

(19)



(11)

EP 3 725 993 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:

02.04.2025 Bulletin 2025/14

(51) International Patent Classification (IPC):

E06B 5/16 (2006.01) **E04B 2/88** (2006.01)
E06B 3/56 (2006.01) **E04B 2/74** (2006.01)
E06B 3/66 (2006.01) **E06B 3/54** (2006.01)

(21) Application number: **19169424.9**

(52) Cooperative Patent Classification (CPC):

(22) Date of filing: **16.04.2019**

E06B 5/16; E04B 2/7455; E06B 3/56; E04B 2/7411; E06B 3/5427; E06B 3/66

(54) **FIRE PROTECTION GLAZING**

BRANDSCHUTZVERGLASUNG

VITRAGE DE PROTECTION CONTRE L'INCENDIE

(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

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(43) Date of publication of application:
21.10.2020 Bulletin 2020/43

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Description

Field of the invention

[0001] The present invention relates to a fire protection glazing for preventing the passage of fire and smoke from one room to another room in the event of fire, having at least two, vertically, adjacent and coplanar arranged fire protection panes, which are held at their vertical edges by means of two profile elements, at least one profile element is arranged at each of the vertical edges of the fire protection panes, a joint opening being defined between the adjacent horizontal edges of the fire protection panes.

[0002] The present invention further relates to a method for establishing such a fire protection glazing.

Background of the invention

[0003] Fire protection glazings are translucent components that prevent the spread of fire and smoke from one room to another, and also prevents the impermissible transition of heat between rooms, within the scope of a certain fire resistance duration. According to the DIN EN 13501 standard, especially the fire resistance classes EI and EW are normalized and explained with regard to the requirements, especially for fire classification of construction products and building elements.

[0004] Fire protection panes used for fire protection glazing are normally constructed in multiple layers of glass panes with a fire protection layer arranged in between. In case of fire, a protective material contained in this fire protection layer is activated, whereby the fire protection pane absorbs heat radiation and forms a highly effective insulation layer. As a result the originally transparent glazing creates a practically opaque fire protection wall.

[0005] The fire protection panes used for fire protection glazing are normally fixed by a support construction, especially in frames, which are matched in size and their fire protection properties to the fire protection panes used. The frames normally comprise vertically and/or horizontally arranged profile elements which hold respectively carry the fire protection panes and realize load transfer. Since fire protection panes used for fire protection glazings can have a very high weight (especially depending on the requirements according to DIN EN 13501), secure fastening respectively fixing of fire protection panes to support construction is necessary, and correspondingly effortful and expensive. Moreover, the so far known support constructions used for such fire protection glazings can affect the optical appearance and limit the light transmission of these glazings. Seen the high weight of the panes, small studs transferring the load are placed between two vertically adjacent panes to transfer the weight of an upper pane to the lower pane or to panes located lower than these panes. The joint opening between horizontal edges of adjacent panes are closed by a sealant, while leaving the studs in place.

[0006] Furthermore, establishing of such fire protection glazings is cumbersome and expensive, especially with regard to the very high weight of fire protection panes, especially since the so far known support constructions comprise various types of fixing elements respectively fastening elements, which can have difficult handling. The same applies for repair respectively replacement of fire protection panes of such fire protection glazings.

[0007] US4500572A and BE1012820A3 disclose glazings having a plurality of panes being vertically, adjacent and coplanar arranged.

Summary of the invention

[0008] Against this background it is object of the present invention to provide a fire protection glazing for preventing the passage of fire and smoke from one room to another room in the event of fire, which is improved with regard to the mentioned disadvantages and can especially be manufactured respectively established easily and cost-effectively and furthermore especially allows an easy and cost-effective repair respectively replacement of fire protection panes.

[0009] According to the first aspect of the invention, a fire protection glazing according to claim 1 is provided.

[0010] According to the present invention, the joint opening between two fire protection panes is closed by sealant only, all along the adjacent horizontal edges of the fire protection panes.

[0011] According to the present invention, the at least two, vertically, adjacent and coplanar arranged fire protection panes are held at and all along their vertical edges by means of at least two profile elements.

[0012] In some embodiments of the present invention, the joint opening between two fire protection panes is closed by a silicon paste only.

[0013] The invention is based on the knowledge made through experiments that adhering of fire protection panes to profile elements by means of glue, advantageously by means of glue only, allows respectively enables an easy and cost-effective establishment of fire protection glazing and furthermore an easily and cost-effectively replacement of fire protection panes of the fire protection glazing, whereby the fire protection glazing advantageously fulfils fire protection requirements, especially the requirements according to DIN EN 13501, preferred the fire resistance classes EI or EW.

[0014] According to the present invention fire protection panes are adhered only to profile elements which extend vertically between the floor and the ceiling of the rooms. According to the present invention the fire protection glazing only comprises profile elements which extend vertically between the floor and the ceiling of the rooms. With elimination respectively, omission of profile elements which especially extend horizontally especially substantially parallel to the floor or the ceiling of the rooms especially the optical appearance and the light

transmission of such inventive fire protection glazing is improved further.

[0015] In some embodiments of the present invention, the glue strip may have a width of more than 10mm, such as more than or equal to 12mm or more than or equal to 15mm or even more than or equal to 20mm. In some embodiments of the present invention the glue strip may have width of less than or equal to 50mm, such as less than or equal to 45mm or even less than or equal to 40mm.

[0016] In some embodiments of the present invention, the glue strip may have a thickness of more than or equal to 0.8mm, such as more than or equal to 1.5mm. In some embodiments of the present invention the glue strip may have a thickness of less than or equal to 4mm, such as less than or equal to 3mm. Too thick glue strips may fail under shear stress causing the fire protection panes to loosen from the profile elements when the joint opening is closed by a sealant only.

[0017] According to the present invention, at least one glue strip is present along the length of the interface between the surface of the fire protection pane and the profile element. In some embodiments of the present invention the glue strip being continuous along the length of the interface between the surface of the fire protection pane and the profile element. However, the glue strip may be interrupted along the length of the interface between the surface of the fire protection pane and the profile element. In the latter case, two glue strips may partially overlap along the length of the interface between the surface of the fire protection pane and the profile element.

[0018] In some embodiments of the present invention, the glue advantageously may be a silicon glue.

[0019] In some embodiments of the present invention, the joint between two fire protection panes is provided by a silicon paste only. This may result in an improved optical appearance and the light transmission of such inventive fire protection glazing may be further improved.

[0020] In some embodiments of the present invention, the joint opening, or space or gap, between two fire protection panes may be more than or equal to 1mm, or even more than or equal to 2mm, such as more than or equal to 3mm. In some embodiments of the present invention, the joint opening, or space or gap, between two fire protection panes may be less than or equal to 10mm, e.g. less than or equal to 7mm, such as less than or equal to 6mm, e.g. less than or equal to 5mm.

[0021] In some embodiments of the present invention, the profile element may have a cross section which is substantially rectangular, substantially rectangular hollow, substantially U-shaped, substantially H-shaped or substantially L-shaped.

[0022] In some embodiments of the present invention, the profile element may be made of wood, steel, aluminium or concrete. This allows to design the optical appearance of an inventive fire protection glazing with numerous options.

[0023] According to the present invention, each fire

protection pane is a compound structure of at least two glass panes arranged in parallel to each other, between which in each case at least one fire protection layer is arranged.

