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(54) A corner protection device.

(57) A panel unit corner projection device (2) for use in protecting a corner of a panel unit in transit, the device being made of a resilient plastics material and comprising two limbs (3, 4) which form a generally L-shaped device, each limb (3, 4) of the L-shape having at least one primary locking clip (8, 9) formed integrally therewith adapted for releasable connection to complementary features provided on a panel unit, each clip (8, 9) having associated therewith a secondary locking wedge (10, 11) which, in use, is adapted to lock the primary locking clip (3, 4) into position on the panel unit (2).

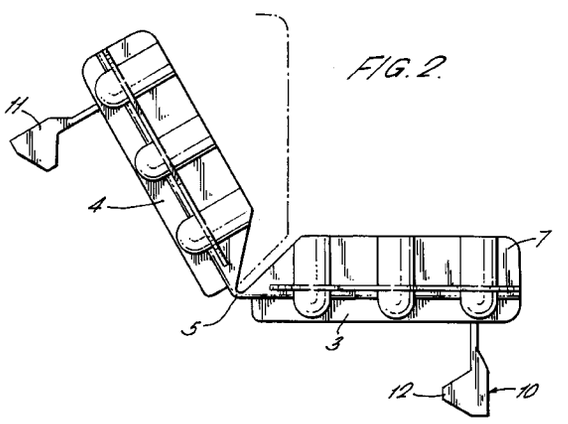

FIG. 2.

EP 0 573 181 A2

The present invention relates to a device for use in protecting a corner of a panel unit in transit, for example, a corner of a double-glazed window unit which may be of plastics.

It is normal practice to protect the corners of panel units, such as window frames, from accidental damage whilst the units are handled during the course of manufacture, delivery and handling on the installation site. A known way of protecting a window unit in transit is to wrap corrugated cardboard around the edges and corners of the window unit and to fix the cardboard in place with adhesive tape.

This is generally unsatisfactory since the cardboard is easily torn, especially when wet, it not strong enough to fully protect the corners and the tape may peel off. One problem in particular is when the unit is being unloaded from a van, the unit being slid along to the end of the van and then lowered to the ground. The cardboard is sometimes ripped off when the unit is being slid along, thereby exposing the corners. Also, the unit may not be carefully lowered to the ground, it being dropped over the last couple of centimeteres, jarring the window unit and possible damaging it.

The corrugated cardboard is not simple to apply since it comes as a sheet not adapted to the shape of the corners of the window unit and has to be folded and then held in position whilst the tape is applied.

GB-A-2221942 describes a window-unit corner protection device for use in protecting a corner of a window unit in transit, the device being generally L-shaped and made of a resilient plastics material, each limb of the L-shape having at least one clip formed integrally therewith adapted for releasable connection to complementary features provided on a window unit.

This device does not, however, lock to the window unit with sufficient strength to guarantee security during handling of the window unit. The grip between the protection device and the window unit is limited by the low friction between these parts. Attempts to strengthen the moulded clips generally result in damage to the clips during insetion into the complementary features on the window unit, or damage when being removed, which means that the protection device may not be reused.

We have now developed a locking corner protection device which overcomes the above problems.

Accordingly, the present invention provides a panel unit corner projection device for use in protecting a corner of a panel unit in transit, the device being made of a resilient plastics material and comprising two limbs which form a generally L-shaped device, each limb of the L-shape havng at least one primary locking clip formed integrally therewith adapted for releasable connection to complementary features provided on a panel unit, each clip having associates therewith a secondary locking wedge which, in use, is adapted to lock the primary locking clip into position on the panel unit.

Such a device can be easy to fit, as it does not require a separate means such as adhesive tape to secure it. With a suitable choice of the plastics material, the device is strong and not easily damaged, in particular it will not deteriorate when wet. A polypropylene co-polymer has been found to be a suitable plastics material which is not so rigid that the device tends to shatter and not so soft that it tends to flick off.

The protection device of the present invention is particularly designed for use with window unit corners, for example double glazed window units, but it will be understood that the device could be used to provide protection to other panel units, such as pictures and the like.

Preferably, two clips are provided on the inner face of each limb. Each clip preferably comprises a plastic spring.

With such a construction the device can be simply offered up to the panel-unit and connected thereto.

