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(54) **Window assembly**

(57) The invention relates to a window assembly comprising a multiple glazing unit; a frame extending all the way round the periphery of the glazing unit; and a wooden casing with a rebate in which the frame with the glazing unit can be accommodated. The frame is fixed to the wooden casing by means of fixing means. The glazing unit is glued on the frame with the outside pane facing outwards in such a way that, viewed from the outside, the frame lies behind said outside pane. The out-

side of the outside pane rests along an outside contact face of the rebate. The rebate is of a stepped design with an inside contact face. The outside contact face and the inside contact face both face inwards and the outside contact face is parallel to a glazing unit. The frame bears a sealing strip, which rests in a sealing manner on the inside contact face. The frame is constructed in particular with aluminium tubular sections.

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Description

[0001] The present invention relates to a window assembly comprising:

- a multiple glazing unit with an outside pane and an inside pane;
- a frame extending around the periphery of the glazing unit;
- a wooden casing with a rebate in which the frame with the glazing unit can be accommodated;

the frame being fixed to the wooden casing by means of fixing means.

[0002] Such an assembly is known. In the case of the usual window assembly the window concerned is a side-hung window. The known window assembly relates to a so-called inward-swinging casement. The known window assembly comprises a double glazing unit with an outside pane situated on the outside and an inside pane situated on the inside. This double glazing unit is accommodated in a frame running around the peripheral edge of the glazing unit and engaging both on the outside, in other words upon the outward-facing outside surface of the outside pane, and upon the inside, in other words upon the inward-facing outside surface of the inside pane, of the glazing unit. The peripheral edge of the window assembly is consequently recessed in a frame rebate formed in the frame and extending in the peripheral direction. As such, this is a known construction for fixing a glazing unit in an aluminium frame. The known window assembly further comprises a wooden casing with a rebate in which the frame can be accommodated together with the glazing unit. The known frame is further provided all the way round with a sealing strip, which provides a seal between the frame and the casing when the window is closed. The known frame is further fixed to the wooden casing by means of fixing means. Said fixing means comprise, on the one hand, hinges that in each case are fixed with one hinge part on the wooden casing and with the other hinge part on the frame and comprise, on the other hand, a closure fixed on the frame, which closure has a locking part, which when the window is closed engages in a locking manner in a recess formed in the casing.

[0003] Such a window assembly has the disadvantage that the frame is bulky. A further disadvantage is that the frame is situated not only on the inside of the glazing, but also on the outside and consequently, viewed from the outside, fills up the frame from the inside, with generally a stepped appearance, in other words the frame provides a stepped transition from the casing to the outside of the outside pane of the glazing unit. This not only objectively reduces the passage of light through the pane, since the frame transmits no light and therefore reduces the remaining light-transmitting surface in the wooden casing, but it also mars the appearance of the exterior wall. Viewed from the outside

wall, the windows appear relatively small. This plays a role, for example, in the case of so-called renovation building, where wooden casings have been there right from the beginning - which does not rule out replacing them with new wooden casings during the renovation -. The aim here is to keep the original front appearance intact and still renew the windows.

[0004] A further disadvantage of aluminium casings generally is that aluminium casings are susceptible to corrosion from a salty environment and environmental pollution. A salty environment is found in the Netherlands in, for example, coastal areas, where the air coming from the sea contains salty constituents. Environmental pollution essentially occurs everywhere, and very particularly in industrial areas and at busy traffic junctions. Salty constituents and other aggressive environmental pollutants present in the air attack the aluminium, even when it is provided with an enameled coating. Another problem here is that the fitting parts are generally made of a different type of metal from aluminium and that galvanic corrosion phenomena occur as a result. This galvanic corrosion is aggravated by salt particles and aggressive environmental pollutant particles present in the air. Such corrosion of aluminium casings occurs particularly on the outward-facing sides of aluminium casings. On the side facing inwards, in other words on the inside of the building, this corrosion occurs to a much lesser degree, and in so far as it does occur it can be treated by cleaning the casing regularly with a damp cloth.

[0005] Plastic casings generally have the disadvantage that the plastic is subject to aging and discoloration. Plastic casings are also often seen as being cheap.

