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(54) A window sash adapted for standardized manufacture

(57) This invention discloses a window sash adapted for standardized manufacture, which comprises a basic sash frame and extra side plates fastened to outer surfaces of side sash members of the basic sash frame. Said basic sash frame consists of a standardized element of a sash, such that the sash frame is adapted for standardized manufacture and suitable for different types of windows. The extra side plates may be diversely configured for different types of windows. Therefore, a sash of this type may be economically, efficiently and effectively manufactured, while at the same time the installation, usage, service and management thereof is greatly facilitated. Said extra side plates define a sealing groove in a longitudinal direction of the sash frame, and a gasket is received in said sealing groove to seal a gap between a window frame and the window sash. A plurality of supports may be arranged on said extra side plates to support side coverings, so that the strength of the covering is efficiently improved.

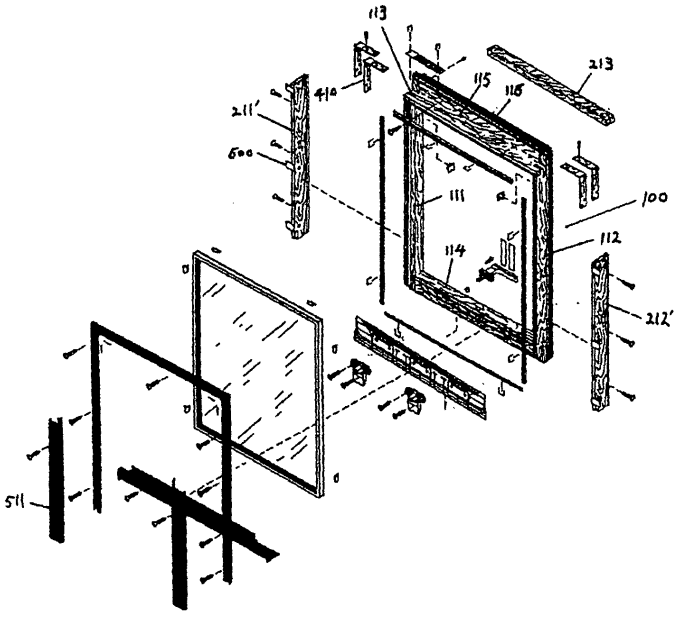

Fig. 2

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Description

Field of the invention

[0001] The present invention relates to a window sash, in particular to a window sash adapted for standardized manufacture, which constitutes a part of a window arranged in a building or a pitched roof.

Background of the invention

[0002] Generally, a window comprises a frame, a sash, a covering, a pane and other accessories. The frame comprises a top frame member, a bottom frame member and two side frame members; and the sash comprises a top sash member, a bottom sash member and two side sash members. When the window is mounted in a building or a pitched roof, the frame is firstly fixed to a wall of the building or the roof, and then the sash with the pane is mounted to the frame, with the covering and other necessary accessories arranged on the frame and sash.

[0003] A window arranged in a building or a pitched roof can meet requirements in use through a combination of said frame and sash with related accessories or parts and the combination of the frame with the sash. Furthermore, with a hinge device mounted in a central or top portion of a frame or a sash, the sash may pivot on an axis arranged in the central or top portion of the frame in an opened state, which are respectively referred to as a centre-hung window and a top-hung window hereinafter.

[0004] As mentioned in the above, window elements, particularly the sash and frame, are quite important. Structures of the sash, frame and accessories thereof have a crucial effect on types of windows, processing, cost, installation, connection, sealing, waterproof, drain, usage and service, etc.

[0005] Different sash structures and different frame structures are needed for different types of windows. For example, the structures of the frame and sash of a centre-hung window are different from that of a top-hung window due to different hinge installation positions, resulting in difficulties in production and installation of frames and sashes, thus leading to an increased cost. For examples, in a Chinese patent application CN99807099 (Publication No. 1304474) titled "a roof window with a main frame and frame coverings", the structures of sashes and frames of different windows are different from each other so that these members must be separately manufactured, thus it is impossible to carry out a standardized manufacture.

[0006] A need therefore exists to realize a combination of economy, efficiency and effectiveness during production of a window, while, at the same time, the window elements should be easy to manufacture and assemble.

[0007] Next, since a sash is mounted to a frame, an exposed sealing groove therefore is generally defined in a joining face of said frame and sash to obtain a sealing between these two parts, and a gasket is embedded in said sealing groove, then fixed. Therefore, although the gasket has been securely fastened by a fixing member, the exposed gasket is still prone to come off due to long term hit and press between the frame or sash and the gasket after the window has been used for a period of time, thereby the sealing between the frame and the sash become loose and the window cannot be normally used.

[0008] Also, parts of the frame and sash should be generally covered from outside by coverings so as to protect wood or other materials in the frame and sash from weathering such as rain, sunshine, wind and snow. The coverings for the frame and sash comprise a top covering, side coverings and a bottom covering.

[0009] The sash and the coverings for the sash are mobile both when the sash is opened or closed. Particularly, at the instant that the sash is closed upon the frame, the sash and the coverings get trembled. Since the coverings are screwed directly onto the frame and sash and pressed thereon, and these coverings are generally made of thin metal material, the strength and stability of the sash coverings or the frame is not sufficient. The sash coverings are prone to distortion and slack after the window is used for a period of time.

[0010] The solution of increasing covering thickness, improving covering structure or replacing covering material will greatly increase the cost and also have a certain effect on manufacture and processing, etc.

Summary of the invention

[0011] An object of the invention is to solve the above problem in the prior art and provide a window sash adapted for standardized manufacture.

[0012] Another object of the invention is to provide a window sash with an excellent sealing between a window frame and the sash.

[0013] Still another object of the invention is to provide a window sash with a covering of improved strength and little deformation.

