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(54) System for fixing supports for persian blinds and veneto-style shutters made of pvc

(57) The present invention relates to a system (10) for supporting and fixing door and window frames, in particular Persian blinds and Veneto-style shutters (usually made of PVC profiles). The systems for supporting and fixing of the type described comprise metal strip (11) supports, adapted to anchor the door and window frame to the masonry or to the walled frame which however cause, by effect of the different thermal capacity with respect to the materials constituting the door and window frame, a heat transfer from them to the profile which over time damages the profile, and in particular damages the coating film which tends to deteriorate until detachment with consequent appearance and structural damage.

The system according to the present invention allows to simply and cost-effectively solve the drawbacks which affect the systems of known type because it entirely avoids contact of the strip with the profile constituting the door and window frame.

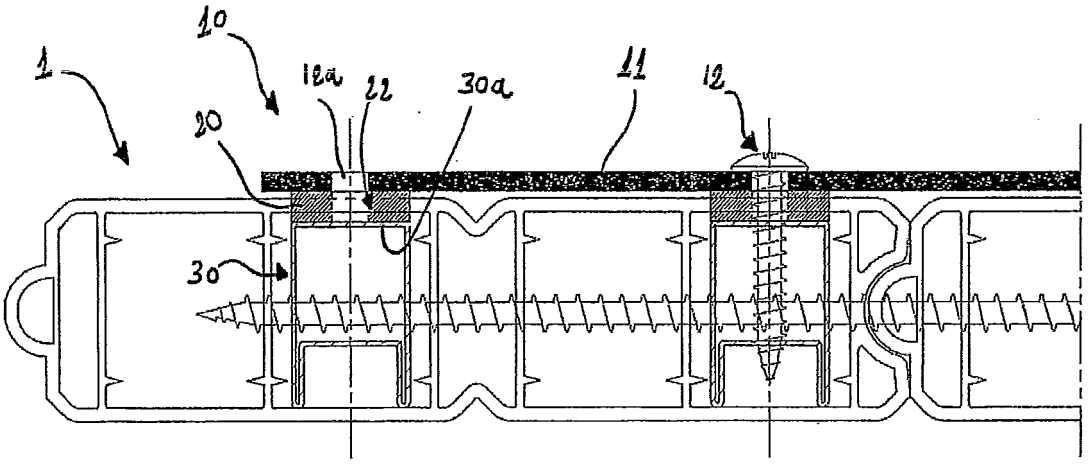

Fig. 4

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Description

[0001] The present invention relates to a system for fixing supports for blackout shutters, in general, and Persian blinds and Veneto-style shutters, in particular.

[0002] As known, nowadays Persian blinds and Veneto-style shutters are prevalently made of PVC (polyvinyl chloride) and are supported and fixed to the wall by means of metal supports, commonly named strips.

[0003] Common Persian blinds, which generally employ angle strips with hinge for supporting the door and window frame to the wall or to the walled frame, are well known. Veneto-style shutters are equally well known, in which the strip has substantially horizontal development instead, thus forming a horizontal "band" along the door and window frame.

[0004] By effect of the weight of the door and window frame, forces proportional to the weight of the door and window frame itself as well as to the type of coupling and fastening of the fixing means of the strips to the door and window frame are exchanged between the PVC door and window frame and the metal strips.

[0005] Examples of door and window frames of these two types are shown in figure 1, which shows a typical Persian blind, and figure 2, which instead shows a Veneto-style shutter with horizontal strip, respectively. In the Veneto-style shutter, in addition to the supporting function, the horizontal strips along with the transversal through screws perform the function of holding the slats of the door and window frame firmly coupled.

[0006] Supports of the known type for Persian blinds and Veneto-style shutters however display a series of drawbacks, mainly related to the systems currently used for fixing said supports to the door and window frame itself.

[0007] As mentioned, many door and window frames are currently made of PVC and normally the metal supports or strips are painted black and placed in contact with the profile of the PVC door and window frame, to which they are connected by means of appropriate fixing means, generally by means of screws.

[0008] Such PVC door and window frames are coated with a specific protective film or coating, suitable for protecting the door and window frame itself from the action of weather elements and creating aesthetic variations of the door and window frame itself (color range and wood grain-type film).