[0006] In the case of wooden casings it is further known not to suspend the glazing of a moving window in the casing by way of a frame, but by fixing the hinges, more generally the window furniture, directly to the glazing, without frame. The fixing of the hinges and also the operating locks etc. is generally carried out in this case by means of holes formed in the glazing. The advantage of this construction is that the wooden window casing can be made substantially slimmer, in particular in the case of so-called moving windows. The glazing can be connected in an entirely flat manner, without the interposition of any frame, to the wooden surrounding casing. The glazing here is generally double glazing. At the position of the fixing holes through the glazing, spacers are then provided in the glazing between the inside pane and the outside pane. A disadvantage of this construction is that it leaves something to be desired in terms of susceptibility to burglary.

[0007] In the case of exterior wall cladding panels it is also known to fix a sheet of glass on a frame of aluminium sections extending around the periphery of the sheet of glass, for example by gluing the sheet of glass on the frame. This frame serves to fix the panel on the underlying exterior wall construction. The underlying exterior wall construction is provided with aluminium bear-

ing sections for this purpose.

[0008] The object of the present invention is to provide an assembly of the type mentioned in the preamble, with a slim appearance which, viewed from the exterior wall leaves the exterior wall profile unchanged, apart from the shape of the casing, which is burglar-proof, and which has high light transmission. Such an assembly must, of course, also be waterproof and windproof.

[0009] The abovementioned object is achieved according to the invention by providing a window assembly comprising:

- a multiple glazing unit with an outside pane and an inside pane;
- a frame extending around the periphery of the glazing unit;
- a wooden casing with a rebate in which the frame with the glazing unit can be accommodated;

the frame being fixed to the wooden casing by means of fixing means, which window assembly according to the invention is in particular characterized in that the glazing unit is glued on the frame with the outside pane facing outwards in such a way that, viewed from the outside, the frame lies behind said outside pane;

in that, at least when the window is closed, the outside of the outside pane rests with an edge zone along an outside contact face of the rebate, which outside contact face, at least when the window is closed, extends parallel to the glazing unit and faces the inside of the casing; in that the rebate is of a stepped design with an inside contact face situated further inwards relative to the outside contact face and facing the inside of the casing; and in that all the way round the frame bears a sealing strip, which rests on the inside contact face, at least when the window is closed.

[0010] The term multiple glazing unit according to the invention is understood as meaning a unit which in a separate form forms a multiple glazing. In the case of a double glazing therefore the inside pane and the outside pane together with the spacers, in the case of which the plenum between the panes can be filled with a special gas composition. The term 'unit' therefore in this case in particular signifies that it is a part that can be handled as a whole. It will also be clear to the person skilled in the art that multiple glazing means not only double glazing, but can equally well be triple or quadruple glazing. The person skilled in the art is in fact aware that there is also multiple glazing with three or more pane surfaces. It is known to the person skilled in the art, for example, to design glass in lead in the form of double glazing by placing single glass in lead glazing between the inside planes and the outside pane.

[0011] By providing an arrangement in which, viewed from the exterior wall, the frame rests behind the outside of the glazing and the outside of the glazing rests with an edge zone along a contact face of the rebate, it is ensured that there is a direct transition from the wooden

casing to the pane, which results in a slim appearance and also means that there are no parts of the frame exposed to the direct action of weather influences. The entire frame in fact lies on the inside of the double glazing or at any rate, viewed in a direction perpendicular to the plane of the glazing, behind the outside pane. As will be clear from the exemplary embodiment shown in the figure, the frame in this case can project laterally relative to the multiple glazing. By making the rebate of a stepped design with a second contact face, called the inside contact face on account of the relative position in relation to the other contact face, and providing the frame all the way round with a sealing strip for resting in a sealing manner on said inside contact face, it is ensured that a good waterproof and windproof seal is obtained, without the glazing itself resting in a sealing manner against the window casing. The seal is not in fact obtained at the glazing, but elsewhere by the fact that the sealing strip rests against the inside contact face. In this way it is not necessary to provide sealing strips on the glazing, and it will suffice to have a glass glazing sheet in practice generally not resting in a sealing manner against a wooden contact face of the rebate.

[0012] It is advantageous according to the invention if the frame comprises a framework of aluminium tubular sections. Aluminium tubular sections are relatively light, sturdy and burglar-proof.

[0013] The window assembly according to the invention can be used very advantageously as a moving window. It is therefore advantageous according to the invention if the frame and the glazing unit together form a moving window and if the fixing means comprise fittings. In this context the term fittings is understood as meaning in particular so-called window furniture.

