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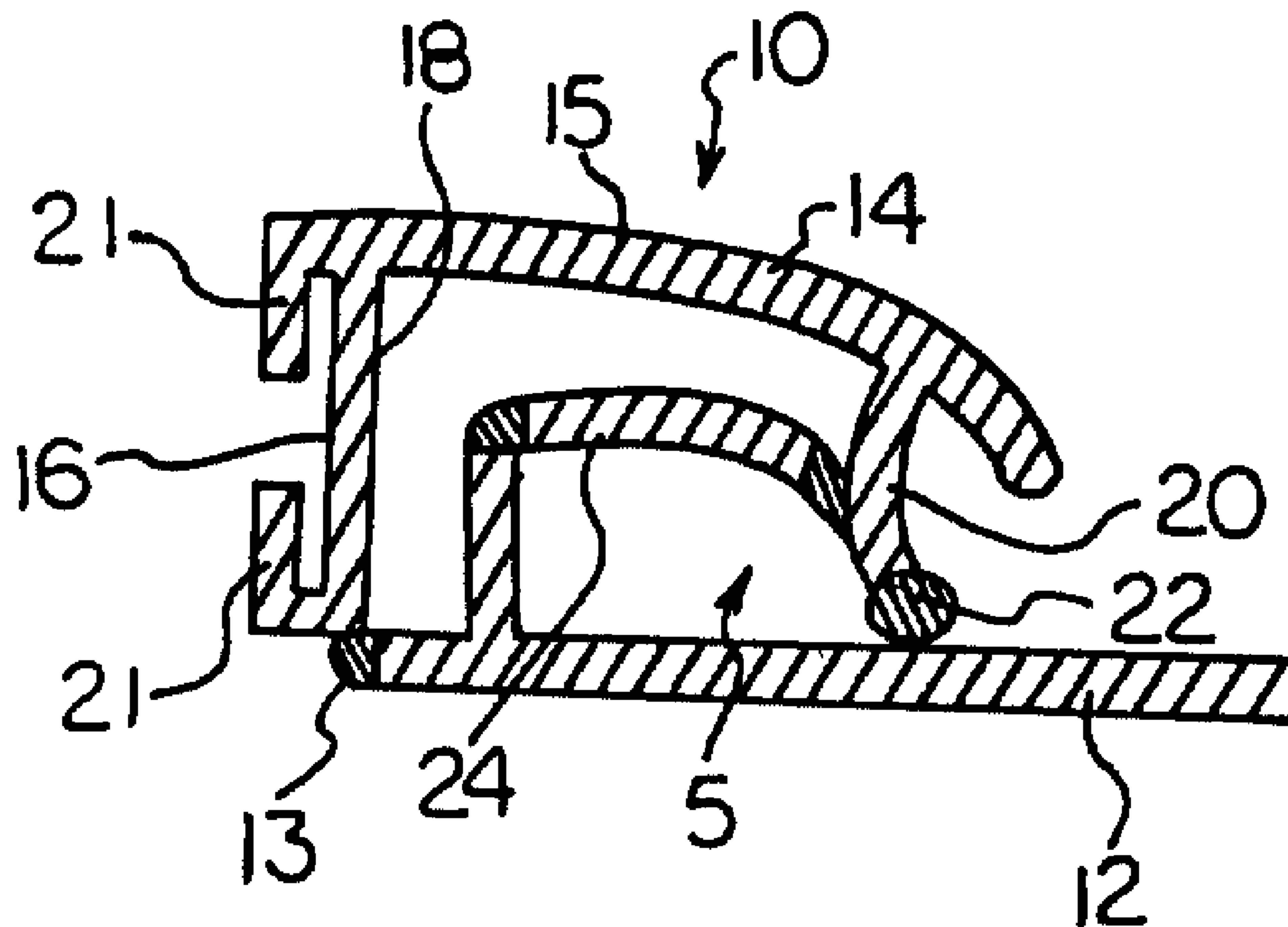
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(54) Titre : CADRE AVEC COUVERCLE PIVOTANT ET MONTANT DE SUPPORT A AFFICHE

(54) Title: SWING-OPEN PICTURE FRAME AND BANNER-HANGER MEMBER



(57) **Abrégé/Abstract:**

A poster or banner hanger, which may also comprise a member of a picture frame, consists of an elongate flat base which supports a picture, and a flip-open cover rotatably mounted to the base. A wall extends the length of the base, and positions a picture within the member. The cover and base are urged together by biasing means, consisting of a generally striplike member joining the wall and cover. Compressive forces between the biasing means and the wall are absorbed by a resilient hinge, which assists in converting compressive forces, into a force urging the cover and base together. This is achieved at least in part by the biasing means and cover meeting at an acute angle, which forces the cover downwardly in response to a compressive force exerted by the biasing means.

ABSTRACT

A poster or banner hanger, which may also comprise a member of a picture frame, consists of an elongate flat base which supports a picture, and a flip-open cover rotatably mounted to the base. A wall extends the length of the base, and positions a picture within the member. The cover and base are urged together by biasing means, consisting of a generally striplike member joining the wall and cover. Compressive forces between the biasing means and the wall are absorbed by a resilient hinge, which assists in converting compressive forces, into a force urging the cover and base together. This is achieved at least in part by the biasing means and cover meeting at an acute angle, which forces the cover downwardly in response to a compressive force exerted by the biasing means.

SWING-OPEN PICTURE FRAME AND BANNER-HANGER MEMBER

Field of the Invention

10 This invention relates to the field of picture and poster displays. In particular, the invention relates to picture frames in which the decorative peripheral flange opens to the front to permit replacement of the picture from the front of the frame. The invention also relates to banner or poster hangers, which use a single member of a frame element to hold only the upper edge of a poster. The invention also relates to picture frames and frame elements which may be easily fabricated from extruded materials such as plastics.

Background of the Invention

20 For many applications such as commercial displays, it is desirable to provide a picture frame which permits the user to easily replace the picture or poster. This may be accomplished by providing a frame in which a front panel or flange may be flipped or snapped open to permit replacement of the picture, and then flipped shut to firmly grip the picture within the frame. In a similar application, a banner hanger comprises a single elongate member having a similar flip-open panel, which grips only the upper edge of a poster. Typically, a banner hanger comprises a pair of opposed gripping members having a slot or channel therebetween within which the poster is retained when the opposed members are shut. A similar elongate gripping strip may be provided to grip the lower edge of a poster, for a gravity-assisted hanging poster display. This arrangement differs from a conventional frame only in that the frame elements do not extend fully around the periphery of the picture, but only on one or possibly two edges.

30 Picture frame elements and banner hangers of this general type of snap-open operation have been proposed, and several of these have achieved commercial success in the market. In particular, regard may be had to the present applicant's previous U.S. patent no. 5,396,722. This disclosures a picture frame, composed of discrete extruded frame elements joined by mitred corners. The elements each

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comprise a generally channel-shaped member, one leg of which forms a flat base for supporting the underside of a poster, and the opposed leg of which forms a front panel covering a peripheral portion of the front of the poster. The two legs serve as opposed gripping members. The front panel is articulated, and is formed from a first, peripheral portion and an inner portion hinged to the peripheral portion by a living hinge extending the length of the panel. The inner portion is biased against the base, and is provided with a pair of downwardly-depending legs to grip a picture or poster against the base.

