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(54) Clamp and support for securing glass to a window opening system

(57) Clamp for securing the window glass to window opening systems in a automotive vehicle, which may be easily pre-fitted in a bracket-drag plate, which facilitates the installation of this securing clamp to the bracket-drag plate and subsequently fitting the assembly to the window glass. This clamp has a U-shaped structure with a central longitudinal lip adapted to fit a window glass, and on the back plate of the clamp projects at least one hook, so there is a gap (d) between the outer surface of the back plate and the inner surface of the hook, designed to hold the upper part of an element of the bracket-drag plate. Another object of the invention is the design of a support-drag plate comprising at least one attachment area shiftable and securable in the aforementioned inner space (d).

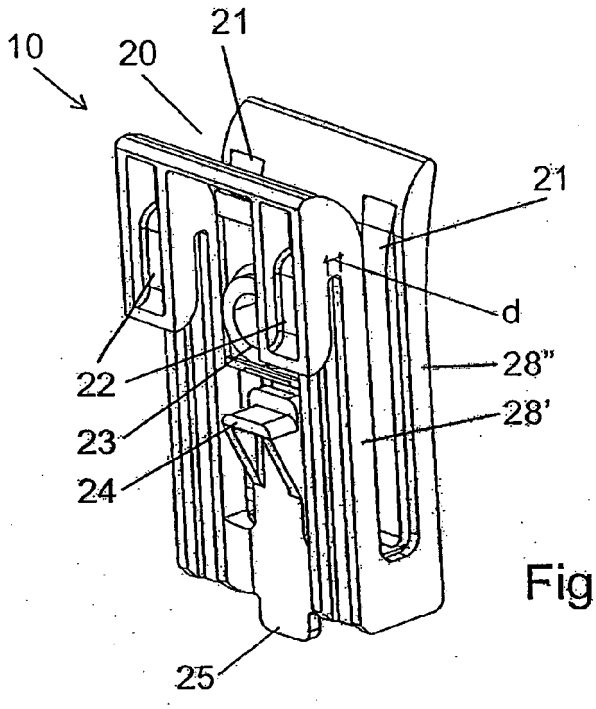

Fig. 1

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Description

Object of the Invention.

[0001] This invention refers to improvements to a clamp for securing the window glass, used in window opening systems for automobiles.

[0002] More specifically this patent is a series of improvements to the clamp and support, described in Spanish patent no. 2316297 B2.

State of the Art.

[0003] The current state of the art for the securing clamp for window glass in window opening systems which use suitable means to support window opening system and therefore also the window glass, enabling it to move vertically, as described and claimed in Spanish patent no. 2316297 B2, of the same holder entitled "improved clamp and support for securing glass to a device intended for motor vehicle windows". This invention shows a configuration with two U-shaped clamps and a support where the clamps incorporate a window glass and press fit to the ends of said support, thanks to two arms on the clamp, facilitating their insertion with ramps.

[0004] Despite the benefits and facilities offered by this clamp and support, they allow a slight in horizontal movement and can produce noise generated by the contact surfaces of the clamp and the glass-support element used in window opening systems.

Scope of the invention.

[0005] The main purpose of the present invention is to design a securing clamp with an improved configuration, which may be easily pre-fitted to a drag plate system, thus substantially facilitating the subsequent installation of the securing clamp and drag plate system assembly to the window glass.

Description of the invention.

[0006] The securing clamp for a window glass presented in this invention is composed principally of an element of plastic material strong enough to bear the weight of the window glass and the friction forces which can affect it, transmitting these to the drag plate, thanks to the attachment of the clamp to the attachment area of the bracket-drag plate and of the latter to the drag plate itself, in the same manner which by means of the fitting the same clamp to the window glass, these elements, joints and fittings being the most commonly used in window opening systems.

