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(71) Applicant: **Fakro PP Spolka Z O.O.**
33-300 Nowy Sacz (PL)

(72) Inventors:
- **Mucha, Lukasz**
  33-330 Grybow (PL)
- **Swierk, Piotr**
  34-730 Mszana Dolna (PL)
- **Migacz, Slawomir**
  33-300 Nowy Sacz (PL)

(74) Representative: **Kacperski, Andrzej**
Kancelaria Prawno-Patentowa
ul. Kupa 3/9
31-057 Krakow (PL)

(54) **Window set for barrel roof**

(57) Window set for barrel roof, comprising the roof window further comprising the window frame and the sash frame, each comprising stiles, top rail and bottom rail, said sash frame comprising the flat window pane with the set of seals, which window includes the adapter frame **(3)** fastened to the window frame **(1),** said stiles **(31)** having concave surfaces **(34)** opposite the window frame and straight surfaces fitting said window frame, and the bottom rail **(32)** and top frame **(33)** of said adapter frame **(3)** having straight surfaces both by and opposite said window frame.

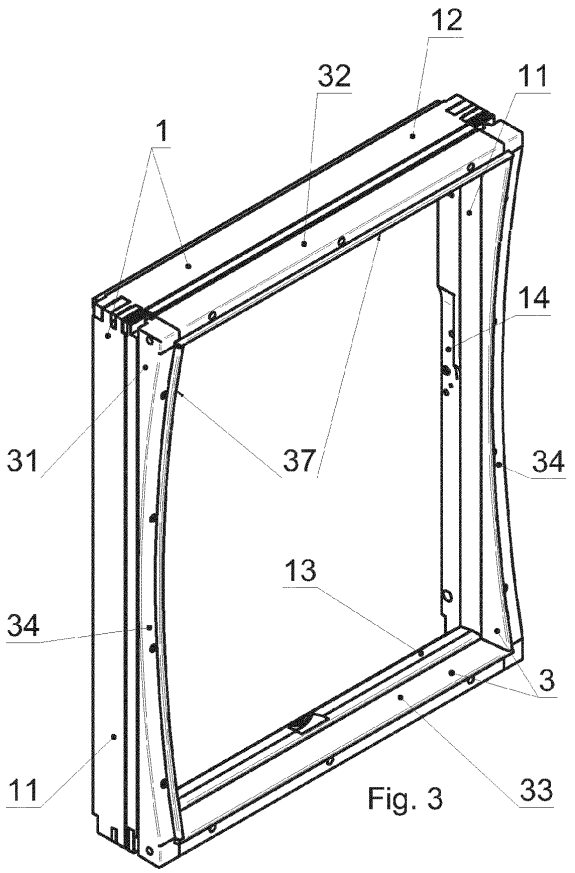

Fig. 3

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Description

[0001] An invention relates to a window set for mounting in a barrel roof. The invention is used in building industry, for daylighting and ventilation of attics with barrel roofs.

[0002] A roof window for mounting in a barrel roof is well known from PL-P-381521. The window has arched stiles of the window frame and sash frame, and arched window pane. Due to the use of bent glass, the solution is very expensive.

[0003] A window set for barrel roof comprising a roof window, further including a window frame and a sash frame, with an adapter frame joined with the window frame, where stiles have concave surfaces opposite the window frame, with a radius of curvature corresponding to the curvature of roof structure rafters. The surfaces of the adapter frame stiles fit the window frame and are straight. A top and bottom rail of the adapter frame, as well as both top and bottom surface of the rails are straight. Both the window frame and the sash frame comprise two stiles, bottom and top rail, and the sash frame further includes a flat window pane with seals. The sash frame is joined with the window frame with at least a single pair of hinges fastened to the stiles of the window frame and the sash frame, and the window further includes lock maintaining its closed position. The roof window also comprises seals between the window frame and the sash frame, set of covers on the window frame and the sash frame, and further includes a roof flashing sealing the joint of the window with the roof structure. The roof flashing fits the window frame and the adapter frame, and match the arched roof shape.

[0004] The window set for barrel roof, apart from the roof window detailed above, described herein as a "main window", and may also comprise additional window sets for mounting in the barrel roof slope at the extension of the main window. The additional window sets are understood to be roof windows with opened sash or a fixed skylight. Each of the additional window sets has a separate adapter frame, independent from the main window.

[0005] In the first embodiment, the window set comprises the main window with the adapter frame.

