



(11) (21) (C) **2,006,677**
(22) 1989/12/27
(43) 1990/06/27
(45) 2000/01/25

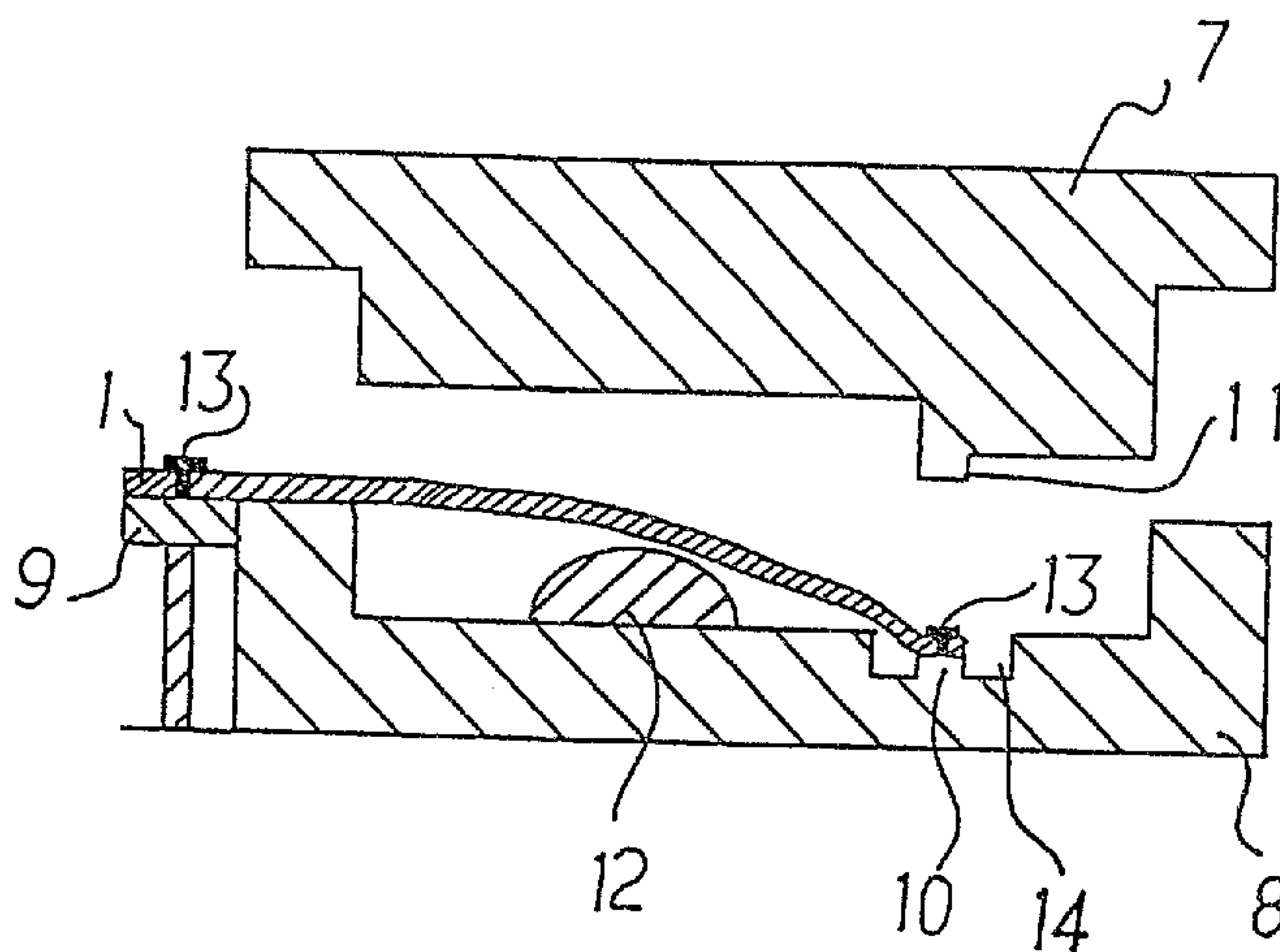
(72) Masui, Shohei, JP
(72) Matsumoto, Masahito, JP
(72) Usui, Nobuhiro, JP
(72) Hosokawa, Toshihiro, JP
(72) Ishitsubo, Ryuichi, JP
(73) SUMITOMO CHEMICAL COMPANY, LIMITED, JP

(51) Int.Cl.⁶ B29C 43/20

(30) 1988/12/27 (334089/1988) JP

(54) **METHODE ET MOULE DE FABRICATION D'UN ARTICLE
MOULE MULTICOUCHE**

(54) **PROCESS AND MOLD FOR PRODUCING A MULTILAYER
MOLDED ARTICLE**



(57) A multilayer molded article comprising a resin body and a skin material covering a part of the surface of the resin body, an edge part of which skin material is placed in a groove formed in the surface of the resin body, is produced by providing an unclosed mold comprising a lower mold having at least one pin for fixing the edge part of the skin material and an upper mold having a projection for forming the groove. The skin material is placed on the lower mold while fixing the edge part of the skin material with the pin. A mass of resin melt is then supplied between the skin material and the lower mold, and the upper and lower molds are closed to form the article.

2006677

Abstract

5 A multilayer molded article comprising a resin body
and a skin material covering a part of the surface of the
resin body, an edge part of which skin material is placed
in a groove formed in the surface of the resin body, is
produced by providing an unclosed mold comprising a lower
mold having at least one pin for fixing the edge part of
the skin material and an upper mold having a projection
for forming the groove. The skin material is placed on
10 the lower mold while fixing the edge part of the skin
material with the pin. A mass of resin melt is then
supplied between the skin material and the lower mold, and
the upper and lower molds are closed to form the article.

2006677

- 1 -

Process and mold for producing a multilayer molded article

5 The present invention relates to a process and a mold for producing a multilayer molded article comprising a resin body and at least one sheet of a skin material that covers a part of a surface area of the resin body.

10 A multilayer molded article comprising a resin body and a skin material laminated on the resin body has a good appearance due to its high quality and warm feel. Such an arrangement greatly improves the texture of a resin molded article to provide an article of high value and beauty.

Multilayer molded articles are widely used as automobile interior or furnishing materials.

15 To improve the ornamental effect of a multilayer molded article including a skin material, it is desirable to laminate the skin material on a part of the surface of the resin body. However, the conventional processes or molds for producing such a multilayer molded article cannot produce an article of sufficient quality. The free
20 edge of the skin material covering a part of the surface of the resin body cannot be finished to the required degree of perfection.

25 One object of the present invention is to provide a process for producing a multilayer molded article comprising a resin body and skin material that covers a part of the surface of the resin body.

Another object of the present invention is to provide a mold suitable for producing such an article.