[0007] This securing clamp has two plates: A front plate and a back plate, parallel and slightly separate from each, forming a U-shaped structure with a central longitudinal lip adapted to fit a window glass. On the back plate of the clamp projects at least one hook, so there is a gap (d) between the outer surface of the back plate and the inner surface of the hook, designed to hold the upper part of an element of the bracket-drag plate. In addition, this back plate and the front plate have orifices at the same height for passage through them of at least one transversal attachment element which joins the window glass to the clamp and the bracket-drag plate.

[0008] Preferably the inner part of this clamp has a separation between plates that is practically constant, except the upper edges where this distance is increased to form a more open entry lip enabling easy fitting of the window glass with at least two side holes through the clamp itself.

[0009] The configuration and materials of these plates allows a certain degree of flexing in the upper part of the plates, just to allow certain movement and thereby improve the positioning of the window glass in the space between these plates.

[0010] The outer face of the front plate of the clamp has a preferably slightly flat surface, with all the edges lightly rounded and with a through hole at the upper central part of a suitable diameter for inserting a securing element such as a screw or standard shaft for securing the window glass bracket to the clamp.

[0011] As mentioned above, on the outer face of the back plate of the clamp starting from the top, there is an outward facing fold configured from a continuity of the lip formed by at least one hook, which allows downward vertical movement of the clamp to be locked on the attachment area of the bracket-drag plate, as well increasing the adhesion of this on the same. In addition, the upper central part of the outer face of the back plate of the clamp, at the height of the hook has a hole through it, of the same characteristics as that described for the front plate, as it is a continuation of it.

[0012] Additionally, the outer face of this back plate includes, below said orifice, a wedge-shaped projecting structure, as well as a clip element for inserting, projecting vertically downwards to the lower base, these elements locking the horizontal movement and vertical upward movement of the clamp with regard to the attachment areas of the support-drag plate and improving the securing capacity of the same attachment area.

[0013] Additionally, the inner face of at least one of the plates, front or back, of the clamp there are one or more non-slip strips placed in vertical position along at least one vertical section of this inner face. These strips extend preferably from upper end to the upper ends of the plate and they are made of non-slip material, thereby enabling the clamp to exert extraordinary pressure on the glass without producing any noise, due to the strong contact between the elements. These non-slip strips can be thinner on their upper ends than the rest of their length, thus facilitating the insertion of the window glass. The function of these strips is none other than to avoid the production of noise between parts.

[0014] Another object of the invention is to design a support for securing window glasses that comprises at

least one attachment area shiftable and securable in the inner space (d) between the outer surface of the back plate and the inner surface of the hook of the aforementioned clamp.

[0015] If there are two clamps, this bracket drag plate has on its ends the respective attachment areas with a slightly L-shaped configuration. Said area/s comprise at least one tab on the upper part, adapted to secure the upper part of the attachment area, an orifice in the same position as the position of the through hole, adapted to enable the passage of a fastener, such as a screw. It also has an orifice, preferably rectangular, below the aforementioned orifice, adapted for inserting and clipping the wedge-shaped element of the clamp, locking upward movement. There is also an orifice at the intersection between the upper portion and the lower horizontal portion, which allows the insertion of a clip of the respective clamp, thus enabling the correct insertion of the clamp and minimising its undesired movement, as it improves the securing capacity.

[0016] If there are two attachment areas, the through orifices of the securing elements to the window glass can be completely circular or elongated to allow a certain play. Preferably, in the case of two attachment areas, one orifice of the attachment area will be circular and the one in the other attachment area will be elongated.

[0017] Said area/s also have an orifice in the lower base, adapted so as to be able to insert the clip of the clamp.

[0018] It is clear that the thickness of the space (d) of the clamp should be at least equal to the thickness of the attachment area.

[0019] In addition, the bracket-drag plate can form a part of the same drag plate, thus allowing passage and anchoring on the guide cable which transmits the vertical movement to the drag plate and therefore to the window glass.

[0020] The securing clamp-bracket drag plate assembly can be supplied pre-assembled, so that the only part to insert by the manufacturer is the window glass, fitting it with the orifices present in both elements (the clamps and the attachment area/s of the bracket-drag plate), inserting the window glass by the lip of the clamp and securing it to the assembly with fasteners or bolts, thus substantially reducing assembly times on the production line and also facilitating handling and transport.

