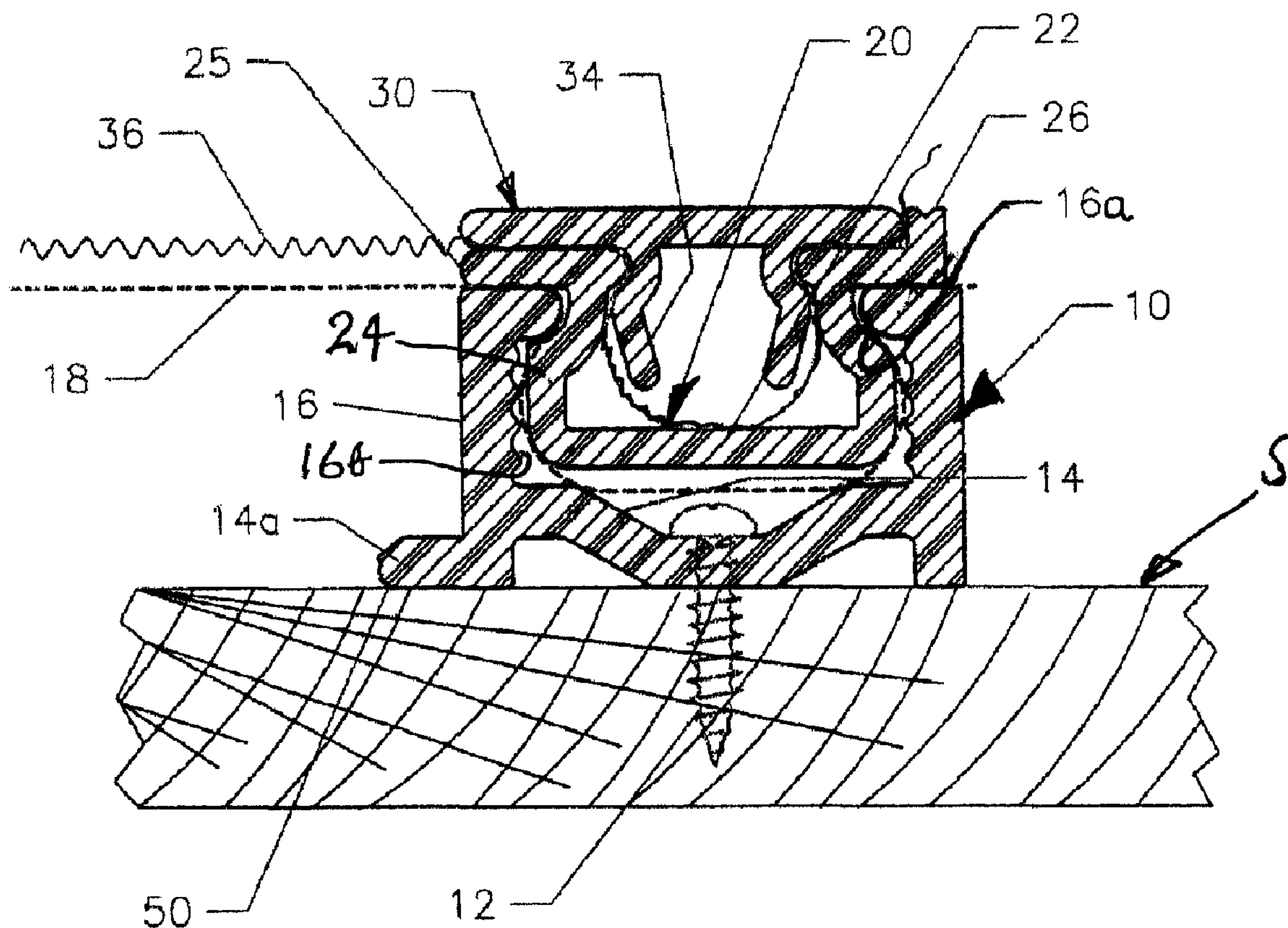




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(54) Titre : FIXATION POUR RETENIR DEUX FEUILLES DE MATERIAU SOUPLE DANS UN CADRE
(54) Title: FASTENER FOR HOLDING TWO SHEETS OF FLEXIBLE MATERIAL TO A FRAME



(57) Abrégé/Abstract:

A fastener for securing first and second sheets of flexible material to a support comprises a channel member and a first retainer member having side portions adapted to fit inside the channel member for holding the first flexible sheet against opposed sides of



(57) **Abrégé(suite)/Abstract(continued):**

the channel member. The first retainer member also provides an inner channel, and a second, inner retainer member is adapted to fit inside this inner channel for holding the second sheet of material between outer sides of the inner retainer member and side portions of the first retainer member. Removal of the second retainer member allows the second flexible sheet to be removed while the first flexible sheet remains in place. when the second retainer member is in place it provides an expansive force on the side portions of the first retainer member for enhanced gripping of the first flexible sheet.

Abstract of the Disclosure.

5 A fastener for securing first and second sheets of flexible material to a support comprises a channel member and a first retainer member having side portions adapted to fit inside the channel member for holding the first flexible sheet against opposed sides of the channel member. The first retainer member also provides an inner channel, and a second, inner retainer member is adapted to fit inside this inner channel for holding the second sheet of material between outer sides of the inner

10 retainer member and side portions of the first retainer member. Removal of the second retainer member allows the second flexible sheet to be removed while the first flexible sheet remains in place. When the second retainer member is in place it provides an expansive force on the side portions of the first retainer

15 member for enhanced gripping of the first flexible sheet.

Title: Fastener for holding two sheets of flexible material to a frame.

Background of the Invention.

1. Field of the Invention

5 The present invention relates to a fastener assembly for holding two sheets of flexible material, for example a mesh screen and a plastic sheet, to a support such as a frame of a greenhouse or gazebo.

2. Prior Art

10 There is a need, for example in greenhouses and gazebos, to have, on occasion, two sheets of flexible material. One sheet may be an apertured screen for protection against insects, and for cold weather an impervious sheet of plastic may be added to exclude cold air. Some fastening assemblies have been designed

15 so that two or more such sheets can be held in a semi-independent manner, i.e. they allow an outer sheet, for example the plastic sheet, to be added or removed without disturbing the inner sheet. Such assemblies are shown for example in the following U.S. patents:

20 4,467,504, issued Aug.28, 1984 to Quist;
 4,682,642, issued July 28, 1987 to Hogshead III et al.
 4,726,411, issued Feb.23, 1988 to Conley;
 4,769,877, issued Sept.13, 1988 to Conley, and
 6,314,684, issued Nov.13, 2001 to Aviram.