[0006] In the second embodiment, the window set comprises the bottom window, intended for mounting in the barrel roof below the main window. The fittings of the bottom window comprising window pane, hinges, covers and other components are as in the main window. Both main and bottom window comprise the common roof flashing, fitting the window frame and the adapter frame from the inside and matching the arched roof shape on the outside. Between the bottom rail of the main window and the top rail of the bottom window, a common roof flashing is trough shaped, preferably with the depth increasing to the outside. The common roof flashing does not exclude version, where the flashing comprises overlapping sections for installation on the roof.

[0007] In the third embodiment, the window set comprises a fixed bottom skylight with a flat window pane with seals, intended for mounting in the barrel roof below the main window. To maintain a uniform width of the main window and the skylight, which also improves the design, the skylight window pane is fitted in an inner frame, fastened to the window frame, and the transverse diameter of the inner frame stiles are similar to the transverse diameter of the stiles in the main window sash frame. The main window and the skylight comprise a common roof flashing, fitting the window frame of both the main window and the skylight and both adapter frames. The roof flashing design is as in the second embodiment.

[0008] In the fourth embodiment, the window set comprises the top window, intended for mounting in the barrel roof above the main window, which may be combined with the main window only or also with the bottom window or the bottom skylight. The fittings comprising window pane, hinges, covers and other components are as in the main window. All window sets in this embodiment comprise a common roof flashing, fitting the window frames and adapter frames.

[0009] In the version of the top window set with the main window only, common roof flashing is as in the second and the third embodiment. The trough of the roof flashing is positioned between the top rail of the main window and the bottom rail of the main window. In the version of the window set with the bottom window or the bottom skylight, all three window sets comprise a common roof flashing, fitting the window frames and adapter frames. The roof flashing have two troughs, one between the top rail of the main window and the bottom rail of the top window, and the other (as in the second and third embodiment) between the bottom rail of the main window and the top rail of the bottom window.

[0010] In the fifth embodiment, the window set have the top skylight, intended for mounting in the barrel roof above the main window, which may be combined with the main window only or also with the bottom window or the bottom skylight. The fittings of the top skylight comprising window pane, hinges, covers and other components are as in the bottom skylight. All windows and skylights in this version of the window set have a common roof flashing, fitting the window frames and adapter frames. The roof flashing is as in the fourth embodiment, in the version for the skylight set with the main window only or the set with the bottom window or the bottom skylight.

[0011] The window sets of the second, third, fourth or fifth embodiment may have the same length of all stiles in the window frames and the same height of windows and skylights. The window sets may further include stiles in the window frames of additional window sets shorter than the window frame of the main window, where the top or bottom windows and skylights have a reduced height in relation to the main window. The window sets of the fourth and fifth embodiment may have shorter stiles both in top and bottom window or skylight, and in only one of them.

[0012] The window set for barrel roof with adapter frames at each window frame included in the set allows mounting standard roof windows with flat window frame and sash frame, fitted with a standard flat window pane in the barrel roof. It does not require use of bent glass, significantly reducing the window price.

[0013] Window set for barrel roof of the present invention shown as embodiments in the following drawings, where the following figures shows:

Fig. 1 - Set of two windows mounted in the barrel roof - axonometric view.
Fig. 2 - Set of two windows - cross section of the plane parallel to the arched roof rafters.
Fig. 3 - Adapter frame fastened to the window frame - axonometric view.
Fig. 4 - Adapter frame - axonometric exploded view.
Fig. 5 - Detailed view of the top corner joint of the adapter frame.
Fig. 6 - Detailed view of the bottom corner joint of the adapter frame.
Fig. 7 - Longitudinal section of the adapter frame and the window frame.
Fig. 8 - Detailed view of the joint of top rails of Fig. 7.
Fig. 9 - Detailed view of the joint of stiles - line A-A of Fig. 5.
Fig. 10 - Detailed view of the joint of bottom rails of Fig. 7.

[0014] Window set for barrel roof comprising two roof windows, each with flat window frame **1** and the sash **2.** Both windows in these embodiments are identical, it is not required to differentiate between the main and additional window. The window frame comprises two stiles **11,** left and right, top rail **12** and bottom rail **13,** all of them straight forming the flat window frame. The sash **2** of the roof window comprises a flat sash frame **21** with the flat window pane **22** specifically comprising two glass panes. Sash frame **21,** specifically its stiles are joint with stiles **11** of the window frame with two hinges, at the stiles, above half of the window height. The window frame **1** comprises recesses **14** in the stiles **11** from the inside, where the hinges are installed.