To this end, the invention consists of a process for producing a multilayer molded article comprising a resin body and a skin material covering a part of the surface of the resin body, an edge part of which skin material is placed in a groove formed in a surface of the resin body, which process comprising: providing an unclosed mold comprising a lower mold having at least one pin for fixing the edge part of the skin material at a position where said edge part is located where an upper mold has a projection for forming the groove, placing the skin material on the lower mold while fixing the edge part of the skin material with the pin, supplying a mass of resin melt between the skin material and the lower mold, and closing the upper and lower molds to form the article.

The invention also consists of a mold for producing a multilayer molded article comprising a resin body and a skin material covering a part of the surface of the resin body, an edge part of which skin material is placed in a groove formed in a surface of the resin body, which mold comprises a lower mold having at least one pin for fixing the edge part of the skin material and an upper mold having a projection for forming the groove in the surface of the resin body.

In the drawings:

Fig. 1 is a cross section of a multilayer molded article having skin material covering a part of the surface of the resin body,

Fig. 2 is a perspective view of the article of Fig. 1, Figs. 3 and 4 schematically show a process for producing such an article, according to an embodiment of the present invention,

Figs. 5A, 5B and 5C are respectively a cross section of the upper mold, a plan view of the lower mold and a cross section of the lower mold, of a first embodiment of

a mold according to the present invention,

Fig. 6 is a cross section of an article produced by means of the mold shown in Figs. 5A, 5B and 5C,

5 Figs. 7A, 7B and 7C are respectively a cross section of the upper mold, a plan view of the lower mold and a cross section of the lower mold, of a second embodiment of a mold according to the present invention,

Fig. 8 is a cross section of an article produced by means of the mold shown in Figs. 7A, 7B and 7C.

10 In the present invention, the skin material may be any of conventionally used materials. Specific examples of the skin material are woven or non-woven fabric, nets made of metals, fibers or thermoplastic resins, paper, metal foils, or a sheet or a film of a thermoplastic resin or an
15 elastomer. The skin material may be decorated with uneven patterns such as grain patterns, printing, dyeing or the like. In addition, the skin material may be made of a foamed material or of a thermoplastic resin or rubber. Also, a laminate comprising at least two layers, each made
20 of the same material or of different materials bonded to each other with an adhesive, can be used as the skin material. Before the skin material is supplied to the mold, a part or all of the skin material can be preheated to adjust its tensile stress and elongation.

25 As the resin to be molded by the process of the present invention, any of the conventional resins used in compression molding, injection molding and extrusion molding can be used. Specific examples of the resin are non-expandable or expandable resins of thermoplastic
30 resins (e.g. polypropylene, polyethylene, polystyrene, acrylonitrile-styrene-butadiene copolymer, nylon, etc.), and thermoplastic elastomers (e.g. ethylene-propylene copolymer, styrene-butadiene copolymer, etc.). The resin may contain at least one additive such as fillers (e.g.
35 inorganic fillers and glass fibers), pigments, lubricants, antistatic agents and the like.

Figs. 1 and 2 show a cross section and a perspective view, respectively, of a multilayer molded article 6 produced in one embodiment of the present invention, which article has skin material 1 covering a part 5 of a surface of a resin body 2, leaving a surface area 4 uncovered. An edge part 1a is placed in a groove 3 formed in the surface of the resin body 2.

The groove 3 has a width and a depth sufficient for receiving the edge part 1a of the skin material 1, and the size of the groove 3 depending on the material, thickness and width of the edge part of the skin material.

One example of a mold to be used in a process according to the present invention is shown in Fig. 3.

The mold comprises an upper mold 7 and a lower mold 8. The lower mold 8 has means for fixing the edge part 1a of the skin material 1. In one embodiment, one or more pins 13 are retained on one or more discretely formed protrusions, as shown in Fig. 3.

The number of pins depends on the length of the edge part 1a to be fixed. Further, the protrusions and the pins can be movable in the direction in which the molds are closed, although they can be fixed to the lower mold 8.

When a pin 13 is vertically movable, it will be lifted to a level at which the edge portion 1a is easily fixed with the pin 13, being lowered to the desired level during molding.

The upper mold 7 has a projection 11 at a position to contact the edge part 1a. The projection 11 can be movable in the direction in which the molds are closed.

Edge parts other than the edge part 1a can be fixed with a clamping frame 9 surrounding the mold.

A multilayer molded article can be produced using the mold of Fig. 3 as follows:

The edge part 1a of the skin material 1 is fixed to a fixing section 10 by the pin 13. The other edge is then fixed to the clamping frame by the other pin 13.

5 A mass of resin melt 12 is supplied between the skin material 1 and the lower mold 8. Since the edge part 1a is fixed to the fixing section 10, there are gaps between the protrusions, as shown in Fig. 5B, so that the resin melt can flow through such gaps and spread over all of the inner surface of the lower mold 8 when the molds 7 and 8 are closed and the resin melt is compressed.

By this process, the article 6 shown in Fig. 6 is produced.

10 In the embodiment of Fig. 7A, 7B and 7C, the pins 13 are directly attached to the bottom of a groove 14. The edge part 1a of the skin material is fixed to the upper part of each pin 13, so that a gap is formed between the skin material and the groove bottom.

15 Using such a mold, the multilayer molded article 6 shown in Fig. 8 can be produced by substantially the same procedure as described above.

20 In an article produced by a process of the present invention, a clear boundary is formed between the covered surface area 5 and the uncovered surface area 4.

Claims:

5 1. A process for producing a multilayer molded article comprising a resin body and a skin material covering a part of the surface of the resin body, an edge part of which skin material is placed in a groove formed in a surface of the resin body, which process comprising:

10 providing an unclosed mold comprising a lower mold having at least one pin for fixing the edge part of the skin material at a position where said edge part is located where an upper mold has a projection for forming the groove,

placing the skin material on the lower mold while fixing the edge part of the skin material with the pin,

15 supplying a mass of resin melt between the skin material and the lower mold, and

closing the upper and lower molds to form the article.

20 2. A mold for producing a multilayer molded article comprising a resin body and a skin material covering a part of the surface of the resin body, an edge part of which skin material is placed in a groove formed in a surface of the resin body, which mold comprises a lower mold having at least one pin for fixing the edge part of the skin material and an upper mold having a projection for forming the groove in the surface of the resin body.

25 3. The mold according to claim 2, wherein the fixing pin is retained on a protrusion on the lower mold.

4. The mold according to claim 3, wherein the protrusion is movable in the direction in which the upper and lower molds are closed.

30 5. The mold according to claim 3, wherein the pin is formed in a groove in the lower mold.

