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EUROPEAN PATENT APPLICATION

(43) Date of publication:
22.03.2017 Bulletin 2017/12

(51) Int Cl.:
E04B 9/00 (2006.01)

(21) Application number: 16189357.3

(22) Date of filing: 16.09.2016

<div>(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 MK MT NL NO PL PT RO RS SE SI SK SM TR Designated Extension States: BA ME Designated Validation States: MA MD</div>	<div>(71) Applicant: AKIFIX S.p.A. con Socio Unico 39100 Bolzano (IT)</div> <div>(72) Inventor: PANDOLFI, Giovanni 39100 BOLZANO (IT)</div> <div>(74) Representative: Manconi, Stefano et al Studio Torta S.p.A. Via Viotti, 9 10121 Torino (IT)</div>
<div>(30) Priority: 16.09.2015 IT UB20153678</div>	

(54)

INSPECTION HATCH

(57) An inspection hatch has an inner door (11), which extends inside an outer framework (2) with a quadrilateral shape, is movable, relative to the outer framework (2), between an opening position and a closing position to open and close the inspection hatch, and is provided with an outer frame (12) and with an inner closing

panel; the outer framework (2) and the outer frame (12) being each defined by at least two respective support section bars (7, 18), which are coupled to one another in a sliding manner, so as to selectively control the size of the outer framework (2) and of the outer frame (12) in at least one direction (4, 6).

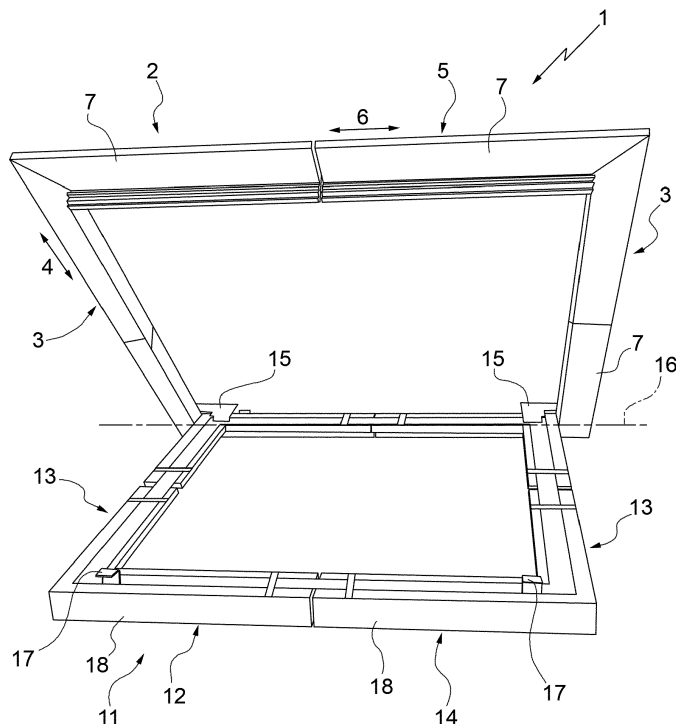


FIG.1

Description

[0001] The present invention relates to an inspection hatch.

[0002] In particular, the present invention relates to an inspection hatch comprising an outer framework, which has an annular, quadrilateral shape and is delimited by two first sides, which are parallel to one another, and by two second sides, which are parallel to one another and perpendicular to the first sides; and an inner door, which is movable, relative to the outer framework, between an opening position and a closing position to open and close the inspection hatch, and comprises an outer frame, which extends along the outer framework when the inspection hatch is closed, and is designed to support an inner closing panel.

[0003] Inspection hatches of the type described above have some drawbacks, mainly due to the fact that said inspection hatches have standard fixed dimensions.

[0004] A customized inspection hatch with dimensions that are different from the standard fixed ones involves a specific request to the manufacturers and, therefore, relatively high delivery times and production costs.

[0005] It is an object of the present invention to provide an inspection hatch designed to eliminate the aforementioned drawbacks in a straightforward, relatively low-cost manner.

[0006] According to the present invention, there is provided an inspection hatch as claimed in the appended claims.