In a similar fashion, U.S. patent no. 4,512,095 (Seely) discloses a poster frame member, comprised of an elongate flat base and an opposed gripping member hinged to the base, to form an openable channel. The front gripping member is biased towards the base for gripping a poster. The front gripping member is essentially box-like in section, having an outer exposed panel which is relatively rigid, and an inner panel which is relatively flexible and which when flexed serves to bias the flange against the base. Dual spaced apart "living hinges" fasten the front gripping member to the base. The dual, parallel hinges act to flex the inner panel as the front piece is swung open or shut, thereby biasing the gripping member towards the base. In order to achieve a gripping action, it is required that the inner panel be substantially more flexible than the other frame elements. Indeed, Seely states that the inner panel is formed from a different material from the other frame elements. This complexity may increase manufacturing costs and potentially shorten the life of the resulting product. As well, the gripping force that is applied via this arrangement may not be sufficiently powerful to permit use of a single frame member to serve as a suitable banner hanger.

Hoffman et al. discloses an extruded poster gripping member, in U.S. patent no. 5,718,402, which comprises a channel-shaped frame element which operates according to essentially the same principle as the earlier Ostrovsky patent. A similar principle of operation is also disclosed in U.K. published application no. GB 2 222 523 A (Davis).

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Increased assembly complexity and costs are a drawback inherent in frame elements of the type which operate according to an over-center principle achieved through the use of a hinged front piece having two downwardly-facing legs which separately contact the base, of the type shown in Hoffman and Davis. When a frame member having this arrangement is cut at a 45 degree angle, to fabricate a mitre-cornered frame, the inner leg must be trimmed manually to prevent contact with a neighbouring frame element when the hinged front piece is flipped open.

10 This adds to the manufacturing complexity and resulting cost of the frame.

It is desirable to provide a picture frame which is relatively simple to manufacture and assemble, easy to use and provides a low failure rate in operation. It is also desirable for aesthetic reasons to provide a picture frame in which the decorative exposed front portion may be composed of a single panel. This is not achieved in the prior Ostrovsky frame and other similar arrangements, in which the hinged panel forms a separate and visibly discrete element from the peripheral portion of the exposed flange.

20 The terms "picture" and "poster" are used interchangeably to refer to any flat weblike element such as a poster, painting, banner, paper, fabric or plastic sheet or the like.

It will be further noted that directional references herein are for convenience given in reference to the frame or frame element being in a horizontal position such that a poster mounted therein lies horizontally and faces upwardly.

Summary of the Invention

30 It is an object of the present invention to provide an improved picture frame element or banner hanger formed from extruded material such as plastic, and which may be formed in a single extrusion process. It is a further object to provide a frame element which is relatively simple to assemble into a complete picture frame or a banner-hanger, and which firmly grips a poster or picture in a reliable

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and trouble-free manner. It is a further object to provide a picture frame member and picture frame assembled therefrom, which is visually attractive.

According to one aspect, the invention is a picture frame member or banner hanger of the type comprising a flat base for supportive engagement against a picture, an openable cover member rotatably mounted to the base for gripping a picture between said base and cover member, and a biasing means disposed within an interior space between said base and said cover member, said biasing means comprising a flexible strip extending lengthwise along the frame member for exerting a force between said cover member and said base to force the cover member against the base. The improvement in the invention comprises:

a wall member extending upwardly from said base into the interior space between said base and cover member, said wall member serving as a picture guide member to properly position the picture within the frame member; and

said biasing means comprising a generally rigid striplike member having first and second lateral edges, said first edge joined to said wall member by first flexible hinge means, said second edge joined to said cover by second flexible hinge means, at least one of said first and second hinge means comprising a soft, resilient member for absorbing compressive force exerted by said biasing means.

A powerful gripping force is achieved by virtue of the compressive force of the biasing member being absorbed substantially entirely by compression and flex of one or both of the hinge members. Since the biasing member is not itself required to flex to absorb compression, it can comprise a relatively rigid member and thus exert a powerful gripping action between the base and cover members.

An over-center action of the biasing means and wall member, wherein opening of the cover member rotates the biasing member into an over-center position relative to the wall, holds the cover member in an open position when the same is rotated past its over-center position.

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Preferably, the cover includes an inner supporting leg, having a generally dogleg profile, which joins with the biasing means and forms an acute angle therewith when the cover is closed. The angle thus formed between these elements converts compressive forces exerted by the biasing means, into a downward force acting on the cover to urge the cover against the base.

10

Preferably, the frame member is formed from a one piece extrusion wherein the hinge members are co-extruded with the other frame components.

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In a preferred aspect, the cover member has a hollow generally channel-shaped configuration when seen in section, defined by spaced apart legs with a panel portion therebetween, the interior of said channel opening towards the base. The two legs contact the base when the frame is closed. A third hinge means in this version joins a first of said legs to said base and said second hinge means joins a second of said legs to said biasing means, a lower edge of said second leg comprising a contact surface between the base and cover member. The contact surface conveniently comprises a soft, resilient bead.

30

In a different embodiment, an additional channel member is disposed on the lower face of the base to receive a rigid picture backing board. One wall of the channel may comprise the lower face of the base.

In a still further embodiment, two independently openable cover members as characterized above are provided on the upper and lower faces of the base. A separate biasing means as described above is enclosed within the interior space of each front piece. This arrangement permits two posters to be separately gripped, to provide a double-sided display structure.

In a further aspect, any of the above frame members may be provided with one or more apertures for suspending the frame from a hang hook or a track for suspending the frame from a mating hook or other member.

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In a still further aspect, the invention is a picture frame formed by a plurality of frame members which all have the characteristics of a selected one of the embodiments described above. In another aspect, a single frame member as characterized herein comprises a banner hanger.

Brief Description of the Drawings

10 Figure 1 is a sectional view of a picture frame member according to the present invention, in the closed position;

Figure 2 is a further sectional view showing the frame member in a fully open position;

Figure 3 is a perspective view, partially in section, of a second embodiment of a frame member;

Figure 4 is a sectional view of the second embodiment in the closed position;

20 Figure 5 is a sectional view of a second embodiment, in a partly open position;

Figure 6 is a further sectional view, showing the fully open position;

Figure 7 illustrates a complete picture frame, assembled from frame members of the first embodiment herein;

Figure 8 is a sectional view of a third embodiment; and

Figure 9 is a sectional view of a fourth embodiment of the invention.

30

Detailed Description of the Preferred Embodiments

A first embodiment of the invention is illustrated at Figures 1 and 2. In this version, a picture frame element is composed of a generally elongate plastic extrusion 10,

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having a recess 5 to receive a poster, picture or the like. The frame element has an elongate, strip-like flat base 12, which when the frame is placed horizontally, supports the underside of a poster or picture (not shown). A poster cover member 14 is hinged to the base along the peripheral edge of the frame element, via a first hinge 13. The cover member 14, when closed, covers an edge region of a poster (not shown) and grips the poster tightly between the cover and the base. The hinge 13 comprises a flexible bead or co-extrusion which extends the length of the frame member. The front cover of the frame element is comprised of an exposed panel 15, which is generally parallel to the base and spaced apart therefrom by a bridging portion 16 which forms the peripheral edge of the frame. The cover and base thus define a hollow interior space when these elements are closed together. The bridging portion itself has the configuration of a channel or track which opens outwardly to the periphery of the frame. The bridging portion 16 is formed from a channel floor 18 which spans the base 12 and panel 14, with the elongate sides of the floor 18 bordered by opposed channels 21 facing towards each other. Together, the channels 21 and floor 18 form a track which permits the frame element to slide onto and attach to an external support such as an appropriately-shaped hang hook (not shown). This permits the picture frame element to be conveniently suspended or otherwise supported in a readily removable fashion. Alternatively, if the picture frame element is used individually a banner hanger, it may be suspended from an overhead cable or the like. An alternative suspension is to suspend the element from hooks inverted into apertures 23 within the member (see Fig. 3).