Fig. 1

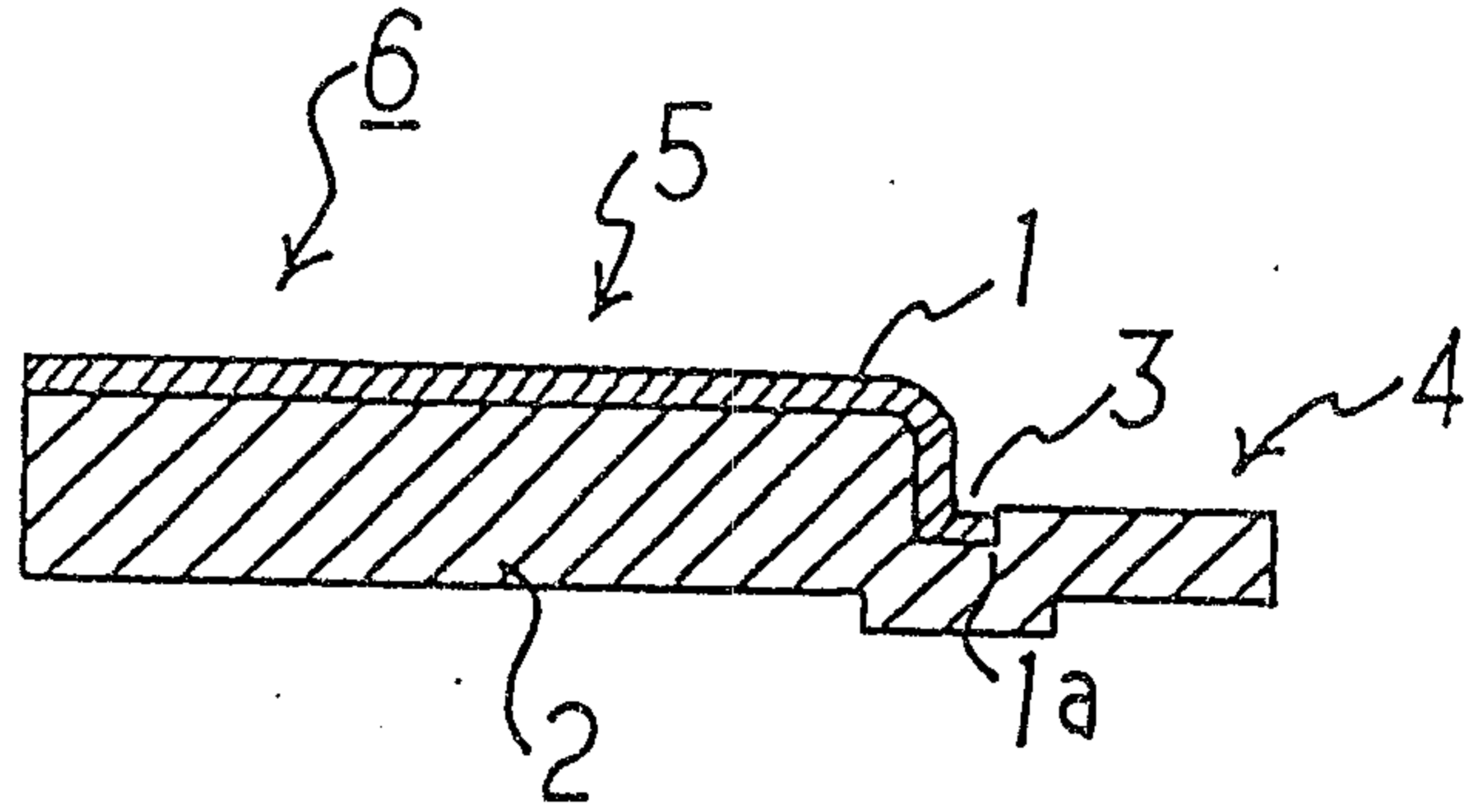


Fig. 2

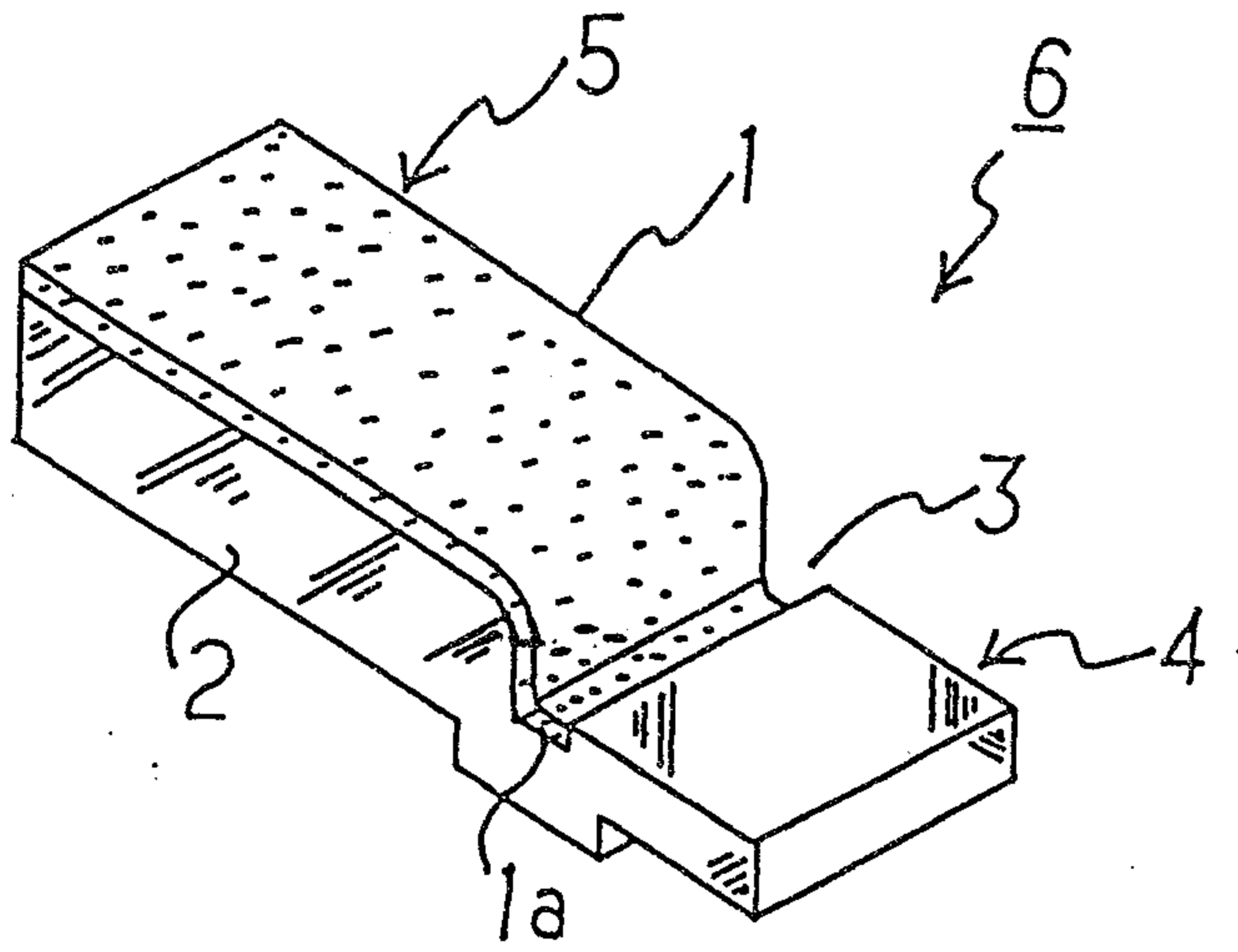