[0015] The adapter frame **3** comprising two stiles **31,** top rail **32** and bottom rail **33** is fixed to the window frame **1,** from the attic side in accordance with this embodiment. The stiles and the rails of the adapter frame are joined with corresponding stiles **11,** top rail **12** and bottom rail **13.** The stiles **31** of the adapter frame comprise concave surfaces **34** opposite to the window frame, and the curvature of the concave surfaces **34** corresponds to the curvature of the barrel roof. The remaining surface of both stiles **31** and all surfaces of top **32** and bottom **33** rail of the adapter frame, are straight.

[0016] The stiles **31** of the adapter frame **3** are joined with top **32** and bottom **33** rail of the frame with screws **35.** To increase the rigidity of the adapter frame, top rail **32** have splines **32a** on both ends, and the bottom rail **33** have splines **33a** on its ends, where the splines of both stiles correspond to the grooves in stiles, in the surfaces from the inside of the adapter frame.

[0017] The assembled adapter frame **3** is fixed to the window frame **1** with screws **36** through the stiles **31,** top **32** and bottom **33** rails of the adapter frame and corresponding window frame stiles and rails. Due to an arched shape of the surface **34** in stiles **31** of the adapter frame, and variable thickness of the stiles, the length of the screws **36** fastening the stiles **31** with stiles of the window frame is variable.

[0018] All adapter frame **3** stiles and rails: stiles **31,** top **32** and bottom **33** rail, at its surfaces fitting the window frame stiles **11,** top **12** and bottom **13** rail have splines, corresponding to the grooves at the surfaces of the window frame stiles (Fig. 8, 9, and 10) positioned from the side of the attic. The grooves in the window frame stiles, if the window frame is mounted in a flat roof are used for setting the position of components which covers the side surfaces of the opening in the roof fitted with a window, where the components fit the window frame. To maintain the layout of the retaining surfaces, stiles of the adapter frame **3** have the edges positioned from the inside of the frame. In stiles, the edge **31 a** is concave, as the concave surface **34,** which it is adjacent to, and the edge **32b** of the top rail and the edge **33b** of the bottom rail are straight. In the installed adapter frame **3**, the edges form a uniform, frame **37** pointing the attic.

[0019] The frames **1** of both roof windows are positioned between two arched rafters **4,** where stiles **11** of the frames are fixed with standard angle holders, used in roof windows. Between two frames, the rafters **4** are joined with a crossbar **41,** and from the inside of the attic, a support plate **42** is fastened with screws. Both adapter frames **3** are positioned on the support plate **42** and supported by the top rail of the adapter frame, positioned below the crossbar **41** and the bottom rail of the adapter frame above the crossbar.

[0020] Each of the roof windows has a set of covers **5** made of metal sheet, protecting the attic against precipitation. The covers **51** are installed over the hinges connecting the sash with the window frame, and fixed to the frame **1,** and the covers **52** positioned below the hinges are fixed to the sash **2** on the sash frame **21.** The set of two roof windows also has a common roof flashing **6** made of metal sheet, which with the surfaces perpendicular to the roof surface **61** fit both the window frames **1** and adapter frames **3.** The flash roofing **6** with the walls fitted to the roof matching the roof curvature enters the roof covering **43** e.g. roof tiles at the section above the top window and at its sides, and the section **62** of the flash roofing is positioned over the roof covering **43.** Between two windows, the roof flashing comprises a trough **63,** draining the rain water from the window located above.

Claims

1. Window set for barrel roof, comprising the roof window further comprising the window frame and the sash frame, each comprising stiles, top rail and bottom rail, said sash frame comprising the flat window pane with the set of seals, said sash frame joined with said window frame with at least a single pair of hinges, said hinges fastened to the window frame stiles and sash frame stiles in closed position, said seals fitted between the window frame and the sash frame, and roof flashing fitted between the window and the roof structure **characterised in that** the window includes the adapter frame (3) fastened to the window frame (1), said stiles (31) having concave surfaces (34) opposite the window frame and straight surfaces fitting said window frame, and the bottom rail (32) and top frame (33) of said adapter frame (3) having straight surfaces both by and opposite said window frame.

2. Window set as claimed in claim 1 **characterised in that** apart from the main window of claim 1, hereinafter referred to as the "main window", it comprises additional window sets for mounting in the covering of the barrel roof as the extension of the main window, and each of said window sets comprising a separate adapter frame.

3. Window set as claimed in claim 2 **characterised in that** it comprises the bottom window for mounting in the barrel roof below the main window, with the fittings as specified for the main window, where both windows have the common roof flashing, fitting the frames of both windows.

