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(54) FRAME PROFILE, SYSTEM OF FRAME PROFILES (VARIANTS) AND A SET OF A TILT AND TURN FITTINGS THEREFOR

(57) The invention can be used for producing windows or similar structures. The inventive system of frame profiles for producing building enclosure structures, including windows or similar structures, comprises at least two frame profiles consisting of a profile body, which is provided with at least one projected part in the form of a baffle, and a fitting groove, wherein the fitting groove is embodied in the baffle of at least one profile. The variants of frame profiles, frame profile systems and a set of tilt and turn fittings therefor are also disclosed. Said invention makes it possible to develop a frame profile whose reduced clearance height does not decrease the rigidity thereof.

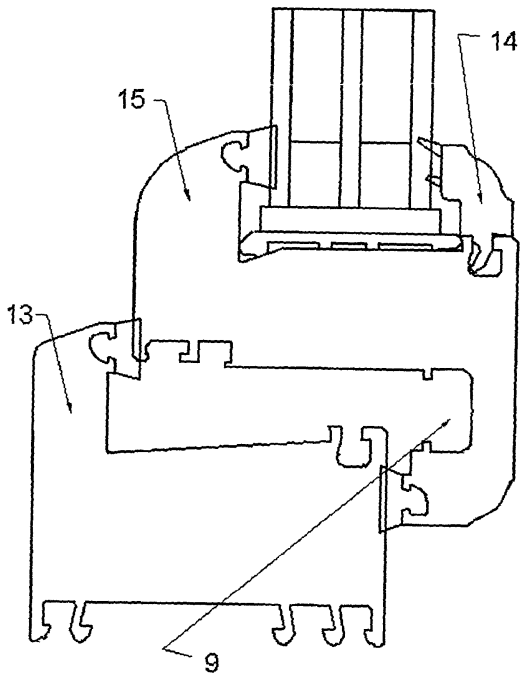

Fig.5

EP 1 988 246 A1

Description

[0001] The present invention relates to the art of construction, and in particular it relates to the fencing structures of residential and public buildings, and can be suitably used for manufacture of windows and similar structures. More particularly, the present invention relates to a frame profile for manufacture of the constructional fencing structures, as well as to a system of frame profiles and a set of swing-swivel fittings therefor.

[0002] Known is a frame profile for manufacture of the constructional fencing structures, including windows and similar structures; comprising a profile body having at least one protruding portion configured as a extension. For assembling the openable window units, the profile body has a groove that accommodates devices (fittings), hereinafter termed as the fitting groove (cf., e.g. "Reference book for measuring. Methodological guide for making measurements of the window and door units", A. Yu. Bezroukov, V.L. Mikov, ed. by A.Yu. Kurenkova, NIUPTs "Mezhreghional,nyi Institut Okna", 2005, pp. 183-185; and "Design of modern window systems of civil buildings", I.V. Boriskiena, A.A. Plotnikov, A.V. Zakharov, Publishers of Association of Construction High Schools, Moscow, 2003, pp. 40-45).

[0003] Said references also teach a system of frame profiles used for assembling the units for manufacture of the constructional fencing structures, including windows or similar structures, which system includes: at least two frame profiles that comprise a profile body having at least one protruding portion configured as an extension, and a fitting groove.

[0004] But such frame profiles, and the systems implemented using them have not sufficient rigidity due to the circumstance that the fitting groove is disposed within the profile body, and consequently due to its reduced dimensions, height in particular.

[0005] Also known is a set of swing-swivel fittings usable for manufacture of the constructional fencing structures, including windows and similar structures, for the above-mentioned frame profiles; which set comprises: a main drive that transforms rotating motion of the window handle into translational motion of the locking elements; locking elements that interact with the conforming parts, angular transmissions that angularly transmit movement of the locking elements; upper and lower hinge groups that disengage frame profiles of a window unit (cf., e.g. the above-recited "Design...", pp. 170 -175).

[0006] But these practically used sets of swing-swivel fittings cannot be accommodated by the fitting groove arranged in the window profile extension.

[0007] The technical problem to be solved by the invention consists in provision of a frame profile having a lesser height, its rigidity being not compromised.

