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(54) Recreational vehicle

(57) The front (3), the rear (5) and/or the roof (4) of a recreational vehicle consists of a plastic plate (6) which have two sides, fixed to the side walls (2) by means of a clamping profile (8), a watertight rubber profile (10) being fixed between the clamping profile (8) and the plastic plate (6). The clamping profile (8) has a screw groove (12) with finishing stripe (11), which are arranged in such a favourable inclined position with respect to the L-shape, that the screw (9) through the clamping profile (8) and through the sealing profile (10) can extend to the sidewall past the sides of the plastic plate (6) clamped in-between, so that this can still move under expansion and especially shrink and consequently is spared from tearing.

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Description

[0001] The following description relates to a caravan, a mobile home or a motor caravan, provided with at least 2 side walls, a front, a rear and a roof and an interior, in which a sitting area and a kitchen may for instance be fitted. The side walls show a contour which is straight or of which one or more portions are arcuate. This description relates to running strips of these contours hereinafter referred to as "clamping profiles", of which various models, with various functions are used. These clamping profiles are usually made of aluminium, being mounted as one piece at the left and right over the length of the contours of the recreational vehicles by means of a screwed connection, of which the screw is fitted in a screw groove with a decorative border. The above-described clamping profiles function as the finishing of the contours at the left and right, where the front, the roof and the rear are fixed to the side walls. They may also have the function of an insertion rail for a tent or an awning and lastly, they also have the function of providing water tightness, having a sealant underneath them.

[0002] These clamping profiles have been used almost unchanged for years and are fitted respectively at the left and right on the circumference of caravans and mobile homes of nearly all makes of recreational vehicles.

[0003] These clamping profiles have never had unfavorable effects, until, about 15 to 20 years ago, plastics, including ABS and polyester, were increasingly used for caravans and mobile homes. All manufacturers used more and more plastics over time, wanting to join in the face lifting of their recreational vehicles.

[0004] Due to the oil crisis of the late seventies, the issue of aerodynamics became a strong point of attention in this field, with as little air resistance as possible being allowed for recreational vehicles, in order to save on fuel, especially for caravans. The caravans and mobile homes had to become more rounded and sloping. This design trend persisted and could be realized most easily, and possibly only by the increasing use of plastics, where before aluminium outside panels were used. This is exactly where the catch is.

[0005] Relatively soon after plastics and polyester had begun to be used, it was found that the screws of the clamping profiles caused these materials to tear.

[0006] Also, these materials, especially those of the ABS-group, are highly sensitive to temperature changes. Tests that I carried out, show that the tolerance between the max. expansion (at +30°C) and the max. shrinkage (at -30°C) in the worst case amounts to 0,6 to 0,7%, depending on the thickness of the material. A thinner material is far more sensitive than a thick material. One has to realize that for a length of 1 meter plastics material this can be 6 to 7 mm. Note that temperatures below zero cause a greater movement than those above zero, the reason for this being that most fronts, roofs and rears are white and repel sunlight, making it difficult (fortunately) for heat absorption to take place.

[0007] Because a plastic front or rear of a caravan, or a cabin cover of a mobile home, or a lighting bumper of both, or an entirely polyester roof, due to their substantial size are subject to a fairly large amount of expansion and shrinkage, it is normal that these parts tear where they have been penetrated by screws.

[0008] Up till now, usually under warranty, manufacturers have replaced the torn parts for their clients, and by repeatedly pointing out to their suppliers the quality of their materials, they have thought to eliminate this problem. Eventually they did not want to give up the plastic materials anymore, because thanks to their use, they were able to create more beautiful, rounder and more modern lines in their designs. That is also the reason that despite the many problems, plastic materials are still used to great extent. But because these problems have lasted so many years, the consequences have become so great for certain manufacturers (they are confronted with damage claims for torn plastic parts daily) that they have started to search for solutions themselves.

[0009] This was reason enough to search for a good solution and this is as follows: the screw groove with decorative stripe in the existing profile of which the screws up to now have penetrated the plastic materials, is moved to the outside corner, so that the screws securing the profile no longer perforate the plastic materials, but pass alongside the plastic materials before penetrating the wood.

