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(54) **Window frame suitable for a lifting door for a fireplace, lifting door for a fireplace and fireplace**

(57) Window frame (1) of a lifting door for a fireplace which separates the combustion chamber of a fireplace from the surrounding area in which the fireplace is situated, which lifting door for a fireplace includes a glass plate (2) or another at least partly transparent panel,

which window frame (1) includes at least an inner window frame (5) whose wall or walls directed towards the centre of the combustion chamber are provided with a protective shield (8).

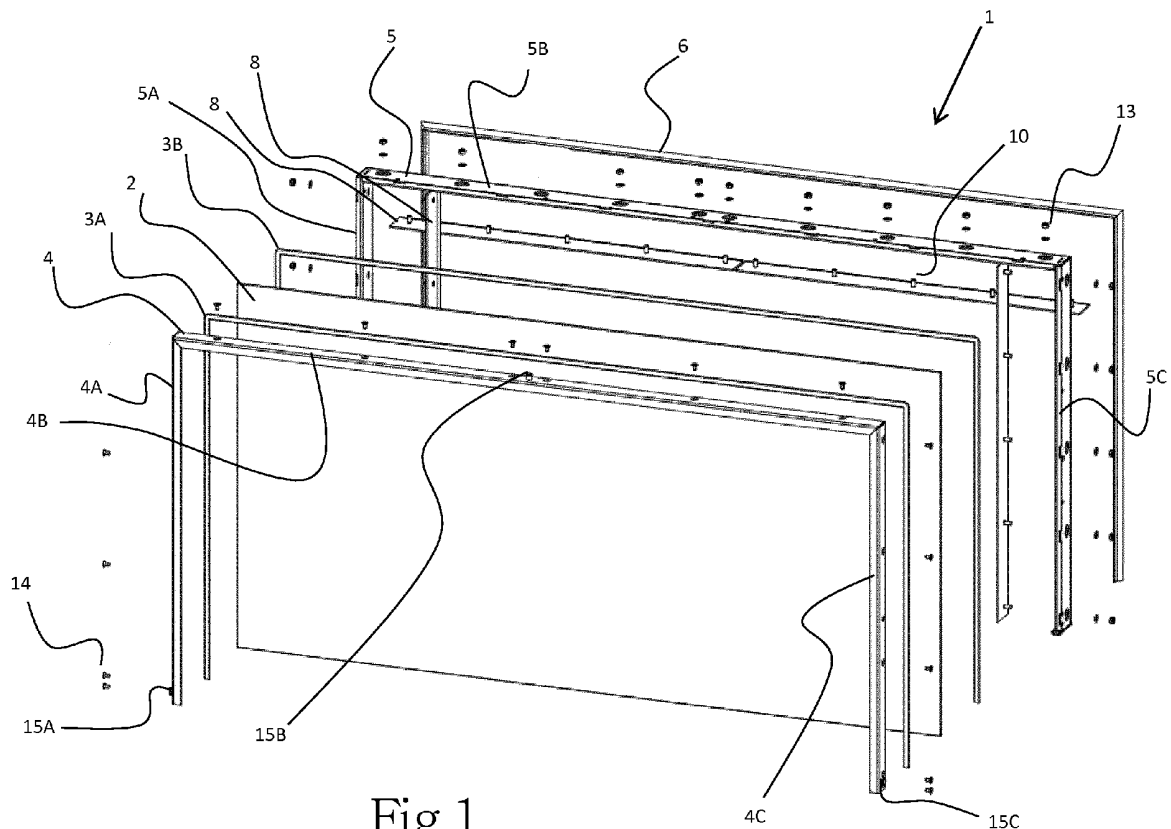


Fig 1

Description

[0001] The present invention concerns a window frame of a lifting door for a fireplace and a matching lifting door for a fireplace and a matching fireplace, preferably a wood fire.

[0002] Such a fireplace includes a combustion chamber which may be either open to the room in which the fireplace is erected, or it can be sealed from the latter by shutting a transparent panel, usually a fitting glass panel.

[0003] The panel is opened and shut by moving it upward and downward respectively.