[0014] According to an aspect of the invention, a window sash adapted for standardized manufacture comprises a basic sash frame and extra side plates fastened to outer surfaces of side sash members of the basic sash frame, said basic sash frame consisting of two side sash members, a top sash member and a bottom sash member which cooperatively form a closed sash frame, and said basic sash frame is a standard sash member, while said extra side plates are adapted for different types of windows.

[0015] Said extra side plates may define a sealing groove in a longitudinal direction of the sash frame, and a gasket is received in said sealing groove to seal a gap between a window frame and the window sash.

[0016] The top sash member of said basic sash frame extends upwardly from its rear side to form a rear plate of the top sash member so as to better fit different types of windows.

[0017] Said extra side plate may be so arranged that

their top surfaces locate above the top surface of the top sash member and approach a top edge of the rear plate for a top-hung window.

[0018] Said extra side plates may be arranged on the outer surface of the side sash members with upper portions of these extra side plates close to middle regions of these sash members for a centre-hung window.

[0019] A plurality of supports may be arranged on said extra side plates to support side coverings.

[0020] Said supports may define a fixing hole therein for a corresponding side sash covering.

[0021] The sash according to the invention comprises a basic sash frame and extra side plates fastened to side sash members thereof, such that the sash frame is adapted for standardized manufacture and suitable for different types of windows, especially for windows arranged in a building or a pitched roof. The extra side plates may be diversely configured for different types of windows. Therefore, a sash of this type may be economically, efficiently and effectively manufactured, while at the same time the installation, usage, service and management thereof is greatly facilitated.

[0022] In a further aspect of the invention, a support for a window covering is provided.

Brief description of the drawings

[0023]

Fig. 1 is a schematic view showing an installation diagram of a sash according to the present invention for a centre-hung window;

Fig. 2 is a schematic view showing another installation diagram of a sash according to the present invention for a top-hung window;

Fig. 3 is a schematic view showing a connection between a top plate and an extra side plate;

Fig. 4a is a cross-section view of the extra side plate of the top-hung window;

Fig. 4b is a cross-section view of the extra side plate of the centre-hung window;

Fig. 5 is a cross-section view showing the top plate, sash frame and hinge fixture in an assembled state for a top-hung window according to the present invention;

Fig. 6 is a perspective view showing the hinge fixture of the present invention;

Fig. 7 is a plan view showing an installing position for a top end of the extra side plate and a hinge mechanism for a centre-hung window;

Fig. 8 is a cross-section view showing a side sash covering, support and side sash frame in an assembled state;

Fig. 9 is an enlarged perspective view of a support;

Fig. 10 is a rear view of the support of Fig. 9;

Fig. 11 is a left side view of the support of Fig. 9;

Fig. 12 is a right side view of the support of Fig. 9.

Detailed description of the invention

[0024] Embodiments of the present invention will now be described in detail in conjunction with the accompanying drawings.

[0025] Figs. 1 and 2 are schematic views showing installation diagrams of a basic sash frame 100 for a centre-hung window and a top-hung window, respectively. The basic sash frame 100 may be also used in other types of windows, such as a special window in which the hinge mechanism is arranged at a position between the top portion and central portion of the window. The window sash adapted for standardized manufacture comprises a basic sash frame 100 and extra side plates 211, 212 or 211', 212' fixed to the outer surface of side sash members 111, 112 of the sash frame 100. Said basic sash frame 100 consists of two side sash members 111, 112, a top sash member 113 and a bottom sash member 114, with all sash members coupled together to form a closed frame structure. The basic sash frame 100 is a standard member of a sash. Although two different types of windows are shown in Figs 1 and 2, respectively, the same basic sash frame 100 is adopted in both windows.

[0026] The extra side plates 211, 212 in Fig. 1 and the extra side plates 211', 212' in Fig. 2 are non-standard parts and have different lengths and different top structures, suitable for different types of windows.

[0027] Each of the extra side plates 211, 212 and 211' 212' defines a sealing groove 231 in a longitudinal direction of the basic sash frame 100, and a gasket 231 is received in the sealing groove 231 to seal a gap between a window frame and the window sash.

[0028] Two side sash members 111, 112, the top sash member 113 and the bottom sash member 114 are coupled together to form an integral structure of the basic sash frame 100. The top sash member 113 extends upwardly from its rear side to form a rear plate 115 of the top sash member so as to better fit different types of windows while reducing non-standard parts as much as possible and simplifying structures of these non-standard parts. For example, only one extra top element 213, which is a non-standard part, is needed for a top-hung window, and the top element 213 can be of simple structure, i.e. nothing but a piece of top plate. The detailed structure of the top element 213 will be described hereinafter.

[0029] Referring to Fig. 2 in conjunction with Fig. 3, the extra side plates 211', 212' are so arranged that their top surfaces are located above the top surface of the top sash member 113 and approach a top edge of the rear plate 115. Such a sash is hinged in a top region of a window frame.

[0030] In the centre-hung window of Fig.1, the extra side plates 211, 212 are arranged on the outer surface of the side sash members 111, 112 with upper portions of these extra side plates close to middle regions of these sash members. Materials may be saved with this design. Such a sash is hinged in a middle region of a window

frame.

[0031] Referring to Fig. 1 in conjunction with Fig. 7, each extra side plate 211, 212 defines a cutout corresponding to the outer profile of a hinge 400 at its upper end portion 232, so that an upper end portion 232 of the extra side plates 211, 212 may extend between the outer surfaces of the side sash members 111, 112 and the hinge 600, and this portion 232 is arranged neighboring a pivot axis of the hinge 400. For a centre-hung window, when the side plates 211, 212 are relatively shorter and the upper-half portion of the side sash member 111, 112 is exposed, the sealing between the exposed sash and the frame may be carried out by another gasket arranged in a corresponding position of the frame. The hinge 400 has an unfavorable effect on the sealing between the sash and the frame in this region. The gasket 300 in the sealing groove 231 can yield a wider sealing when the upper end portion 232 of the side plates 211, 212 is closer to the pivot axis of the hinge 400. In other words, sealing between the sash and frame in the hinge region is improved when the upper end portion 232 of the side plates 211, 212 is closer to the pivot axis of the hinge 400.

