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(54) **A set of side frame covers of a roof window**

(57) A set of side frame covers for a roof window, preferably tilt or pivot and tilt window comprising frame covers (13) fixed to the side frames (11) of a window frame and sash covers (23) on the side frames (21) of

the window frame, further including the trims (15, 25). The set of covers further including elastomeric seals (3, 4), preferably attached to the trims (15, 25), at least sealing the gaps between the trims and the sash cover (23).

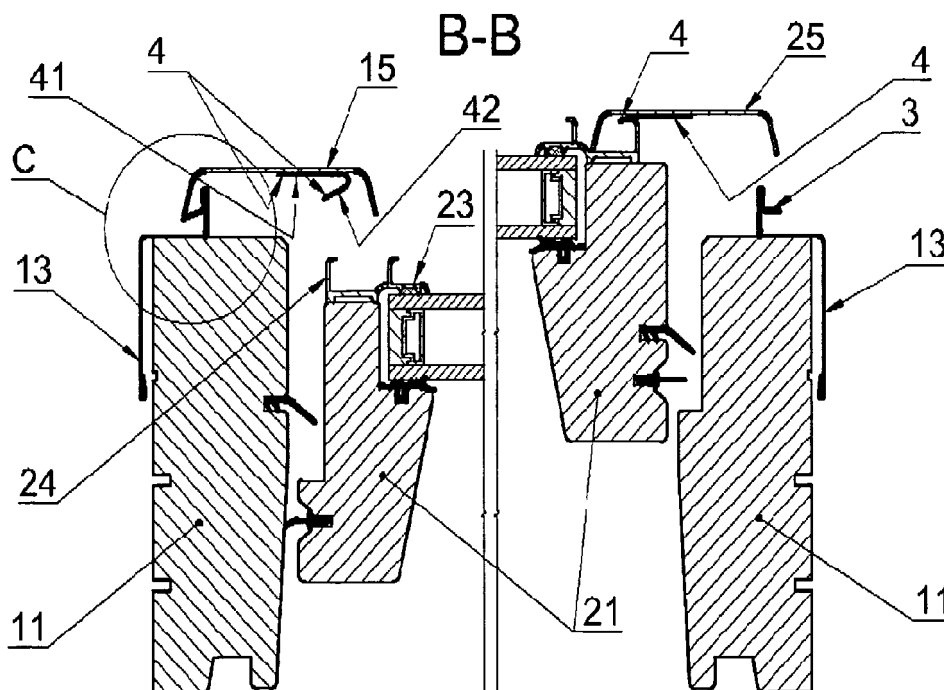


Fig. 3

Description

[0001] The invention discloses a set of side frame covers for a roof window, protecting both the window and the attic where the roof window is installed against weather conditions, such as rain, snow and wind. The disclosed set of covers is intended for use in pivot windows or dual action tilt and pivot windows.

[0002] Prior art. A prior art, for example as offered by the Applicant, includes roof windows with a set of covers for the side frames of a window frame and a sash frame with trapezoidal profile trims. The window frame covers feature outer side seals, corresponding to the outer bends of the trims. The covers do not feature seals from the sash frame side, as well as a window pane installed in the frame.

[0003] Disclosure. A set of side frame covers for a roof window comprising side frame covers for a window frame, hereinafter referred to as the "frame covers" and side frame covers of a sash frame, hereinafter referred to as the "sash covers" with the trims, covering the frame and sash covers, said covers further including elastomeric seals between the trims and the frame and sash covers, preferably attached to the trims, sealing at least the gaps between the trims and the sash covers. Preferably, said seals forming a sealing kit for the gap between the trims and the sash covers, from the window pane side, and the gap between the trims and the frame covers, from the inside of the window side. The sealing kit may also include the seals attached to the frame cover or the sash cover.

[0004] The sash covers are made of sections, preferably also used as a clamping strip fixing the window pane in the sash frame, said sections comprising an arm adjacent to the window pane. The sash frame section also include a protrusion transverse, preferably perpendicular to the sash frame face, i.e. the surface parallel to the window pane, along the entire sash frame side frame. The frame covers are made of bent sheet and overlap the side surfaces of the window frame and the flashing. The sections of the frame cover are positioned on the window frame face, i.e. the surface parallel to the roof with a protrusion transverse, preferably perpendicular to the window frame face.

[0005] The trims comprise edges bent towards the window frame and the sash frame, overlapping the protrusions of the frame and sash covers. Preferably the trims have a trapezoidal profile, and the bent sections overlap the protrusions of the frame and sash covers.

[0006] A window fitted with the set of side frame covers is opened by rotating the sash around its horizontal axis. The window may be opened by rotating the sash around the axis of rotation in its central section or as a dual action tilt and pivot window, where the axis of rotation for the tilt function is positioned near the top frames of the window frame and the sash frame. In both versions, each trim is divided into two parts - the bottom trim below the pivot hinge, and the top trim above the pivot hinge. The bottom

trim is slightly narrower than the top trim to overlap the top cover in the direction of the rain water flow on the roof window. The set of side frame covers can also be used in a single action window, opened as a pivot window, where the trims are uniform along the entire window length.

[0007] In the first version of the invention, a seal for the gap between the trim and the sash frame comprises a wide fixing surface, adjacent to the inner surface of the trim in its middle section, i.e. to the smaller base of the trapezoid. The fixing surface of the seal is attached to the inner surface of the trim; preferably the seal is glued to the inner surface. The seal along its entire length is fitted with a movable sealing blade, adjoining the sash cover with the window in a closed position, sealing the gap between the sash cover and the trim.

[0008] For the seal attached with the fixing surface to the trim, the sealing blade may be arched at the entire seal length, and a free edge of the sealing blade faces the fixing surface. The sealing blade of detailed shape is preferably used in the top trims, for easy fitting the seal to the sash cover and the top trim moving in relation to each other when the window closes. In the bottom trim, located near and moving with the sash, the sealing blade is single and not arched to avoid double thickness at the contact area with the sash cover. The seal attached to the trim with the fixing surface may also include an additional movable sealing blade, adjoining the window frame frame cover with the window in closed position.

[0009] In the second embodiment, the seal between the trim and the sash cover, attached to the trim has a closed profile. The seal has a hexagonal profile with two base surfaces parallel to the main surface of the trims, and two opposite surface pairs forming the concave sections of the seal profile. The first half of the seal profile, limited with the surface perpendicular to the sash frame face, is similar to the large E Greek letter, and the second half of the seal profile is symmetrical. The seal is attached, preferably glued with one of the flat surfaces to the trims, and the second flat surface adjoins the sash cover protrusion.

