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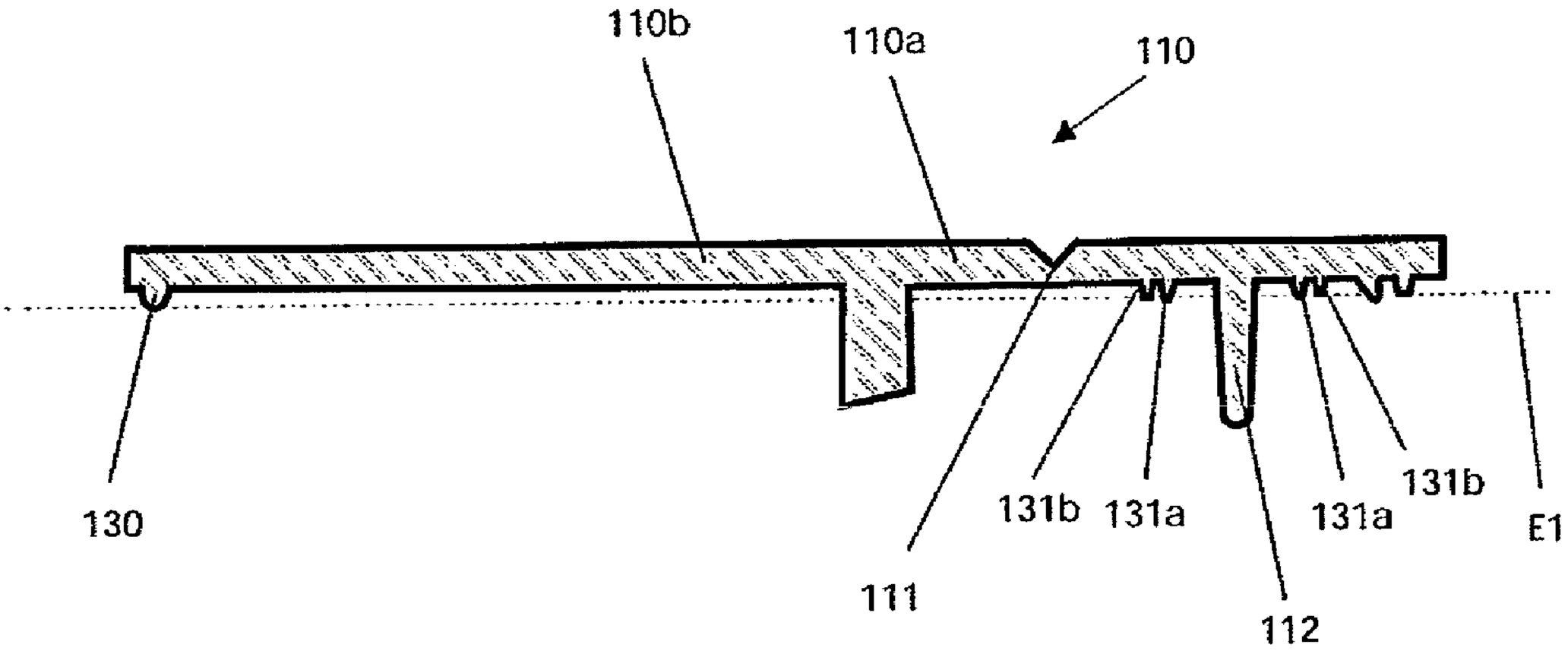


(57) **Abrégé/Abstract:**
The invention relates to a lid of a container, in particular of a beverage can, having at least one outlet opening which penetrates the lid and can be re-closed by at least one closure element, which is arranged on the underside of the lid, and the at least one closure element can by an actuating element arranged on the upper side of the lid be moved from a closed position, in which the at least one outlet opening is closed, into an open position, in which the outlet opening is at least partially exposed, where the at least one closure element comprises a first sealing means for sealing the at least one outlet opening in relation to the underside of the lid and the actuating element has at least one second sealing means which seals the at least one outlet opening in relation to the upper side of the lid.