5 **[0024]** The fire protection pane may be build according to the so-called water-glass-technology or according to the so-called gel-technology. In the case of a fire protection pane according to the water-glass technology, as a fire protection layer between a multiplicity, at least two
10 glass panes are used materials, which in particular comprises an alkali silicate mass, which acts as a foaming agent in the event of fire and lathers up. In the case of a fire protection pane according to the gel-technology, the fire protection layer arranged between two glass panes,
15 which is activated in the event of fire, is formed of gelatinous materials, in particular of organic polymers. As a result, in both cases the originally transparent glazing creates a practically opaque fire protection wall in case of fire.

20 **[0025]** The at least two glass panes of the fire protection pane may be spaced apart from each other by means of a spacer providing an edge-compound, which spacer preferably is arranged between the at least two glass panes of the fire protection pane and particularly preferred extends along the side edges of the fire protection
25 pane.

[0026] In some embodiments of the present invention, the fire protection pane may have a height in a range of more than or equal to 1 meter, such as more than or equal
30 to 1.5m. In some embodiments of the present invention, the fire protection pane may have a width in a range of more than 2 meter, such as more than or equal to 3 meter, even more than or equal to 4m.

[0027] A further embodiment of the present invention is characterized in that the fire protection pane has a weight
35 in a range of $\geq 25 \text{ kg/m}^2$ and $\leq 180 \text{ kg/m}^2$.

[0028] According to a second aspect of the invention, a method for establishing a fire protection glazing according to the first aspect of the invention is provided. The method for establishing a fire protection glazing for preventing the passage of fire and smoke from one room to another room in the event of fire, comprises the steps of

- providing at least two profile elements (3) in substantial vertical direction,
- providing at least two fire protection panes (2),
- adhering in substantially vertical direction a first of the at least two fire protection panes (2) to the two profile elements (3) by providing a glue strip (6a) of a width of more than or equal to 10mm along the length of the interface (4) between the surface (5) of the fire protection pane (2) and the profile elements (3),
- adhering in substantially vertical direction and coplanar with the first of the at least two fire protection panes (2) a second of the at least two fire protection panes (2) to the two profile elements (3) by providing a glue strip (6a) of a width of more than or equal to
50 10mm along the length of the interface (4) between

the surface (5) of the fire protection pane (2) and the profile elements (3), thereby providing a joint opening (7) between the adjacent horizontal edges of the two fire protection panes (2),

- closing the joint opening (7) by a sealant (8), preferably closing the joint opening (7) by a sealant (8) only.

[0029] According to preferred embodiments, the method may comprise, the steps of

- prior to the step of adhering the second of the at least two fire protection panes to the at least two profiles, providing load transferring setting blocks at the horizontal edge of the first of the at least two fire protection panes and mounting the second of the at least two fire protection panes in contact with these setting blocks,
- after the step of adhering the second of the at least two fire protection panes (2) to the two profile elements (3) but prior to the step of closing the joint opening, removing the load transferring setting blocks from within the joint opening.

[0030] The methods according to the second aspect of the invention may be used to provide a fire protection glazing according to the first aspect of the invention. All preferred features described in relation to the fire protection glazing according to the first aspect of the invention can be used in methods according to the second aspect of the invention.

[0031] The fire protection glazings according to the invention have the advantage that the load transferring setting blocks are not necessarily to be present, hence a load transfer setting block free fire protection glazing can be provided. In case one of the fire protection panes fails, e.g. is broken once installed, this defect pane of the fire protection glazing can be removed from the glazing by cutting it out of the glazing. The sealant along the edge of the remaining panes in the glazing can be removed and a new pane can easily be installed without the need to dismantle all elements and panes of the fire protection glazing.

Brief description of the drawings

[0032] Further details, characteristics and advantages of the present invention are explained in the following in more detail based on the description of the exemplary embodiments shown in the figures of the drawing. In these figures:

- Fig. 1 shows a front view of a schematic embodiment of a fire protection glazing according to the present invention;
- Fig. 2 shows a sectional view according to section line II - II of Fig. 1;
- Fig. 3a shows a schematic embodiment of a step of a

Fig. 3b

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Fig. 3c

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Fig. 3d

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Fig. 4

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Fig. 5

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method for establishing a fire protection glazing according to the present invention;

shows a schematic embodiment of a further step of a method for establishing a fire protection glazing according to the present invention;

shows a schematic embodiment of a further step of a method for establishing a fire protection glazing according to the present invention;

shows a schematic embodiment of a further step of a method for establishing a fire protection glazing according to the present invention;

shows a front view of a further schematic embodiment of a fire protection glazing according to the present invention; and

shows a sectional view according to section line V - V of Fig. 4.

[0033] Fig. 1 and Fig. 2 show a schematic embodiment of a fire protection glazing 1 for preventing the passage of fire and smoke from one room to another room in the event of fire. In the present embodiment two, vertically, adjacent and coplanar arranged fire protection panes 2 are held at each of their vertical edges by means of two profile elements 3.

[0034] Each of the profile elements 3 is arranged at each of the vertical edges of the fire protection panes 2. The profile elements 3 extend vertically between the floor F and the ceiling C of the rooms. Each of the profile elements 3 has a cross section which is substantially rectangular hollow. Between the adjacent horizontal edges of the fire protection panes 2 a joint opening 7a is defined. The profile elements 3 are made of wood, steel, aluminium and/or concrete.

[0035] At each interface 4 between the surface 5 of a fire protection pane 2 and a profile element 3 the fire protection pane 2 is adhered to the profile element 3 - in the present embodiment to at least one of the two substantially rectangular hollow profile elements 3, preferably to both of the substantially rectangular hollow profile elements 3 - by means of glue 6. The glue 6 being present all the length of the interface 4 between the surface 5 of the fire protection pane 2 and the profile element 3 such that it provides a glue strip 6a.

[0036] The glue strip 6a has a width W of more than or equal to 10mm and a thickness D of less than 4mm, along the length of the interface 4 between the surface 5 of the fire protection pane 2 and the profile element 3.

[0037] The joint opening 7a between the two fire protection panes 2 is closed by sealant 8 only, along the adjacent horizontal edges of the fire protection panes 2. The glue strip 6a being continuous along the length of the interface 4 between the surface 5 of the fire protection pane 2 and the profile element 3.

[0038] The glue 6 is a silicon glue with an adhesive force sufficient to keep the fire protective pane to the

profile. Suitable glue is Promat-SYSTEMGLASS-silicone.

[0039] The joint opening 7a between the two fire protection panes 2 is closed by a sealant 8 only, which is present along the adjacent horizontal edges of the fire protection panes 2. The sealant 8 is a silicon paste. Thus, the joint 7a between the two fire protection panes 2 is provided by a silicon paste 8 only. The joint opening 7 between the two fire protection panes 2 has a space/gap T which is in the range of 2 to 7 mm.

[0040] Each fire protection pane 2 is a compound structure of at least two glass panes 9 arranged in parallel to each other, between which in each case at least one fire protection layer 10 is arranged. In the present embodiment a fire protection pane 2 comprises two glass panes 9 which are spaced apart from each other by means of a spacer 11 providing an edge-compound. The spacer 11 is arranged between the two glass panes 9 and extends along the side edges of the fire protection pane 2. The edges of the fire protection pane are sealed with a sealing 12.