The invention thus provides a recreational vehicle, such as a caravan, mobile home or motor caravan, having two side walls and a front, a rear and a roof mounted to the side walls, whereas one of these comprise at least one plastic plate as outer covering, which extends between the side walls and which has two side edges, at least one of which is secured to one of said side walls by being clamped underneath a clamping profile secured to said side wall along at least a portion of the contour thereof, the clamping profile being bent along said contour and a watertight resilient profile being provided between the clamping profile and the side edge of the plastic plate, wherein said clamping profile has an L-shade with on top a screw groove with finishing stripe placed at a slanting angle with respect to the L-shape.

In one embodiment of the invention the clamping profile that follows the contour of the side wall with at least an curved portion can, more in particular, have no greater height dimension, than that which can still be bent together with the contour manually, and which height dimension is smaller than 25 mm and preferably 15 mm.

In another embodiment of the invention the clamping profile can have greater height dimensions than those when it can be bent together with the curved portion of the contour of the side wall manually, and the clamping profile has to be bent by machine.

According to a preferred feature of the invention the clamping profile may in particular have an L-shape with

a screw groove with finishing stripe, whereas said screw groove is in such a slanting angle, that the screw extending through the clamping profile, through a rubber profile with sealing kit and into the side wall, does not penetrate said plastic plate, but passes alongside it.
According to another preferred feature of the invention the clamping profile, in particular has a L-shape angle which is smaller than ninety degrees so that, because of this smaller than ninety degree angle, the tension during the clamping is increased in such way that an optimal sealing is secured with the resilient seal and sealing kit, the side walls, the front, the roof and/or the rear.
The invention thus specifically relates to a recreational vehicle comprising a clamping profile, made in various shapes, out of various materials and with various technical properties, but always serving the purpose that a screw can be inserted in such an inclined position that in order to achieve the clamping the screw can be inserted through a screw groove with a finishing strip, and reaches the wall without touching the clamped plastic plates, but passes alongside those, thus avoiding perforations that cause tearing.
According to other particular features of the invention, the plastic plate referred to, may preferably be made of ABS or polyester, and the resilient profile referred to may preferably be made of rubber.

[0010] The numerals used in the following description relate to the appended figures illustrating and clarifying the invention by way of non limiting example.

Figure 1 is a schematic perspective view of a caravan;
Figure 2 is a cross-section of a mounted traditional clamping profile;
Figure 3 is a cross-sectional view of a mounted new clamping profile according to the present invention;
Figure 4 and 5 show cross sections of technical possibilities and variants of the clamping profile.

[0011] The present invention relates to recreational vehicles like a caravan, a mobile home or a motor caravan, provided with a sitting area and a kitchen.

[0012] The caravan shown in figure 1 comprises a chassis with wheels 1, having a floor mounted thereupon, two side walls 2, a front 3, roof 4 and rear 5. The front 3, roof 4 and rear 5 are made of plastic plates 6 of which the sides have been secured to the side walls 2. As can be seen, the front 3 consists of a pre-formed plastic plate 6, having an aesthetic and aerodynamic form, and in which a booth 7 for a gas bottle or other accessory is integrated. The front 3 and the rear 5 are usually made of an ABS plastic but may also be made of aluminium or other synthetic materials like polyester. The roof 4 may consist of a flat aluminium plate or a flat plastic plate 6, but also the rear 5 can be made of these flat materials. Between the front and the roof there is provided a strip which provides a watertight connection. As can be seen in figure 1, the side walls 2 display an curved contour of a caravan where the front 3, the roof 4 and the rear 5 are fixed to the side walls 2. The front 3, the roof 4 an d the rear 5 are fixed to the side walls 2, and finished by means of a clamping profile 8 which runs along the contour in one piece. The contour of the side walls 2 has bent portions usually having a radius. Consequently, the aluminium clamping profile 8 can easily be bent over them.