[0007] The invention will now be described with reference to the accompanying drawings, which show a non-limiting embodiment thereof, wherein:

figure 1 is a schematic perspective view, with parts removed for greater clarity, of a preferred embodiment of the inspection hatch according to the invention;

figures 2 and 3 are a schematic plan view and a schematic view from the bottom, with parts removed for greater clarity, of the inspection hatch of figure 1 shown in a first operating position; and

figures 4 and 5 are a schematic plan view and a schematic view from the bottom, with parts removed for greater clarity, of the inspection hatch of figure 1 shown in a second operating position.

[0008] With reference to the accompanying figures, number 1 indicates, as a whole, an inspection hatch comprising an outer framework 2, which has an annular, quadrilateral shape and is delimited by two sides 3, which are parallel to one another and to a direction 4, and by two sides 5, which are parallel to one another and to a direction 6 that is transverse to the direction 4.

[0009] The outer framework 2 is designed to be fixed to a support structure and comprises, in this specific case, four support section bars 7, each of which is L-shaped and is coupled in a sliding manner to each adjacent sup-

port section bar 7 by means of a relative coupling section bar 8 with a substantially flat shape, which is engaged inside the two support section bars 7.

[0010] Each coupling section bar 8 has, in the area of its free ends, two limit stop teeth 9, which project perpendicularly to the coupling section bar 8 and cooperate with relative limit stop clamps 10, which are mounted in the area of the free ends of the relative support section bars 7, so as to stop the relative support section bars 7 along the coupling section bar 8 in one of the directions 4, 6.

[0011] The inspection hatch 1 comprises, furthermore, an inner door 11, which is movable, relative to the outer framework 2, between an opening position (figure 1) and a closing position (figures 2, 3, 4, 5) to open and close the inspection hatch 1.

[0012] The inner door 11 comprises an outer frame 12, which extends along the outer framework 2 when the inspection hatch 1 is closed, and is designed to support an inner closing panel (not shown).

[0013] The outer frame 12 has an annular, quadrilateral shape and is delimited by to sides 13, which are parallel to one another and to the direction 4, and by two sides 14, which are parallel to one another and to the direction 6.

[0014] The outer frame 12 is coupled in a rotary manner to the outer framework 2 by means of a pair of hinges 15, so as to rotate, relative to the outer framework 2, around a fulcrum axis 16, which is parallel to the direction 6, between its opening and closing position to open and close the inspection hatch 1.

[0015] The outer frame 12 is locked in its closing position, in which it closes the inspection hatch 1, by means of two known hooking devices 17, which are interposed between the outer framework 2 and the outer frame 12.

[0016] The outer frame 12 comprises, in this specific case, four support section bars 18, each of which is L-shaped and is coupled in a sliding manner to each adjacent support section bar 18 by means of a relative coupling section bar 19 with a substantially flat shape, which is engaged inside the two support section bars 18.

[0017] Each coupling section bar 19 has, in the area of its free ends, two limit stop teeth 20, which project perpendicularly to the coupling section bar 19 and cooperate with relative limit stop clamps 21, which are mounted in the area of the free ends of the relative support section bars 18, so as to stop the relative support section bars 18 along the coupling section bar 19 in one of the directions 4, 6.

[0018] The inspection hatch 1 comprises, furthermore, a plurality of clips 22 of plastic material, which are distributed along the outer framework 2 and the outer frame 12 and are designed to lock the support section bars 7, 18 relative to one another in one of the directions 4, 6 and in a direction 23 that is orthogonal to the directions 4, 6.

[0019] In other words, the clips 22 allow each support section bar 7, 18 to move relative to each adjacent support section bar 7, 18 exclusively in one of the directions

4, 6.

[0020] The hinges 15 and the hooking devices 17 allow the support section bars 7 and the support section bars 18 to be locked relative to one another in the directions 4, 6 and, therefore, allow users to move the support section bars 7, 18 in an integral manner in the directions 4, 6.

[0021] Hence, the support section bars 7, 18 are selectively movable between a closed position (figures 2 and 3), in which each support section bar 7, 18 is arranged substantially in contact with each adjacent support section bar 7, 18, and an open position (not shown), in which each support section bar 7, 18 is arranged at a given distance from each adjacent support section bar 7, 18.