[0041] As an example, two glass panes of 3 meter by 1.4 meter, and having a surface weight of ca. 70 kg/m², were glued to a rectangular hollow section profiled element using Promat-SYSTEMGLASS-silicone applied as glue strips all along the interface between the vertically oriented profiles. The glue strips had a width of about 10 mm and a thickness of about 1.2mm. The joint opening between the two fire protection panes is closed by Promat-SYSTEMGLASS-silicone, which is present along the adjacent horizontal edges of the fire protection panes. The joint opening between the two fire protection panes has a space/gap T which is about 4 mm.

[0042] Fig. 3a to Fig. 3d show a schematic embodiment of a steps of a method for establishing a fire protection glazing 1 for preventing the passage of fire and smoke from one room to another room in the event of fire.

[0043] Fig. 3a shows providing at least two profile elements 3 in substantial vertical direction. This comprises especially the steps of

- a) placing and mounting a first profile element 3 which extends vertically especially between the floor F and the ceiling C of the rooms; and
- b) placing and mounting a second profile element 3 which is horizontally spaced apart the first profile element 3 at a distance S and extends vertically especially between the floor F and the ceiling C of the rooms.

[0044] Fig. 3b shows adhering in substantially vertical direction a first of at least two provided fire protection panes 2 to the two profile elements 3 by providing a glue strip 6a along the length of the interface 4 between the surface 5 of the fire protection pane 2 and the profile elements 3. The glue strip 6a has a width W of more than or equal to 10mm and a thickness D of less than 4mm. This comprises especially the steps of

c) applying silicon glue 6 to the profile elements 3 and/or to the vertical edges of at least one surface 5 of the first fire protection pane 2; and

d) adhering the first fire protection pane 2 to the profile elements 3 by means of the silicon glue 6, preferably such that at each interface 4 between the surface 5 of the fire protection pane 2 and a profile element 3 the fire protection pane 2 is adhered to the profile element 3 by means of the glue 6, whereby the glue 6 being present all the length of the interface 4 between the surface 5 of the fire protection pane 2 and the profile element 3.

[0045] Fig. 3c shows adhering in substantially vertical direction and coplanar with the first of the at least two fire protection panes 2 a second of the at least two fire protection panes 2 to the two profile elements 3 by providing a glue strip 6a along the length of the interface 4 between the surface 5 of the fire protection pane 2 and the profile elements 3, thereby providing a joint opening 7 between the adjacent horizontal edges of the two fire protection panes 2. The glue strip 6a has a width W of more than or equal to 10mm and a thickness D of less than 4mm. This may comprise the steps of

e) providing a number (e.g. 2) load transferring setting blocks 20 or spacer elements at the horizontal edge of the first fire protective pane.

f) applying glue 6 to the profile elements 3 and/or to the vertical edges of at least one surface 5 of a further fire protection pane 2; and

g) adhering the further fire protection pane 2 to the profile elements 3 by means of glue 6, presently above the first fire protection pane 2, preferably adhering such that at each interface 4 between the surface 5 of the fire protection pane 2 and a profile element 3 the fire protection pane 2 is adhered to the profile element 3 by means of the glue 6, whereby the glue 6 being present all the length of the interface 4 between the surface 5 of the fire protection pane 2 and the profile element 3.

[0046] Fig. 3d shows closing the joint opening 7 by a sealant 8, preferably closing the joint opening 7 by a sealant 8 only. This comprises especially the steps of

h) remove the load transferring setting blocks, usually after a sufficient time lapse to cure the glue 6a, e.g. 24h.

i) applying a sealant 8, preferably a silicon paste 8 to the joint opening 7 only, thereby closing the joint opening in full.

[0047] Fig. 4 and Fig. 5 show a schematic embodiment of a further fire protection glazing 1 for preventing the passage of fire and smoke from one room to another room in the event of fire. In the present embodiment a plurality of vertically, adjacent and coplanar arranged fire

protection panes 2 are each held at their vertical edges by means of two profile elements 3 respectively 3a.

[0048] Each of the profile elements 3 respectively 3a is arranged at each of the vertical edges of the fire protection panes 2. The profile elements 3 respectively 3a extend vertically between the floor F and the ceiling C of the rooms. Each of the profile elements 3 has a cross section which is substantially rectangular hollow. Each of the profile elements 3a has a cross section which is substantially H-shaped. Between the adjacent horizontal edges of the fire protection panes 2 a joint opening 7 is defined. The profile elements 3 respectively 3a are made of wood, steel, aluminium and/or concrete.

[0049] At each interface 4 between the surface 5 of a fire protection pane 2 and a profile element 3 respectively 3a the fire protection pane 2 is adhered to the profile element 3 respectively 3a - in the present embodiment to at least one of the two substantially rectangular hollow profile elements 3, preferably to both rectangular hollow profile elements 3 and respectively to at least one of the four free legs of the substantially H-shaped profile elements 3a - by means of glue 6. The glue 6 being present all the length of the interface 4 between the surface 5 of the fire protection pane 2 and the profile element 3 respectively 3a such that it provides a glue strip 6a.

[0050] The glue strip 6a has a width W of more than or equal to 10mm and a thickness D of less than 4mm along the length of the interface 4 between the surface 5 of the fire protection pane 2 and the profile element 3 respectively 3a. The joint opening 7 between two fire protection panes 2 is closed by sealant 8 only, along the adjacent horizontal edges of the fire protection panes 2. The glue strip 6a being continuous along the length of the interface 4 between the surface 5 of a fire protection pane 2 and the profile element 3 respectively 3a.

[0051] The glue 6 is a silicon glue.

[0052] The joint opening 7 between two fire protection panes 2 is closed by a sealant 8 only, which is present along the adjacent horizontal edges of the fire protection panes 2. The sealant 8 is a silicon paste. Thus the joint 7a between two fire protection panes 2 is provided by a silicon paste 8 only.

[0053] Each fire protection pane 2 is a compound structure of at least two glass panes 9 arranged in parallel to each other, between which in each case at least one fire protection layer 10 is arranged. In the present embodiment a fire protection pane 2 comprises two glass panes 9 which are spaced apart from each other by means of a spacer 11 providing an edge-compound. The spacer 11 is arranged between the two glass panes 9 and extends along the side edges of the fire protection pane 2. The edges of the fire protection pane are sealed with a sealing 12.

[0054] In case of a fire protection glazing 1 according to Fig. 4 and Fig. 5, the method steps described above in the context of the steps of a method according to Fig. 3a to Fig. 3d are - if needed partly and with other sequences - repeated with/for a further fire protection pane 2, profile

element 3 respectively 3a, glue 6, glue strip 6a and/or sealant 8, preferably until the fire protection glazing 1 is present, especially in a way that is reasonably and observant for the person skilled in the art, especially with regard to the parts and/or sequences of the method steps.

[0055] The exemplary embodiments of the invention shown in the figures merely serve to explain the invention and are in no way restrictive.