The panel 15 is spaced apart from the base 12 along the inner edge of the panel (i.e. the edge opposed to the bridge 16) by an elongate striplike leg 20 extending the length of the frame element. The leg 20 is disposed at an angle relative to the base, when the cover is closed, such that the leg angles upwardly and inwardly towards the interior of the assembled frame. The leg thus has a dogleg profile.

The lower edge of the leg 20 has a soft bead 22 along its lower edge, to provide

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a soft and resilient contact member to engage a poster between the leg 20 and base 12. The panel 15 overhangs the leg 20 along the inner edge of the panel 15 to provide a convenient gripping surface to permit a user to open the cover 14.

10 The cover member 14 may be selectively maintained in either of an opened and closed position by means of an over-center principle of operation which will be described below. When in the closed position (Figure 1), the cover member is biassed firmly against the base 12 in order to grip a poster or picture between these elements. The gripping force of the cover member 14 is provided by means of a biasing member 24, the structure and principle of operation of which will now be described. The biasing member 24 comprises an elongate striplike panel which is disposed within the interior of the space between the base 12 and cover member 14. The biasing member 24 is hinged to a wall 28 which extends upwardly from the base 12, at a position which is generally adjacent to and spaced apart from the bridge 16. The member 24 is joined to the wall 28 by means of a second flexible hinge 30 along a first elongate edge 32 of the member 24. The second opposed edge 34 of the member 24 is hinged via a third flexible hinge 36, 20 to the interior face of the leg 20. The biasing member 24 thus links the wall 28 to the leg 20. It will thus be seen that the biasing member 24 is fully enclosed within the interior of the structure 10 at all times. Thus, it is not visible to the user except when the frame is opened to replace a picture. The second and third flexible hinges are soft and resilient to absorb compressive forces exerted by the member 24 between the wall 28 and leg 20, as will be described more fully below.

30 The wall 28 also serves as a picture guide member to permit proper positioning of a picture within the frame member. This is particularly important when the frame member is used as a single striplike member to serve as a banner hanger, i.e., only a single edge of a picture is gripped.

When seen in section, the edge region of the biasing member 24 which faces the third hinge 36 curves downwardly. Thus, the upper portion of the leg 20 and the

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biassing member 24 meet at an acute angle when the cover is closed against the base.

Operation of the frame member will now be described by reference to Figures 4 - 6, commencing in the open position as seen in Figure 6. Figures 3 - 6 illustrate a slight variation, wherein no peripheral hang track is provided. The remaining elements are the same as in Figures 1 and 2. The open position is maintained by the compressive force exerted by the biassing member 24, between the wall 28 and leg 20. When the biassing member is in an over-center position relative to the wall 28, as seen in Figure 6, the compressive force exerted by the biassing member 24 will tend to maintain the cover in a fully open position. As the cover member 14 is rotated towards the closed position, the biassing member initially resists rotation as it approaches coplanarity with the wall member as a result of the compressive forces exerted between the wall 28 and leg 20. Initially, this has the effect of forcing these members apart, thereby tending to the cover member towards the fully opened position. Continued rotation of the cover member 14 past the over-center position reverses this effect and urges the cover member and based together. This effect is again achieved at least in part by the resiliency of the second and third hinges, in cooperation with the increasingly acute angle formed between the leg 20 and biassing member 24. As the cover member is closed, the third hinge 36 flexes and stretches, absorbing at least some of the compressive force of the biassing member 24. Further, as the cover member 14 rotates towards the closed position, the increasingly acute angle between leg 20 and the biassing member, results in the compressive forces tending to drive the cover member and plate together. Since the biassing member 24 is relatively rigid, i.e. it resists flex along its short axis, the compressive force exerted thereby increases as the cover member closes. This compressive force is absorbed in large measure by a stretching of the third hinge 36. Thus, the resiliency of the hinge 36 may be selected to achieve a suitable degree of gripping between the cover member and the base. The second hinge 30 also contributed to the biassing action by appropriate compression as the cover is closed.

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The compressive force is exerted by the biasing member 24 is also absorbed to some extent by a limited flex of the cover member, wall and the biasing member itself.

Conveniently, the frame member 10 is formed in a single extrusion. The hinges 13, 30 and 36 may be co-extruded with the rigid frame elements. Preferably, the extrusion is formed from a relatively rigid plastic material such as [].

10

Figure 7 illustrates a rectangular picture frame, formed from four frame elements 10 of the type generally characterized above. The frame has mitred corners which are formed by cutting or slicing the frame members at 45 degree angles, and fastening the elements together by glueing or other convenient means.

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Figure 8 illustrates a further embodiment particularly adapted for holding a rigid backing board independently of a poster or picture. This version comprises a flat, elongate base 50, and an openable cover member 52, of the type characterized in respect of the first or second embodiments described above. A poster backing board-receiving channel 54 is disposed on the underside of the base 50. The base itself forms the upper wall of the channel 54, with the lower wall of the channel 54 comprising an elongate platelike member 56 spaced apart from the base. A bridging portion 58 connects the upper and lower walls. The channel opens to one side of the frame member. In operation, a backing board (not shown) is simply slipped into the channel, and is retained therein by the resiliency of the channel members, which grip the backing board. The backing board must have a suitable thickness to be tightly gripped within the channel 54, which is greater than the width of the channel when the channel is in a relaxed position as shown in Figure 8.

30

Figure 9 illustrates a fourth embodiment which is intended to provide a banner hanger or frame member 68 which is double sided for holding two posters viewable from either side. In this version, two base members 70(a) and 70(b) are provided,

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each being generally strip like as characterized above. Two cover members 72(a) and 72(b) as described above are each hinged to a corresponding base member, such that the two cover members are opposed to each other, with one facing upwardly and one facing downwardly when the bases are disposed horizontally. The two bases are spaced apart from each other by a bridging member 74 along the outer edge of the bases. The space defined between the two bases forms a channel 76 opening towards the interior of the frame member 68. The channel 76 grippingly retains a backing board as characterized above in respect of the third embodiment. The cover members 72(a) and 70(b) are mirror images of each other, and may comprise either type of the first or second embodiments described above, or any variant thereof. In operation, a backing board is provided which has a thickness which is preferably greater than the channel width when the channel is in a relaxed position, thereby permitting the channel to grip the backing board as a result of the resiliency of the bridging member. A poster may be placed against each side of the backing board, with each poster being independently gripped by a corresponding cover member.