[0013] Figure 2 shows us a cross section of a traditionally mounted clamping profile 8 with a right angle of 90 degrees in which it is clear that the self-tapping screw 9 with which the clamping profile 8 is fixed, penetrates the plastic plate 6, thus creating a stressed zone in the plastic plate 6 that may cause tearing. Figure 2 also shows that between the clamping profile 8 and the plastic plate 6 a rubber profile 10 filled with sealing kit is fitted to ensure water tightness. In figure 2 can also be seen how a decorative stripe 11 seals the screw groove 12. Figure 2 also shows that the screw 9, after penetrating the profile 8, the rubber profile 10 providing water tightness and the plastic plate 6, ends up in the side wall 2, to which front 3 and the roof 4 or the rear 5 are fixed, by which the clamping profile 8 may be subjected to a certain clamping force. It is a pity that above explanation of the screw system of figure 2 caused a great deal of frustration and discomfort both to consumers and manufacturers of recreational vehicles. That is why this figure 2 has been crossed as a sign of disapproval.

[0014] Figure 3 shows us the invention with the solution for the difficulties set forth in figure 2. As can be seen in figure 3 the screw groove 12 with finishing stripe 11 has been moved to the corner of the clamping profile 8 and placed in such an ideal inclined position which can always be changed in the clamping profile 8 if necessary. Also in figure 3 its positive effect can be seen: when the self-tapping screw 9 reaches the side wall 2 through the clamping profile 8 via the rubber sealing profile 10 filled with sealing kit, this screw no longer penetrates the plastic plate 6, but passes by it, as a result of which no longer a stressed area is created in the plastic plate 6, by which this plastic plate may tear. Figure 3 also shows the logical positive result that the clamping profile 8 is pressed against the side wall 2 with the rubber profile 10 better because thanks to the inclined screw groove 12 with finishing stripe 11, the screwing forces exerted on the clamping profile 8 are distributed well both horizontally and vertically. This provides a better guarantee of a watertight sealing and an improved cosmetic finish. In order to have this distribution of forces in the clamping profile 8 take place in an optimal manner, the normal L-angle of ninety degrees in the clamping profile 8 has been reduced with a few degrees, as is clear from figure 3.

[0015] Figure 4 and 5 show the possibilities to apply various models and potential technical modifications to the clamping profile 8, but in which the screw groove 12 is placed in such a way, that the aim to have the self-tapping screw 9 pass by the plastic plate 6 and reach

the side wall 2 is always reached. Figures 4 and 5 also show how in the clamping profile 8 two lips 13 serve the purpose of providing the clamping profile 8 with a better distribution and an always correct amount of pressure to the corner of the side wall 2. Logically, however, in these cases the form of the sealing rubber with sealing kit 10 must be changed.

Claims

1. A recreational vehicle, such as a caravan, mobile home or motor caravan, having two side walls (2) and a front (3), a rear (5) and a roof (4) mounted to the side walls (2) whereas the front (3), the rear (5) and/or the roof (4) comprise at least one plastic plate (6) as outer covering, which extends between the side walls (2) and which has two side edges, at least one of which is secured to one of said side walls (2) by being clamped underneath a clamping profile (8) secured to said side wall (2) along at least a portion of the contour thereof, the clamping profile (8) being bent along said contour and a watertight resilient profile (10) being provided between the clamping profile (8) and the side edge of the plastic plate (6), **characterized in that** said clamping profile (8) has an L-shade with on top a screw groove (12) with finishing stripe (11) placed at a slanting angle with respect to the L-shape.

2. A recreational vehicle according to claim 1, **characterized by** a clamping profile (8) that follows the contour of the side wall (2) with at least an curved portion, which clamping profile (8) can have no greater height dimension, than that which can still be bent together with the contour manually, and which height dimension is smaller than 25 mm and preferably 15 mm.

3. A recreational vehicle according to claim 1 and 2, **characterized by** a clamping profile (8) with greater height dimensions than those when it can be bent together with the curved portion of the contour of the side wall (2) manually, and the clamping profile (8) has to be bent by machine.

4. A recreational vehicle according to claims 1, 2 and 3, **characterized by** a clamping profile (8) on the contour of the side wall (2), which clamping profile (8) has an L-shape with a screw groove (12) with finishing stripe (11), whereas said screw groove (12) is in such a slanting angle, that the screw (9) extending through the clamping profile (8), through a rubber profile with sealing kit (10) and into the side wall (2), does not penetrate said plastic plate (6), but passes alongside it.

