

(19)



(11)

EP 4 571 009 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.06.2025 Bulletin 2025/25

(51) International Patent Classification (IPC):
E04D 13/03^(2006.01) E04D 13/035^(2006.01)

(21) Application number: **24218319.2**

(52) Cooperative Patent Classification (CPC):
E04D 13/031; E04D 13/0354

(22) Date of filing: **09.12.2024**

(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 ME MK MT NL
NO PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(71) Applicant: **FAKRO PP Sp. z o.o.**
33-300 Nowy Sacz (PL)

(72) Inventor: **Ryszard, Florek**
33-336 Labowa (PL)

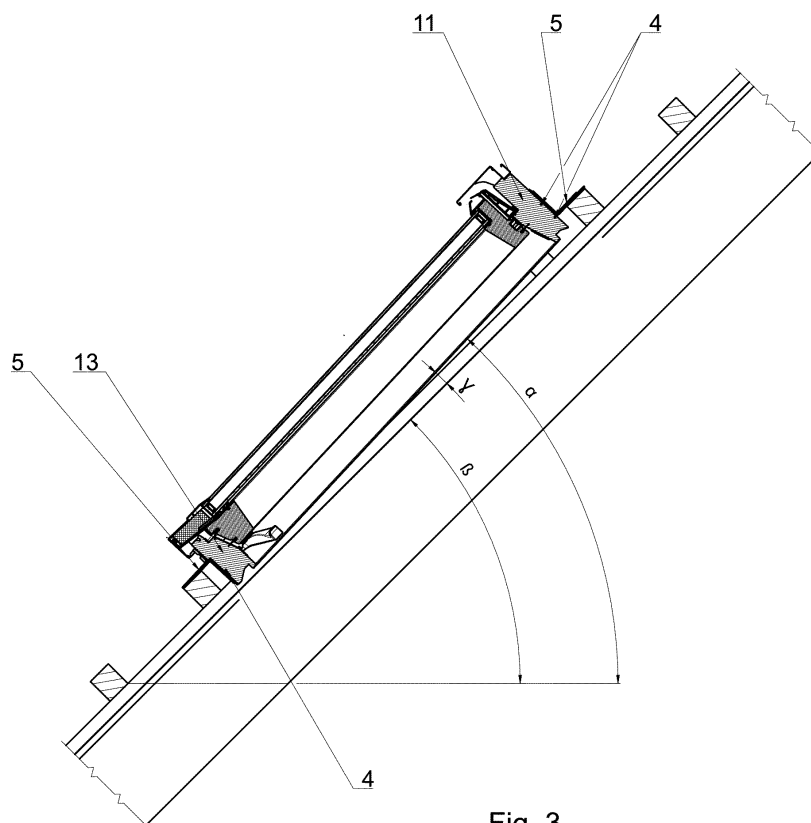
(74) Representative: **Bukanska, Alicja**
Fakro PP Sp. z o.o.
ul. Wegierska 144a
33-300 Nowy Sacz (PL)

(30) Priority: **13.12.2023 PL 44708223**

(54) ROOF WINDOW AND ROOF WINDOW ASSEMBLY METHOD IN A ROOF STRUCTURE

(57) The subject-matter of the invention comprises a roof window and an assembly method for that window, constructed out of a jamb and a sash with a glass unit, and the roof window sash is seated in the jamb circumference using a pair of hinges, and the jamb is constructed out of four stiles attached to each other to form a rectangular frame, that is upper stile (11), lower stile (13) and two side

stiles (12), wherein upper stile (11) in its assembled state in a roof is higher than all the other stiles in the roof, and jamb stiles feature window assembly in roof depth markers (4), characterized in that, in an assembled state in a roof, roof window slope angle α is within the 1-30° range and angle α is different than roof pitch angle β .

**Fig. 3****EP 4 571 009 A1**

Description

[0001] The subject-matter of the invention comprises a roof window and roof window assembly method in a roof structure, and in particular in a flat roof structure.