[0010] The version of the invention includes the seal of a semicircle profile. The seal is attached, preferably glued with its flat surface to the trims.

[0011] In the third version of the invention, a set of side frame covers of a roof window includes an inner side seal, between the sash cover, and an inner arch of the trim, from the window pane side. The seal is attached to the sash cover, preferably in the groove in the sash cover protrusion, transverse to the sash face, where the sealing blade of the seal adjoins the bottom surface of the inner arch of the trim with the window in a closed position. The inner side seal replaces the seal from the first version of the invention in its sealing function at the sash cover side or complements the seal forming a double seal.

[0012] The set of side frame covers of the roof window may further include the outer side seal, between the frame cover and the outer arch of the trim. The seal is

attached to the window frame cover made of sheet metal, preferably clamped in a bend of the top cover section. The seal has a T profile, where two stationary arms adjoin the top section of the frame cover. The side outer seal is used mainly in the side frame covers, whereas the seal from the first version does not feature the additional, sealing blade. It may also be used with the seal with an additional sealing blade, forming a double seal from the side window frame side.

[0013] Advantages of the invention. The side frame covers for the roof window, due to the seal between the trims and the frame and sash covers provide the protection against weather conditions, i.e. rain, snow or wind. They prevent snow and rain from penetrating the trims and the attic, where the window is installed. The seals with the fixing surface, attaching the seals to the trims, also suppress the noise of rain drops falling on the external trim surfaces.

[0014] Preferred embodiments. A set of side frame covers of the present invention is shown as the preferred embodiments in the following figures for the pivot windows, where the following figures show:

Fig. 1 - A roof window, partially opened, pivot type - isometric view, with offset sections marked, A-A for closed window and B-B for partially open window, shown in the figures below.

Fig. 2 - A set of covers with seals with a fixing surface and an arched sealing blade facing the fixing surface, with an outer side seals - in a closed window position, A-A offset section.

Fig. 3 - The set of covers of Fig. 2 - in a partially open window position, B-B offset section.

Fig. 4 - A set of covers with seals with a fixing surface attaching the seals to the trims with an arched sealing blade facing the fixing surface with an additional sealing blade - in a closed window position, A-A offset section.

Fig. 5 - The set of covers of Fig. 4 - in a partially open window position, B-B offset section.

Fig. 6 - A set of covers with a fixing surface attaching the covers to the trims with a long sealing blade and an additional sealing blade - in a closed window position, A-A offset section.

Fig. 7 - The set of covers of Fig. 6 - in a partially closed window position, B-B offset section.

Fig. 8 - A set of covers with a closed profile seal attached to the trims and an outer side seal - in a closed window position, A-A offset section.

Fig. 9 - The set of covers of Fig. 8 - in a partially open window, B-B offset section.

Fig. 10 - A set of covers with an inner side seal and an outer side seal - in a

closed window, A-A offset section.

Fig. 11 - The set of covers of Fig. 10 - in a partially open window, B-B offset section.

Fig. 12 - Outer side seal - detail C of Fig. 2, 8, and 10.

Fig. 13 - Closed section seal - detail D of Fig. 8.

Fig. 14 - Inner side seal - detail E of Fig. 10.

[0015] The invention is disclosed based on the preferred embodiments for pivot and dual action tilt and pivot windows, which were not included in the figures, but are described with the indication of design similarities and differences in relation to the examples showed in the figures.

[0016] The common components of the roof windows in accordance with the embodiments shown.

A roof window comprises a window frame **1**, seated in a roof plane, said window frame comprising the side frames **11** and a movable sash **2**, a frame thereof comprising side frames **21**, further including a double window pane **22** with a seal kit and spacers between said window panes. In the middle section of the window, slightly above the half of said window frame **1** length, a pivot hinge **12** is fixed to both side frames **11**, joining said frames with the side frames **21** of said sash frame **2**. The pivot hinge fixed to the window frame comprises an arched guide, corresponding to the arched slide of the pivot hinge fixed to said sash frame.

[0017] Along the entire length of said side frame **11** of said window frame **1**, a frame cover **13** made of bent sheet metal, with a profile comprising a section positioned on the window frame face and the section overlapping the side surface of the side frame. The window frame **13** further includes a protrusion **14** perpendicular to the window frame face.

[0018] Along the entire length of the side frame **21** of said sash frame **2**, a sash cover **23** is installed used as a clamping strip for the window pane **22**. The sash cover **23** is a section with a profile including a section adjoining the sash frame face and the clamping section, overlapping the window pane **22** edge. The sash cover **23** further includes a protrusion **24**, at the edge of the section, said protrusion perpendicular to the sash frame face.

[0019] The set of side frame covers of a roof window further includes the trims of a trapezoidal profile, made of bent sheet metal. Above a pivot hinge **12**, on both sides of the window are the top trims **15** attached to the side frames **11** of the window frame **1**, stationary when the window is opened or closed. Below the pivot hinge **12**, on both sides of the window are the bottom trims **25** attached to the side frames **21** of the window frame **1**, moving with the sash when the window is opened or closed. In its cross-section, the top trim **15** comprises a middle section, a smaller base of the trapezoid profile, further including an inner bend **16** and an outer bend **17** - both at an obtuse angle in relation to the middle section and facing the frame and sash covers, overlapping the protrusions **14**, **24** of said covers. Also the bottom trim **25** in

its cross-section comprises a middle section, further including an inner bend **26** and an outer bend **27** - shaped and positioned identical to the top trim.

[0020] The distance between the bends: inner **16** and outer **17** of the top trim **15** is slightly larger than the distance between the bends: inner **26** and outer **27** of the bottom trim **25**, and the top trim **15** is installed further the window frame and the sash frame than the bottom trim **25**. The top end of said bottom trim **25** is located under the bottom end of the top trim **15** in a closed window position.

[0021] Besides the frame cover, sash cover and the trim seals, the window further includes known seal kits attached in the grooves between the side frames **11** of the window frame and the side frames **21** of the sash frame. At the section of the window below the pivot hinges, a single seal **18** is seated in the groove of the side frame **11** of the window frame, and the second seal **28** is seated in the groove of the side frame **21** of the sash frame. At the section of the window above the pivot hinges, both seals **28** are seated in the grooves of the side frame **21** of the sash frame.