Fig. 3

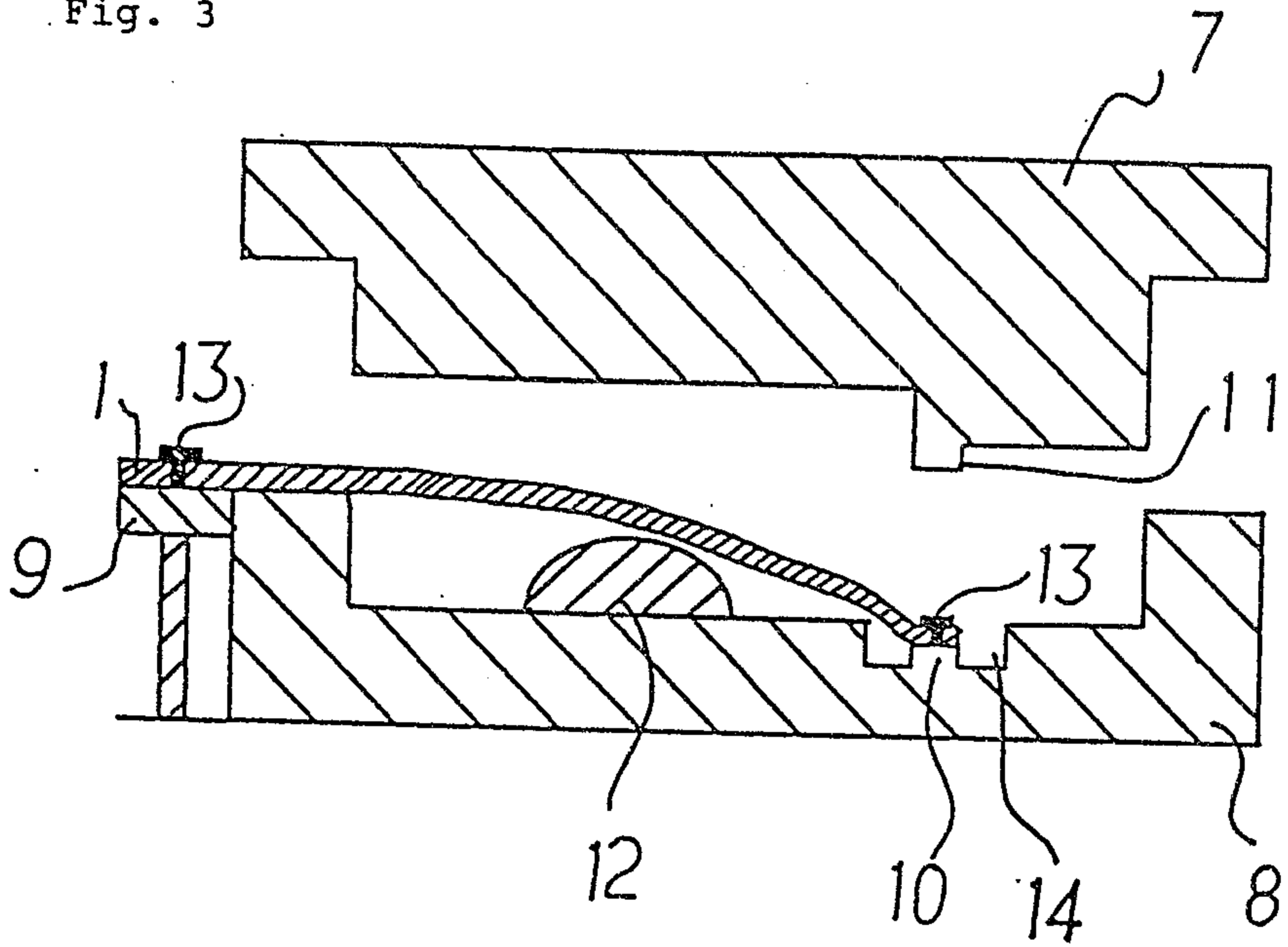


fig. 4

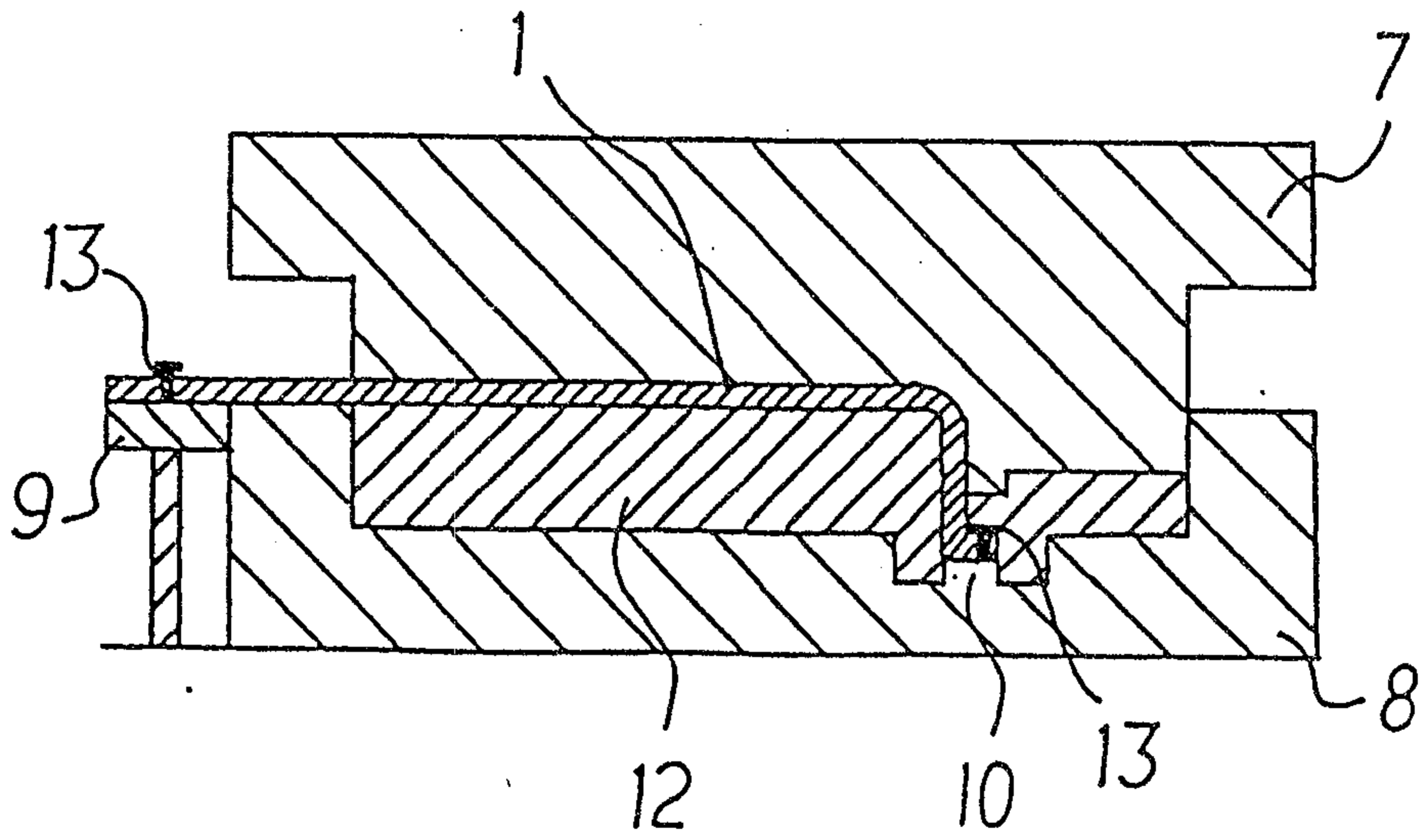


