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SECURITY GLAZING SYSTEM, IN PARTICULAR INSULATING SECURITY GLAZING SYSTEM, AND SECURITY GLAZING, IN PARTICULAR INSULATING SECURITY GLAZING, OVER CORNER

Description

The invention relates to a security glazing system, in particular security insulating glazing system, and to a security glazing system, in particular security insulating glazing system, above a corner.

In the prior art, bullet-resistant and burglar-resistant security glazing for corner solutions of glass facades are known in principle, for example in the resistance classes according to EN 356, P6B to P8B, (in accordance with validity at the time of application) or according to EN 1627, RC2 to RC6, (in accordance with validity at the time of application); or in the resistance classes “bullet” according to EN 1063 (in accordance with validity at the time of application) or according to EN 1522 (in accordance with validity at the time of application) resp. EN 1523 (valid at the time of application), BR-1-S and NS to BR-7-S and NS; or in the “explosion” resistance class EN 13541 (valid at the time of application) and EN 13123/13124 (valid at the time of application).

Common glazing in combination with thick laminated security glass and all-round four-sided bearing looks unattractive and clumsy due to the wide profile frames used. Therefore, they are used reluctantly.

There are also conventional corner solutions with glass edges that are not enclosed in a frame profile. However, such double-sided glazing can be overcome comparatively easily and quickly by experienced burglars. This usually involves exploiting the weak point between two adjacent discs of glazing that is only supported on two sides.

DE 10 2013 217 600 A1 discloses glazing, particularly around corners, which meets the aesthetic requirements of glass cladding that is as continuous as possible, but offers points of attack for burglary, since seals serving only to insulate prevent forced entry into laterally open intermediate spaces. As a result, this type of glazing is not able to provide protection against burglary.

Similarly, US 5,026,581 which describes a mullion and disc construction, for an acoustic glass wall. Their construction elements for the connection of glass windows adjacent to the mullions serve to optimize sound insulation, but also cannot guarantee protection against burglary. Furthermore, the mullion structures do not meet the aesthetic requirements in terms of a continuous glass front appearance.

EP 2 644 792 A1 describes a mechanism for connecting glass windows that are in contact with one another. However, special focus is placed on simple mutual anchoring and bracing and precise positioning of the wall elements in relation to one another. Due to the simplicity of the setting, this design is also correspondingly easy to disassemble again. Sealants, approximately by silicone sealant have only an aesthetic function. In addition, visible moldings are installed, which disturbs the impression of a continuous glass front.

EP 3 088 620 A1 discloses a connection of abutting glass pane structures, such as a glass roof and glass wall structure, intended for statically non-self-supporting all-glass structures, such as a conservatory. Here, too, the design of “externally” accessible glue joints provides points of attack, enabling approximately the entire roof structure to be lifted off. This is reinforced in particular by the fact that round anchors, which are intended to distribute the weight of the roof on the supporting structure, can be used as levers. In addition, the retaining structure has unfilled intermediate spaces that facilitate break-in in the event of adhesive joint breakage.

Based on this prior art, it is the object of the invention to enable security glazing, particularly security insulating glazing, to be made over corners which is both visually attractive and meets high security requirements.

According to the invention, this object is solved by a security glazing, in particular security insulating glazing system according to claim 1. In accordance with a further claim, the invention relates to security glazing, in particular security insulating glazing, above corners.

In accordance with a first aspect of the invention, a security glazing system comprising first and second corner-connectable security glazing panes and at least one corner reinforcement profile is proposed, wherein the security glazing panes each comprise an outer pane and an inner pane spaced from the outer

pane, and a corner pane extending along an edge of the respective security glazing pane. insulating glass panes each have an outer pane and an inner pane (spaced from the outer pane), and a corner recess extending along an edge (of the respective safety glass pane or insulating glass pane), wherein the reinforcing profile can be accommodated in a room defined by the corner recesses for corner reinforcement.

It is understood that the corner recesses extend particularly along the edges of the safety glass panes or insulating glass panes, which are adjacent to one another in the assembled state, such that a room for corner reinforcement is defined by the corner recesses.

A key idea of the invention is that corner recesses are designed which can (jointly) accommodate a reinforcing profile (e.g. made of steel). In the assembled state, the corner recesses in particular can complement one another to form an enclosed room. The corner recesses are thus preferably located on a respective inner edge of the respective safety glass pane, in particular safety insulating glass pane.

Overall, this enables visually attractive security glazing, particularly security insulating glazing, since the first and second security glass panes, particularly security insulating glass panes, can be brought up against one another (without a bulky frame) to form a corner in security glazing, particularly security insulating glazing (e.g. facade), and at the same time increased security is ensured due to the corner reinforcement profile.

The security glazing, particularly security insulating glazing system, can be designed to meet one or more of the above standards or resistance classes. The outer and inner panes are not necessarily individual panes. For example, both the outer and, in particular, the inner pane can also be designed from several individual panes (each monolithic in itself) to increase the security or resistance of the security glazing, in particular the security insulating glazing system.

