, they are of the articulated type or with double-axis.

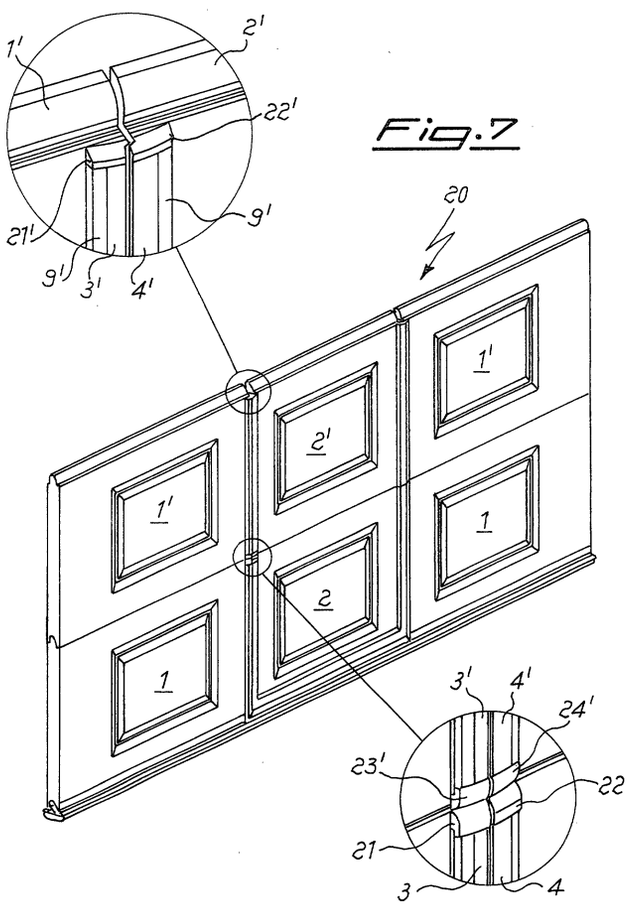

Fig.7

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Description

[0001] The invention relates to the doors provided in the gates or main entrances of industrial warehouses, garages and the like, for allowing persons to pass through without having to open the whole gate; these doors are commonly called "access doors" and in the remainder of this description will therefore be referred to with this term.

[0002] It must be pointed out here that the gates considered here may be either of the type comprising hinged shutters or of sectional type, i.e. consisting of panels with a composite structure (also called "sandwich" structure) which are hinged together and slide along guides provided in the walls, so that they can be raised and lowered in the vertical direction during the opening and closing phases.

[0003] Therefore, although in the description reference will be made mainly to gates of the sectional type, this should not be understood in a limiting way and what will be explained could refer to other kinds of gates as well, with any appropriate modification.

[0004] At present the access doors consist of shutters or leaves fixed to the gate by single-axis hinges of the type similar to that used for the doors of houses; this solution is simple and low-cost but has a few drawbacks.

[0005] One of them consists in the fact that the hinges are visible and therefore (in addition to being unaesthetic) are inevitably exposed to atmospheric agents and other external factors, thereby deteriorating with time or being damaged by knocks, stresses and the like; indeed it must be considered that in industrial applications, like those of industrial gates typically are, the access doors often are subject to knocks as a result of imprecise manoeuvres by lorries, forklift trucks and the like.

[0006] It follows that often the closing of the access doors, with time, becomes defective and difficult to repair; the hinges are indeed fixed to the shutter of the access door and to the gate by means of rivets, which cannot be removed without damaging the structure of the panels thereof.

[0007] It must in fact be understood that both the main entrances and the access doors are formed by panels consisting of a layer of insulating material (usually expanded polyurethane or mineral wool) which does not have a good structural strength and is arranged between two external sheet-metal surfaces to which the rivets are fastened; the metal sheets would be damaged if the rivets were to be removed in order to replace the hinges, with the risk of damaging the structure of the associated panel.

[0008] The present invention aims to improve this state of the art, namely it has the object of providing an access door with structural and operating features that ensure efficient and regular closing over time, without the drawbacks mentioned above.

[0009] This object is achieved by an access door wherein the hinges which connect the leaf to a panel of the sectional gate, are arranged on respective sections provided on both of them along their edges where rotation of the leaf occurs.

[0010] According to a preferred embodiment of the invention, the hinges have a double axis of rotation and the sections have protections for the means (screws, rivets and the like) for their fixing to the leaf and the panel.

