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(54) **WINDOW SASH MOUNTING ASSEMBLY IN A DUAL-FUNCTION ROOF WINDOW**

(57) The window sash **(1)** is mounted in the intermediate arm **(8)** by means of the pivoting hinge, whereas the first sub-assembly of the latter features an arch-shaped guide **(17)** and is mounted in the intermediate arm **(8),** and the other sub-assembly of the hinge, with the arch-shaped slider **(5)** moving along the said guide, is mounted by means of its slider plate **(4)** to the lateral plane of the side member **(2)** of the sash frame. The inner plane of motion **(6)** adjacent to the side of the arch-shaped slider **(5)** from the side of the sash **(1)** and the outer plane of motion **(7)** adjacent to the opposite side of the slider **(5)** are located on both sides of the plane **(12)** perpendicular to the axis of rotation of the sash, determined by the geometrical centre **(11)** of the intermediate arm's **(8)** main cross-section.

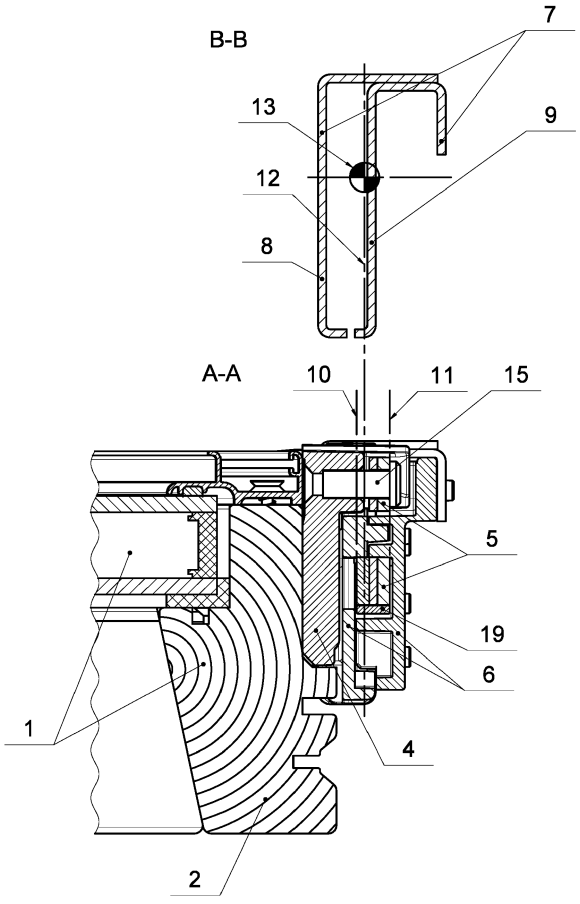

Fig. 2

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Description

[0001] The invention relates to a window sash mounting assembly in a dual-function roof window opened as a pivoting one, that is by rotation of the sash around a horizontal axis located slightly above half of the window, or opened as a tilting one, that is by rotation of the sash around a horizontal axis located at the top of the window, near the upper member of the window frame.

[0002] **FIELD OF THE INVENTION.** The window sash mounting assembly in a dual-function roof window, comprising two intermediate arms, situated on the outside of the window sash on its right and left side. A lower ends of said arms are connected by two pivoting hinges (one on each side of the window) to the window sash, where in each of the hinges, the sub-assembly attached in the intermediate arm features an arch-shaped guide, and the sub-assembly attached to the sash features an arch-shaped slider, is characterised in that in each pivoting hinge two planes adjacent to the sides of the slider from the side of the sash and from the outside, on its section moving along the guide, are located on both sides of the plane perpendicular to the axis of rotation of the sash, determined by the geometrical centre of the intermediate arm's main cross-section. The indicated planes adjacent to the slider are further herein referred to as the 'inner plane of motion' -with regard to the plane adjacent to the slider from the side of the sash, and the 'outer plane of motion' - with regard to the plane adjacent to the slider from the outer, lateral side of the window. The 'geometrical centre of the main cross-section' in the intermediate arm shall be understood as position of the said geometrical centre on the arm's sections which do not feature any openings, journals, tabs or other shape elements which might locally displace the geometrical centre of the arm's cross-section.