25 **Summary of the Invention**

The present invention provides a fastener capable of holding two flexible sheets in semi-independent manner, to allow removal of an outer sheet without disturbing an inner sheet,

which is simple in construction and in which enhanced gripping of the inner sheet occurs by cooperation with the retainer for the outer sheet.

5 In accordance with the present invention, a fastener for securing first and second sheets of flexible material to a support and for allowing one of said sheets to be removed while another sheet remains secured, comprises:

a channel member having opposed sides and which is attachable to said support,

10 a first retainer member having side portions adapted to fit inside said channel member for holding said first flexible sheet between its side portions and said opposed sides of the channel member, said first retainer member also providing an inner channel between inside surfaces of said side portions, said 15 inside surfaces including at least one undercut, inwardly diverging side surface, and

a second, inner, retainer member adapted to fit at least partially inside said inner channel for holding said second sheet of flexible material between outer sides of said inner 20 retainer member and said inside surfaces of said side portions of said first retainer member, said second retainer member having at least one outwardly diverging side surface adapted to engage said undercut, inwardly diverging side surface of said inner channel,

25 whereby removal of said second retainer member allows the second flexible sheet to be removed while said first flexible sheet remains in place, and

whereby when said second retainer member is in place it provides an expansive force on said side portions of the first 30 retainer member for enhanced gripping of said first flexible sheet against the opposed sides of the channel member.

Preferably, each of the inner surfaces of the first retainer member has an undercut, inwardly diverging side surface, and the second retainer member has both of its side surfaces outwardly diverging to engage the side surfaces of said
5 first retainer member.

The channel member, the first retainer member, and the second retainer member may be part of a kit of parts which include an alternate retainer member which can be used in place of the first retainer member when the parts are to be used for
10 only the first flexible sheet, the alternate retainer member having side portions adapted to fit inside said channel member and having enhanced rigidity compared to the first retainer member.

The sides of the channel member may have inner surfaces
15 provided with longitudinal ridges. Also, the channel member may be formed as one of a pair of similar channel members which are joined by a web having a line of weakening allowing the channel members to be used either as a dual track pair, or singly after severing along said line of weakening.

20 **Brief Description of the drawings.**

A preferred embodiment of the invention will now be described by way of example with reference to the accompanying drawings, in which;

25 Fig.1 is a cross-section through the complete fastener assembly, as mounted on a support;

Fig.1a is a similar view showing the first retainer member being inserted into the channel member to hold the first flexible sheet;

Fig.1b is a similar view of the complete fastener parts

with the second retainer member being inserted into the first retainer member to hold the second flexible sheet;

Fig.2 is a detailed cross-section through the first retainer member;

5 Fig.2a shows a detail of the first retainer member;

Fig.3 is a cross-section through the second or inner retainer member;

Fig.4 is a cross-section through an alternate first retainer member;

10 Fig.5 is a view of the alternate assembly using the alternate first retainer member;

Fig.5a is a view showing the alternate first retainer member being inserted into the channel member, and

15 Fig.6 is a cross-section through a pair of channel members as extruded.

Detailed Description.

As shown in Fig.1, the complete assembly includes a channel member 10 of extruded plastic material which is held onto a support S, typically the frame member of a greenhouse or gazebo, by screws 12 which penetrate the base 14 of the channel member. 20 The channel member 10 also has a flat flange 14a projecting from the base 14, and upstanding, opposed sides 16 terminating in undercut, inwardly projecting lips 16a. The sides of channel member 10 have longitudinal ridges 16b.

25 The marginal portion of flexible mesh screening material 18 is held within the channel member 10 by a first retainer member 20, also of extruded plastic, which is separately shown in Fig.2. This latter member is itself of channel form, having a flat base 22, and upwardly extending side portions 24 which terminate in 30 outwardly projecting flanges 25, one of which has an upwardly

projecting outer rib 26. As shown in Fig.2a, the side portions 24 each have an upper recessed portion 24a which engages with the respective inwardly projecting lip 16a of the channel member. When the screen 18 has been inserted into the channel member, it can be retained by inserting the first retainer member 20 to hold the screen between the lips 16a and the recesses 24a, the parts having sufficient resiliency to allow this insertion. The insertion is shown in Fig.1a.

As shown in Fig.2, the first retainer member 20 also has an inner channel formed between side portions 24, and these side portions have inner side surfaces 24b which are undercut and which diverge inwardly, i.e diverge towards the base 22 of the inner channel. These side surfaces thus provide means for holding a second, inner, retainer member 30, shown separately in Fig.3. This member 30, which is also extruded of plastic, has a flat top plate 32, and two depending webs 34. These webs have outer sides with outwardly diverging side surfaces 34a arranged to engage the undercut side surfaces 24b of the first retainer member.

With the channel member and first retainer member holding the screen 18, an additional layer of sheet material, such as a plastic sheet 36 shown in Fig.1, can be inserted into the channel provided by the first retainer member 20 and held in place by the second, inner retainer member 30, the webs 34 having sufficient resiliency to allow this. This insertion is shown in Fig.1b. However, this inner retainer member 30 has a dual function, since it also provides an expanding force on the sides of the first retainer member 20 and helps to hold the screen 18 secure.

It will be seen that, if only the first retainer member 20

is used to secure the screen, this will be held less securely than when the second retainer member is present. Accordingly, it is advantageous to provide the parts described above as a kit which includes an alternate first retainer member 40, this being
5 shown in Fig.4, and which is used when the channel member 10, which remains fixed to the support, is only required to hold a single sheet of material. The alternate retainer member 40, which is also extruded of plastic material, is similar in respect of its outer side surfaces to the first retainer member,
10 and cooperates with the channel member 10 in the same way, as is shown in Fig.5. Here however, the sides 44 are reinforced by a top plate 42, so as to have less flexibility than the first retainer member and to provide a stronger holding force than the first retainer member when used alone. A recess 44a receives the
15 inwardly projecting lips 16a of the channel member.