[0009] Such film or protective coating, usually several tenths of a millimeter thick, normally consists of two hot coupled layers: a first inner layer, made of plasticized and molded PVC, and a second outer layer, made of transparent PMMA (polymethyl methacrylate). Although improved in terms of weatherproofing performance, the protective film is however very sensitive to the high temperatures which may be reached by the metal strip by effect of sun radiation. Substantially, sunlight striking the metal strip causes it to heat, and by effect of the different thermal capacities of the metal with respect to the PVC, a temperature delta is established between metal strip and the door and window frame itself. As mentioned, the protective film is very sensitive to the high temperature of the metal strip and may be damaged by effect of the heat transferred thereto.

[0010] Furthermore, as mentioned, the strip is fixed to the door and window frame by means of a plurality of fastening screws. Each of said screws performs a fastening function on the strip, and the action of each screw is translated into a compression action of the strip on the PVC door and window frame with direct contact between strip and protective film. Such compression, if excessively localized, amplifies the thermal effect described above, aiding the possible damage of the PVC coating film.

[0011] It has been observed that, by effect of this damage, the appearance of the film, usually semi-opaque and embossed, turns uniform and shiny. Furthermore, the thermal expansion and subsequent dimensional shrinkage of the PVC profiles on which the metal strip is fixed may cause a deformation of the strip itself over time, in particular an inclination of the strip, which no longer touches the profile of the door and window frame in a uniform manner, thus with a uniform pressure distribution, but instead tends to touch the profile itself in a single point, creating localized stresses of even considerable entity. As a secondary consequence, the fastening screws result also inclined with respect to the initial perpendicular direction of the surface of the door and window frame. Such point or zone of greater support of the strip on the door and window frame usually corresponds to that shown in figure 2 with letter a in the case of Veneto-style shutters.

[0012] Experience shows that in such a zone over time, even only 6 months after installation of the door and window frame if the environmental conditions are particularly favorable, wrinkles are formed due to the accumulation of PVC coating film which detaches from the profile itself due to the stresses which are relieved onto the supports of the artifact, to the deformations and the different thermal capacity of the strip and door and window frame, which are always exposed to sunlight in its normal lifecycle.

[0013] As mentioned, damage of such a zone is normally positioned as shown in figure 2, i.e. inside the strips which mechanically support the Persian blind or Veneto-style shutter. Such a damage is also due to the fact that the metal reinforcements, provided inside the PVC door and window frame and positioned at the fixing points of the strip, being free to position vertically in the profile chamber, may not perfectly adhere to the inner face of the accommodation recess of the reinforcements themselves, allowing the deformation of the outer resting surface, because there is no direct connection between reinforcement and strip. The coupling of such metal reinforcement with the profile indeed presents, as mentioned, a given clearance to allow insertion thereof. Furthermore, the production process of the profile cannot exactly ensure its internal measurement so that such clearance

may also be higher than 1 mm.

[0014] With time and with the recurring of heating/cooling cycles, the formation of wrinkles due to accumulation of coating film as described above may detach the film itself from the profile, thus laying bare the PVC surface which is different in appearance and color. The damage of the coating film thus further exposes the PVC to the weathering agents, in addition to causing an inacceptable difference in appearance. Due to the clearance between metal reinforcement and PVC profile and to the expansion of the latter, the holes for positioning and fastening the screws of the strip may ultimately tend to ovalize, reaching, as conclusive cause, the risk of structural collapse of the door and window frame itself.

[0015] It is the main task of the present invention to solve the above-described drawbacks related to the damage of the PVC window coating film.

[0016] In the scope of this task, it is the object of the present invention to provide a system for fixing supports of door and window frames which allows to overcome the damage to the PVC coating film, in particular the thermal damage caused by heating of the parts of the system with different thermal capacities, and due to the transfer of uneven stresses causing deformation of the components forming the system themselves, avoiding problems of clearance and tolerance between the parts at the same time.

[0017] It is thus the object of the present invention of the present invention to provide a fixing system of the supports of door and window frames which allows to uniformly transfer the stresses from the components of the supporting system to the PVC door and window frame.