[0014] It is further advantageous according to the invention if the fixing means comprise a metal strip, such as an aluminium or a steel casing strip, if the casing strip, facing an opposite casing part, is fixed in the rebate, and if at least a part of the fittings is fixed on the casing strip. Such a casing strip can facilitate the fixing to a wooden casing. Such a casing strip can also reinforce a fixing to the casing, which provides greater security against burglary.

[0015] It is further advantageous according to the invention if the casing strip is provided with an undercut first groove extending in the longitudinal direction of the casing strip, and if, at least when the window is closed, the frame comprises an undercut second groove extending parallel to the first groove, and if the first and second groove interact to fix at least a part of the fittings. Such undercut grooves are known and in practice are also commonly used for fixing fittings. The fittings can be fixed by means of such an undercut groove at essentially any desired place along the frame. Such an undercut groove also makes it possible to accommodate operating means for the fittings.

[0016] The fittings according to the invention can comprise one or more hinges or one or more scissor

mechanisms or one or more stay mechanisms.

[0017] The fittings according to the invention can also comprise casing locking means fixed to the wooden frame, such as locking lugs or recesses for locking lugs, and also frame locking means provided on the frame and interacting with the casing locking means, such as recesses for locking lugs and locking lugs respectively. Such fittings are known in particular for increasing security against burglary. By means of such fittings the window can be fixed to the casing at several points, for example all the way round along the entire frame.

[0018] It is further advantageous according to the invention if the casing locking means and frame locking means are slidable relative to each other.

[0019] According to the invention, the fixing means can be fixed directly to the wooden casing, but can also be fixed indirectly to the wooden casing. A combination of the two is also conceivable.

[0020] It is further advantageous according to the invention if when the window is closed the rebate defines a pressure relief space between the outside and inside contact faces, and if the pressure relief space is connected to the outside of the casing in such a draining manner that outside pressure prevails in the pressure relief space. This ensures that water that has penetrated between the glazing and the outside contact face is reliably drained away to the outside of the glazing - back towards the exterior wall - instead of being able to penetrate inside by way of the sealing strip. Keeping the pressure relief space at the same pressure as the exterior wall pressure also prevents a pressure that is lower than the outside pressure from prevailing in the pressure relief space, which would tend to draw in that water. With regard to the inside of the building, it should be pointed out that underpressure will often prevail there, and that the draining connection of the pressure relief space to the outside of the casing has the additional advantage that in so far as a draft flow is produced by way of the sealing strip and the relative underpressure on the inside of the building, this draft flow extracts air mainly by way of the amply proportioned drainage channel, and that the extracted air provides pressure equalization. This therefore prevents water droplets from being sucked in. This therefore prevents water droplets from being sucked in.

[0021] In order to ensure good insulation, it is advantageous according to the invention if the outside of the glazing unit is insulated relative to the inside of the frame by means of one or more cold bridges.

[0022] The present invention will be explained in greater detail below with reference to the exemplary embodiment illustrated in the drawings, in which:

Figure 1 shows a cross section of a part of an assembly according to the invention;
Figure 2 shows a front view, from the inside of a building, of an assembly according to the invention;
and

Figure 3 shows an example of casing locking means and frame locking means.

[0023] Corresponding parts are provided with the same reference numeral in the figures.

[0024] Fig. 1 shows a cross section of an assembly 1 according to the invention, which assembly is provided with a wooden casing 2 and an aluminium frame 3, in the case of which the outside 36 of the glazing - or the outward-facing surface of the outside pane 31 - is insulated relative to the inside of the frame 37 by means of one or more cold bridges, and on which the glazing 30 is glued by means of adhesive layers 5, 6. Adhesive layer 5 in particular prevents burglary here, since the glazing will simply fall out of the frame when the outside pane 31 of the glazing is broken, if there is no adhesive connection 5. The frame 3 comprises a tubular section 7, which is connected by way of hinges 9 to a fixing means 8, which is fixed to the wooden casing 2. The hinge 9 and the fixing means 8 together form a flat face 38, which, depending on the measurements of the rebate, can ultimately lie in its entirety against the wooden casing 39. The tubular section 7 comprises a slot 12 in which a metal strip, such as an aluminium strip or a steel strip, can be placed, which strip comprises frame locking means. The fixing means 8 comprises a slot 13 in which a metal strip, such as an aluminium strip or a steel strip, can be placed, which strip comprises casing locking means. A draft strip 10 is present between the tubular section 7 and the wooden window 2.