[0008] Reduced dimensions, height in particular, results in an increase in the relative surface area of glazing of a window structure assembled with the use of such frame profiles. The reduced dimensions and cross-section area also result, inter alia, result in a reduced quantity of a material required for manufacture of such frame profile, and, consequently, allows lower the cost of both a frame profile and a window structure or a similar structure as a whole.

[0009] Said object is attained by provision of a frame profile for manufacture of the constructional fencing structures, including windows or similar structures, and comprising a profile body having at least one portion configured as an extension, and a fitting groove, said fitting groove being implemented within the extension.

[0010] The inner side of at least one extension preferably has a groove to accommodate a seal to ensure tight junction of the profile with other members of the structure.

[0011] The profile body further may comprise a main chamber for disposing a reinforcing element of the closed cross-section therein; the chamber may be of the rectangular shape for the purpose of a more uniform distribution of a load thereon.

[0012] The extension is further provided with auxiliary chambers to improve the sound-proofing and thermal-physics properties of the profile; in which chambers arranged are stiffening ribs to improve strength of the profile.

[0013] The frame profile is preferably made of wood, plastic or aluminium.

[0014] Another embodiment of the invention is a frame profile for manufacture of the constructional fencing structures, including windows and similar structures; comprising a chamber that accommodates a reinforcing element; outer and inner ledges, and a fitting groove; a portion of the outer ledge, that is opposite to the glazing element, has a protruding portion configured as an extension; the fitting groove being implemented in the extension.

[0015] The inner side of at least one extension preferably has a groove to accommodate a seal to ensure tight junction of the profile with other members of the structure.

[0016] The profile body may further comprise a main chamber for disposing a reinforcing element of the closed cross-section therein; the chamber may be of the rectangular shape for the purpose of a more even distribution of a load thereon.

[0017] The extension is further provided with auxiliary chambers therein to improve the sound-proofing and thermal-physics properties of the profile; in which chambers arranged are stiffening ribs to improve strength of the profile.

[0018] The frame profile is preferably made of wood, plastic or aluminium.

[0019] Another aspect of the ivention is a system of frame profiles for manufacture of the constructional fencing structures, including windows or similar structures; comprising at least two frame profiles having a profile body provided with at least one protruding portion configured as an extension, and a fitting groove; at least in one of the profiles said fitting groove is implemented in the extension.

[0020] Another embodiment of the invention is a system of frame profiles for manufacture of the constructional fencing structures, including windows or similar structures; comprising at least two frame profiles having a chamber that accommodates a reinforcing element; outer and inner ledges, and a fitting groove; a portion of the outer ledge, that is opposite to the glazing element, has a protruding portion configured as an extension; the fitting groove in one of profiles being implemented in the extension.

[0021] Another aspect of the invention is a set of swing-swivel fittings for manufacture of the constructional fencing structures, including windows or similar structures; comprising a main drive that transforms rotating motion of the window handle into translational motion of the locking elements; locking elements that interact with the conforming parts, angular transmissions that angularly transmit movement of the locking elements, upper and lower hinge groups that disengage the frame profiles of a window unit; wherein the locking elements are implemented in the form of Γ-shaped elements adapted to interact with the conforming parts in the direction that is parallel with axis of symmetry of the fitting groove.

[0022] Other advantages and characteristics of the invention are set forth in the following description of versions of its embodiment, provided only as the non-limiting examples and shown in the accompanying drawings, wherein:

Fig. 1 - a longitudinal section of a conventional frame profile of a casement used for manufacture of the constructional fencing structures.

Fig. 2 - a conventional fittings' locking element that interacts with a conforming part in the direction that is perpendicular to axis of symmetry of the fitting groove.

Fig. 3 - longitudinal section a frame profile of a casement according to the invention.

Fig. 4 - a Γ-shaped fittings' locking element, shown in the longitudinal cross-section and interacting with a conforming part in the direction that is parallel with axis of symmetry of the fitting groove, according to the invention.

Fig. 5 shows a longitudinal cross-section of a system of profiles embodied according to the invention.