Fig.6 shows the preferred form of extrusion for the channel member 10. As shown, two such channel members are formed as a double extrusion, joined by a web 50 which has a central line of weakening 51 and which provides the flanges 14a. The two
20 channels may be separated along this line of weakening, or, alternatively may be used together as a double channel member or dual track pair to provide additional holding power. Fig.6 also shows the line of indentation 52 along the center of each channel member which provides a location for the screws 12.

I claim.

1. A fastener for securing first and second sheets of flexible material to a support and for allowing one of said sheets to be removed while another sheet remains secured, comprising:

5 a channel member having opposed sides and which is attachable to said support,

a first retainer member having side portions adapted to fit inside said channel member for holding said first flexible sheet between its side portions and said opposed sides of the channel member, said first retainer member also providing an inner channel between inside surfaces of said side portions, said 10 inside surfaces including at least one undercut, inwardly diverging side surface, and

a second, inner, retainer member adapted to fit at least 15 partially inside said inner channel for holding said second sheet of flexible material between outer sides of said second retainer member and said inside surfaces of said side portions of said first retainer member, said second retainer member having at least one outwardly diverging side surface adapted to 20 engage said undercut, inwardly diverging side surface of said inner channel,

whereby removal of said second retainer member allows the second flexible sheet to be removed while said first flexible sheet remains in place, and

25 whereby when said second retainer member is in place it provides an expansive force on said side portions of the first retainer member for enhanced gripping of said first flexible sheet against the opposed sides of the channel member.

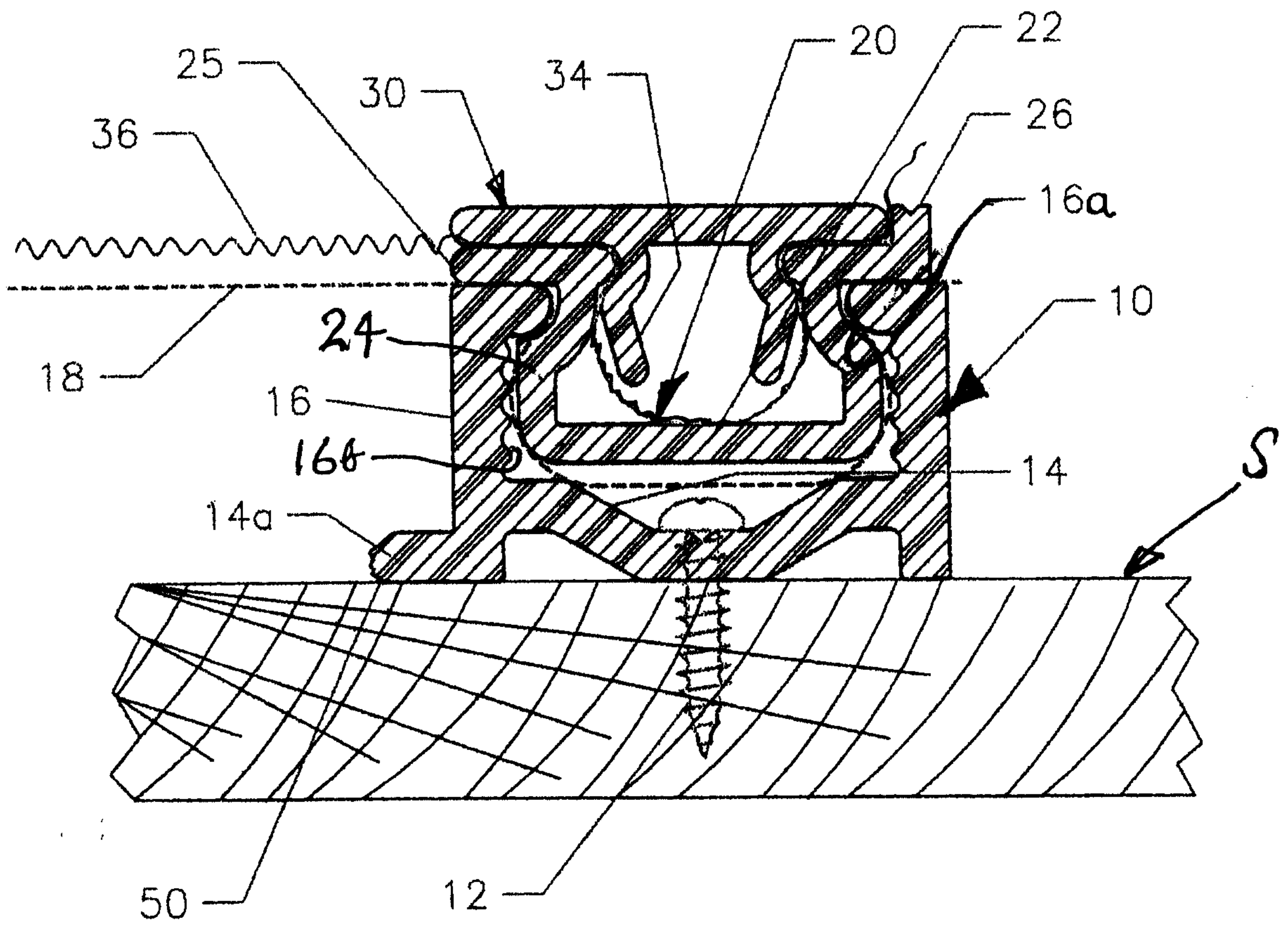
30 2. A fastener according to claim 1, wherein said channel member, said first retainer member, and said second retainer member are part of a kit of parts which include an alternate retainer

member which can be used in place of the first retainer member when the parts are to be used for only the first flexible sheet, said alternate retainer member having side portions adapted to fit inside said channel member and having enhanced rigidity
5 compared to said first retainer member.

3. A fastener according to claim 1, wherein said sides of said channel member have inner surfaces provided with longitudinal ridges.

10 4. A fastener according to claim 1, wherein said channel member is formed as one of a pair of similar channel members, said pair being joined by a web having a line of weakening allowing said channel members to be used either as a dual track pair, or singly after severing along said line of weakening.

15 5. A fastener according to claim 1, wherein said inner surfaces of the first retainer member each has an undercut, inwardly diverging side surface, and wherein said second retainer member has both of its side surfaces outwardly diverging to engage the side surfaces of said first retainer member.