ABSTRACT

The invention relates to a lid of a container, in particular of a beverage can, having at least one outlet opening which penetrates the lid and can be re-closed by at least one closure element, which is arranged on the underside of the lid, and the at least one closure element can by an actuating element arranged on the upper side of the lid be moved from a closed position, in which the at least one outlet opening is closed, into an open position, in which the outlet opening is at least partially exposed, where the at least one closure element comprises a first sealing means for sealing the at least one outlet opening in relation to the underside of the lid and the actuating element has at least one second sealing means which seals the at least one outlet opening in relation to the upper side of the lid.

Lid of a container

The invention relates to a lid of a container, in particular of a beverage can.

Containers of the type described above are produced, for example, as re-closable beverage cans. In a particularly advantageous embodiment of such cans, a pour opening is provided in the lid panel that is like the remainder of the can made of metal, typically made of aluminum or tinplate. This opening is closed by a closure element bearing against the interior of the can at the lid panel. This closure element is moved by an actuating element actuatable from the exterior, for example, by a flap or a slider, from a closed position to an open position, whereby the pour opening is exposed for emptying the can and can again be closed in a tight manner after the initial opening. Such a beverage can be learned, for example, from the applicant's AT 507 950 A1.

A major problem with re-closable beverage cans is the required low bacterial count. After the initial opening and partial emptying of the beverage can, remains of the content often remain in the region of the pour opening, which after re-closuring are a source of contamination and hence of the occurrence of mold and the like.

It is therefore an object of the invention to provide a lid for a re-closable container that also after re-closure and during prolonged storage prevents contaminants from occurring or entering in the region of the can opening as well as possibly in the beverage can.

In view of this object, the present invention provides that the actuating element comprises at least one second sealing means that seals the at least one outlet opening in relation to the upper side of the lid. The combination of two sealing means leads to the fact that the first sealing means being arranged on the interior on the closure element prevents any leakage of the beverage contents via the outlet opening, whereas the second sealing means seals the outlet

opening relative to the environment and thereby prevents contaminants from entering at the outlet opening during the production cycle, in particular during bottling, where appropriate during post treatment and during transportation to the customer.

In a particularly preferred embodiment of the invention, at least one further opening is provided, spaced apart from the at least one outlet opening and penetrating the lid, which is likewise sealed by the second sealing means relative to the upper side of the lid. This second opening penetrating the lid is a pressure equalization opening which when actuating the actuating element for opening the container is first exposed in order to relieve the pressure usually prevailing in the beverage can when it is filled with a carbonated beverage, in order to then expose the outlet opening itself. This second opening as well is susceptible to contamination, so that this pressure equalization opening is in this embodiment of the invention also sealed by the second sealing means which is arranged on the actuating element. It can also be provided, however, that this opening is by a further, third sealing means protected against contamination from the environment.

A particularly good seal is achieved when the second and/or third sealing means is formed as a sealing lip and/or a sealing edge. In a particularly preferred embodiment of the invention, the sealing lip or sealing edge forms an angle with the lid panel different from 90 degrees, which results in an improved seal against the environment.

It is presently particularly preferably provided that the second sealing means is formed integrally with the actuating device. This facilitates mounting the closure device on the lid during production and reduces misalignment and as a result any problems with the sealing properties of the second sealing means.

Since the actuating element is usually made of rigid plastic material, whereas the sealing means needs to exhibit flexible properties for sealing, it is particularly preferably provided that the actuating element is produced as a two-component injection-molded member in order to enable production as a member being integrally formed with the sealing means according to the invention.

In a further embodiment of the invention, the actuating element comprises at least one hinge over which the second sealing means extends. Opening the container and thereby exposing of the outlet opening is therewith facilitated in that the actuating element comprises a hinge which

facilitates lifting and/or displacing the actuating element. The arrangement of the second sealing means over the hinge ensures that the outlet opening and possibly the ventilation opening are securely sealed when the container is re-closed. Reliable sealing of the opening located in the lid is in particular ensured when the second sealing means extends substantially parallel to the outer edge of the actuating element. In this manner, all openings in the lid panel covered by the actuating element are sealed by the second sealing means against the environment.