[0032] The cutout defined in the upper end portion 232 of the side plate 211, 212 comprises an arc section and a straight section joined to the arc section with a smooth transition. The straight section forms a longitudinal protruding straight portion 233 at the upper end of the extra side plate 211, 212, and is inserted into a gap between the hinge 400 and the side sash member 111, 112, resulting in a satisfactory sealing between the sash and the frame in the hinge region.

[0033] Referring to Figs. 1 and 2 in conjunction with Figs. 5 and 8, a ring sealing groove 118 is provided around the outer surface of the basic sash frame 100 so as to provide an overall sealing between the sash and the frame.

[0034] With the ring sealing groove 118, a ring sealing flange 116 is formed along the periphery of the basic sash frame 100. The ring sealing groove 118 extends from the outer surface of the sash frame 100 toward the inside thereof, and the ring sealing flange 116 overlays the rear plate 115 of the top sash member.

[0035] On the outer surface of the side frame members 111, 112, side walls of the ring sealing flange 116 are vertically arranged, and the straight flange 233 of upper end portion 232 of the extra side plates 211, 212 is received within the gap between the hinge 400 and a side wall of the ring sealing flange 116.

[0036] At the bottom of each extra side plates 211, 212, 211', 212', a sealing groove 231 is provided (Fig. 4). The opening of the sealing groove 231 faces a side wall of the ring sealing flange 116, and a gasket 300 is received within the sealing groove 231. Therefore, the gasket 300 is sandwiched between the extra side plate and the side frame member, such that the deformation and breaking-off of the gasket 300 are prevented even though the sash is opened and closed many times.

[0037] The sealing groove 231 in each extra side plate 211, 212, 211', 212' is a through groove, which extends from one end of the extra side plate to the other end thereof, so that an area covered by the sealing may be increased.

[0038] The extra side plates 211, 212, 211', 212' each define a plurality of fixing holes on its outer surface. The extra side plate 211, 212, 211', 212' is fixed to the respective outer surface of the side frame member 111, 112 of the basic sash frame 100 by fasteners such as screws.

[0039] In Figs. 2 and 3, there are two symmetric extra side plates, i.e. plates 211, 212 and plates 211', 212', which are fixed to the left and right side frame members 111, 112 of the basic sash member 100, respectively.

[0040] In the top-hung window of Fig. 2, a top plate 213 is connected between top ends of the extra side plates 211', 212' to facilitate mounting of various components or accessories which are necessary for the top portion of the sash, for example, a hinge mechanism secured in the top portion of the sash. Top plate 213 is coupled to the rear plate 115 and two extra side plates 211', 212', respectively, through a lap joint or scarf joint, which improves the structural performance of the sash as a whole.

[0041] Referring to Figs. 3 and 5, a horizontal step 117 is provided at the upper front portion of the rear plate 115 of the top sash member so that it may be coupled to the top plate 213 through a lap joint, and another horizontal step 214 is correspondingly provided at the rear portion of the top plate 213 so that it may be coupled to the rear plate 115 through a lap joint.

[0042] As shown in Fig. 3, steps correspondingly coupled to said side plates 211', 212' may be provided on the top plate 213 at both sides so as to engage the inner straight surfaces of the extra side plates 211', 212' through a lap joint, respectively. Alternatively, the top plate 213 may be formed with two straight side faces, which can engage steps arranged on the inner surfaces of the extra side plates 211', 212' through a lap joint, respectively.

[0043] The top plate 213 forms a favourable integral structure with the rear plate 115 and side plates 211', 212', respectively, through a lap joint or scarf joint, thereby forming an integral sash with the basic sash member 100 and other necessary accessories. Of course, the top plate 213, the rear plate 115 and the side plates 211', 212' may form an integral structure by other connecting means.

[0044] In Fig. 5, two L-shaped hinge fixtures 410 are respectively fastened to two ends of the top plate 213 by screws. One leg of an L-shaped hinge fixture 410 is secured to the top surface of the top plate 213 by screw, and the other leg is secured to outer surface of the extra side plate 212', thereby the L-shaped hinge fixture 410 may connect the top plate 213 with the extra side plates 211', 212', and a hinge mechanism for sash rotation may be mounted thereon.

[0045] The L-shaped hinge fixture 410 defines a plu-

rality of fixing holes 411, 412 on its top surface and side surface, respectively, for the purpose of fixation. A connecting pivot shaft 413 coupled to the hinge mechanism is provided on the upper side surface of the L-shaped hinge fixture 410.

[0046] A plurality of supports to support a side sash covering is arranged on both extra side plates to reinforce the side covering and prevent damage or deformation at edges of the side sash covering. Of course, the supports may also be provided on the bottom sash member to support the bottom sash covering, or be provided on the frame to support the frame covering, if necessary. The supports are not shown in Fig. 1.

[0047] Fig. 8 is a cross-sectional view showing left extra side plate 211', left side sash member 111 and correspondingly assembled frame, covering and pane.

[0048] Referring to Figs. 2, 8 and 9, the side plate 211' is provided with a plurality of supports 600 to support the side sash covering 511. The support 600 may be made of non-metal materials and may be fixed to or embedded in the extra side plate 211'. In this case, the support 600 defines a fixing hole 611 for a corresponding side sash covering 511. A screw passes through the side sash covering 511 and fixes the covering to the support 600.