[0003] Upper ends of the intermediate arms are connected by tilting hinges to the window frame. When the window is opened in the pivoting function, intermediate arms rest on the window frame, whereas only the sash is rotating. When the window is opened in the tilting function, intermediate arms are rotating along with the window sash. Intermediate arms always move around the horizontal axis, i.e. in the vertical plane; therefore, location of the slider's inner plane of motion and outer plane of motion on both sides of the plane perpendicular to the axis of rotation of the sash, determined by the geometrical centre of the intermediate arm's main cross-section, as indicated above, refers to all temporary positions of the intermediate arm. The indicated location of the inner and outer plane of motion of the slider with respect to the geometrical centre of the intermediate arm's cross-section, refers also to the situation wherein the arch-shaped slider is locked in a fixed, forward-most position slid out of the guide, and the window is further opened by rotation of the sash on the axis connecting the arch-shaped slider with the plate referred to as the 'slider plate' and attaching the hinge sub-assembly to the lateral plane of the window sash frame.

[0004] In particular, the intermediate arm has a box-like structure, and the slider of the pivoting hinge fits into the cross-section of this intermediate arm with at least some of its width. Preferably, the slider's inner plane of motion and outer plane of motion in the pivoting hinge are located symmetrically with respect to the plane perpendicular to the axis of rotation of the sash, determined by the geometrical centre of the intermediate arm's main cross-section.

[0005] For implementation of the slider's location with respect to the intermediate arm, as described herein, the slider plate has a spacer offset that is monolithic with the same. From the offset protrudes the slider's axis on which the arch-shaped slider is mounted in the form of a metal sheet pack: near the point of attachment on the slider's axis there are two metal sheet plates, and on the section fitting into the guide there are three metal sheet plates. The slider plate of the pivoting hinge is preferably cast, in particular of the aluminium-zinc alloy. The slider plate of the hinge has also a supporting tab, protruding from the plate's spacer offset towards the subassembly of the guide-comprising hinge. In the hinge's position with the slider in the forward-most position slid out of the guide, where the window is further opened by rotation of the sash on the slider's axes, the supporting tab rests on the guide in the first sub-assembly of the pivoting hinge on both sides of the arch-shaped slider.

[0006] **The invention's embodiment.** The window sash mounting assembly in a dual-function roof window, being the subject of the invention, is illustrated in the drawing, wherein individual figures represent the following:

Fig. 1 - The roof window, closed - in axonometric view.

Fig. 2 - Cross-section through the pivoting hinge (with plane marked as A-A in Fig. 1) set up against the superimposed cross-section through the intermediate arm (with plane marked as B-B in Fig. 1).

Fig. 3 - Detail of the pivoting hinge, with parts of the window sash and of the intermediate arm, in the window's partially open position in the pivoting function - in axonometric view.

Fig. 4 - Pivoting hinge sub-assembly attached to the window sash, with its arch-shaped slider and slider plate - in axonometric view.

Reference symbols in the drawing.

[0007]

1 Window sash

2 Side member of the sash frame

3 Glazing unit in the window sash

4 Slider plate of the pivoting hinge

5 Arch-shaped slider of the pivoting hinge

6 Inner plane of motion

7 Outer plane of motion

8 Intermediate arm

9 Channel section of the intermediate arm

10 Z-bar of the intermediate arm

11 Geometrical centre of the intermediate arm's cross-section

12 Plane determined by the geometrical centre of the intermediate arm's cross-section

13 Spacer offset

14 Slider axis

15 Supporting tab

16 Slider plate end stop

17 Arch-shaped guide of the pivoting hinge

18 Upper plane of the guide

19 Oblique bracket for the threaded connector

20 Socket for the threaded connector

21 Flat spring (under the slider)

[0008] Not included: journals fixing the position of the slider plate with respect to the sash frame (claim 9) - protrude from the slider plate perpendicularly to the same, on its opposite side with respect to the slider.

