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— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

[Continued on next page]

(54) **Title**: COUNTERFRAME FOR DOORS OR WINDOWS, CROSSPIECE ELEMENT AND SPACER ELEMENT FOR COUNTERFRAME

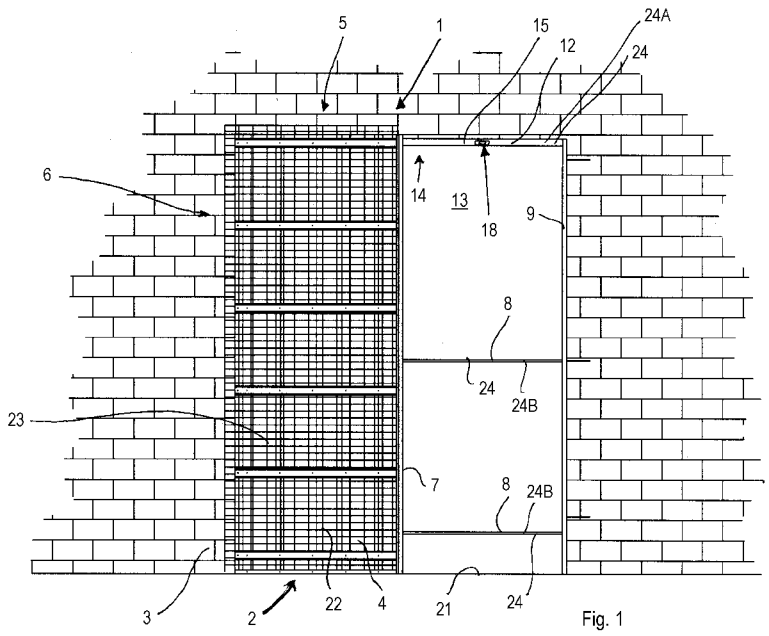

Fig. 1

(57) **Abstract**: A counterframe for a slidable door or window comprises: - a box structure (2) shaped for receiving internally- said sliding door or window and suitable for being embedded in a housing zone of a wall (3), and - acoustic insulating means (23) to acoustically insulate said housing zone, said acoustic insulating means comprising a soundproofing paint (23) applied to said box structure (2). A crosspiece element for counterframe for a slidable door or window, suitable for supporting and slidably guiding said sliding door or window, is provided. The crosspiece element is provided with positioning indicating means (18) incorporated therein to indicate whether said crosspiece element (12) is in a horizontal position. The invention further relates to a spacer element for maintaining in a fixing position a counterframe (1) for a slidable door or window, the spacer element comprising warning means (24) to warn of an inaccessible zone near said spacer element (8).

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Counterframe for doors or windows, crosspiece element and spacer element for counterframe

The invention relates to a counterframe for doors or windows, in particular for sliding doors, a crosspiece element for a counterframe, and a spacer element to fix a counterframe.

A counterframe is known comprising a box structure intended for being embedded inside a wall of a building, and shaped for receiving a sliding door inside the box structure. The box structure defines an internal space in which the sliding door is received. In particular, the box structure comprises a pair of front walls that, at the end of installation of the box structure in the wall or the building, are parallel to the latter. The building wall zone occupied by the box structure, where it is desired that it be soundproofed, requires suitable soundproofing panels to be installed, in such a manner as to insulate acoustically the two adjacent rooms that are separated by the sliding door. Unfortunately, this complicates the operations of installing the box structure and further causes an increase in manufacturing costs as the internal walls normally have a thickness that is reduced to prevent the soundproofing panels being applied.

Further, the known box structure always occupies a thickness that is in itself significant, to which the not inconsiderable thicknesses of the pair of the soundproofing panels must be added. This makes it impossible to apply soundproofing panels in the case of installation of an internal wall of the building because the internal wall has a thickness that is significantly less than that of the perimeter wall of the building. Thus one drawback of the aforementioned counterframe is that it does not enable the zone affected by the box structure to be soundproofed, in particular in the case of installation of very thin walls of the building.

To the box structure a crosspiece element is fixed above, inside which there is a guide that is suitable for slidably supporting and guiding the sliding door during use. The crosspiece element connects the box structure to a vertical upright and thus bounds a gap intended to be opened or closed by the sliding door.

In order to install the counterframe, spacer elements are provided that help to maintain the counterframe in a correct position for all the time required by the cement or other substances in order to obtain definitive and stable fixing of the counterframe to a wall of a building. The spacer walls are made of galvanized sheet iron or another material and are not subject to other painting treatment. Once the counterframe is well anchored to the wall, the spacer elements are removed from the counterframe.

The spacer elements, during fixing of the counterframe, are interposed between a side wall of the box structure and the vertical upright of the counterframe, so as to extend horizontally into the zone that will be occupied by the sliding door, during normal use, i.e. after installation has been completed. It is clear that the opening of the wall in which the sliding door will be received is substantially inaccessible, owing to the spacer elements that prevent passage through the gap of the counterframe. The presence of the spacer elements may represent an obstacle to operators who work on the site, and above all a risk for their safety, in particular in poor lighting conditions as in the case of unexpected power cuts or during the performance of work in twilight. Further, if it is necessary to evacuate the site rapidly, the aforementioned spacer elements and the crosspiece element do not facilitate operators in their search for escape routes, but on the contrary can make this search more difficult.