[0022] Figures 4 and 5 show an intermediate position, in which only the sides 3 and 13 were elongated.

[0023] The inspection hatch 1 comprises, furthermore, a plurality of closing section bars 24 (two of them are shown in figure 5 with a broken line), each of which is inserted between two adjacent support section bars 7, 18 when the support section bars 7, 18 are arranged in their open position, overlaps a relative coupling section bar 19, and has an outer face, which is equivalent to the one of the support section bars 7, 18.

[0024] Each closing section bar 24 is snap-hooked in a hooking channel 25 (figure 4), which is obtained in the relative coupling section bar 19.

[0025] After having obtained the desired dimensions of the inspection hatch 1:

the support section bars 7, 18 are locked in the directions 4, 6 by means of, for example, punching with the coupling section bars 19, self-perforating fixing means, or gluing; and

the aforesaid inner closing panel (not shown) is fitted in the outer frame 12 to complete the inspection hatch 1.

Obviously, even the inner closing panel (not shown) can be used to lock the support section bars 7, 18 in their open position.

[0026] According to a variant, which is not shown herein, the four support section bars 7 are replaced by two support section bars that are substantially U-shaped and the four support section bars 18 are replaced by two support section bars that are substantially U-shaped, so as to selectively control the size of the inspection hatch 1 only in one of the directions 4, 6.

[0027] The configuration of the outer framework 2 and of the outer frame 12 allows user to obtain customized inspection hatches 1 with dimensions that are different from the standard fixed ones currently available in the market.

Claims

1. An inspection hatch comprising an outer framework

(2), which has an annular, quadrilateral shape and is delimited by two first sides (3), which are parallel to one another and to a first direction (4), and by two second sides (5), which are parallel to one another and to a second direction (6) that is transverse to the first direction (4); and an inner door (11), which is movable, relative to the outer framework (2), between an opening position and a closing position to open and close the inspection hatch, and comprises an outer frame (12), which extends along the outer framework (2) when the inspection hatch is closed, and is designed to support an inner closing panel; and **characterized in that** the outer framework (2) comprises at least two first support section bars (7), which are coupled to one another in a sliding manner, so as to selectively control the size of the outer framework (2) in at least one of said first and second directions (4, 6), and **in that** the outer frame (12) comprises at least two second support section bars (18), which are coupled to one another in a sliding manner, so as to selectively control the size of the outer frame (12) in at least one of said first and second directions (4, 6).

2. An inspection hatch according to claim 1, wherein each first and second support section bar (7, 18) is substantially U-shaped.

3. An inspection hatch according to claim 1, wherein the outer framework (2) comprises four first support section bars (7), which are coupled to one another in a sliding manner, so as to selectively control the size the outer framework (2) in said first and second directions (4, 6), and wherein the outer frame (12) comprises four second support section bars (18), which are coupled to one another in a sliding manner, so as to selectively control the size of the outer frame (12) in said first and second directions (4, 6).

4. An inspection hatch according to claim 3, wherein each first and second support section bar (7, 18) is substantially L-shaped.

5. An inspection hatch according to any of the previous claims and comprising, furthermore, first locking means (15, 17) to lock the outer frame (12) on the outer framework (2) in the first direction (4) and/or in the second direction (6) and to move said first and second support section bars (7, 18) in the first direction (4) and/or in the second direction (6) in an integral manner.

6. An inspection hatch according to any of the previous claims and comprising, furthermore, second locking means (22) to lock each first support section bar (7) on the relative second support section bar (18) in one of said first and second directions (4, 6) and in a third direction (23), which is orthogonal to said first

and second directions (4, 6).