[0002] A solution entailing a flat roof skylight with an inclined jamb has been disclosed under US4413450A for example. The jamb, referred to as a "curb" in the said application, is an element of the skylight and is mounted on a roof. The inclined curb ensures an inclined skylight position in a roof, which in particular provides rainwater run-off from its surface.

[0003] An adjustable dormer comprising three main units has also been disclosed under DE102009059953A1. The dormer lower part is attached to a building roof in accordance with technical standards. The roof dormer intermediate part is foldable or articulated and comprises a front window and side panels which can also be windows. The skylight is seated on the upper part of the front window and two side panels. In one embodiment, the dormer lower part is seated in the roof deeper than the dormer upper part.

[0004] Roof window tightness depends, amongst others, on the angle at which it is installed in a roof, which usually corresponds to the roof pitch angle and the sealing unit in the form of a sealing flange. Window are often designed to provide tightness for a certain range of roof pitch angles, and if a given roof exceeds that range, changes are made to the roof window structure in order to ensure tightness of the window itself as well as the seal between the window and the covering. The present invention pertains to a roof window according to claim 1 and a method for assembling the said roof window according to claim 5 on a flat roof, with the roof pitch angle within the 2-15° range, wherein the window is designed to provide tightness for a roof pitch angle of 15°.

[0005] The essence of the invention comprises a roof window constructed out of a jamb and a sash with a glass unit. The roof window sash is seated in the jamb circumference using a pair of hinges, and the jamb is constructed out of four stiles attached to each other to form a rectangular frame, i.e. an upper stile, a lower stile and two side stiles, wherein the upper stile in its assembled state in a roof is higher than all the other stiles in the roof. The assembly method consists of the following stages:

- preparation of a roof opening,
- delivery of the roof window to a roof,
- assembly of the roof window in a pre-prepared roof opening at angle α different from angle β which represents the roof pitch angle,
- assembly of a system specific flange around the roof window.

[0006] Preferably the roof window is assembled in a roof using angle brackets, which are essentially L-shaped in their longitudinal sections. An angle bracket features a bending edge, which, during assembly, overlaps with a place on the jamb stiles indicating the window assembly depth in a roof. Such a place is located on the jamb stile, within its height, which is a defined dimension between the upper and lower surface of each jamb stile. Preferably such a place is a depth marker, in the form of at least one assembly groove running along the length of the stile or a painted line on the stile. On the angle bracket bending edge there may be ridges in the form of teeth which sit in the aforementioned assembly groove during assembly. In disclosed solutions, the roof window features three assembly grooves, so that the distance between the topmost assembly groove determining the deepest assembly depth of the window in a roof and the lowest assembly groove determining the most raised roof window assembly relative to the roof is 60 mm. Preferably, the distances between the assembly grooves are the same. One of the angle bracket arms is mounted on the upper surface of battens or on a counter batten, so that batten upper surface overlaps with an appropriate groove or line on the jamb, and the second angle bracket arm is mounted to the jamb stile. During jamb assembly in a roof, the roof window jamb upper stile and the jamb lower stile are mounted to the roof structure at different assembly depths determined by the aforementioned depth markers. Such a jamb position in a roof makes an angle α , which is the window slope angle in the roof, defined as the angle between the jamb side stile and the horizontal, and it lies within the 1-30° range. In disclosed solutions, the roof window is assembled in a roof, with the roof pitch angle β measured between batten upper surfaces and the horizontal, is equal to angle α . The roof window according to the invention is assembled in a roof in such a way that the jamb upper stile and the lower stile are mounted in a roof at different depths and as such angle α is different from angle β . In the assembled position, the window lower part, and in particular the lower jamb stile, at most partially extends above the upper batten surface and preferably its upper surface is level with the upper batten surface. For the roof window upper stile, in its assembled state, its upper surface is always above the roof batten upper surface, but no window stile is entirely above the roof batten surface. The difference between angles α and β gives us angle γ , defined as the angle between the jamb side stile and the roof upper surface. Knowing angle γ which a technician has to eliminate, they use the following equation to check if the required angle γ is achievable for a given position of the window in a roof.

$$\operatorname{tg}(\gamma) = \frac{\text{jamb assembly depth}}{\text{jamb side stile length}}$$

[0007] The required angle γ reflects the angle by which the roof pitch angle has to be increased relative to the horizontal in order to assemble the window in a roof at angle α for which tightness is ensured.