Fig. 5A

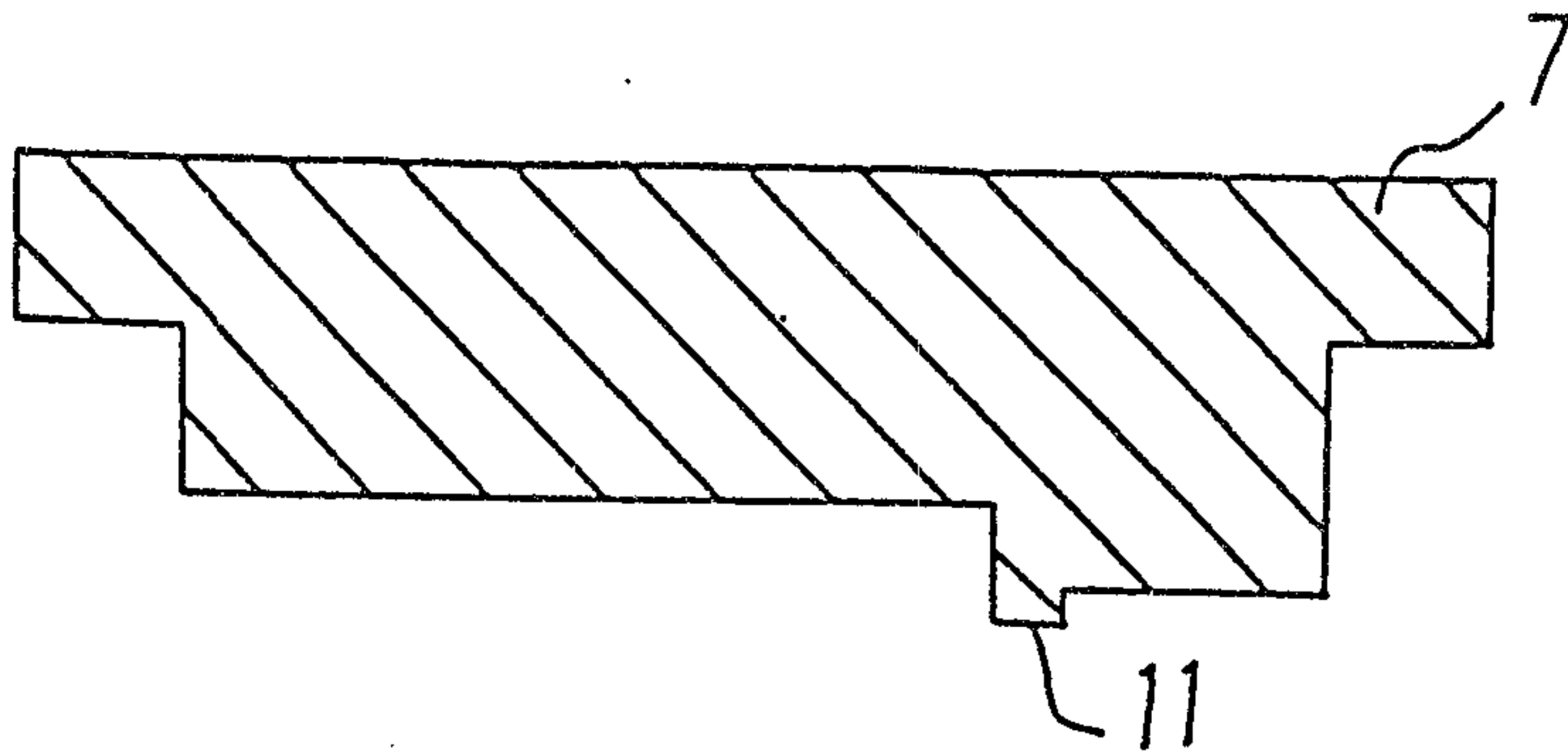


Fig. 5B

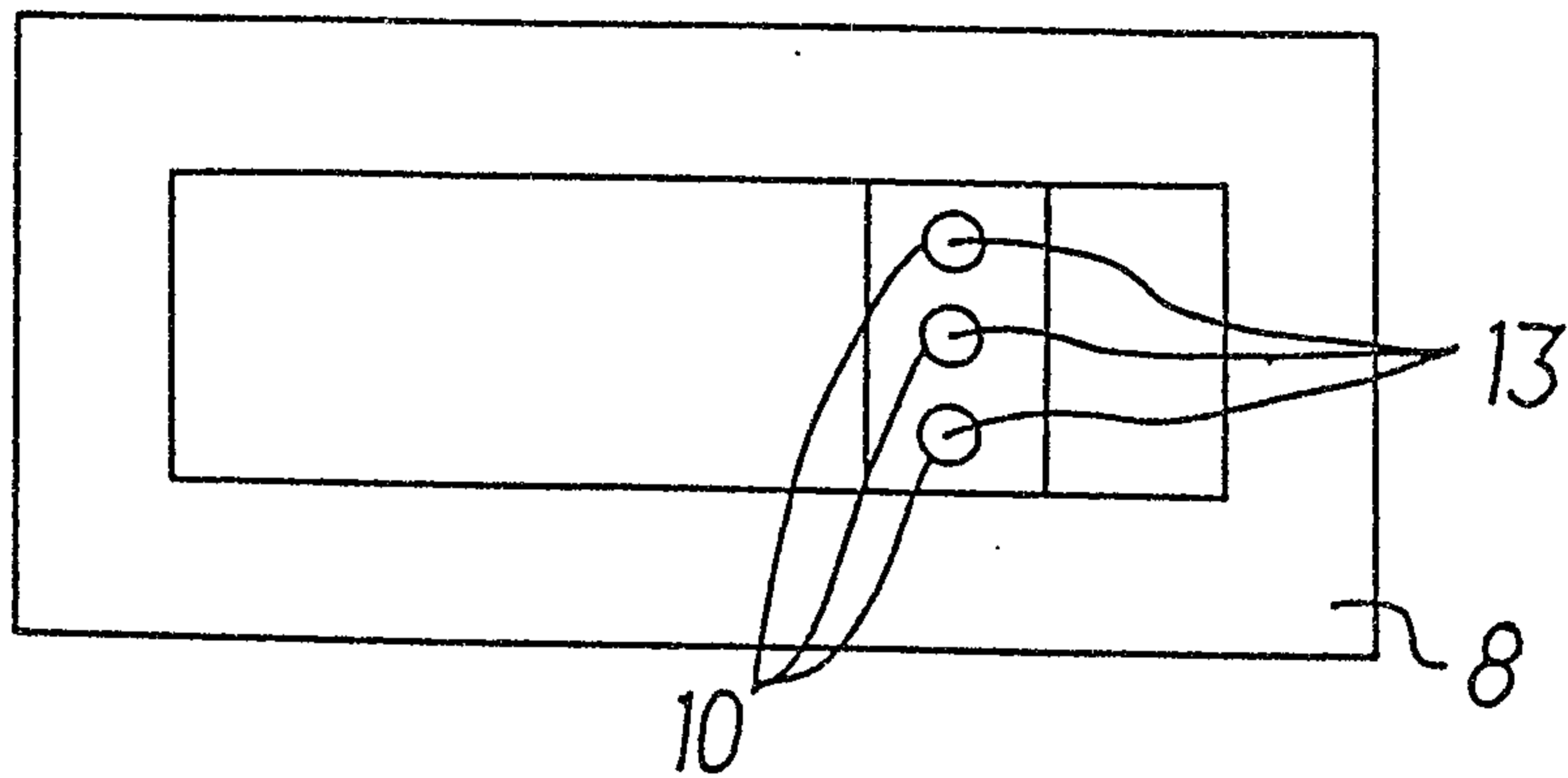