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**THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:**

1. An elongate picture frame member for either assembly into a polygonal picture frame or for use as a striplike banner hanger, of the type comprising a flat base for supportive engagement against a picture, an openable cover member rotatably mounted to said base for gripping a picture between said base and cover member, and biasing means disposed within an interior space between said base and said cover member, said biasing means comprising means for exerting a force between said cover member and said base to force said cover member against said base; the improvement comprising:
 - a wall member extending upwardly from said base into the interior space between said base and cover member, said wall member serving as a picture guide member; and
 - said biasing means comprising a generally rigid striplike member having first and second lateral edges, said first edge joined to said wall member by first flexible hinge means, said second edge joined to said cover by second flexible hinge means, at least one of said first and second hinge means comprising a soft, resilient member for absorbing compressive force exerted by said biasing means between said wall member and said cover.
2. A picture frame member as defined in claim 1, wherein said cover includes a downwardly-sloping leg portion which meets said biasing means at an angle which is acute when said cover is closed, when seen from above.
3. A picture frame member as defined in claim 1, formed from a single extrusion.
4. A picture frame member as defined in claim 3, wherein at least one of said hinge means comprises a co-extrusion, the other co-extrusion comprising

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the other elements of said frame member.

5. A picture frame member as defined in claim 1, wherein said first or second hinge means is resilient to absorb compressive forces exerted by said biasing means by stretching or compression.
6. A picture frame member as defined in claim 1, wherein said cover member has a hollow, generally inverted channel-shaped configuration defined by spaced apart legs with a panel therebetween, the interior of said channel opening towards said cover, wherein a third hinge means joins a first of said legs to said base and said second hinge means joins a second of said legs to said biasing means, a lower edge of said second leg comprising a contact surface between said cover member and said base.
7. A picture frame member as defined in claim 1, wherein said first or second hinge means are adapted to absorb substantially all of the compressive force exerted by said biasing member between said cover member and said wall.
8. A picture frame member as defined in claim 1, further comprising a backing board gripper channel, comprising of pair of channel walls spaced apart by a bridging member, said channel opening towards an elongate side of said base.
9. A picture frame member as defined in claim 1, wherein a first of said walls is formed by said base.
10. A picture frame member as defined in claim 1, further comprising a second cover member, wall member and biasing means all as defined in claim 1, disposed on a second, opposed side of said base for gripping a second poster to form a two-sided picture frame member.

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11. A picture frame member as defined in claim 10, further comprised of a second elongate generally flat base, said base and said second base being spaced apart by a bridging member, said bases defining a channel therebetween for gripping a backing board, said front piece and said second front piece being associated with said base and second base respectively.
12. A picture frame comprised of a plurality of elongate frame members as defined in any of claims 1 - 11, arranged in a polygon.