[0011] These and further features of the invention will emerge more clearly from the description provided hereinbelow, relating to a non-exclusive embodiment thereof illustrated in the accompanying drawings wherein:

- Fig. 1 and Fig. 2 show a portion of an access door according to the invention, respectively in the closed and open condition;
- Fig.3 is a cross-section of a detail of the preceding figures;
- Fig. 4, 5 and 6 show a cross-sectional view of a variant of the above access door, in respective operating conditions;

[0012] Fig. 7 is a perspective view of a sectional gate in accordance with the invention.

[0013] With reference to the drawings, in them numeral 1 denotes the panel of a gate for industrial or civil applications, of the type known per se like, for example, the sectional gates produced and distributed by the same applicant of the present Application.

[0014] Numeral 2 instead denotes the leaf of an access door associated with the aforementioned gate; for assemblying leaf 2 with panel 1, respective sections 4 and 5 are provided on them and fixed by means of rivets 5.

[0015] Said rivets 5 are applied along respective flanges 3a, 3b; 4a, 4b of the sections 3 and 4 which extend along the visible surfaces of the panel 1 and the leaf 2.

[0016] Moreover, each section 3 and 4 has a central portion 3c, 4c which closes the end of the panel and of the leaf, and a protruding lug 3d, 4d which in the closed condition of the leaf engages with a corresponding abutment surface 3e, 4e of the other section.

[0017] Preferably seals 7 and 8 made of rubber or other suitable material are applied onto said abutment surfaces.

[0018] Finally, protection of the rivets 5 against external agents is ensured by covering listels 9 which are snap-engaged onto the flanges 3a, 3b, 4a, 4b of the sections.

[0019] These listels have also a shape which fits with the rounded aspect of the remainder of the sections 3 and 4, thereby ensuring that the external surface of the flanges 3a, 3b, 4a, 4b of the sections is continuous and devoid of sharp edges or projections, to prevent clothes or objects from getting caught thereon when persons pass through the access door.

[0020] The panel and the leaf with the respective sections are connected by a series of hinges 10 (only one

of them is shown in the drawings) which, in accordance with a preferred embodiment of the invention, are of the concealed articulated type, such as those described in US patent No. 3.209.390, or in any case with a double axis as will be seen more clearly below.

[0021] The hinges are fixed to the central portions 3c, 4c of the sections 3, 4 by means of screws and extend partially into the insulating layer of the panel 1 and of the leaf 2; they allow rotation of the leaf through 180° until it is brought into the rotated position which can be seen in Fig. 2.

[0022] From what has been described hitherto, it is possible to understand how the access door considered above achieves the object set forth initially.

[0023] First of all it is obvious that the use of concealed or built in hinges ensures that they are not exposed to external agents, thereby rendering their operation always safe and reliable.

[0024] It must be pointed out, however, that mounting of these hinges is made possible by the presence of the sections 3 and 4 which allow stable and reliable fixing thereof. Indeed the expanded polyurethane or mineral wool of the insulating layer in the panel 1 and in the leaf 2 are not suitable to support the hinges, since they do not have sufficient mechanical strength; the sections 3 and 4, on the other hand, which may be made of any appropriate metallic material such as aluminium, steel and the like, or also high-strength plastic or synthetic material, provide a suitable support for fixing the hinges with screws.

[0025] The hinges may be easily replaced since, for this purpose, it is sufficient to remove their fixing screws.

[0026] Another important aspect which must be emphasized, is that in the access door considered above the rivets 5 for fixing the sections are protected by listels 9, so that problems of external corrosion with the typical rust drippings which occurs in such cases are actually eliminated.

[0027] This is made possible by the use of sections with flanges 3a, 3b, 4a, 4b and by the fact that the rivets are used only for fixing thereof, and not for fixing the hinges as instead occurs in the known art; in other words, since the hinges are arranged inside the panel and the leaf, on the outside thereof there are no projecting elements (such as the pins of the hinges) which may hinder application of the listels.

[0028] Of course variants of the invention with respect to the preceding example thereof are possible; in particular the form of the hinges and of the sections may differ from those seen, although remaining within the operating principles explained above.

[0029] One of such possible variants is shown in Figures 4 to 6 wherein, for the sake of simplicity, the same numbering of the parts structurally or functionally equivalent to those already seen has been maintained.

[0030] As can be seen, the shape of the sections 3 and 4 is slightly modified and also the hinge 10 is of simpler double-axis type; namely the movement of the leaf with respect to the fixed panel occurs by means of the action of a connecting rod 12 which connects the two pins 13 and 14 fixed to the panels 3 and 4 respectively.