In a particularly preferred embodiment of the invention, at least one spacer element is arranged at least in part parallel to the second sealing means. The sealing means is due to the internal pressure and the deformation of the container lid resulting therefrom as well as during opening and re-closing of the container subjected to forces that accelerate the wear of the sealing means. The spacer element, preferably being formed as an outer edge, then has the duty to absorb these forces in order to thereby achieve a mechanical decoupling, thereby reducing the forces acting upon the sealing means.

In one variant with particular advantages the second sealing means comprises a first region which in the open position of the closure element is located in the region of the outlet opening and this first portion comprises only a sealing bead. It is often inevitable that the sealing element during the opening motion in a first region passes over the edge of the pour opening. A sealing lip can thereby or during a later closing motion be damaged or destroyed. It is therefore particularly advantageous that the sealing element is in these regions formed in a robust manner and comprises, for example, only a sealing bead. In practice, this is designed such that the sealing lip and the sealing bead unite in the transition to this first region. In this, partially somewhat lesser sealing is accepted to avoid problems when opening and re-closing.

In a further embodiment, there is provided a lid of a container having at least one outlet opening which penetrates said lid and can be re-closed by at least one closure element,

wherein said at least one closure element is arranged on an underside of said lid,

wherein said at least one closure element can by an actuating element arranged on an upper side of said lid be moved from a closed position, in which said at least one outlet opening is closed, into an open position, in which said at least one outlet opening is at least partially exposed,

wherein said at least one closure element comprises a first sealing means for sealing said at least one outlet opening in relation to said underside of said lid,

wherein said actuating element comprises at least one second sealing means which seals said at least one outlet opening in relation to said upper side of said lid; and

wherein said at least one second sealing means is designed at least partly as a double seal, and said at least one second sealing means comprises a first region which is in the open position of said at least one closure element located in the region of said at least one outlet opening, and wherein said first region comprises only a sealing bead.

The invention is below explained in more detail by way of a non-restricting embodiment with accompanying figures.

Fig. 1 shows a perspective view of the lid according to the invention,

Fig. 2 shows a sectional view of the lid of Fig. 1,

Fig. 3 shows a sectional view of the actuating element shown in Fig. 1,

Fig. 4 shows the underside of the actuating element facing the lid panel,

Fig. 5 shows a further embodiment of the second sealing means in a sectional view, and

Fig. 5a and Fig. 5b show variants of Fig.5.

The invention relates to a lid of a container, in particular of a beverage can, having at least one outlet opening which penetrates the lid and can be re-closed by at least one closure element, where the at least one closure element is arranged on the underside of the lid, and the at least one closure element can by an actuating element arranged on the upper side of the lid be moved from a closed position, in which the at least one outlet opening is closed, into an open position, in which the outlet opening is at least partially exposed, and the at least one closure element comprises a first sealing means for sealing the at least one outlet opening in relation to the underside of the lid.

Fig. 1 shows a lid 100 according to the invention in a perspective view, where on the lid panel 101, an actuating element 110 is arranged which is designed in two parts, and the actuating element 110 comprises a fixation element 110a that is via a hinge 111 in connection with a sliding element 110b.

As shown in the sectional view of Fig. 2, the lid panel 101 comprises a pour opening 103 which is in the closed position of the actuating element 110 closed by a closure element 120 arranged below the lid panel 101. This closure element 120 comprises a first sealing means 121 that seals the container content in relation to the underside of the lid panel (101), thereby preventing leakage of the re-closed beverage can.

In the lid panel 101, an opening is furthermore arranged which continues in the closure element 120 as a pressure equalization opening 122 into which a pin 112 of the fixation element 110 engages when the container is closed.