Claims

1. A window sash mounting assembly for a dual-function roof window arranged to be opened in the pivoting function, that is by rotation of the sash around a horizontal axis located slightly above half the height of the window, and/or opened in the tilting function, that is by rotation of the sash around a horizontal axis located at the top of the window, comprising

- two intermediate arms, located on the outside of the sash on its right and left side, wherein upper ends of the said arms are connected by tilting hinges to the window frame, and their lower ends are connected by two pivoting hinges to the window sash, where in each of the hinges, the first hinge sub-assembly comprises an arch-shaped guide attached in the intermediate arm, and the other hinge sub-assembly comprises an arch-shaped slider, moving along the arch-shaped guide of the first sub-assembly, and comprises a plate for attaching the other sub-assembly to the lateral plane of the window sash frame, referred to as the 'slider plate', whereas the arch-shaped slider is connected to the slider plate by means of the axis which is arranged to allow for additional rotation the sash after sliding the slider out of the guide to the forward-most position,

characterised in that

- the two planes of each pivoting hinge which on the section of the slider **(5)** are arranged to be moved along the guide **(17)** are adjacent to its sides from the side of the window sash **(1)** and from the outside, and said planes referred to respectively as the 'inner plane of motion' **(6),** i.e. from the side of the sash, and the 'outer plane of motion' **(7),** are located on both sides of the plane **(12)** perpendicular to the axis of rotation of the sash, determined by the geometrical centre **(11)** of the intermediate arm's **(8)** main cross-section in all its positions.

2. The window sash mounting assembly according to claim 1, **characterised in that** the intermediate arm has a box-like structure, and the slider of the pivoting hinge fits into the cross-section of the intermediate arm with at least some of its width.

3. The window sash mounting assembly according to claim 1, or 2, **characterised in that** the slider's inner plane of motion and outer plane of motion in the pivoting hinge are located symmetrically with respect to the plane perpendicular to the axis of rotation of the sash, determined by the geometrical centre of the intermediate arm's main cross-section.

4. The window sash mounting assembly according to claim 1, or 2, or 3, **characterised in that** the slider plate **(4)** has a spacer offset **(13)** that is monolithic with the same, from which protrudes the axis **(14)** on which the arch-shaped slider **(5)** is mounted.

5. The window sash mounting assembly according to claim 1, or 2, or 3, or 4, **characterised in that** the slider plate **(4)** of the hinge has a supporting tab **(15)** protruding from the plate towards the subassembly of the guide-comprising hinge, and while the hinge

is in the position with the slider **(5)** slid out of the guide, the supporting tab rests on the guide on both sides of the arch-shaped slider.

6. The window sash mounting assembly according to claim 1, or 2, or 3, or 4, or 5, **characterised in that** the slider plate **(4)** of the pivoting hinge is cast, preferably of the aluminium-zinc alloy.

7. The window sash mounting assembly according to one of the claims from 1 to 6, **characterised in that** the arch-shaped guide **(17)** is cast, preferably of the aluminium-zinc alloy.

8. The window sash mounting assembly according to one of the claims from 1 to 7, **characterised in that** the slider plate **(4)** features at least one oblique bracket **(19)** with an opening for at least one threaded connector attaching the plate to the sash frame, the said connector being located at an acute angle with respect to the main plane of the plate's adhesion to the lateral plane of the sash frame, and geometrical axes of openings in oblique brackets are located in transversal planes with respect to the longer side of the slider plate.

9. The window sash mounting assembly according to claim 8, **characterised in that** the slider plate features journals fixing its position with respect to the sash frame.