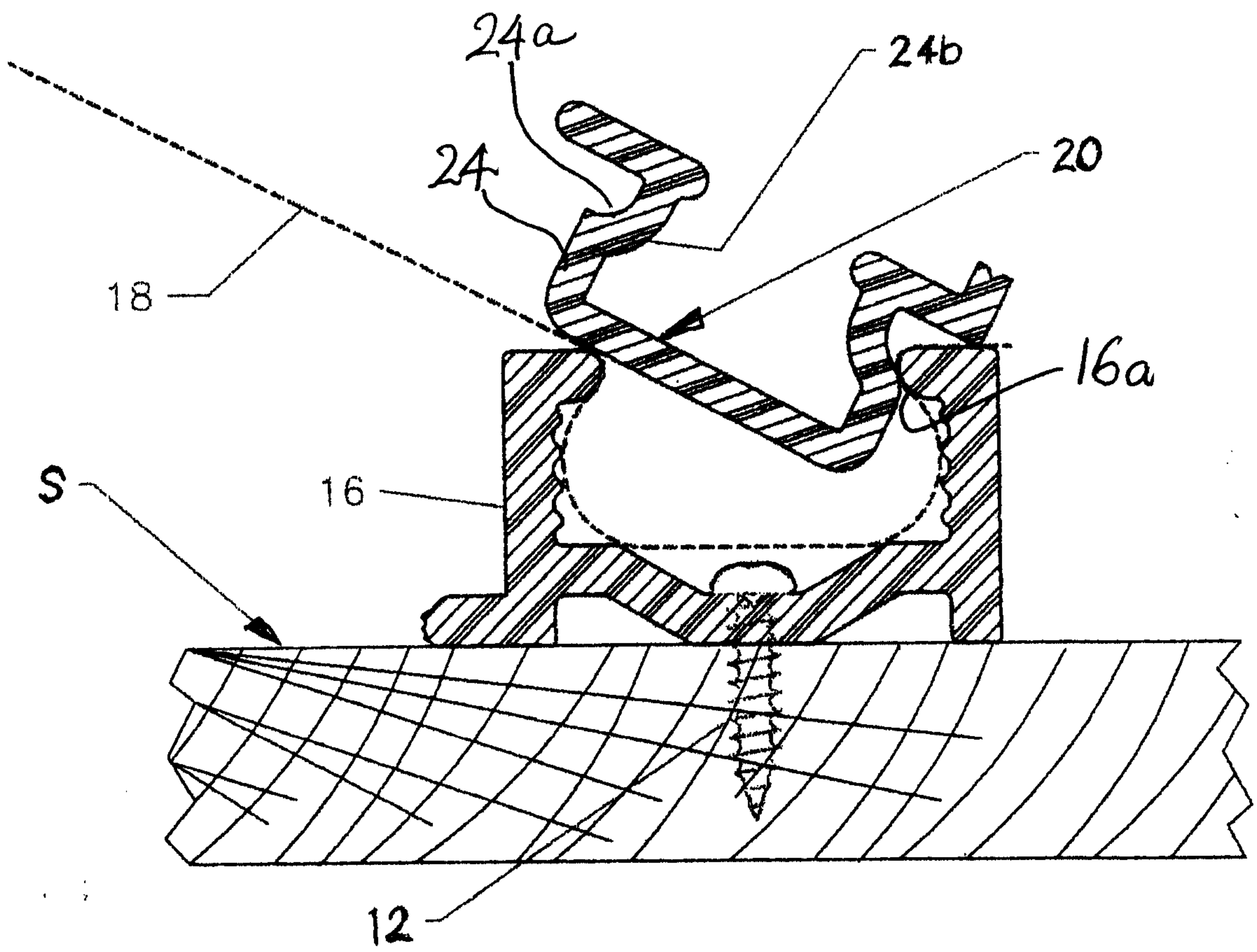


FIG. 1a

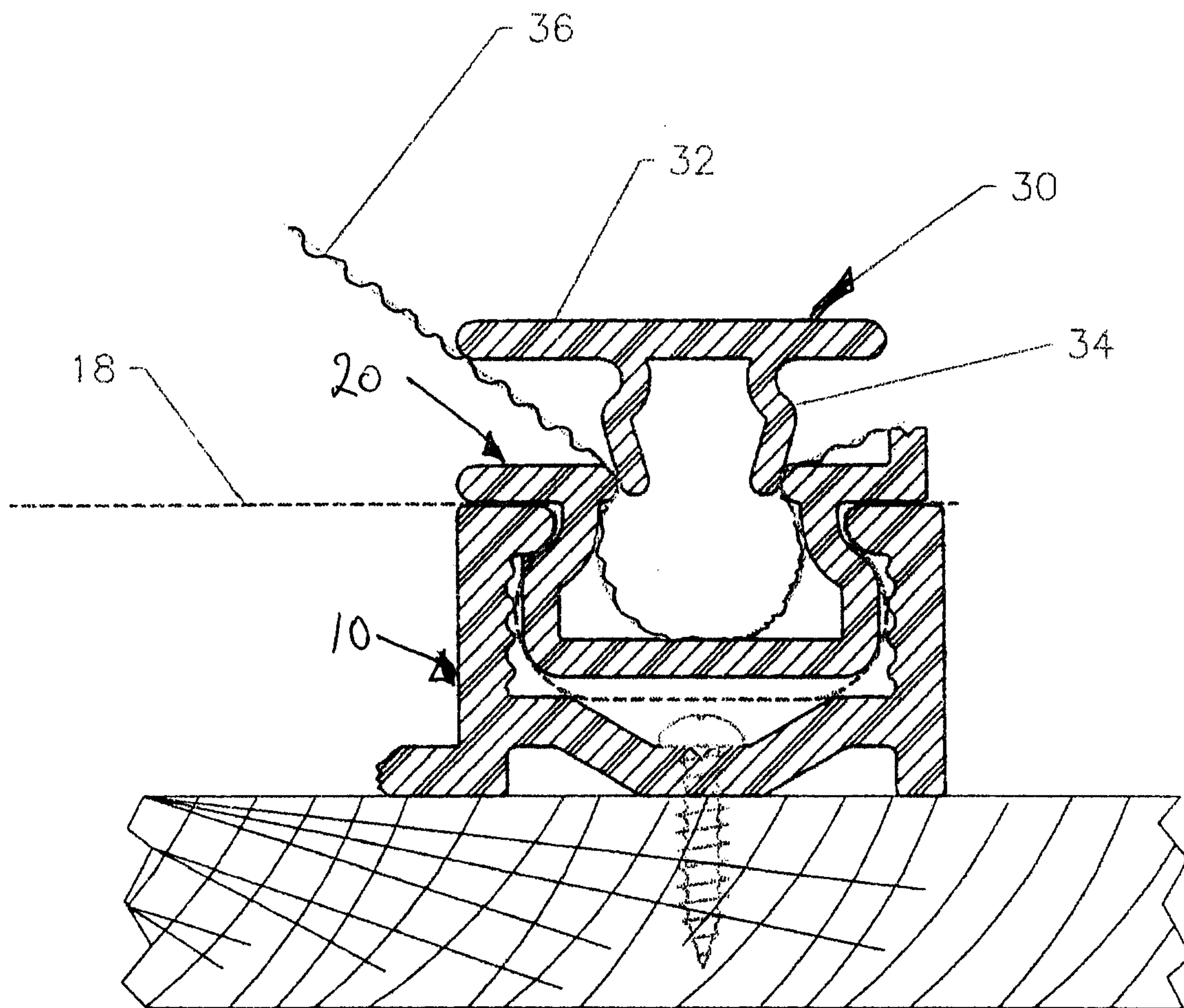