The device of the invention may comprise two limbs which are joined together by means of a hinge formed integrally therewith, the two limbs being pivotable about the hinge to form the generally L-shaped device.

Each clip may comprise an upstanding portion which is connected at either end thereof to the respective limb of the device, an elongate slot thus being formed between the clip and the portion of the limb to which it is attached. This construction is suitable for panel units having grooves or recesses in their faces for the projections to engage in. When the clips are engaged in such grooves, the associated secondary locating wedge is then pressed into the groove in order to lock the primary locking clip in position.

Preferably, the projections on the clips have pawls formed therein. This allows the projections to be located in undercut grooves formed in the panel unit and pushed into locking engagement with the groove by means of the secondary locking wedge or wedges.

The secondary locking wedges are associated one with each of the primary locking clips in order to lock the clips into position on the panel unit. The secondary locking wedges are preferably formed integrally with the protection device. In a particularly preferred embodiment of the present invention the secondary locking wedges are hinged to the outer face of each limb, one locking wedge being associated with each clip. In use of the device, the locking wedges are pivoted around the hinges thereof and are pushed into the elongate slots formed between the primary locking clips and the portions of the limbs to which the primary locking clips are attached.

The secondary locking wedges are preferably of

triangular shape which assists in the location of the wedges to lock the primary locking clips into position. In a preferred aspect of the present invention, when two primary locking clips are provided on each limb of the device, the two corresponding secondary locking wedges are formed as a hinged pair, which facilitates the fitting of the device to the corner unit.

Each limb may be elastically flexed so that it is bowed in cross-section. The resilience of the limbs facilitates the fitting of the device to a corner unit, allowing, for example, clips to be made stronger since it is the limb which flexes and not the clip.

Preferably, each limb has two longitudinally extending and transversely spaced arms.

Preferably each limb has at least one projection on its outer face. This feature facilitates movement of the window unit and provides a measure of protection of the window unit when being stored since the projections, at least one on each device at the corners, raises the window unit clear of the ground surface.

There may be at least two projections on each limb longitudinally spaced from each other and, preferably, the projections extend transversely and are rounded in cross-section.

These features facilitate for example the unloading of a window unit from a van since the window unit with projection devices on each corner can be simply slid along with no damage occurring to the window unit.

Preferably, each limb has longitudinally extending side walls transversely spaced from the integral connection means, the walls being cut away adjacent the integrally formed hinge.

The side walls allow the window units to be stacked flat without actually contacting each other.

The present invention will be described by way of example and with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of part of a double glazing unit window frame ready to be fitted to a protection device of the present invention;

Figure 2 is a side elevation of a protection device of the invention;

Figure 3 is a plan view of one limb of the device of the invention;

Figure 4 is an end view of one limb of the device of the present invention with the frame above it;

Figure 5 is a sectional view along line B-B of Figure 3 with the frame above it;

Figure 6 is a sectional view along line A-A of Figure 3 with the protection device inserted into the frame;

Figure 7 is a sectional view along line B-B of Figure 3 with the device inserted into the frame;

Figure 8 is a sectional view along line A-A of Figure 3 with the protection device inserted into the frame and the frame locked into position; and

Figure 9 is a sectional view along line B-B with the protection device inserted into the frame and locked into position.

The protection device of the present invention is illustrated in the accompanying drawings as a window unit corner protection device. This device is made in one piece from a resilient plastics material, such as a polypropylene copolymer.

Referring to the drawings, a corner of a window unit is generally shown at 1 and the corner protection device generally shown at 2. The corner protection device comprises two limbs 3 and 4 which are hinged together at 5. Each limb comprises longitudinally extending side walls, limb 3 having longitudinally extending side walls 6 and 7. The walls 6 and 7 adjacent the hinge 5 are angled so that when limbs 3 and 4 are pivoted about hinge 5 a device of generally L-shaped construction is formed.

The limb 3 has upstanding projections 8 and 9 formed intergrally therewith, these projections having pawls 14 and 15 formed thereon as is best shown in Figure 4. The projections 8 and 9 are connected at either end to the limb 3 of the device and thus form springs.