The corner reinforcement profile may be completely or at least predominantly receivable or accommodated in the room defined by the corner recess. A predominant receptacle means in particular that at least 50 wt.%, preferably 80

wt.%, of the corner reinforcement profile is received in the room defined by the corner recesses.

Preferably, no cavity is designed (at least substantially) between an inner surface of at least one of the two outer panes and the corner reinforcement profile. The (respective) inner surface may be connected to the corner reinforcement profile directly or via one or more intermediate element(s) (such as a sealing strip).

Particularly preferably, no cavity is designed between an inner surface of both outer panes and the corner reinforcement profile (at least substantially). The respective inner surface may be connected to the corner reinforcement profile directly or via one or more intermediate element(s), such as a sealing strip.

In accordance with the invention, an (imaginary) extension of the respective inner pane does not intersect (and vice versa) the respective (cornered) associated (other) inner pane. The respective inner pane ends in each case in front of or at a level of an inner side of the respective other (cornered) inner pane (and vice versa).

In embodiments, an (imaginary) extension of the respective outer pane does not intersect (and vice versa) the respective (cornered) associated (other) outer pane. In embodiments, each respective outer pane ends in front of or at a level of an inner side of the respective other (cornered) outer pane (and vice versa).

The reinforcing profile is designed as a single piece, in particular monolithically. A one-piece design means in particular that the reinforcing profile is designed in one piece or, if necessary, in several pieces, wherein in the latter case there is a material connection between the individual parts and/or there is no frictional connection and/or no form closure between the individual parts. In particular, no screw connection should be designed between individual parts (if provided) of the reinforcement profile.

The outer pane and/or the inner pane (and/or individual panes thereof) are preferably free of material weakening points, in particular free of recesses and/or openings (in particular through-holes). In embodiments, a plurality or all of the elements of the corner connection may be free of material weakening points, in particular recesses and/or openings (in particular through-holes).

Preferably, the reinforcing profile is not arranged between the two inner panes arranged at an angle and/or is not arranged between the two outer panes arranged at an angle. Thus, in particular, the reinforcing profile is not arranged between an edge of one inner pane and the inside of the other inner pane or vice versa and/or, in particular, is not arranged between an edge of one outer pane and the inside of the other outer pane or vice versa.

In particular, the reinforcing profile is also not partially arranged between the two inner pans arranged at an angle and/or the two outer pans arranged at an angle. That is, the reinforcing profile is in particular also not partially arranged between an edge of one inner pane and the inside of the other inner pane or vice versa and/or in particular also not partially arranged between an edge of one outer pane and the inside of the other outer pane or vice versa.

Preferably, the outer pane overhangs the inner pane (one and the same safety glass pane, particularly safety insulating glass pane). Overall, therefore, a step is designed by the (extended) outer pane, which in turn defines a corner recess. If the outer or inner pane consists of a plurality of individual panes, preferably at least the most protruding (or overhanging) outer individual pane should protrude further than the most protruding individual pane of the inner pane. In one specific embodiment, for example, only one inner pane of the outer pane may protrude further than one (or more or all) of the individual panes of the inner pane. In any case, a corner recess with a corresponding room for the receptacle of the corner reinforcement profile can be designed in a simple manner. Alternatively, the corner recess may be designed integrally, at least in part, through the outer or inner pane.

The corner reinforcement profile is preferably formed at least partially from a metal or metal alloy, particularly steel. Alternatively, the corner reinforcement profile can also be (at least partially) designed from plastic, in particular fiber-reinforced (e.g. glass fiber and/or carbon fiber-reinforced) plastic and/or another metal, such as aluminum or titanium, or another metal alloy, such as an aluminum and/or titanium alloy. The steel is particularly stainless steel or high-grade steel.

In embodiments, the corner reinforcement profile may be a hollow profile, preferably a square hollow profile, or a U-profile or an L-profile.

Between the outer pane and the inner pane of the respective safety glass pane, in particular safety insulating glass pane, a reinforcing profile may be provided to reinforce the respective safety glass pane, in particular safety insulating glass pane. Alternatively or additionally, a U-profile (particularly in the form of the reinforcing profile just mentioned) is provided for receiving portions, particularly tabs, of the corner reinforcement profile for its holder and/or fastening. Such measures can further improve the security or resistance of the security glazing, particularly security insulating glazing system.

Generally, the corner reinforcement profile may have at least one protrusion (e.g., tab) engageable with a corresponding recess in an edge of the inner or outer pane for holding and/or fastening the corner reinforcement profile. Conversely, at least one recess may be provided in the corner reinforcement profile which is correspondingly engageable with one or more protrusions (e.g. tabs) on the edge of the respective outer or inner pane. The protrusions or recesses mentioned here can extend over at least 50 % of the axial extension of the corner reinforcement profile, particularly over its entire length.