Claims

1. A fire protection glazing (1) for preventing the passage of fire and smoke from one room to another room in the event of fire, having at least two fire protection panes (2) and at least two profile elements (3, 3a),

wherein each fire protection pane (2) is a compound structure of at least two glass panes (9) arranged in parallel to each other, between which in each case at least one fire protection layer (10) is arranged, wherein said fire protection panes are vertically, adjacent and coplanar arranged and are provided with adjacent horizontal edges and with vertical edges,

wherein a joint opening (7) is defined between the adjacent horizontal edges of the fire protection panes (2), and the joint opening (7) between two fire protection panes (2) is closed by sealant (8) only, all along the adjacent horizontal edges of the fire protection panes (2),

wherein the fire protection panes (2) are held at and all along their vertical edges by means of said at least two profile elements (3, 3a), wherein each profile element (3, 3a) extends in vertical direction and is arranged at a vertical edge of a fire protection pane (2),

at each interface (4) between the surface (5) of a fire protection pane (2) and a profile element (3) the fire protection pane (2) is adhered to the profile element (3, 3a) by means of glue (6), the glue (6) being present all the length of the interface (4) between the surface (5) of the fire protection pane (2) and the profile element (3, 3a) such that it provides a glue strip (6a) of a width of more than or equal to 10 mm along the length of the interface (4) between the surface (5) of the fire protection pane (2) and the profile element (3, 3a),

wherein the fire protection glazing only comprises profile elements which extend vertically between the floor and the ceiling of the rooms.

2. The fire protection glazing (1) according to claim 1, **characterized in that** the glue (6) provides a glue strip (6a) of a width of more than or equal to 12mm.

3. The fire protection glazing (1) according to claim 1 or 2, **characterized in that** the glue (6) provides a glue strip (6a) of a width of less than or equal to 50mm.
4. A fire protection glazing (1) according to any one of the claims 1 to 3, **characterized in that** the glue (6) provides a glue strip (6a) of a thickness of less than or equal to 4mm.
5. A fire protection glazing (1) according to any one of the claims 1 to 4, **characterized in that** the glue strip (6a) being continuous along the length of the interface (4) between the surface (5) of the fire protection pane (2) and the profile element (3).
6. A fire protection glazing (1) according to any one of claims 1 to 5, **characterized in that** the joint opening (7) between two fire protection panes (2) is closed by a silicon paste only.
7. A fire protection glazing (1) according to claim 1, wherein each of the profile elements (3) has a cross section that is substantially rectangular hollow.
8. A fire protection glazing (1) according to claim 1, wherein
- the fire protection glazing comprises a plurality of fire protection panes that are arranged in a first and a second row of vertically adjacent and coplanar fire protection panes with profile elements at and all along their vertical edges,
 - the profile elements (3, 3a) include profile elements (3) with a substantially rectangular hollow cross-section and profile elements (3a) with a substantially H-shaped cross-section.
9. A fire protection glazing (1) as claimed in any of the preceding claims, wherein the fire protection panes are held on both of its surfaces (5) at a vertical edge by means of at least one profile element.
10. A method for establishing a fire protection glazing (1) as claimed in any of the preceding claims for preventing the passage of fire and smoke from one room to another room in the event of fire, comprising the steps of
- providing at least two profile elements (3) extending in substantial vertical direction,
 - providing at least two fire protection panes (2),
 - adhering in substantially vertical direction a first of the at least two fire protection panes (2) to the two profile elements (3) by providing a glue strip (6a) of a width of more than or equal to 10mm along the length of the interface (4) between the surface (5) of the fire protection pane (2) and the profile elements (3),

- adhering in substantially vertical direction and coplanar with the first of the at least two fire protection panes (2) a second of the at least two fire protection panes (2) to the two profile elements (3) by providing a glue strip (6a) of a width of more than or equal to 10mm along the length of the interface (4) between the surface (5) of the fire protection pane (2) and the profile elements (3), thereby providing a joint opening (7) between the adjacent horizontal edges of the two fire protection panes (2),
- closing the joint opening (7) by a sealant (8).

11. A method according to claim 10, the method further comprising the steps of

- prior to the step of adhering the second of the at least two fire protection panes to the at least two profiles, providing load transferring setting blocks at the horizontal edge of the first of the at least two fire protection panes and mounting the second of the at least two fire protection panes in contact with these studs,
- after the step of adhering the second of the at least two fire protection panes (2) to the two profile elements (3) but prior to the step of closing the joint opening, removing the load transferring setting blocks from within the joint opening.

Patentansprüche

1. Eine Brandschutzverglasung (1) zur Verhinderung des Durchdringens von Feuer und Rauch von einem Raum in einen anderen Raum im Brandfall, mit mindestens zwei Brandschutzscheiben (2) und mindestens zwei Profilelemente (3, 3a),

wobei jede Brandschutzscheibe (2) eine Verbundkonstruktion aus mindestens zwei parallel zueinander angeordneten Glasscheiben (9) ist, zwischen denen jeweils mindestens eine Brandschutzschicht (10) angeordnet ist, wobei die Brandschutzscheiben vertikal, nebeneinander und koplanar angeordnet sind und mit nebeneinanderliegenden horizontalen Kanten und mit vertikalen Kanten versehen sind, wobei zwischen den nebeneinanderliegenden horizontalen Kanten der Brandschutzscheiben (2) eine Fugenöffnung (7) definiert ist und die Fugenöffnung (7) zwischen zwei Brandschutzscheiben (2) nur durch Dichtungsmittel (8) entlang der nebeneinanderliegenden horizontalen Kanten der Brandschutzscheiben (2) verschlossen ist, wobei die Brandschutzscheiben (2) an und entlang ihrer vertikalen Kanten mittels der mindes-