[0025] The glazing 30 is double glazing here. The double glazing 30 here comprises an outside pane 31 and an inside pane 32. The inside pane 32 is of a laminated or float glass or some toughened or untoughened construction. The outside pane 31 and inside pane 32 are held mutually spaced by a spacing assembly 33. This spacing assembly 33 can also be a cold bridge, which counteracts heat transfer from the outside pane 31 to the inside pane 32.

[0026] The frame 3 also comprises, in addition to the tubular section 7, an aluminium section 34 situated more towards the outside. This section 34 is connected to the tubular section 7 by means of plastic strips 35, which form a cold bridge. The outside glazing is glued to the section 34 by means of an adhesive connection 6. The inside pane 32 is glued to the tubular section 7 by means of the adhesive connection 5. If the adhesive connections 5 and 6 possess sufficient heat insulating properties, it may be possible to omit the cold bridges 35.

[0027] Fig. 2 shows a front view - from the inside of a building - of the assembly 1. It can be seen clearly here that the frame 3 runs around the entire periphery of the glazing 4. In this example of the invention the hinges 9 are situated to the right of the glazing 4, while on the left side of the glazing 4 there is a handle 14, by means of which the locking means can be opened and closed.

[0028] Fig. 3 shows an example of frame locking means and casing locking means, which can be placed

in the slots 12 and 13 respectively (see Fig. 1). The bottom strip 15 contains locking lugs 16, which can move through the slots 17 by means of control of the handle 14 (see Fig. 2). The top strip 18 comprises recesses for locking lugs 19.

[0029] It will be clear to the person skilled in the art that yet further variants are conceivable within the scope of protection defined by the claims. For example, it is possible to omit the section 34 and the cold bridges 35 entirely. The inside pane 32 in that case can extend outwards as far as the outside pane 31. It will then suffice to glue only the inside pane 32 on the tubular section 7. It will also be clear here that the draft strip 10 will preferably be fixed at another point on the tubular section 7, for example by moving the fixing point shown in Fig. 1 through 90° to a plane running parallel to that of the inside pane 32. The advantage of gluing of the inside pane on the tubular section 7 in connection with burglary prevention is then fully retained.

Claims

1. Window assembly comprising:

- a multiple glazing unit with an outside pane and an inside pane;
- a frame extending around the periphery of the glazing unit;
- a wooden casing with a rebate in which the frame with the glazing unit can be accommodated;

the frame being fixed to the wooden casing by means of fixing means;

characterized in that

the glazing unit is glued on the frame with the outside pane facing outwards in such a way that, viewed from the outside, the frame lies behind said outside pane;

in that, at least when the window is closed, the outside of the outside pane rests with an edge zone along an outside contact face of the rebate, which outside contact face, at least when the window is closed, extends parallel to the glazing unit and faces the inside of the casing;

in that the rebate is of a stepped design with an inside contact face situated further inwards relative to the outside contact face and facing the inside of the casing; and

in that all the way round the frame bears a sealing strip, which rests in a sealing manner on the inside contact face, at least when the window is closed.

2. Window assembly according to Claim 1, in which the frame comprises a framework of aluminium tubular sections.

3. Window assembly according to one of the preceding claims, in which the frame and the glazing unit together form a moving window, and in which the fixing means comprise fittings.

4. Window assembly according to Claim 3, in which the fixing means further comprise a metal casing strip, such as an aluminium or a steel casing strip, in which the casing strip, facing an opposite casing part, is fixed in the rebate, and in which at least a part of the fittings are fixed on the casing strip.

5. Window assembly according to Claim 4, in which the casing strip is provided with an undercut first groove extending in the longitudinal direction of the casing strip, and in which, at least when the window is closed, the frame comprises an undercut second groove extending parallel to the first groove, and in which the first and second groove interact to fix at least a part of the fittings.

6. Window assembly according to one of Claims 3 - 5, in which the fittings comprise one or more hinges or one or more scissor mechanisms or one or more window stays.

7. Window assembly according to one of Claims 3 - 6, in which the fittings comprise casing locking means fixed to the wooden frame, such as locking lugs or recesses for locking lugs, and also frame locking means provided on the frame and interacting with the casing locking means, such as recesses for locking lugs and locking lugs respectively.

8. Window assembly according to Claim 7, in which the casing locking means and frame locking means are slidable relative to each other.

9. Window assembly according to one of the preceding claims, in which the fixing means are fixed indirectly, such as by way of a casing strip, to the wooden casing.