[0049] Each support 600 comprises a first portion 610 and a second portion 620 which are integrally joined, so that the support 600 may perform better and may be arranged on the extra side plate 211' more conveniently (the extra side plate and the side member of the basic sash frame may be referred to as a side sash frame or a sash frame as a whole). A top surface of the first portion 610 is used as the supporting surface for the side covering 511, while the fixing hole 611 is opened from the top surface of the first portion 610 and extends into the second portion 620.

[0050] Referring to Figs. 9-12, which schematically show the structure of the support, the support 600 is provided with positioning pins 621, 622 such that the support 600 can be readily and firmly secured on the extra side plate 211'. It is understood that the support 600 may be attached by other means, such as a single positioning pin on the support, or a positioning block, or screws, etc. Respective positioning holes corresponding to these positioning pins 621, 622 are provided on the extra side plate 211'. Only one positioning pin 621 is schematically shown in Fig. 8, while the other positioning pin 622 is not shown.

[0051] The positioning pins 621, 622 are arranged on an inner end surface 623 of the second portion 620. Said inner end surface 623 is a plane which snugly fits on an outer surface of the extra side plate such that the support 600 is more stable, and thus the support 600 may be firmly attached to the extra side plate while the supported side covering 511 may be steadily held, thereby the stability of the sash as a whole is improved. The positioning pins 621, 622 are perpendicularly arranged on inner end surface 623 of the second portion 620.

[0052] The outer surface of the positioning pin 621 is provided with a plurality of umbrella-shaped frustum of a cone 624, with the frustum cone 624 tapering in an insertion direction of the positioning pin so that the positioning pin 621 may be readily secured in the positioning hole of the extra side plate 211' or side sash member. This facilitates an insertion of the positioning pin 620 while preventing the positioning pin 621 from moving outward and getting loosed. Such an effect is especially obvious when a screw exerts upon the fixing hole 611.

[0053] The positioning pin has a substantially criss-cross section. Each of the four flanges 625 of the criss-cross forms a tapering section 626. Such a design is also advantageous for an insertion of the positioning pin 622 and further may prevent the positioning pin 622 from rotating in a circumference direction. This advantageous effect is also obvious when a screw exerts upon the fixing hole 611.

[0054] The support 600 comprises two of said positioning pins 621, 622, which are respectively diagonally arranged on inner end surface 623 of the second portion 620, so as to effectively prevent the support 600 from rotating, improve stability of the side coverings 511 and increase the solidity of the integral structure of the sash. For example, when the sash is rotated to open or close, particularly when the sash is closed with respect to the frame, the support tends to move or sway upon vibration due to rotating of the sash and contact vibration between the sash and frame; furthermore, the support 600 tends to sway under non-even stress when the screws are forced into the support 600 since the support 600 is screw-fastened with the side covering 511. Arrangement of two positioning pins 621, 622, especially two diagonally disposed positioning pins 621, 622, can effectively prevent the support 600 from loosing, and may result in uniformly distributed stress on the support 600.

[0055] The second portion 620 further defines a rod-shaped reinforcement portion 628 on the outer end surface 627 thereof to improve the structural strength of the support 600. The fixing hole 611 of the support 600 extends into said reinforcement portion 628. A triangular rib 629 is arranged between the outer end surface of the reinforcement portion 628 of the second portion 620 and the outer end surface 612 of the bottom surface of the first portion 610, so as to improve the structural strength of the support 600 as a whole.

[0056] The inner end surface 613 of the bottom surface of the first portion 610 is pressed against the front face of the extra side plate 211' tightly, while the outer end surface 612 of the bottom surface of the first portion 610 hangs over the extra side plate 211'. Thus, the support 600 may carry out various functions such as positioning, fixing and supporting, and the overall structure thereof is simple and compact.

[0057] The inner end surface of the bottom surface of the first portion 610 has an inclined edge to facilitate connecting with the side sash covering and side sash member.

[0058] An inclined surface is provided between the in-

ner end surface of the bottom surface of the first portion 610 and the inner end surface of the second portion 620 to engage with the side sash member, so as to facilitate connection between the side sash covering and the side sash member.

[0059] Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention. Thus, the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the examples given.

Claims

1. A window sash adapted for standardized manufacture, **characterized in that** it comprises a basic sash frame and extra side plates fastened to outer surfaces of side sash members of the basic sash frame, said basic sash frame consisting of two side sash members, a top sash member and a bottom sash member which cooperatively form a closed sash frame, and said basic sash frame is a standard sash member, while said extra side plates are adapted for different types of the windows.

2. A window sash according to claim 1, **characterized in that** said extra side plates define a sealing groove in a longitudinal direction of the sash frame, and a gasket is received in said sealing groove to seal a gap between a window frame and the window sash.

3. A window sash according to claim 1 or 2, **characterized in that** said top sash member of said basic sash frame extends upwardly from its rear side to form a rear plate of the top sash member so as to better fit different types of windows.

4. A window sash according to claim 3, **characterized in that** said extra side plate are so arranged that their top surfaces locate above the top surface of the top sash member and approach a top edge of the rear plate for a top-hung window.

5. A window sash according to any one of the preceding claims, **characterized in that** said extra side plates are arranged on the outer surface of the side sash members with upper portions of these extra side plates close to middle regions of these sash members for a centre-hung window.

6. A window sash according to claim 5, **characterized in that** said extra side plate defines a cutout at its upper end portion, so that an upper end portion of the extra side plates extends between the outer surface of the side sash member and the hinge, this portion being arranged neighboring a pivot axis of the hinge so as to improve sealing between the sash and frame in the hinge region.