The security glazing, particularly security insulating glazing, system may further comprise a sealer and/or a sealant for sealing a corner joint from the inside and/or outside.

The respective outer surface of the corresponding safety glass pane, particularly safety insulating glass pane, can be designed to be at least partially intransparent or opaque in the area of the corner recess. In this embodiment, a corner reinforcement profile arranged in the corner recess is not visible or is only visible to a limited extent. This makes it even more difficult to break in, as the corner reinforcement profile is not visible or is difficult to see. The opacity is preferably designed by enameling (e.g. screen printing).

In principle (apart from the non-transparent portions just described, if applicable), the safety glass panes, particularly safety insulating glass panes, are preferably transparent or at least substantially transparent. In this context, transparent means in particular transparent or translucent, i.e. allowing light to pass through. The

safety glass panes, particularly insulating security glass panes, are thus preferably translucent or translucid.

Preferably, the security glass panes, particularly insulating security glass panes, are designed without frames. This means in particular that the individual safety glass panes, in particular insulating security glass panes, are not or will not be encircled in a frame profile, but are only mounted on two sides (possibly three sides), but not on four sides, in (non-closed) frame parts. Individual, adjacent security glass panes, particularly insulating security glass panes, may have a free butt edge in the assembled state (butt joint glazing) and be held in (non-closed) frame members on only two sides (or three sides).

The security glazing, in particular security insulating glazing system, preferably has resistant, in particular burglar-resistant, properties. Resistant means in particular that there is an aperture-, bullet- and/or blast-resistant property.

Outer pane and inner pane may be spaced apart by a distance. One or more spacers can be provided for this purpose. An intermediate space defined by the distance may be filled with a gas, preferably a noble gas such as argon and/or krypton, and/or may be partially evacuated. The distance can alternatively or additionally be at least partially filled with a panel structure, particularly laminated glazing and/or fire-resistant glazing.

In one embodiment, the security glazing, particularly security insulating glazing system may have an inner profile, particularly an L-profile, for arrangement in an inner corner area and/or outer profile, particularly an L-profile, for arrangement in an exterior corner area. An inner corner portion means in particular a portion of the assembled security glazing, in particular insulating security glazing, consisting of adjacent edge portions of an inner surface of the two adjacent security glass panes, in particular insulating security glass panes. The same applies to the outside corner area.

The outer pane can be made up of one or two or more individual panes.

The inner pane may be composed of one or two or more, for example five (or more), individual panes. This can improve the security or resistance of security

glazing, particularly security insulating glazing. Particularly if the outer pane is composed of two or more individual panes, these may be arranged in a step-like manner (e.g. so that one, for example outer, individual pane overhangs the other, for example inner, individual pane).

At least one further profile (particularly a plastic profile) can be accommodated in the corner reinforcement profile. As a result, a comparatively robust structure can be produced overall, wherein such an inner profile can counteract deformation, for example.

The system may comprise at least one insulation (or insulating material) and/or a seal (or sealing material), preferably at least one sealing strip, for arrangement between the corner reinforcement profile, on the one hand, and the first and/or second security glass pane, in particular insulating security glass pane, on the other hand. Such insulation or seal may be made of or comprise an elastomer. A modulus of elasticity (Young's modulus) of the insulation or seal can (at a room temperature of particularly 25°C) be less than 1000 N/mm2, preferably less than 100 N/mm^2. Insofar as the insulation or seal consists of several materials, this applies in particular to the material with the lowest modulus of elasticity or to the average modulus of elasticity. Relatively speaking, the Young's modulus can be at least a factor of 10 lower than a Young's modulus of the corner reinforcement profile. In the case of a corner reinforcement profile made of several materials, the modulus of elasticity may be relatively lower by at least a factor of 10 than a modulus of elasticity of at least one material of the corner reinforcement profile.

In accordance with a further aspect of the invention, a security glazing, in particular security insulating glazing, is proposed above corner comprising a security glazing, in particular security insulating glazing system as described above. Corner security glazing, in particular insulating security glazing, means in particular assembled security glazing, in particular insulating security glazing, in which a corner is designed (by at least two adjacent security glass panes, in particular insulating security glass panes). The corner may have an angle between 10 degrees to 170 degrees, preferably 45 degrees to 135 degrees, particularly (at least approximately) 90 degrees. In this context, the angle or configuration across corners refers in particular to main planes resulting from an orientation (or

extension) of the adjacent security glass pane, in particular insulating security glass panes. Such a corner may particularly define a building corner or at least contribute to its formation.

A corner joint (between cross-corner adjacent security glass panes, particularly insulating security glass panes) is preferably sealed from the inside and/or outside.

Preferably, an inner profile (particularly L-profile) is arranged in an inner corner area and/or an outer profile (particularly L-profile) is arranged in an outer corner area.

