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(54) **Clamp for mounting a frame in a wall**

(57) The invention relates to a substantially U-shaped clamp functioning as aid for fixing a frame in an opening arranged in a wall, comprising two side panels which extend substantially parallel to each other and which are mutually connected by a connecting panel extending substantially transversely of the side panels, wherein the side panels are adapted to extend in the installed position on either side of the wall part, and an engaging element which extends at an acute angle to

the connecting panel from the connecting panel to the side of the connecting panel remote from the side panels, and which is adapted to engage behind a part of the frame for fixing, wherein the engaging element extends in the direction transversely of the fold line between the side panels and the connecting panel. As a result of this measure the direction of the forces during loading coincides with the longitudinal direction of the engaging element, so that the engaging element can better withstand these forces.

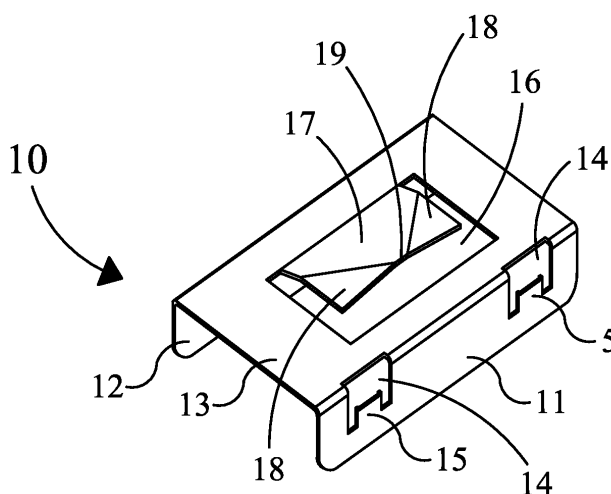


FIG. 2

Description

[0001] The invention relates to an aid for mounting a window or a door, and in particular for the placing and fixation of window and door elements in skeleton construction, container construction, house-building and public utility construction.

[0002] Frames for a window or a door are generally screwed or glued into a wall, optionally making use of a tape. Another placing option is described in EP-A-1 464 787. A window frame is here fixed by means of a stop bracket ('équerre de butée') placed on the inner side of a wall. The drawback of this method is that two people are required for a correct placing; one on the inside for placing and pressing the stop brackets, and one on the outside for placing the frame. In order to obviate this problem an aid is known for mounting a window or a door, comprising a U-profile consisting of two side surfaces and a connecting surface, characterized in that the connecting surface comprises a clamping hook. This achieves that structural elements such as frames for doors and windows can be placed by one person from only one side of the wall. An additional advantage is that the panels can be placed from the outer side of the wall. A further advantage is that the fitting time is reduced. At a later stage after placing of the structural element, finishing thereof can be carried out independently of placing of the window or door. The aid makes use of a hook and/or clamp, either in the aid or combined in the aid and the profile part. The aid allows a combination with 'traditional' methods such as screwing, clamping, glueing with a tape or wet glueing, and is distinguished from the already existing, above-mentioned principles (e.g. EP-A-1 464 787) in that there is no necessity for an auxiliary or sub-structure for positioning of the aid from the inward facing side of the wall.

[0003] Such a clamp functioning as aid is known from figures 1 and 2 of GB-A-830 274. This known clamp comprises:

- two side panels which extend substantially parallel to each other and which are mutually connected by a connecting panel extending substantially transversely of the side panels, wherein the side panels are adapted to extend in the installed position on either side of the wall part;
- an engaging element which extends at an acute angle to the connecting panel from the connecting panel to the side of the connecting panel remote from the side panels, and which is adapted to engage behind a part of the frame for fixing.

[0004] Such a clamp is known from figures 1 and 2 of GB-A-830 274.

[0005] The engaging element known from this document extends in the direction parallel to the fold line between the side panels and the connecting panel.

[0006] Considerable forces are exerted on this engag-

ing element during use of this clamp, so that there is the danger of the engaging element being bent or being damaged in other manner and not being able to perform its function properly, whereby the frame for placing is not properly fixed in the associated opening.

[0007] The object of the present invention is to provide such a clamp wherein these drawbacks are obviated.

[0008] This object is achieved with such a clamp wherein the engaging element extends in the direction transversely of the fold line between the side panels and the connecting panel. As a result of this measure the direction of the forces during loading coincides with the longitudinal direction of the engaging element, so that the engaging element can better withstand these forces.