[0023] Fig. 1 shows a conventional window profile, consisting of a profile body (1) and protruding portions implemented in the form of extensions (2), with a fitting groove (3) implemented in the profile body (1). Extensions (2), on their inner side, may include auxiliary grooves (4) intended for accommodation of a seal to ensure tight junction of a profile with other members of the structure.

[0024] Fig. 2 shows, in conjuction, two conventional frame profiles held by a fittings' locking element (5) that is implemented, for example in the form of a cylindrical roller, and disposed on fittings of one of profiles. Fig. 2 further shows that the locking element (5) interacts with a conforming part (6) on fittings of another profile in the direction of the axis (x) perpendicular to axis of symmetry of the fittings' groove.

[0025] Fig. 3 shows a version of a window profile according to the invention. This window profile consists of a profile body (7) and protruding parts in the form of extensions (8); at least one of the extensions having a fitting groove (9) to accommodate fittings therein.

[0026] The inner side of the extensions may include additional grooves (10) intended to accommodate a seal for provision of tight junction of the profile with other members of the structure. The profile body may be provided also with a main chamber (not shown in the drawing), wherein a reinforcing element is disposed. As different from the conventional profile, the profile's main chamber according to the invention may have the rectangular shape for a more uniform distribution of load. The extensions may further include auxiliary chambers (not shown in the drawings) to improve the sound-proofing and thermal-physics properties of the profile. In all chambers, stiffening ribs may be arranged to enhance strength of the profile. The profile may be made of wood, plastic or aluminium, depending of the required characteristics.

[0027] Fig. 4 shows the longitudinal cross-section of a Γ-shaped locking element (11) of swing-swivel fittings for manufacture of the constructional fencing structures, inclusive of windows or similar structures, for the above-recited frame profiles.

[0028] Fig. 4 shows, in more detail, two window profiles, in conjuction, according to the invention, which profiles are held by a Γ-shaped locking element disposed on fittings of one frame profile and interacting with a conforming part (12) on fitting of another frame profile in the direction (x) that is parallel with axis of symmetry (x') of a fitting groove (9). The locking elements, as well as the parts conforming therewith, are positioned at a distance from one another along the entire length of the profile, which allows provide uniform clamping of one profile to another.

[0029] A system of profiles, that constitutes a window unit according to the invention, is shown in Fig. 5. This system of profiles consists of a frame profile (13), a glazing moulding (14) and a frame profile of a casement (15) having a fitting groove (9) disposed in the casement profile extension.

[0030] This system of profiles is made of materials that must meet the following requirements:

- materials used for manufacture of said system must comply with the applicable standards, specifications, technical certificates enacted according to an established procedure;
- materials used for manufacture of said system must be weather-resistant;
- materials used for manufacture of said system must be those that have passed tests for durability (reliability) at the formally qualified testing centers.

[0031] Manufacture of a frame profile according to the invention essentially corresponds to that of the conventional frame profiles. Depending on a material used for manufacture, a frame profile according to the invention may be obtained by extrusion of PVC, by longitudinal milling of a cant, or by hot-pressing of aluminium alloys. This profile, to ensure its normal functioning, must be manufactured in conformity with the following requirements:

[0032] The manufactured profile must comply with its engineering specifications.

[0033] To ensure normal functioning, nominal sizes of height, width, functional sizes of the grooves for sealing gaskets, and also sizes of the fitting groove must be within the deviation limits cited in Table 1.

Table 1

Size	Deviation limit, mm
Width	±0.3
Height	±0.5
Functional sizes of grooves	±0.3
Other	±0.5

[0034] A profile must be capable of retaining its shape under the action of the operation loads and other types of load. Deviation limits of a profile shape, for the purpose to ensure its normal functioning, must be as follows, at most:

- rectilinearity of the face edges, in cross-section: ± 0.3 mm per 100 mm;
- parallelism of the face edges, in cross-section: 1 mm per 100 mm;
- rectilinearity of the profile sides, lengthwise: 1 mm per 1000 mm of length.

[0035] Indices of physical-mechanical properties of a profile must correspond to the current relevant Code;
Mass of 1 m of a profile in length must correspond to the value determined in the production forms and records. Deviation of said mass should not exceed 7% of that value.