[0021] Other details and features will be detailed in the description given below, which illustrate an example of the invention shown for illustrative but not limiting purposes, with the help of the corresponding Drawings.

[0022] Below is a list of the different parts of the invention, which are indicated in the following Drawings with their respective numbers; (10, 10a, 10b) securing clamp, (11a, 11b) holes-glass, (12) window glass, (13) bracket-drag plate, (14) drag plate, (15, 15a, 15b) attachment area of the bracket-drag plate, (13), (16) orifice, (17, 17a, 17b) orifices of the securing clamp, (10), (18, 18a, 18b) tabs, (19a, 19b) screw type fasteners, (20, 20a, 20b) lip of the securing clamp, (10), (21) non-slip strips of the securing clamp, (10), (22) securing clamp hooks, (10), (23) circular orifice of the securing clamp, (10), (24, 24a, 24b) wedges, (25, 25a, 25b) clip, (26) clamp-drag plate assembly, (27, 27a, 27b) orifice, (28) clamp strips (10), front plate (28"), back plate (28'), (d) space between the outer surface of the back plate (28') and the inner surface of the hook (22).

Description of the drawings.

[0023]

Figure 1 is a perspective view of the clamp (10) showing the rear and the most important features, such as the lip (20) which is formed between the two plates (28) which constitute the clamp (10), from which the hooks project (22), the wedge (24) and the clip (25) as securing elements, and on the inside of the clamp (10) the non-slip strips (21).

Figure 2 is a perspective view of the clamp (10) inserted in the attachment area (15) of the bracket-drag plate (13).

Figure 3a is a perspective of the mounting clamp-drag plate (26) before being secured to the window glass (12).

Figure 3b is a perspective view of the mounting clamp-drag plate (26) when it has been secured to the window glass (12) by means of orifices (11a, 11b) in the window glass (12) and the respective fasteners (19a, 19b).

Description of a preferred embodiment of the invention.

[0024] One of the preferred embodiments of the present invention consists, in accordance with figure 1, of a securing clamp (10) formed by two U-shaped plates (28), made mainly of plastic material or similar, with sufficiently strong features so as to be able to bear the weight of the window glass itself (12) as well as the forces generated by vertical motion.

[0025] The bracket-drag plate (13) has at least two attachment areas (15a, 15b), in their respective ends, for securing the corresponding clamps (10a, 10b), these attachment areas (15a, 15b) having a slightly L-shaped configuration with an upper vertical portion and a lower horizontal portion, the lower horizontal portion located just below the lower base of the clamp (10a, 10b). At the central part of this device (13) is connected the drag plate element (14) which transmits vertical movement to the window glass (12), thus the drag plate element (14) is in the central part and linked at its respective side ends to the mentioned attachment areas (15a, 15b).

[0026] In this case, the inner part of the clamp (10) has a fixed width, with the exception of the lip (20), this width is greater and has at least two elongated non-slip strips (21), which extend from end to end of the lip (20) and

cover about half the internal surface of the clamp (10). These non-slip strips (21) also are slightly thicker at the lip (20) than the rest of its length.

[0027] With the aim of improving the securing capacity, the clamp (10) incorporates at least three securing devices, such as: Hooks (22), wedge (24), and clip (25), located at the upper, centre and lower areas of the clamp (10) respectively, thanks to which it is anchored to the clamp (10) at the attachment area (15) of the drag plate (13). The hooks (22) block the vertical movement downwards and stick to the clamp (10) to the area (15), the wedge (24) avoiding horizontal movement and vertical upwards, whereas the clip (25) locks the horizontal movement and helps to secure the clamp to area (15). Between the hooks (22), the clamp (10) has a circular hole (23), which goes right through the clamp (10) and which corresponds in position and size with the orifice (17) present in the area (15) of the drag plate (13). While in the securing area (15) there are also securing devices such as a tab (18), the rectangular hole (16) and the rectangular curved hole (27), located at the upper and lower central areas respectively and allowing the insertion and locking of the devices for securing the clamp (10). As can be observed in figures 1 and 2.