[0018] Not last object of the present invention is to provide a system for fixing supports of door and window frames which allows to create an integral mechanical connection between strip and inner reinforcement, by means of both longitudinal screws and transversal screws (in the case of Veneto-style shutters). In this manner, the clearance between inner reinforcement and profile will not affect the statics of the door and window frame.

[0019] This task and this and other objects which will be described in greater detail below, are achieved by a system for fixing the supports for door and window frames, particularly for door and window frames made of PVC, adapted to anchor the door and window frame to the masonry or to the walled frame.

[0020] Said supports, being of the type comprising one or more strips in which one or more through holes are made for inserting fixing means designed to be inserted in reinforcement elements set on the inside of the door and window frame, is **characterized in that** it further comprises one or more spacer elementsdesigned to prevent said one or more strips from coming into direct contact with the profiles forming the door and window frame.

[0021] The system for fixing according to the present invention is further **characterized in that** said spacers are designed to be inserted in a seat in the form of a through hole, purposely made on the side of the door and window frame that faces said strip, so that the spacer, in the configuration where the system is assembled, comes to rest with one face against the strip and with the opposite face against the top edge of the reinforcement element within the profile.

[0022] Further features and advantages of the present invention will be more apparent in the following detailed description provided by way of non-limitative example and set forth in the accompanying figures, in which:

figure 1 shows a diagrammatic view of a Persian blind;

figure 2 shows a diagrammatic view of a Veneto-style shutter;

figure 3 shows a cross section of a door and window frame of the type in figure 2 diagrammatically showing the tool needed for preparing the seat of the components of the fixing system according to the present invention;

figure 4 shows, by way of example, the cross section in figure 3, in assembly configuration, with the reinforcement positioned in conditions in which the gap between inner face of the strip and resting surface on the metal reinforcement is the maximum possible, i.e. in the most unfavorable condition. It is worth specifying that the positioning of the metal reinforcement in the vertical direction is determined, in the case in of Veneto-style shutters, by the insertion mode of the transversal fixing screw between the slats and, in the case of the Persian blinds, by means of the angular reinforcement joint;

figures from 5 to 8 diagrammatically show other possible fixing diagrams of the system according to the present invention applied to door and window frames of other type which involve different peculiarities of the assembly of the system;

figure 9 shows, by way of example, a possible alternative embodiment of the fixing system according to the present invention.

[0023] According to a preferred embodiment of the present invention shown in the mentioned figures by way of not limiting example, the door and window frames 1, generally made of PVC described herein and to which the suggested fixing system is applied, may be of any type. In particular, in case of the Persian blinds in figure 1 or the Veneto-style shutters in figure 2, they are connected to the masonry or to the walled frame 2 by means of a fixing system 10.

[0024] The fixing system 10 comprises a strip 11, preferably made of metal material, which is generally connected either to the walled frame 2 or directly to the masonry by means of a hinge, thus allowing the opening of the door and window frame.

[0025] One or more holes 12a, adapted to the insertion of fixing means 12, which may preferably consist of self-tapping screws 12, are obtained on said strip 11, as shown in figure 4.

[0026] One or more metal reinforcements 30 are provided inside the door and window frame 1, arranged perpendicularly with respect to the longitudinal dimension of said strip 11. The metal reinforcements 30 preferably display a preferably quadrangular, hollow, closed profile, so as to guarantee a good structural resistance to the forces acting thereon but at the same maintaining light weight. According to a preferred embodiment of the fixing system 10 according to the present invention, the metal reinforcement 30 presents an upper edge 30a which faces the side of the profile of the door and window frame 1 or 2 on which the strip 11 rests, and an opposite lower edge 30b and substantially parallel thereto.

[0027] As shown in the figures, in particular in figure y, the fixing system according to the present invention comprises a spacer 20, indifferently made of either metal material, e.g. aluminum or aluminum alloys, plastic or composite material, providing it is pressure stress resistant.

[0028] According to the invention, the shape of said spacer 20 substantially coincides with that of the seat 21 thereof obtained on the side of the door and window frame profile 1 and 2 at the hole 12a provided on the strip 11 for inserting the fixing screws 12. The seat 21 may be advantageously obtained via a milling operation using a cup wheel cutter 40, as shown in figure 3. Therefore, the seat 21 will be essentially a through hole having a circular profile, and thus the space 20 adapted to be inserted in said seat 21 is advantageously disc-shaped. The disc spacer 20, equipped with an axial through hole 22, will have different thicknesses which may be chosen according to the various applications. Different forms or types of door and window frame may require other forms and/or thicknesses of the spacer 20, which will not therefore be intended as limited to the forms or proportions shown by way of example in the figures.

