



(11) **EP 3 144 440 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
04.12.2019 Bulletin 2019/49

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

(21) Application number: **16189357.3**

(22) Date of filing: **16.09.2016**

(54) **INSPECTION HATCH**

INSPEKTIONKLAPPE

TRAPPE D'INSPECTION

(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

(30) Priority: **16.09.2015 IT UB20153678**

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

(60) Divisional application:
18156378.4 / 3 342 950

(73) Proprietor: **AKIFIX S.P.A.**
39100 Bolzano (IT)

(72) Inventor: **PANDOLFI, Giovanni**
39100 BOLZANO (IT)

(74) Representative: **Baldi, Claudio et al**
Ing. Claudio Baldi S.r.l.
Viale Cavallotti 13
P.O. Box 187
60035 Jesi (AN) (IT)

(56) References cited:
EP-A2- 0 723 054 DE-A1- 3 523 738

EP 3 144 440 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

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] An inspection hatch according to the preamble of the subject-matter of claim 1 is described in DE3523738 A1.

[0006] 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.

[0007] According to the present invention, there is provided an inspection hatch as claimed in the appended claims.

[0008] 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.

[0009] 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.

[0010] 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 support 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.

[0011] 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.

[0012] 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.

[0013] 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).

[0014] The outer frame 12 has an annular, quadrilateral shape and is delimited by two 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.

[0015] 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.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] Figures 4 and 5 show an intermediate position, in which only the sides 3 and 13 were elongated.

[0024] 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.

[0025] 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.

[0026] 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.

[0027] Obviously, even the inner closing panel (not shown) can be used to lock the support section bars 7, 18 in their open position.

[0028] 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.

[0029] 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; the outer framework (2) comprising 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 the outer frame (12) comprising 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); and **characterized in that** it comprises, 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
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, 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).

6. 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).
7. An inspection hatch according to claim 6 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).
8. An inspection hatch according to claim 6 or 7 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).
9. An inspection hatch according to any of the claims from 6 to 8 and comprising, furthermore, third locking means to permanently lock each support section bar (7, 18) along the relative coupling section bar (8, 19).
10. 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.

Patentansprüche

1. Inspektionsluke, umfassend einen äußeren Rahmen (2), der eine ringförmige, vierseitige Form aufweist und durch zwei erste Seiten (3), die parallel zueinander und zu einer ersten Richtung (4) verlaufen, und durch zwei zweite Seiten (5), die parallel zueinander und zu einer zweiten, quer zu der ersten Richtung (4) verlaufenden Richtung (6) verlaufen, begrenzt ist; und eine Innentür (11), die in Bezug auf den äußeren Rahmen (2) zwischen einer Öffnungsposition und einer Schließposition zum Öffnen und Schließen der Inspektionsluke beweglich ist und einen äußeren Rahmen (12) umfasst, der sich entlang des äußeren Rahmens (2) erstreckt, wenn die Inspektionsluke geschlossen ist, und konzipiert ist, um eine innere Verschlussplatte zu tragen; wobei der äußere Rahmen (2) mindestens zwei erste Träger-

profilstangen (7) umfasst, die gleitend miteinander gekoppelt sind, um die Größe des äußeren Rahmens (12) in mindestens einer der ersten und der zweiten Richtung (4, 6) selektiv zu steuern; wobei der äußere Rahmen (12) mindestens zwei zweite Trägerprofilstangen (18) umfasst, die gleitend miteinander gekoppelt sind, um die Größe des äußeren Rahmens (12) in mindestens einer der ersten und der zweiten Richtung (4, 6) selektiv zu steuern; und **dadurch gekennzeichnet, dass** sie ferner erste Verriegelungsmittel (15, 17) umfasst, um den äußeren Rahmen (12) auf dem äußeren Rahmen (2) in der ersten Richtung (4) und/oder in der zweiten Richtung (6) zu verriegeln und die erste und die zweite Trägerprofilstange (7, 18) in die erste Richtung (4) und/oder die zweite Richtung (6) einstückig zu bewegen.