[0036] A profile must have an appropriately formalized sanitary certificate. Operation and storage of a profile must not exert any injurious action of health.

[0037] The claimed system of frame profiles allows improve the thermal, physical-mechanical and sound-proofing indices of window articles; lower the cost of said articles and improve the light-transmission capability thereof owing to reduced sizes of cross-section of the profiles.

[0038] A person skilled in the art will appreciate that the embodiments described above may have other variations and modifications that are covered by the scope of protection of this invention, which scope is defined by entire set of the features of the invention claims.

Claims

1. A frame profile for manufacture of the constructional fencing structures, including windows or similar structures, comprising a profile body having at least one portion configured as an extension, and a fitting groove, **characterised in that** said fitting groove is implemented within the extension.

2. The frame profile as claimed in Claim 1, **characterised in that** the inner side of at least one extension has a groove to accommodate a seal to ensure tight junction of the profile with other members of the structure.

3. The frame profile as claimed in Claim 1, **characterised in that** the profile body is provided with a main chamber therein for disposing a reinforcing element of the closed cross-section.

4. The frame profile as claimed in Claim 3, **characterised in that** the chamber is of the rectangular shape in oder to ensure a more uniform distribution of a load.

5. The frame profile as claimed in Claim 1, **characterised in that** the extension has auxiliary chambers implemented therein to improve the sound-proofing and thermal-physics properties of the profile.

6. The frame profile as claimed in Claim 5, **characterised in that** in said a chambers arranged are stiffening ribs to improve strength of the profile.

7. The frame profile as claimed in any one of Claim 1-6, **characterised in that** the profile is made of wood, plastic or aluminium.

8. A frame profile for manufacture of the constructional fencing structures, including windows and similar structures; comprising a chamber that accommodates a reinforcing element; outer and inner ledges, and a fitting groove; a portion of the outer ledge, that is opposite to the glazing element, has a protruding portion configured as an extension; **characterised in that** the fitting groove is implemented in the extension.

9. The frame profile as claimed in Claim 8, **characterised in that** the inner side of at least one extension has a groove to accommodate a seal to ensure tight junction of the profile and other members of the structure.

10. The frame profile as claimed in Claim 8, **character-**

ised in that the profile body comprises a main chamber implemented therein for disposing a reinforcing element of the closed cross-section.

11. The frame profile as claimed in Claim 10, **characterised in that** the chamber is of the rectangular shape for the purpose of a more even distribution of a load.

12. The frame profile as claimed in Claim 8, **characterised in that** the extension is provided with auxiliary chambers implemented therein to improve the sound-proofing and thermal-physics properties of the profile.

13. The frame profile as claimed in Claim 12, **characterised in that** in said chambers arranged are stiffening ribs to improve strength of the profile.

14. The frame profile as claimed in any one of Claim 8-13, **characterised in that** the profile is made of wood, plastic or aluminium.

15. A system of frame profiles for manufacture of the constructional fencing structures, including windows or similar structures; comprising at least two frame profiles having a profile body provided with at least one protruding portion configured as an extension, and a fitting groove; **characterised in that** at least in one of the profiles said fitting groove is implemented in the extension.

16. A system of frame profiles for manufacture of the constructional fencing structures, including windows or similar structures; comprising at least two frame profiles having a chamber that accommodates a reinforcing element; outer and inner ledges, and a fitting groove; a portion of the outer ledge, that is opposite to the glazing element, has a protruding portion configured as an extension; **characterised in that** at least in one of the profiles a fitting groove is implemented in the extension.

17. A set of swing-swivel fittings for manufacture of the constructional fencing structures, including windows or similar structures, for frame profiles according to Claim 1; comprising a main drive that transforms rotating motion of the window handle into translational motion of the locking elements; locking elements that interact with the conforming parts, angular transmissions that angularly transmit movement of the locking elements, upper and lower hinge groups that disengage the frame profiles of a window unit; **characterised in that** the locking elements are implemented in the form of Γ-shaped elements adapted to interact with the conforming parts in the direction that is parallel with axis of symmetry of the fitting groove.