[0028] Additionally, to facilitate the final fitting of the window glass (12) aligning its holes (11a, 11b) with those (23) on each clamp (10a, 10b) and those (17a, 17b) in areas (15a, 15b) respectively, and therefore on the drag plate (14), this second block is supplied already assembled, in accordance with figures 3a and 3b, where these attachment areas (15a, 15b) are a part of the bracket-drag plate (13), from which depends the drag plate itself (14) and securing the clamps (10a, 10b), the clamp-drag plate assembly (26) is obtained. Onto this assembly (26) it is easy to fit the window glass (12) by lips (20a, 20b) of the clamps (10a, 10b) and fit (6) the entire assembly (26) with the window glass (12), thanks to the securing elements such as screws (19a, 19b) and the holes (11a, 11b) in the window glass itself (12), this attachment being easy and quick to make in the final assembly of the window mechanism, reducing assembly times and therefore costs.

[0029] Alternatively, non-slips strips (21) may be added to the contact areas of the clamp (10) with the attachment area (15).

[0030] Having sufficiently described this invention using the figures attached, it is easy to understand that any modification may be made to the detail which may be deemed to be appropriate, whenever these changes do not alter the essence of the invention summarised in the following claims.

Claims

1. **"CLAMP FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** used with the aim of sliding the window glass of an automobile window with a window system, with at least a drag plate with a bracket-drag plate which includes at least two attachment areas to which the mounting clamps of the glass-support on which the window glass rests, **characterised in that** the clamp (10) has two plates (28); a front plate (28'') and a back plate (28'), parallel and slightly separate from each, forming a U-shaped structure with a central longitudinal lip (20) adapted to fit a window glass (12) on the inner surface. And on the back plate (28') of the clamp (10) projects at least one hook, so there is a gap (d) between the outer surface of the back plate (28') and the inner surface of the hook (22), designed to hold the upper part of an element of the bracket-drag plate, the back plate (28') and the front plate (28 '') having orifices (23) for passage through them of at least one transversal attachment element (19), and the back plate (28') having a wedge-shaped projecting element (24).

2. **"CLAMP FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** according to claim 1, **characterised in that** it comprises two hooks (20) separate from each other adapted to secure the upper part of an element of the bracket drag plate.

3. **"CLAMP FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** according to claim 1, **characterised in that**, additionally, the clamp (10) has on the lower side of the back plate (28') a clip element (25), with a body that projects vertically downwards, this clip element (25) begin designed to insert inside an orifice (27) of an attachment area (15) of a bracket-drag plate (13), thereby locking said clip element (25) the horizontal movement of the clamp (10) with regard to the corresponding attachment area (15) of the bracket-drag plate (13).

4. **"CLAMP FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** according to claim 1, **characterised in that**, additionally the clamp (10) has on the outer face of the back plate (28') of the clamp (10) a wedge-shaped attachment structure (24) projecting outwards, this wedge element (24) being designed to insert and lock by clipping on the inside of an orifice (16) in the attachment area (15) of a bracket-drag plate (13), thus the wedge element (24) locks the movement vertical of the clamp (10) with regard to the corresponding attachment area (15) of the bracket-drag plate (13).

5. **"CLAMP FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** according to claim 1, **characterised in that**, the inner face of at least one of the plates, front or back, of the clamp (10) there are one or more non-slip strips (21) placed in vertical position along at least one vertical section of this inner face.

6. **"CLAMP FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** according to claim 1, **characterised in that**, the inner part of the clamp (10) has a fixed width, with the exception of the lip (20), this width is greater and has at least elongated two non-slip strips (21) which cover about half the internal surface of the clamp (10).

7. **"CLAMP FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** according to any of the claims 1 to 6, **characterised in that** these non-slip strips (21) are slightly thicker at the lip (20) of the clamp (10) than the rest of its length.