[0022] **Embodiment 1.** A set of side frame covers of the roof window shown in Fig. 2 and Fig. 3, comprises a well known outer side seal **3**, on the outer surface of a side frame **11** of a window frame **1**, between a protrusion **14** of the frame cover **13** and an outer bend of a trim. The seal has a T profile, with two stationary arms **31** of said profile adjoining the protrusion **14** of the frame cover **13**, and the top arm clamped with a section **14a** of said cover (detail - Fig. 12). A sealing blade **32** of said outer side seal in a closed window position, with its free edge adjoining the bottom surface of an outer bend **17** of a top trim **15**, and an outer bend **27** of a bottom trim **25**.

[0023] At the opposite inner side of the side frames, the set of covers comprises a flat seal **4** with a fixing surface **41**, adjoining half of the width of a middle bottom section of the trims **15**, **25**, and attached to the surface, preferably glued. The sealing blades of the seal **4** cooperate with a protrusion **24** of a sash cover **23**, said seals available in two versions, one for the top trim, and the other for the bottom trim. The seal attached to the top trim **15** comprises an arched sealing blade **42**, a free end thereof facing the fixing surface **41**. The seal is more flexible and better adapts itself to the moving sash trim. A seal attached to the bottom trim **25** comprises a relatively short, straight sealing blade **43**. It makes it easy to fit the seal with a single sealing blade layer, under the bottom trim **25**, which is nearer to the window compared to the top trim.

[0024] **Embodiment 2.** A set of side frame covers shown in Fig. 4 and Fig. 5, comprises only the flat seals **5** with a fixing surface **51**, adhering almost to the entire width of a bottom middle section of the trims **15**, **25** and attached to said surface, preferably glued. On the side corresponding to a protrusion **24** of a frame cover **23**, a seal **5** is attached to a top trim **15**, with an arched sealing blade **52**, and said seal **5** fixed to said top trim **25** has a

relatively short, straight sealing blade **53**. Both versions of the sealing blades are similar to the blades **42** and **43** of the seal **4** of the first embodiment.

[0025] On the opposite, outer side of the side frames, the seal **5** has an additional sealing blade **54**, diagonal in relation to the fixing surface **51**, similar to the inclination of the outer bends **17**, **27** of the top **15** and the bottom **25** trim. It is supported by the face a protrusion **14** of a frame cover **13** in a closed window position. The blade is identical for both trims.

[0026] **Embodiment 3.** A set of side frame covers shown in Fig. 6 and 7 comprises only the flat seals. A top trim **15** comprises a seal **6** with a fixing surface **61**, adjoining almost the entire width of a bottom middle surface of said trim, and attached to said surface, preferably glued. The seal **6** on the side corresponding to a protrusion **24** of a sash cover **23** comprises a long sealing blade **62**, diagonal in relation to the fixing surface **61**, similar to an outer bend **16** of a top trim. The long sealing blade **62** overlaps the protrusion **24** of the sash cover **23**, and a free edge of said sealing blade rests on the section of said sash cover on the sash frame face. On the opposite side, the seal **6** comprises an additional sealing blade **63**, corresponding to a protrusion **14** of a frame cover **13**, identical to the sealing blade **54** of the second embodiment. A bottom trim **25** comprises a seal **5** with a fixing surface **51** and a straight sealing blade **53**, identical to the second embodiment.

[0027] **Embodiment 4.** A set of side frame covers shown in Fig. 8 and 9 comprising a tubular seal **7** between a top trim **15** and a protrusion **24** of a sash cover **23**. The tubular seal **7** (detail - Fig. 12) has a hexagon profile with two base surfaces **71** parallel to each other, and after attaching one of said surfaces to the bottom of the top trim **15**, also parallel to the main surface of said cover. The tubular seal **7** between said two base surfaces comprises two opposite surface **72** pairs, forming a concave sections of said seal profile. The tubular seal **7** adjoins the protrusion **24** of said sash cover **23**. A bottom trim **25** comprises a flat seal **4** with a relatively short, straight sealing blade **43**, identical to the first embodiment.

[0028] **Embodiment 5.** A set of side frame covers showed in Fig. 10 and Fig. 11 comprising an inner side seal **8**. The seal is seated in the grooves **29** (Detail - Fig. 14) in the protrusions **24** of a sash cover. The sealing blades **81** of the inner side seal adjoin with the free ends thereof of a top trim **15** and a bottom trim **25**. On the opposite outer side of the frames, the set of covers comprises an outer side seal **4**, identical to the first embodiment (Fig. 2, 3, and 12).

[0029] **Dual action windows.** Dual action pivot and tilt windows, opened with tilt function, by rotating the windows around the axis near the window frame top frame, or with pivot function with the intermediate arms pivotally mounted to the window frame, said arms fitted with hinges for opening the window in pivot mode, joining the intermediate arms with the side frames of a sash frame. The top trims are attached to the intermediate arms, not

to the window frame, as in the pivot action windows. The intermediate arms, in a pivot mode rest on the window frame, and the embodiment no. 1 to 5 shown above apply also to the dual action window opened in pivot mode. When opening the window using the tilt function, the intermediate arms moves to the top with the sash, adjoining the side frames of the sash frame. The top trims move with the intermediate arms, which with the window open are located in relation to the side frames of the sash frame identical as the bottom trims. For the dual action window, opened with the tilt function, the embodiment no. 1 to 5 in the scope of the bottom trim description are valid both for top and bottom trims. To illustrate the embodiments, for the window opened with the tilt function, the figures 2 to 11 are provided, relating both to the bottom (as shown) and top trims.