[0029] Furthermore, the fixing system shown for Veneto-style shutters is similar in the sashes of the Persian blinds and the frames in fig. 1 in which the spacers 20 are also inserted under the supporting hinge pivots positioned on the frames themselves and under the straight and angular strips. With particular reference to figures 3 and 4, the spacer 20 is adapted to be arranged inside the seat 21 obtained on the side of the door and window frame on which the strip 11 rests. In particular, the system according to the present invention includes a seat 21 adapted to accommodate the spacer 20 and made at each of the holes 12a on the strip 11 for fixing it to the door and window frame. Indeed, the seat 21 is a through hole which crosses the thickness of the door and window frame and allows the spacer 20 to rest directly on the metal reinforcement 30 contemplated inside the door and window frame.

[0030] More in particular, the spacer 20 rests on the upper edge 30a of said metal reinforcement 30, thus directly relieving the stresses transmitted by the screws 12 from the strip to the door and window frame onto said reinforcement 30. As mentioned, the transmitted forces are both forces associated to the fastening of the screws 12 and forces associated to the supporting action of the door and window frame on the strip.

[0031] As mentioned, the screws 12 are inserted in the through hole 12a provided in the strip 11 and in the through hole 22 provided axially to said spacer 20.

[0032] In this manner, the fixing means consisting of self-tapping screws 12 in the example may directly mesh with said metal reinforcements 30, inserting themselves in said reinforcements. The assembly sequence of the fixing system in the case of Veneto-style door and window frames fig. 2 is the following:

a) transversal fixing of the slats or PVC profiles by means of long screws which join at least two slats at a time and the slat pairs to one another. PVC glue is inserted between each slat in male/female part to make the door and window frame structure even more rigid;
b) positioning the strips according to the height of the door and window frame and marking the fixing positions of the same to the inner reinforcement of the profile;
c) milling the PVC profile up to the first wall of the inner reinforcement and milling the first chamber of the reinforcement itself;
d) inserting the spacers 20 in each milling of the profile;
e) fixing the screws.

[0033] The reinforcement position inside the profile may vary according to the assembly method. If this is carried out by positioning the slats flat, theoretically the reinforcement is arranged by gravity downwards in the inner chamber of the profile.

[0034] The position of the reinforcement does not affect the result because the thickness of the spacer 20 may vary according to the configuration fig. 1 or fig. 2, and the assembly system (flat, vertical, etc.).

[0035] These indications, efficient for Veneto-style shutters, are similarly applicable to Persian blinds, with the exception that the assembly to several adjacent slats is instead constituted by a welded angle frame.

[0036] According to a preferred embodiment of the present invention shown in the accompanying figures, the fixing means 12 of the strip 11 to the door and window frame 1 are constituted by screws, as mentioned.

[0037] In particular, such screws 12 are self-tapping so as to directly drill the metal reinforcement 30 when they are inserted and tightened.

[0038] The system according to the present invention thus allows to completely avoid the contact between the metal strip 11 and the PVC door and window frame, thus avoiding the detrimental effects of heat transfer and stress transfer between strip and door and window frame.

[0039] With the proposed system, the strip discharge the stresses through the spacer directly onto the upper surface of the metal reinforcement 30 within the door and

window frame. Therefore, the combined effect of the PVC door and window frame heating due to the thermal transfer from the strip is especially avoided, which thermal transfer causes the deformation of the profile around the screw in systems of known type. The PVC profile deformation over its entire length also leads in general to a misalignment of the screw itself and therefore to a further disadvantageous force transfer from the supporting system to the door and window frame. A permanent static connection is instead created with the new fixing system among: inner transversal screws - metal reinforcement - fixing screws and strip, thus considerably improving the statics of the door and window frame itself.

[0040] Naturally, as known to a person skilled in the art, the considerations and problems illustrated and discussed herein in relation to PVC door and window frames are equally applicable and transferable to door and window frames made of materials having similar features and thus similar problems.