[0004] This panel should be provided on at least one of the edges, usually on both upright side edges and on the horizontal top edge, with sections guaranteeing the necessary solidity and also allowing the panel to be guided.

[0005] These sections form the window frame of such a lifting door.

[0006] In order to obtain a visually attractive fireplace with a lifting door, it is crucial and at the same time a challenge to obtain a window frame which is visible as little as possible while in use.

[0007] Note that such fireplaces with lifting doors are usually built in, so that mainly only the combustion chamber is visible from the room in which the fireplace is situated, possibly screened by the panel when it is in a closed position.

[0008] The closed position of the panel results in a higher yield or higher energy efficiency of the fireplace, and offers increased safety.

[0009] The user wishes to make maximum use of these advantages, but it is known that the atmosphere created by a traditional open fireplace is adversely affected by the degree of visibility of the panel.

[0010] All this emphasizes the importance of any improvement which limits the visibility of the panel and/or of the frame.

[0011] NL 1032376 describes a fireplace including a combustion chamber which can be closed off at least on a first anterior open side by means of an at least partially transparent panel, which panel is surrounded at least at its upstanding peripheral edges by a frame composed of frame section parts and which can be moved in the plane formed by the panel in order to open or close the combustion chamber, whereby the frame section part provided round an upright peripheral edge of the panel is composed of a U-section round the peripheral edge, whereby the leg of the U-section situated on the side of the panel facing away from the combustion chamber has a minimal longitudinal dimension and the leg of the U-section situated on the side of the panel facing the combustion chamber is provided over at least a part of the length of the frame section part with a reinforcement element which is widened in the direction of the combustion chamber.

[0012] The overall construction of such a fireplace, in particular of the frame section parts, results in a worthy reduction of the visibility of the window frame compared

to other existing fireplaces.

[0013] The present invention aims to further reduce the visibility of the window frame and to provide for a simple construction of the window frame and the cooperating guide and lifting mechanism.

[0014] To this end, the present invention concerns a window frame of a lifting door for a fireplace which separates the combustion chamber of a fireplace from the surrounding area in which the fireplace is provided, which lifting door for a fireplace includes a glass plate or another at least partly transparent panel, which window frame includes at least one inner window frame whose wall or walls facing the centre of the combustion chamber are provided with a protective shield.

[0015] The present invention also concerns a lifting door for a fireplace including such a window frame and a fireplace including such a lifting door for a fireplace.

[0016] In order to better explain the characteristics of the present invention, the following preferred embodiment of a window frame of a lifting door for a fireplace according to the invention is described by way of example only without being limitative in any way, with reference to the accompanying drawings, in which:

figure 1 is an exploded view of the window frame of a lifting door for a fireplace according to the invention; figure 2 is a section to a larger scale, at half height, of the assembly represented upright and to the left in figure 1.

[0017] Figure 1 is an exploded view of the window frame 1 of a lifting door for a fireplace, and substantially also of a lifting door for a fireplace according to the invention.

[0018] In this position as shown, the lifting door is represented vertically, according to the normal position of use when applied in a fireplace.

[0019] Moreover, the lifting door is represented here from a perspective outside the fireplace and diagonally in front of the fireplace window.

[0020] The space behind the lifting door for a fireplace, in a position of use and when incorporated in a fireplace, is occupied by the combustion chamber of the fireplace, either for gas or wood or another fuel.

[0021] Figure 2 shows the window frame 1, now assembled, shown as a cross section.

[0022] The window frame 1 includes a glass plate 2 with on both sides along the left, right and top side edge a strip-shaped glass seal 3A and 3B, which is completely encased between an outer window frame 4 on the one hand and an inner window frame 5 on the other hand.

[0023] The outer window frame 4 is an assembled U-shaped unit here, whereby the constituent elements are three substantially L-shaped sections: a vertically oriented section 4A when in use on the left-hand side of the glass plate 2 as seen from the outside of the fireplace, a thus seen top horizontal section 4B and a thus seen vertically oriented section 4C on the right-hand side of the

glass plate 2.