2. Inspektionsluke nach Anspruch 1, wobei jede erste und zweite Trägerprofilstange (7, 18) im Wesentlichen U-förmig ist.
3. Inspektionsluke nach Anspruch 1, wobei der äußere Rahmen (2) vier erste Trägerprofilstangen (7) umfasst, die gleitend miteinander gekoppelt sind, um die Größe des äußeren Rahmens (2) in der ersten und zweiten Richtung (4, 6) selektiv zu steuern, und wobei der äußere Rahmen (12) vier zweite Trägerprofilstangen (18) umfasst, die gleitend miteinander gekoppelt sind, um die Größe des äußeren Rahmens (12) in der ersten und zweiten Richtung (4, 6) selektiv zu steuern.
4. Inspektionsklappe nach Anspruch 3, wobei jede erste und zweite Trägerprofilstange (7, 18) im Wesentlichen L-förmig ist.
5. Inspektionsluke nach einem der vorhergehenden Ansprüche, umfassend ferner zweite Verriegelungsmittel (22) zum Verriegeln jeder ersten Trägerprofilstange (7) auf der jeweiligen zweiten Trägerprofilstange (18) in einer der ersten und zweiten Richtungen (4, 6) und in einer dritten Richtung (23), die orthogonal zu der ersten und zweiten Richtung (4, 6) ist.
6. Inspektionsluke nach einem der vorhergehenden Ansprüche, umfassend ferner eine Vielzahl von ersten Kopplungsprofilstangen (8), die so zahlreich sind wie die ersten Trägerprofilstangen (7) und gleitend durch die ersten Trägerprofilstangen (7) in Eingriff stehen, und eine Vielzahl von zweiten Kopplungsprofilstangen (19), die so zahlreich sind wie die zweiten Trägerprofilstangen (18) und gleitend durch die zweiten Trägerprofilstangen (18) in Eingriff stehen.
7. Inspektionsluke nach Anspruch 6, umfassend ferner erste Begrenzungsanschlagmittel (9, 10) zum An-

schlagen der ersten Stützprofilstangen (7) entlang der ersten Kopplungsprofilstangen (8) in der ersten Richtung (4) und/oder in der zweiten Richtung (6) und zweite Begrenzungsanschlagmittel (20, 21) zum Anschlagen der zweiten Trägerprofilstangen (18) entlang der zweiten Kopplungsprofilstangen (19) in der ersten Richtung (4) und/oder in der zweiten Richtung (6).

8. Inspektionsluke nach Anspruch 6 oder 7, ferner umfassend für jede Kopplungsprofilstange (8, 19) eine jeweilige Schließprofilstange (24) umfasst, die an der Kopplungsprofilstange (8, 19) zwischen den entsprechenden Trägerprofilstangen (7, 18) einhängbar ist.
9. Inspektionsluke nach einem der Ansprüche 6 bis 8 und umfassend ferner dritte Verriegelungsmittel zum dauerhaften Verriegeln jeder Trägerprofilstange (7, 18) entlang der jeweiligen Kopplungsprofilstange (8, 19).
10. Inspektionsluke nach einem der vorhergehenden Ansprüche, wobei die Innentür (11) mit dem äußeren Rahmen (2) drehbar gekoppelt ist, um sich zwischen ihrer Öffnungs- und Schließposition zu bewegen.