10. Window assembly according to one of the preceding claims, in which the fixing means are fixed directly to the wooden casing.

11. Window assembly according to one of the preceding claims, in which when the window is closed the rebate between the outside and the inside contact face defines a pressure relief space, and in which the pressure relief space is connected to the outside of the casing in such a draining manner that the outside pressure prevails in the pressure relief space.

12. Window assembly according to one of the preceding claims, in which the outside of the glazing unit is insulated relative to the inside of the frame by

means of one or more cold bridges.

- 13.** Window assembly according to one of the preceding claims, in which the outside pane projects all the way round relative to the inside pane, and in which the frame is glued both to the rear side of the projecting part of the outside pane and to the edge zone of the inside of the inside pane. 5
- 14.** Window assembly according to Claim 12, in which the part of the frame glued to the inside pane is connected by way of a cold bridge to the remainder of the frame. 10

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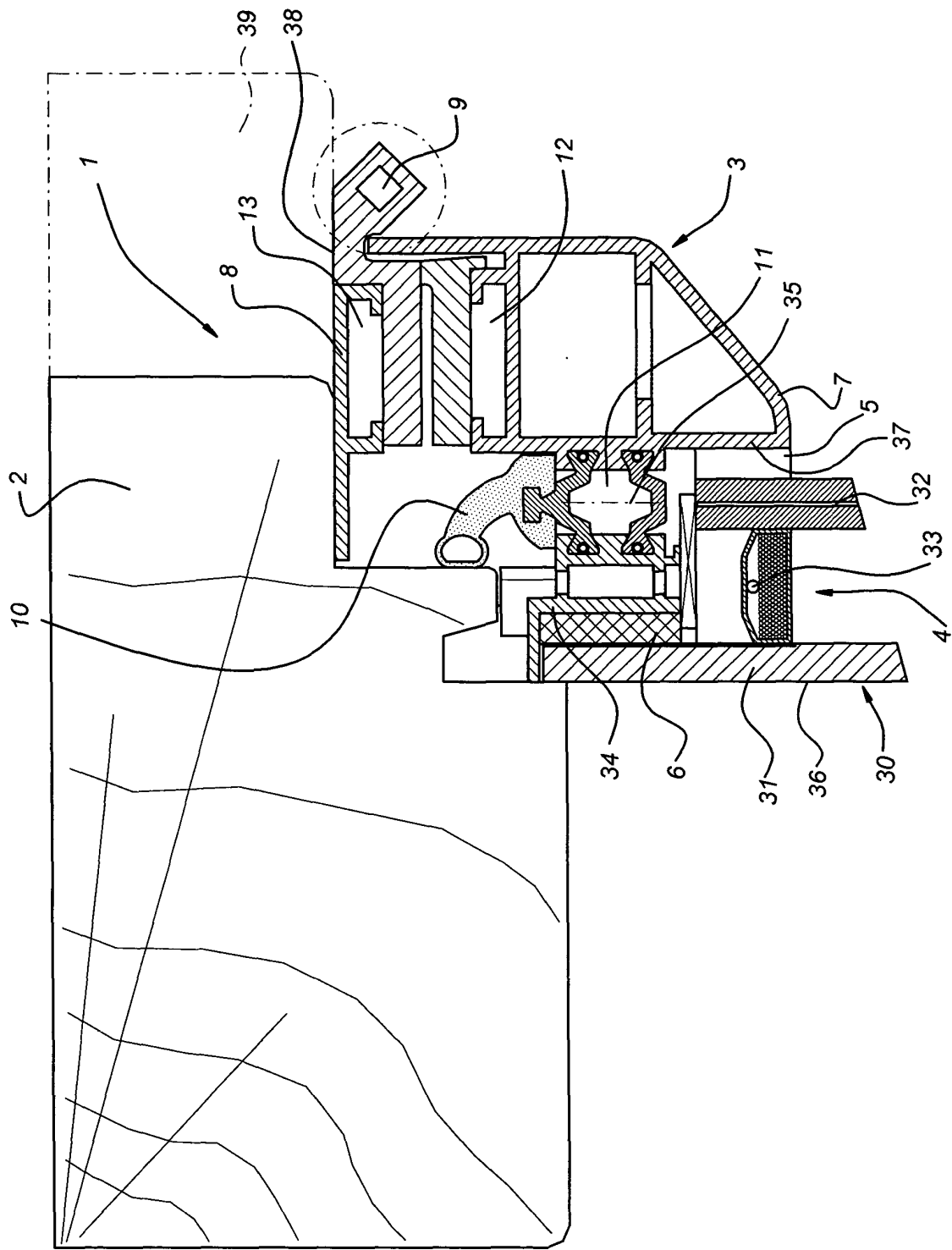