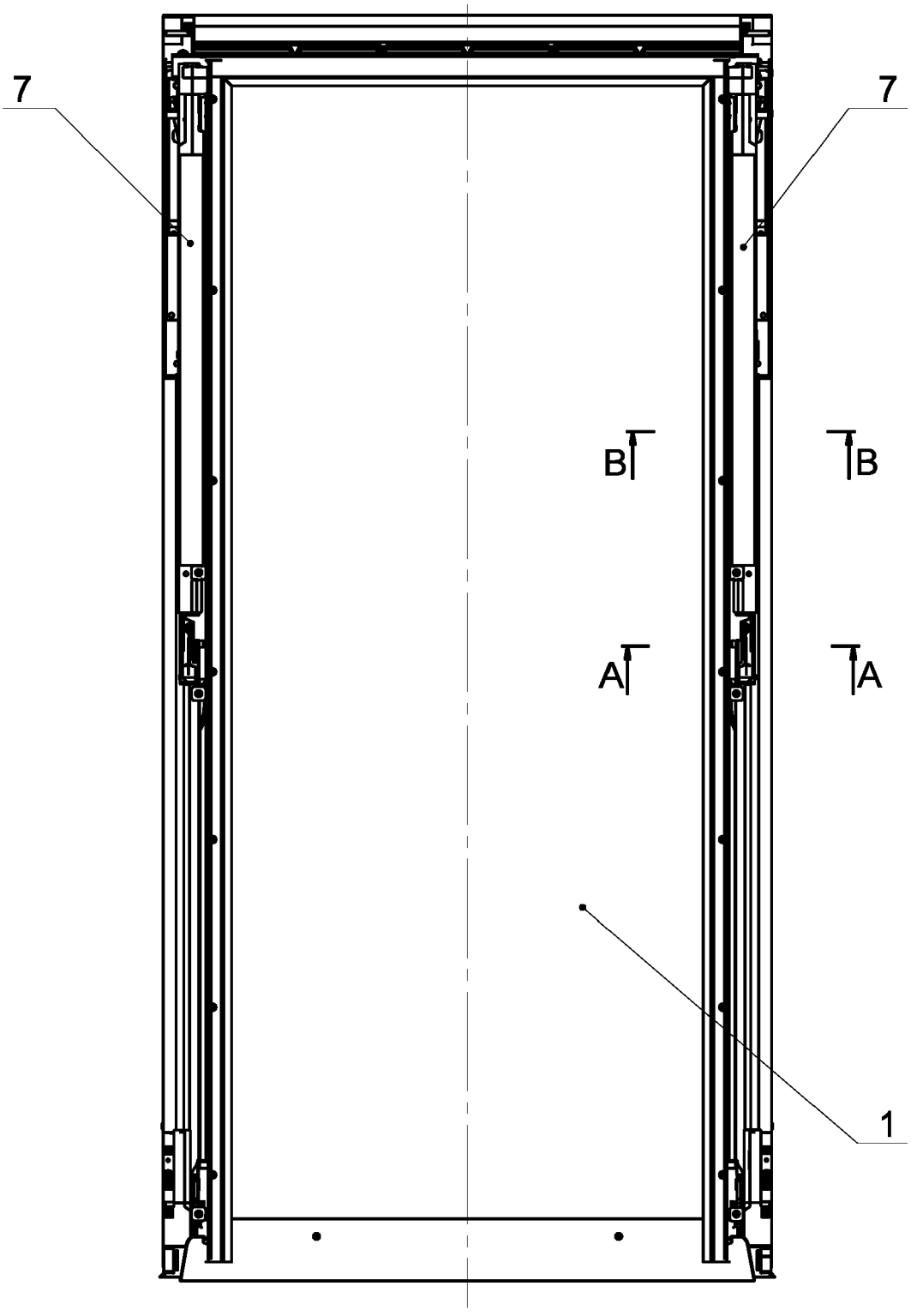

Fig. 1

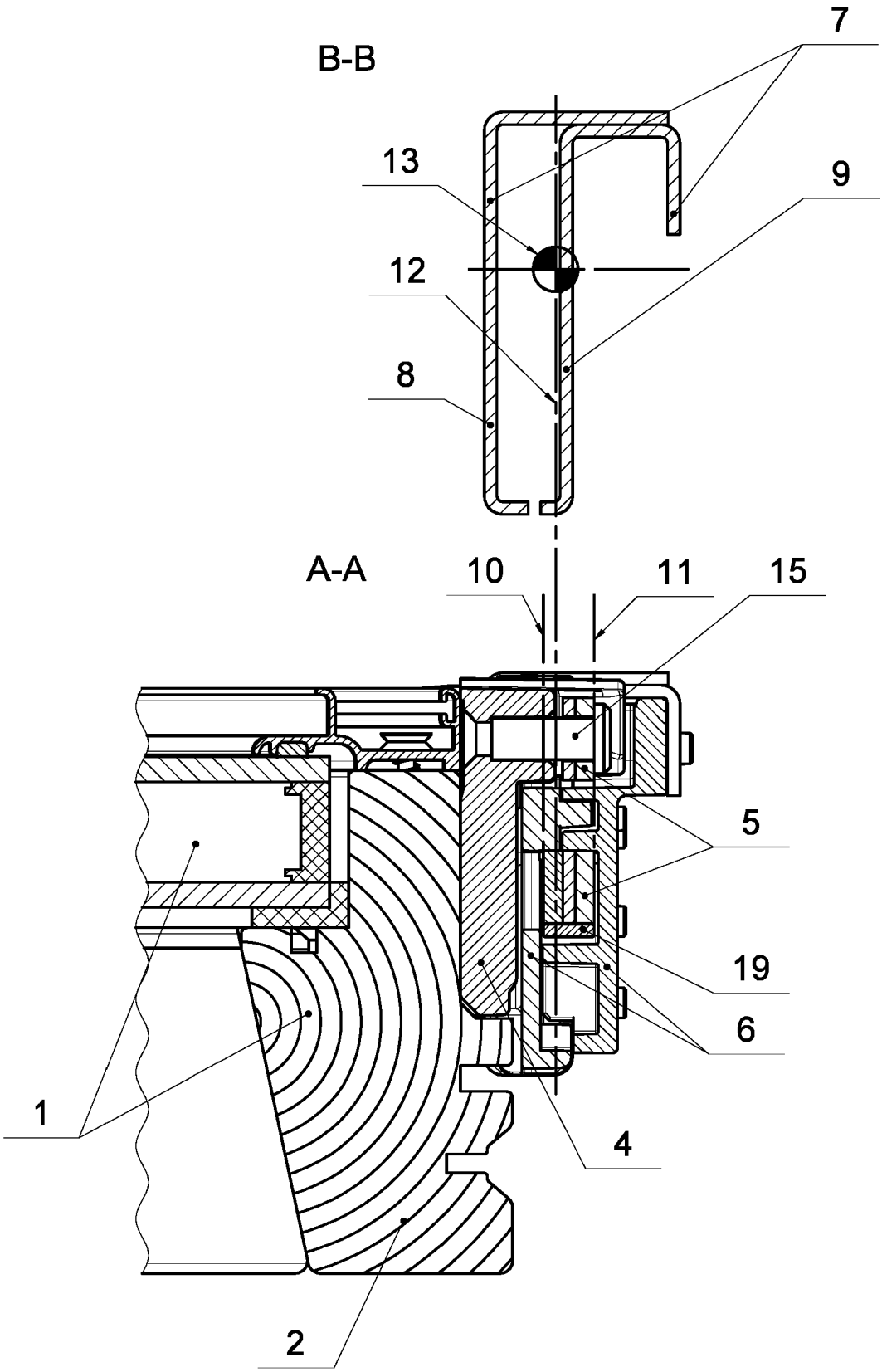

Fig. 2

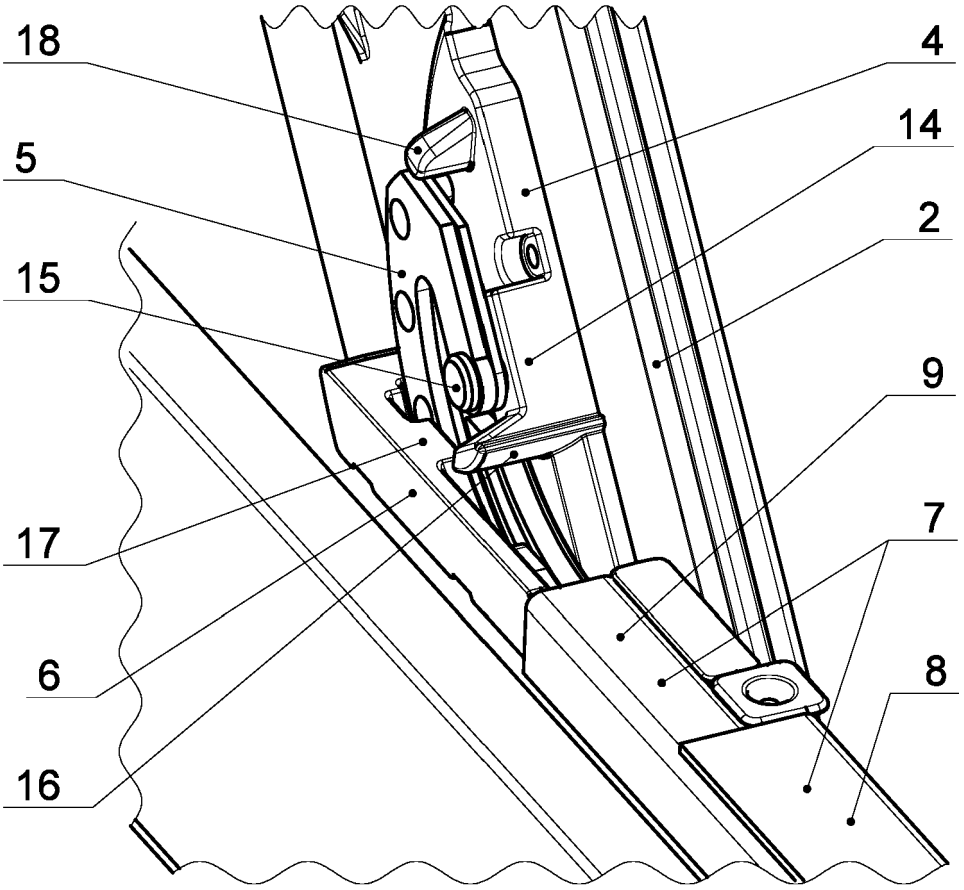

Fig. 3