Revendications

1. Trappe d'inspection comprenant un cadre externe (2), ayant une forme annulaire quadrilatérale et délimité par deux premiers côtés (3), parallèles l'un l'autre et orientés vers une première direction (4) et par deux seconds côtés (5), parallèles l'un l'autre et orientés vers une seconde direction (6) qui est transversale à la première direction (4) ; et une porte interne (11), qui est mobile, relativement au cadre externe (2), entre une position d'ouverture et une position de fermeture pour ouvrir et fermer la trappe d'inspection et comprenant un cadre externe (12), qui s'allonge le long du cadre externe (2) lorsque la trappe d'inspection est fermée et qui est conçue pour soutenir un panneau de fermeture interne ; le cadre externe (2) comprenant au moins deux premières barres de section de support (7), qui sont couplées de manière coulissante à une autre barre de section de façon à sélectivement commander la dimension du cadre externe (2) sur au moins l'une des dites première et seconde directions (4, 6) ; et le cadre externe (12) comprenant au moins deux secondes barres de section de support (18) qui sont couplées de manière coulissante à une autre barre de section de façon à sélectivement commander la dimension du cadre externe (12) sur au moins l'une des dites première et seconde directions (4, 6) ; et **caractérisée en ce qu'elle** comprend également des premiers moyens de blocage (15, 17) pour bloquer le

cadre externe (12) sur le cadre externe (2) sur la première direction (4) et/ou sur la seconde direction (6) et déplacer lesdites première et seconde barres de section de support (7, 18) vers la première direction (4) et/ou vers la seconde direction (6) de manière intégrale.

2. Trappe d'inspection selon la revendication 1, où chaque première et seconde barres de section de support (7, 18) a essentiellement une forme en « U ».
3. Trappe d'inspection selon la revendication 1, où le cadre externe (2) comprend quatre premières barres de section de support (7) qui sont couplées de manière coulissante à une autre barre de section de support de façon à commander la dimension du cadre externe (2) dans lesdites première et seconde directions (4, 6) et où le cadre externe (12) comprend quatre secondes barres de section de support (18) qui sont couplées de manière coulissante à une autre barre de section de support de façon à commander sélectivement la dimension du cadre externe (12) dans lesdites première et seconde directions (4, 6).
4. Trappe d'inspection selon la revendication 3, où chaque première et seconde barres de section de support (7, 18) a essentiellement une forme en « L ».
5. Trappe d'inspection selon l'une quelconque des revendications précédentes et comprenant, également, des seconds moyens de blocage (22) pour bloquer chaque première barre de section de support (7) sur la correspondante seconde barre de section de support (18) dans l'une des dites première et deuxième directions (4, 6) et dans une troisième direction (23) qui est orthogonale aux dites première et seconde directions (4, 6).
6. Trappe d'inspection selon l'une quelconque des revendications précédentes et comprenant, également, une pluralité de premières barres de section d'accouplement (8) qui sont en nombre égal aux premières barres de section de support (7) et sont engagées de manière coulissante par les premières barres de section de support (7) et une pluralité de secondes barres de section d'accouplement (19) qui sont en nombre égal aux secondes barres de section de support (18) et sont engagées de manière coulissante par les secondes barres de section de support (18).
7. Trappe d'inspection selon la revendication 6 et comprenant, également, des premiers moyens d'arrêt (9, 10) pour arrêter les premières barres de section de support (7) le long des premières barres de section d'accouplement (8) dans la première direction (4) et/ou dans la seconde direction (6) et des seconds

moyens d'arrêt (20, 21) pour arrêter les secondes barres de section de support (18) le long des secondes barres de section d'accouplement (19) dans la première direction (4) et/ou dans la seconde direction (6).

5

8. Trappe d'inspection selon la revendication 6 ou 7 et comprenant, également, pour chaque barre de section d'accouplement (8, 19) une respectivement barre de section de fermeture (24) qui peut être accrochée à la barre de section d'accouplement (8, 19) entre les correspondantes barres de section de support (7, 18).
9. Trappe d'inspection selon l'une des revendications de 6 à 8 et comprenant, également, des troisièmes moyens de blocage pour bloquer de façon permanente chaque barre de section de support (7, 18) le long de la correspondante barre de section d'accouplement (8, 19).
10. Trappe d'inspection selon l'une quelconque des revendications précédentes, où la porte interne (11) est couplée au cadre externe (2) de manière pivotante, de façon à se déplacer entre ses positions d'ouverture et de fermeture.