[0041] Naturally, according to an alternative embodiment, the fixing system according to the present invention may contemplate that the strip and the spacer are made in one piece, as shown in figure 9. In this case, holes must be made in the PVC profile having diameter slightly larger than the actual introduction diameter required for introducing the male parts which work as spacer between the inner reinforcement of the profile and the support, thus leaving the PVC profile free to expand.

[0042] It has thus been shown how the system for fixing supports for door and window frames according to the present invention achieves the suggested purpose and objects.

[0043] In particular, it has been shown how the fixing system according to the present invention allows to eliminate the drawbacks which affect the systems of known type and which lead to damaging the protective PVC film of the door and window frames with consequent aesthetic and structural damage. In all constructive solutions and types, the new fixing system ensures that the metal strip never touches the surface of the PVC profile.

[0044] Furthermore, the system according to the present invention allows to optimize the transfer of load and forces from the supporting system to the PVC door and window frame and allow to avoid the drawbacks which occur upon the contact of the metal supporting elements with the PVC door and window frame.

[0045] Furthermore, the fixing system according to the present invention is extremely simple to install which allows to replace old type systems even already installed with the new system.

[0046] Many changes may be made by a person skilled in the art without departing from the scope of protection of the present invention.

[0047] Therefore, the scope of protection of the claims must not be limited to the drawings or preferred embodiments described by way of example, rather the claims must include all the features of patentable novelty inferable from the present invention, including all the features which would be treated as equivalent by a person skilled in the art.

Claims

1. A system for fixing (10) supports for door and window frames (1), particularly for door and window frames made of PVC, designed to anchor the door and window frame to the masonry or to the walled frame (2), said supports being of the type comprising one or more strips (11) on which one or more through holes (12a) are made for insertion of fixing means (12) designed to be inserted in reinforcement elements (30) set on the inside of the door and window frame (1), and **characterized in that** it further comprises one or more spacer elements (20), designed to prevent said one or more strips (11) from coming into contact with said door and window frame (1).

2. The system for fixing (10) according to the preceding claim, **characterized in that** said spacers (20) are designed to be inserted in a seat (21) in the form of a through hole purposely made on the side of the door and window frame that faces said strip (11) so that said spacer, in the configuration where the system is assembled, comes to rest with one face against said strip (11) and with the opposite face against the top edge (30a) of said reinforcement element (30).

3. The system for fixing (10) according to the preceding claim, **characterized in that** said one or more spacer elements (20) have the shape of a disk and present a through axial hole (22) designed to receive said fixing means (12).

4. The system for fixing (10) according to one or more of the preceding claims, **characterized in that** said seats (21) in the form of a through hole are provided on the side of the door and window frame that faces said strip (11) in a position corresponding to each of said through holes (12a) present in said strip (11), said seat (21) having a substantially circular profile designed to receive said spacer element (20).

5. The system for fixing (10) according to the preceding claim, **characterized in that** said spacer (20) is made of metal material.

6. The system for fixing (10) according to any one of Claims 1 to 5, **characterized in that** said spacer (20) is made of plastic material.

7. The system for fixing (10) according to any one of Claims 1 to 5, **characterized in that** said spacer (20) is made of composite material.

8. The system for fixing (10) according to any one of the preceding claims, **characterized in that** said fixing means are constituted by self-tapping screws (12).

9. The system for fixing (10) according to any one of the preceding claims, **characterized in that** said reinforcement element (30) is made of metallic material.

10. The system for fixing (10) according to one or more of the preceding claims, **characterized in that** said spacer elements (20) are obtained in one piece with said strip (11).

11. The system for fixing (10) according to the preceding claim, **characterized in that** said strip (11) comprising said spacers (20) is made by die-casting.