5. A recreational vehicle according to claims 1-4, **characterized by** a clamping profile (8), having a L-shape angle which is smaller than ninety degrees so that, because of this smaller than ninety degree angle, the tension during the clamping is increased in such way that an optimal sealing is secured with the resilient seal and sealing kit (10), the side walls (2), the front (3), the roof (4) and/or the rear (5).

6. A recreational vehicle according to claims 1-5, **characterized by** a clamping profile (8), made in various shapes, out of various materials and with various technical properties, but always serving the purpose that a screw (9) can be inserted in such an inclined position that in order to achieve the clamping the screw (9) can be inserted through a screw groove (12) with a finishing strip (11), and reaches the wall (2) without touching the clamped plastic plates (6), but passes alongside those, thus avoiding perforations that cause tearing.

7. A recreational vehicle according any one of the preceding claims, **characterized in that** said plastic plate (6) is made of ABS or polyester.

8. A recreational vehicle according to any one of the preceding claims **characterized, in that** said resilient profile is made of rubber.

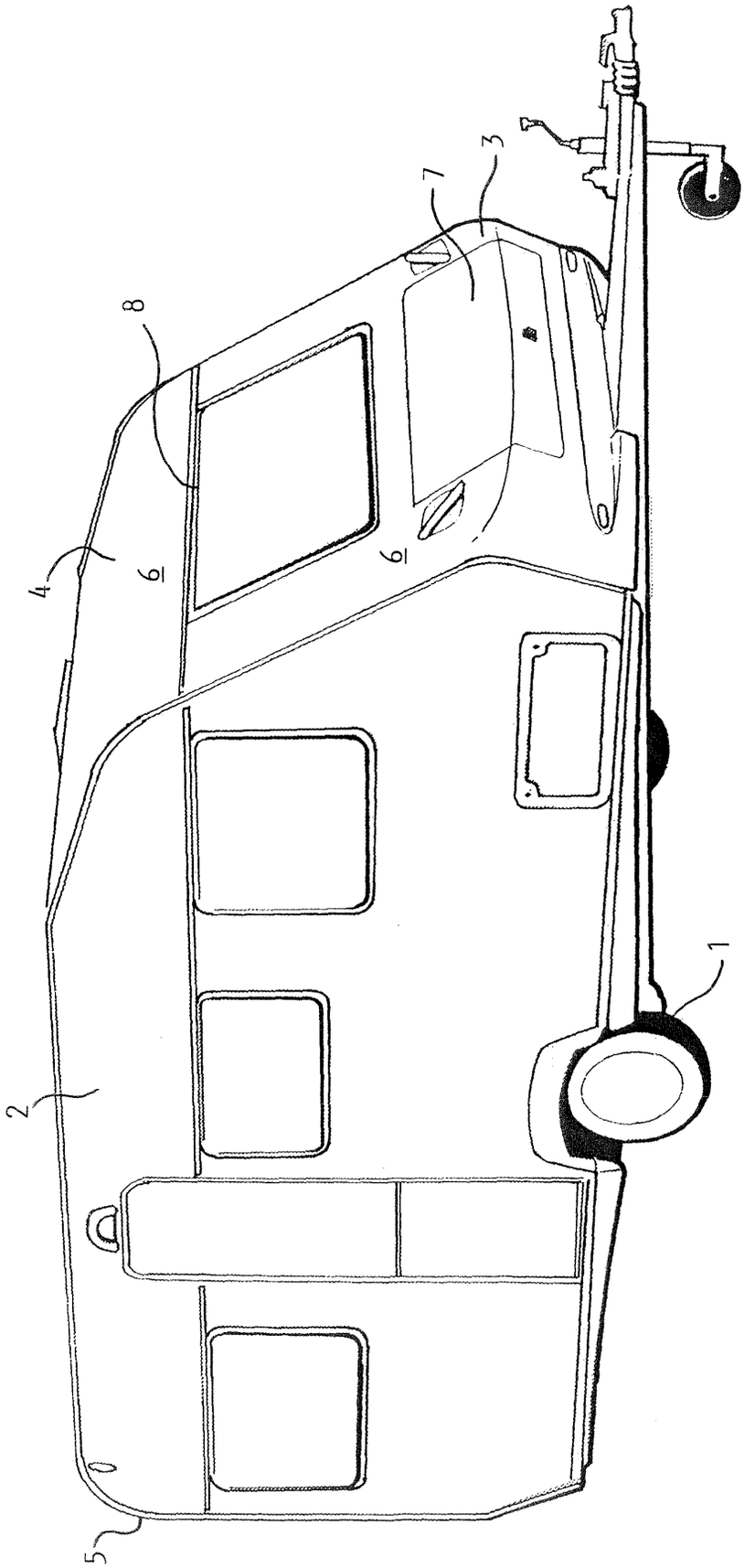

Fig. 1

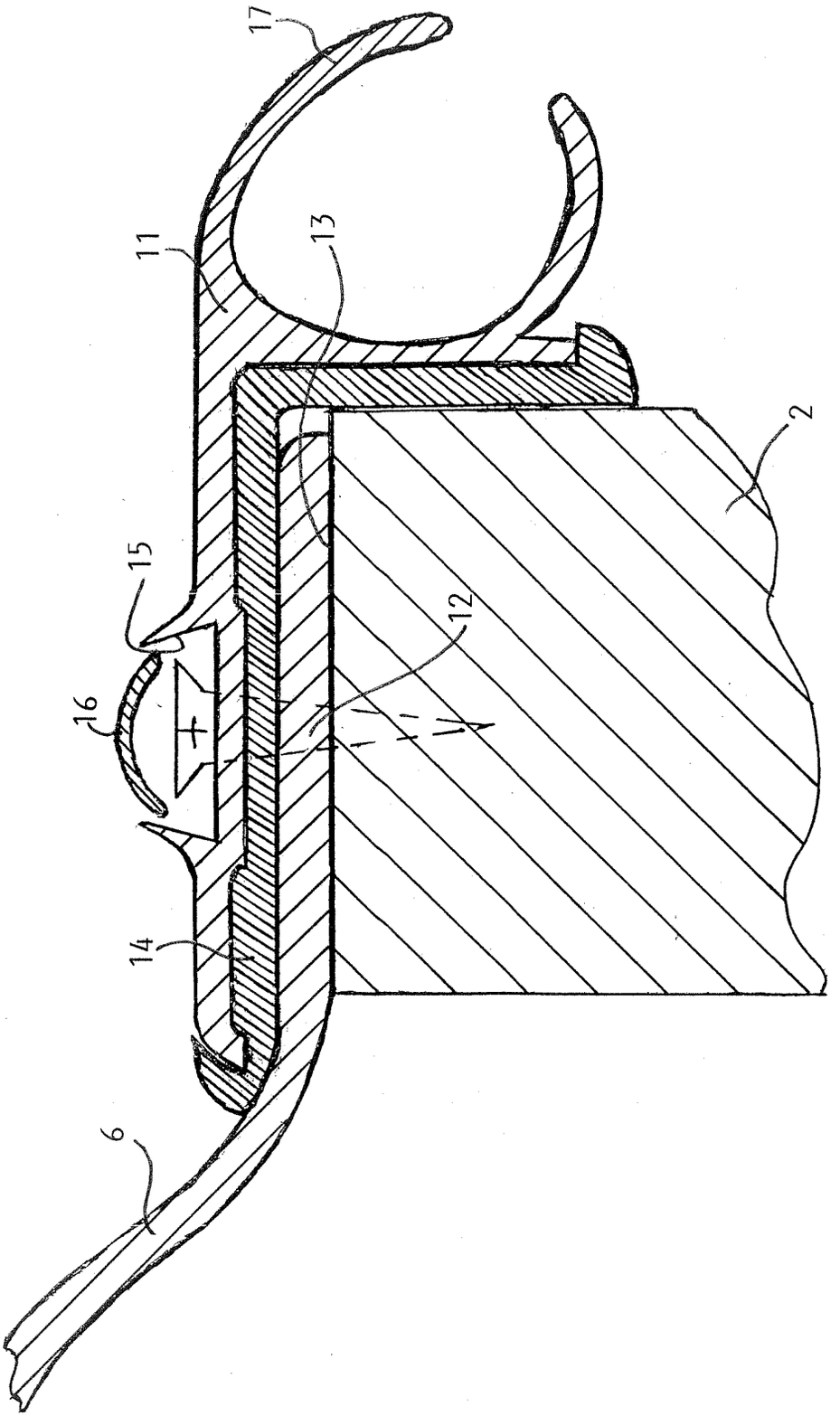

Fig. 2

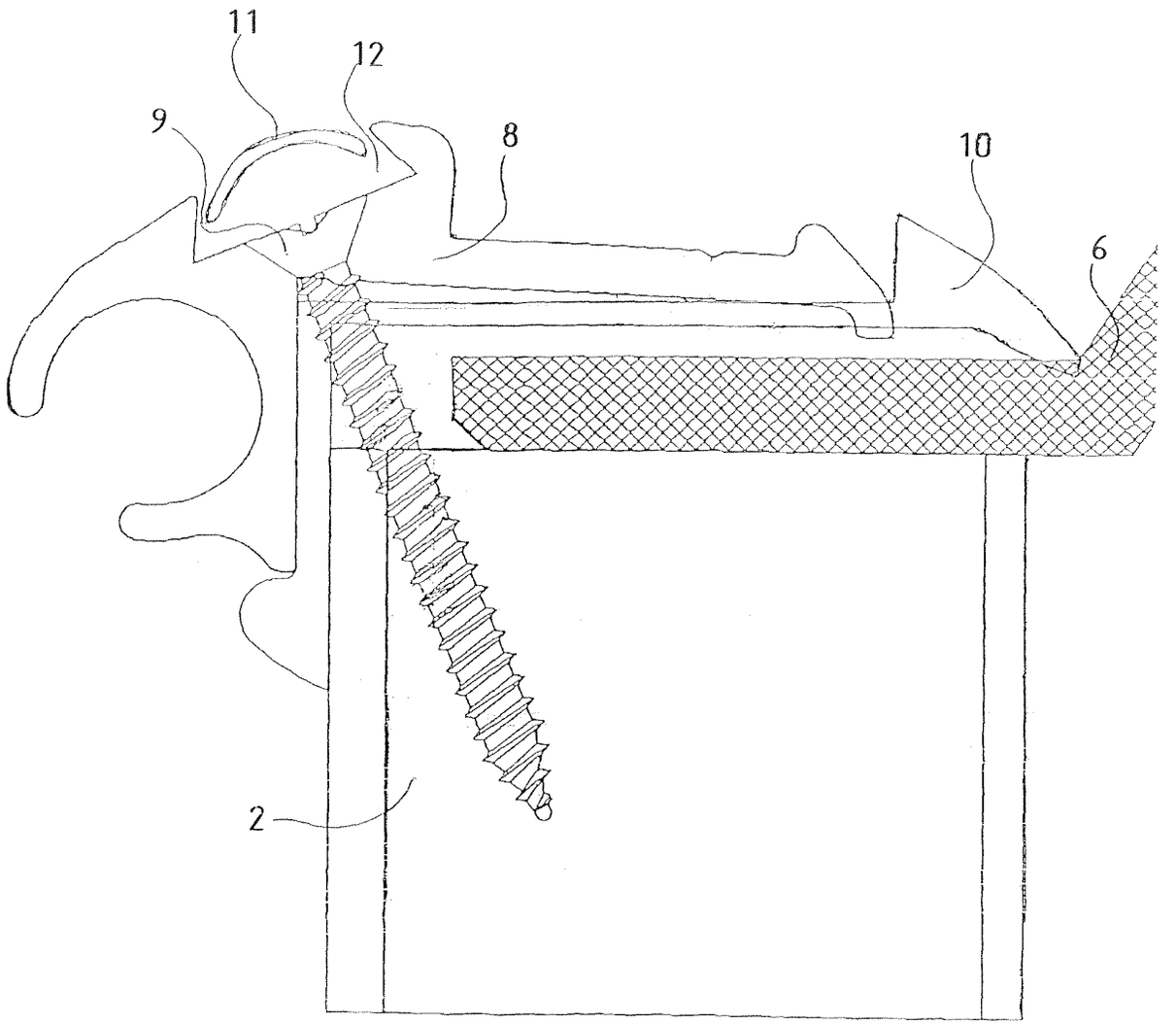

Fig. 3

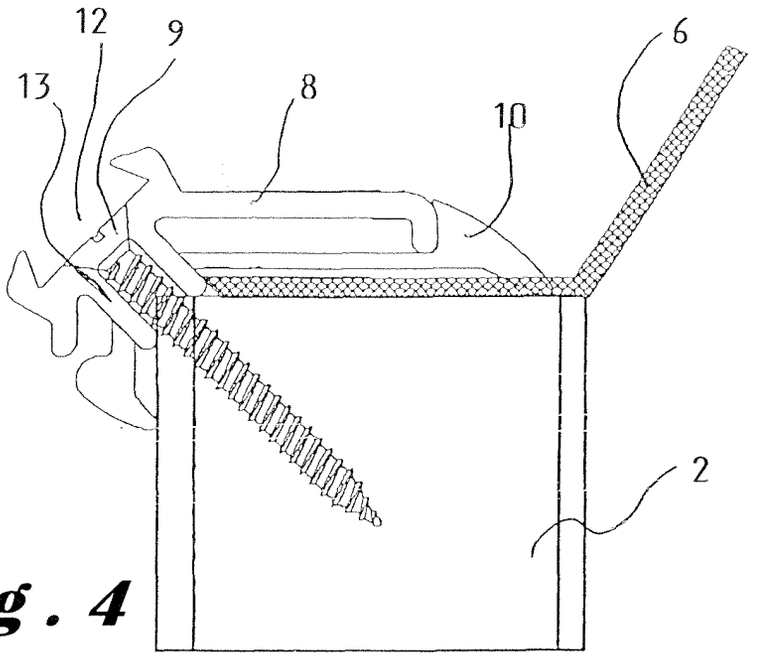

Fig. 4

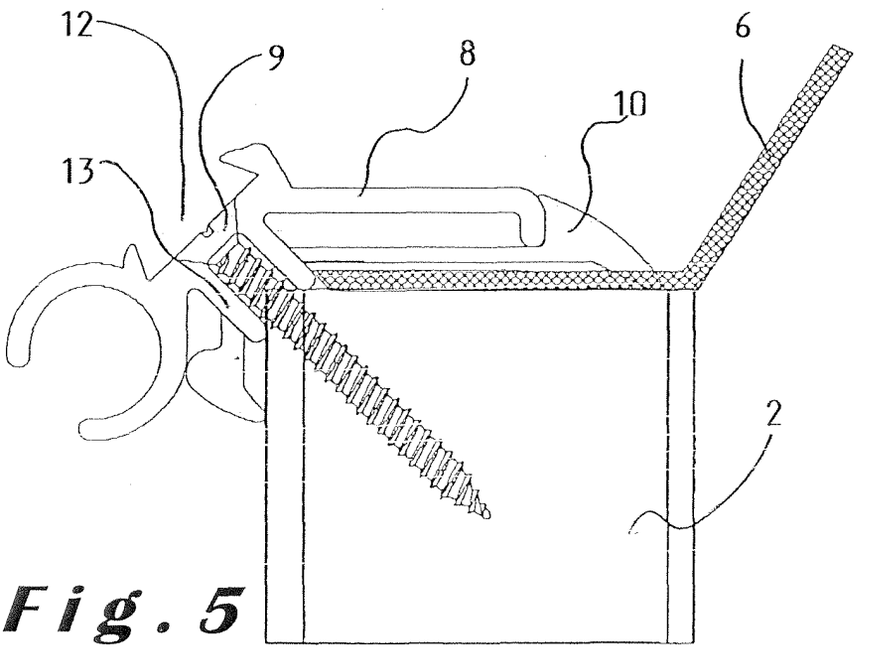

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 05 10 5268

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)
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E04H
B60P

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 September 2005	Kriekoukis, S

CATEGORY OF CITED DOCUMENTS

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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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14-09-2005

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82