8. **"SUPPORT FOR SECURING GLASS TO A WINDOW OPENING SYSTEM", characterised in that** it comprises at least one attachment area (15) shiftable and securable in the inner space (d) between the outer surface of the back plate (28') and the inner surface of the hook (22) of the clamp (10) claimed in the claim 1.

9. **"SUPPORT FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** according to claim 8, **characterised in that** it has on its ends the respective attachment areas (15a, 15b) with a slightly L-shaped configuration with an upper vertical portion and a lower horizontal portion, the lower horizontal portion located just below the lower base of the clamp (10a, 10b).

10. **"IMPROVED SUPPORT FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** according to claim 8, **characterised in that** said area/s (15a, 15b) comprise at least one tab (18) on the upper part, adapted to secure the upper part of the attachment area (15), an orifice (17) in the same position as the position of the through hole (23), said orifice (17) being adapted to enable the passage of a fastener (19), and it also has an orifice (16) below the aforementioned orifice (17), adapted for inserting and clipping the wedge-shaped element (24).

11. **"IMPROVED SUPPORT FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** according to claim 8, **characterised in that** said area/s (15a, 15b) also have an orifice (27) in the lower base, adapted so as to be able to insert the clip (25) of the clamp (10).

12. **"IMPROVED SUPPORT FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** according to claim 8, **characterised in that** the through orifices of the securing elements (17a, 17b) to the window glass can be completely circular or elongated to allow a certain play of the securing element (15a, 15b) with regard to the clamp (10).

13. **"CLAMP FOR SECURING GLASS TO A WINDOW OPENING SYSTEM",** according to any of the claims 1 to 12, **characterised in that** the thickness of the space (d) of the clamp (10) should be at least equal to the thickness of the attachment area (15) of the bracket-drag plate (13).