7. A window sash according to claim 6, **characterized in that** said cutout defined comprises an arc section and a straight section joined to the arc section with a smooth transaction, wherein said straight section forms a longitudinal protruding straight portion at the upper end of the extra side plate 211, resultingin a satisfactory sealing between the sash and the frame in the hinge region.

8. A window sash according to claim 2, **characterized in that** a ring sealing groove is formed along the periphery of said basic sash frame and a ring sealing flange is formed thereon to seal the sash and the frame as a whole.

9. A window sash according to claim 8, **characterized in that** said ring sealing groove defines a ring sealing flange along the periphery of said sash frame.

10. A window sash according to claim 9, **characterized in that** the ring sealing groove is at the inner side of the outer surface of the sash frame, and the ring sealing flange overlaps the rear plate.

11. A window sash according to claim 10, **characterized in that** side walls of said ring sealing flange are vertically arranged along the outer surface of the side frame members, and the straight flange of upper end portion of said extra side plate is received within a gap between the hinge and a side wall of said ring sealing flange.

12. A window sash according to claim 8, **characterized in that** a sealing groove is provided at the bottom of said extra side plate, wherein the opening of said sealing groove faces a side wall of said ring sealing flange 116 and a gasket is received within said sealing groove.

13. A window sash according to claim 12, **characterized in that** said sealing groove in said extra side plates is a through groove extending from the bottom end of the extra side plate to the top end thereof.

14. A window sash according to claim 1, **characterized in that** said extra side plate defines a plurality of fixing holes on its outer surface, wherein said extra side plate is fixed to an outer surface of the side frame member of the basic sash frame by fasteners.

15. A window sash according to claims 4 or 5, **characterized in that** said extra side plates consists of two symmetrical plates which are arranged on the left and right side frame member, respectively.

16. A window sash according to claim 15, **characterized in that** a top plate is connected between top ends of said two extra side plates, so that a hinge mechanism arranged in the top portion of the sash is secured thereon.

17. A window sash according to claim 16, **characterized in that** said top plate is coupled to the rear plate and two extra side plates, respectively, through a lap joint or scarf joint.

18. A window sash according to claim 17, **characterized in that** steps correspondingly coupled to said extra side plates are provided on said top plate at both sides so as to engage the inner straight surfaces of the extra side plates through a lap joint, respectively.

19. A window sash according to claim 18, **characterized in that** the top sash member forms steps on both its ends, for respectively overlapping with the inner surfaces of the extra side members.

20. A window sash according to claim 16 **characterized in that** two L-shaped hinge fixtures are respectively fastened to each end of said top plate 213, wherein one leg of said L-shaped hinge fixture is secured to the top surface of the top plate, while the other leg is secured to outer surface of the extra side plate, so that the L-shaped hinge fixture may fix the top plate and the extra side plates and a hinge mechanism for sash rotation may be mounted thereon.

21. A window sash according to claim 20, **characterized in that** a connecting pivot shaft coupled to the hinge mechanism is provided on the upper side surface of said L-shaped hinge fixture.

22. A support for a window covering, **characterized in that** said support comprises a support body, wherein a fixing hole for connection with a corresponding side sash covering and at least one positioning pin for connection with a window frame or sash member are defined in the support body.

23. A support according to claim 22, **characterized in that** said support body comprises a first portion and a second portion which are integrally joined, wherein a top surface of the first portion serves as a supporting surface for the side covering, while said fixing hole is opened from the top surface of the first portion and extends into the second portion through the first portion.

24. A support according to claim 23, **characterized in that** said positioning pins are arranged on an inner end surface of the second portion, wherein said inner end surface is a plane which snugly fits on an outer surface of the extra side plate such that the support is firmly and steadily coupled to the extra side plate, and the positioning pins are perpendicularly arranged on the inner end surface of the second portion.

25. A support according to claim 24, **characterized in that** the outer surface of said positioning pin is provided with a plurality of umbrella-shaped frustums of a cone, with these frustums of a cone tapering in an insertion direction of the positioning pin so that the positioning pin may be readily secured in the positioning hole of the extra side plate.

26. A support according to claim 25, **characterized in that** a plurality of flanges is provided on the positioning pin.

27. A support according to claim 25, **characterized in that** the number of said positioning pins is two, which are diagonally arranged on the inner end surface of the second portion, respectively, so as to effectively prevent the support from loosening.

28. A support according to claim 26, **characterized in that** the positioning pin has a substantially crisscross section.

29. A support according to claim 27, **characterized in that** said flange is provided with vertical tapering sections.

30. A support according to claim 24, **characterized in that** said second portion defines a rod-shaped reinforcement portion on the outer end surface thereof, wherein said fixing hole of the support extends into said rod-shaped reinforcement portion.

31. A support according to claim 30, **characterized in that** a triangular rib is arranged between the outer end surface of said reinforcement portion of the second portion and the outer end surface of the bottom surface of the first portion, so as to improve the structural strength of the support as a whole.

32. A support according to claim 31, **characterized in that** said inner end surface of the bottom surface of the first portion is pressed tightly against the front face of the extra side plate, while the outer end surface of the bottom surface of the first portion hangs over the extra side plate.

33. A window sash according to any one of claims 1-21, **characterized in that** a plurality of supports according to any one claims 22-32 is arranged on the extra side plate to support a side covering.