The security glazing, in particular insulating security glazing, may comprise an insulation and/or seal, preferably at least one sealing strip, which is/are arranged between the corner reinforcement profile, on the one hand, and the first and/or second security glass pane, in particular insulating security glass pane, on the other hand.

In accordance with a further aspect of the invention, a method is proposed in which individual elements of the security glazing, in particular security insulating glazing, system described above are arranged against one another and connected to one another for the production of the security glazing, in particular security insulating glazing, described above. Concrete method steps can be derived from the above description of the security glazing system, in particular security insulating glazing system, or the security glazing, in particular security insulating glazing, described above, for example the application of a sealant and/or insulating material and/or sealing material.

In accordance with another aspect of the invention, a building or vehicle comprising the above security glazing, in particular security insulating glazing, is proposed.

If a reinforcing profile is designed between the outer and the inner pane of the respective insulating security glass pane, in particular insulating security glass pane, for reinforcing the respective insulating security glass pane, in particular insulating security glass pane, this reinforcing profile is preferably designed and/or arranged and/or mounted as described in WO 2017/174578 A1. Preferably, such a reinforcing profile is designed as a hollow profile or U-profile or L-profile. In the U-profile design, two spaced-apart first profile sections and a second profile section

extending (substantially) perpendicular to the two profile sections can be provided, wherein the second profile section is arranged between the two first profile sections. In an L-shaped design, two profile sections extending (substantially) perpendicular to each other may be provided. A first profile portion may be arranged (substantially) parallel to a flat face of the first disc and/or second disc, and a second profile portion may be arranged (substantially) parallel to an abutting face. The reinforcing profile may have a dimensionally stable and/or resistant material, such as metal, in particular ferrous or non-ferrous metal, in particular steel and/or a plastic and/or a composite material. The reinforcing profile (of the respective security glass pane, in particular insulating security glass pane) can be mounted as in WO 2017/174578 A1, in particular the sealant described there can be fastened (to the edge area of the security glass pane, in particular insulating security glass pane) for this purpose.

The first and/or the second pane(s) may be designed as fire-resistant glazing, security glazing, particularly security insulating glazing, and/or laminated glazing. It is also possible that thermal and/or solar control layers, other functional and decorative glasses can be combined in the construction of the safety panel or panels. Privacy films, matte films, textured glasses, switchable glasses can also be integrated into the structure of the panels. Movable lamellae, blinds, films and similar can also be introduced into the pane structure of the panels or safety panels. The panes may also have composite films and composite sheets made of, for example, PVB, particularly EVA and TPU, ionomers, structural interlayers, PMMA, PC.

The two panes of the first and second insulating security glass pane, particularly insulating security glass pane, may be spaced apart by a spacer. The spacer can be displaced further inside the respective insulating security glass pane, in particular insulating security glass pane, i.e. further towards a center of a flat side of the insulating security glass pane, in particular insulating security glass pane, in comparison to a reinforcing profile that may be provided.

The first pane and/or the second pane may or may not have a monolithic and/or multi-layer pane composite. The multilayer pane laminate may have at least two spaced-apart panes of flat glass, laminated glass, laminated security glass, or

thermally toughened single-pane security glass. Between the spaced glasses, one or more intermediate layer(s) may be contained which react to temperature in the event of fire, have a cooling effect, and/or become cloudy, foam up, as known for example from EP 1 194 673, or consume. It is also possible that only a part of the pane has such a pane composite and/or fire protection interlayer, i.e. fire protection intermediate layer(s).

The first or second insulating security glass pane, in particular insulating security glass pane, may have laminated films and laminated sheets, made for example of PVB, in particular EVA and TPU, ionomers, structural interlayers, PMMA, PC.

The first or second security glass pane, in particular insulating security glass pane, can have one or more intermediate spaces in addition to the outer and inner pane (which in turn can be composed of several individual panes), wherein two or more intermediate spaces can be provided accordingly, with corresponding spacers if necessary. For example, an outer pane, an inner pane, and a middle pane may be provided, wherein intermediate spaces may be provided between the outer and middle, and middle and inner, panes.

In an advantageous embodiment, the outer pane of the first or second security glass pane, in particular insulating security glass pane, is made of flat glass, float glass, soda-lime glass, quartz glass, or borosilicate glass.

In one embodiment, the outer pane of the first or second safety glass pane, in particular insulating security glass pane, is tempered, preferably in accordance with DIN 12150-1: Glass in building – Thermally tempered soda-lime single-pane safety glass – Part 1: Definition and description, particularly preferably with a surface compressive stress of more than 100 N/mm^2 and in particular from 100 N/mm^2 to 150 N/mm^2. Due to the preload, the outer pane shatters preferentially into blunt-edged fragments with sizes of less than 1 cm^2 when damaged.