[0008] The roof window jamb assembly depth is defined by a dimension running along the height of the jamb upper stile, along a section from a jamb corner to a position on the jamb upper stile which indicates an angle bracket support point, that is a position at which the selected roof window assembly depth marker is located. The side stile length is its longest dimension.

[0009] The final window assembly in a roof stage entails assembly of a sealing flange, and a system specific sealing flange is foreseen for every assembly depth.

[0010] The illustration depicts the invention, with given figures depicting the following:

Fig. 1 roof window and roof structure opening

Fig. 2 window assembled in a roof

Fig. 3 longitudinal section of the window assembled in a roof

Fig. 4, 5 angle bracket assembly location on roof window jamb

[0011] The assembly method entails seating the roof window in roof structure opening 3. The roof window is constructed out of a jamb, in the form of frame comprising upper stile 11, lower stile 13 and two side stiles 12 attached to each other at frame corners. Each jamb side stile 13, features roof window hinge jamb section on the inside of the frame for attaching the jamb to a sash with a glass unit. To that end each sash side stile features a hinge sash section, establishing an articulated attachment with the hinge jamb section. The roof window assembly method in roof structure opening 3 entails preparing opening 3, delivery of the roof window to a roof, assembly of the roof window jamb in that opening, and then assembly of the sash with a glass unit in the jamb. At least window jamb upper stile 11 and lower stile 13 feature jamb assembly in roof depth marker 4 on its external surfaces, and preferably they feature three depth markers 4 reflecting three different window assembly depths in a roof. The said markers constitute assembly grooves spanning the entire length of the stiles. Assembly angle brackets 5 teeth are aligned with these grooves and then one assembly bracket arm is attached using screws to the jamb and the other arm is attached to the roof structure. The essence of the invention entails such a roof window assembly, that the roof window jamb is assembled in a roof at angle α which is different than roof pitch angle β . In the present embodiment angle $\beta = 12^\circ$, whereas the window should be assembled at angle α , where $\alpha = 15^\circ$, and to achieve that, a window position in the roof is determined to eliminate the difference in the form of angle γ , where $\gamma = 3^\circ$.

Claims

1. A roof window comprising

a jamb and

a sash with a glass unit, and the roof window sash is seated in the jamb circumference and is attached to the jamb by a pair of hinges,

and the jamb comprising a four stiles attached to each other to form a rectangular frame, called an upper stile (11), a lower stile (13) and two side stiles (12), wherein the upper stile (11) in its assembled state in a roof is higher than all the other stiles in the roof, and the jamb stiles comprises a window assembly in roof depth markers (4),

characterised in that, in an assembled state in a roof, the roof window slope angle α is within the 1-30° range and angle α is different than roof pitch angle β .

2. The roof window according to claim 1 **characterized in that** the roof window jamb stiles comprises at least two depth markers (4).

3. The roof window according to claim 1 or 2 **characterised in that** the depth markers determine an assembly angle bracket assembly place.

4. The roof window according to claim 1 or 2, or 3 **characterized in that** depth markers are either assembly grooves (4) or painted lines.

5. The roof window assembly method in a roof structure comprising the following steps:

- preparation of a roof opening,

delivery of the roof window to a roof, wherein the roof window comprising a jamb and a sash with a glass unit, and the roof window sash is seated in the jamb circumference and is attached to the jamb by a pair of hinges, and the jamb comprising a four stiles attached to each other to form a rectangular frame, called an upper stile (11), a lower stile (13) and two side stiles (12), **characterized in that**

- the next step entails assembly of the window in a roof at angle α , so that roof window jamb upper stile (11) and roof window jamb lower stile (13) are at different assembly depths determined by the depth markers, so that the roof window is assembled in the roof at angle α which lies within the 1-30° range and angle α is different than the roof pitch angle β .