10

15

20

25

30

35

40

45

50

55

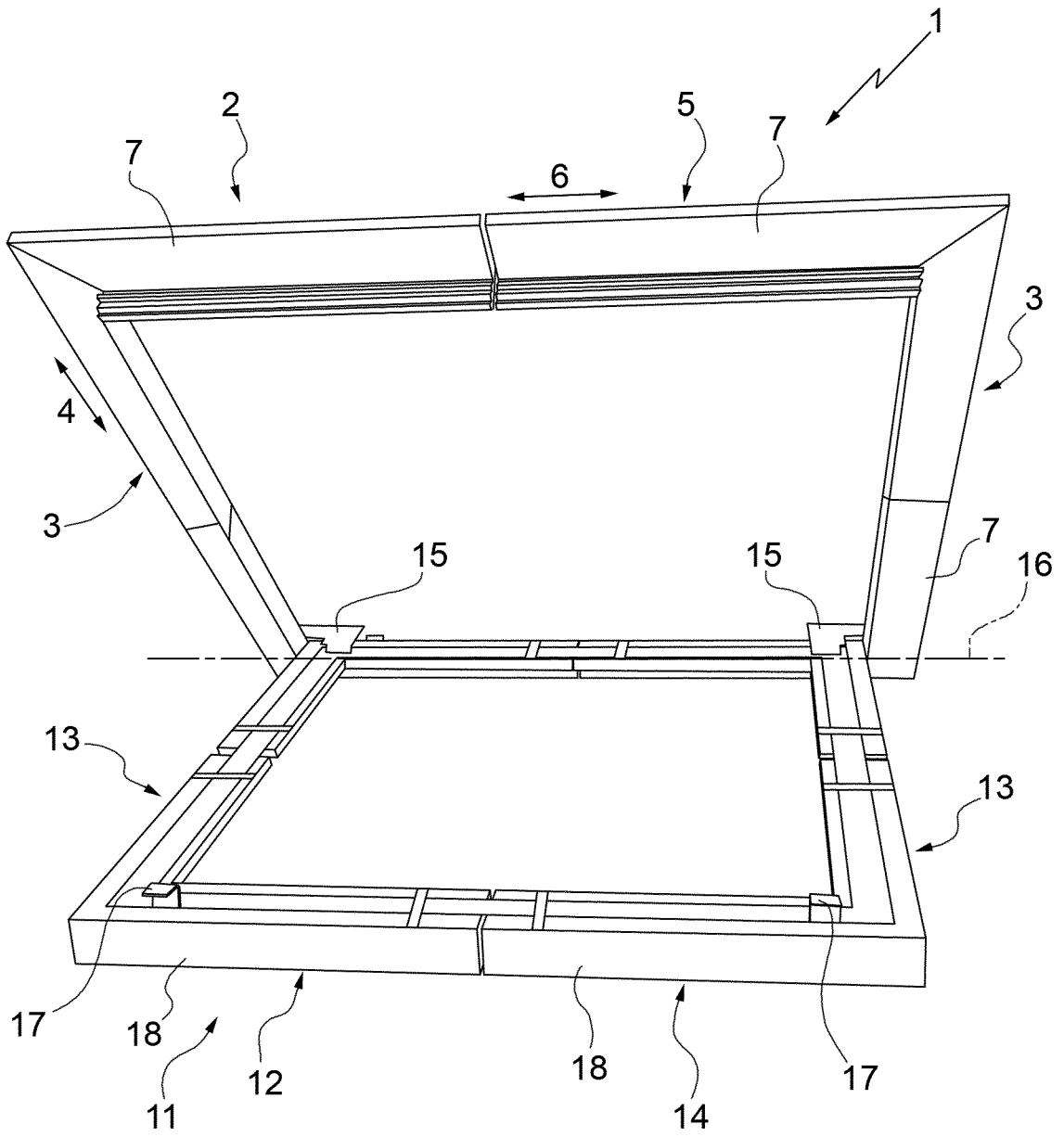