In order to install the counterframe correctly, it is necessary for the crosspiece element to be arranged in a perfectly horizontal position. In fact, the non

horizontality of the crosspiece element means that the sliding door is not correctly oriented with respect to the ground and a cavity is generated between the lower edge of the door and the ground with a thickness that is greater on one side and less on an opposite side. Further, if the crosspiece element is tilted with respect to the ground, the sliding door is not able to remain in an open position or in a closed position during use but tends to slide by gravity towards the zone at which the crosspiece element is at a lower height. It is thus necessary for an operator in charge of mounting the counterframe to be particularly careful to ensure perfect horizontality of the crosspiece element. In order to do so, it is necessary for the operator to use a portable level instrument that is part of the tools of the operator.

During the operations of fixing the counterframe, the operator moves the crosspiece element by adjusting the position thereof and rests the level instrument thereupon in order to check the horizontality thereof. The operator subjects the crosspiece element to minor movements and sometimes rests the level instrument thereupon to check the position, or moves the crosspiece element, trying to maintain the level instrument resting thereupon. These operations are rather difficult because the operator is forced to use hands both on the crosspiece element and on the level instrument, and they also significantly slow the operations of fixing the crosspiece element. Further, the risk exists that the portable level instrument may be forgotten elsewhere and/or not be available in the place in which counterframe mounting must occur, thus causing difficulties or even a suspension of the operations of mounting and fixing the counterframe.

One object of the invention is to improve known counterframes for sliding doors.

Another object of the invention is to obtain a soundproofed counterframe that is suitable for being installed easily and very rapidly on a wall.

Another object of the invention is to obtain a counterframe for sliding doors that is able to be installed on a wall with a very reduced thickness that at the same time enables effective acoustic insulation of the wall to be obtained.

Another object of the invention is to obtain a counterframe provided with spacer elements and with a crosspiece element that enables safety conditions on the worksite to be improved in which the counterframe is located during installation of the latter.

Another object of the invention is to obtain a counterframe that can be installed with great facility and very rapidly on a wall.

In a first aspect of the invention, a counterframe is provided as defined in claim 1.

In a second aspect of the invention, there is provided a crosspiece element for a counterframe as defined in claim 13.

In a third aspect of the invention, there is provided a spacer element for a counterframe as defined in claim 24.

The invention can be better understood and implemented with reference to the attached drawings, which illustrate some embodiments thereof by way of non-limiting example, in which:

Figure 1 is a front view of a counterframe according to the invention in an installation configuration;

Figure 2 is an exploded view of the counterframe in Figure 1;

Figure 2A is an enlarged detail in Figure 2;

Figure 2B is another enlarged detail in Figure 2;

Figure 3 shows the counterframe in another installation configuration;

Figure 4 is an exploded view of the counterframe in Figure 3;

Figure 4A is an enlarged detail in Figure 4;
Figure 4B is an enlarged detail in Figure 4;
With reference to Figures 1 to 4, a counterframe 1 for a sliding door is shown, comprising a box structure 2 that is suitable for receiving a sliding door internally and is shaped for being built into a wall of a building 3.
The box structure 2, which is more visible in Figures 3 and 4, comprises a pair of mutually parallel front walls 4, which are intended to be positioned parallel to the surfaces of the wall of a building 3. The front walls 4 are mutually spaced apart such as to define an internal cavity inside which the sliding door is received, and are connected together by further walls of lesser width, arranged transversely to the front walls 4. In particular, the box structure 2 comprises an upper wall 5, and a first side wall 6, that at the end of installation are substantially positioned respectively horizontally and vertically.
The first side wall 6 is arranged at one end of the box structure 2 opposite the end through which the sliding door is slidably received inside the box structure 2.
The box structure 2, until the sliding door is fitted on the counterframe 1, also comprises a second side wall 7, opposite and facing the first side wall 6. The second side wall 7 is used in the phases of installing the counterframe 1, as will be disclosed further on. On the second side wall 7, once the counterframe is well fixed to the wall of a building 3, an aperture is subsequently obtained to enable the sliding door to access the inside of the box structure 2.
The box structure 2 can be provided with net elements 22 made of metal or another material (shown in Figures 1 and 2) to which it is possible to apply a layer of plaster. Each net element 22 can be fixed, by suitable mechanical hooking means, to a respective front wall 4.
The counterframe 1 comprises an upright 9, intended to be applied parallel to the second side wall 7 and to a distance

from the box structure 2 in function of the width of the gap 13 affected by the sliding door. The upright 9 can be of wood or another material. On the upright 9 clamps 10 or other fixing elements of another type are provided that enable the upright 9 to be fixed at the wall 3 of the building.

The counterframe comprises a crosspiece element 12 suitable for being positioned in an upper zone of the gap 13. The crosspiece element 12 is connected between the box structure 2 and the upright 9. The crosspiece element 12 can be made of sheet metal or of another material.

The crosspiece element 12 comprises an elongated portion 15, to which a supporting guide 14 is connected that is suitable for supporting and guiding, with suitable bearings, the sliding door once it has been mounted. The supporting guide 14 comprises a part 16 that extends longitudinally outside the elongated portion and a further part that extends longitudinally inside the elongated portion 15.