6. The assembly method according to claim 5 **characterized in that** during roof window assembly in a roof, assembly angle bracket (5) teeth are aligned with assembly grooves (4) which constitute depth markers, so that one assembly bracket arm is attached using screws to the jamb and the other arm is attached to the roof structure.

7. The assembly method according to claim 5 or 6 is **characterized in that** the final assembly step entails assembly of a sealing flange around the roof window.

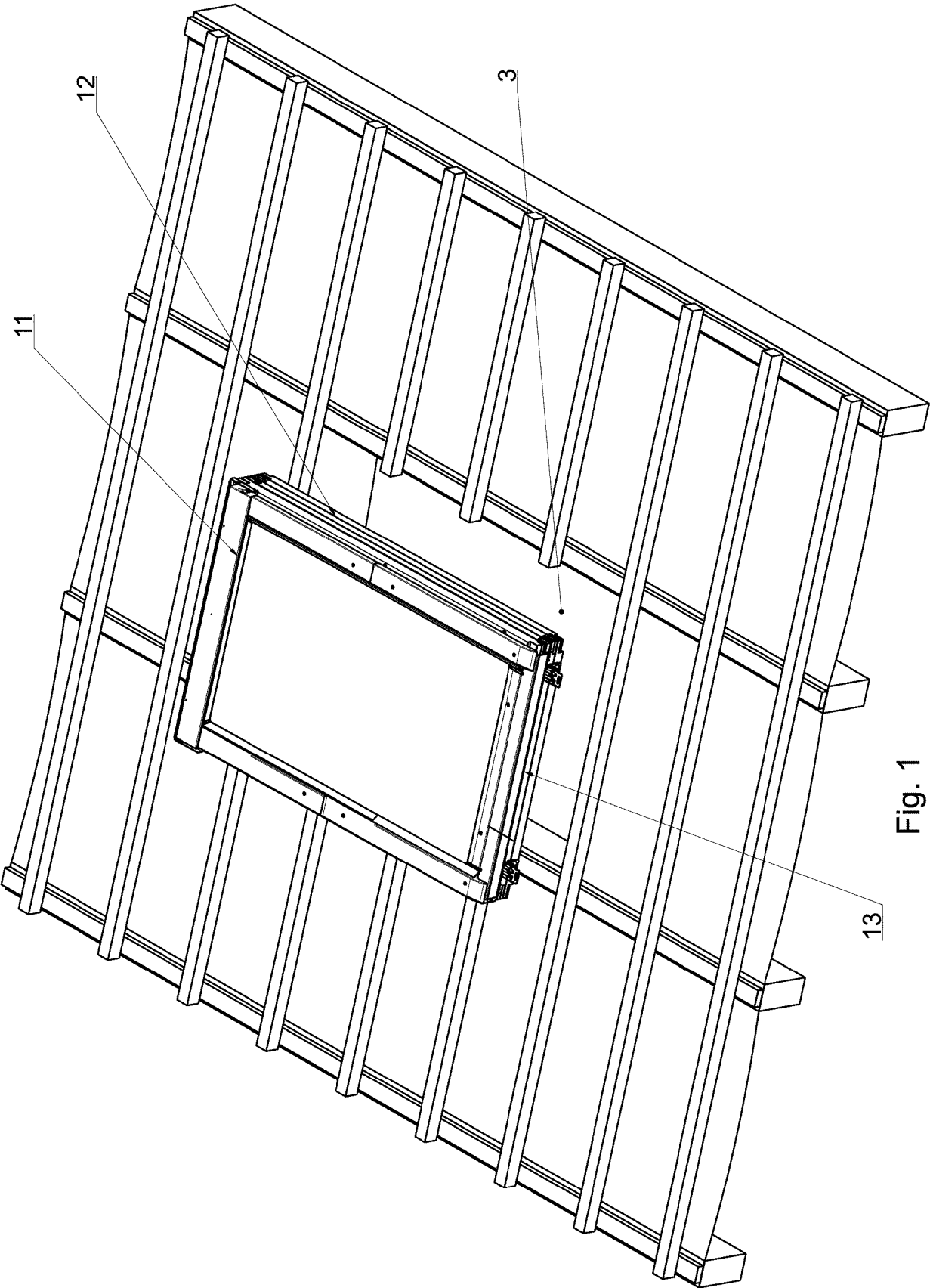


Fig. 1

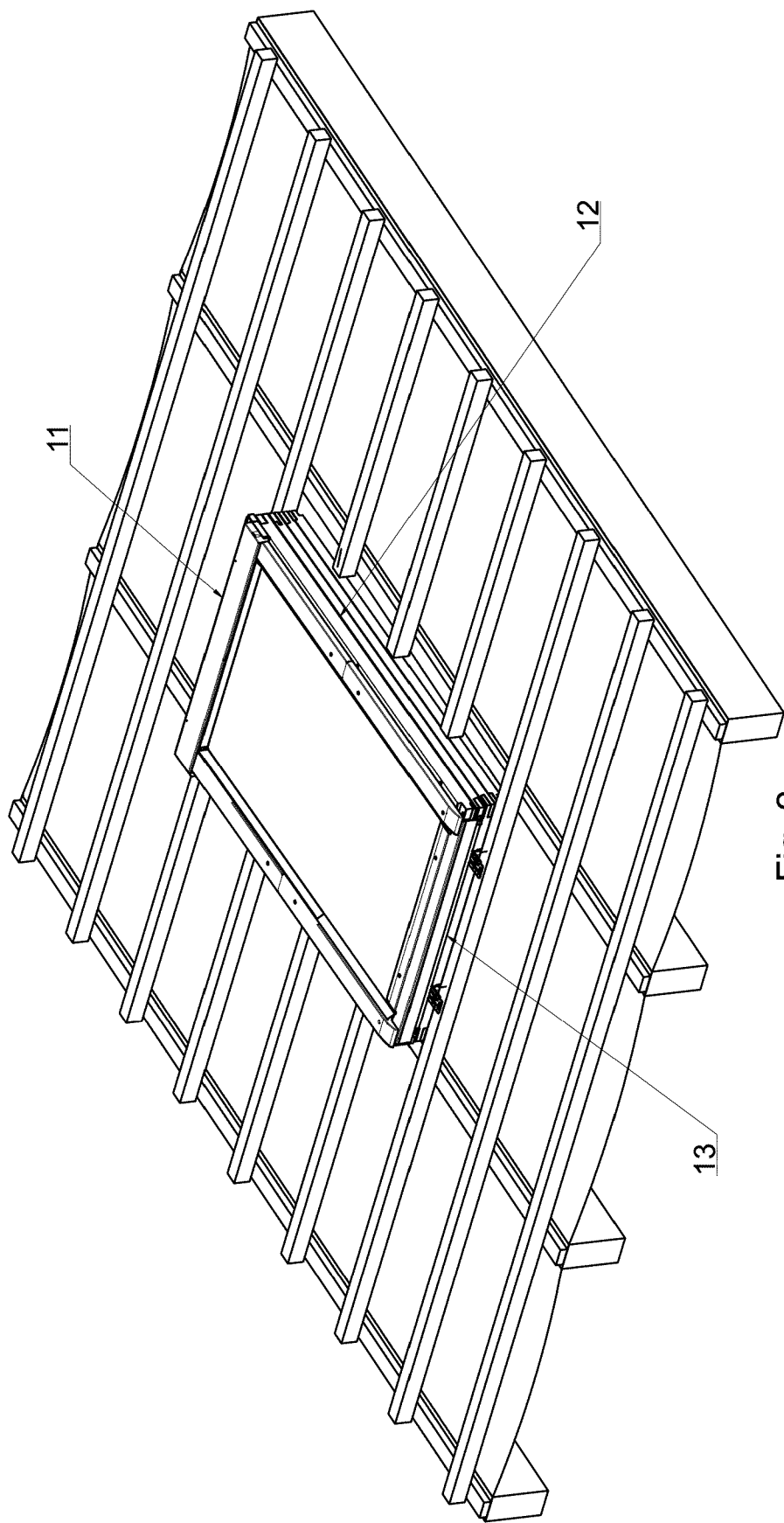
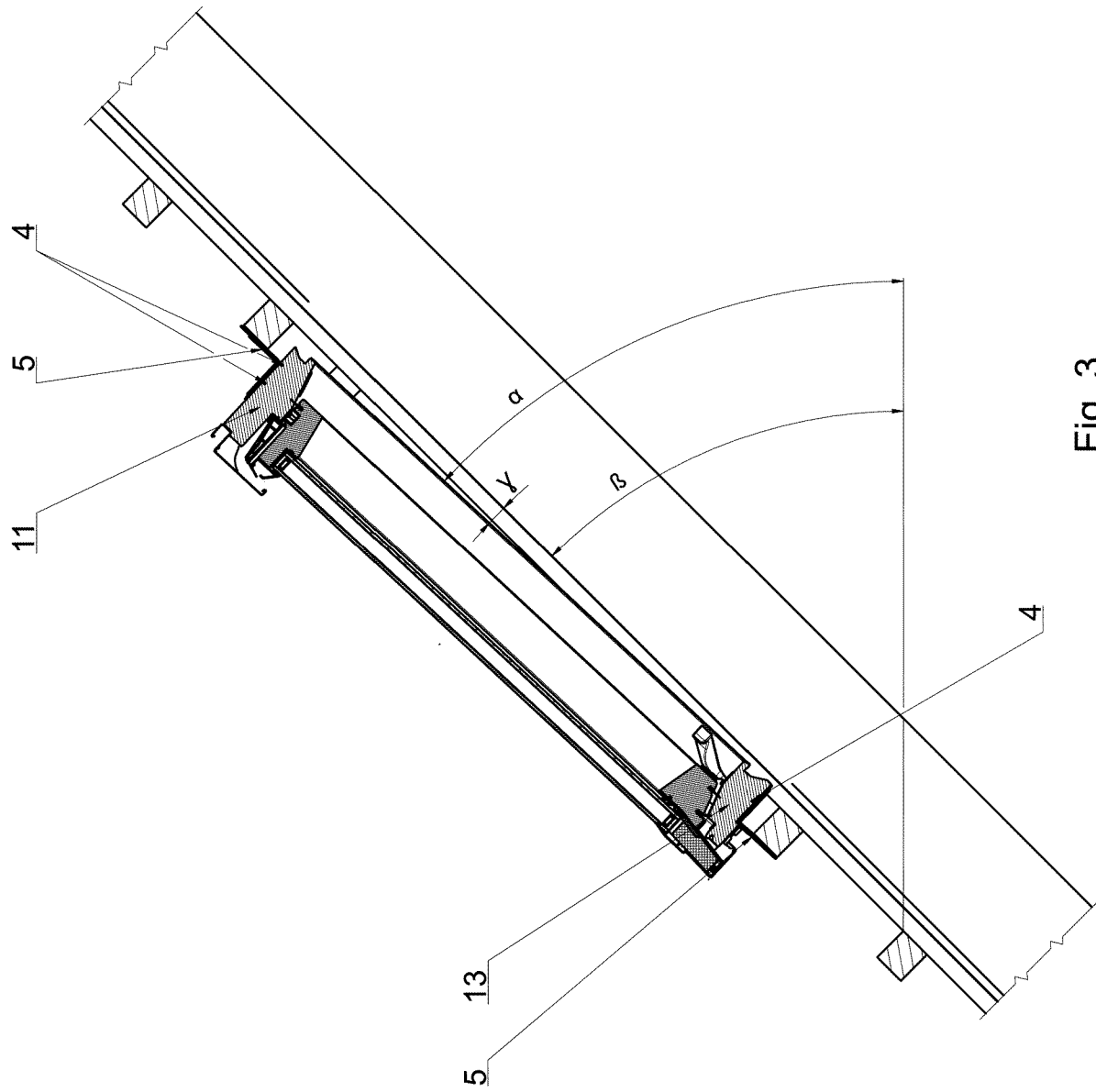