FIG.1

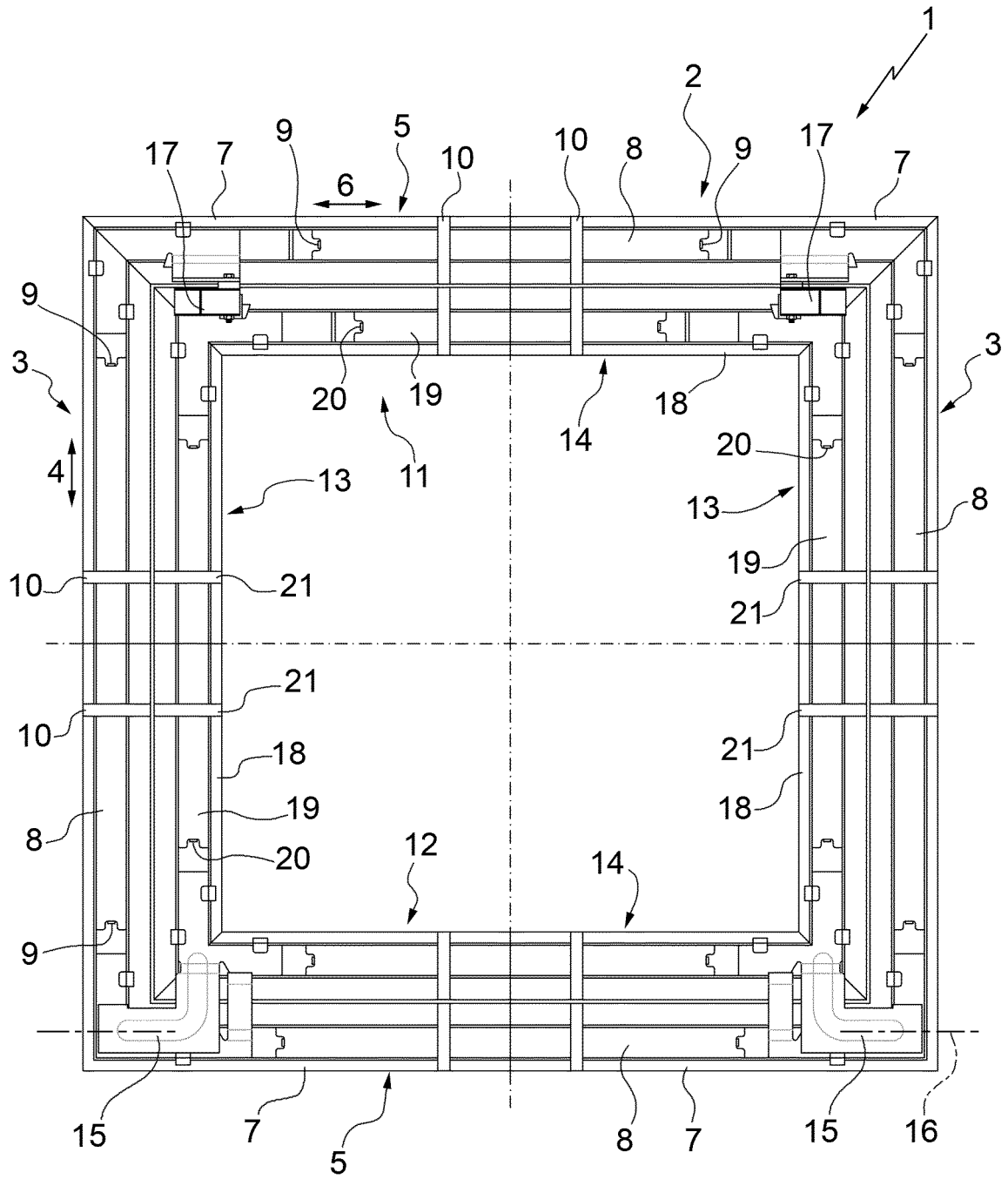


FIG.2