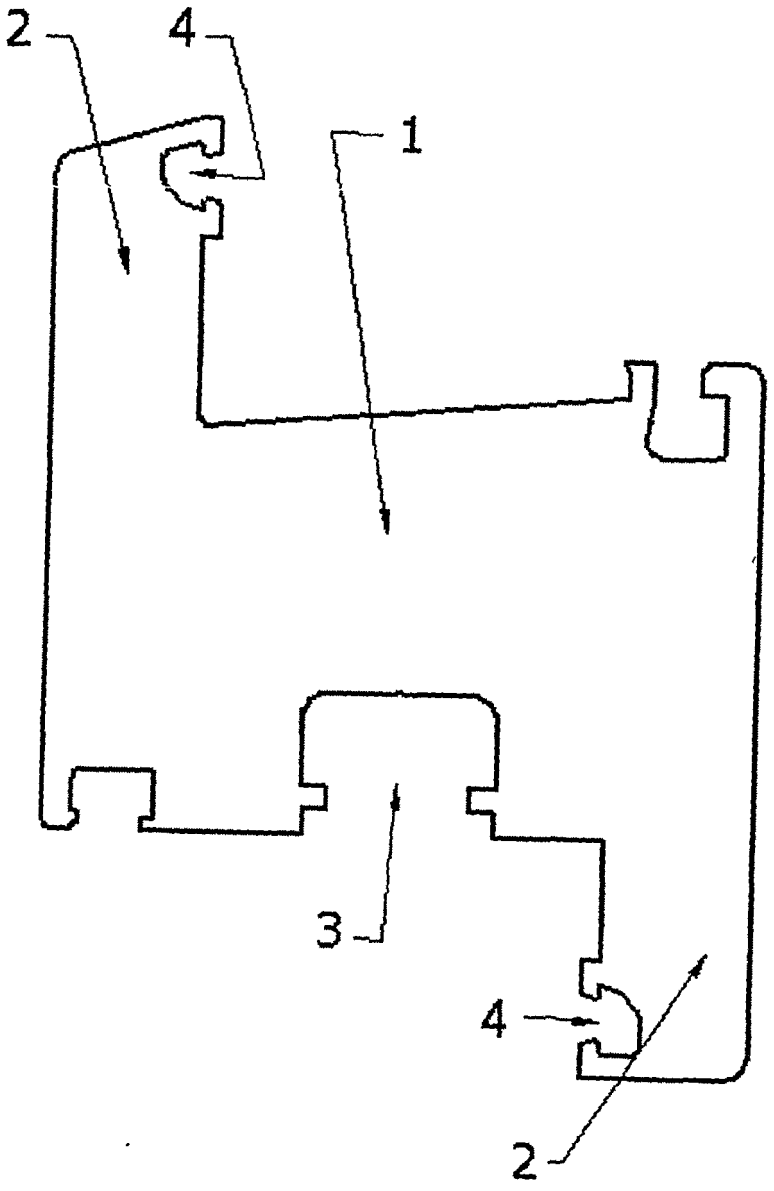

Fig.1

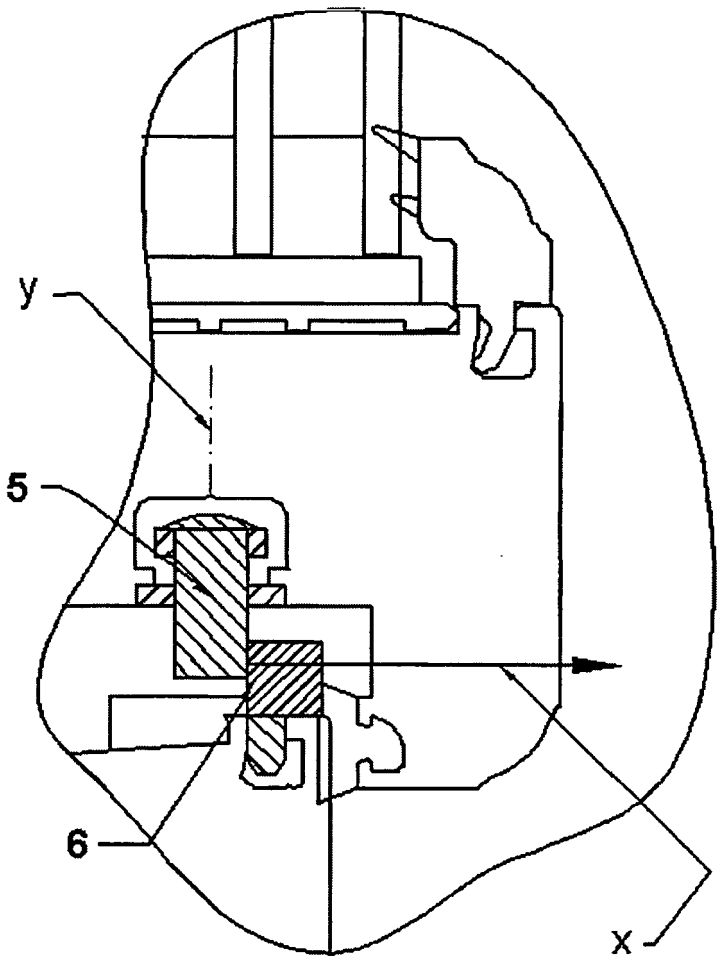

Fig.2

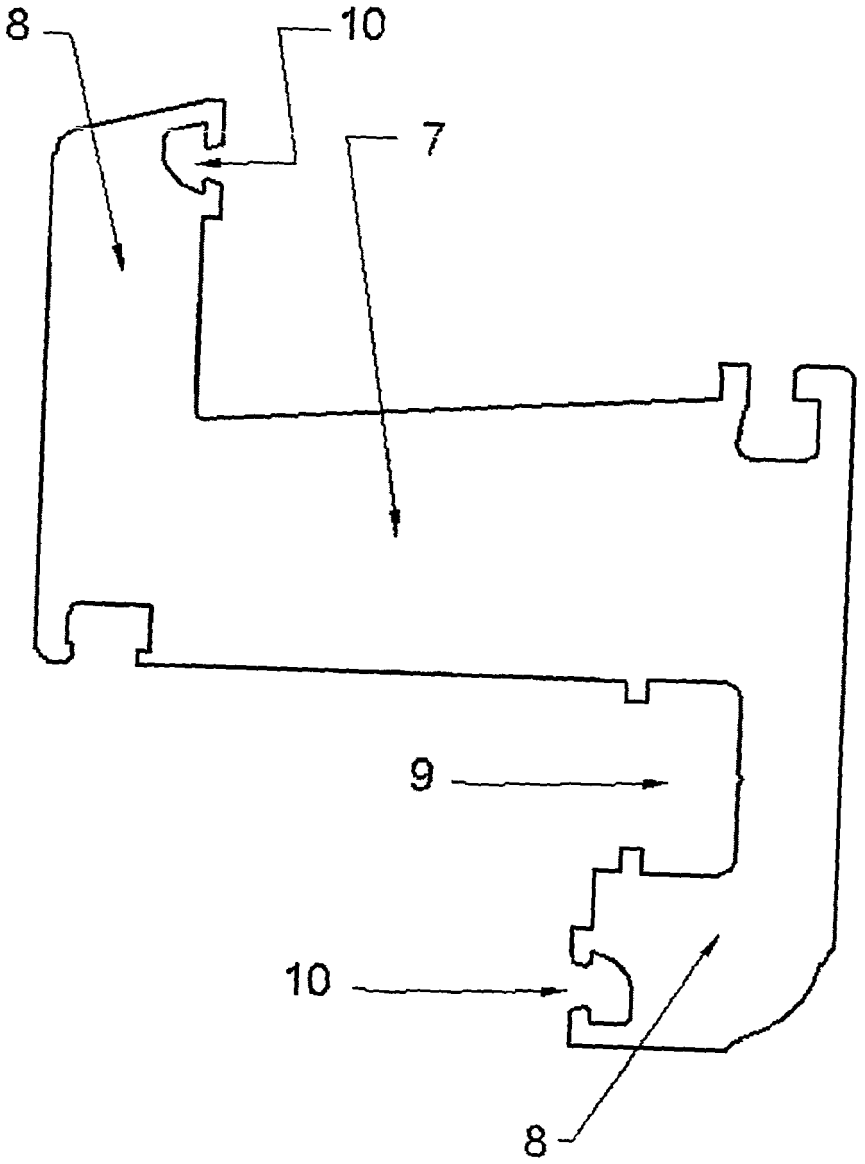

Fig.3

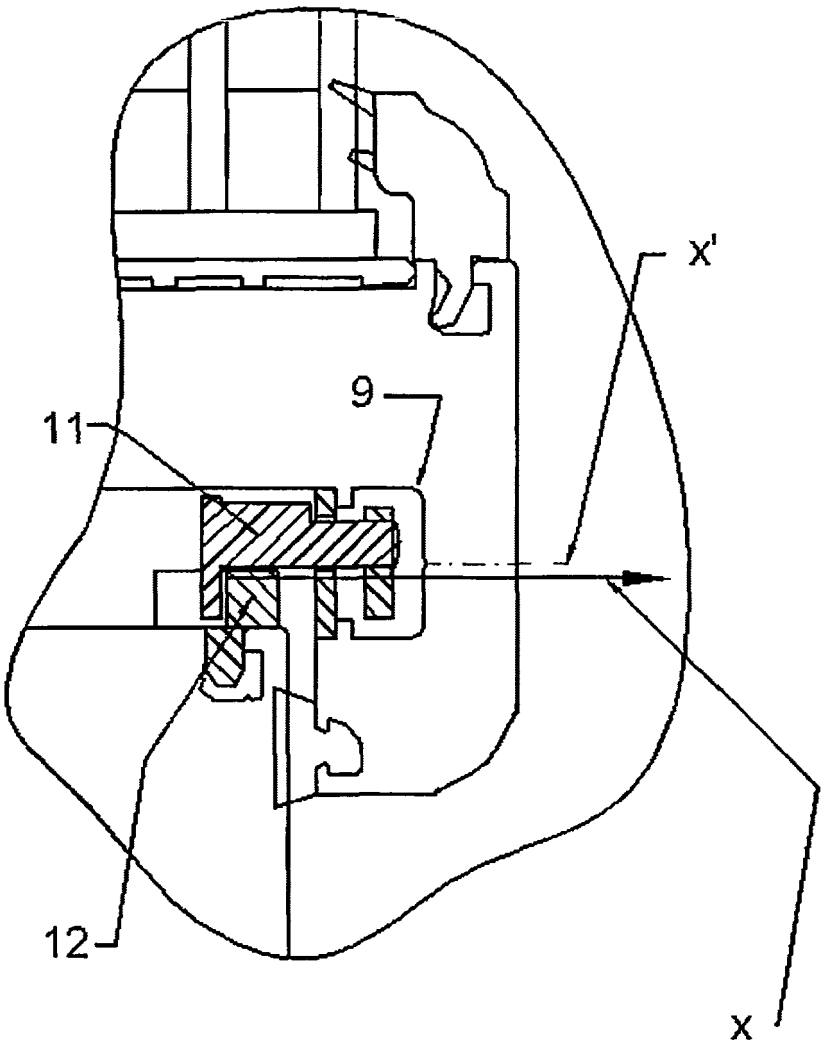

Fig.4

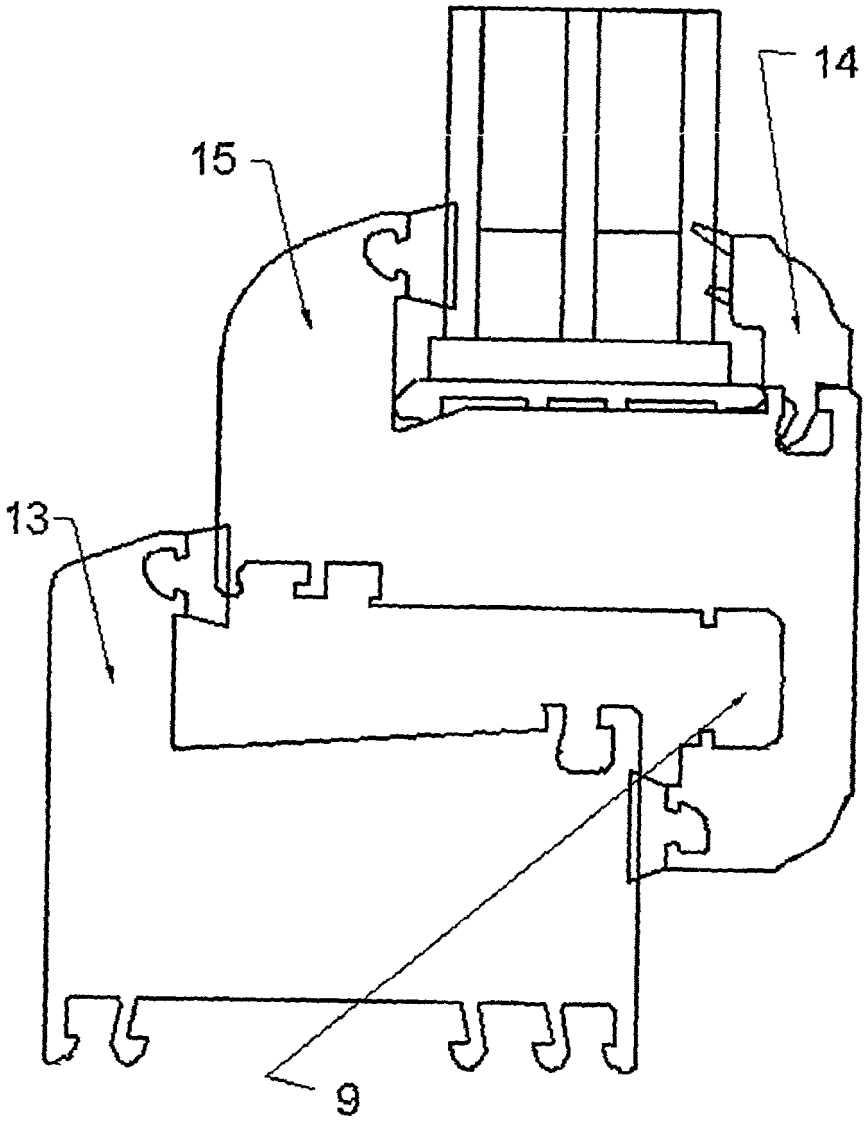

Fig.5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/RU2006/000051

A. CLASSIFICATION OF SUBJECT MATTER ***E06B 3/22*** *(2006.01)*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E06B 1/00, 1/16, 3/00, 3/22, 3/24, 3/26, E05C 