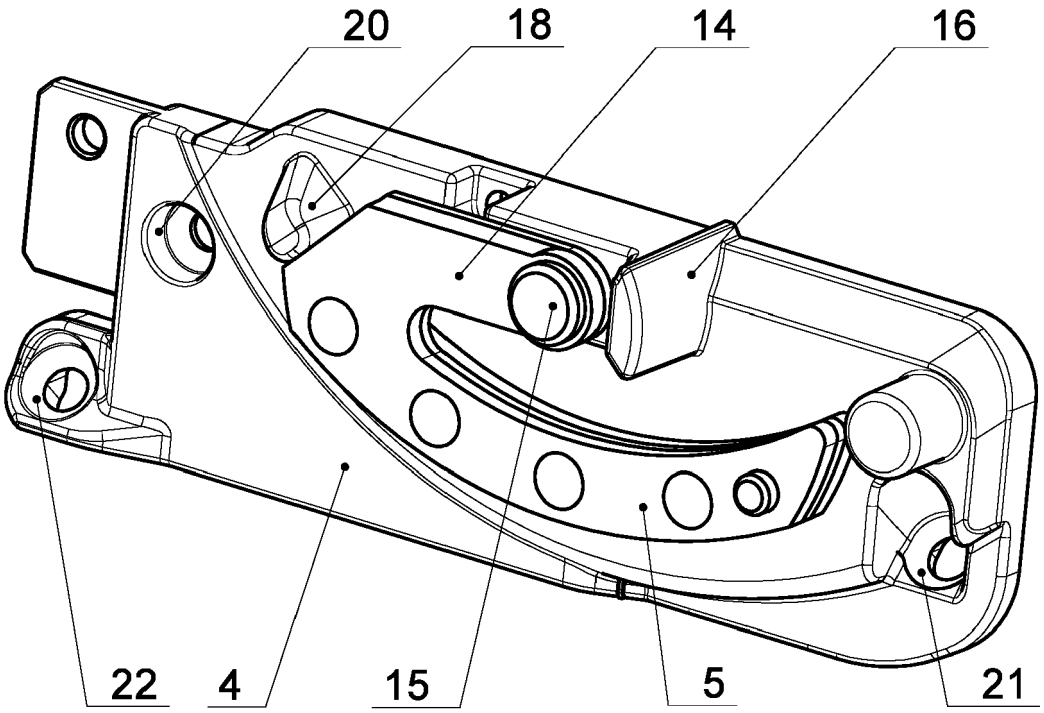

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 18 15 0283

DOCUMENTS CONSIDERED TO BE RELEVANT

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	5 June 2018	Leroux, Corentine

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 15 0283

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