[0009] It is noted here that the same document does show an engaging element which extends partially in the direction of the forces, but which is provided with a part extending from a side panel so that this engaging element also collapses quickly, and the resilience depends on the angle between the side panel and the connecting panel. At a greater wall thickness of the wall over which the aid is placed this angle becomes obtuse, thereby reducing the resilience of the engaging element.

[0010] The measure according to the present main claim obviates these problems.

[0011] According to a first preferred embodiment, the engaging element extends from a line lying at a distance from the fold line between the connecting panel and the side panel.

[0012] The transmission of force between the engaging element and the clamp according to the invention is hereby improved because the engaging element is directly connected to the connecting panel at a small angle.

[0013] The production of the clamp is simplified and the cost price thereof reduced when the clamp is manufactured by folding plate material, and the engaging element is formed by a toe.

[0014] The strength and stiffness of the engaging element is improved when the toe is provided with at least one folded part. In order to retain symmetry it is attractive when the toe is provided with two folded parts.

[0015] In order to improve the transmission of the forces to the wall parts adjoining the opening, it is attractive when the clamp is provided with at least one clamping finger for exerting a clamping force on a side surface of the wall part adjoining the opening; particularly when the aid is placed such that the clamping finger is situated on the inner side of the wall, this guarantees a good connection of the clamp according to the invention to the outer side of the wall over which the clamp is placed, thereby enhancing a watertight closure between frame and wall.

[0016] This transmission of force takes place in the most effective manner when the clamp is adapted to exert a clamping force on the wall part on which the clamp is placed. An attractive embodiment provides for this purpose the measure that at least one clamping finger extends from at least one of the side panels.

[0017] In order to prevent the clamp being pulled askew, it is attractive when at least one clamping finger extends from both side panels, although in order to facilitate placing it is recommended to place the fingers in only a single side panel.

[0018] In order to facilitate placing of the clamp on an edge of the wall part adjoining the opening, it is recommended that in at least one of the clamping panels two clamping fingers are arranged which extend substantially in the direction parallel to the fold line between the connecting panel and the side panels.

[0019] In contrast to the above embodiments wherein the clamping fingers extend from one of the side panels, it is also possible in principle for at least one clamping finger to extend from the connecting surface in the direction transversely of the connecting panel, this clamping finger being adapted to exert a clamping force on one of the side surfaces of the wall part.

[0020] It is however also attractive when, on both fold lines of the connecting surface, at least two clamping fingers extend from the connecting surface in the direction transversely of the connecting panel, which fingers are each adapted to exert a clamping force on one of the side surfaces of the wall part.

[0021] In order to increase the stiffness of the fingers it is attractive when the fingers extend in the plane transversely of the connecting panel and the side panels.

[0022] The invention also relates to a combination of at least one U-shaped clamp according to any of the foregoing claims and a frame, wherein the frame is provided with an edge adapted for engagement by the engaging element of one of the U-shaped clamps.

[0023] The invention will be elucidated hereinbelow with reference to the accompanying drawings, in which:

Figure 1 shows a partially broken-away view of a frame placed using clamps according to the invention;

Figure 2 is a perspective view of a first embodiment of a clamp according to the invention;

Figure 3 is a perspective view of a second embodiment of a clamp according to the invention; and

Figure 4 is a perspective view of a third embodiment of a clamp according to the invention.

[0024] Figure 1 shows a wall 1, for instance the wall of a caravan or a construction in the form of a skeleton or container structure, in which is arranged an opening 2 in which a window 3 is placed. Wall 1 is here preferably, though not necessarily, formed from sandwich material formed by a foam layer or other type of layer with an insulating action 4 connected on both sides to a hard sealing layer 5.

[0025] A frame 6 must be placed in order to place window 3. In order to simplify fitting thereof, such a frame is integrally preassembled and then placed. In order to ensure a watertight seal against the wall such a frame 6 is provided with a flange 7 which lies against wall 1 so that

frame 6 is placed from only the inside or outside and subsequently fixed. The watertight moisture barrier is usually provided here by a sealing profile connected to the flange. A flange assembled from profiles 8 can then be placed on the other side.