Fig. 3 shows the actuating element 110 in a sectional view, where on the underside of the actuating element 110, a second sealing means 130 is arranged which extends substantially along the outer edge of the actuating element 110 (Fig. 4). Furthermore, a third sealing means 131 is disposed on the fixation element 110a and surrounds the pin 112. This third sealing means 131 is formed as a double seal comprising a sealing lip 131a and a sealing bead 131b which is formed in the manner of an O-ring. In this, the sealing bead 131b serves not only for sealing purposes but also as a spacer element that protects the sealing lip from excessive load during improper opening or closing. The sealing lip 131a intersects the bearing plane E1 of the actuating element 110 on the lid panel 101 at an angle of about 40° to 50°. With the arrangement of the inventive third sealing means 131 on the underside of the actuating element 110, the pressure equalization opening 122 is sealed in relation to the environment when the container is closed.

In this embodiment of the invention the second and the third sealing means 130, 131 are made from a single material, namely the same as that of the actuating element 110. The sealing lip 131a is designed in a particularly slim manner in order to achieve sufficient flexibility and thereby sealing.

Figs. 5 show further embodiments of the third sealing means 131 according to the invention, where it should be noted that the following comments apply analogously to the second sealing element 130.

A sealing edge 131b of the sealing bead is in the variant of Fig. 5 further provided in addition to a sealing lip 131a, where the entire sealing means 131 is designed as a soft component of an actuating element 110 produced by two-component injection-molding.

The variant of Fig. 5a provides that only the sealing lip 131a is made of soft material, and a variant is shown in Fig. 5b which provides an actuating element 110 with the sealing means 131 made of a single material resulting in cost advantages. In this case, the design of the sealing lip 131a is crucial in order to ensure an adequate seal.

It is understood that the lid according to the invention is not restricted to the embodiment described above The second sealing means can in particular be arranged in different ways on the actuating element and have different cross-sections. The outlet opening in the lid panel and an optionally provided pressure equalization opening are sealed from the environment by appropriate sealing means on the actuating element.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A lid of a container having at least one outlet opening which penetrates said lid and can be re-closed by at least one closure element,

wherein said at least one closure element is arranged on an underside of said lid,

wherein said at least one closure element can by an actuating element arranged on an upper side of said lid be moved from a closed position, in which said at least one outlet opening is closed, into an open position, in which said at least one outlet opening is at least partially exposed,

wherein said at least one closure element comprises a first sealing means for sealing said at least one outlet opening in relation to said underside of said lid,

wherein said actuating element comprises at least one second sealing means which seals said at least one outlet opening in relation to said upper side of said lid; and

wherein said at least one second sealing means is designed at least partly as a double seal, and said at least one second sealing means comprises a first region which is in the open position of said at least one closure element located in the region of said at least one outlet opening, and wherein said first region comprises only a sealing bead.

2. The lid according to claim 1, wherein the lid is for a beverage can.

3. The lid according to claim 1 or 2, wherein at least one further opening is provided, spaced apart from said at least one outlet opening and penetrating said lid, which is sealed by said at least one second sealing means relative to said upper side of said lid.

4. The lid according to claim 3, wherein a third sealing means seals said at least one further opening in relation to said surface of said lid.

5. The lid according to claim 4, wherein said at least one second sealing means, said third sealing means, or both are designed as a sealing lip, a sealing edge, or both.

6. The lid according to claim 5, wherein said at least one second sealing means, said third sealing means, or both are designed as a sealing lip, and wherein said sealing lip forms an angle with said lid different from 90°.

7. The lid according to any one of claims 4 to 6, said at least one second sealing means, said third sealing means, or both are designed integrally with said actuating element.

8. The lid according to claim 4, wherein said third sealing means is designed at least partly as a double seal.

9. The lid according to claim 8, wherein said double seal is composed of a sealing lip and a sealing bead.

10. The lid according to any one of claims 1 to 9, wherein said actuating element is manufactured as a two-component injection-molded member.

11. The lid according to any one of claims 1 to 10, wherein said actuating element comprises at least one hinge over which said at least one second sealing means extends.

12. The lid according to any one of claims 1 to 11, wherein said at least one second sealing means extends substantially parallel to an outer edge of said actuating element.