7/00, 7/02, F16S 3/00, 5/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

RUPAT, RUPAT_OLD, RUPAT_NEW, RUABRU, PatFT, PAJ, PCT, Esp@cenet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y A	DE 2729478 A1 (ETABLISSEMENT TESTA) 25.01.1979, page 9, lines 1-17, figure 1	1, 3-4, 8, 10-11, 15-16 2, 5-7, 9, 12-14 17
Y	GB 2274672 A (STATUS INNOVATIONS LIMITED) 03.08.1994, figure 1	2, 9
Y	DE 3445307 A1 (POGUNTKE, HELMUT) 12.06.1986, page 2, lines 4-8	7, 14
Y	DE 202005001073 U1 (ALUPLAST GMBH) 09.06.2005, figure 2	5-6, 12-13
A	RU 2225491 C2 (ZIGENIA-FRANK KG) 10.03.2004	17

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search	Date of mailing of the international search report
08 October 2006 (08.10.2006)	16 November 2006 (16.11.2006)
Name and mailing address of the ISA/RU Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1998)

REFERENCES CITED IN THE DESCRIPTION

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Non-patent literature cited in the description

- **A. YU. BEZROUKOV ; V.L. MIKOV.** Reference book for measuring. Methodological guide for making measurements of the window and door units. Mezhreghional,nyi Institut Okna, 2005, 183-185 **[0002]**
- **I.V. BORISKIENA ; A.A. PLOTNIKOV ; A.V. ZAKHAROV.** Design of modern window systems of civil buildings. Publishers of Association of Construction High Schools, 2003, 40-45 **[0002]**
- *Design...,* 170-175 **[0005]**