Fig. 5C

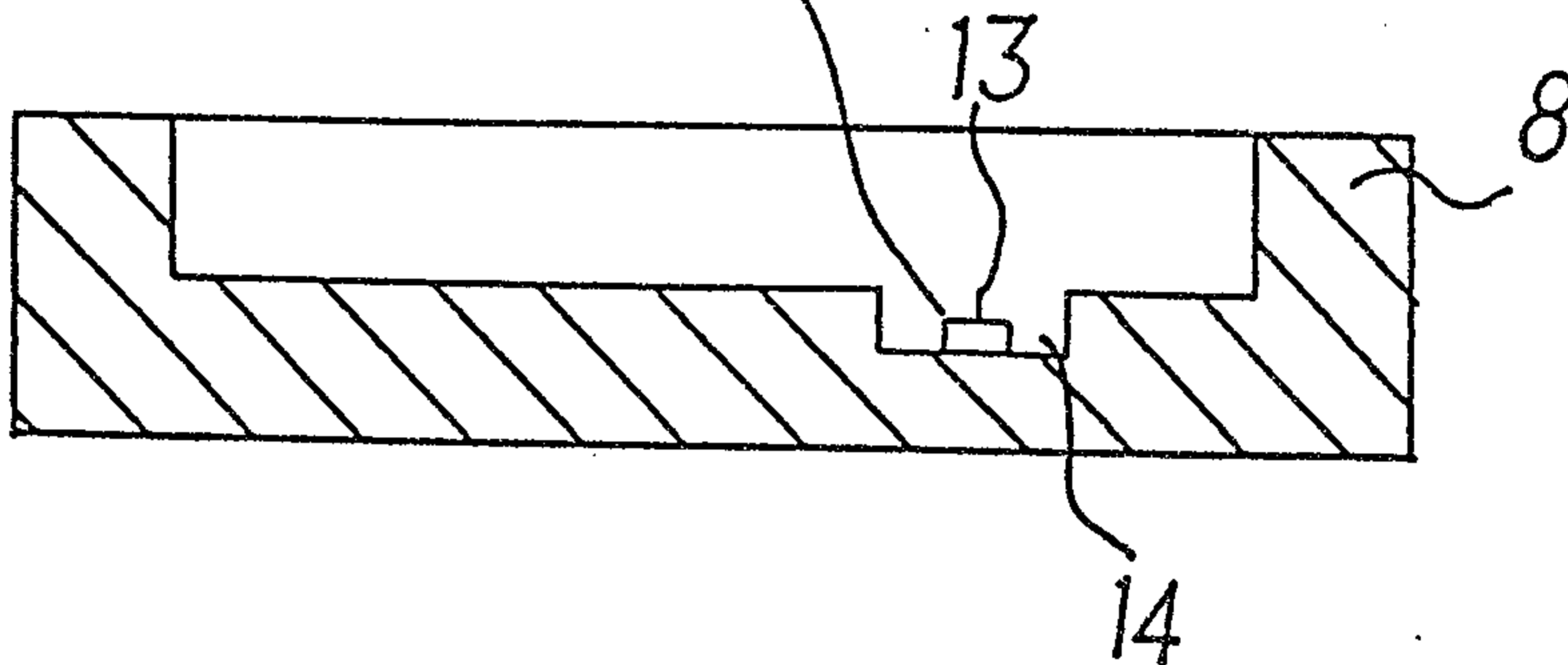


Fig. 6