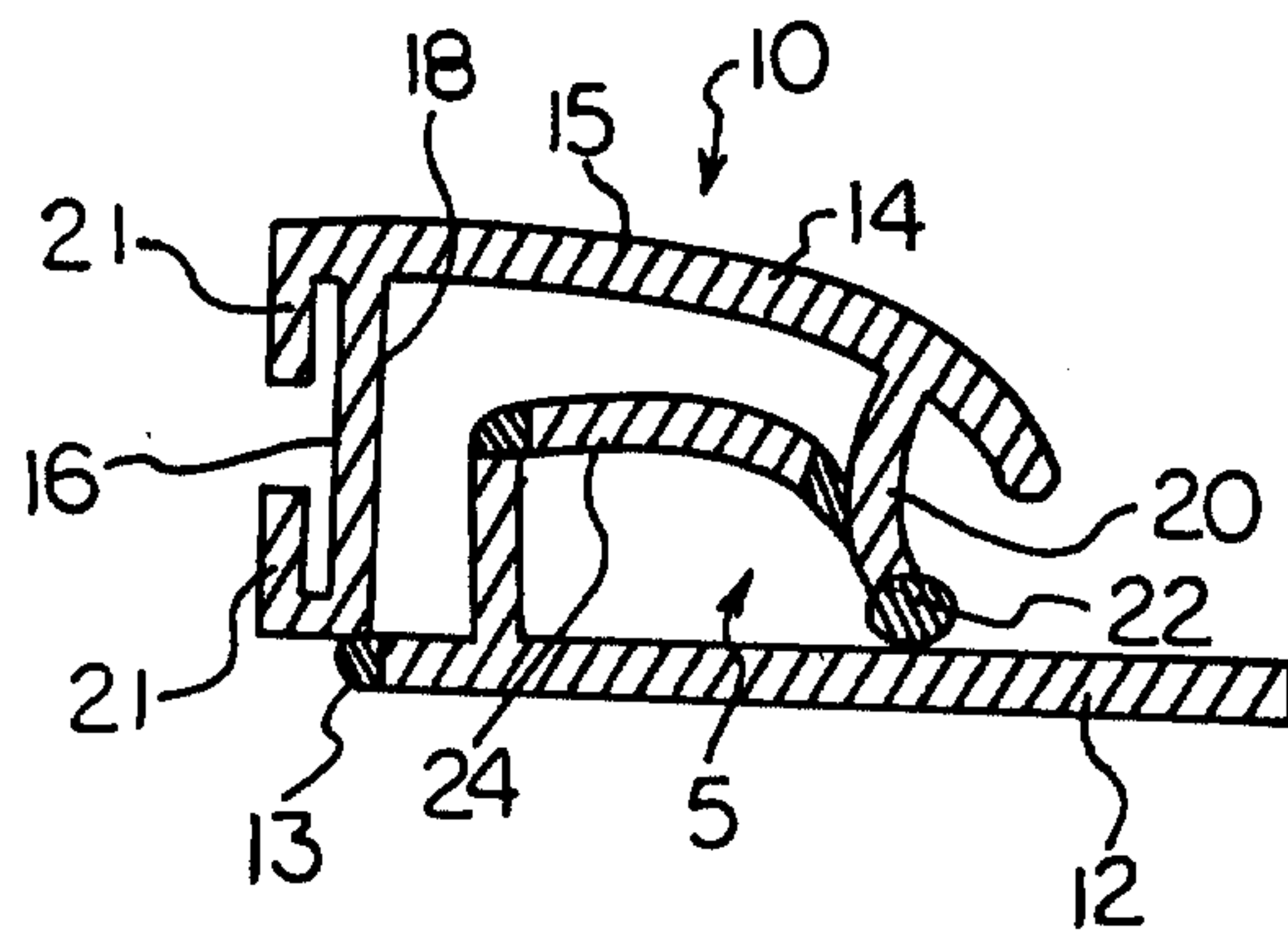


Fig. 1

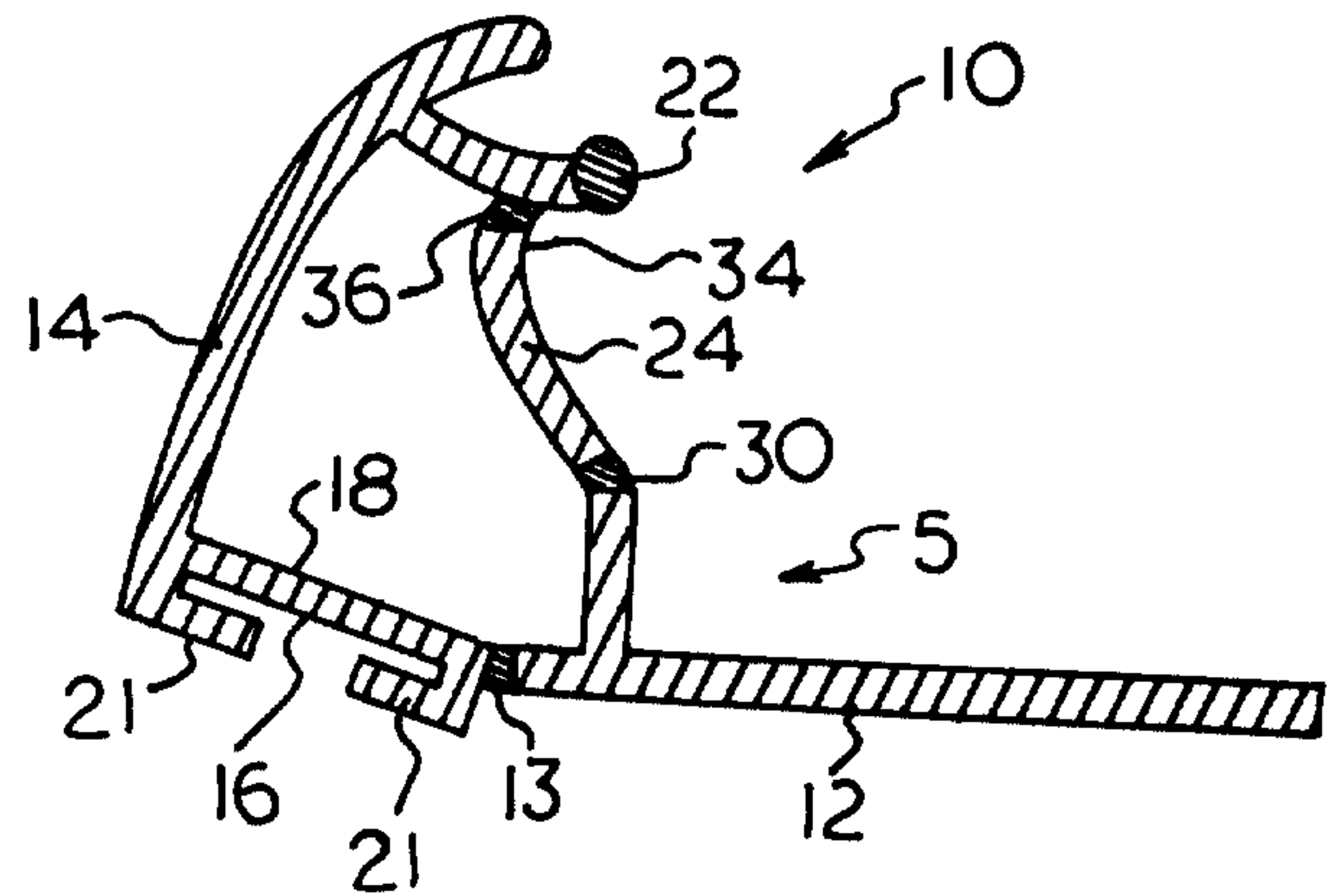


Fig. 2