The inner pane of the first or second insulating security glass pane, in particular insulating security glass pane, preferably contains glass, particularly preferably flat glass, float glass, quartz glass, borosilicate glass, soda-lime glass, or clear plastics, preferably rigid clear plastics, in particular polyethylene, polypropylene, polycarbonate, polymethyl methacrylate, polystyrene, polyamide, polyester,

polyvinyl chloride and/or mixtures thereof. Suitable glasses are known, for example, from EP 0 847 965 B1.

In one embodiment, the outer pane and/or the inner pane comprises a first pane and at least one other pane. The first pane of the outer and/or inner pane is connected over its outer surface and at least one intermediate layer, preferably a thermoplastic intermediate layer, to another pane to form a laminated pane. The further pane can in turn be connected to another pane via a further intermediate layer. The further pane(s) preferably contain(s) a plastic. Such laminated panes are particularly resistant to penetration from the outside, so that high security classes can be achieved. The panes of the laminated pane are connected by at least one intermediate layer. The intermediate layer preferably contains a thermoplastic, such as polyvinyl butyral (PVB), ethylene vinyl acetate (EVA), polyurethane (PU), polyethylene terephthalate (PET), or multiple layers thereof, preferably with thicknesses of 0.3 mm to 0.9 mm.

The first security glass pane and/or the second security glass pane may have an integrated alarm function. Such an alarm function can be designed, for example, as an alarm fuse in which an alarm loop, i.e. an electrical conductor loop, is incorporated or applied to an ESG (single-pane security) glass. When the respective pane is broken, the circuit of the alarm loop in particular is then interrupted and the alarm is triggered. Thus, when the pane is broken, the resistance of the alarm fuse can be changed, causing a change in the signal of the alarm fuse and thus triggering the alarm.

The security glazing, in particular security insulating glazing or the inner and outer pane (and intermediate panes, if applicable) can/can combine different security classes, such as attack resistance, bullet resistance, blast resistance and/or fire resistance. In this case, the structure of the security glazing, in particular security insulating glazing, or the panes of security glazing, in particular security insulating glazing, can be configured according to the requirements. In particular, attack resistance, especially burglary resistance, can be combined with a fire protection function in the butt joint glazing.

The security glazing, in particular insulating security glazing, may comprise more than two security glass panes, in particular insulating security glass panes (across corners), for example at least four or at least eight or at least 20 security glass panes, in particular insulating security glass panes. A corresponding corner can be defined, for example, by in each case (or on both sides opposite the corner) at least two superimposed insulating security glass panes, particularly insulating security glass panes, or at least four superimposed insulating security glass panes, particularly insulating security glass panes.

The invention is explained below with reference to the accompanying figures. In the figures:

Fig. 1 shows a schematic cross-sectional view of a first embodiment of a security insulating glazing according to the invention; and

Fig. 2 shows a schematic cross-sectional view of a second embodiment of the security insulating glazing according to the invention.

Fig. 1 shows a corner security insulating glazing according to the invention. The security insulating glazing comprises a first security insulating glass pane 10a and a second security insulating glass pane 10b. The insulating security glass panes 10a, 10b each comprise an outer pane 11a, 11b and an inner pane 12a, 12b. The outer pans 11a, 11b consist of a (monolithic) individual pane. The inner panes 12a, 12b comprise a plurality (in the present case, five) of individual panes (each of which is monolithic in itself). The insulating security glass panes 10a, 10b or their outer panes 11a, 11b adjoin one another at a corner 13. In this case, the outer pans 11a, 11b extend to the corner 13 or a sealing material 14. The respective outer panes 11a, 11b project beyond the respective inner panes 12a, 12b so that corner recesses 15a, 15b are formed in the insulating security glass panes 10a, 10b. These corner recesses 15a, 15b together define a room (cavity) 16 in which a corner reinforcement profile 17 is located. Insulation or one or more sealing strips 18 is provided between the corner reinforcement profile 17 and the adjacent portions of the insulating security glass panes 10a, 10b. These sealing tapes are used in particular for thermal insulation and can be formed from an

elastomer. An enamel coating (screen printing) is preferably provided in the area of the corner recesses 15a, 15b (not visible in the figure).

The respective outer pane 11a, 11b is spaced from the respective inner pane 12a, 12b by a spacer 19a, 19b. Adjacent to the outside of this spacer 19a, 19b are reinforcing profiles 20a, 20b in the form of U-profiles, which in turn are arranged in a respective insulating material 21a, 21b between the panes 11a, 12a and 11b, 12b, respectively.

The corner reinforcement profile 17 has (tab-like) protrusions 22a, 22b that engage with the U-profiles 20a, 20b. An L-shaped profile 24 (angle) is arranged in an inner corner area 23. This can improve the appearance.