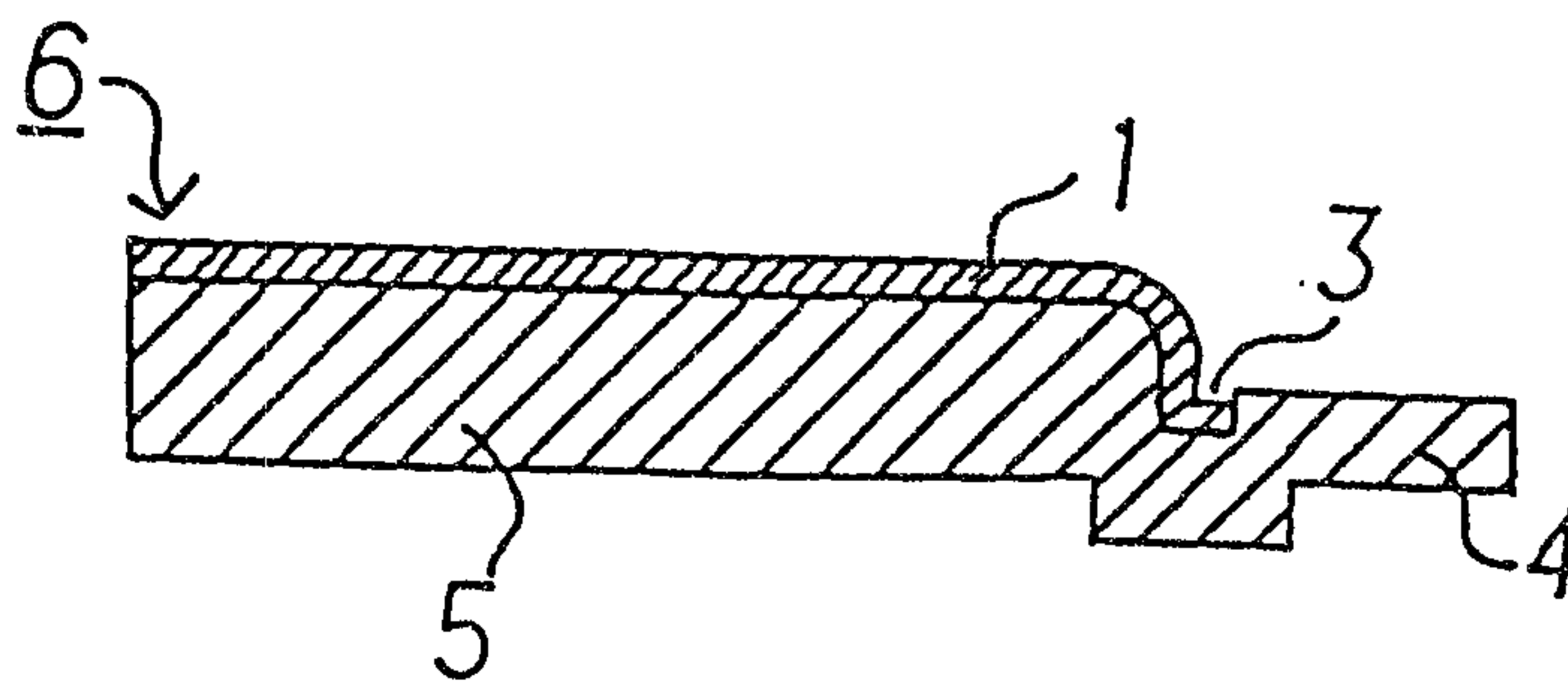


Fig. 7A

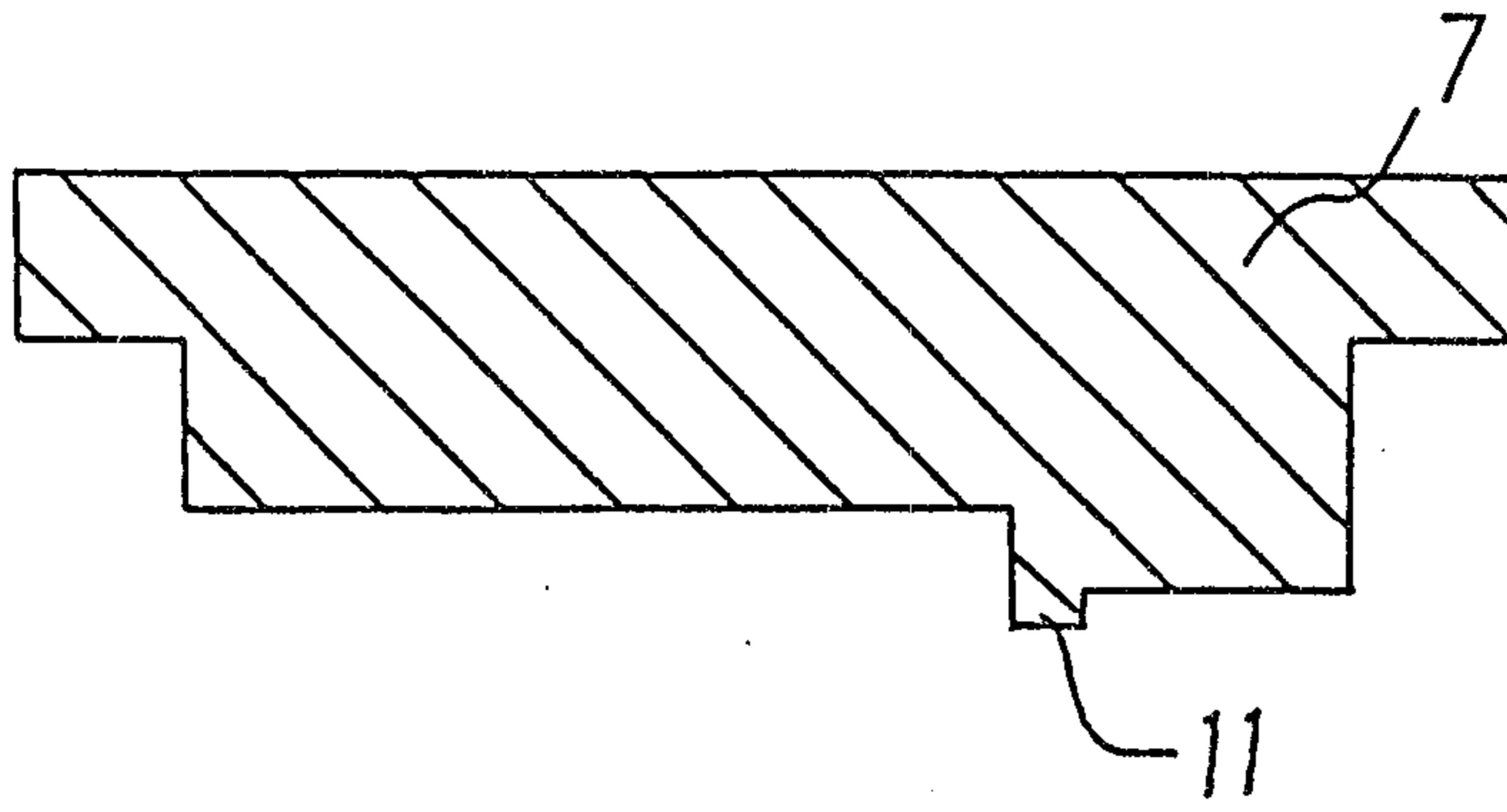


Fig. 7B