4. Window set as claimed in claim 2 **characterised in that** it comprises fixed bottom skylight, said skylight comprising the flat window with the set of seals fitted in the window frame, said skylight intended for mounting in the barrel roof below the main window and said main window and skylight having the common roof flashing, said roof flashing fitting the window frames and adapter frames.

5. Window as claimed in claim 2, 3 or 4 **characterised in that** said top window intended for mounting in the barrel roof above the main window, with fittings as for the main window, where all window sets comprise common roof flashing, fitting the window frames and adapter frames.

6. Window set as claimed in claim 1 2, 3, 4 or 5 **characterised in that** it comprises fixed top skylight, intended for mounting in the barrel roof above said main window, further including flat window pane with the set of seals fitted in the window frame and said windows and skylights having common roof flashing, fitting the window frames and adapter frames.

7. Window set as claimed in claim 2, 4, 5 or 6 **characterised in that** the stiles in the window frames of said additional windows are shorter than stiles of the main window frame.

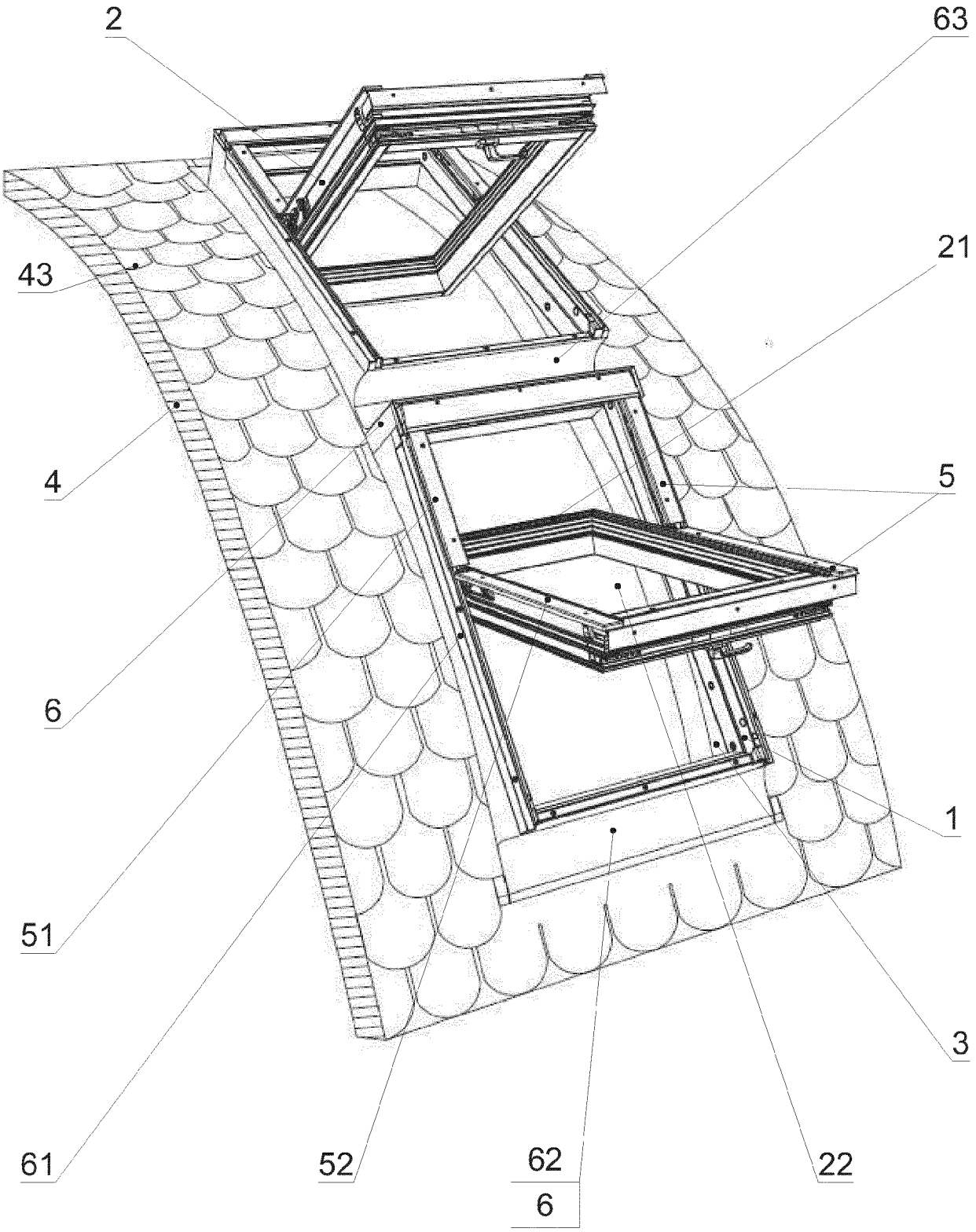

Fig. 1

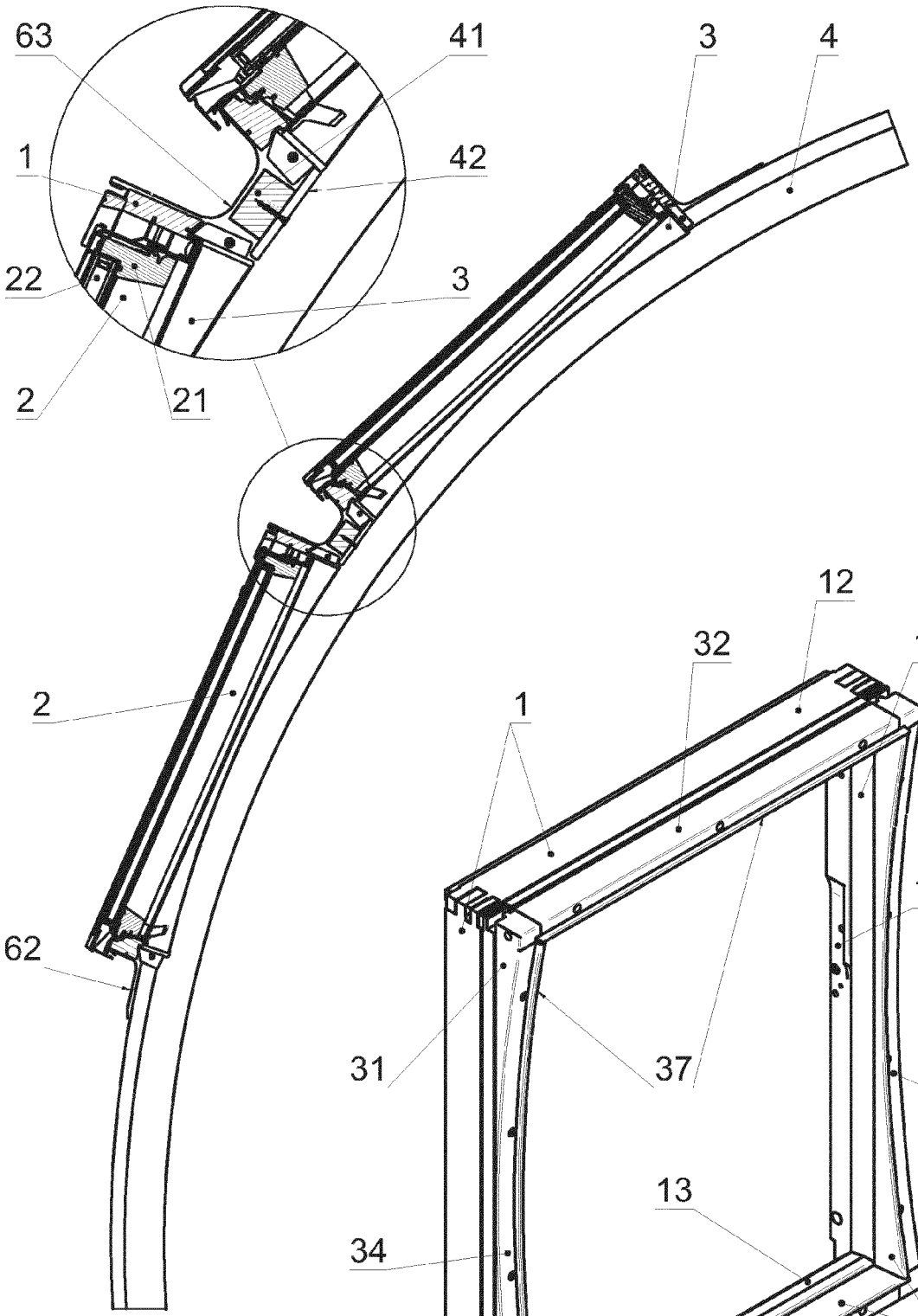

Fig. 2

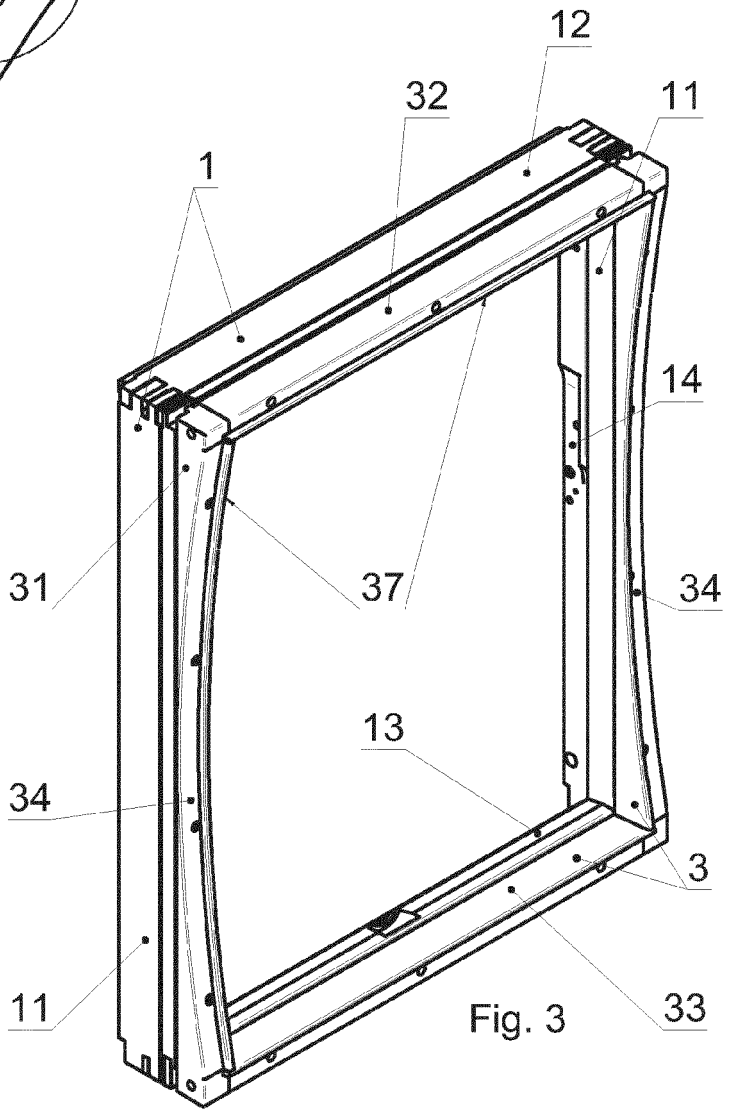

Fig. 3

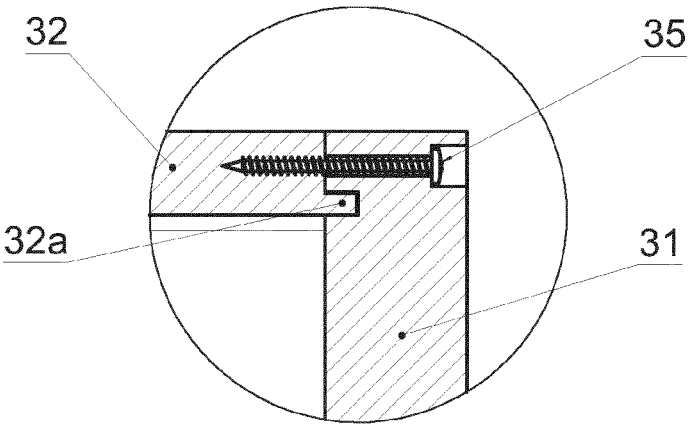

Fig. 5