The embodiment according to Fig. 2 is basically the same as the embodiment according to Fig. 1, wherein the differences are explained below. First, the respective outer pane 11a, 11b in Fig. 2 is designed from two individual panes 25a, 26a or 25b, 26b (each monolithic in itself). The respective outer pane 25a, 25b is set back relative to the respective inner pane 26a, 26b. The area thus left free (on the outside of the respective inner individual pane 26a, 26b) is covered by an outer L-shaped profile 27 (angle), e.g. made of steel, in particular stainless steel. Furthermore, in the embodiment in accordance with Fig. 2, the protrusions 22a, 22b as well as the corresponding U-profiles have been omitted (however, these could be provided).

Basically, in the embodiments in accordance with Figs. 1 and 2, corner joints are sealed from the inside and outside.

Optional use of glass screen-printed at the edge can protect the joint area itself and the sealant against viewing of any reinforcement that has been applied, as well as the method of bonding or connection, and against possible UV impact in outdoor applications.

Common thermal and solar control layers or other functional and decorative glass can be combined. Additional privacy functions can be implemented using matte films, textured glass, switchable glass or movable lamellae, blinds or films incorporated into the pane structure.

Overall, a flush, high-quality look can be realized, as is often expected or desired by architects. Previously known glass systems, particularly with bullet- and burglar-resistant glazing, were unable to meet such requirements.

List of reference numbers

10a	first security glass pane, first insulating security glass pane
10b	second insulating security glass pane, second insulating security glass pane
11a	outer pane
11b	outer pane
12a	inner pane
12b	inner pane
13	corner
14	sealing material
15a	corner recess
15b	corner recess
16	room (cavity)
17	corner reinforcement profile
18	sealing tape
19a	spacer
19b	spacer
20a	reinforcement profile/U-profile
20b	reinforcement profile/U-profile
21a	insulation material
21b	insulation material
22a	protrusion

22b protrusion

23 inner corner area

24 inner profile/L-profile

25a outer individual pane

25b outer individual pane

26a inner individual pane

26b inner individual pane

27 outer profile

PATENTKRAV

1. Sikkerhedsglasrudesystem, der omfatter en første (10a) og en anden (10b) sikkerhedsglasrude, der er tilpasset til at blive sammenføjet i hjørner, og mindst én hjørneforstærkningsprofil (17), hvor sikkerhedsglasruderne (10a, 10b) hver især omfatter en ydre rude (11a, 11b) og en indre rude (12a, 12b) og en hjørnereces (15a, 15b), der strækker sig langs en kant, **kendetegnet ved, at**

hjørneforstærkningsprofilen (17) kan modtages i et rum (16), der defineres af hjørnerecesserne (15a, 15b), til hjørneforstærkning og er udformet integralt, og hvor én indre rude (12a) ender foran eller på et niveau for en inderside af den anden indre rude (12b) og vice versa.

2. Sikkerhedsglasrudesystem ifølge krav 1, hvor den pågældende hjørnereces (15a, 15b) er dannet ved, at den ydre rude (11a, 11b) rager ud over den indre rude (12a, 12b) i den samme sikkerhedsglasrude (10a, 10b).

3. Sikkerhedsglasrudesystem ifølge et hvilket som helst af de foregående krav, hvor hjørneforstærkningsprofilen (17) mindst delvist er dannet af et metal, især stål.

4. Sikkerhedsglasrudesystem ifølge et hvilket som helst af de foregående krav, hvor hjørneforstærkningsprofilen (17) er en hulprofil, fortrinsvis en kvadratisk hulprofil eller en U-profil eller en L-profil.

5. Sikkerhedsglasrudesystem ifølge et hvilket som helst af de foregående krav, hvor der mellem den ydre rude (11a, 11b) og den indre rude (12a, 12b) af den pågældende sikkerhedsrude (10a, 10b) er tilvejebragt en forstærkningsprofil (20a, 20b) til forstærkning af den pågældende sikkerhedsrude (10a, 10b) og/eller en U-profil (20a, 20b) til fastgørelse af dele, især flige, af hjørneforstærkningsprofilen (17) til holderen og/eller fastgørelsen.

6. Sikkerhedsglasrudesystem ifølge et hvilket som helst af de foregående krav, der omfatter et tætningselement og/eller et tætningsmateriale til tætning af en hjørneforbindelse fra indersiden og/eller ydersiden.

7. Sikkerhedsglasrudesystem ifølge et hvilket som helst af de foregående krav, hvor den pågældende yderflade i hjørnerecessens (15a, 15b) område mindst delvist er intransparent eller opak, fortrinsvis på grund af en emaljebelægning.

8. Sikkerhedsglasrudesystem ifølge et hvilket som helst af de foregående krav, der omfatter en indre profil (24), især L-profil, til anbringelse i et indre hjørneområde (23), og/eller en ydre profil (27), især L-profil, til anbringelse i et ydre hjørneområde.

9. Sikkerhedsglasrudesystem ifølge et hvilket som helst af de foregående krav, hvor den ydre rude (11a, 11b) er konstrueret ud fra én eller to eller flere individuelle ruder, og/eller hvor den indre rude (12a, 12b) er konstrueret ud fra én eller to eller flere, for eksempel fem, individuelle ruder.