The part 16 of the supporting guide 14 is shaped to be fixed to the upper wall 5 of the box structure 2 by locking screws 17 with a hexagonal head or fixing elements of another type, for example of the snap-fit type.

The counterframe 1 is painted with an insulating product 23. The insulating product comprises a soundproofing paint 23 that enables the two rooms to be insulated acoustically between which the counterframe 1 is interposed. The insulating product 23 contains internally hollow glass microspheres that make the insulating product 23 acoustically insulating and noise-absorbent. The silicon-based glass microspheres are a few micrometres in diameter and the interior thereof defines microchambers that act as acoustically insulating, noise-absorbent elements. Further, the insulating product 23 that is thus configured also acts as a heat insulator. This is particularly advantageous for the counterframe 1, above all when the latter is configured for housing a window, which is intended to preserve the

internal temperature of the building from the external environment.

Further, once the insulation product 23 is applied it defines a surface having a roughness that is such as to favour the adhesion thereto of the plaster.

The soundproofing paint 23 is already provided on the counterframe 1 before the latter is installed. The soundproofing paint 23 is applied to the counterframe 1 in such a way as to define a very thin layer, about 1mm thick. The counterframe 1 is then ready to be installed already soundproofed.

Owing to the very thin thickness of the soundproofing paint 23, there is no difficulty in installing the counterframe 1 in walls with a very reduced thickness, for example walls that when completed are 105 mm thick or even less. The soundproofing paint 23 may also be less thick by 1 mm or thicker by 1 mm, according to the thickness of the wall in which the counterframe 1 is installed.

The soundproofing paint 23 is blue in colour but can also be of other types of colour. The insulating product, comprising the soundproofing paint 23, as said previously, has the effect of increasing the adhesion of the plaster or of other materials to the zones occupied by the paint. The soundproofing paint 23, provided on the net elements 22, enables a layer of plaster to be applied to the net elements 22. Owing to the net elements 22, which can be geometrically shaped to promote the grip of the plaster, and owing to the action of the soundproofing paint 23, which helps the plaster significantly to grip the net elements 22, strong adherence of the plaster to the counterframe 1 is obtained. Owing to the counterframe 1 that is thus configured it is possible to obtain effective soundproofing also in thin walls of a building, unlike what occurs in the prior art, in which the need to set up the soundproofing panel prevents the plaster being applied directly to the counterframe. On the other hand, if an attempt were made to apply the plaster

to the soundproofing panels used in the prior art, poor results would be obtained owing to the very poor adhesion between soundproofing plaster and panels. This would rapidly cause the undesired detachment of the plaster from the soundproofing panels.

In one embodiment of the counterframe 1 according to the invention, it is possible to configure the box structure 2 suitably in such a manner as to enable the plaster or other covering materials to be applied directly to the front walls 4, without it being necessary to provide net elements 22. The front walls 4 may have, for example, a zigzag section, or other shapes so as to enable a covering material to be placed thereupon. In one installation configuration, shown in Figure 3, the box structure 2 is embedded into a wall of a building 3 without the use of the net elements 22. In this case, wallboard panels 11, for example, can be applied to the front walls 4.

The crosspiece element 12 is provided with positioning indicating means 18 that has the function of indicating the correct or incorrect position of the crosspiece element 12 during assembly. In one embodiment, the positioning indicating means comprises a level element 18 that enables the horizontality of the crosspiece element 12 to be checked.

The level element 18, in the disclosed embodiment, comprises a bubble level, i.e. comprises a receptacle that extends in part along the crosspiece element 12 and contains a liquid, inside which there is an air bubble. The receptacle is transparent to enable the mounting operator to see how the air bubble positions itself. This thus enables the operator to adjust and ease the position of the crosspiece element very rapidly, such that the latter is perfectly horizontal. In this manner, the sliding door, once it has been assembled, is able to operate correctly. The level element 18, in another embodiment, can comprise a water level. In this case, the level is provided with two ampullas that are

communicating and contain water and indicates the correct or incorrect position of the crosspiece element 12 according to whether the height of the water in the two ampullas is the same or not.

In particular, a pair of level elements 18 is provided arranged on opposite sides of the crosspiece element 12. In this manner, the mounting operator can conveniently check the horizontality of the crosspiece element 12 from both rooms separated by the counterframe 1.

Owing to the position indicating means 18 that is incorporated into the crosspiece element 12, the operator can dedicate himself, with his own hands, to handling only the crosspiece element 12 without having to worry about also handling a portable level - include in the set of tools of the mounting operator - to be positioned on the crosspiece element 12 to check the horizontality thereof. Further, in the case of prior-art counterframes that require the portable level to be used, there may be a risk that the latter is forgotten elsewhere and/or is not available in the place in which counterframe assembly may occur, this causing difficulties or even a suspension to the operations of mounting and fixing the counterframe. On the other hand, owing to the positioning indicating means 18, such drawbacks are prevented.

Thus, the positioning indicating means 18 facilitates and accelerates counterframe-installation operations and facilitates the work of a mounting operator.

Owing to the positioning indicating means 18 it is thus possible to dispose of an instrument that is always within view because it is incorporated into the counterframe 1.