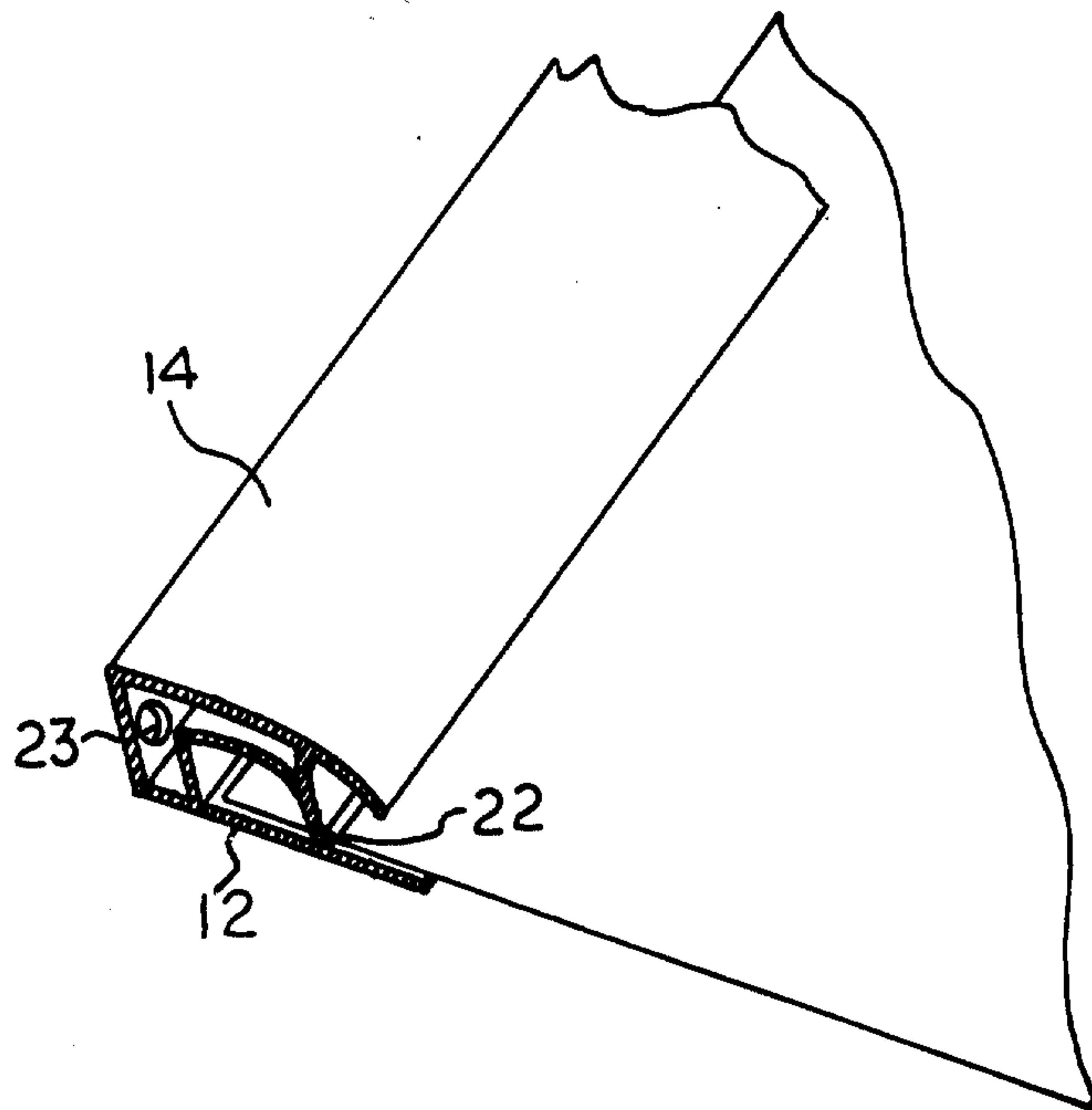


Fig. 3

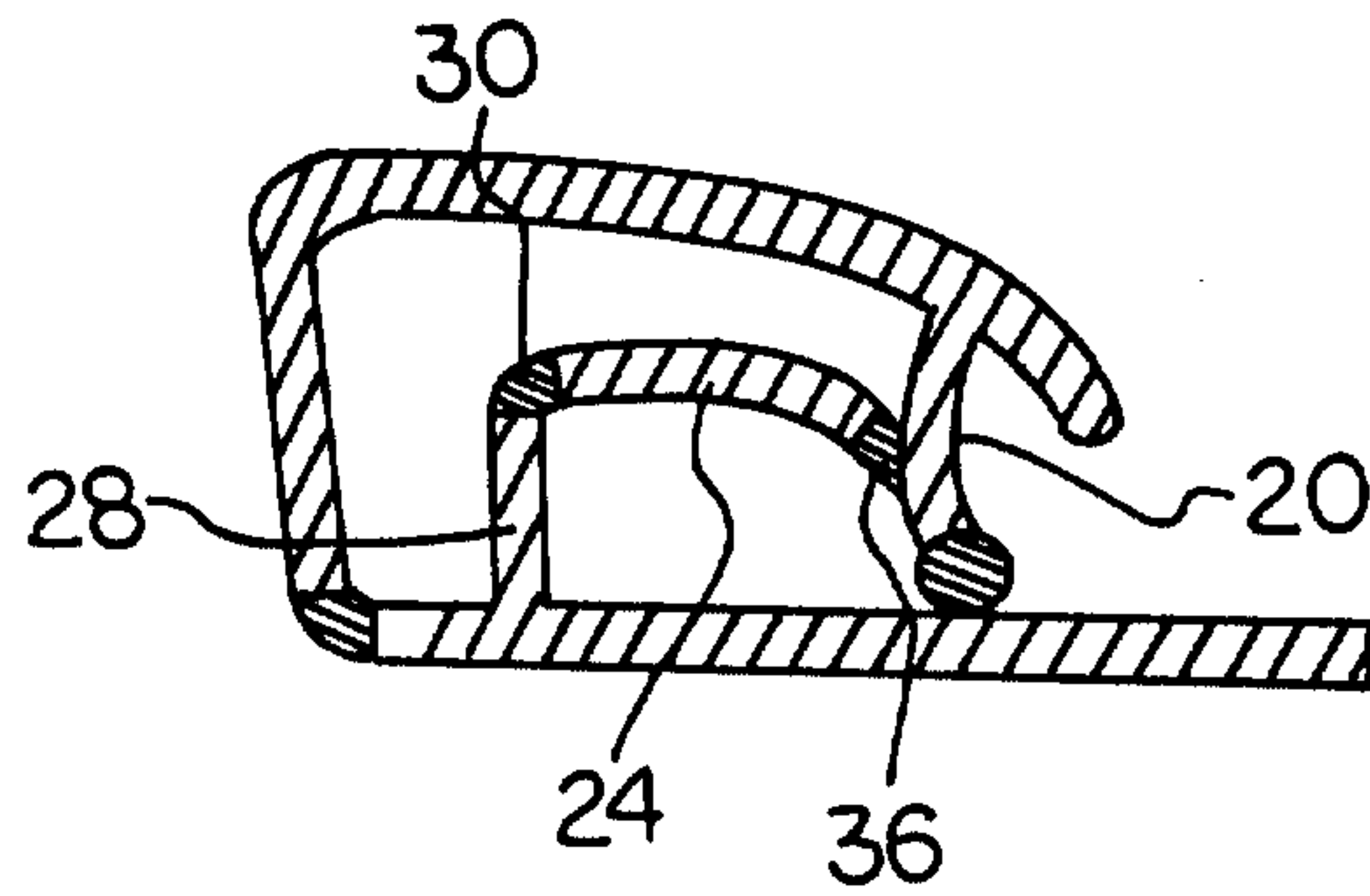