FIG. 1b

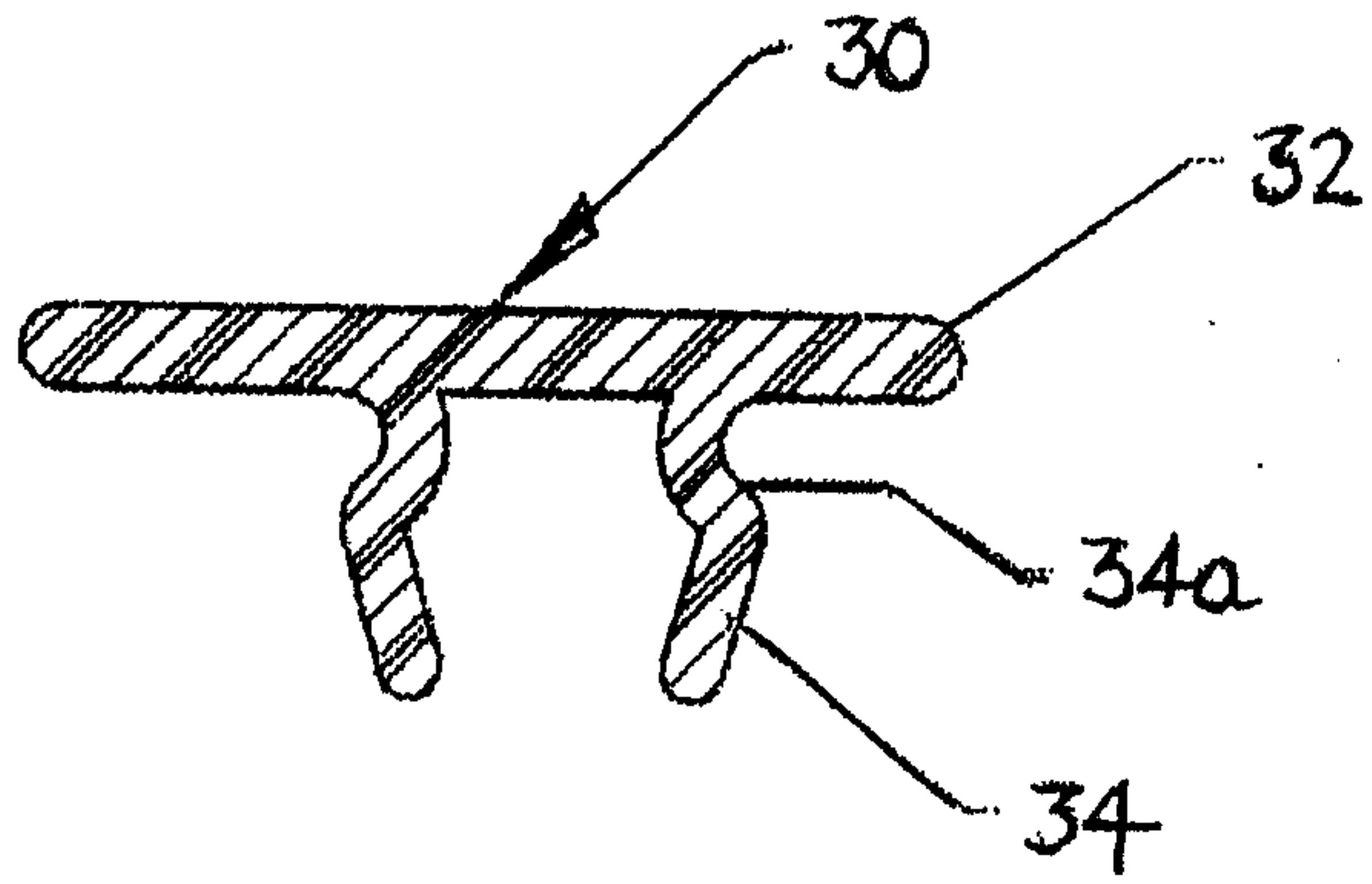
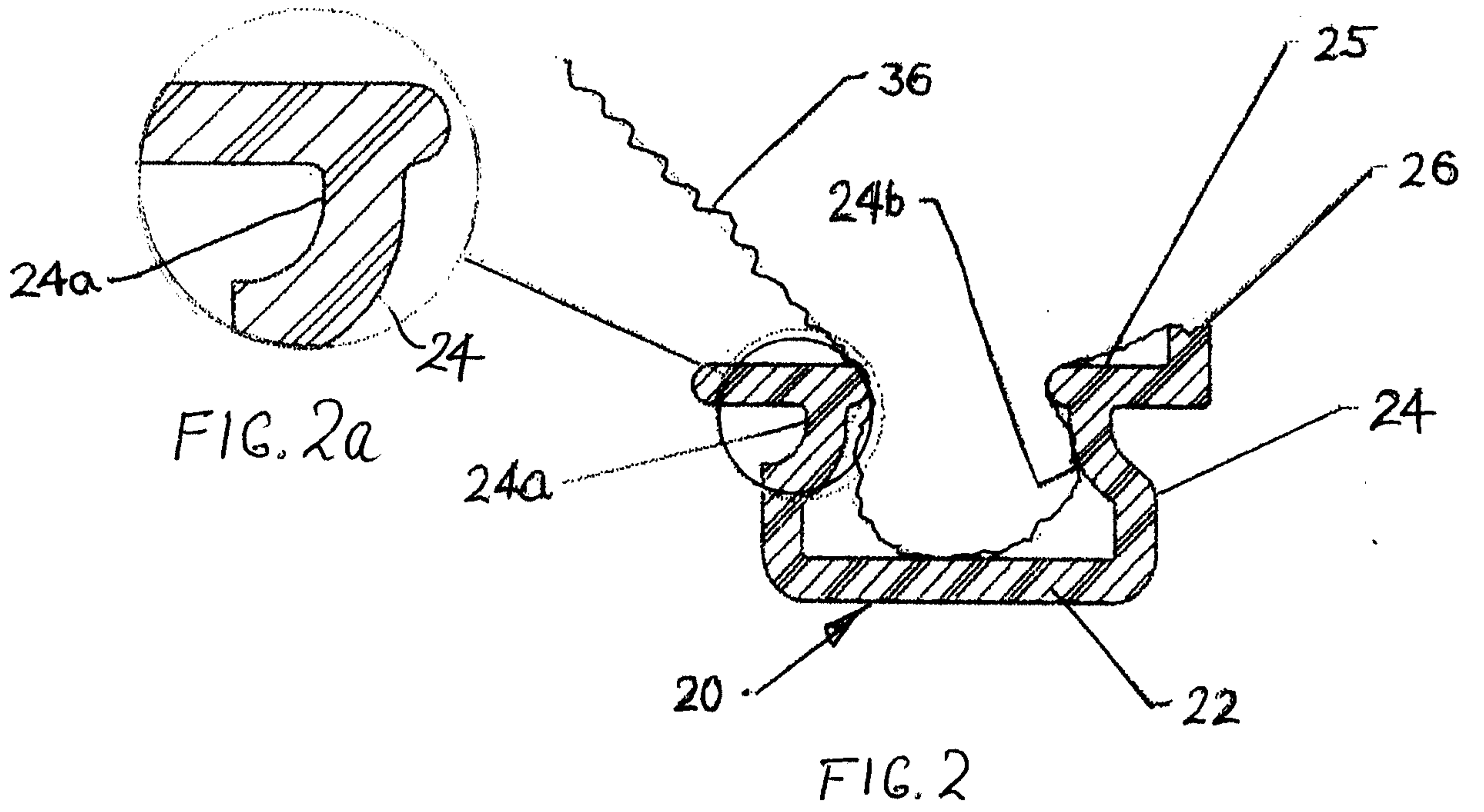