For the mounting and fixing of the counterframe 1, spacer elements 8 are provided that during the operations of fixing the counterframe 1 to the wall of a building 3, are used to maintain the counterframe 1 in a correct position. The spacer elements 8 can be made of sheet metal or of another material, such as, for example, wood, plastic, etc. The

spacer elements 8, which are two in number, but which can also be a different number, are supplied with the counterframe 1 to facilitate the mounting and fixing thereof and are configured to be interposed between the second side wall 7 and the upright 9. On the second side wall 7 and on the upright 9 there are obtained certain coupling openings 19(that are visible in Figures 2 and 4) that are shaped for coupling with coupling protrusions 20 that are provided at the ends of the spacer elements 8.

The spacer elements 8 are maintained interposed between the upright 9 and the box structure 2 for the time necessary for the latter to be fixed definitively to the wall of the building, for example the necessary time requested by cement and/or glue and/or other substances used to fix the counterframe 1.

On worksites, or in buildings under construction, the greatest attention must be paid to safety standards and it is necessary to indicate appropriately the zones that are accessible and the zones that are not accessible and present dangers.

For this purpose, the crosspiece element 12 and the spacer elements 8 are painted with a warning paint 24. The warning paint 24 is already on the crosspiece element 12 and on the spacer elements 8 before the counterframe 1 is installed.

The warning paint comprises a fluorescent warning paint 24. In one embodiment, the crosspiece element 12 is painted with a green warning paint 24A and the spacer elements 8 are painted with a red warning paint 24B. Owing to the spacer elements 8 that are thus painted an operator, and/or the person on the work site or in the building being built, perceives, even in poor lighting, the presence of the spacer elements 8 and from the red colour concludes that it is forbidden and/or dangerous to go beyond the spacer elements 8.

In one embodiment, the spacer elements 8 are made of coloured plastics or another coloured material that does not

therefore need to be painted. Similarly, also the crosspiece element 12 can be made of coloured plastics or another coloured material, devoid of painting.

The spacer elements 8 according to the invention are thus highly visible, unlike prior-art spacer elements that, being made of non-coloured or non-painted material are not very visible, especially in poor lighting conditions. In the absence of the spacer elements 8, thus when the counterframe is now well fixed to the wall 3 of the building, the crosspiece element 12 painted in green indicates to an operator the possibility of passing through the gap defined between the box structure 2 and the upright 9.

When a counterframe is mounted on a worksite, the building is still in a step in which the building is in a so-called 'raw' state; in the event of a sudden power cut or during work performed in twilight, thus in poor lighting conditions, the green and red signals help workers and other operators to identify the passage zones and the inaccessible zones. In particular, in the case of a counterframe for a sliding door, the green warning paint 24A provided on the crosspiece element 12 indicates an 'escape route' via the gap defined between crosspiece element 12 and the floor 21, in the absence of the spacer elements 8. The red warning paint 24B provided on the spacer elements 8 indicates the presence of an obstacle and thus indicates the need to pay attention and/or prevents the passage. The crosspiece element 12 and the spacer elements 8 that are thus configured thus enable the safety conditions of operators on the work site to be improved significantly. Obviously, it is possible to provide the warning paint, of a suitable colour, also other zones of the counterframe 1 like the box structure 2 and/or the vertical upright 9, to show the accessible zones and the non-accessible zones better. The upright 9, in one embodiment, can be made of coloured plastics or another coloured material, which does not therefore need to be painted but

equally performs the function of signalling similarly to the warning paint 24.

Variations on and/or additions to what has been disclosed and illustrated in the attached drawings are possible. In particular, it is possible to configure the counterframe 1 so as to house a double sliding door, i.e. a door with two wings. In this case, two box structures are provided that are similar to those disclosed and arranged on opposite sides to one another, each box structure being suitable for receiving one wing of the double door. The two wings are in this manner slidable towards and away from one another. Alternatively, it is possible to configure the counterframe 1 so as to enable the counterframe 1 to house two single doors of convergent type. In this case, a single box structure is provided with a width such as to enable two distinct slidable doors to be received in the interior thereof and on opposite sides, each door being associated with a set environment. In other words, the counterframe 1 comprises a box structure that is twice the size of the embodiment shown in the drawings, which is interposed between two uprights associated with the two distinct rooms. In the box structure two cavities are defined, each of which receives a respective door. The two cavities are aligned on one another and the two doors slide substantially along the same plane and in opposite zones to a median zone of the box structure. It is also possible to provide a further embodiment that is similar to the latter that has just been disclosed but differs inasmuch as the box structure has a smaller width but a greater thickness. In other words, the two cavities that receive the two respective doors are superimposed on one another, such that the two doors can slide along two respective planes that are parallel to one another and spaced apart from one another.

It is also possible to provide further embodiments of the counterframe 1 disclosed above, In particular, it is possible to configure the counterframe 1 so as to make the

counterframe 1 suitable for a slidable window rather than a sliding door.