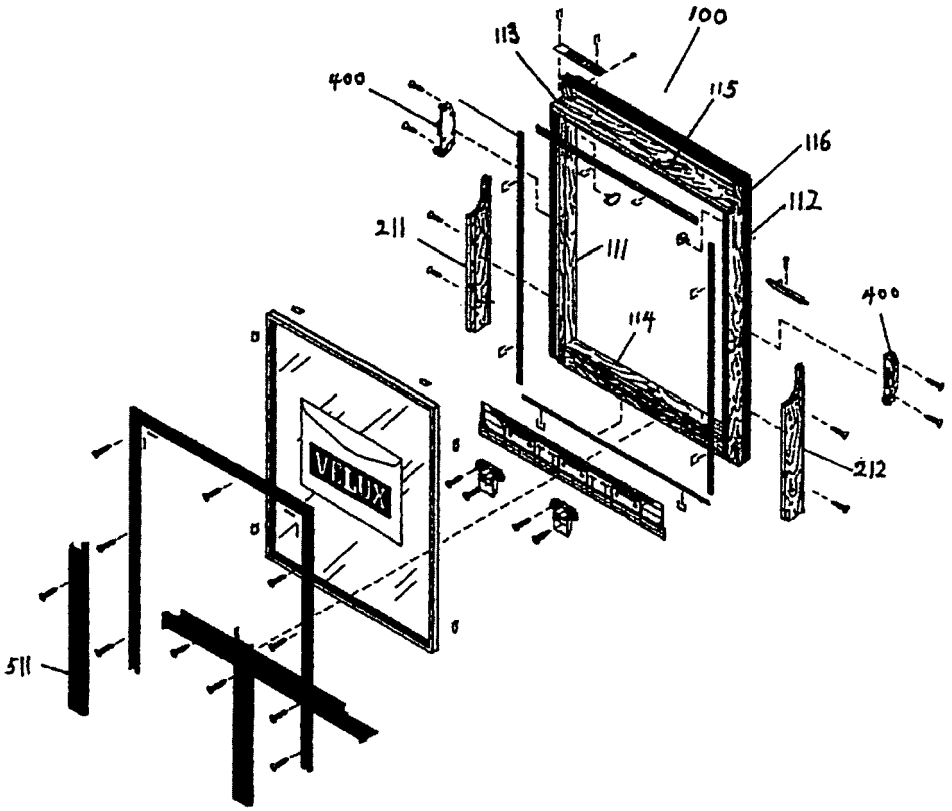

Fig. 1

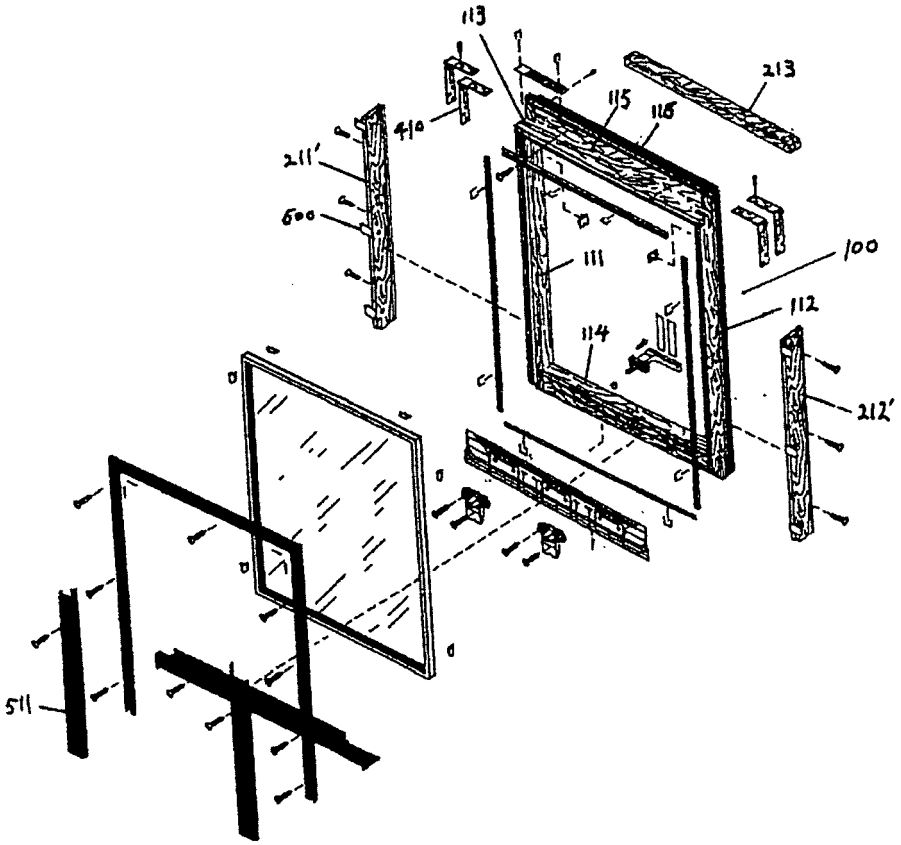

Fig. 2

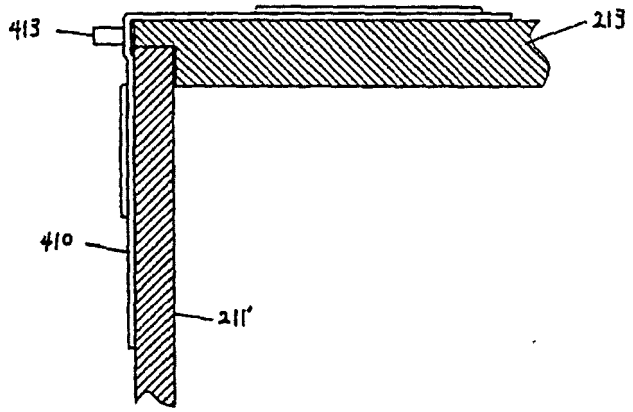

Fig. 3

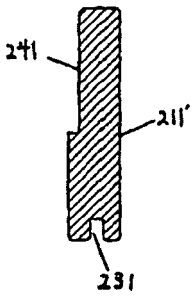

Fig. 4a

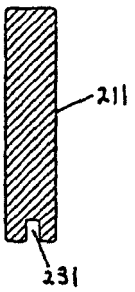

Fig. 4b