Fig. 4

Fig. 5

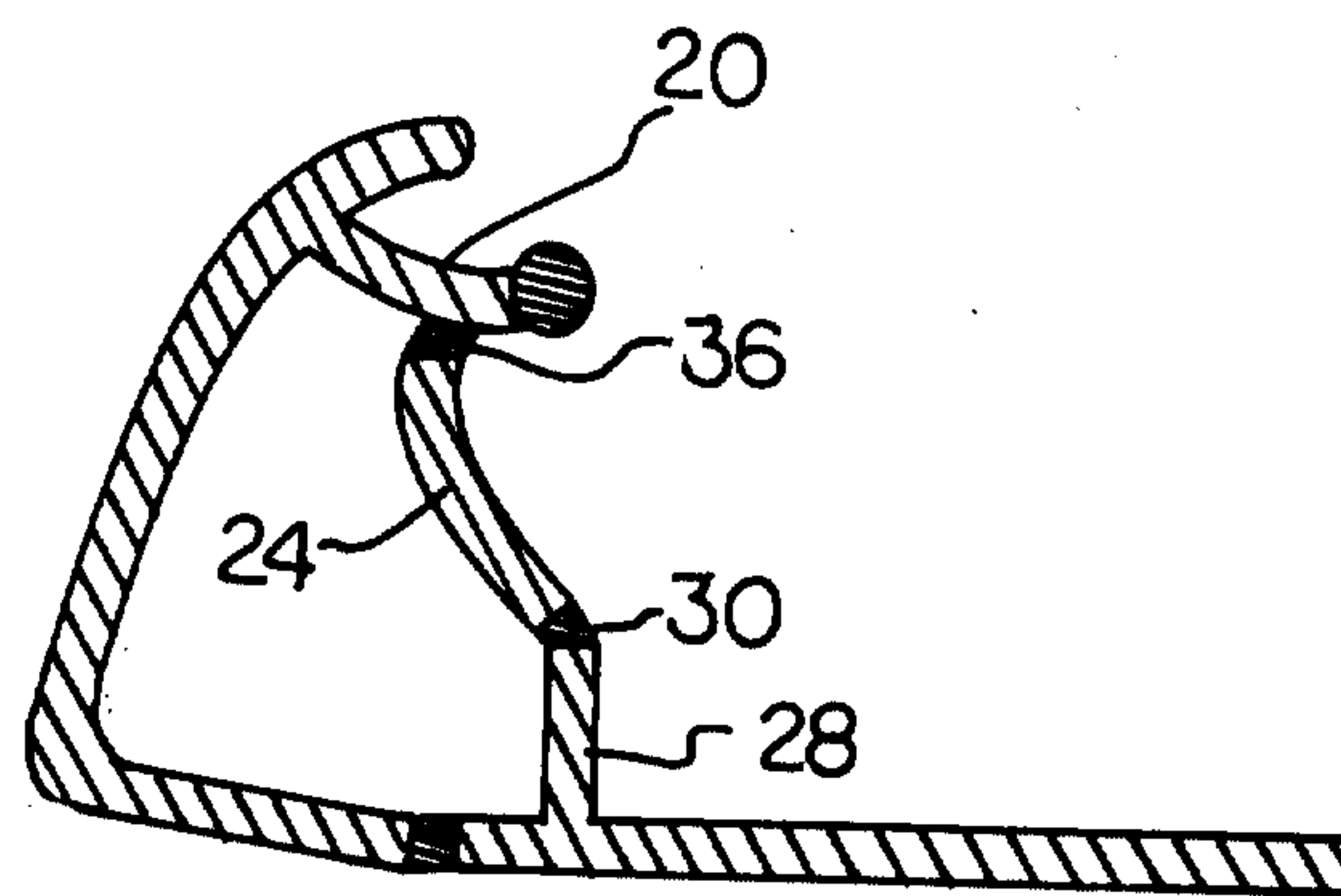
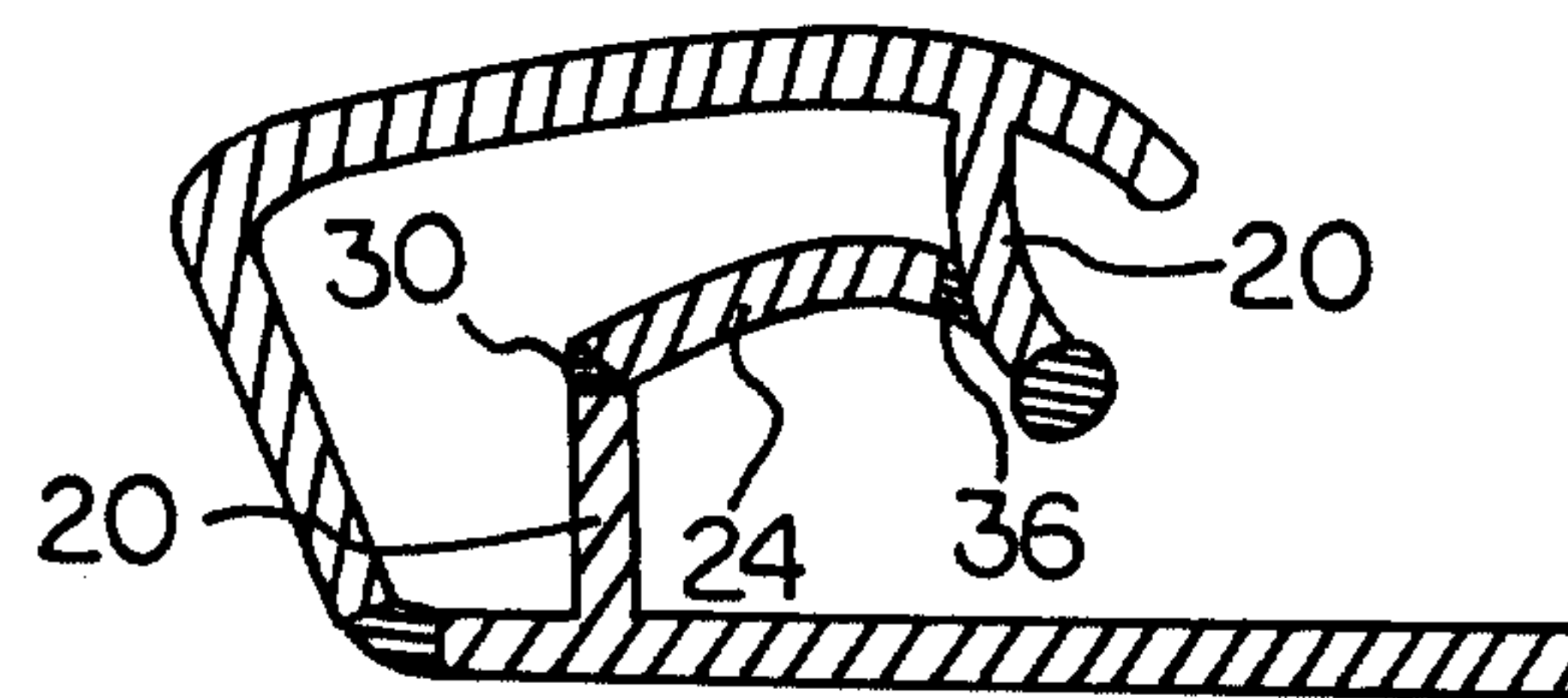