CLAIMS

1. Counterframe for a slidable door or window, comprising:
   - a box structure (2) shaped for receiving internal said sliding door or window and suitable for being embedded in a housing zone of a wall (3), and
   - acoustic insulating means (23) to acoustically insulate said housing zone,

   characterised in that said acoustic insulating means comprises a soundproofing paint (23) applied to said box structure (2).
2. Counterframe according to claim 1 wherein said soundproofing paint (23) is also thermally insulating.
3. Counterframe according to claim 1 or 2, wherein said soundproofing paint (23) comprises internally hollow glass microspheres.
4. Counterframe according to any one of claims 1 to 3, wherein said soundproofing paint (23) is applied so as to define a layer having a thickness of about 1 mm.
5. Counterframe according to any one of claims 1 to 4, wherein said soundproofing paint (23) is able to increase the adhesion of the plaster to the zones to which said soundproofing paint (23) is applied.
6. Counterframe according to any one of claims 1 to 5, wherein said box structure comprises a pair of front walls (4) that are mutually parallel and painted with said soundproofing paint (23).
7. Counterframe according to claim 6, wherein said front walls (4) are shaped geometrically in such a manner that wallboard panels (11) can be applied thereto.
8. Counterframe according to claim 6, wherein said front walls (4) are shaped geometrically in such a manner that a plaster can be applied directly to the front walls (4).
9. Counterframe according to any one of claims 1 to 6, wherein said box structure (2) comprises net elements

(22) to which it is possible to apply a layer of plaster.

10. Counterframe according to claim 9 as appended to claim 6, wherein each net element (22) is fixed to a respective front wall (4) by mechanical hooking means.

11. Counterframe according to claim 9 or 10, wherein said net elements (22) are painted with said soundproofing paint (23) and are geometrically shaped in such a manner as to promote the grip of the plaster.

12. Counterframe according to any one of claims 1 to 11, wherein said soundproofing paint (23) is blue in colour.

13. Crosspiece element for counterframe for a slidable door or window, suitable for supporting and slidably guiding said sliding door or window, characterised in that comprises positioning indicating means (18) incorporated into said crosspiece element (12) to indicate whether said crosspiece element (12) is in a horizontal position.

14. Crosspiece element according to claim 13, wherein said positioning indicating means (18) comprises level means (18).

15. Crosspiece element according to claim 14, wherein said level means comprises two level elements (18) arranged on two respective sides opposite said crosspiece element (12).

16. Crosspiece element according to claim 15, wherein each said level element comprises a bubble level (18).

17. Crosspiece element according to claim 16, wherein said bubble level (18) comprises a receptacle extending in part along said crosspiece element (12) and containing a liquid inside which there is an air bubble.

18. Crosspiece element according to claim 17, wherein said receptacle is transparent to enable the position of said air bubble to be viewed.

19. Crosspiece element according to claim 15, wherein each said level elements comprises a water level (18).
20. Crosspiece element according to claim 19, wherein said water level (18) comprises two ampullas that are communicating and containing water, the horizontality of said crosspiece element (12) being indicated by whether the heights of the water in the two ampullas are the same or different.
21. Crosspiece element according to any one of claims 13 to 20, and further comprising a supporting guide (14) that is suitable for slidably supporting said sliding door or window.
22. Counterframe for a slidable door or window, comprising:
    - a box structure (2) shaped for receiving internally said sliding door or window and suitable for being embedded in a housing zone of a wall (3),
    - a crosspiece element (12) according to any one of claims 13 to 21, connected to said box structure (2) and housing a supporting guide (14) for said sliding door.
23. Counterframe according to claim 22, wherein said crosspiece element (12) is connectable by locking screws (17) to said box structure (2) and to an upright (9) included in said counterframe (1) and suitable for receiving in an abutting manner said sliding door or window.
24. Spacer element for maintaining in a fixing position a counterframe (1) for a slidable door or window, characterised in that comprises warning means (24) to warn of an inaccessible zone near said spacer element (8).
25. Spacer element according to claim 24, wherein said warning means comprises a warning paint (24).
26. Spacer element according to claim 25, wherein said warning paint is a fluorescent warning paint (24B), particular red in colour.

27. Spacer element according to claim 24, wherein said warning means comprises coloured plastics or another coloured material of which said spacer element (8) is made.

28. Spacer element according to claim 27, wherein said coloured plastics or said another coloured material is fluorescent, particular red in colour.

29. Crosspiece element for counterframe for a slidable door or window, suitable for supporting and slidably guiding said sliding door or window, characterised in that comprises warning means (24) to warn that a zone is accessible near said crosspiece element (12).

30. Crosspiece element according to claim 29, wherein said warning means comprises a warning paint (24).

31. Crosspiece element according to claim 30, wherein said warning paint is a fluorescent warning paint (24A), in particular green in colour.

32. Crosspiece element according to claim 29, wherein said warning means comprises coloured plastics or another coloured material wherein said crosspiece element (12) is made.

33. Crosspiece element according to claim 32, wherein said coloured plastics or said another coloured material is fluorescent, in particular green in colour.

34. Counterframe for a slidable door or window, comprising:
- a box structure (2) shaped for receiving internally said sliding door or window and suitable for being embedded in a housing zone of a wall (3),
- at least one spacer element (8) according to any one of claims 24 to 28,
- a crosspiece element (12) according to any one of claims 29 to 33, connected to said box structure (2) and housing a supporting guide (14) for said sliding door or window .

35. Counterframe according to claim 34, and further comprising an upright (9) for receiving in an abutting

manner said sliding door or window, said spacer element (8) being interposable between said box structure (2) and said upright (9) to fix said counterframe (1).