- tens zwei Profilelemente (3, 3a) gehalten sind, wobei jedes Profilelement (3, 3a) sich in vertikaler Richtung erstreckt und an einer vertikalen Kante einer Brandschutzscheibe (2) angeordnet ist,
- an jeder Schnittstelle (4) zwischen der Oberfläche (5) einer Brandschutzscheibe (2) und einem Profilelement (3) die Brandschutzscheibe (2) mittels Klebstoff (6) an das Profilelement (3, 3a) angehaftet ist, wobei der Klebstoff (6) über die gesamte Länge der Schnittstelle (4) zwischen der Oberfläche (5) der Brandschutzscheibe (2) und dem Profilelement (3, 3a) vorhanden ist, so dass er einen Klebstoffstreifen (6a) mit einer Breite von mehr als oder gleich 10 mm entlang der Länge der Schnittstelle (4) zwischen der Oberfläche (5) der Brandschutzscheibe (2) und dem Profilelement (3, 3a) bereitstellt, wobei die Brandschutzverglasung nur Profilelemente umfasst, die sich vertikal zwischen dem Boden und der Decke der Räume erstrecken.
2. Brandschutzverglasung (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Kleber (6) einen Kleberstreifen (6a) mit einer Breite von mehr als oder gleich 12 mm bildet.
 3. Brandschutzverglasung (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der Kleber (6) einen Kleberstreifen (6a) mit einer Breite von 50 mm oder weniger bildet.
 4. Brandschutzverglasung (1) nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** der Kleber (6) einen Kleberstreifen (6a) mit einer Dicke von kleiner oder gleich 4mm bildet.
 5. Brandschutzverglasung (1) nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** der Klebestreifen (6a) über die gesamte Länge der Schnittstelle (4) zwischen der Oberfläche (5) der Brandschutzscheibe (2) und dem Profilelement (3) durchgehend ist.
 6. Brandschutzverglasung (1) nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die Fugenöffnung (7) zwischen zwei Brandschutzscheiben (2) lediglich durch eine Silikonpaste verschlossen ist.
 7. Brandschutzverglasung (1) nach Anspruch 1, wobei jedes der Profilelemente (3) einen im Wesentlichen rechteckig-hohlförmigen Querschnitt aufweist.
 8. Brandschutzverglasung (1) nach Anspruch 1, wobei
 - die Brandschutzverglasung eine Vielzahl von Brandschutzscheiben umfasst, die in einer ersten und einer zweiten Reihe vertikal benachbarter und koplanarer Brandschutzscheiben mit Profilelementen an und entlang ihrer vertikalen Kanten angeordnet sind,
 - die Profilelemente (3, 3a) Profilelemente (3) mit einem im Wesentlichen rechteckigen Hohlquerschnitt und Profilelemente (3a) mit einem im Wesentlichen H-förmigen Querschnitt umfassen.
 9. Brandschutzverglasung (1) nach einem der vorhergehenden Ansprüche, wobei die Brandschutzscheiben an ihren beiden Oberflächen (5) an einer vertikalen Kante mittels mindestens einem Profilelement gehalten sind.
 10. Verfahren zum Herstellen einer Brandschutzverglasung (1) nach einem der vorhergehenden Ansprüche zum Verhindern des Durchdringens von Feuer und Rauch von einem Raum in einen anderen Raum im Brandfall, umfassend die Schritte:
 - Bereitstellen von mindestens zwei Profilelementen (3), die sich im Wesentlichen in vertikaler Richtung erstrecken,
 - Bereitstellen von mindestens zwei Brandschutzscheiben (2),
 - Anhaften einer ersten der mindestens zwei Brandschutzscheiben (2) in im Wesentlichen vertikaler Richtung an den zwei Profilelementen (3) durch Anbringen eines Klebestreifens (6a) mit einer Breite von mehr als oder gleich 10 mm entlang der Länge der Schnittstelle (4) zwischen der Oberfläche (5) der Brandschutzscheibe (2) und den Profilelementen (3),
 - Anhaften einer zweiten der mindestens zwei Brandschutzscheiben (2) in im Wesentlichen vertikaler Richtung und koplanar mit der ersten der mindestens zwei Brandschutzscheiben (2) an den zwei Profilelementen (3) durch Anbringen eines Klebestreifens (6a) mit einer Breite von mehr als oder gleich 10 mm entlang der Länge der Schnittstelle (4) zwischen der Oberfläche (5) der Brandschutzscheibe (2) und der Profilelemente (3), wodurch eine Fugenöffnung (7) zwischen den benachbarten horizontalen Kanten der beiden Brandschutzscheiben (2) entsteht,
 - Verschließen der Fugenöffnung (7) durch ein Dichtmittel (8).
 11. Verfahren nach Anspruch 10, wobei das Verfahren weiterhin die Schritte umfasst:
 - vor dem Schritt des Anhaften der zweiten der mindestens zwei Brandschutzscheiben an den mindestens zwei Profilen Anbringen von lastübertragenden Setzklötzen an der horizontalen

Kante der ersten der mindestens zwei Brandschutzscheiben und Anbringen der zweiten der mindestens zwei Brandschutzscheiben in Kontakt mit diesen Klötzen,
 - nach dem Schritt des Anbringens der zweiten der mindestens zwei Brandschutzscheiben (2) an den zwei Profilelementen (3), aber vor dem Schritt des Schließens der Fugenöffnung, Entfernen der lastübertragenden Setzklötze aus dem Inneren der Fugenöffnung.

Revendications

1. Vitrage coupe-feu (1) destiné à empêcher le passage du feu et de la fumée d'une pièce à une autre en cas d'incendie, comprenant au moins deux vitres coupe-feu (2) et au moins deux éléments profilés (3, 3a),

dans lequel chaque vitre coupe-feu (2) est une structure composite d'au moins deux vitres (9) disposées parallèlement l'une à l'autre, entre lesquelles est disposée dans chaque cas au moins une couche coupe-feu (10), lesdites vitres coupe-feu étant disposées verticalement, adjacentes et coplanaires et étant pourvues de bords horizontaux adjacents et de bords verticaux,

dans lequel une ouverture de joint (7) est définie entre les bords horizontaux adjacents des vitres coupe-feu (2), et l'ouverture de joint (7) entre deux vitres coupe-feu (2) est fermée par un produit d'étanchéité (8) uniquement, tout le long des bords horizontaux adjacents des vitres coupe-feu (2),

dans lequel les vitres coupe-feu (2) sont maintenues au niveau de leurs bords verticaux et tout le long de leurs bords verticaux au moyen desdits au moins deux éléments profilés (3, 3a), chaque élément profilé (3, 3a) s'étend dans la direction verticale et est disposé au niveau d'un bord vertical d'une vitre coupe-feu (2),

à chaque interface (4) entre la surface (5) d'une vitre coupe-feu (2) et un élément profilé (3), la vitre coupe-feu (2) est collée à l'élément profilé (3, 3a) au moyen de colle (6), la colle (6) étant présente sur toute la longueur de l'interface (4) entre la surface (5) de la vitre coupe-feu (2) et l'élément profilé (3, 3a) de telle sorte qu'elle forme une bande de colle (6a) d'une largeur supérieure ou égale à 10 mm sur la longueur de l'interface (4) entre la surface (5) de la vitre coupe-feu (2) et l'élément profilé (3, 3a),

dans lequel le vitrage coupe-feu ne comprend que des éléments profilés qui s'étendent verticalement entre le sol et le plafond des locaux.

2. Vitrage coupe-feu (1) selon la revendication 1, **caractérisé en ce que** la colle (6) fournit une bande de colle (6a) d'une largeur supérieure ou égale à 12 mm.
3. Vitrage coupe-feu (1) selon la revendication 1 ou 2, **caractérisé en ce que** la colle (6) fournit une bande de colle (6a) d'une largeur inférieure ou égale à 50 mm.
4. Vitrage coupe-feu (1) selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** la colle (6) fournit un cordon de colle (6a) d'une épaisseur inférieure ou égale à 4 mm.
5. Vitrage coupe-feu (1) selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** la bande de colle (6a) est continue sur toute la longueur de l'interface (4) entre la surface (5) du vitrage coupe-feu (2) et l'élément profilé (3).
6. Vitrage coupe-feu (1) selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** l'ouverture de joint (7) entre deux vitres coupe-feu (2) est fermée uniquement par une pâte silicone.
7. Vitrage coupe-feu (1) selon la revendication 1, dans lequel chacun des éléments profilés (3) présente une section transversale substantiellement rectangulaire creuse.
8. Vitrage coupe-feu (1) selon la revendication 1, dans lequel
- le vitrage coupe-feu comprend une pluralité de vitres coupe-feu qui sont disposées en une première et une deuxième rangée de vitres coupe-feu adjacentes verticalement et coplanaires avec des éléments profilés sur et tout le long de leurs bords verticaux,
 - les éléments profilés (3, 3a) comprennent des éléments profilés (3) ayant une section transversale creuse substantiellement rectangulaire et des éléments profilés (3a) ayant une section transversale substantiellement en forme de H.
9. Vitrage coupe-feu (1) selon l'une quelconque des revendications précédentes, dans lequel les vitres coupe-feu sont maintenues sur leurs deux surfaces (5) au niveau d'un bord vertical au moyen d'au moins un élément profilé.
10. Procédé de mise en place d'un vitrage coupe-feu (1) selon l'une quelconque des revendications précédentes pour empêcher le passage du feu et de la fumée d'une pièce à une autre en cas d'incendie, comprenant les étapes consistant à