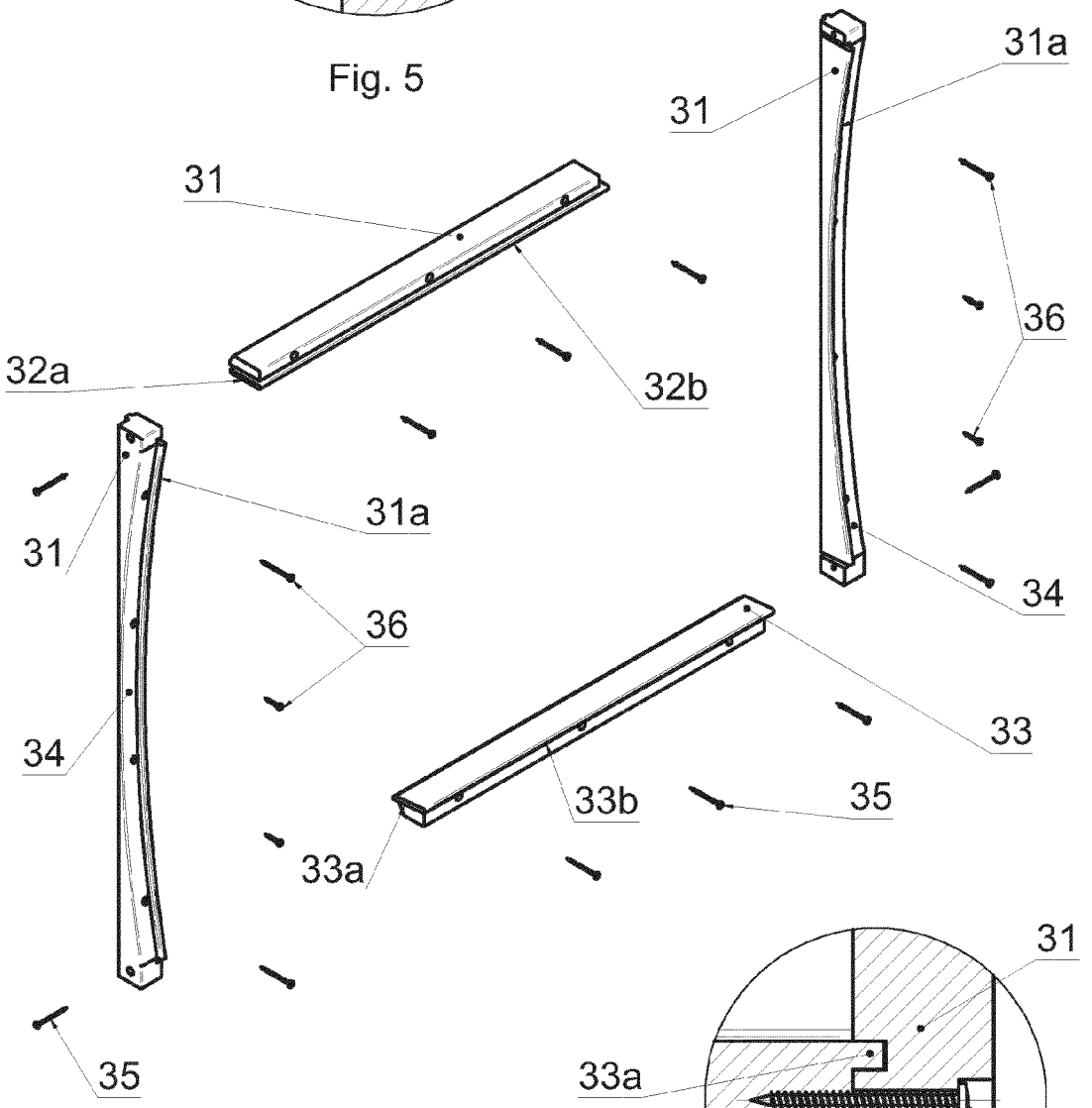

Fig. 4

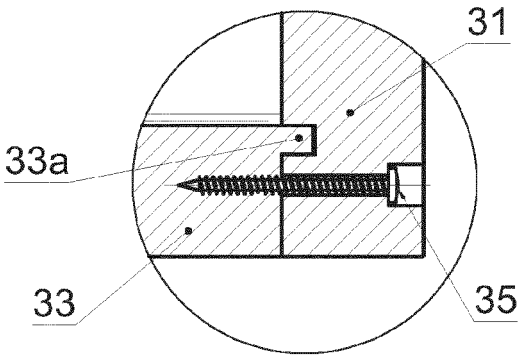

Fig. 6

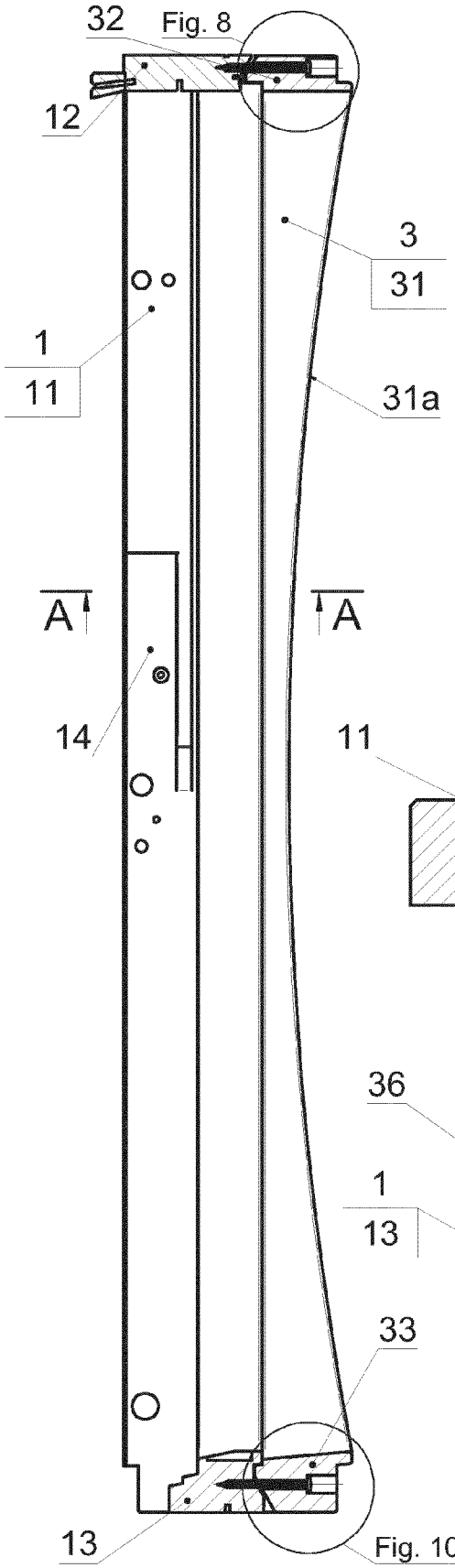

Fig. 7

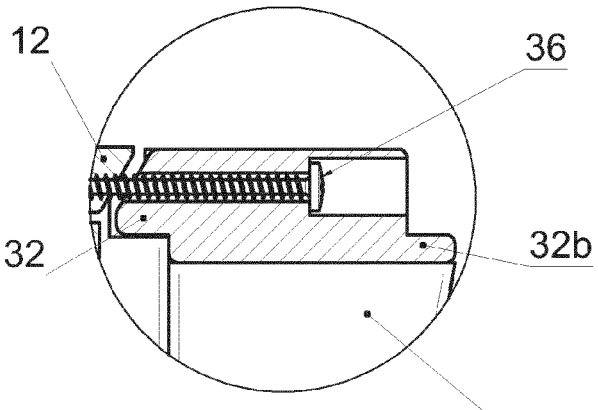

Fig. 8

A-A

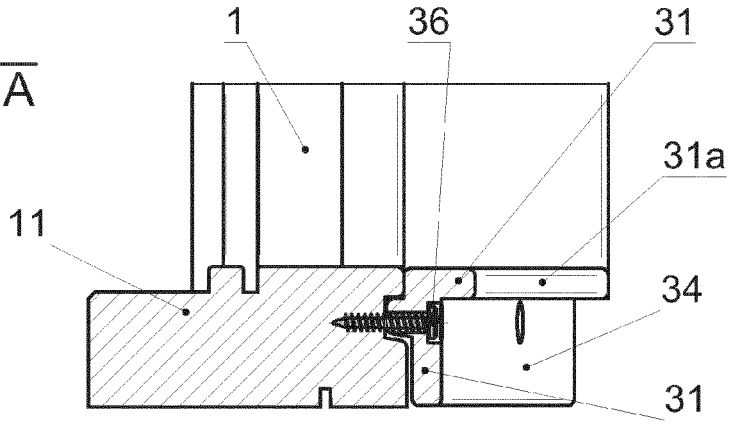

Fig. 9

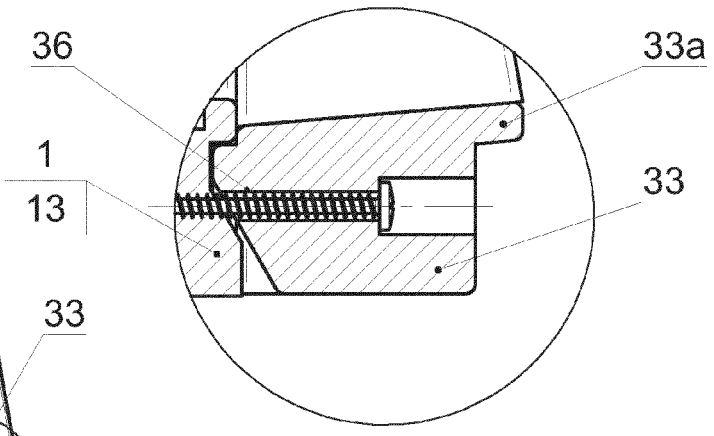

Fig. 10

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- PL 381521 P **[0002]**