Each limb of the device has a hinged pair 10 and 11 of secondary locking wedges hinged to the outer surface of each limb. As shown in Figure 4, the hinged locking wedges 10 are hinged at points 20 and 21 to the limb 3. The hinged unit 10 comprises secondary locking wedges 12 and 13 which are generally of triangular shape. The window frame 1 has grooves 18 and 19 formed in the underneath thereof, these grooves being adapted to receive not only the primary locking clips 8 and 9, but also the secondary locking wedges 12 and 13.

Accordingly, in use of the device the primary locking wedges 8 and 9 are pushed into the grooves 18 and 19 formed in the window frame unit 1. The primary clips 8 and 9 are pushed into position in the grooves merely by applying a reasonable amount of finger pressure. The primary locking clips 8 and 9 in position in grooves 18 and 19 can best be seen in Figure 6. When the primary locking clips 8 and 9 are in position, the hinged unit 10 is then pivoted about hinges 20 and 21 so that the secondary locking wedges 12 and 13 pass through the elongate slots 16 and 17, respectively, adjacent the primary locking clips 8 and 9 and are then pushed into the grooves 18 and 19 to lock the primary locking clips 18 and 19 in position. It will be noted that the grooves 18 and 19 as shown in the drawings are undercut and thus the pawls 14 and 15 formed on the primary locking clips 8 and 9 are pushed into the grooves, thus helping to lock them into position.

When the window unit has reached its destination the reverse procedure can be adapted in order to remove the corner protetion unit 2 from the window frame 1.

On its outer face, each limb 3 and 4 has two trans-

versely extending projections 22 which are longitudinally spaced from each other. Each projection 22 is rounded in cross-section. These projections, together with the walls 6 and 7, provide support for the device when it is stored upon the ground. Furthermore, the rounded projections 22 assist in enabling a protected window frame to be slid along the ground surface quite smoothly. Construction of the device is such that the corner protection unit is locked in position, so that if the free end of one limb 3 or 4 were to catch on something, the device would not readily peel off from the window frame.

Whilst the corner protection device has been described with reference to a frame with undercut grooves 18 and 19, the device in the present invention is adaptable for use with grooves which are not undercut. In these circumstances, a friction fit is achieved which locks the clips into position on the window frame. In this variation, the pawls 14 and 15 which located the undercut grooves are removed and the wedging action between the primary and secondary locking members is relied upon to achieve the necessary locking action by interference fit.

Claims

1. A panel unit corner projection device (2) for use in protecting a corner of a panel unit in transit, the device being made of a resilient plastics material and comprising two limbs (3, 4) which form a generally L-shaped device, each limb (3, 4) of the L-shape having at least one primary locking clip (8, 9) formed integrally therewith adapted for releasable connection to complementary features provided on a panel unit, each clip (8, 9) having associated therewith a secondary locking wedge (10, 11) which, in use, is adapted to lock the primary locking clip (3, 4) into position on the panel unit (2).

2. A device as claimed in claim 1, wherein two clips (5, 9) are provided on the inner face of each limb.

3. A device as claimed in claim 2, wherein each clip comprises a plastic spring.

4. A device as claimed in claim 2 or claim 3, wherein each clip (8, 9) comprises an upstanding portion which is connected at either end thereof to the respective limb (3, 4) of the device (2).

5. A device as claimed in any one of the preceding claims wherein each clip (8, 9) has a pawl (14, 15) formed thereon.

6. A device as claimed in any one of the preceding claims wherein the two limbs (3, 4) are joined together by means of a hinge (5) formed integrally therewith, the two limbs (3, 4) being pivotable about the hinge (5) to form the generally L-shaped device.

7. A device as claimed in claim 6 wherein each limb (3, 4) has two longitudinally extending side walls (6, 7) the walls (6, 7) being cut away adjacent the integrally formed hinge (5).

8. A device as claimed in any one of the preceding claims, wherein each limb (3, 4) has at least one projection (22) on its outer face.

9. A device as claimed in claim 8, wherein there are at least two projections (22) on each limb (3, 4) longitudinally spaced from each other.

10. A device as claimed in any one of the preceding claims wherein the secondary locking wedges (10, 11) are formed integrally with the protection device (2).

11. A device as claimed in claim 10, wherein the secondary locking wedges (10, 11) are hinged to the outer face of each limb (3, 4).