[0031] From a functional point of view, the opening movement of the leaf in order to pass from the closed condition (Fig. 4) to the open condition at 180° (Fig. 6), is the same as that of the preceding example; the same applies with the advantages of the access door described further above.

[0032] In particular, in this case although the hinge 10 is not of the built in type, the pins 13 and 14 thereof are located inside the sections and are therefore protected as explained above.

[0033] Last, with reference to Fig. 7, it can be understood how the closed box-shaped configuration of the sections and their flanges, obtained also because of the presence of the covering listels 9, allows application of closing elements which seal their ends, preventing the infiltration of water, dust and the like, inside them.

[0034] This possibility is particularly advantageous for panels of sectional gates like the one shown in Figure 7, because it allows the ends of the sections to be configured with the typical curved profile of the edges of these panels.

[0035] This figure shows a sectional gate which is denoted in its entirety by 20 and is formed by a series of panels 1, 1', 1", etc. (in the drawing only two of them have been shown) hinged together in a known manner, and in which an access door is provided; in the drawings and in the description the elements associated with the panels at the bottom or at the top of the gate are indicated by a prime.

[0036] The access door is formed by two panels 2 and 2' mounted on respective panels 1 and 1' of the gate as already explained, namely with the sections 3, 4 and 3' 4' similar to those described farther above to which reference may be made for the sake of brevity.

[0037] At the ends of these sections there are applied caps 21, 22, 21'-24', which are preferably shaped with a curved profile: in this way they fit with the usual concave and convex profiles of the edges of the panels for sectional gates, thereby avoiding the risk of fingers getting trapped during opening and closing thereof.

Claims

1. Access door for gates, wherein a leaf (2) is mounted on a panel (1) of the gate by means of hinges (10), **characterized in that** it comprises a first and a second section (3, 4) arranged respectively along the edge of the panel and of the leaf where rotation of the latter occurs, and **in that** the hinges comprise at least two axes of rotation and are fixed to said sections.

2. Access door according to Claim 1, wherein the hinges (10) are of the built in articulated type and are

fixed to a central portion (3c, 4c) of the sections (3, 4) extending along the end of the panel (1) and of the leaf (2).

3. Access door according to Claim 1, wherein the hinges are of the double-axis type with pins (13, 14) housed inside respective seats provided in the sections.

4. Access door according to any one of Claims 1 to 3, wherein the sections (3, 4) comprise respective flanges (3a, 3b, 4a, 4b) extending along the faces at sight of the panel (1) and of the leaf (2), to which they are fixed by means of rivets (5) or other similar fixing means.

5. Access door according to Claim 4, comprising listels (9) for covering said rivets (5) or other similar fixing means, which are applied through snap-engagement onto the flanges (3a, 3b, 4a, 4b) of the sections (3, 4).

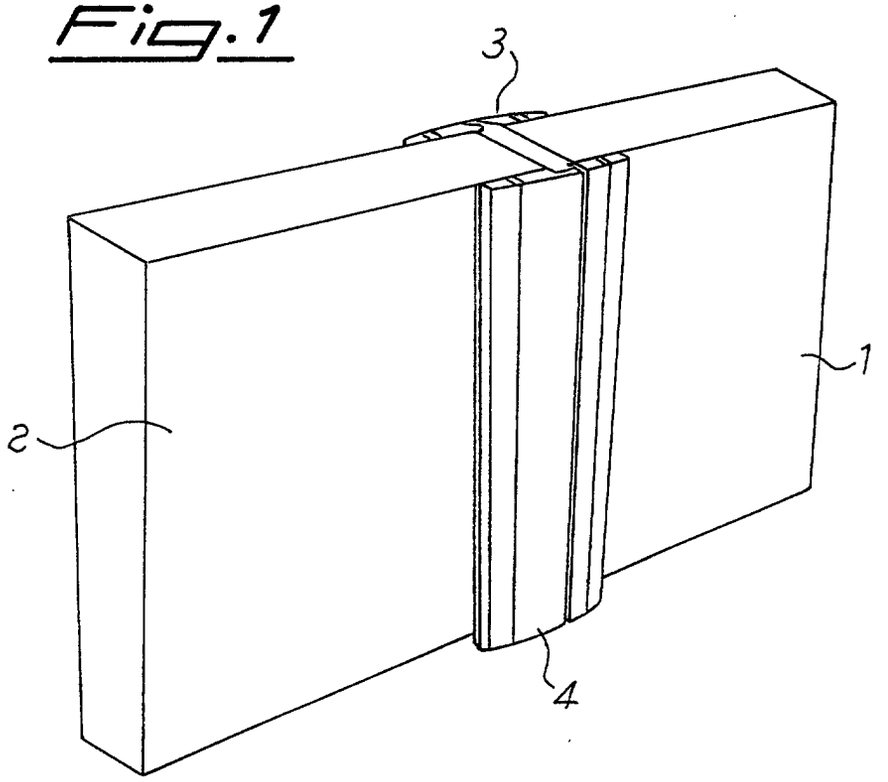
6. Access door according to Claim 5, wherein the sections (3, 4) comprise lugs (3d, 4d) and abutment surfaces (3e, 4e) mutually engaging in the closed condition of the leaf (2), and with which the covering listels are fitted so as to form a substantially smooth external surface in this condition.