Fig. 6

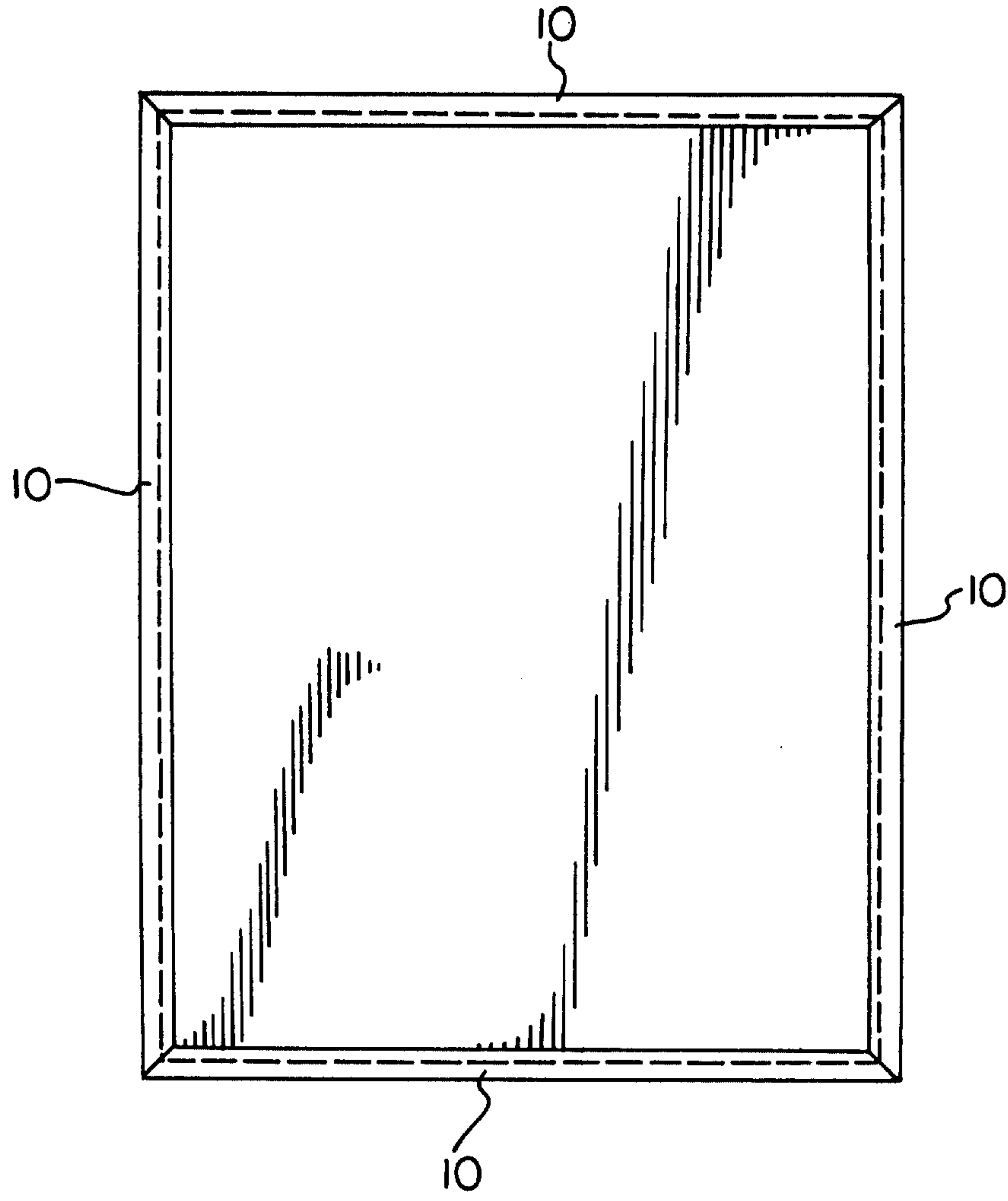


Fig. 7

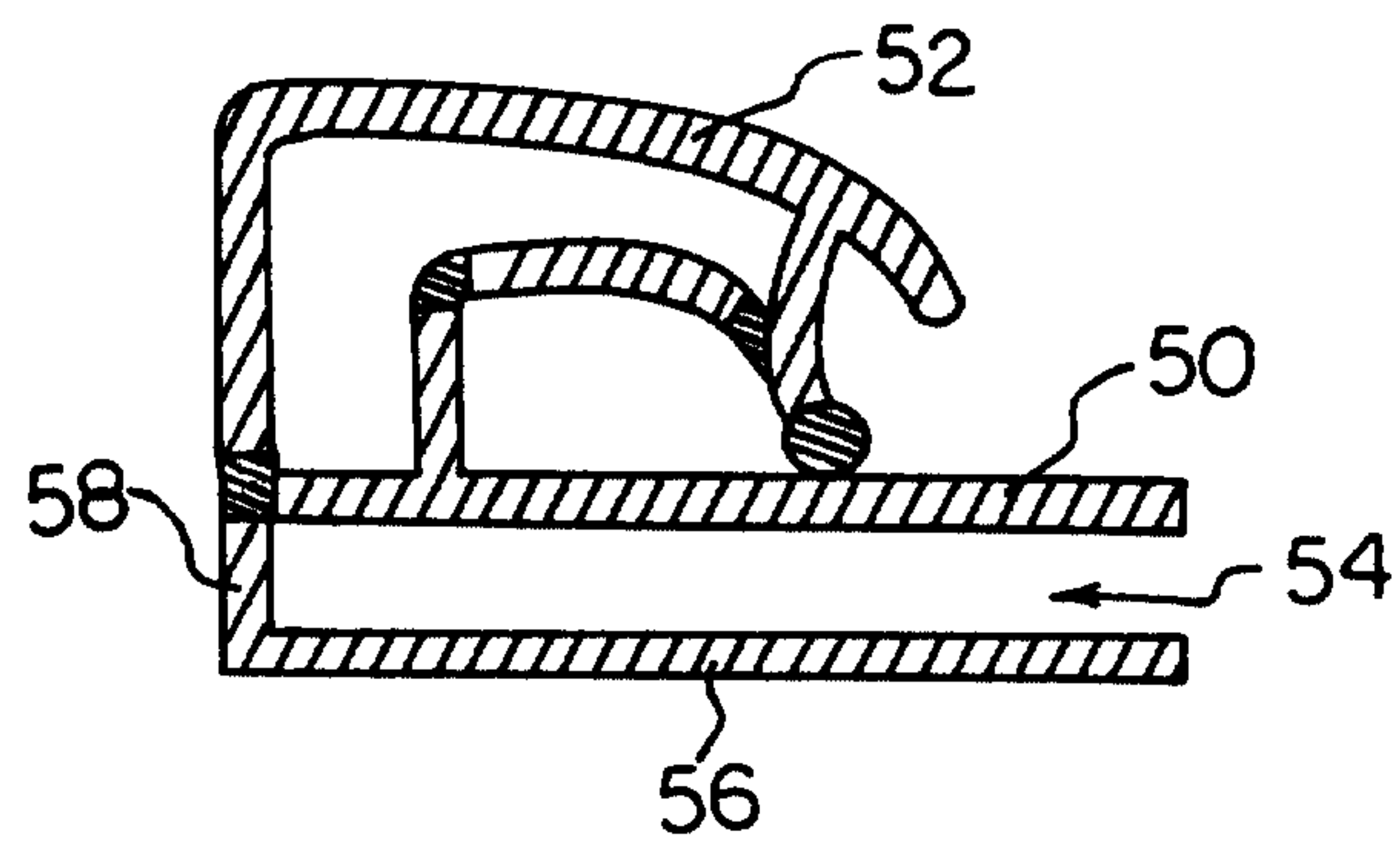


Fig. 8

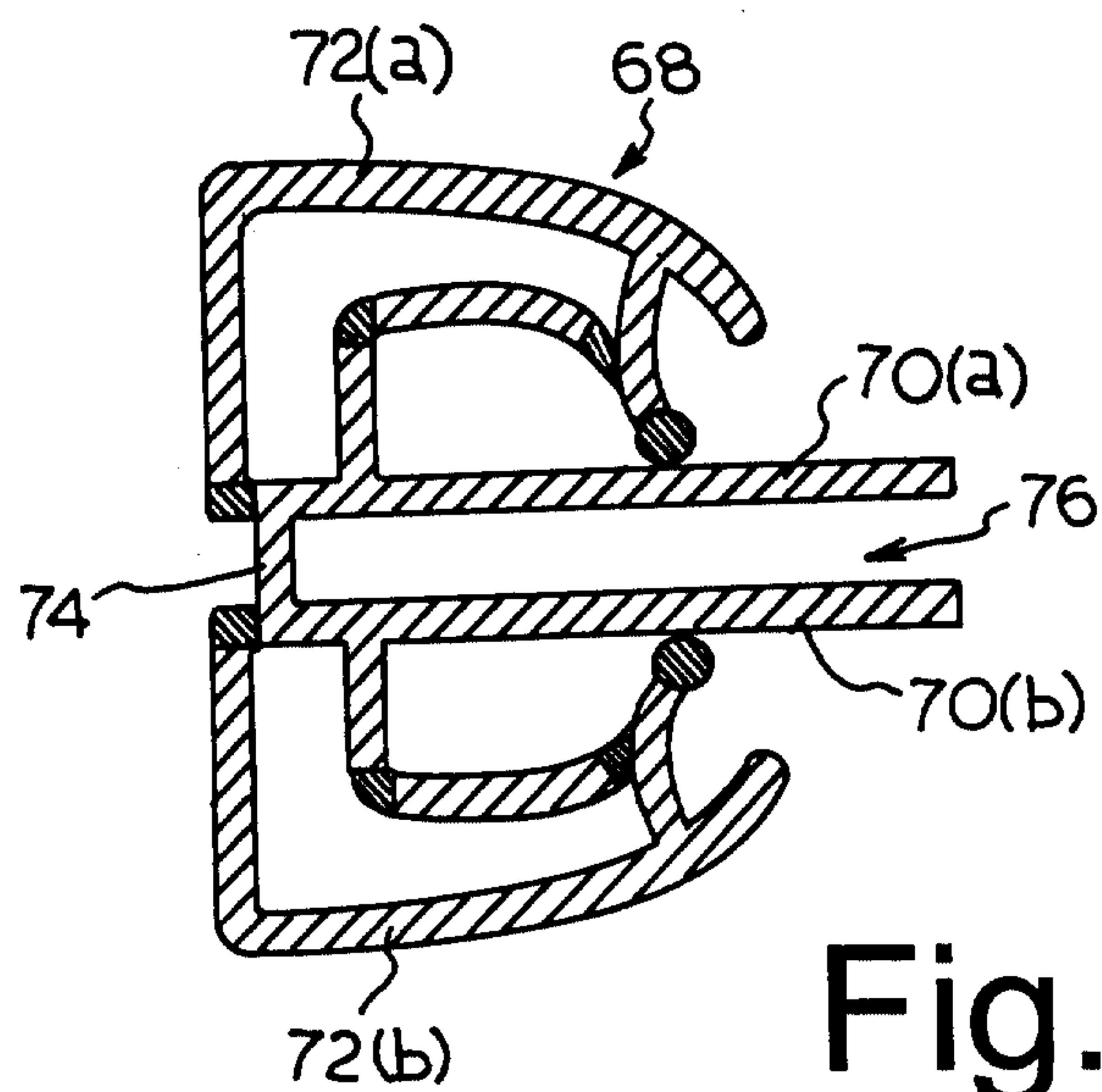


Fig. 9