12. A device as claimed in claim 10 or claim 11 wherein, when two primary locking clips (8, 9) are provided on each limb (3, 4) of the device (2), the two corresponding secondary locking wedges (10, 11) are formed as a hinged pair.

FIG. 1.

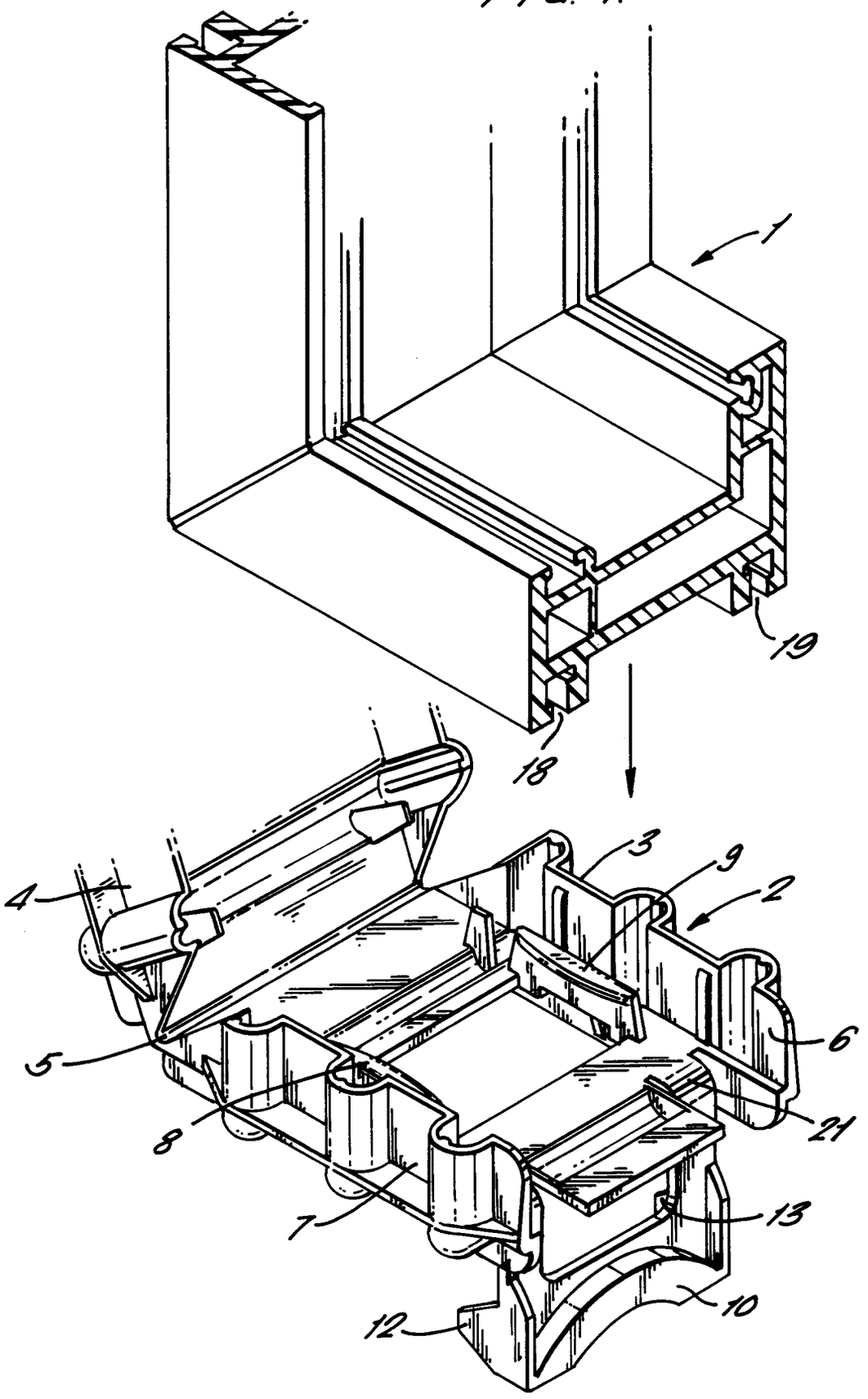

FIG. 2.