7. Sectional gate **characterized in that** it comprises an access door according to any of Claims 1 to 6.

8. Sectional gate according to Claim 7, wherein the ends of the sections (3, 4) of the access door are provided with sealing caps (21, 22, 21'-24').

9. Sectional gate according to Claim 8, wherein the caps (21, 22, 21'-24') are profiled so as to match the edges of the panels (1, 2, 1', 2') of the gate and of the leaf.

Fig.1



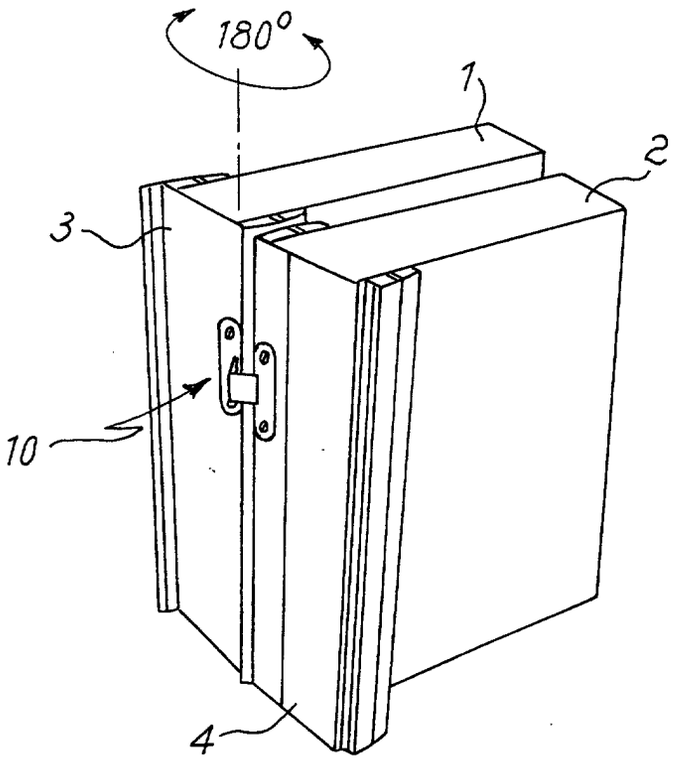
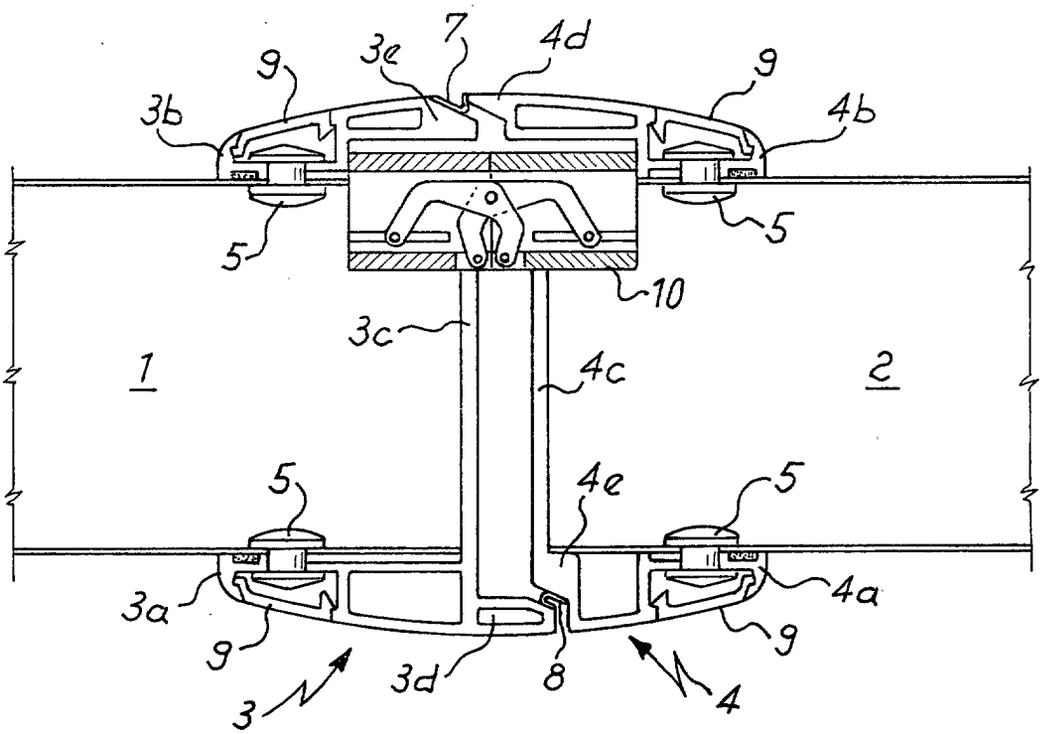