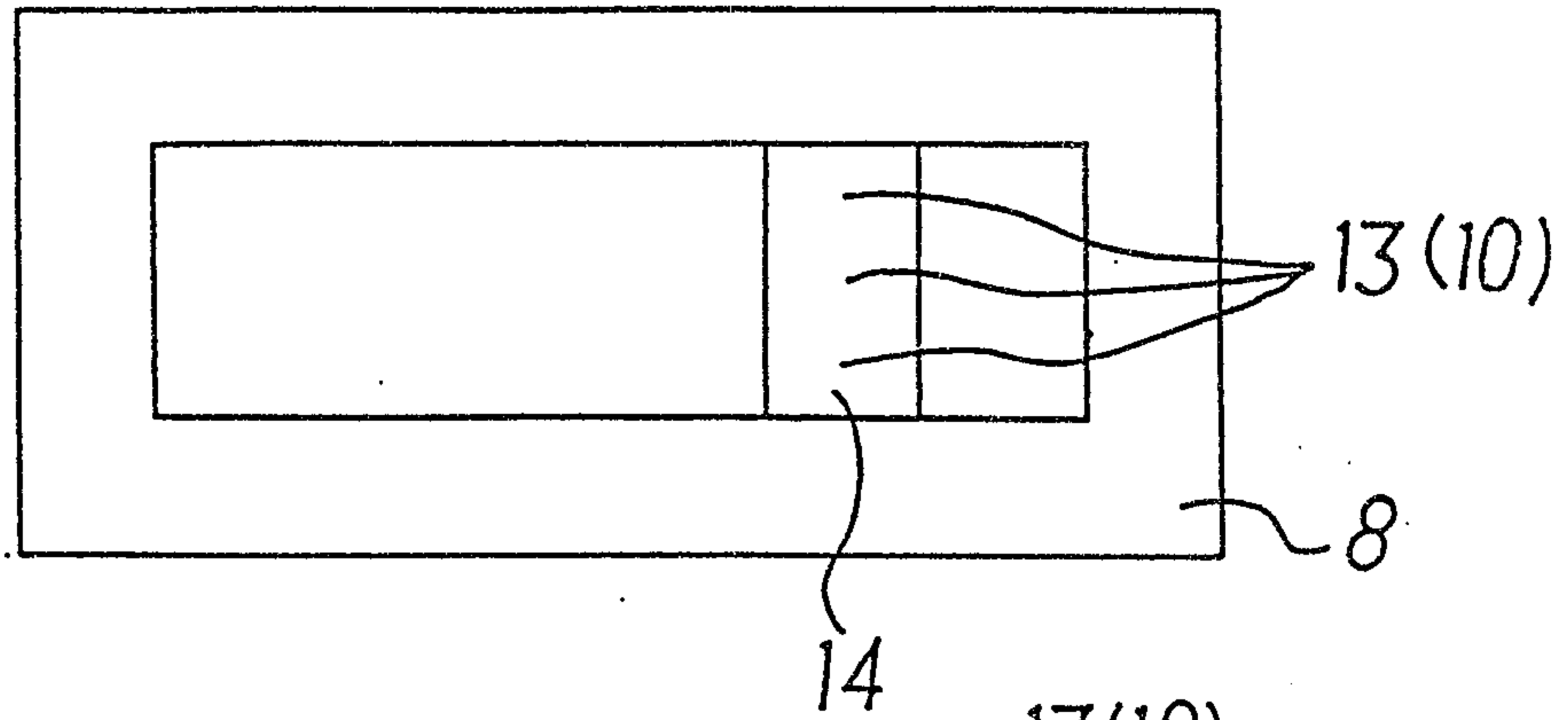


Fig. 7C

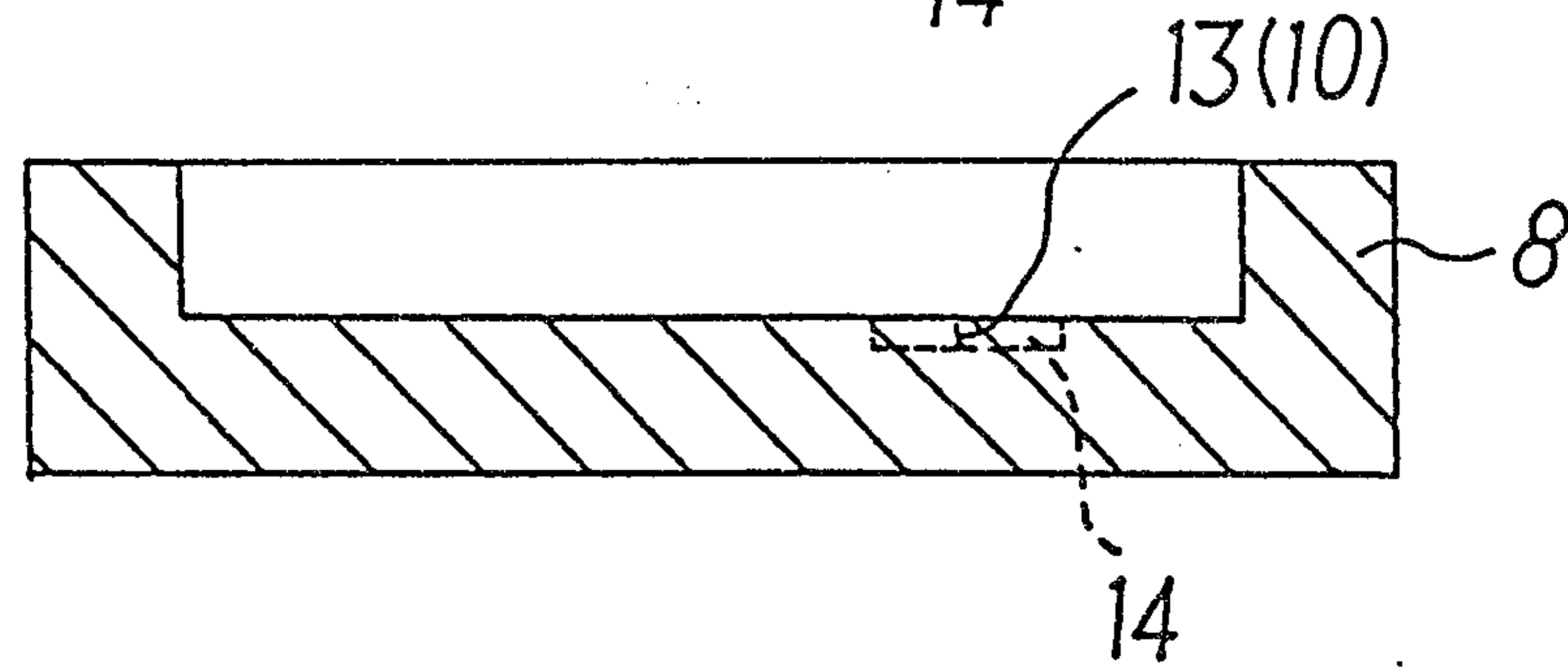


Fig. 8