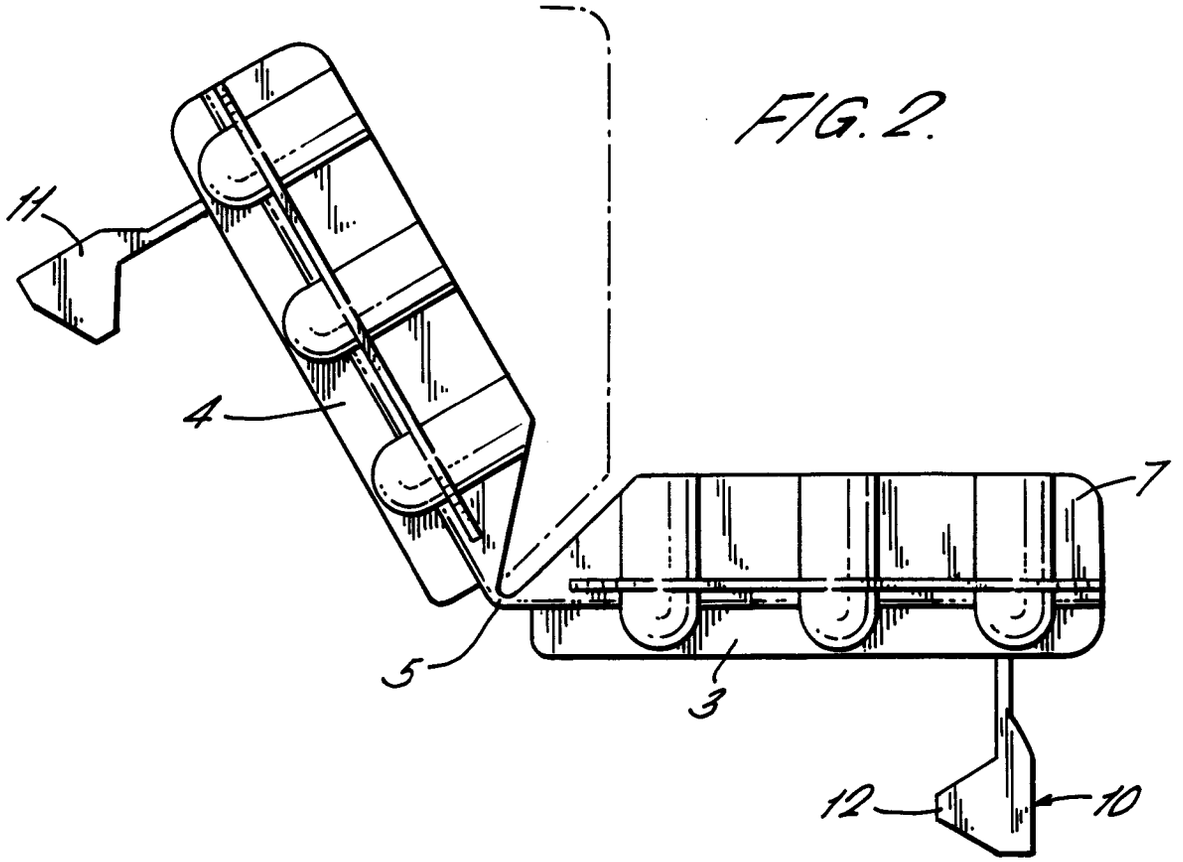

FIG. 3.