7. An inspection hatch according to any of the previous claims and comprising, furthermore, a plurality of first coupling section bars (8), which are as many as the first support section bars (7) and are engaged in a sliding manner by the first support section bars (7), and a plurality of second coupling section bars (19), which are as many as the second support section bars (18) and are engaged in a sliding manner by the second support section bars (18). 5 10
8. An inspection hatch according to claim 7 and comprising, furthermore, first limit stop means (9, 10) to stop the first support section bars (7) along the first coupling section bars (8) in the first direction (4) and/or in the second direction (6) and second limit stop means (20, 21) to stop the second support section bars (18) along the second coupling section bars (19) in the first direction (4) and/or in the second direction (6). 15 20
9. An inspection hatch according to claim 7 or 8 and comprising, furthermore, for each coupling section bar (8, 19), a respective closing section bar (24), which can be hooked to the coupling section bar (8, 19) between the corresponding support section bars (7, 18). 25
10. An inspection hatch according to any of the claims from 7 to 9 and comprising, furthermore, third locking means to permanently lock each support section bar (7, 18) along the relative coupling section bar (8, 19). 30
11. An inspection hatch according to any of the previous claims, wherein the inner door (11) is coupled to the outer framework (2) in a rotary manner, so as to move between its opening and closing positions. 35

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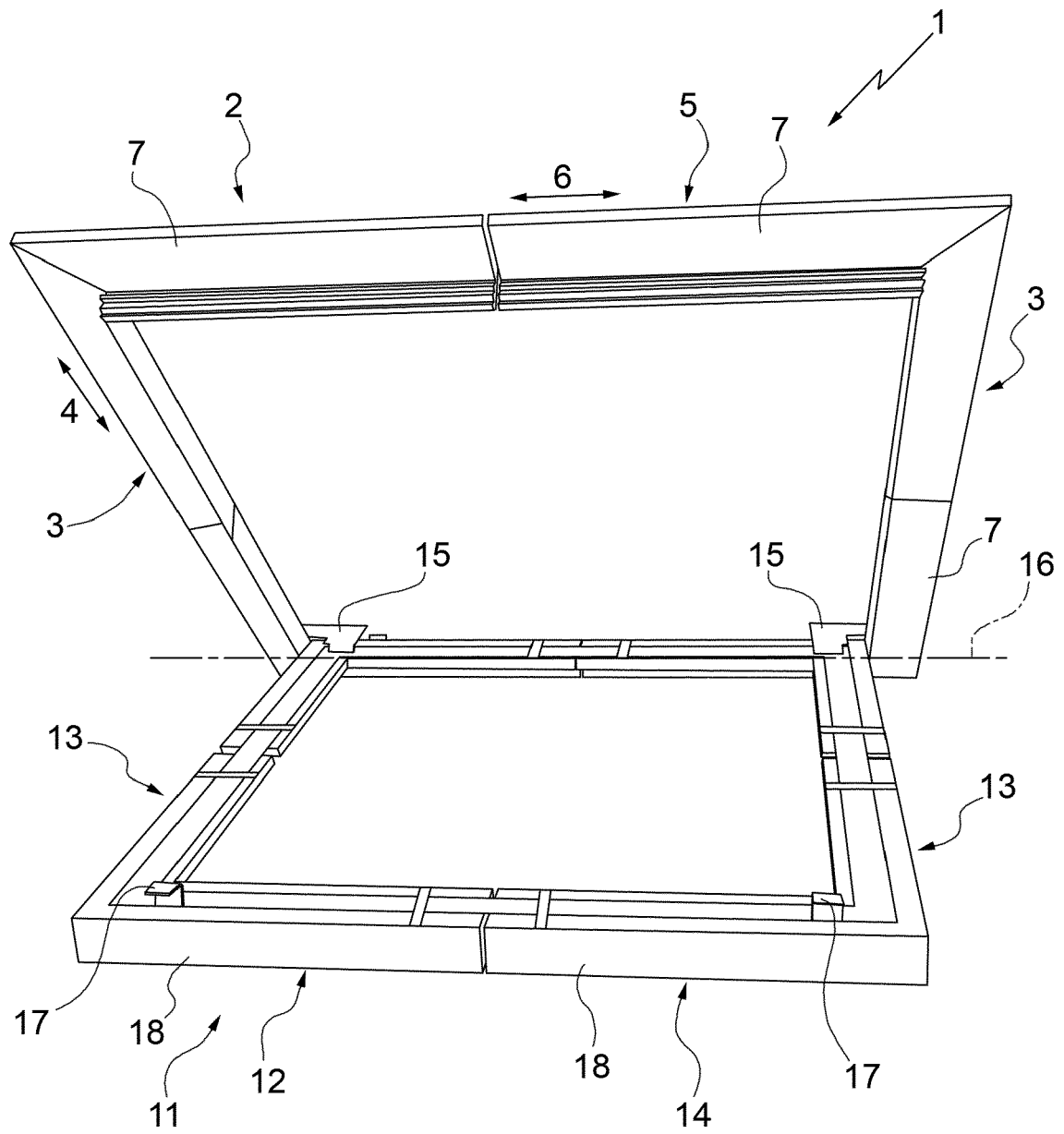