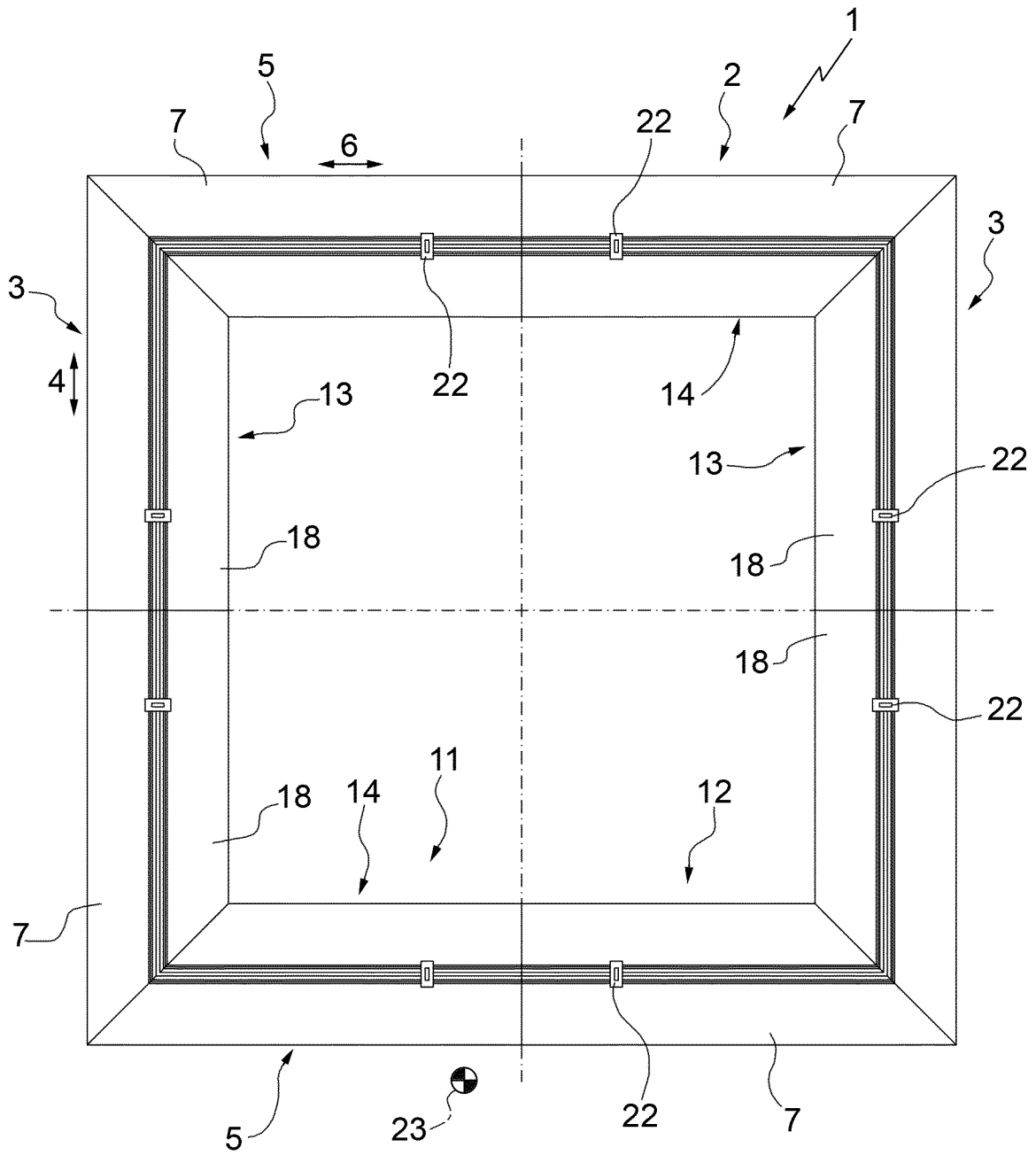


FIG.3

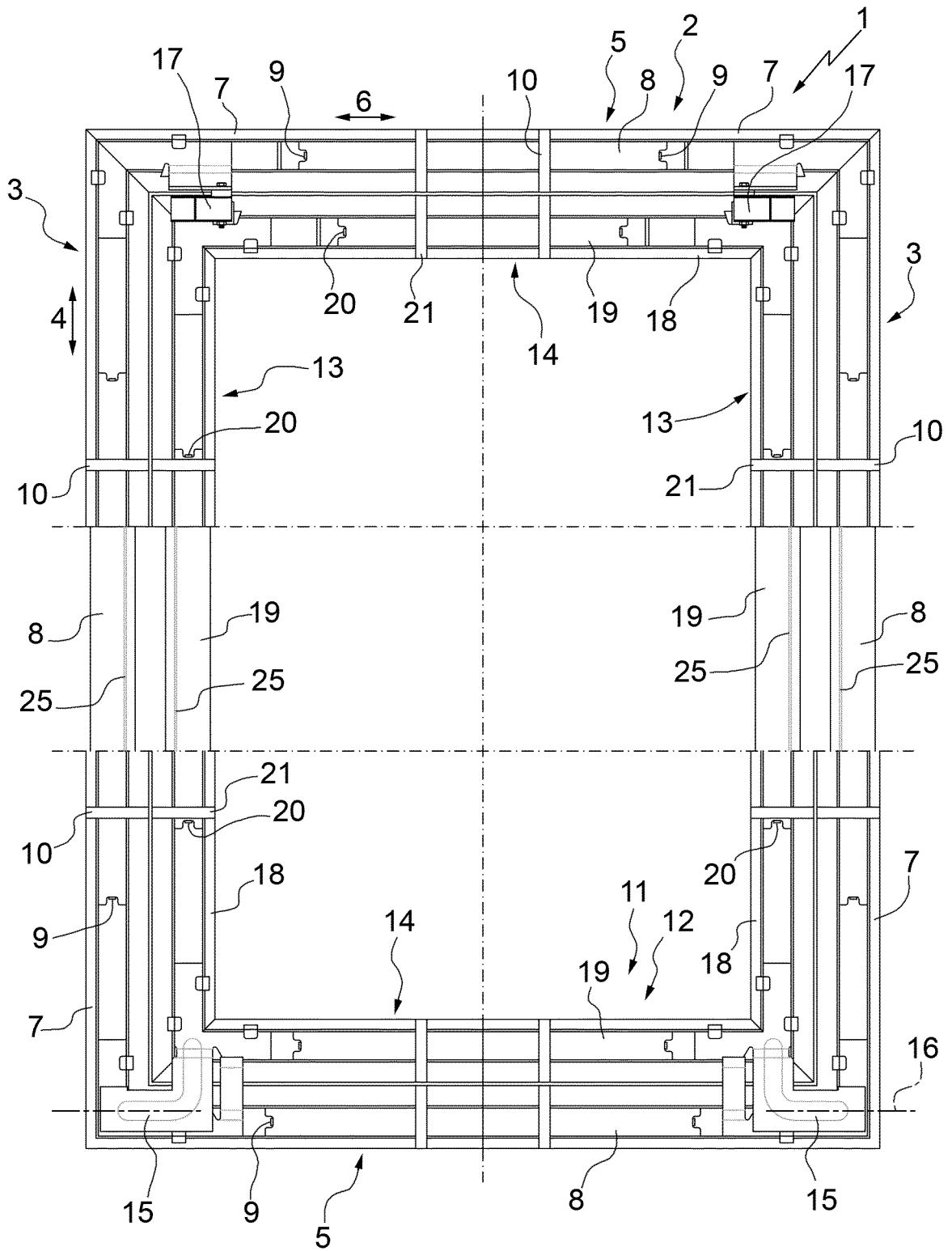