Claims

1. A set of side frame covers for a roof window, preferably opened by the rotation of a sash around its horizontal axis, as a pivot window - by the rotation around the axis in the middle section of said window or as a dual action pivot and tilt window, where with the window opened in a tilt mode, the axis of rotation of said sash is near a top frame of a window frame, said window frame comprising the covers of said side frames of said window frame, hereinafter referred to as the "frame covers", and the covers of the side frames of a window sash, hereinafter referred to as the "sash covers", preferably used as a clamping strip for a window pane of said window, said window pane seated in said sash frame, further including the trims, preferably with a trapezoid profile, covering said frame cover and said sash cover, where the edges of said trims are arched towards said frame and said sash frame, and overlap the sash and frame protrusions, transverse to the sash frame and window frame faces, **wherein**, between said trims (15, 25) and said frame cover (13) and said sash cover (23) said set of covers comprises the elastomeric seals (3, 4, 5, 6, 7, and 8), preferably attached to said trims, sealing at least the gaps between said trims (15, 25) and said sash covers (23).
2. A set of covers according to claim 1 **wherein** the seal (4, 5, and 6) between the trim (15, 25) and the sash cover (23) comprises a wide fixing surface (41, 51, 61), said fixing surface adjoining the inner surface of said trim (15, 25) in the middle section thereof and attached to said surface, further including a movable sealing blade (42, 52, 53, 62), which in a closed window position adjoins said sash cover (23).
3. A set of covers according to claim 2 **wherein** in said seal (4, 5) attached with said fixing surface (41, 51) thereof to said trims (15, 25), the free edge of said sealing blade (42, 52) faces said fixing surface.
4. A set of covers according to claims 2 or 3 **wherein** said seal (5, 6) attached with said fixing surface (51, 61) thereof to the trims (15, 25) comprises an additional movable sealing blade (54, 63), said sealing blade in closed windows position adjoining said frame cover (13).
5. A set of covers according to claim 1 **wherein** said seal (7) between said trim (15) and said sash cover (23), attached to the trims has a closed hollow profile.
6. A set of covers according to claim 5 **wherein** said seal (7) has a hexagon profile of the cross section with two base surfaces (71) parallel to the main surface of said trims (15) and two opposite surface (72) pairs forming concave sections of said seal.
7. A set of covers according to claim 5 **wherein** said seal has a semicircle profile and is attached with a flat surface thereof to said trims.
8. A set of covers according to claims 1, 2, 3, 4, 5, 6 or 7 **wherein** it comprises an inner side seal (8) between said sash cover (15, 25) and an inner bend (16, 26) of said trim from a window pane side (22), wherein said seal is attached to said sash cover (23), preferably in a groove (29) positioned in a protrusion (24) of said sash cover transverse to the sash face.
9. A set of covers according to claims 1, 2, 3, 4, 5, 6, 7 or 8 **wherein** it comprises an outer side seal (3) between said frame cover (13) and an inner bend (17, 27) of said trims (15, 25), said seal attached to said frame cover (13), preferably clamped in a bend (14a) of a top section of a protrusion (14) of said frame cover.
10. A set of covers according to claim 9 **wherein** said outer side seal (3) has a T outline, and two stationary arms (31) of said outline adjoins said protrusion (14) of said frame cover.