[0024] Each section 4A-4C is provided with a leg 4A'-4C' turned away from the combustion chamber and thus situated on the outside of the fireplace, having a width B1 which is almost 1.3 cm here, including the thickness of the legs 4A"-4C" directed at right angles thereto and essentially at right angles to the glass plate 2.

[0025] The inner window frame 5 concerns an assembled U-shaped unit whereby the constituent elements are three substantially tubular and mutually appropriate sections 5A, 5B and 5C having a substantially rectangular section.

[0026] In particular, every tubular section 5A, 5B and 5C is composed of two substantially L-shaped sections 5Aa and 5Ab, 5Ba and 5Bb, 5Ca and 5Cb in this case, each mutually connected by welding.

[0027] The inner window frame 5 and thus the constituent tubular sections 5A, 5B and 5C have a maximum width B2 of 0.9 cm in this case.

[0028] The inner window frame 5, on the side facing the centre of the combustion chamber, in particular near the short side of the tubes 5A-5C away from the glass plate 2, is provided with a window gasket 6.

[0029] Such a window gasket 6, known as such, has a compressible part 7A here with a circular section and a connected lip 7B; however, a substantially corresponding double folded sealing strip may suffice.

[0030] The window gasket 6 is connected to the inner window frame 5 by clamping it between the inner window frame 5 and a protective shield 8 applied thereto.

[0031] The protective shield 8 is formed in particular of metal strips 9, substantially flat but with a slightly oblique side edge, and provided with coupling means 10, in this case press studs similar to the shank of a bolt.

[0032] The coupling means 10 go through corresponding passages 11 in the leaning wall of the inner window frame 5.

[0033] In line with this, there is always a wider recess 12 in the opposite, remote wall of the inner window frame 5, creating ease of access for providing a spring washer and a nut 13, or in a more general way to couple the protective shield 8 to the inner window frame 5 and to clamp the window gasket 6 between both.

[0034] The outer window frame 4 is connected to the inner window frame 5 in this case by means of bolts or screws 14 with a countersunk head.

[0035] The outer window frame 4 is provided left and right with two cylindrical bushes 15A and 15C with a widened collar, one of which is a press-in nut, and with a third cylindrical bush 15B at the top.

[0036] A first bush 15A is provided in particular on the outwardly facing side of the section 4A which is vertically oriented when in use on the left-hand side of the glass plate 2, in particular near its free end, away from the section 4B which is horizontal when in use.

[0037] The second bush 15C is analogously provided on the vertically oriented section 4C on the right-hand side of the glass plate 2 and at the same height, i.e. at

the same distance from the section 4B which is horizontal when in use.

[0038] The third bush 15B is provided substantially in the centre of the horizontally oriented section 4B.

5 **[0039]** The operation and the advantages of the described window frame 1 for a lifting door for a fireplace according to the invention is as follows.

[0040] The glass plate 2 is mounted between the outer window frame 4 and the inner window frame 5.

10 **[0041]** The edges of the glass plate 2 are thereby appropriately protected by providing a strip-shaped glass seal 3A and 3B on either side along the left, right and top side edge, in particular between the glass plate 2 and the aforesaid window frames 4 and 5.

15 **[0042]** The inner window frame 5 is provided with a window gasket 6 on the inner side, i.e. on the side away from the outer window frame 4, and in particular near the short side away from the glass plate 2.

[0043] Further, the outer window frame 4 is provided with two cylindrical bushes with a widened collar 15.

20 **[0044]** This assembly might be sufficient as such, were it not for the constituent parts which are dimensioned such that deformation due to thermal stresses is not excluded.

25 **[0045]** Indeed, the window frame is necessary to protect the glass plate 2 and to further provide for a lifting mechanism.

[0046] Furthermore, it is important to provide for a good sealing of the combustion space.

30 **[0047]** However, in order to obtain a visually pleasing fireplace with a lifting door, it is crucial and at the same time a major challenge to obtain a window frame 1 which is minimally visible when in use.

35 **[0048]** It is clear that minimal visual presence on the one hand, and providing answers to the above-mentioned functional requirements on the other hand are a challenge.

40 **[0049]** In addition, the high temperature in the heater room and especially the large temperature differences between the heater room and the ambient temperature may lead to thermal stresses and deformations when the design of the window frame is not well thought-out.