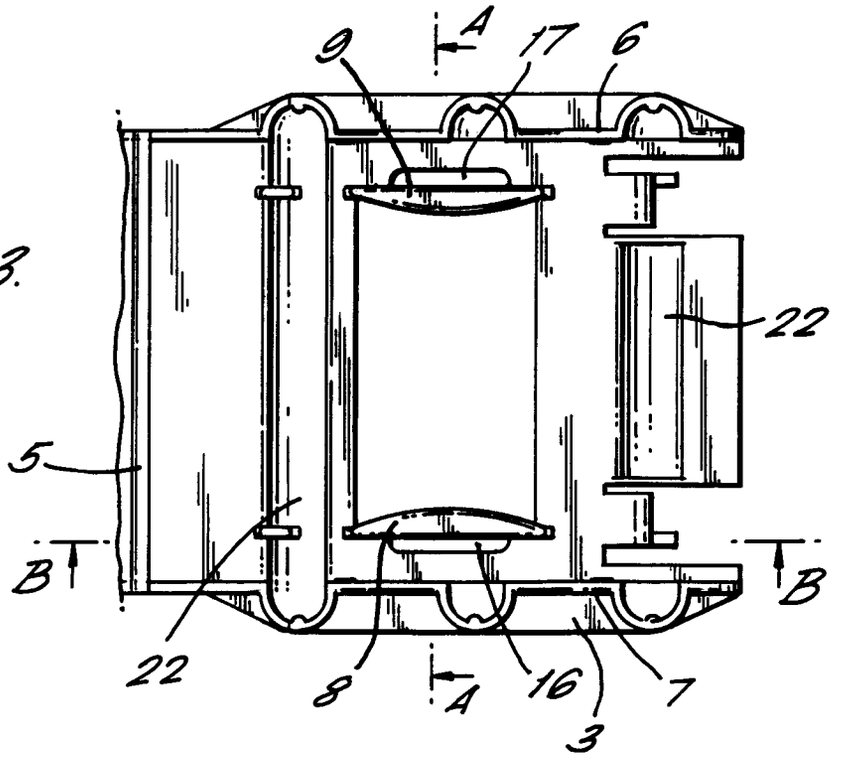

FIG. 4.

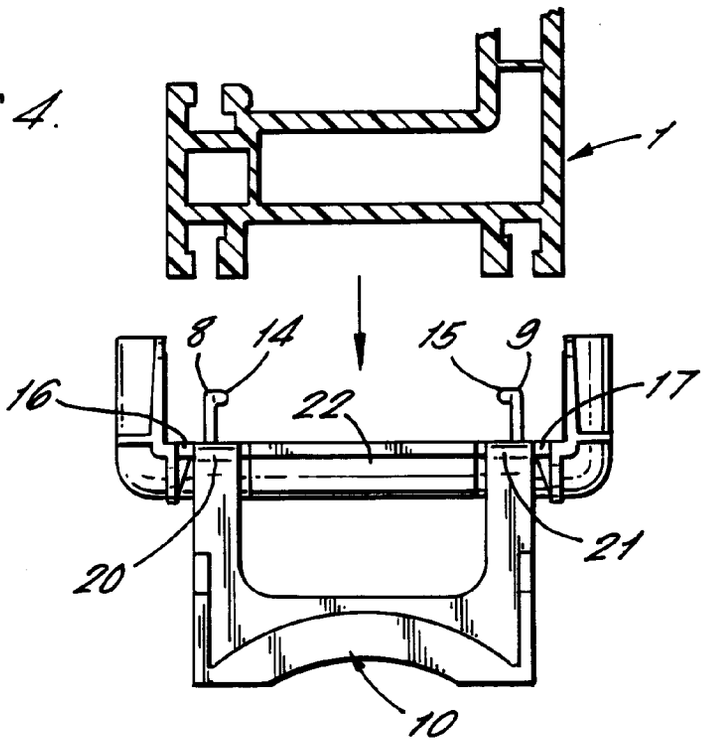

FIG. 6.

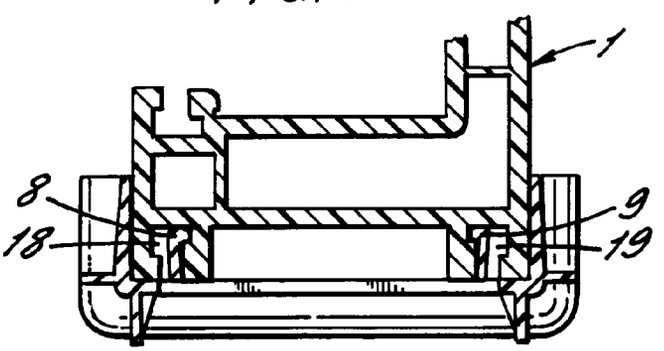

FIG. 8.