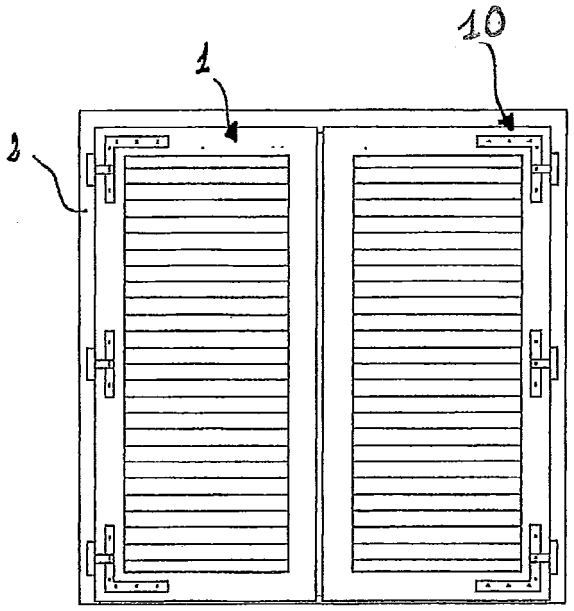

Fig. 1

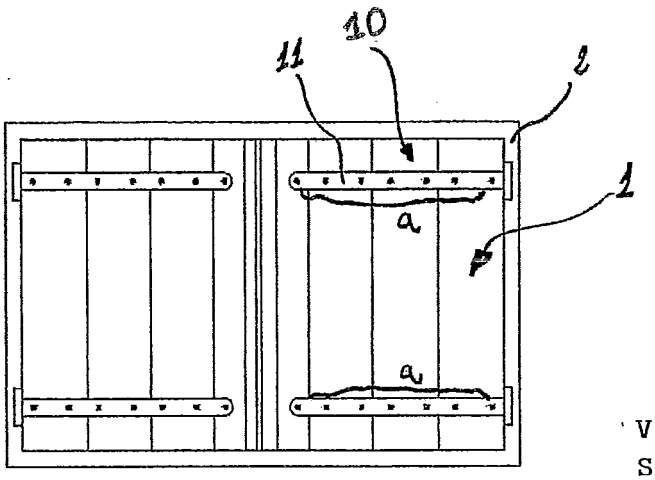

Fig. 2

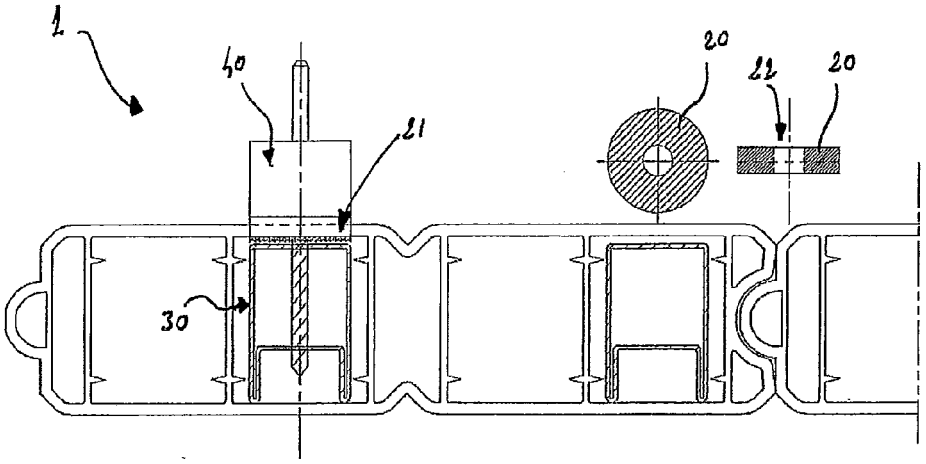

Fig. 3