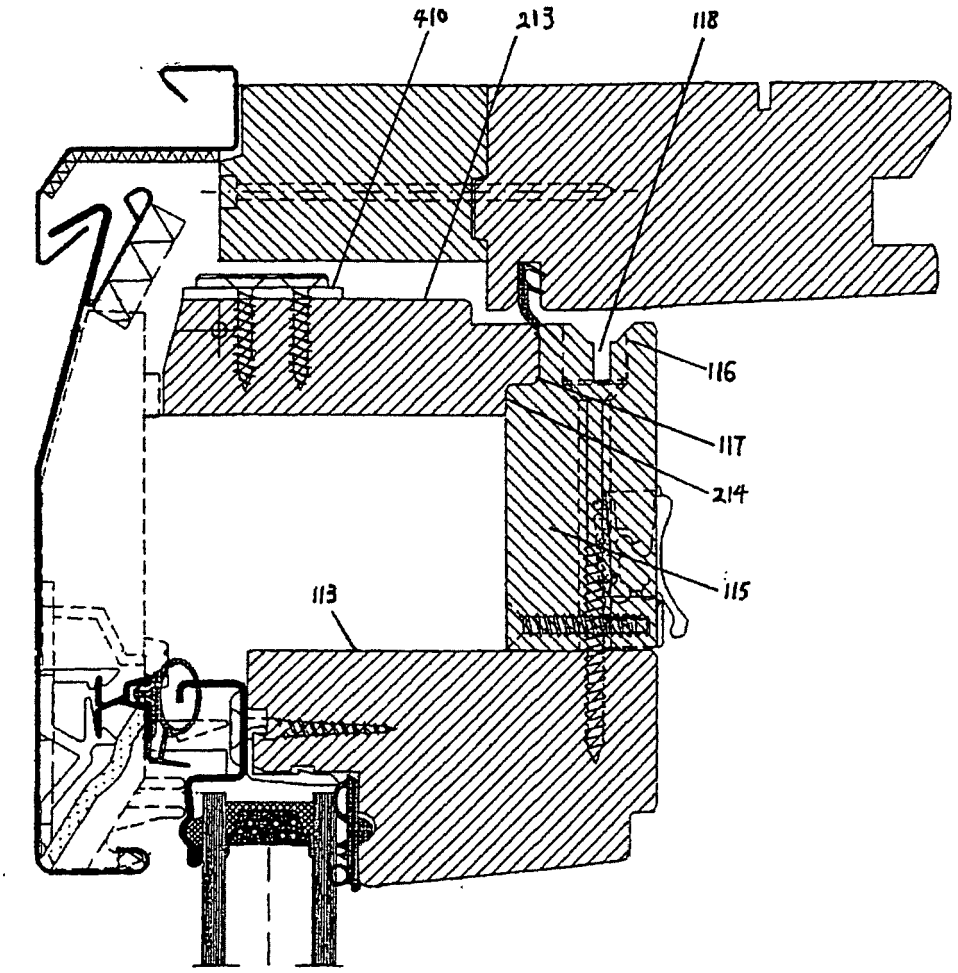

Fig. 5

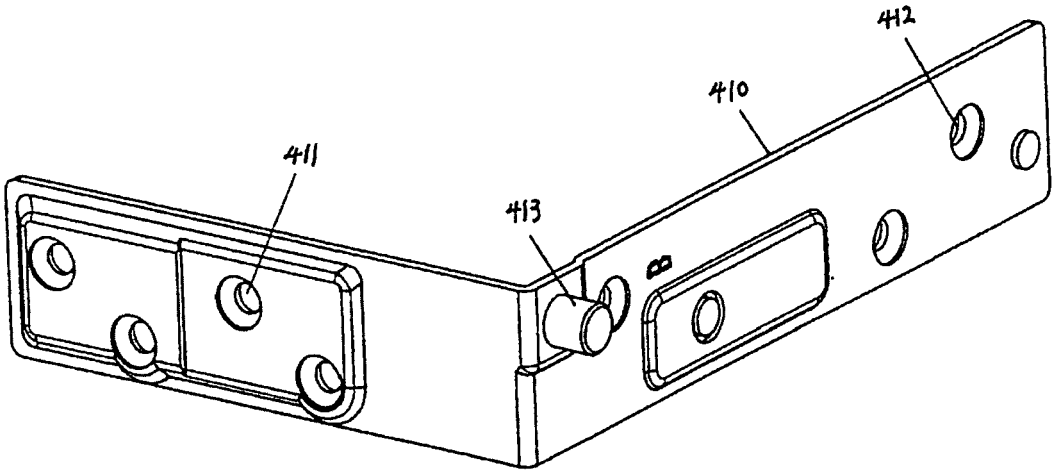

Fig. 6

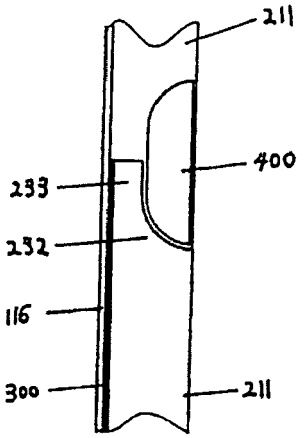

Fig. 7

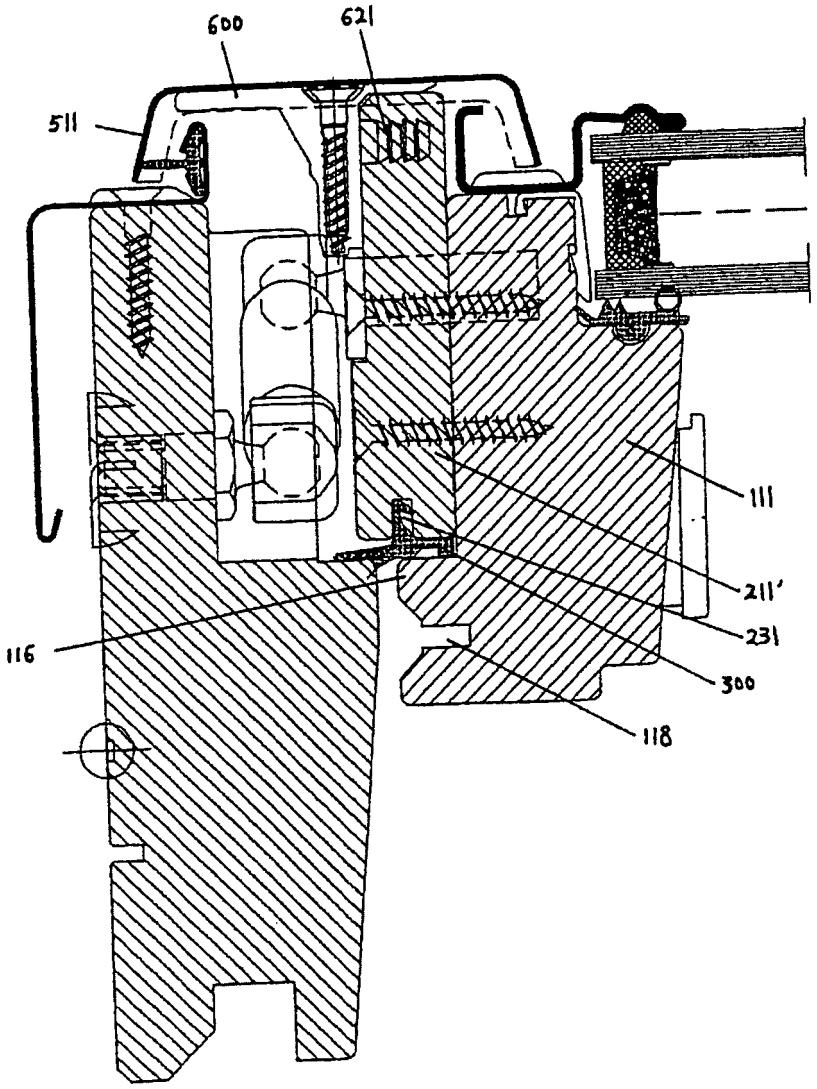

Fig. 8

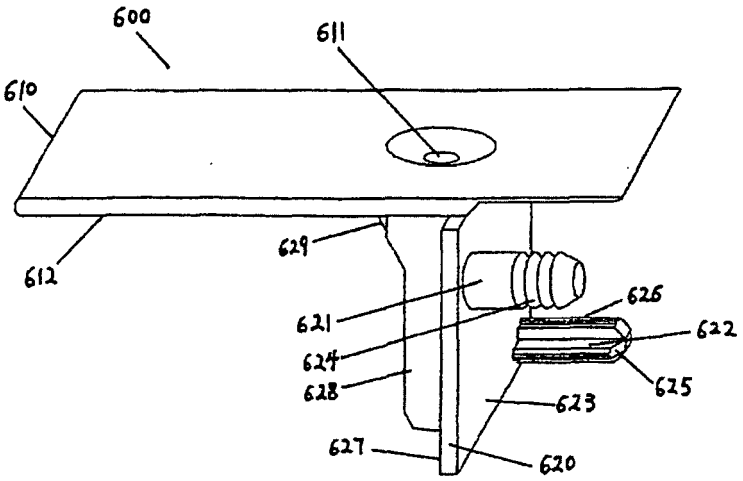