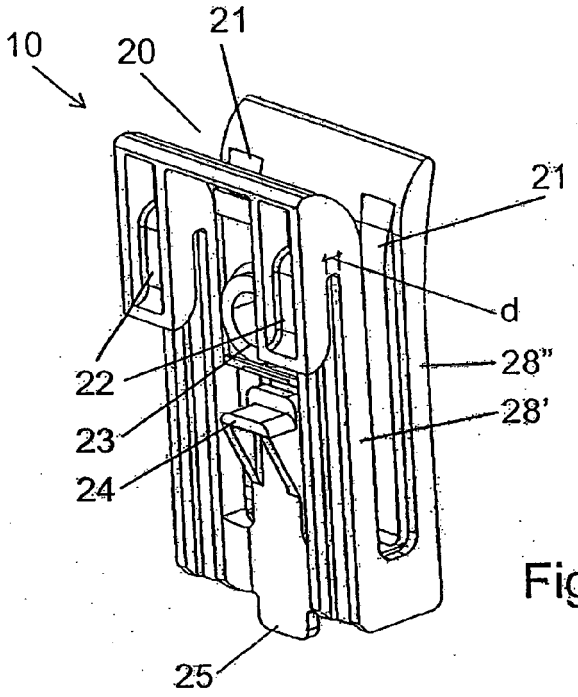
10
20
21
21
d
28"
28'
22
23
24
25

Fig. 1

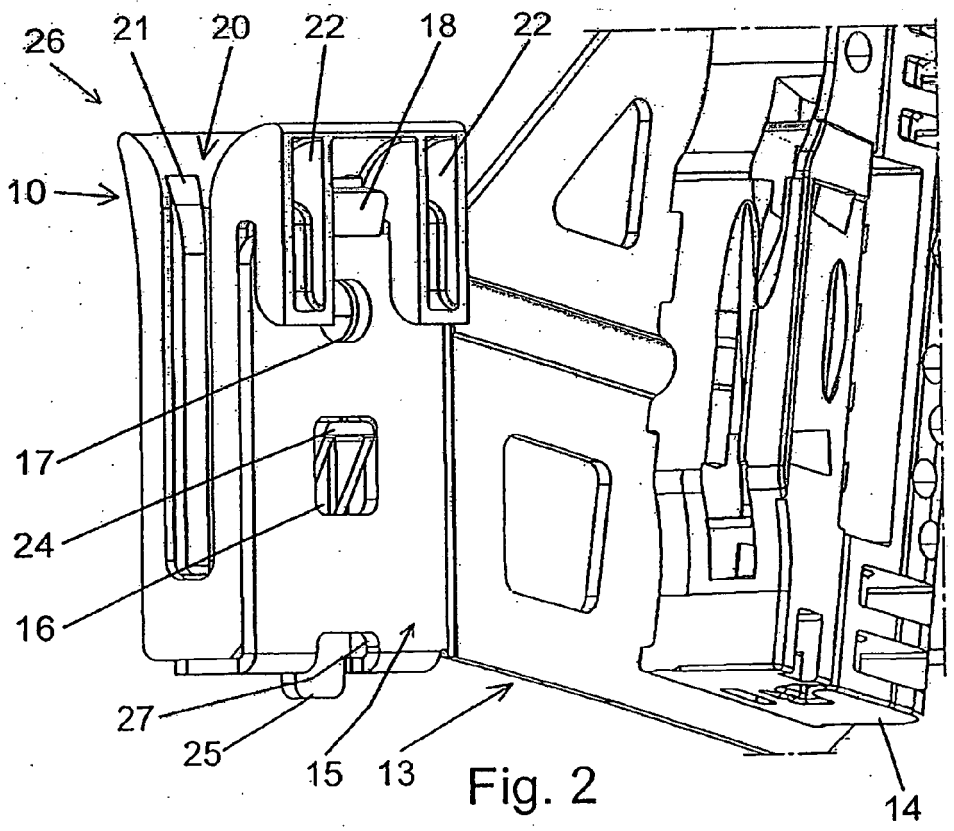
26
21
20
22
18
22
10
17
24
16
27
25
15
13
14

Fig. 2

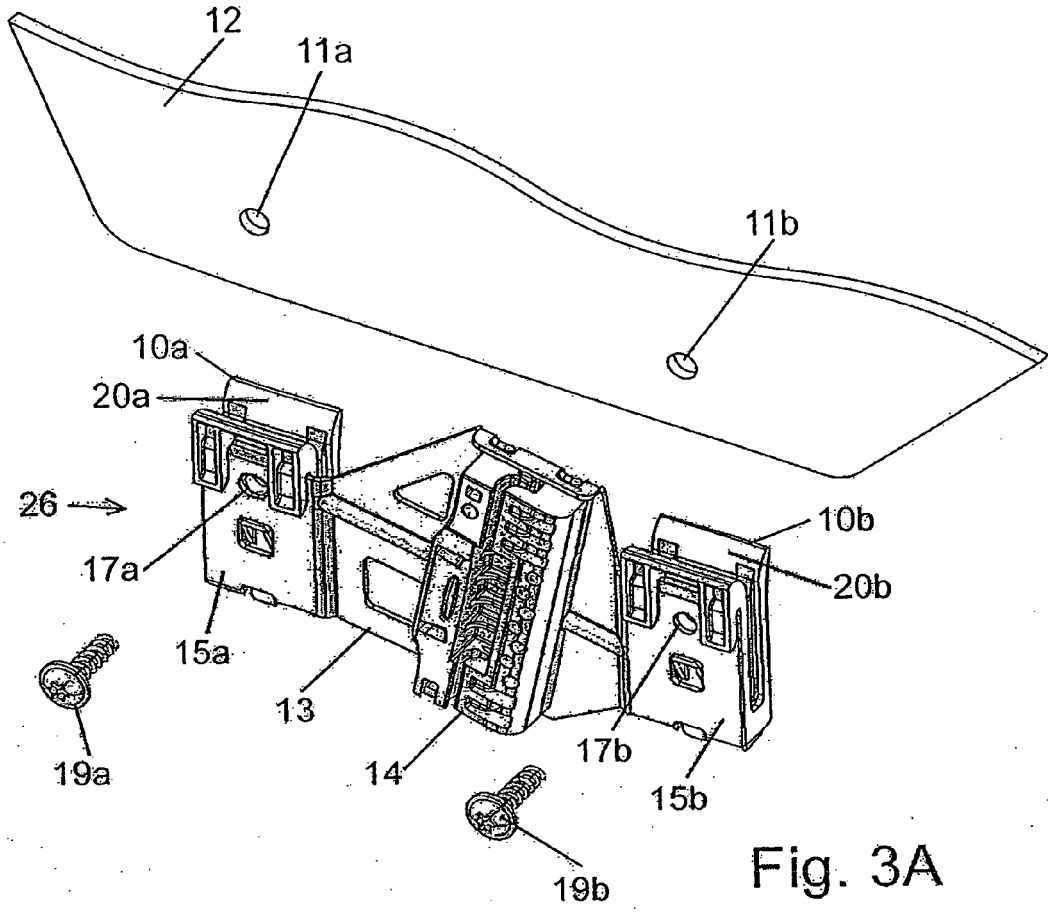
12
11a
11b
10a
20a
26
17a
15a
13
19a
14
17b
15b
10b
20b
19b