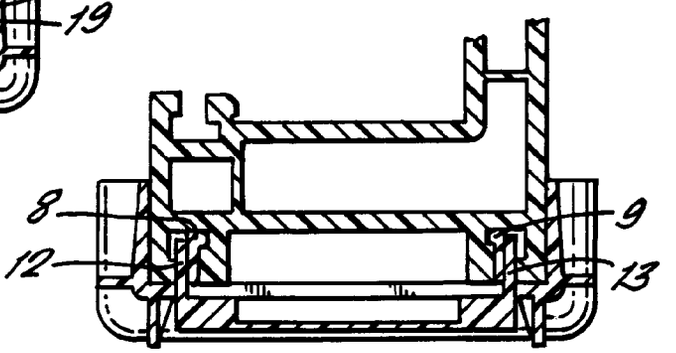

FIG. 5.

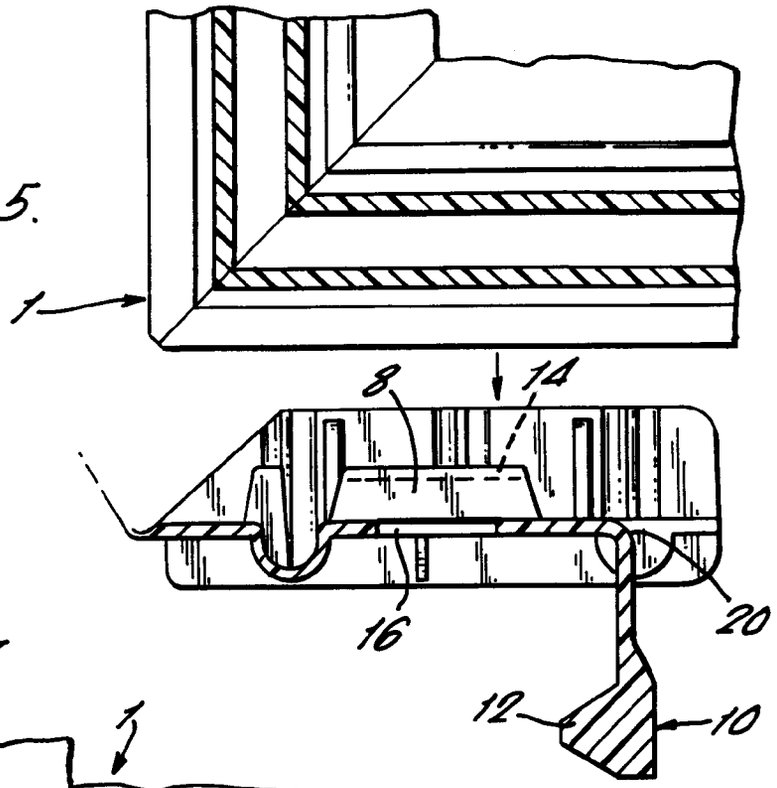

FIG. 7.

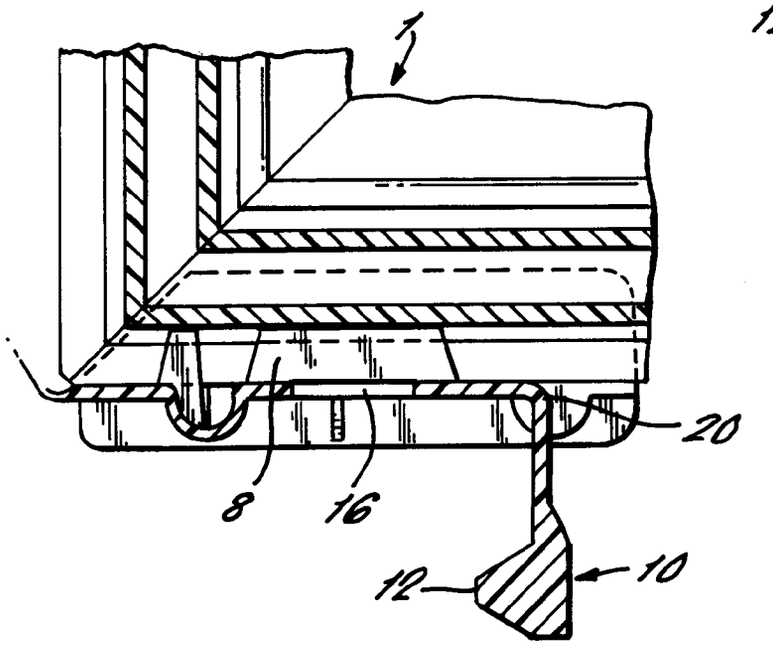

FIG. 9.