[0026] For fixing of frame 6 use is made of the clamps 10 according to the invention. Depending on the dimensions of frame 6, a number of clamps 10 according to the invention are placed on the edges of opening 2 arranged in wall 1. When frame 6 is then placed, an edge or protrusion 9 present in frame 6 is engaged by the engaging element of clamps 10 placed on the edge so that frame 6 is fixed. The relevant edge 9 of the frame can otherwise also be formed by a sawtooth profile arranged in frame 6, so that the possible variations in the thickness of wall 1 can be compensated.

[0027] Figure 2 shows a perspective view of a first embodiment of such a clamp 10. Clamp 10 comprises two side panels 11, 12 connected by a connecting panel 13. With a correct choice of dimensions the side panels 11, 12 clamp the clamp 10 onto wall 1. In order to improve this clamping function two recesses 14, in which clamping fingers 15 are formed, are arranged in a side panel 11. These clamping fingers 15 extend inward at an angle. Owing to their positioning they make placing of the clamps on the edge of the wall easier. An opening 16 is also recessed into connecting panel 11, in which opening is formed an engaging element in the form of an engaging finger 17 which extends from the side of side panel 12. This engaging finger 17 is provided with two folded panels 18 which serve to increase the stiffness of engaging finger 17. In order to enhance the engaging function the engaging finger 17 is provided with a protrusion 19.

[0028] In figure 3 a second embodiment of clamp 10 according to the invention is placed. This embodiment is distinguished by the different placing of clamping fingers 15, which in this embodiment extend parallel to the fold line between panels 11 and 13 and panels 12 and 13 respectively. These fingers also extend inward. In this embodiment the fingers 15 are also arranged in both side panels 11 and 12.

[0029] Finally, figure 4 shows an embodiment of clamp 10 wherein clamping fingers 20 are recessed, not out of side panels 11, 12 as in the above embodiments, but out of connecting panel 13. The present embodiment also differs in the fact that clamping fingers 20 extend transversely of the direction of side panels 11, 12 so that clamping fingers 20 only come with a narrow side into contact with wall part 1. Clamping fingers 20 hereby become much stiffer in the loaded direction, which can be useful in some situations. Owing to the stiffer clamping fingers 20 the sealing layers 5 can particularly be brought to a fixed size determined by the aid. This enhances a watertight fitting between flange 7 and sealing layer 5 on the outside of layer 4.

[0030] All the above elucidated embodiments are preferably manufactured from plate material, preferably of metal such as spring steel. The clamp being manufac-

tured from plastic is however by no means precluded. The measures present in the various embodiments shown above can also be combined with each other.

Claims

1. Substantially U-shaped clamp functioning as aid for fixing a frame in an opening arranged in a wall, comprising:

- two side panels which extend substantially parallel to each other and which are mutually connected by a connecting panel extending substantially transversely of the side panels, wherein the side panels are adapted to extend in the installed position on either side of the wall part;
- an engaging element which extends at an acute angle to the connecting panel from the connecting panel to the side of the connecting panel remote from the side panels, and which is adapted to engage behind a part of the frame for fixing,

characterized in that the engaging element extends in the direction transversely of the fold line between the side panels and the connecting panel.

2. U-shaped clamp as claimed in claim 1, **characterized in that** the engaging element extends from a line lying at a distance from the fold line between the connecting panel and the side panel.

3. U-shaped clamp as claimed in claim 1 or 2, **characterized in that** the clamp is manufactured by folding plate material, and that the engaging element is formed by a toe.

4. U-shaped clamp as claimed in claim 3, **characterized in that** the toe is provided with at least one folded part.

5. U-shaped clamp as claimed in any of the foregoing claims, **characterized by** at least one clamping finger for exerting a clamping force on a side surface of the wall part adjoining the opening.

6. U-shaped clamp as claimed in claim 5, **characterized in that** at least one clamping finger extends from at least one of the side panels.

7. U-shaped clamp as claimed in claim 6, **characterized in that** at least one clamping finger extends from both side panels.

8. U-shaped clamp as claimed in claim 5, 6 or 7, **characterized in that** in at least one of the clamping panels two clamping fingers are arranged which extend

substantially in the direction parallel to the fold line between the connecting panel and the side panels.

9. U-shaped clamp as claimed in claim 5, **characterized in that** at least one clamping finger extends from the connecting surface in the direction transversely of the connecting panel, this clamping finger being adapted to exert a clamping force on one of the side surfaces of the wall part.

10. U-shaped clamp as claimed in claim 5, **characterized in that** on both fold lines of the connecting surface at least two clamping fingers extend from the connecting surface in the direction transversely of the connecting panel, which fingers are each adapted to exert a clamping force on one of the side surfaces of the wall part.