10. Sikkerhedsglasrudesystem ifølge et hvilket som helst af de foregående krav, hvor en yderligere profil, især en plastprofil, er indeholdt i hjørneforstærkningsprofilen (17).

11. Sikkerhedsglasrudesystem ifølge et hvilket som helst af de foregående krav, der omfatter en isolering og/eller tætning, fortrinsvis mindst én tætningsliste (18), til anbringelse mellem hjørneforstærkningsprofilen (17) på den ene side og den første (10a) og/eller den anden (10b) sikkerhedsglasrude på den anden side.

12. Sikkerhedsglasrudesystem ifølge et hvilket som helst af de foregående krav, hvor sikkerhedsglasrudesystemet er et sikkerhedsisoleringsglasrudesystem, og/eller hvor sikkerhedsglasruderne (10a, 10b) er sikkerhedsisoleringsglasruder.

13. Sikkerhedsglasrudesystem, især sikkerhedsisoleringsglasrude, over et hjørne, der omfatter et sikkerhedsglasrudesystem ifølge et hvilket som helst af de foregående krav.

14. Sikkerhedsglasrude, især sikkerhedsisoleringsglasrude ifølge krav 13, hvor en hjørneforbindelse tætnes fra indersiden og/eller ydersiden.

15. Sikkerhedsglasrude, især sikkerhedsisoleringsglasrude ifølge krav 13 eller 14, der omfatter en isolering og/eller tætning, fortrinsvis mindst én tætningsliste (18), der er anbragt mellem hjørneforstærkningsprofilen (17) på den ene side og

den første (10a) og/eller den anden (10b) sikkerhedsglasrude, især sikkerhedsisoleringsglasrude, på den anden side.

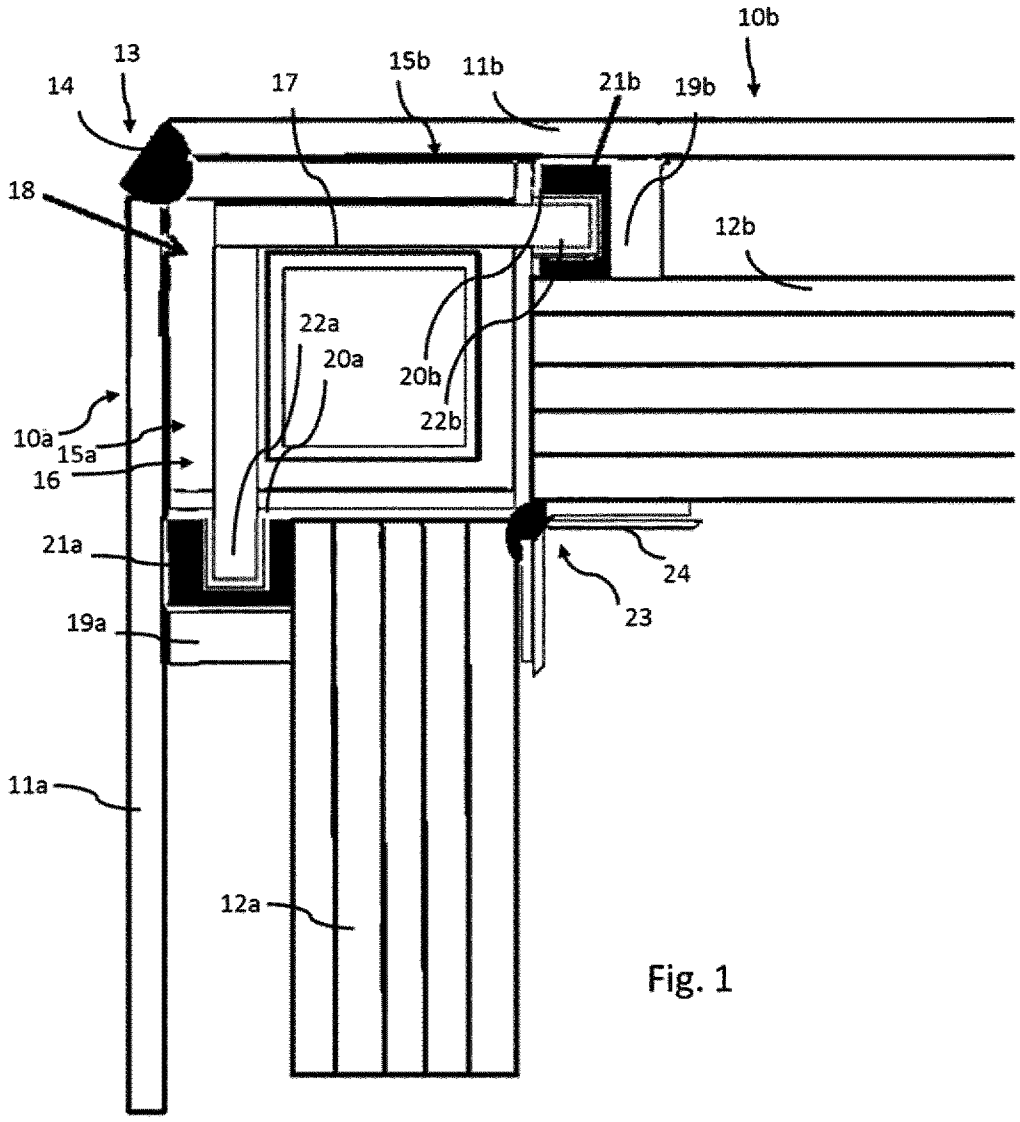
10b
13
14
17
15b
11b
21b
19b
18
12b
22a
20a
20b
22b
10a
15a
16
21a
24
23
19a
11a
12a