Fig.2

Fig.3

OUTER SIDE



INNER SIDE

Fig.6

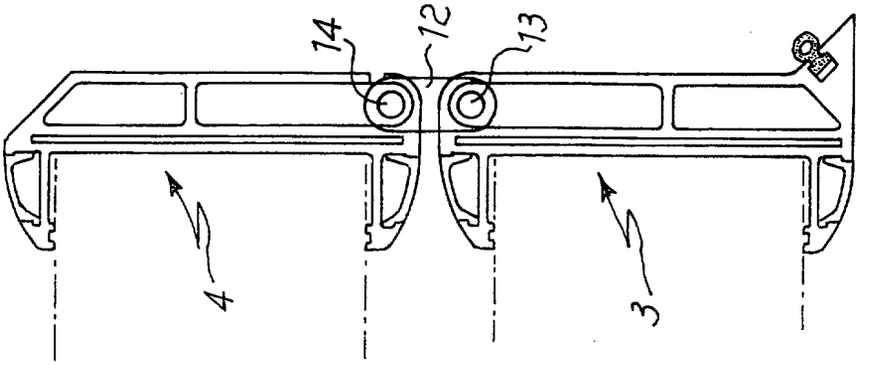


Fig.5

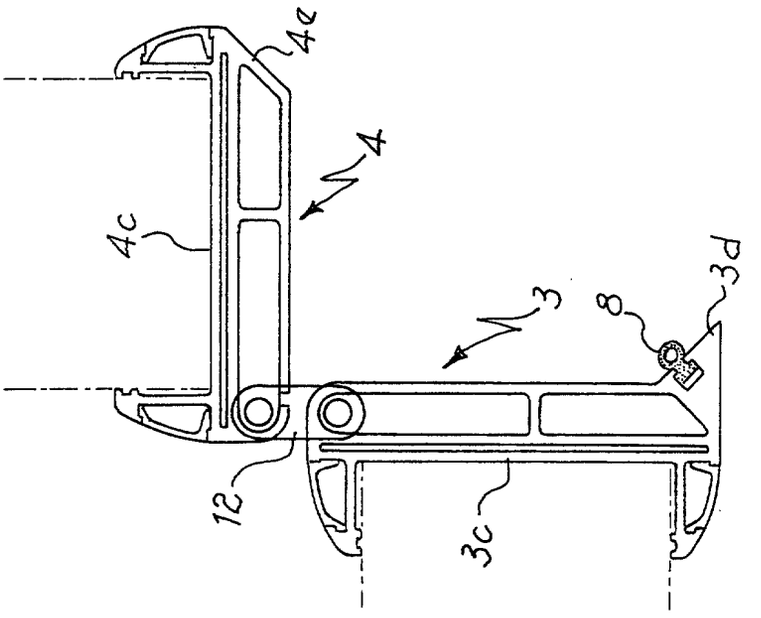
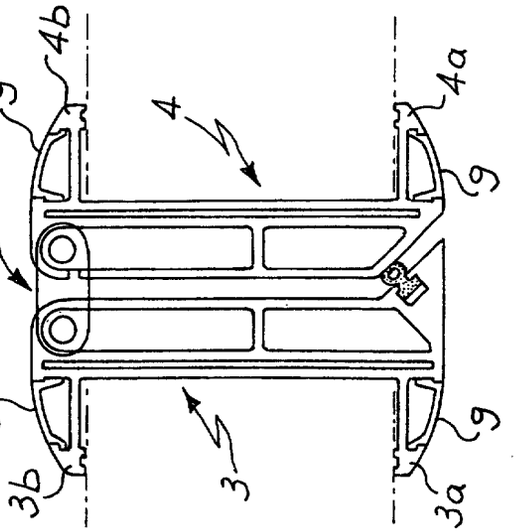