11. U-shaped clamp as claimed in claims 9 and 10, **characterized in that** the fingers extend in the plane transversely of the connecting panel and the side panels.

12. Combination of at least one U-shaped clamp as claimed in any of the foregoing claims and a frame, **characterized in that** the frame is provided with an edge adapted for engagement by the engaging element of one of the U-shaped clamps.

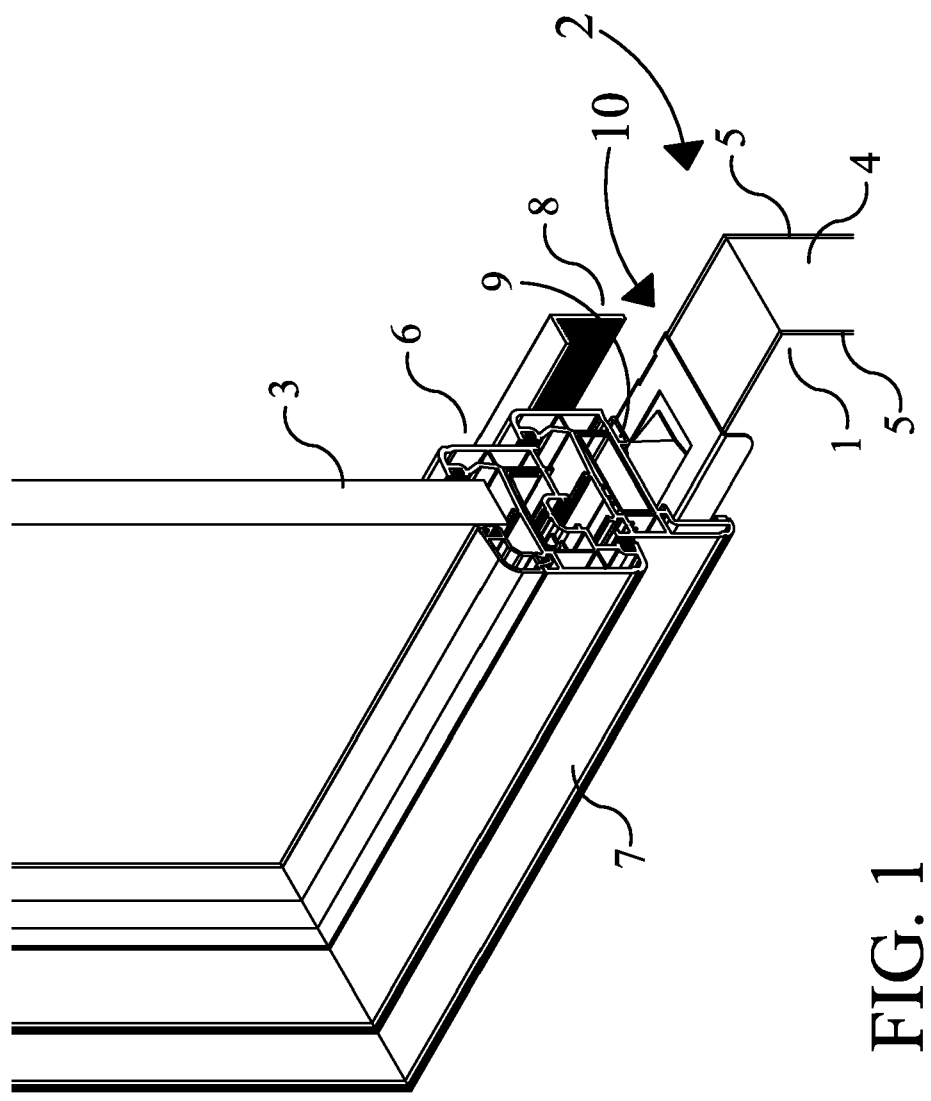


FIG. 1

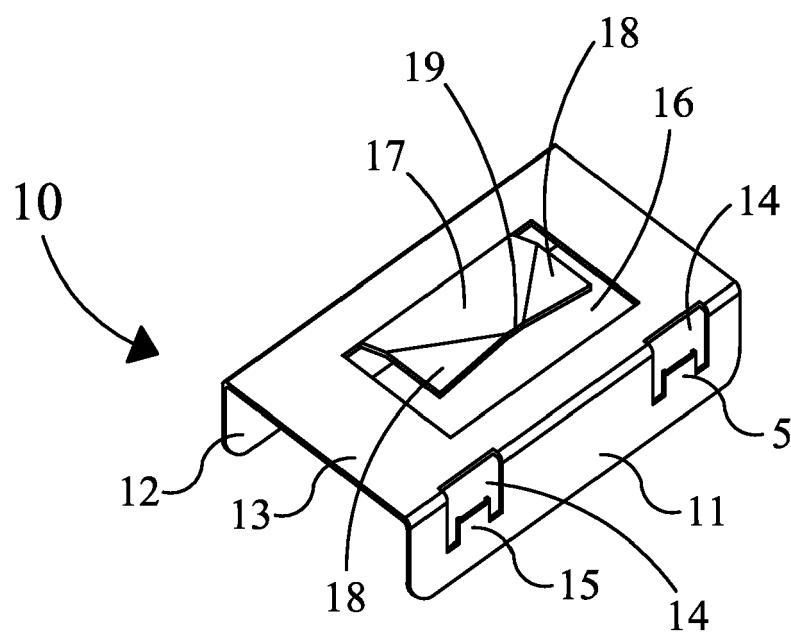


FIG. 2

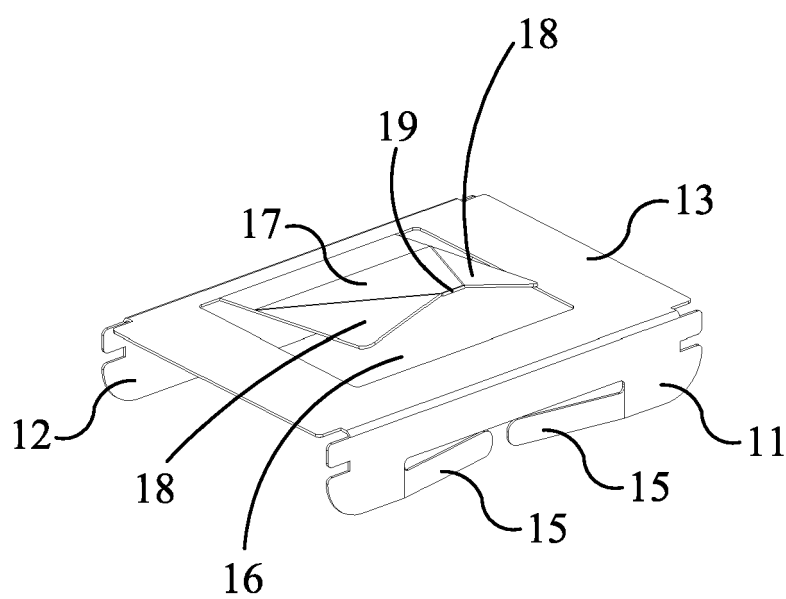


FIG. 3

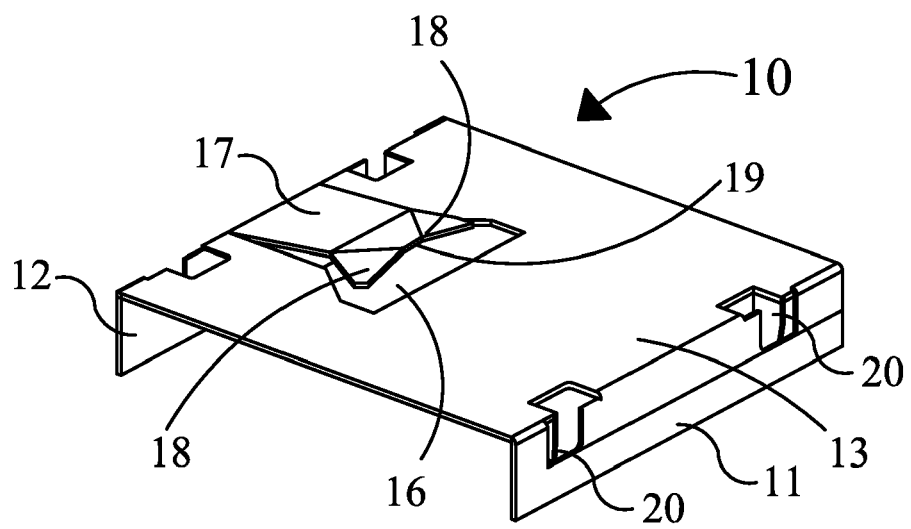


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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