Fig. 3A

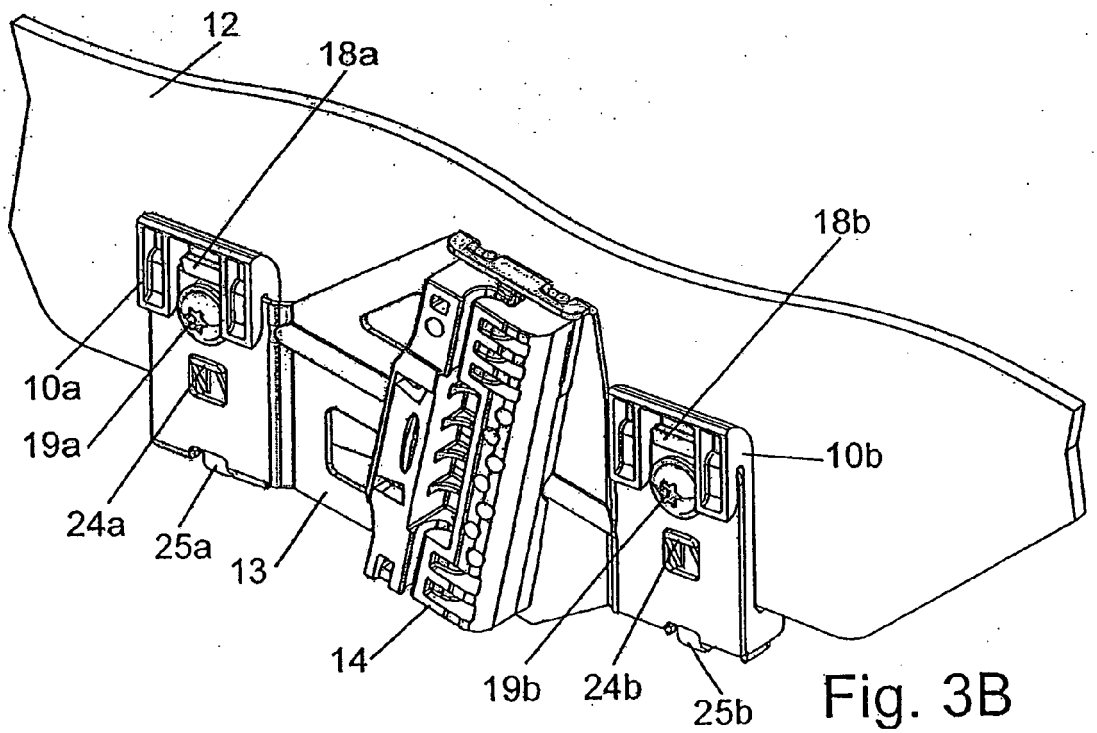
12
18a
18b
10a
19a
24a
25a
13
14
19b
24b
25b
10b

Fig. 3B

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- ES 2316297 B2 **[0002] [0003]**