36. Counterframe according to any one of claims 1 to 12, and/or according to claim 22 or 23, and/or according to claim 34 or 35.

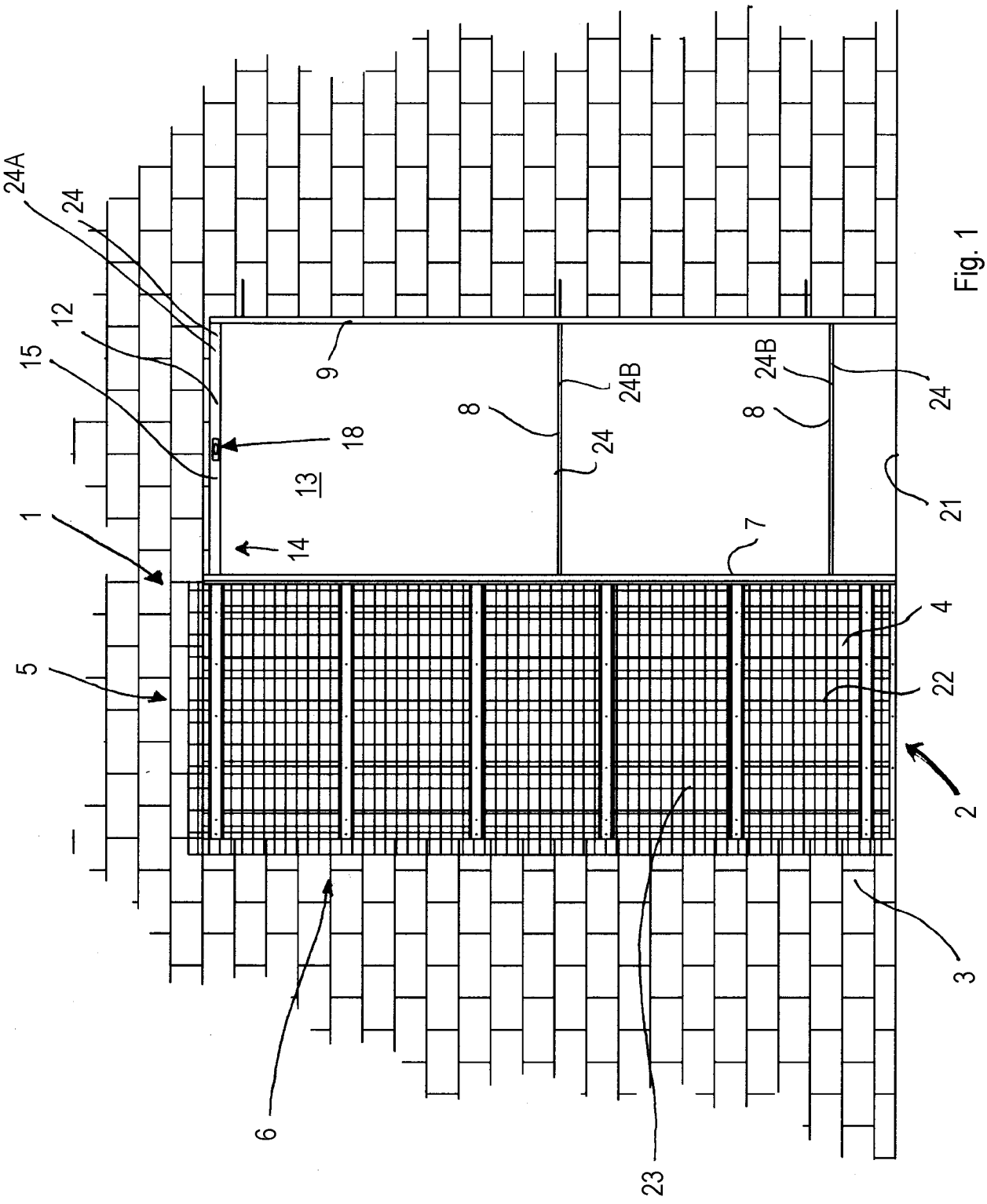