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Fig. 9

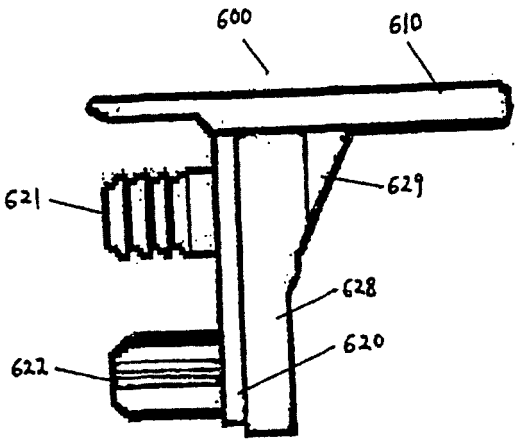
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Fig. 10

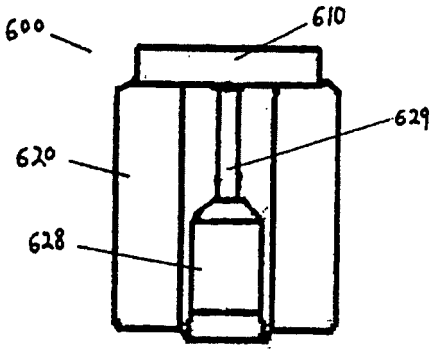

Fig. 11

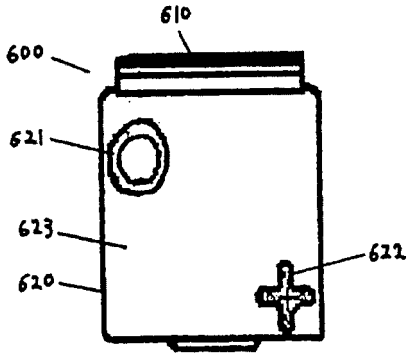

Fig. 12