- fournir au moins deux éléments profilés (3) s'étendant dans une direction substantiellement verticale,
- fournir au moins deux vitres coupe-feu (2),
- coller dans une direction substantiellement verticale une première des au moins deux vitres coupe-feu (2) aux deux éléments profilés (3) en prévoyant une bande de colle (6a) d'une largeur supérieure ou égale à 10 mm sur la longueur de l'interface (4) entre la surface (5) de la vitre coupe-feu (2) et les éléments profilés (3),
- coller dans une direction substantiellement verticale et coplanaire à la première des au moins deux vitres coupe-feu (2) une seconde des au moins deux vitres coupe-feu (2) aux deux éléments profilés (3) en prévoyant une bande de colle (6a) d'une largeur supérieure ou égale à 10 mm sur la longueur de l'interface (4) entre la surface (5) de la vitre coupe-feu (2) et les éléments profilés (3), en ménageant ainsi une ouverture de joint (7) entre les bords horizontaux adjacents des deux vitres coupe-feu (2),
- fermeture de l'ouverture de joint (7) par un produit d'étanchéité (8).

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11. Procédé selon la revendication 10, le procédé comprenant en outre les étapes consistant à

- avant l'étape de collage du second des au moins deux panneaux de protection incendie aux au moins deux profilés, fournir des blocs de réglage de transfert de charge au niveau du bord horizontal du premier des au moins deux panneaux de protection incendie et monter le second des au moins deux panneaux de protection incendie en contact avec ces plots,
- après l'étape de collage du second des au moins deux panneaux de protection incendie (2) aux deux éléments de profilé (3) mais avant l'étape de fermeture de l'ouverture de joint, retirer les blocs de réglage de transfert de charge de l'intérieur de l'ouverture de joint.

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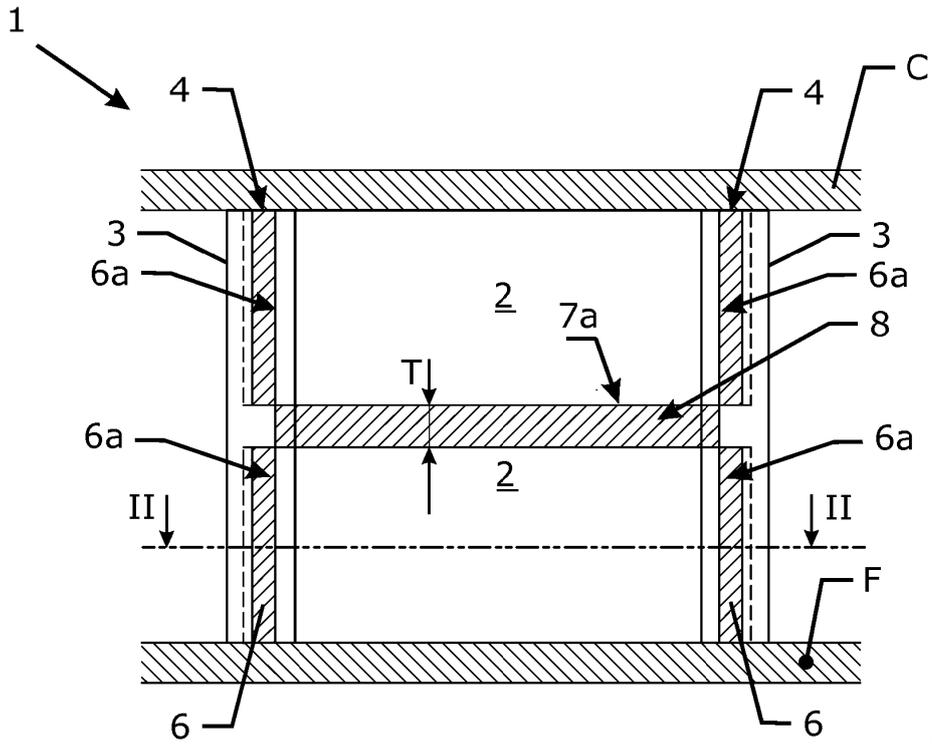