[0050] The inner window frame 5 and thus the constituent tubular sections 5A, 5B and 5C, in the light of the above aim, have a restricted maximum width B2 of 0.9 cm in this case.

[0051] The outer window frame 4 is an assembled U-shaped unit, whereby the constituent elements are three substantially L-shaped sections in this case.

50 **[0052]** The leg 4A'-4C' of each of the L-sections 4A-4C situated on the outside of the fireplace, i.e. the leg shown in the front of the figures, has a restricted width B1 of almost 1.3 cm here, which width corresponds to the width of the inner window frame 5, in order to visually protect the inner window frame 5 situated on the inside.

[0053] However, this minimalistic embodiment would deform if there were no protective shield 8.

[0054] Indeed, the protective shield 8 not only clamps

the window gasket 6 but also at least partly protects the inner window frame 5 against radiant heat - which is a major feature - thus significantly reducing deformation of the window frame 1 according to the invention.

[0055] Indeed, thanks to the presence of the protective shield 8, the inner window frame 5 and the outer window frame 4 will heat up gradually and particularly more evenly as a result of the heat conduction.

[0056] High temperatures are not a problem as such, but high temperature differences are, since they make the parts situated on the hot side expand more than the more distant parts.

[0057] The protective shield 8 prevents too high temperature differences, which makes it possible for the constituent parts of the window frame 1 and thus also the window frame 1 of the lifting door for a fireplace to be small dimensioned.

[0058] Note that the width B1 of the legs 4A'-4C' of the sections 4A-4C turned away from the combustion chamber substantially corresponds here to the sum of the thickness of the legs 4A"-4C" of the same sections 4A-4C directed crosswise to the glass plate 2, the width B2 of the tubes 5A-5C and the thickness of the protective shield 8, which has for a result that the parts of the window frame 1 situated on the inside of the glass plate 2 are optimally hidden from sight.

[0059] Inserting and clamping the window gasket 6 between the inner window frame 5 and the protective shield 8 additionally makes it possible to provide the window gasket 6 on the inside of the lifting door and to connect it there, and to shield at least a part thereof from direct radiation.

[0060] As mentioned, the protective shield 8 is in particular formed of metal strips 9 here, substantially flat but with a slightly oblique side edge, which accommodates the window gasket 6 and shields it at least partly from direct radiation.

[0061] The two cylindrical bushes with widened collar 15 provided to the left and to the right of the outer window frame 4, in particular on the vertically oriented sections 4A and 4C, are part of the opening and closing mechanism and allow for the lifting door to be hung in a guideway and to hinge open from a closed position, whereby these bushes 15 serve as hinges, such that the glass plate 2 can be easily cleaned.

[0062] The bush 15B on the horizontally oriented sections 4B is designed to lock the lifting door.

[0063] Note that at the bottom of the strip-shaped glass seals 3A and 3B, under the glass plate 2 there, is provided a shoulder 16 to support the glass plate 2.

[0064] As mentioned, the protective shield 8 in particular consists of metal strips 9 in this case, substantially flat but with a slightly oblique side edge, such that the window gasket 6 can be accommodated and is simultaneously at least partly shielded from direct radiation.

[0065] It is clear that the protective shield 8 may take various forms and must not necessarily be directly provided on the inner tube 5.

[0066] Indeed, an additional thermal insulating layer can be provided between the protective shield 8 and the inner tube 5, possibly as part of the window gasket 6, for example by making the lip 7 or an inserted part of a double-folded sealing strip longer.

[0067] The protective shield 8 preferably covers the entire inner window frame 5 from the radiant heat source; however, that is not necessary but preferred, since a part of the frame will be exposed to radiant heat in the case of partial shielding.

[0068] The protective shield 8 may consist of a metal plate, as in the embodiment discussed, but alternatively it may consist of a coating or a film suitable for screening and/or reflecting thermal radiation. However, this variant of the embodiment does not offer the possibility to connect the window gasket 6 to the inner window frame 5 by clamping it between the inner window frame 5 and a protective shield 8 of said design.