Fig. 1

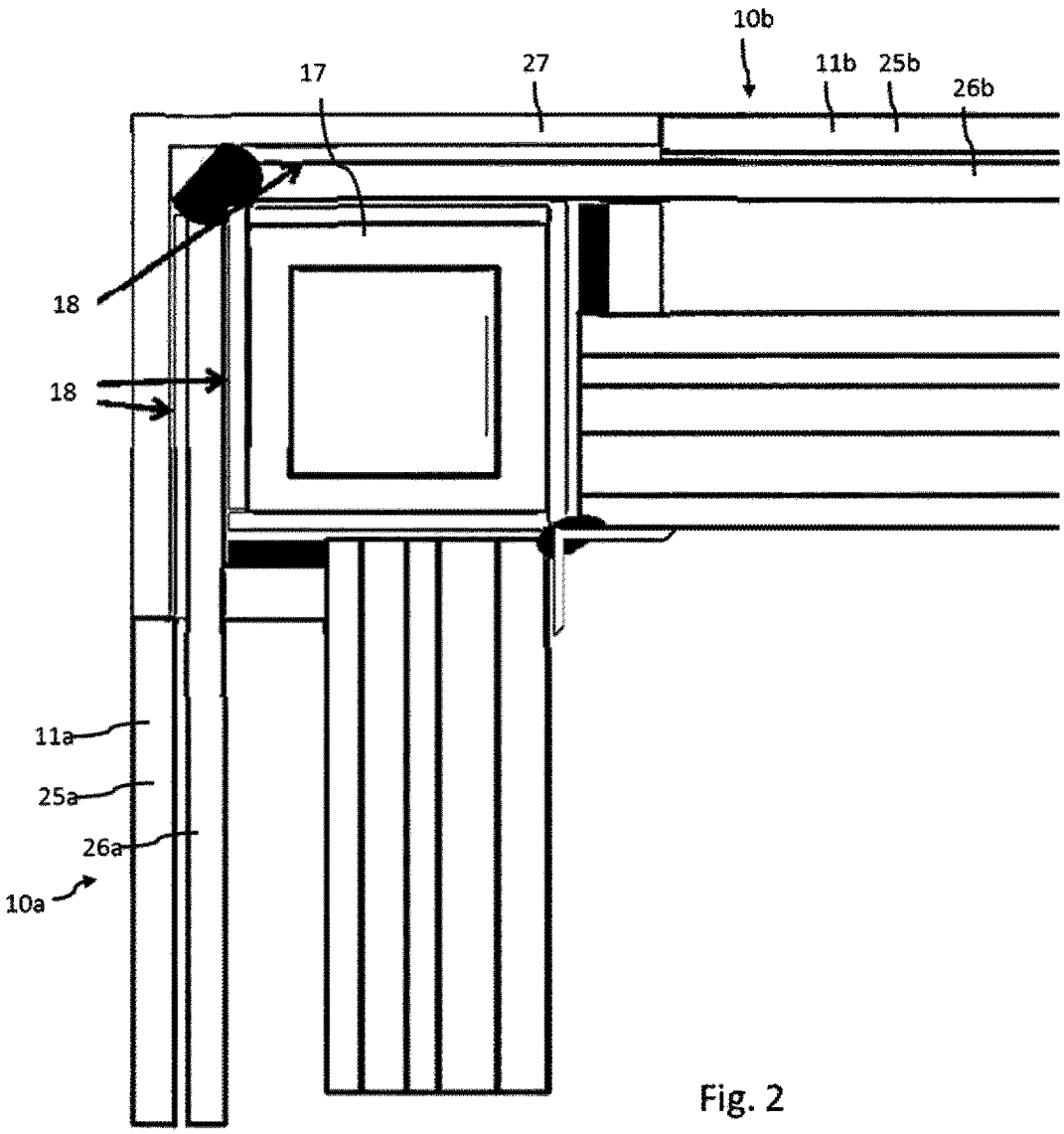

Fig. 2