Fig. 1

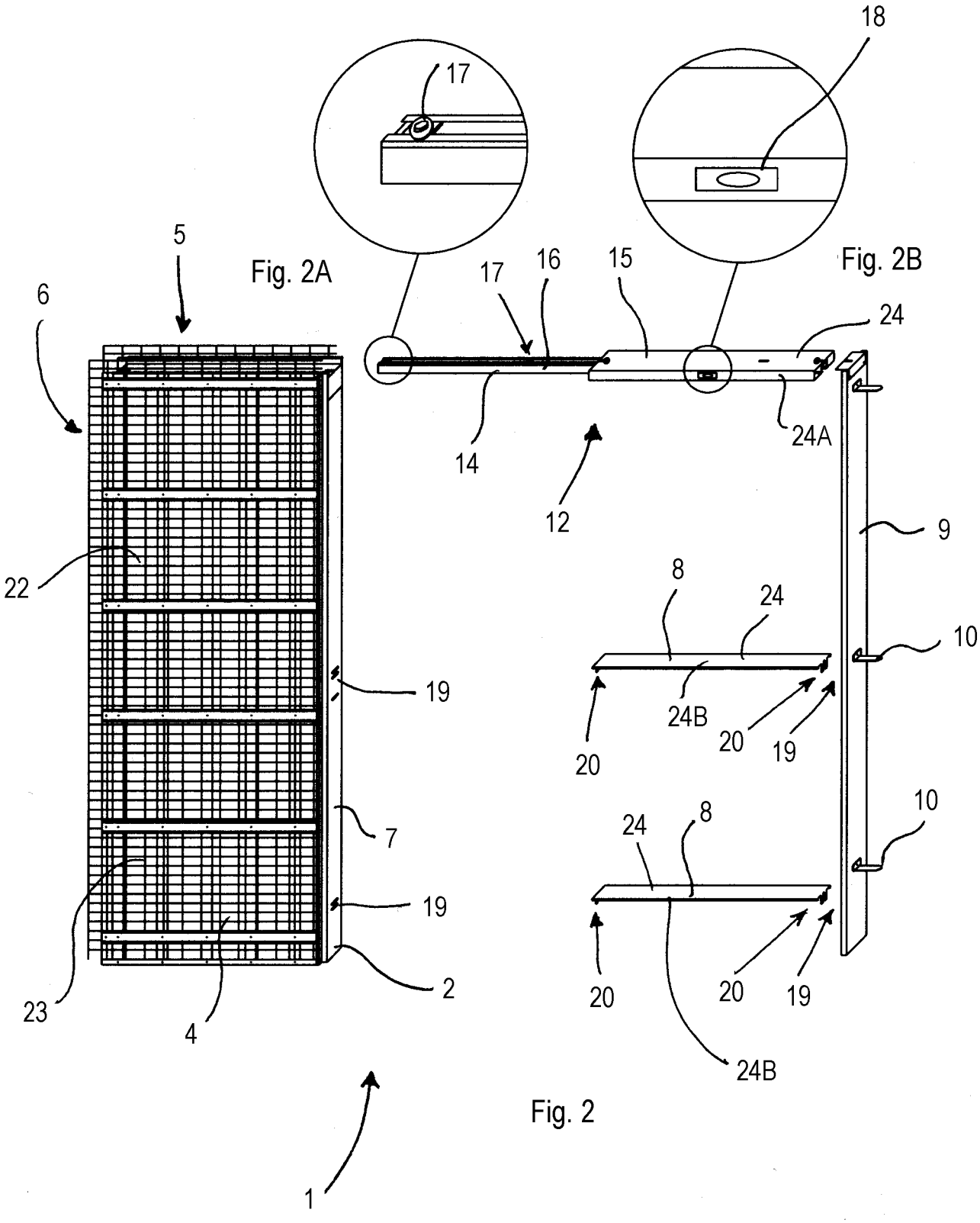
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Fig. 2A
Fig. 2B
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Fig. 2