FIG.4

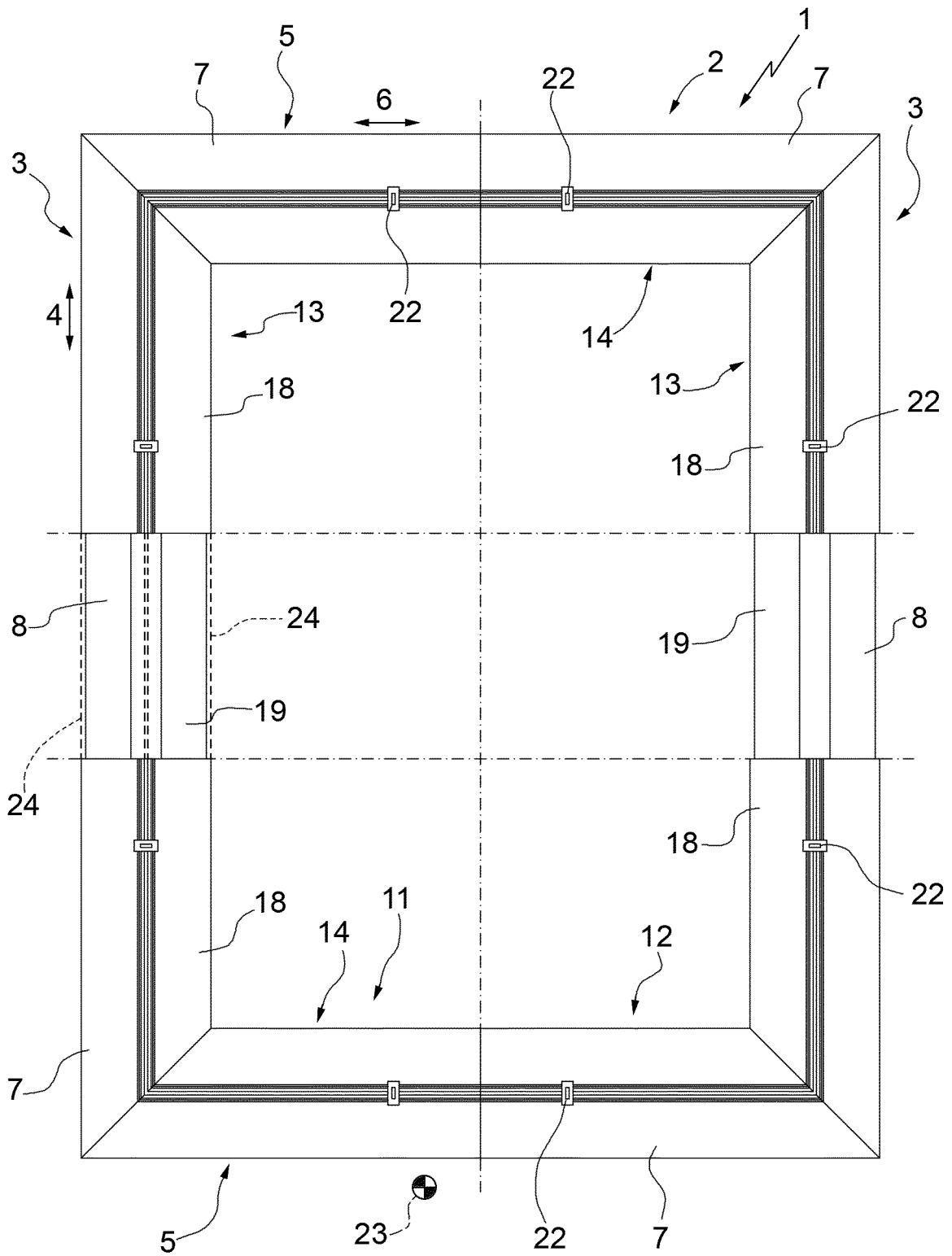


FIG.5

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- DE 3523738 A1 [0005]