Fig.4



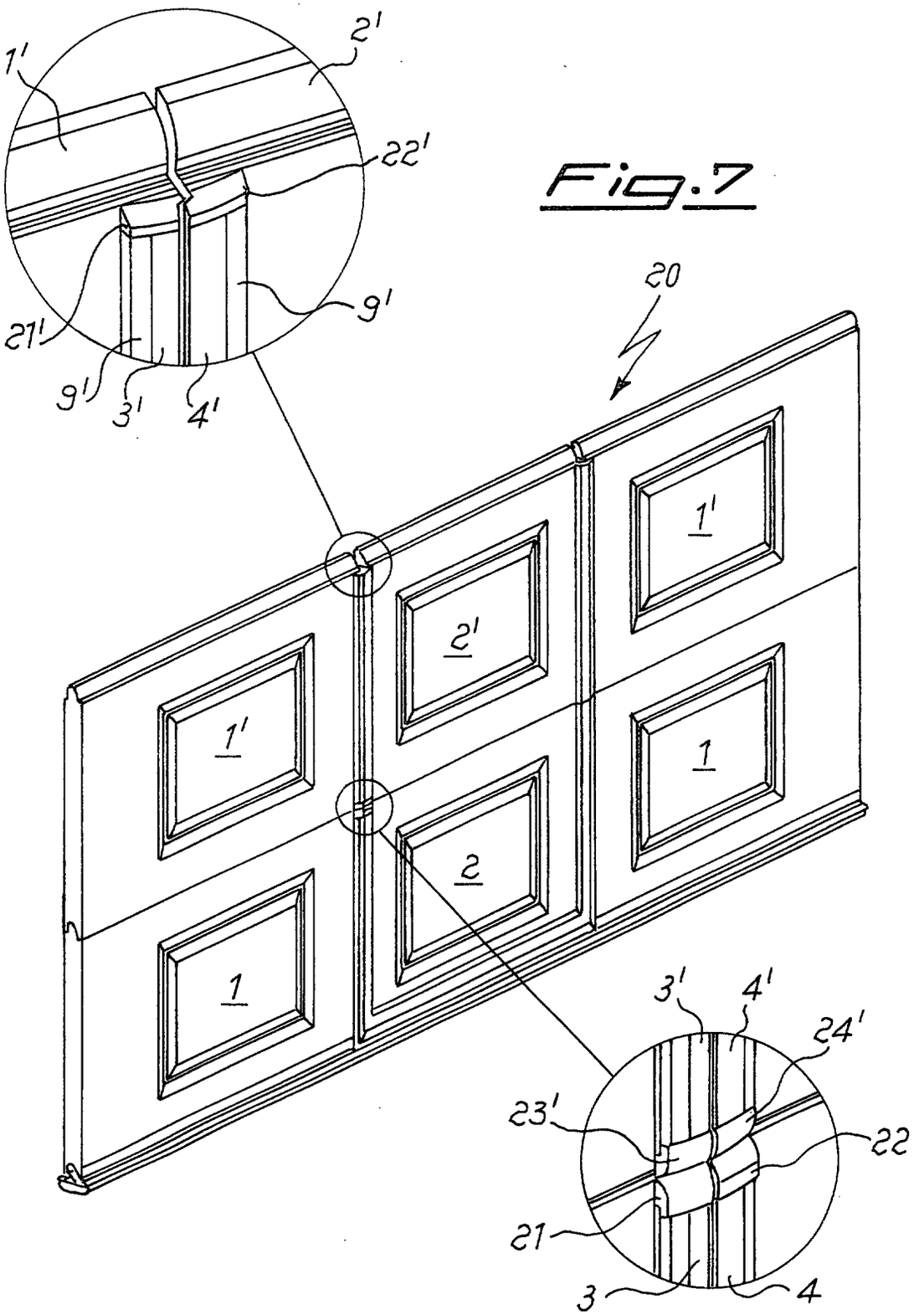


Fig.7

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EUROPEAN SEARCH REPORT

Application Number
EP 02 42 5404

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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	12 November 2002	Witasse-Moreau, C

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