FIG. 3

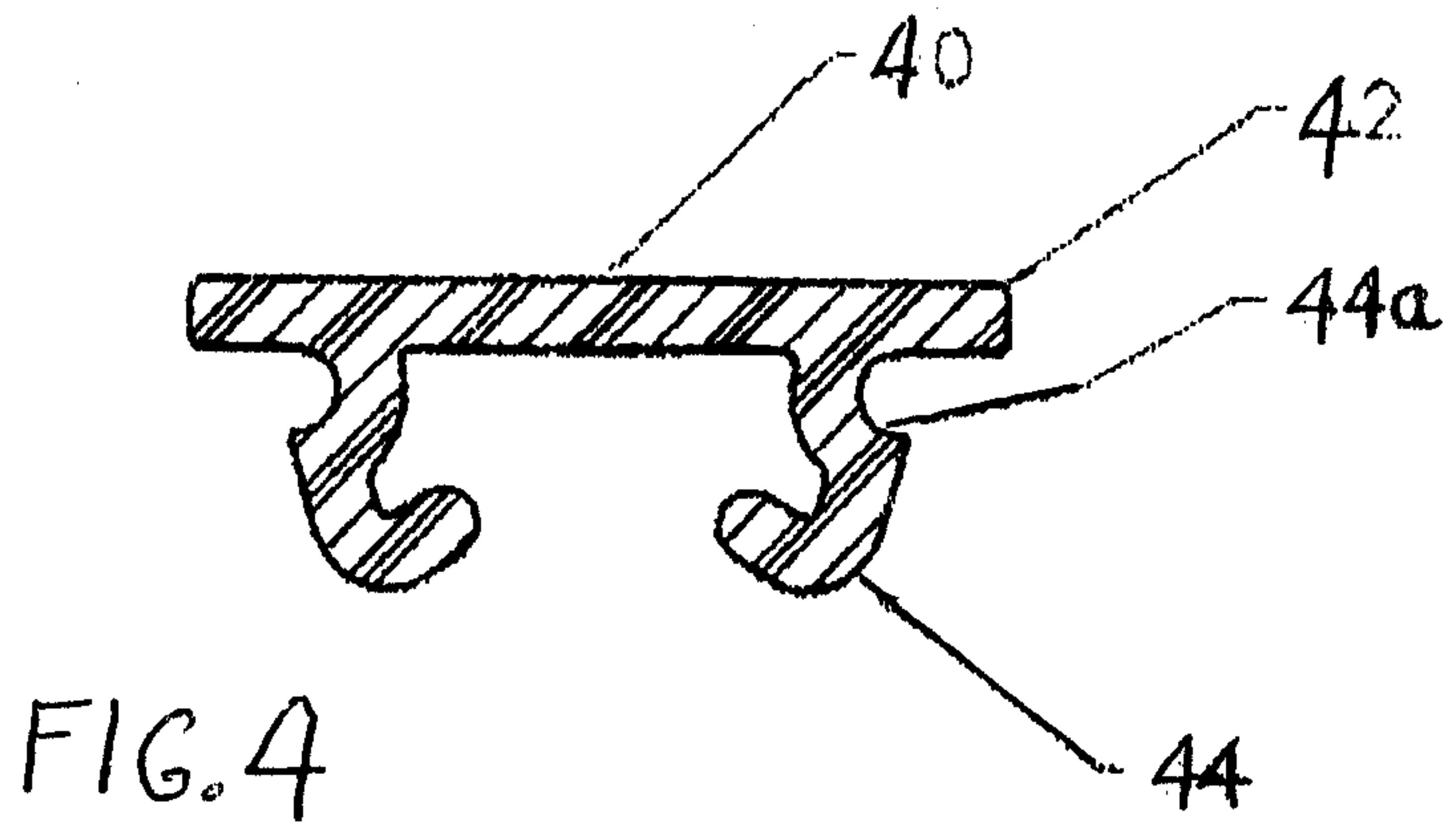


FIG. 4