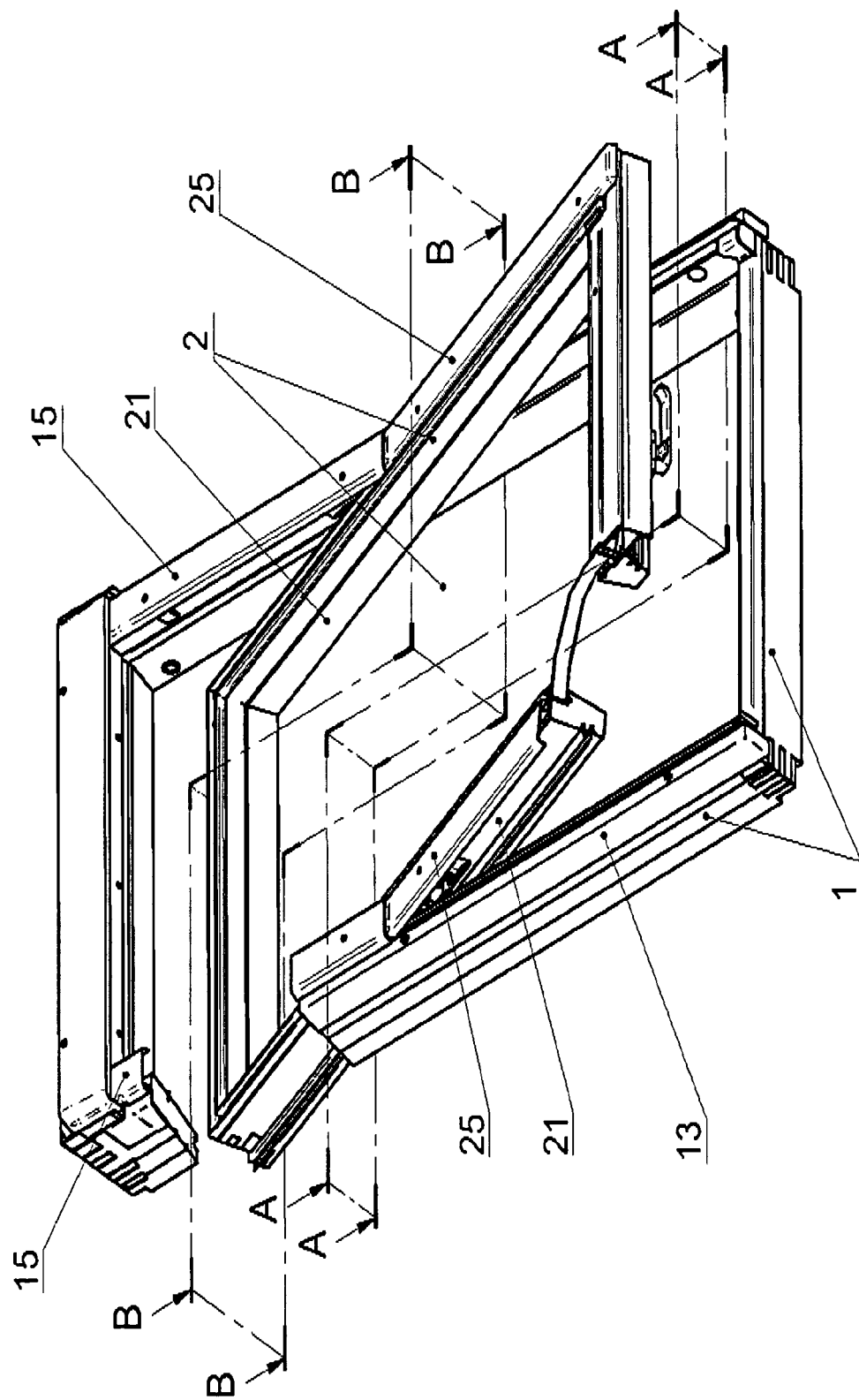


Fig. 1

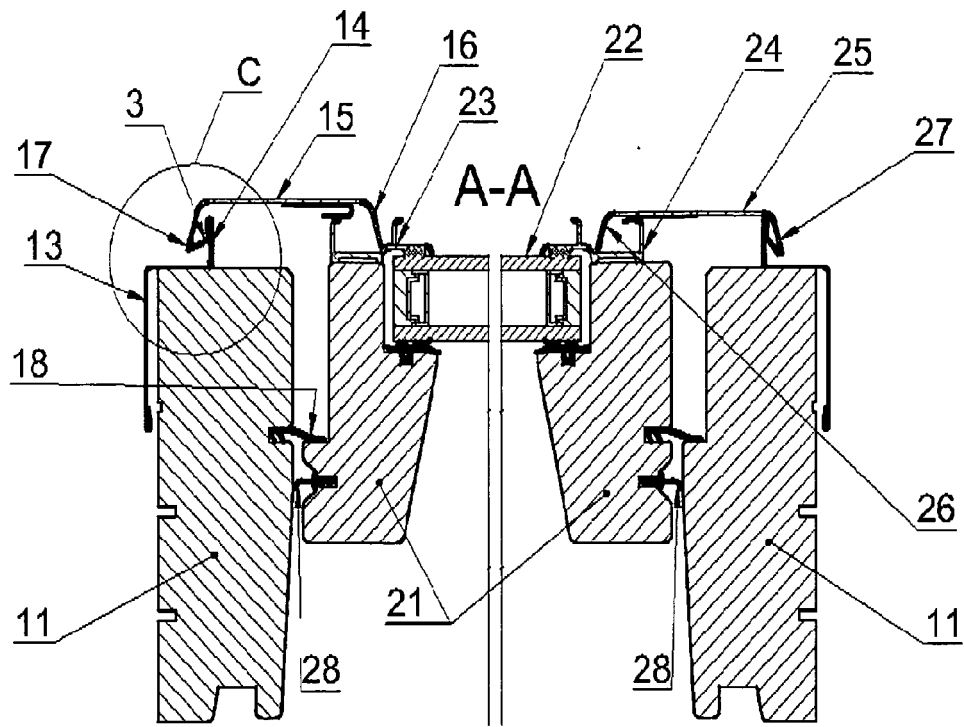


Fig. 2

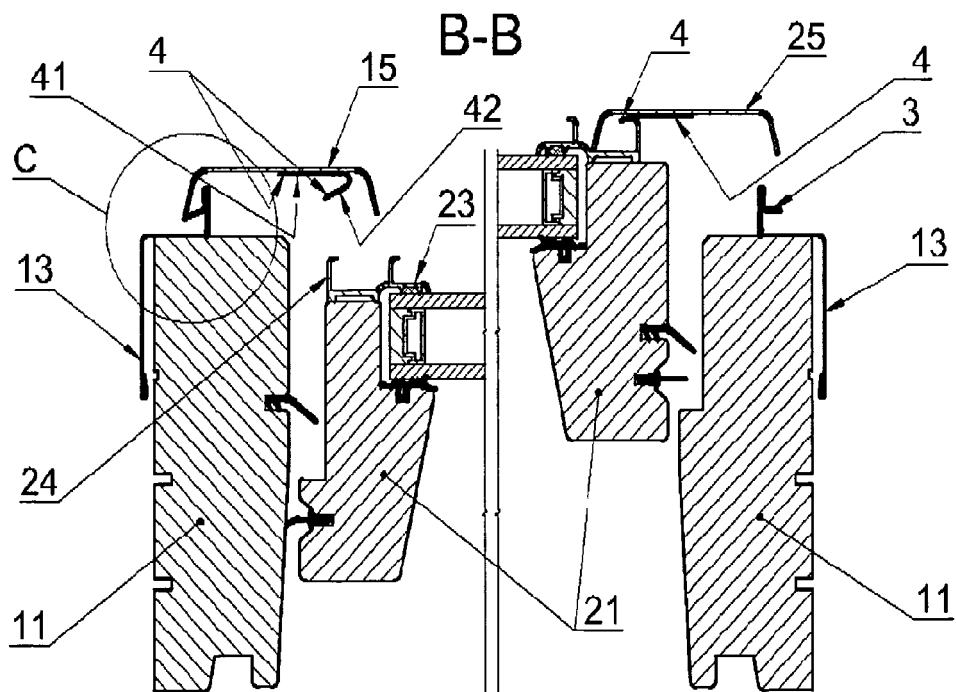


Fig. 3

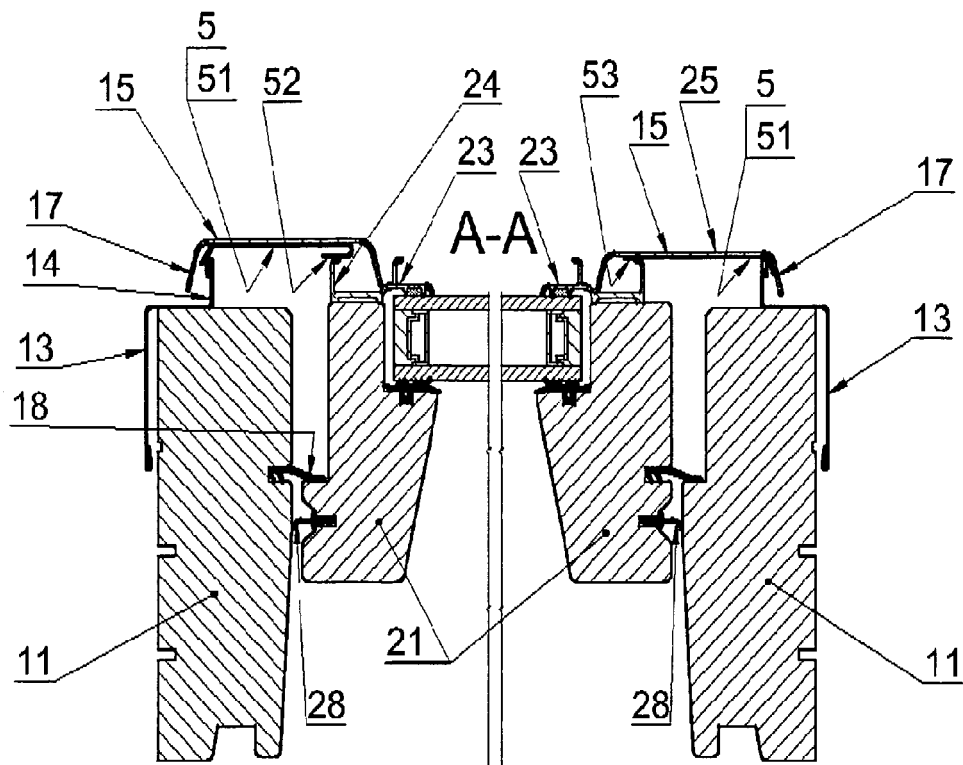


Fig. 4

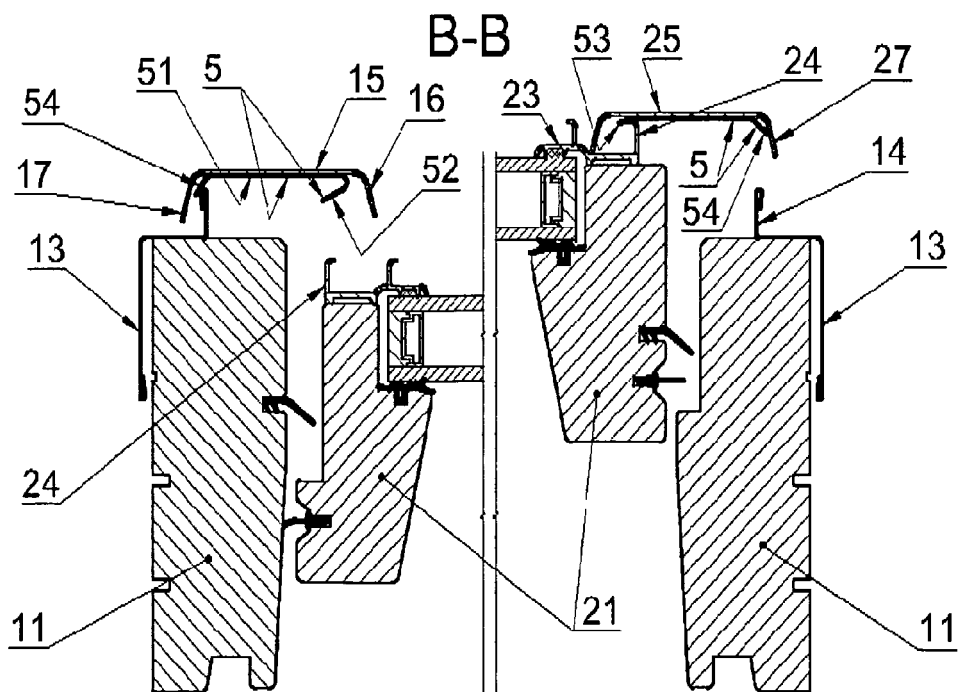


Fig. 5

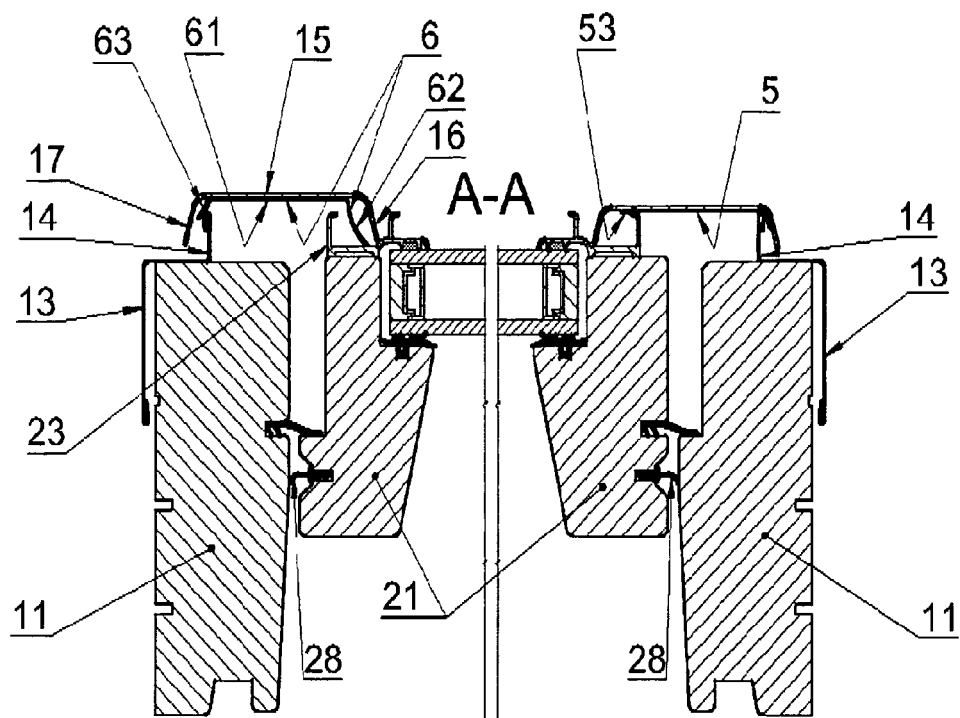


Fig. 6

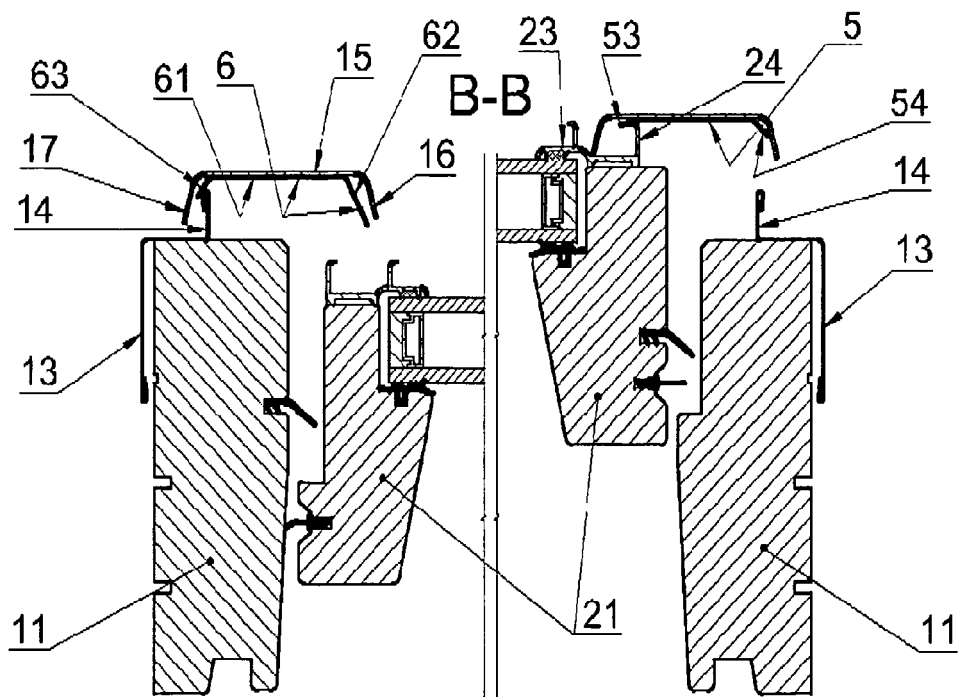


Fig. 7