Fig. 1

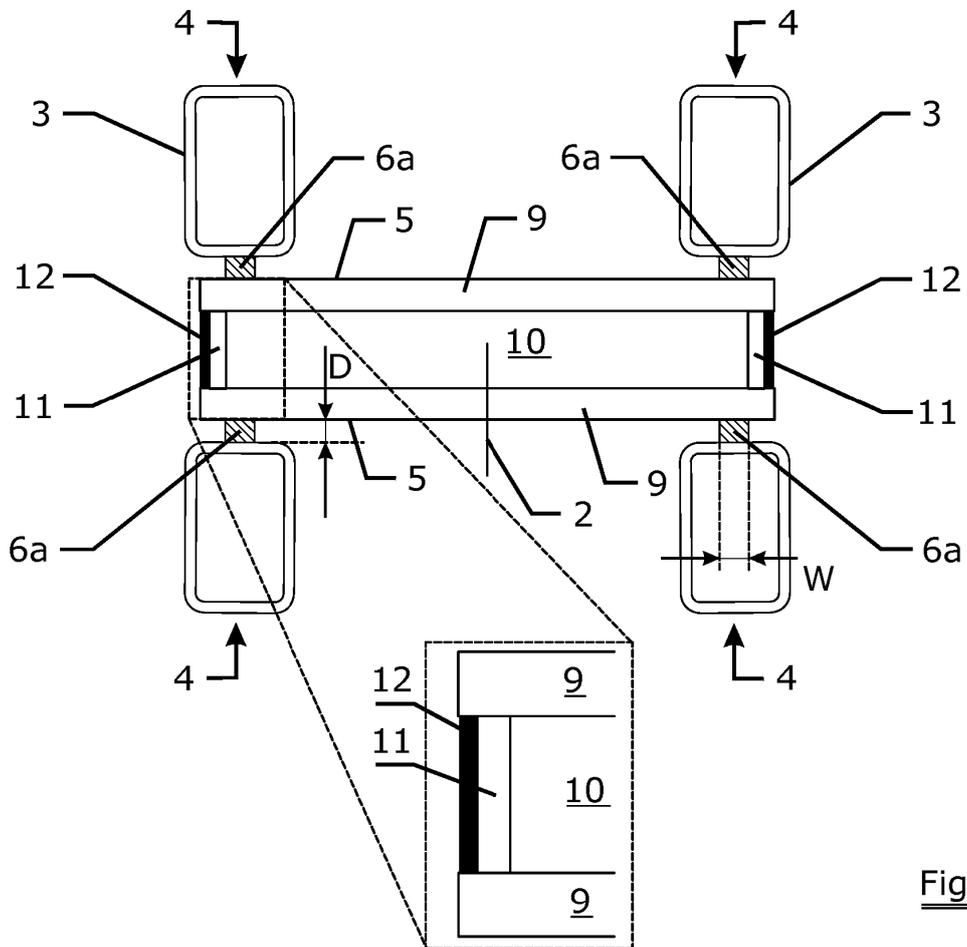


Fig. 2

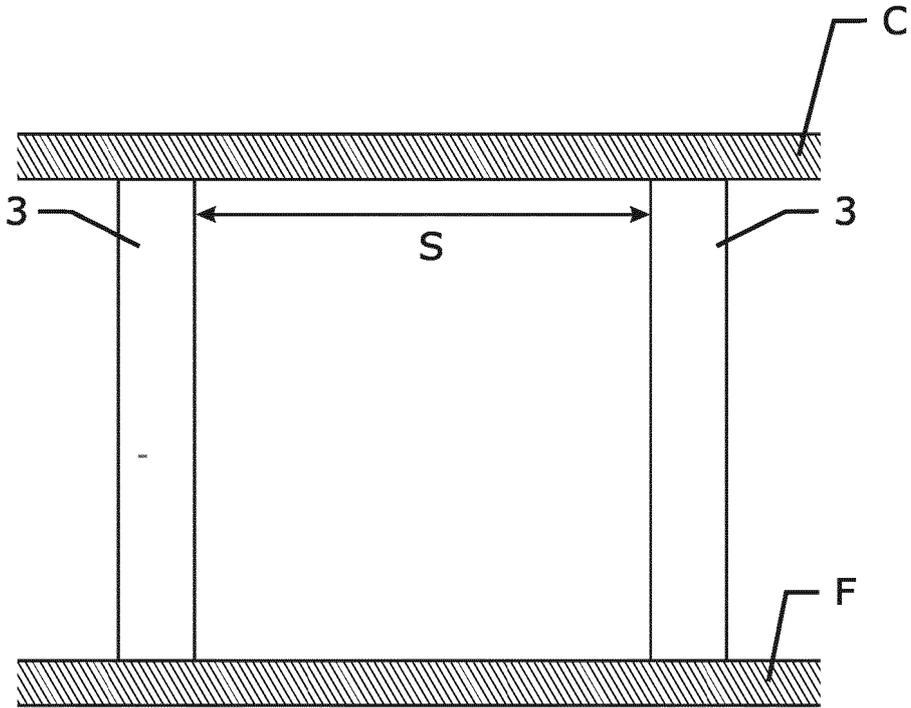


Fig. 3a

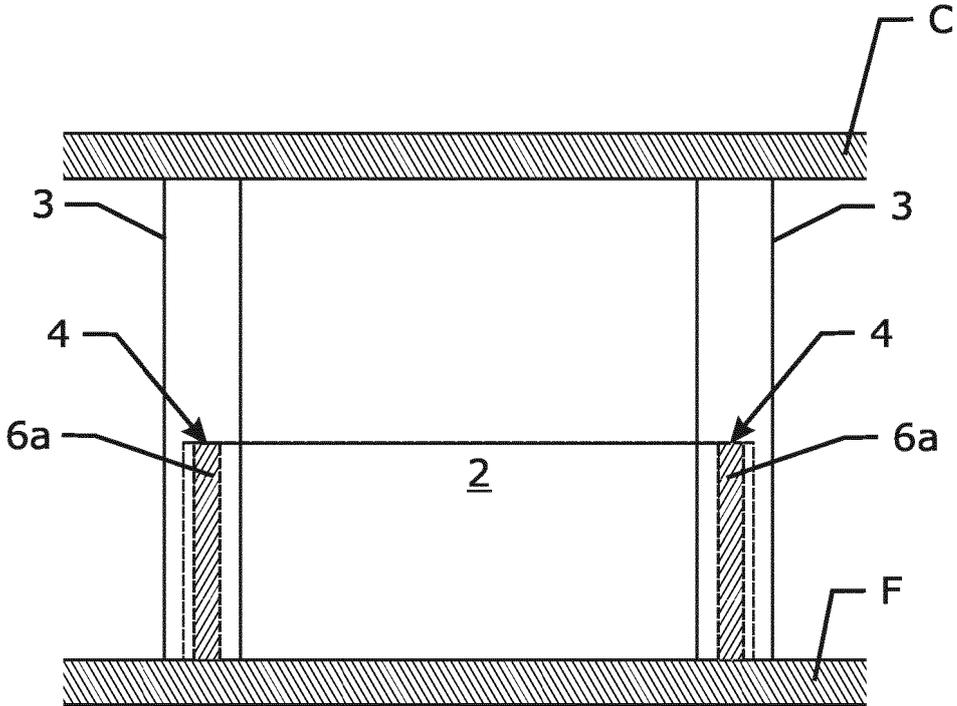


Fig. 3b

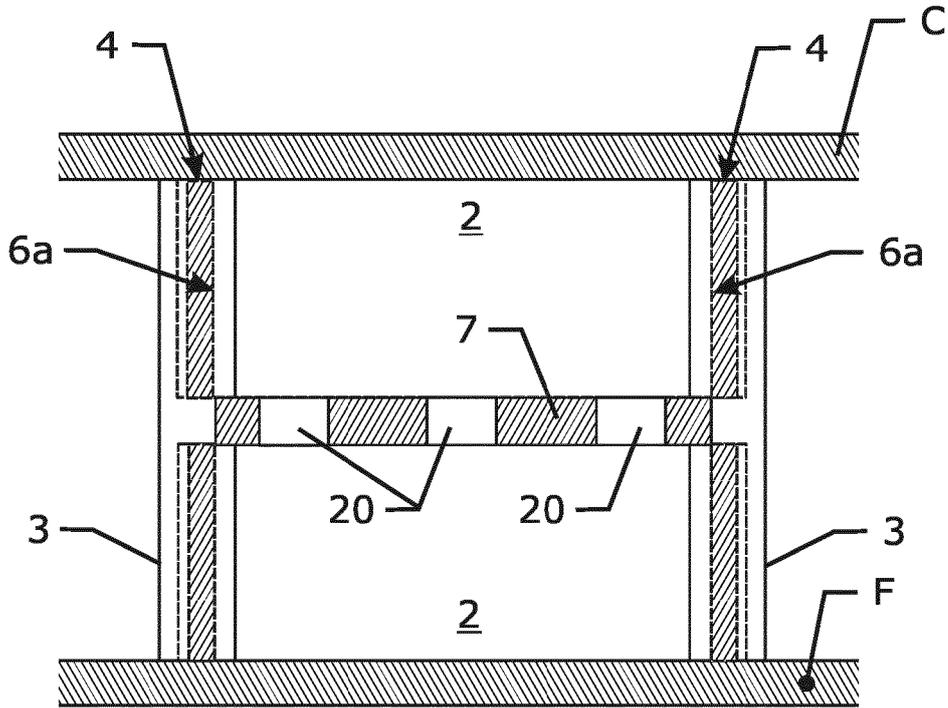


Fig. 3c