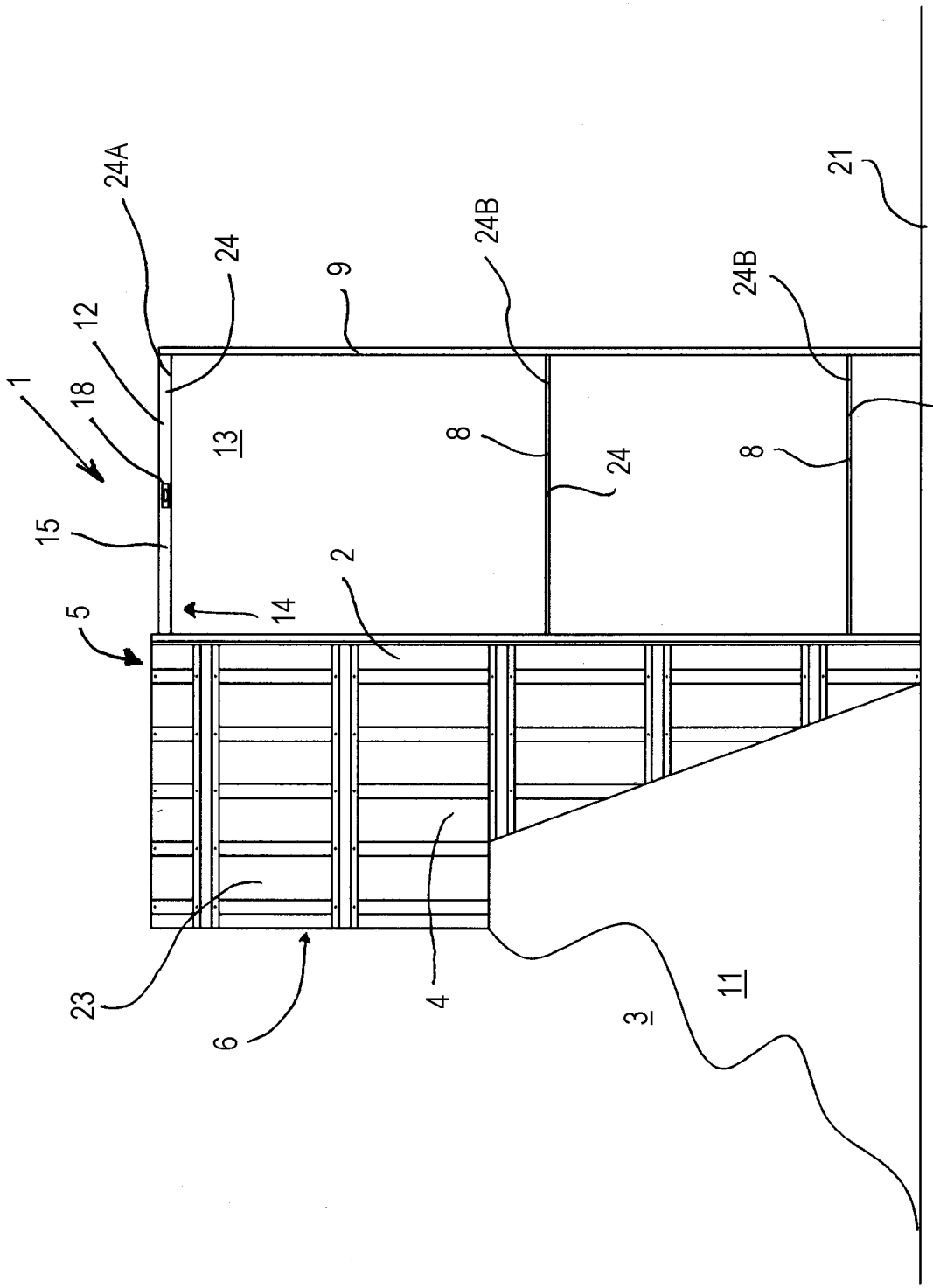

Fig. 3

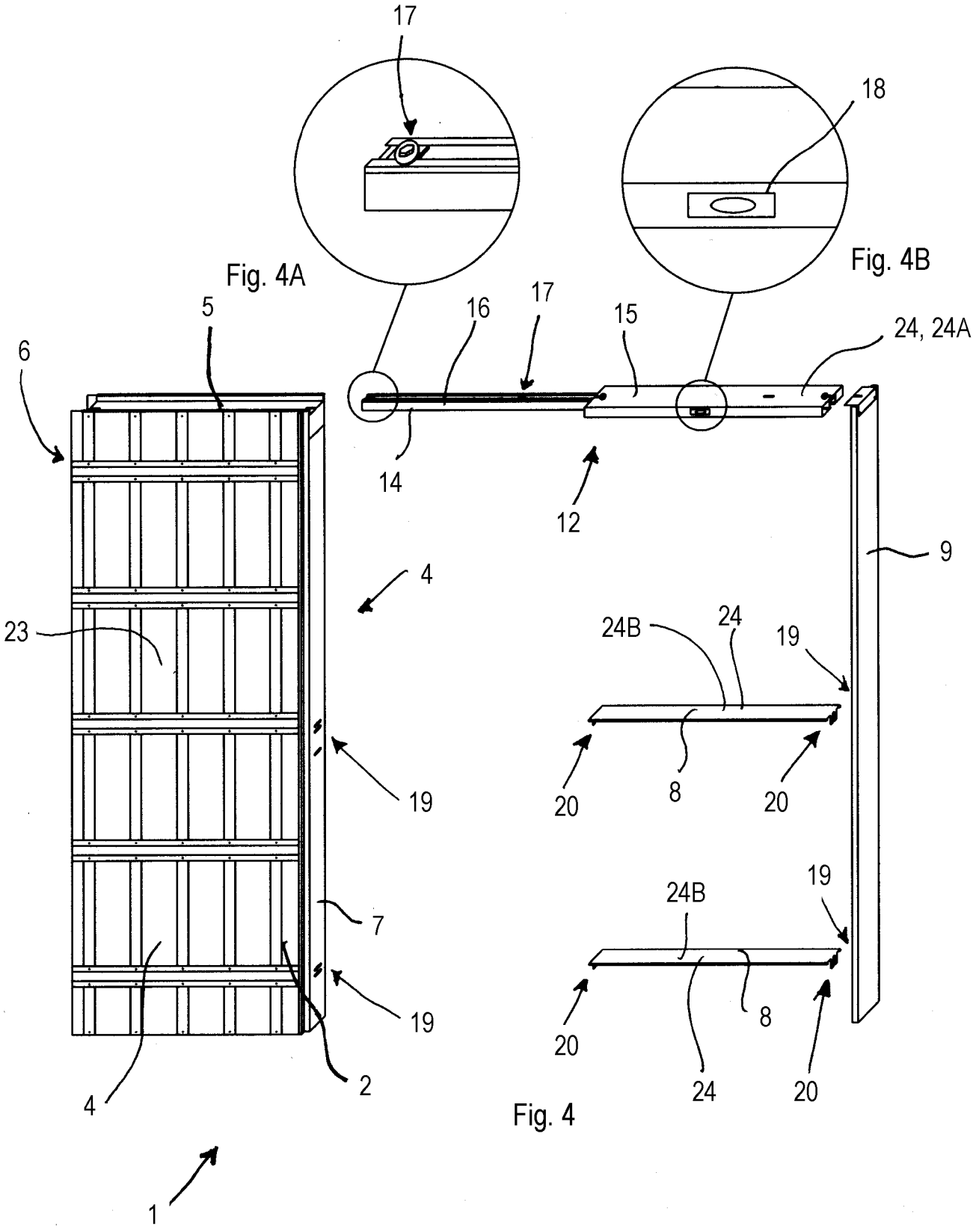
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Fig. 4A
Fig. 4B
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Fig. 4