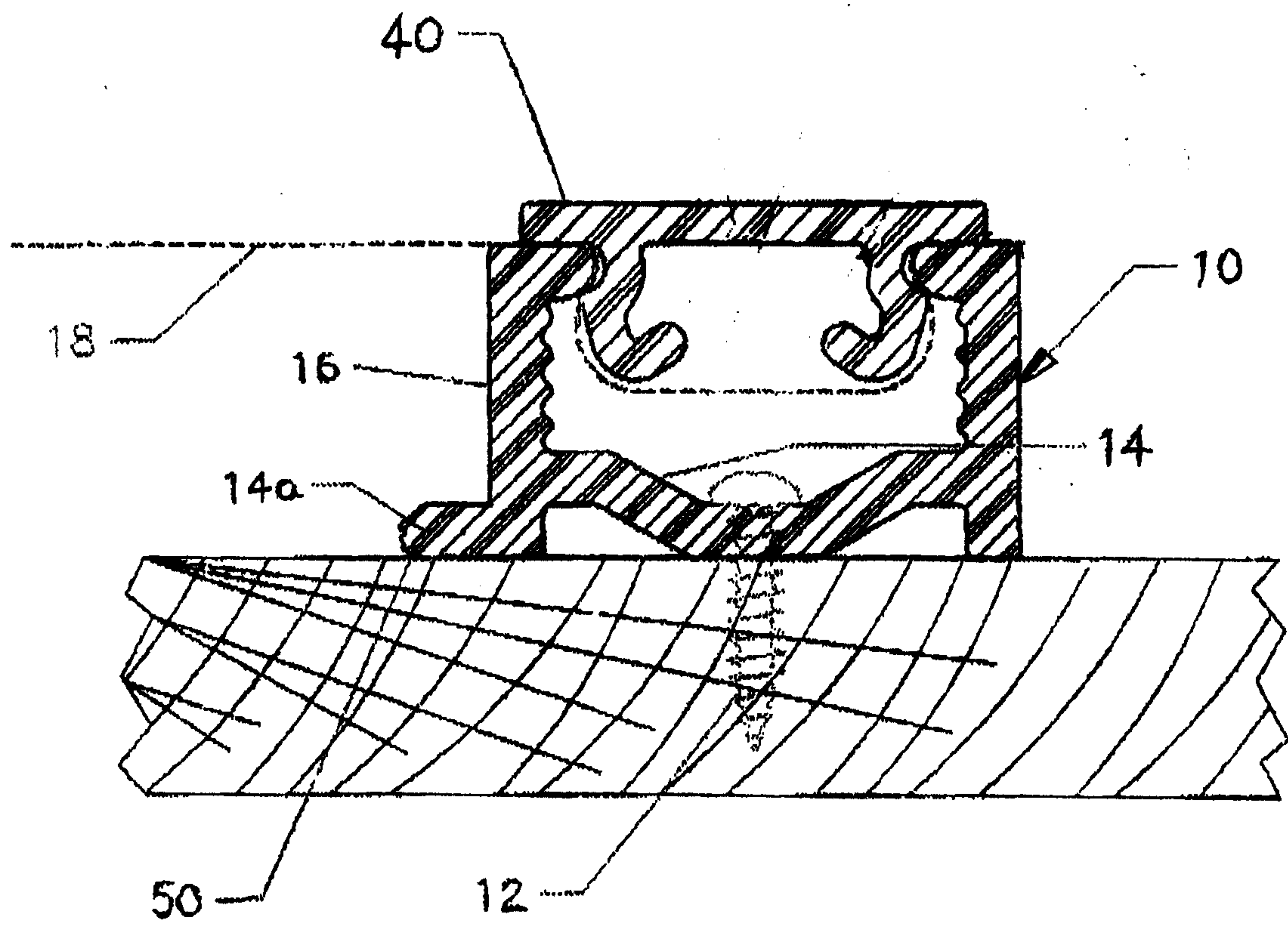


FIG. 5

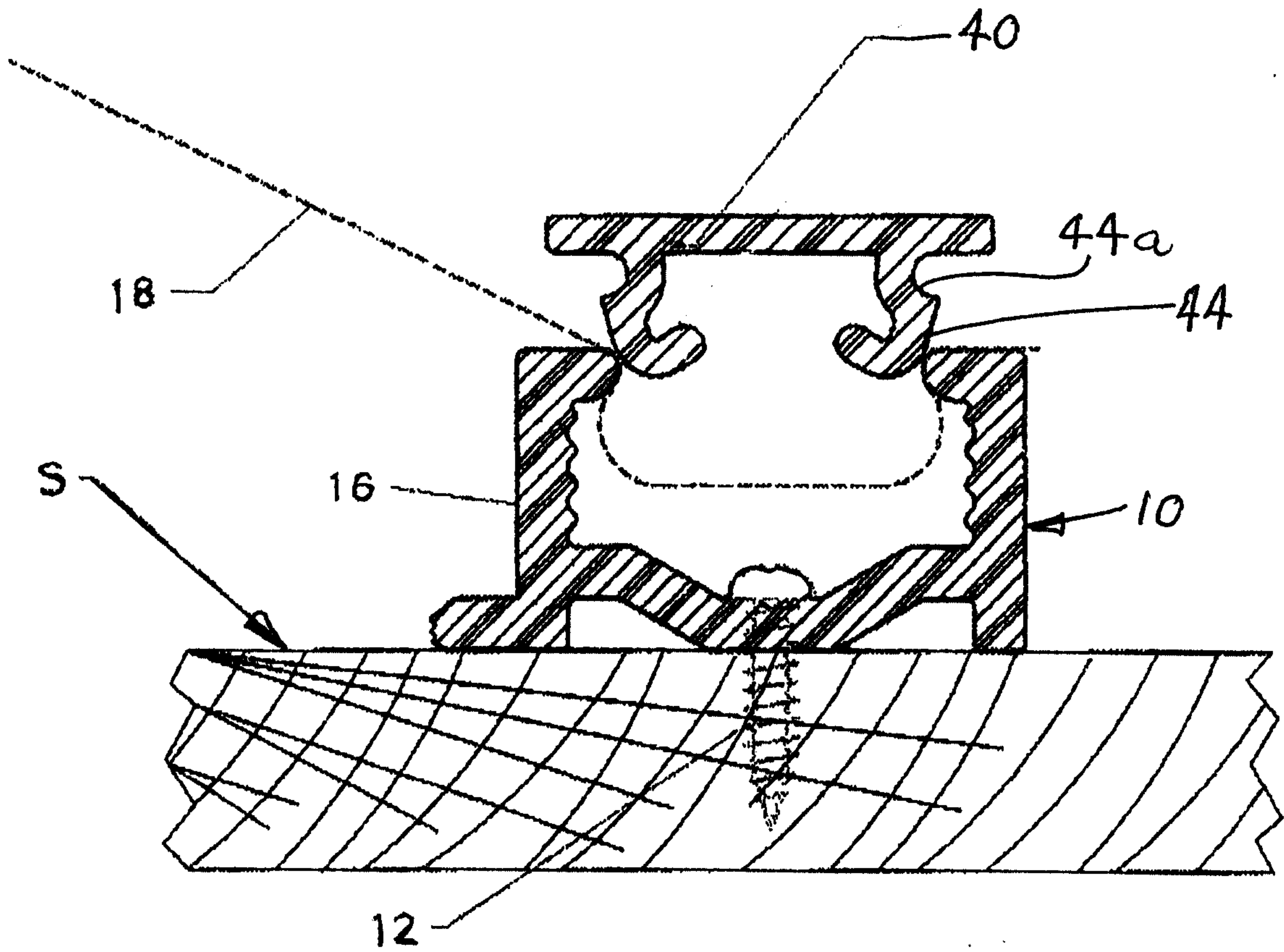