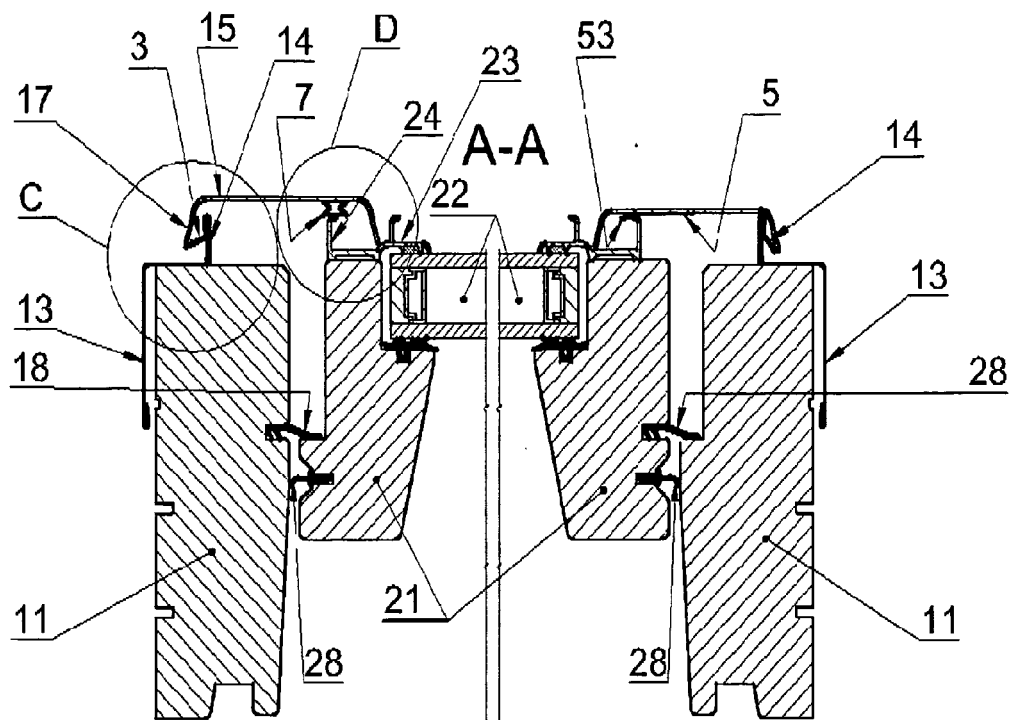


Fig. 8

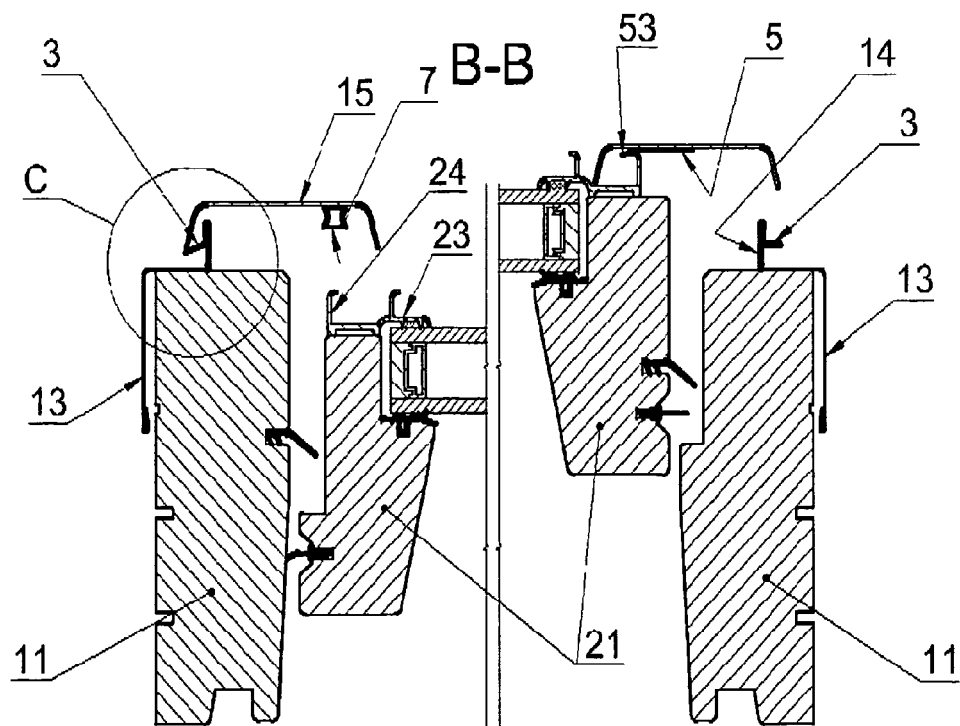


Fig. 9

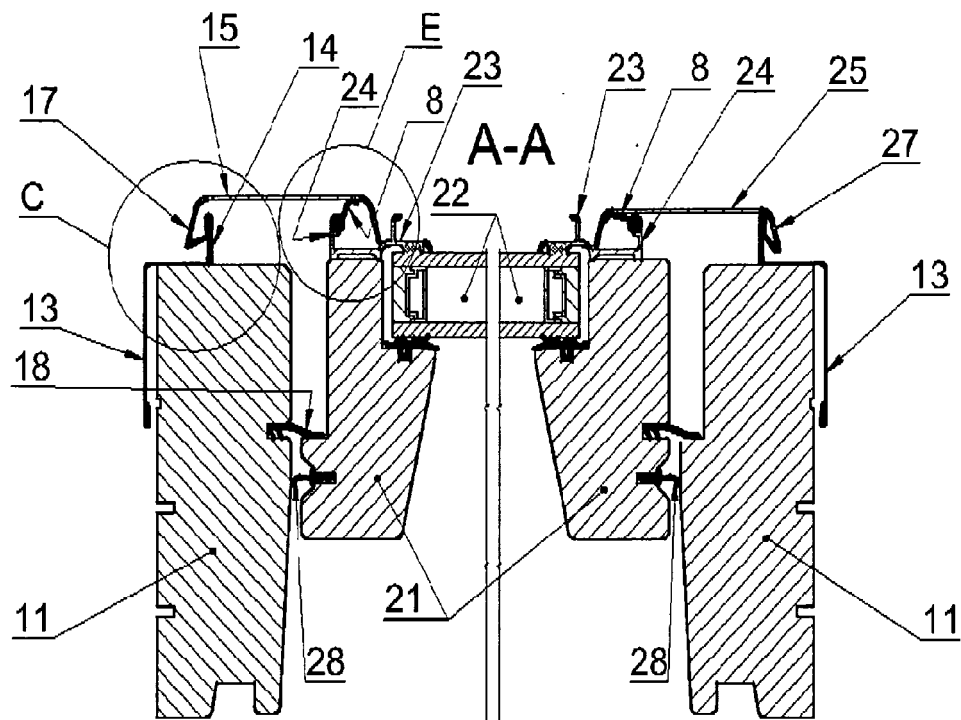


Fig. 10

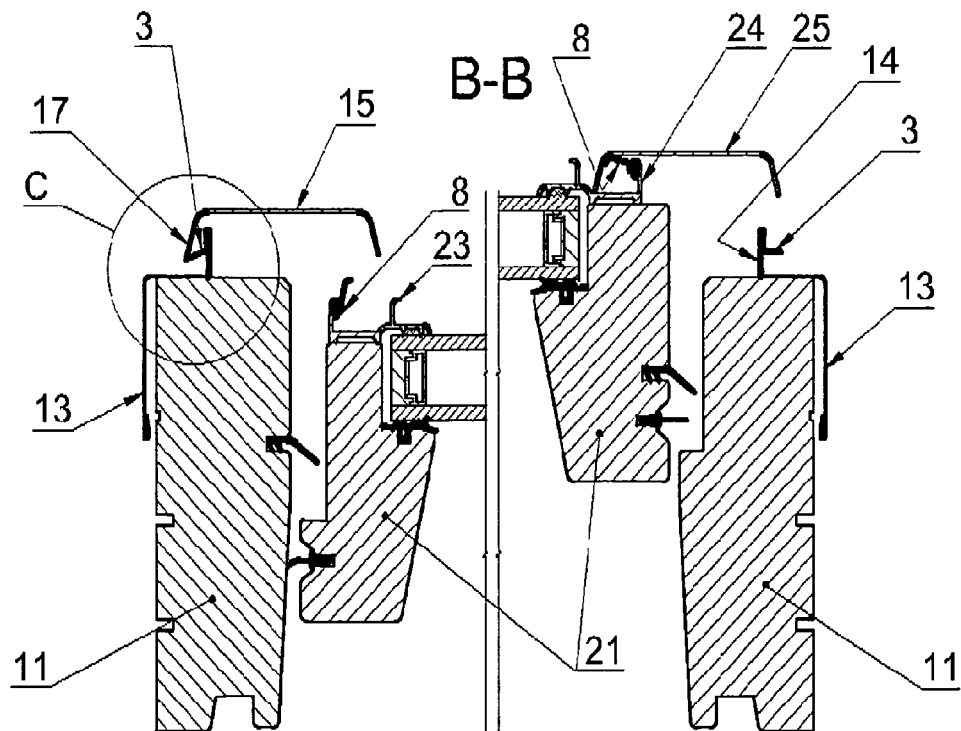


Fig. 11

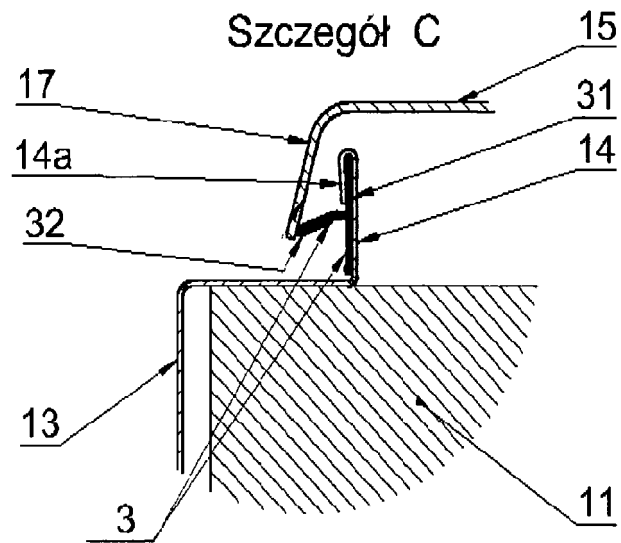


Fig. 12

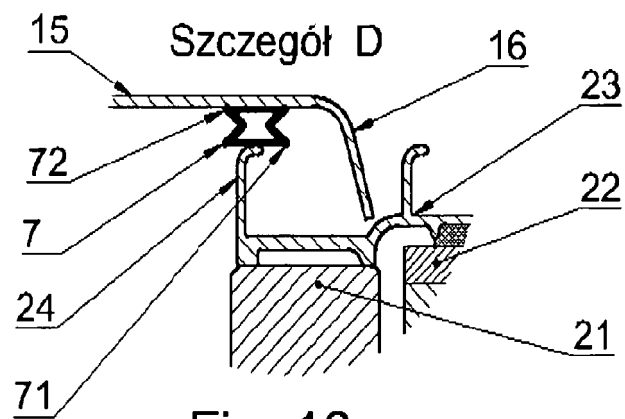


Fig. 13

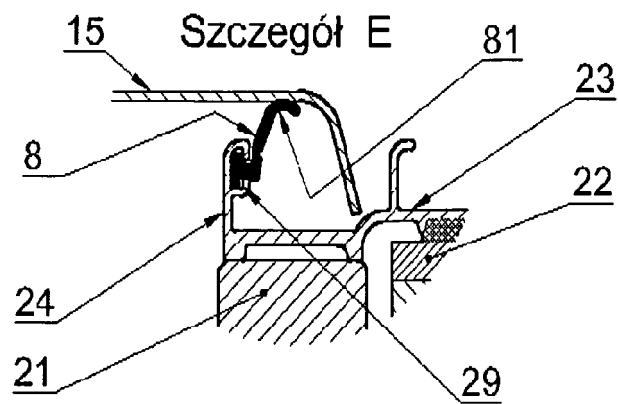


Fig. 14



EUROPEAN SEARCH REPORT

Application Number
EP 12 00 5432

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	BE 1 015 350 A3 (LIJNEN INVEST NV [BE]) 1 February 2005 (2005-02-01) * figures 4,13 *	1,5-10	INV. E04D13/03 E04D13/035
A	EP 1 681 399 A2 (VKR HOLDING AS [DK]) 19 July 2006 (2006-07-19) * figure 8 *	1,9,10	
			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 13 November 2012	Examiner Tryfonas, N
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 (P04001)

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

EP 12 00 5432

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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13-11-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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