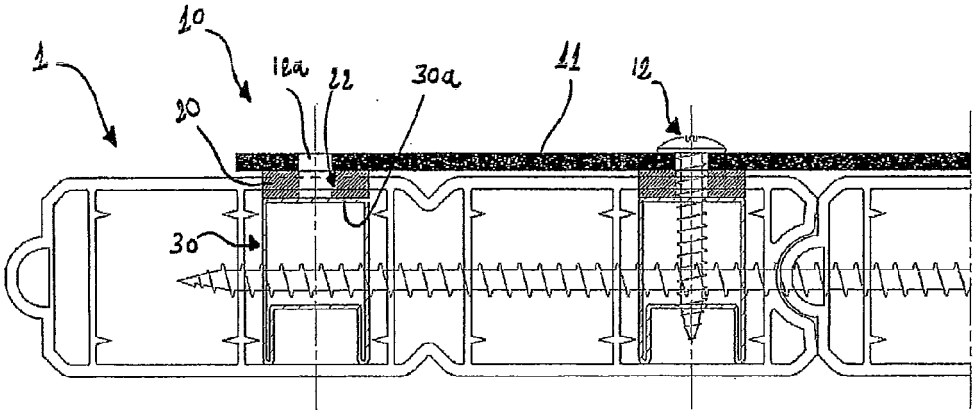

Fig. 4

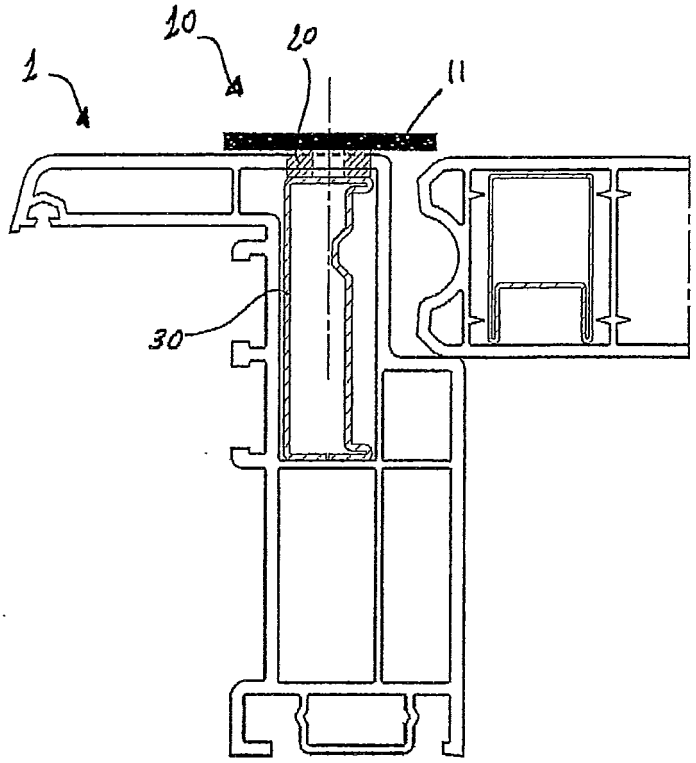

Fig. 5

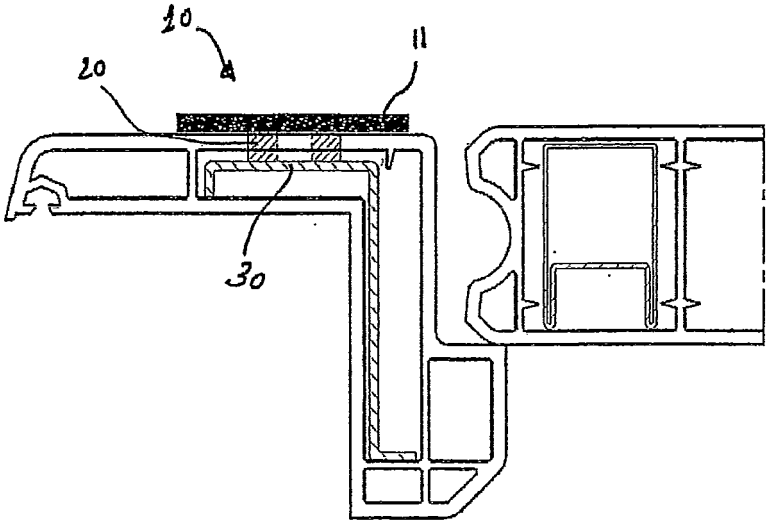

Fig. 6