Fig 2

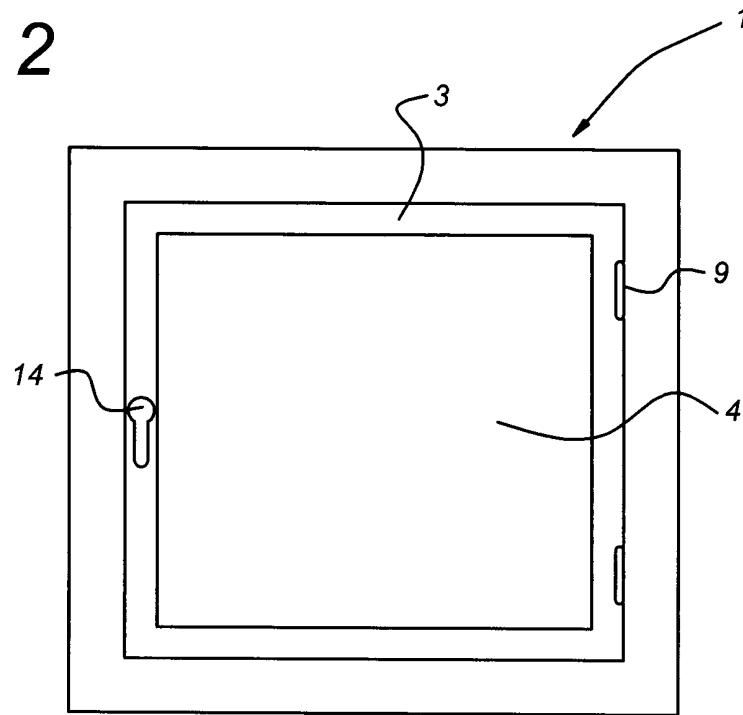
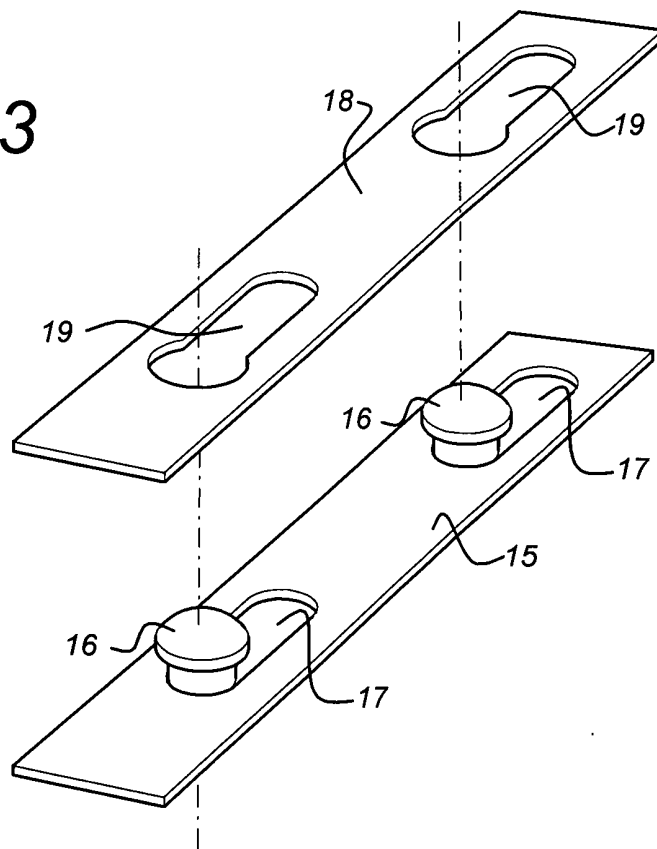


Fig 3





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 04 07 6327

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	DE 298 18 846 U (ARNOLD GLASWERKE ; INST FENSTERTECHNIK EV (DE)) 5 January 2000 (2000-01-05) * figure 2 *	1-14	E06B3/30
A	DE 101 57 646 A (MAYER WALTER) 5 June 2003 (2003-06-05) * figure 3 *	1	
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 29 July 2004	Examiner Verdonck, B
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 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 04 07 6327

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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29-07-2004

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