FIG.1

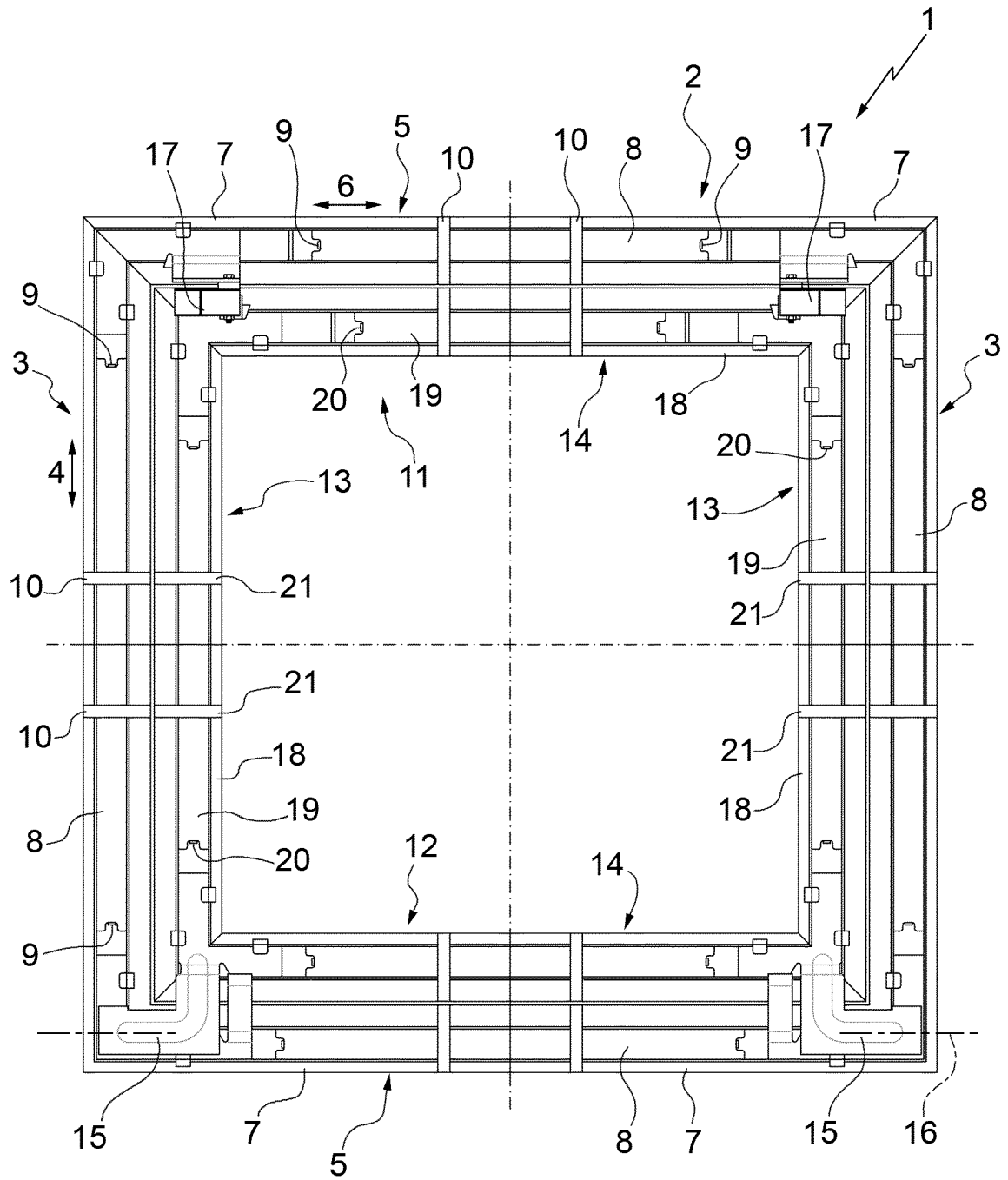


FIG.2

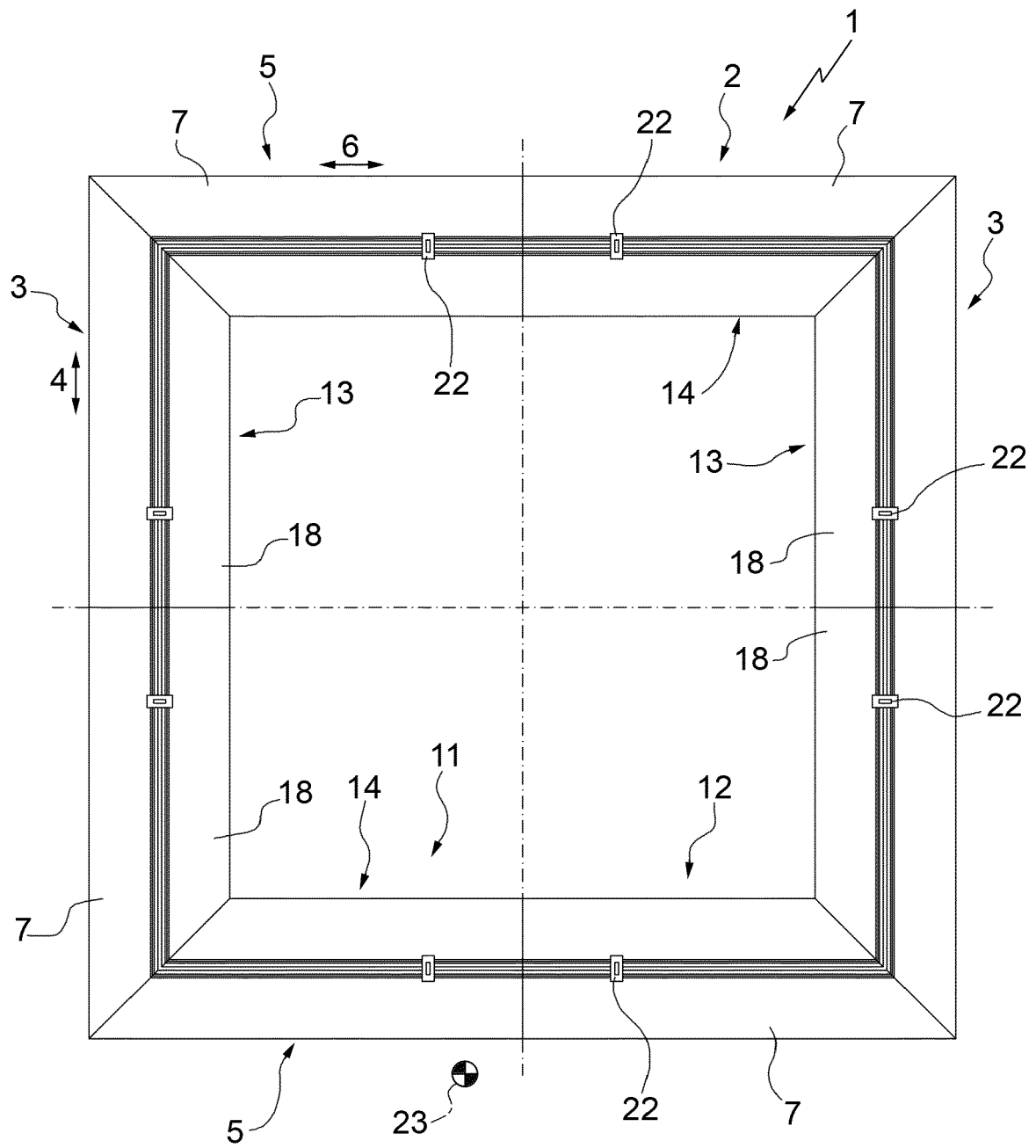


FIG.3

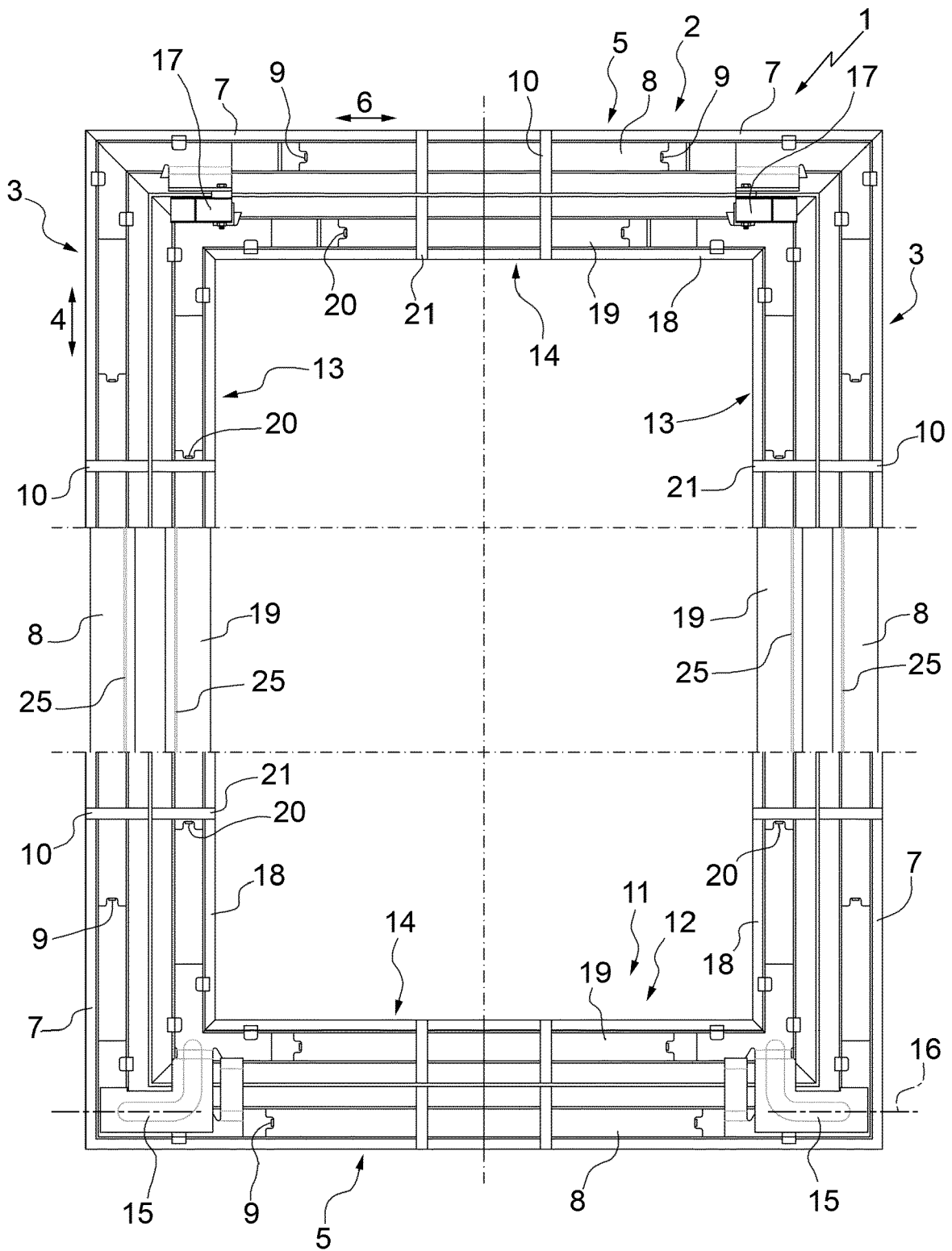


FIG.4

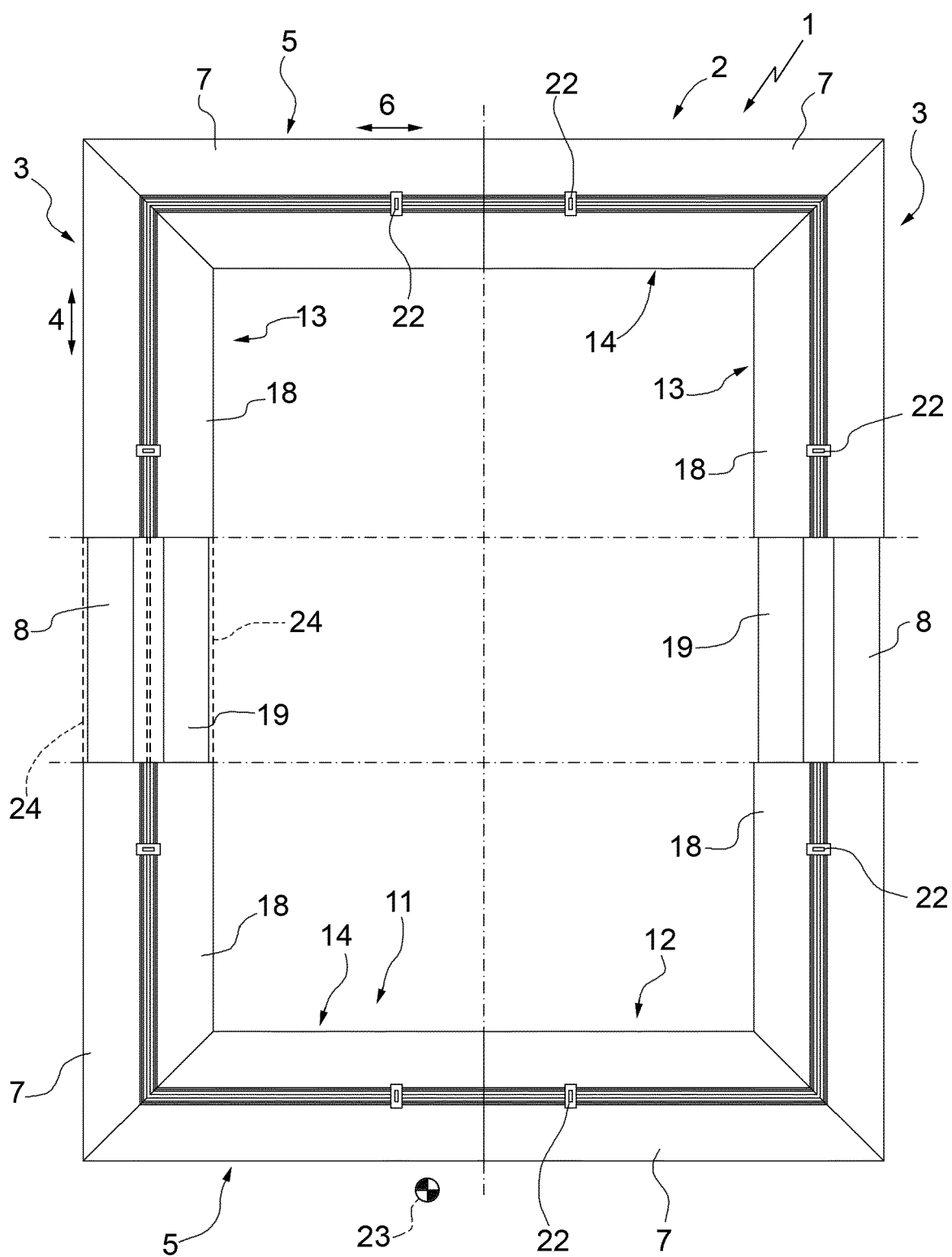


FIG.5



EUROPEAN SEARCH REPORT

Application Number
EP 16 18 9357

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 35 23 738 A1 (ROTH ECKART) 8 January 1987 (1987-01-08)	1	INV. E04B9/00
A	* column 3, line 37 - column 10, line 52; figures 1-7 *	2-11	
A	----- EP 0 723 054 A2 (ROTH ECKART [DE]) 24 July 1996 (1996-07-24) * the whole document *	1-11	

			TECHNICAL FIELDS SEARCHED (IPC)
			E04B E04F E06B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 January 2017	Examiner Lopes, Claudia
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 16 18 9357

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82