Fig. 2



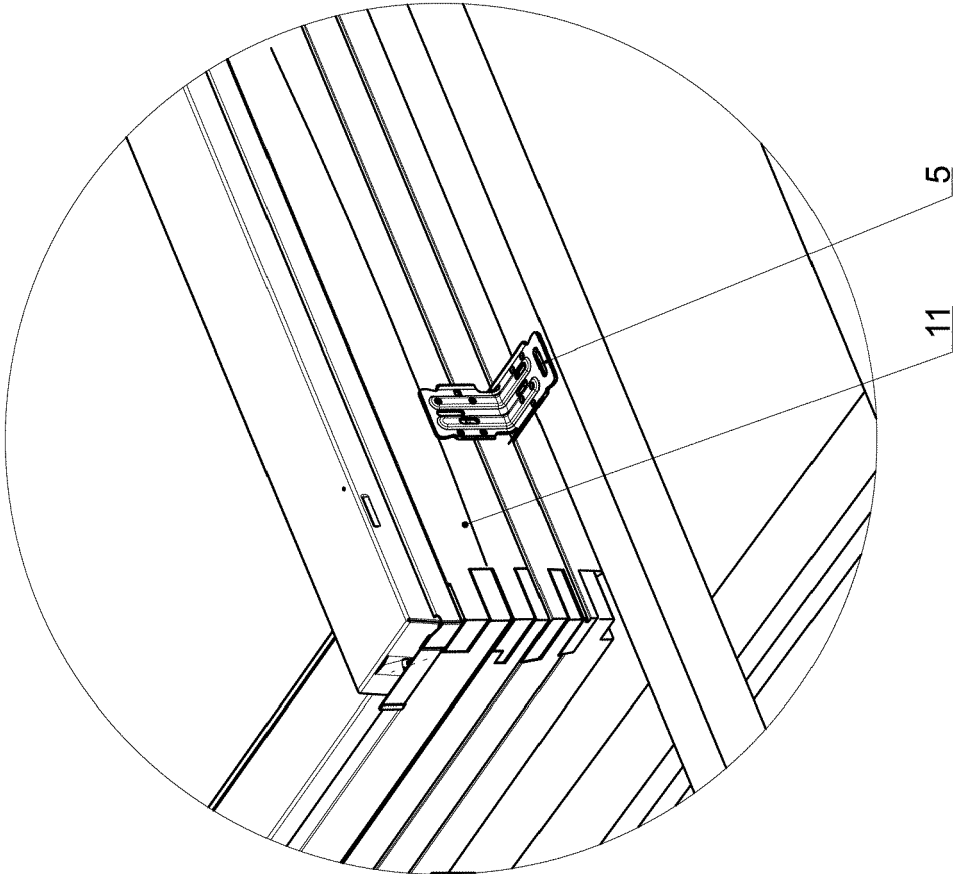


Fig. 5

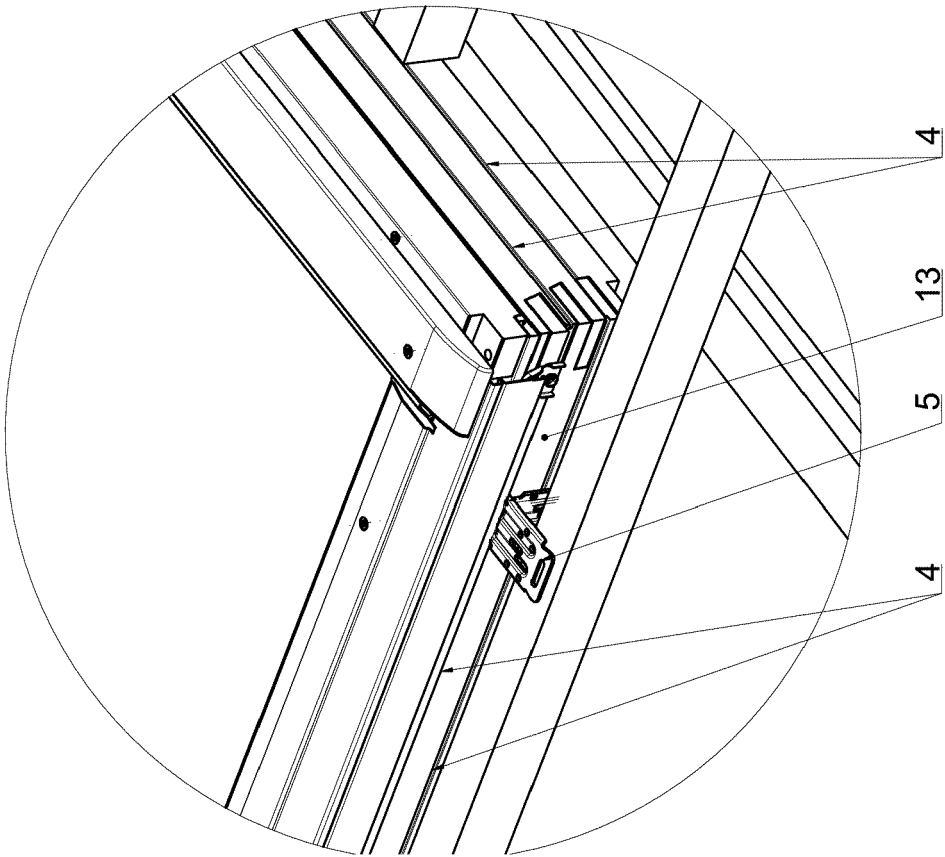


Fig. 4



EUROPEAN SEARCH REPORT

Application Number

EP 24 21 8319

5

10

15

20

25

30

35

40

45

50

55

1

EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 578 763 B1 (VKR HOLDING AS [DK]) 13 December 2017 (2017-12-13)	1-4	INV. E04D13/03 E04D13/035
A	* paragraph [0051]; figures 4a, 8 * -----	5-7	
X	EP 0 293 460 B1 (RASMUSSEN KANN IND AS [DK]) 7 November 1990 (1990-11-07)	1-4	
A	* figures 2,3 * -----	5-7	
X	EP 2 305 914 A2 (COYLE SEAN [GB]) 6 April 2011 (2011-04-06)	1-4	
A	* figure 6 * -----	5-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 10 April 2025	Examiner Tran, Kim Lien
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			

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 24 21 8319

5

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

10-04-2025

10

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 2578763	B1	13-12-2017	DK	2578763 T3	05-03-2018
			EP	2578763 A1	10-04-2013
			EP	3026192 A1	01-06-2016
			ES	2657397 T3	05-03-2018
			ES	2983483 T3	23-10-2024
			HU	E036818 T2	28-08-2018
			HU	E067981 T2	28-12-2024
			PL	2578763 T3	30-05-2018
			PL	3026192 T3	14-10-2024
EP 0293460	B1	07-11-1990	DE	3642464 A1	28-07-1988
			EP	0293460 A1	07-12-1988
			HU	201820 B	28-12-1990
			WO	8804348 A1	16-06-1988
EP 2305914	A2	06-04-2011	NONE		

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 4413450 A [0002]
- DE 102009059953 A1 [0003]