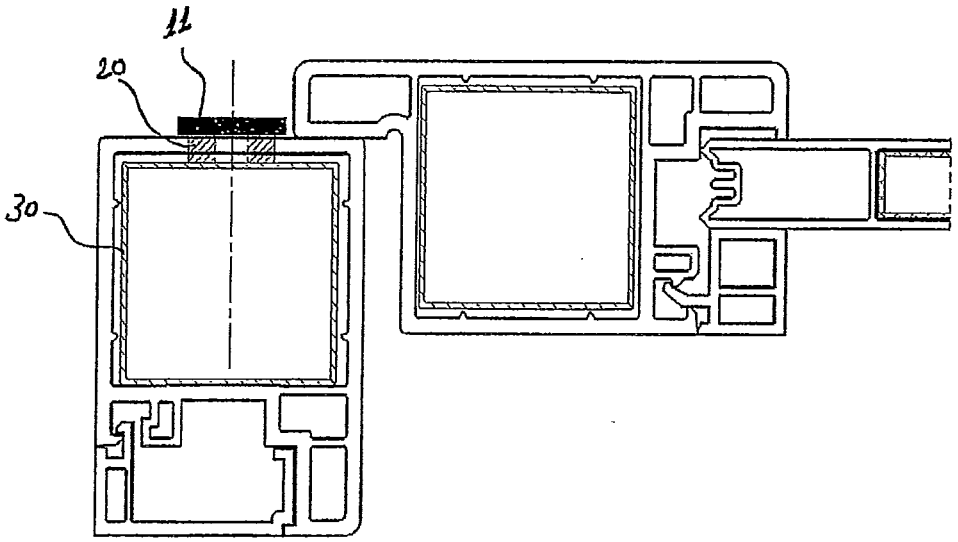

Fig. 7

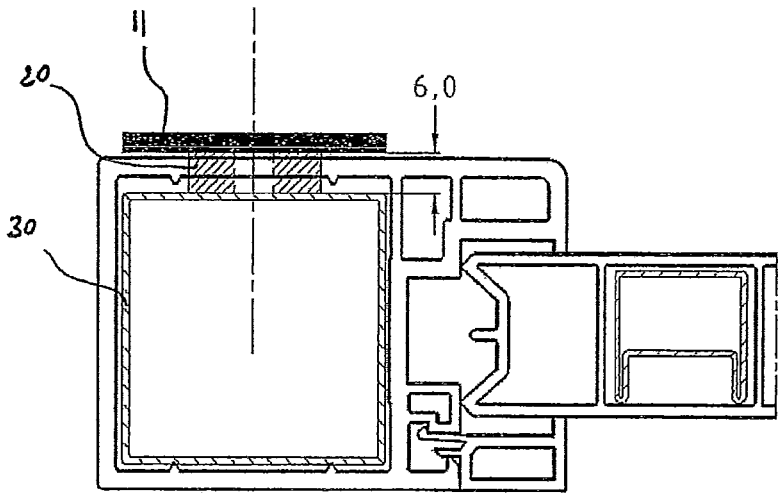

Fig. 8

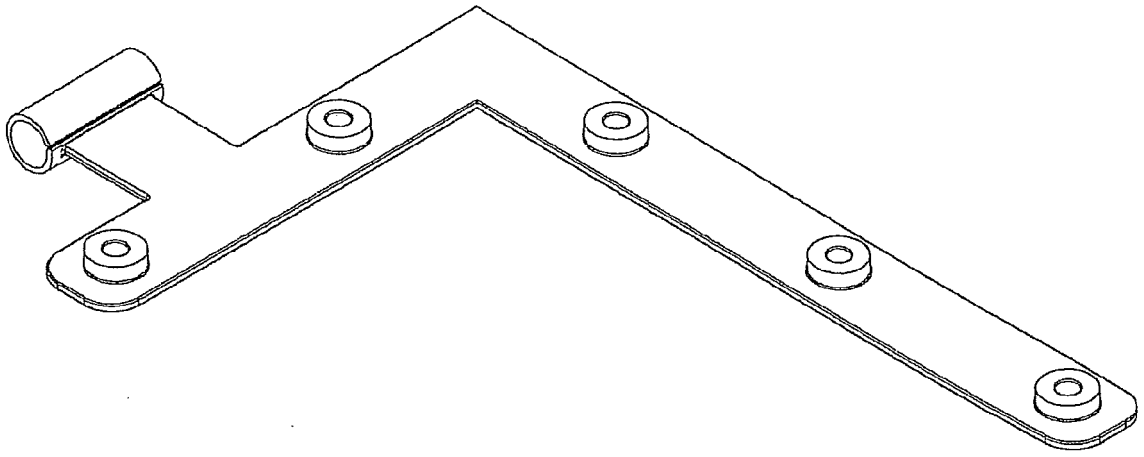

Fig. 9