FIG. 5a

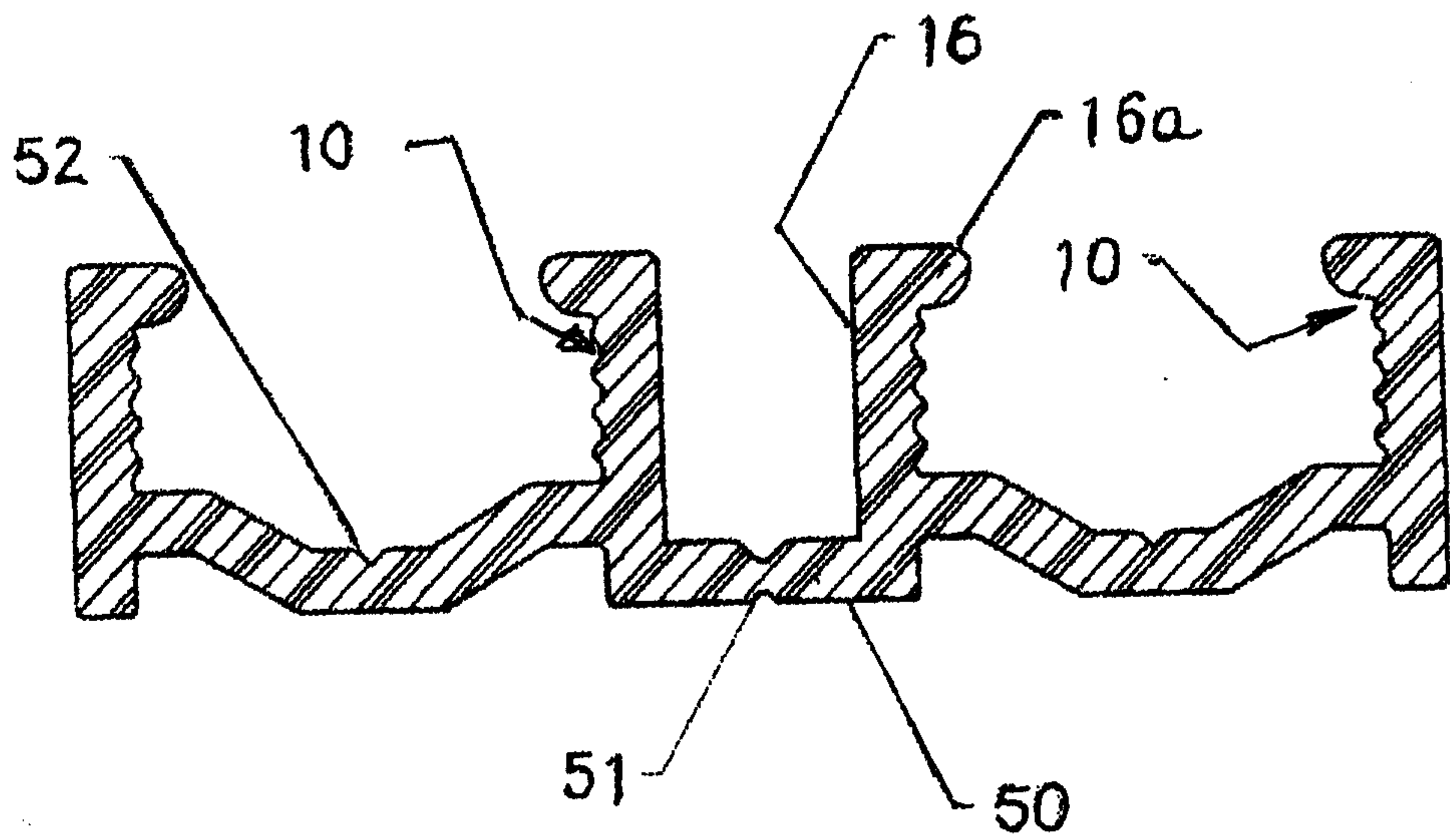


FIG. 6