[0069] Note that the U-shaped construction of the outer window frame 4 and of the inner window frame 5 is not a prerequisite, and that "frame" should be interpreted broadly, and certainly must not concern a closed frame.

[0070] In an extreme application, outer window frame 4 and inner window frame 5 may refer to a single integrated section.

[0071] Indeed, also when only one or two of the edges of the glass plate 2 are provided with a window frame 1 according to the invention, reference will be made to an inner window frame 4 and an outer window frame 5 if both are present.

[0072] The above-described structure of the window frame 1 is not a prerequisite either. If an edge of the glass plate 2 is to be protected, in principle a U-section around the edge of the glass plate 2 may suffice.

[0073] However, in view of a minimally visible window frame 1, the legs of such a U-section should have a minimal length.

[0074] This may reduce the structural strength, and therefore a maximum of structure is provided in the direction at right angles to the glass plate 2.

[0075] The inner window frame 5 offers this structural strength.

[0076] In order to make this inner window frame 5 narrow as well, in the described embodiment not wider than the width of the legs 4A'-4C' of the sections 4A-4C situated on the outside of the combustion chamber, the walls of the inner window frame 5 directed towards the centre of the combustion chamber are provided with a protective shield 8.

[0077] This results in at least a two-fold layer on these walls of the inner window frame 5 directed towards the centre of the combustion chamber, made up of two plate strips whose protective shield 8 is made thinner than the coated walls of the inner window frame 5 in this case.

[0078] Moreover, the manner in which the protective shield 8 is mounted allows for some play.

[0079] It is clear that the construction of the outer frame 4 and of the inner frame 5 may be different from the ones

discussed above and represented in the figures.

[0080] The section or the sections 4A-4C of the outer frame 4 preferably include at least a section 4C provided with a leg 4A'-4C' provided on the side of the glass plate 2 turned away from the combustion chamber, and further with legs 4A"-4C" directed at right angles thereto.

[0081] Instead of an L-section also U-sections may be concerned, or even other sections which are provided in the inner window frame 5 in an integrated manner with the outer frame 4.

[0082] It is also clear that the inner window frame 5 may be built up differently and must not necessarily be built of tubes with a rectangular cross-section.

[0083] The inner window frame 5 may for example be built of U-sections, either or not with the legs at right angles to the centre piece, on which are applied folded plates which are flat or which have an S-shaped cross-section.

[0084] The present invention is by no means restricted to the embodiment described by way of example and represented in the accompanying drawings; on the contrary, such a window frame of a lifting door for a fireplace according to the invention can be made in all sorts of shapes and dimensions while still remaining within the scope of the invention.

Claims

1. Window frame (1) of a lifting door for a fireplace which separates the combustion chamber of a fireplace from the surrounding area in which the fireplace is situated, which lifting door for a fireplace includes a glass plate (2) or another at least partly transparent panel, which window frame (1) includes at least an inner window frame (5), **characterised in that** the wall or walls of the inner window frame (5) directed towards the centre of the combustion chamber are provided with a protective shield (8).
2. Window frame (1) according to claim 1, **characterised in that** the assembly of the inner window frame (5) with the protective shield (8) results in an at least two-fold layer on the wall or walls of the inner window frame (5) directed towards the centre of the combustion chamber.
3. Window frame (1) according to claim 1 or 2, **characterised in that** the inner window frame (5) includes a tubular section (5A-5C) whose cross-section forms a continuous line surrounding a cavity.
4. Window frame (1) according to claim 3, **characterised in that** the inner window frame (5) includes a tubular section (5A-5C) having a substantially rectangular cross-section.
5. Window frame (1) according to claim 3 or 4, **char-**

acterised in that the tubular section (5A-5C) is composed of two substantially L-shaped sections (5Aa and 5Ab, 5Ba and 5Bb, 5Ca and 5Cb).