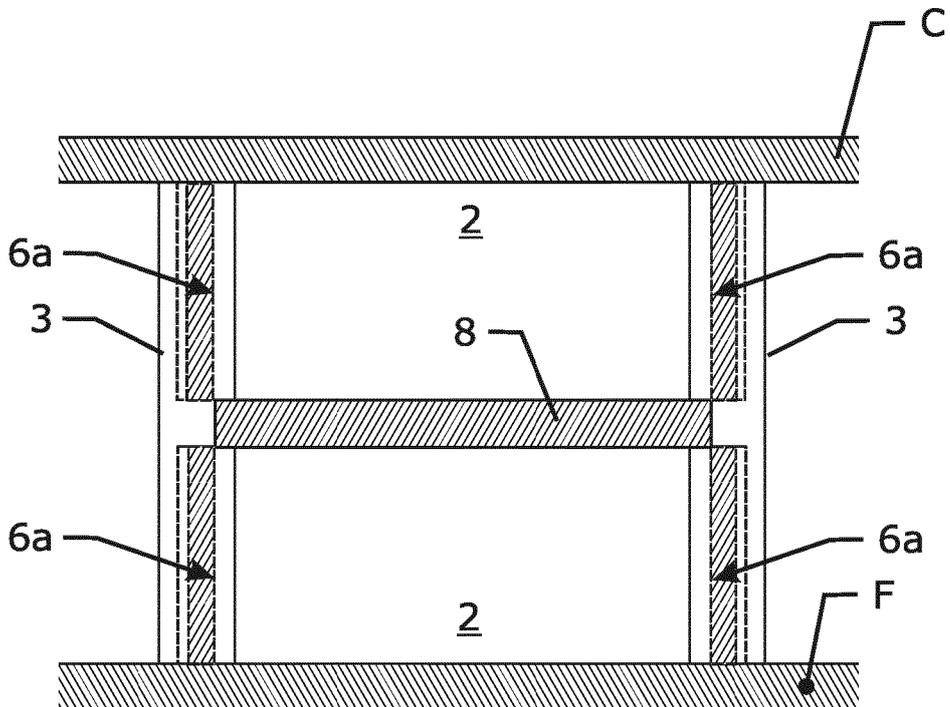


Fig. 3d

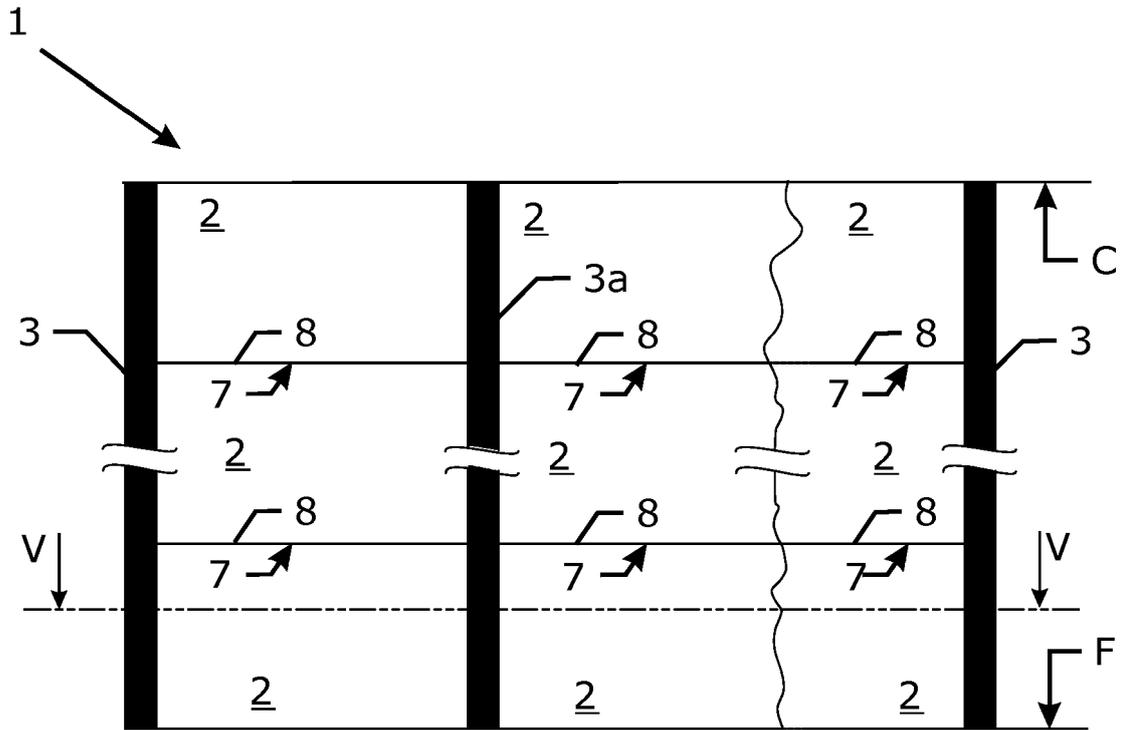


Fig. 4

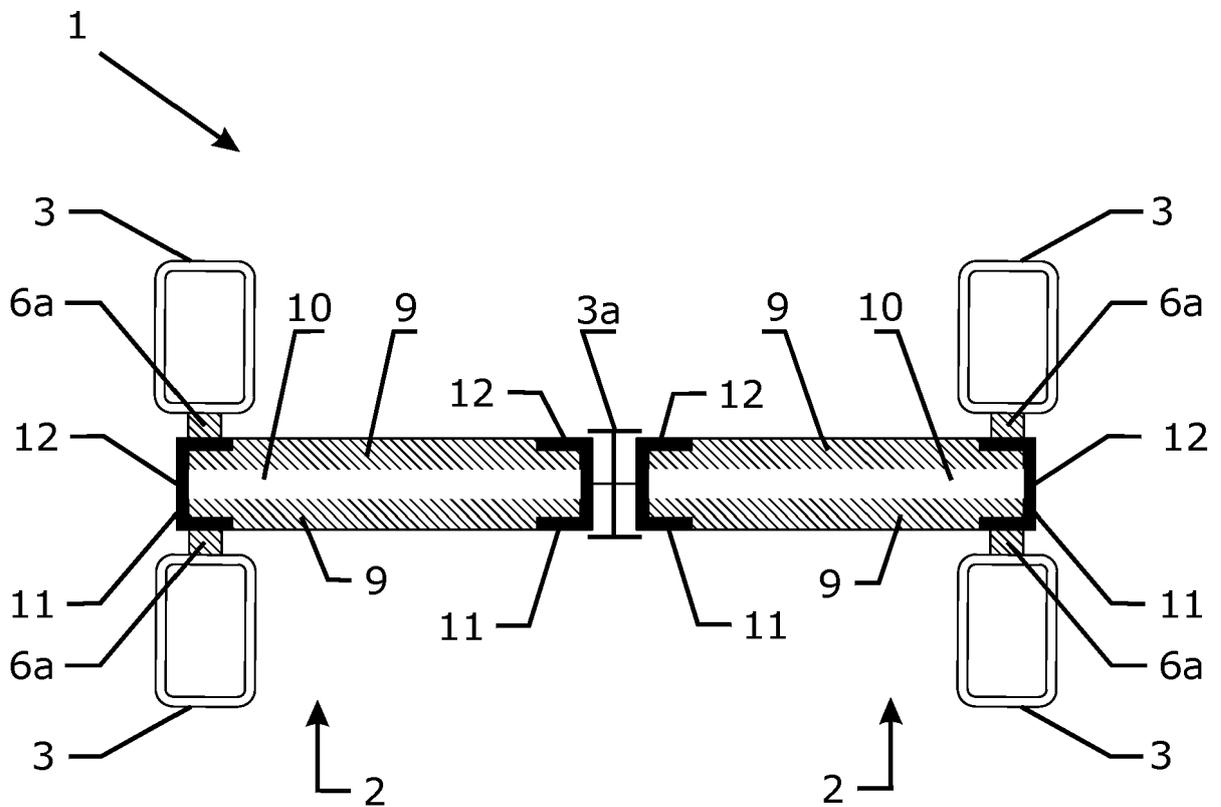


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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