- 5 6. Window frame (1) according to one or several of the preceding claims, **characterised in that** the window frame (1) includes an outer window frame (4) which is connected to or integrated with the inner window frame (5).
- 10 7. Window frame (1) according to claim 6, **characterised in that** the outer window frame (4) is built of L-shaped sections (4A-4C), each provided with a leg (4A'-4C') turned away from the combustion chamber and thus situated on the outside of the fireplace having a width (B1), including the thickness of the legs (4A"-4C") directed at right angles to the legs (4A'-4C'), which width deviates maximally 30%, or better still maximally 20%, 10% or 5% from the sum of the thickness of the legs (4A"-4C") of the sections (4A-4C) directed at right angles to the glass plate 2, a width (B2) of the tubes (5A-5C) of the inner window frame (5) and a thickness of the protective shield (8).
- 15 8. Window frame (1) according to one or several of the preceding claims, **characterised in that** the window frame (1) includes a window gasket (6) provided on the side of the inner window frame (5) facing the centre of the combustion chamber.
- 20 9. Window frame (1) according to claim 8, **characterised in that** the window gasket (6) is connected to the inner window frame (5) by clamping it between the inner window frame (5) and the protective shield (8) applied thereto.
- 25 10. Lifting door for a fireplace including a window frame (1) according to one or several of the preceding claims.
- 30 11. Fireplace including a lifting door for a fireplace according to claim 10.
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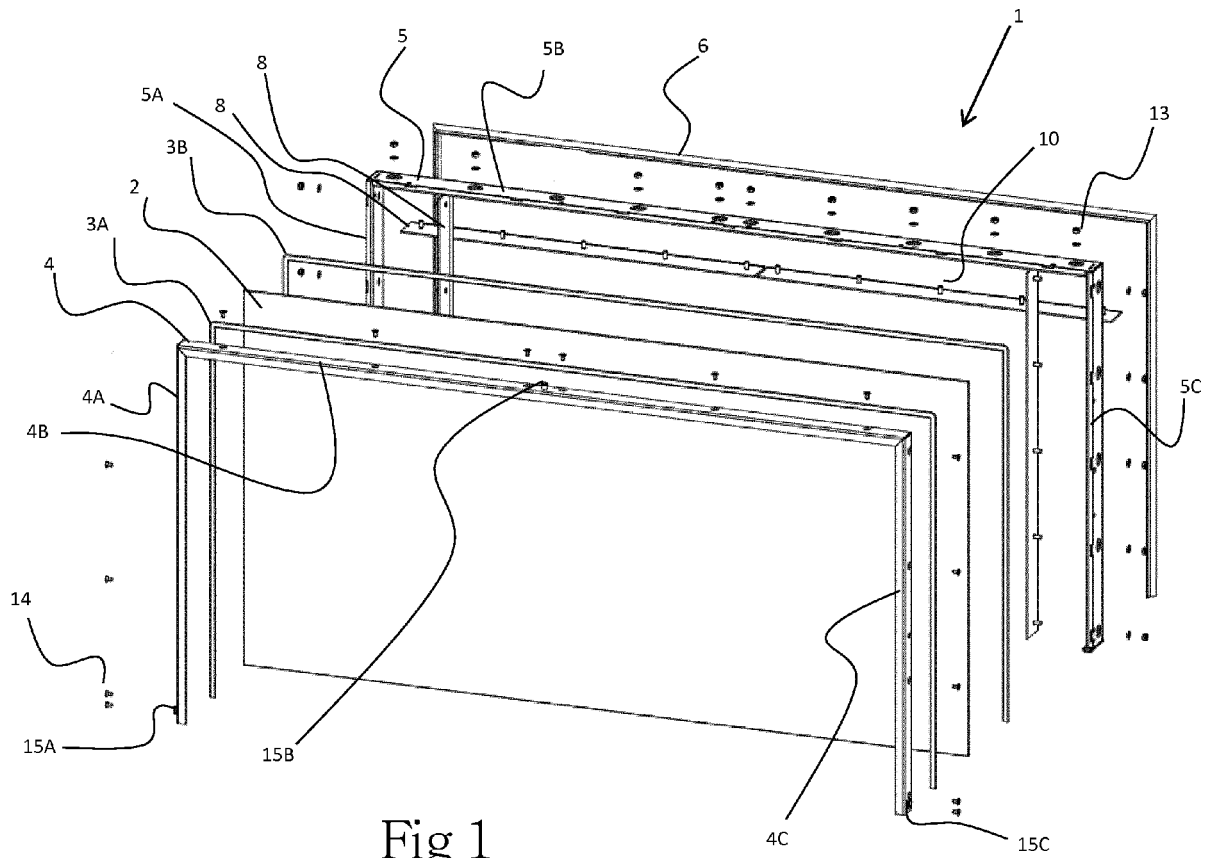
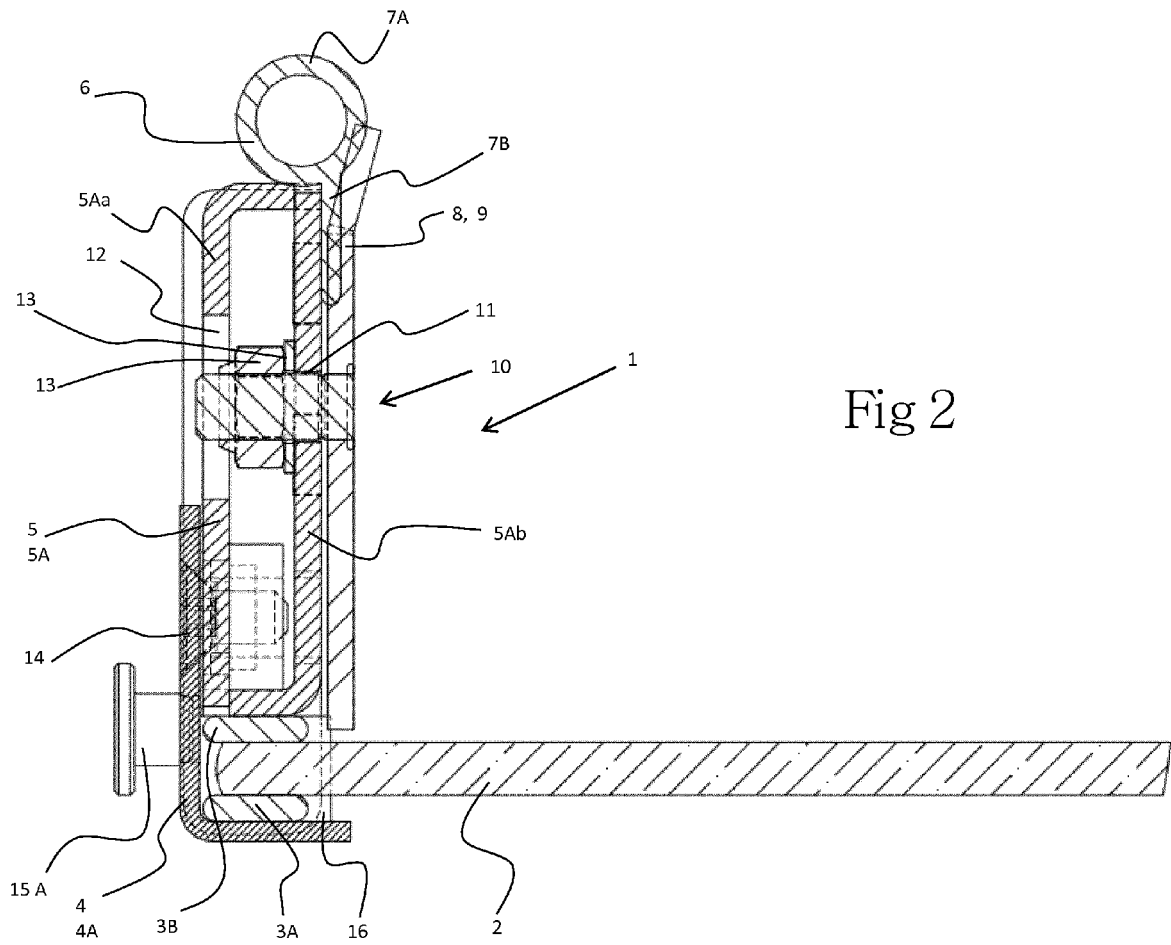


Fig 1





EUROPEAN SEARCH REPORT

Application Number
EP 13 19 3598

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 April 2014	Examiner Rodriguez, Alexander
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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