13. The lid according to any one of claims 1 to 12, wherein said at least one second sealing means extends substantially along said outer edge of said actuating element.

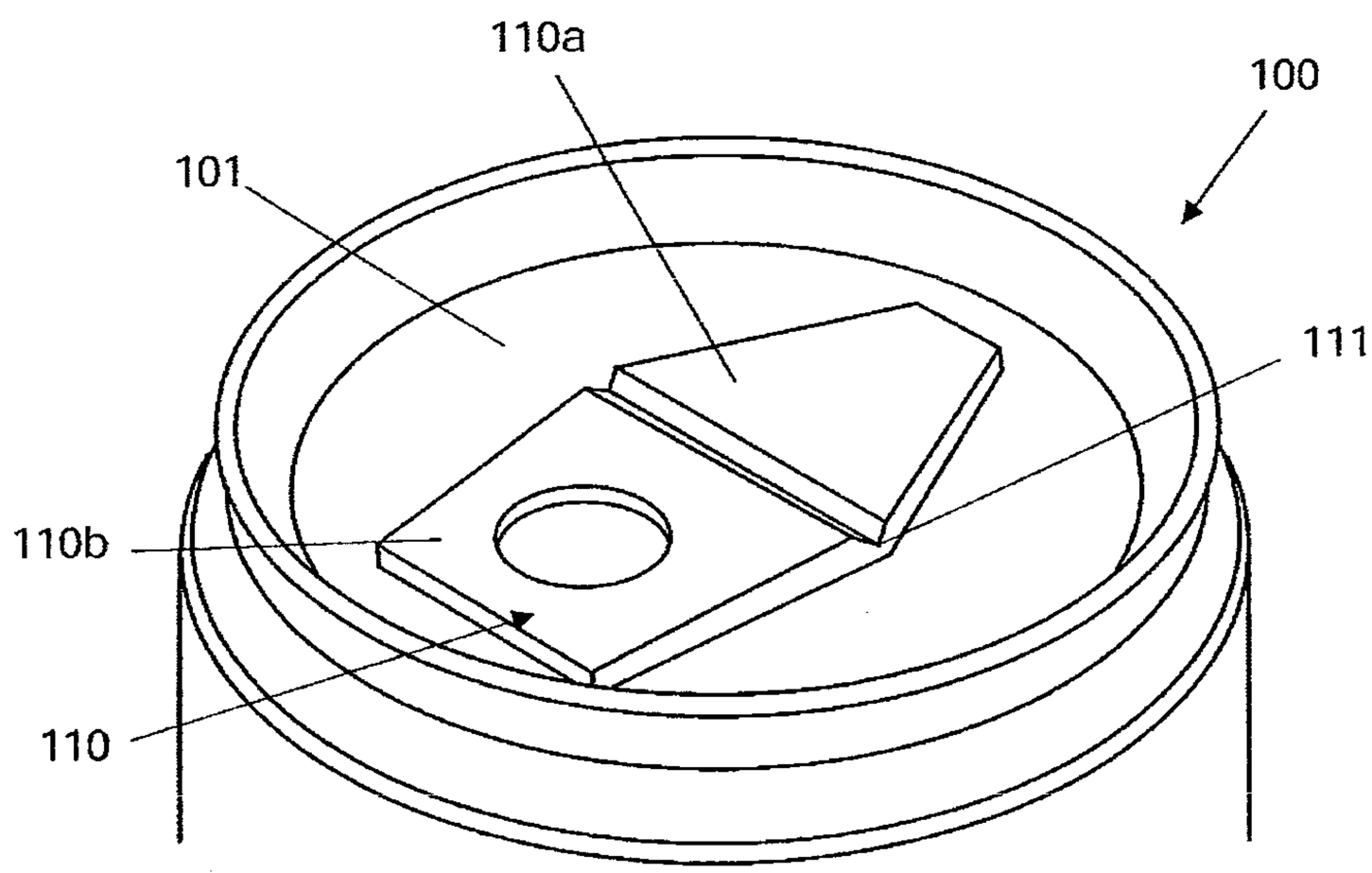


Fig. 1

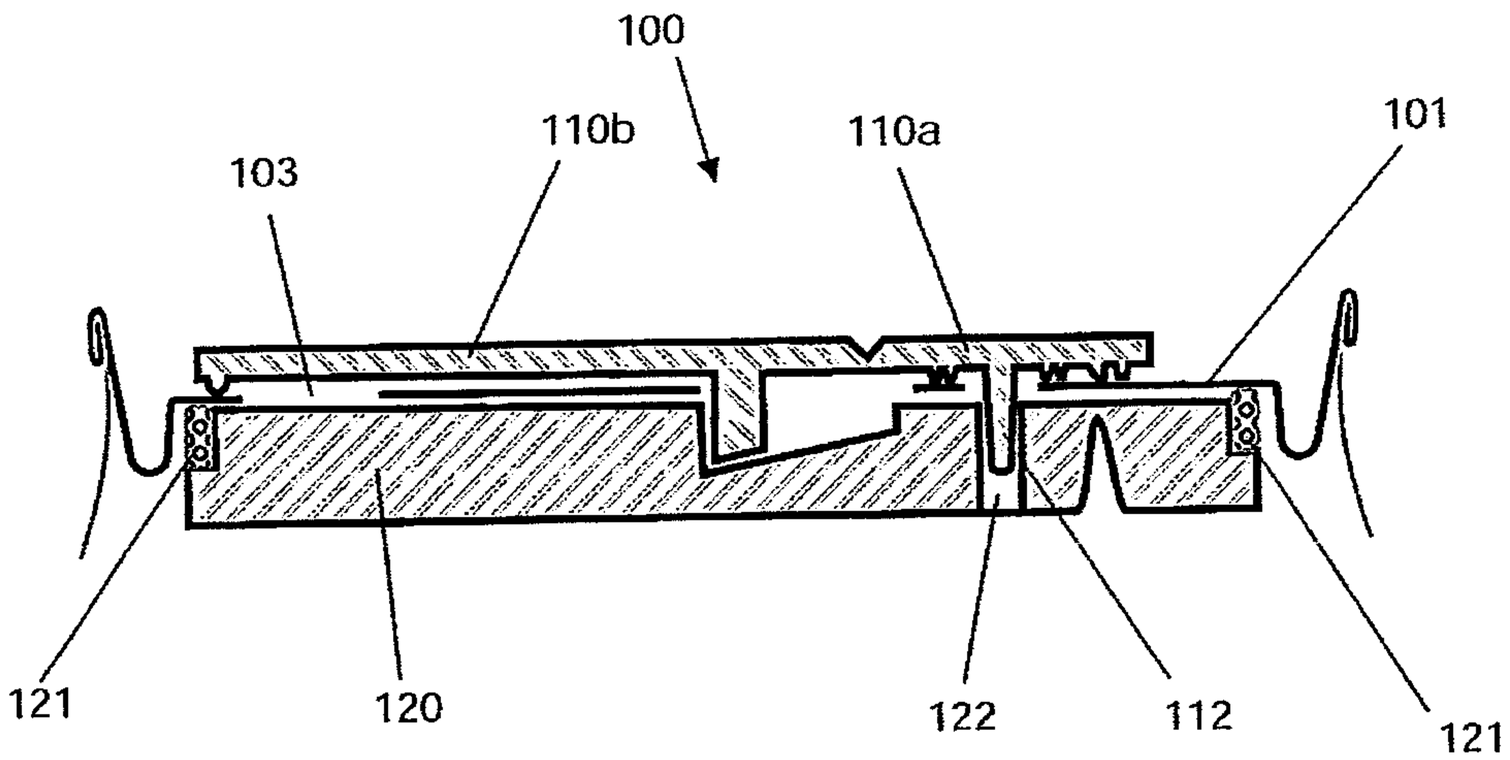


Fig. 2

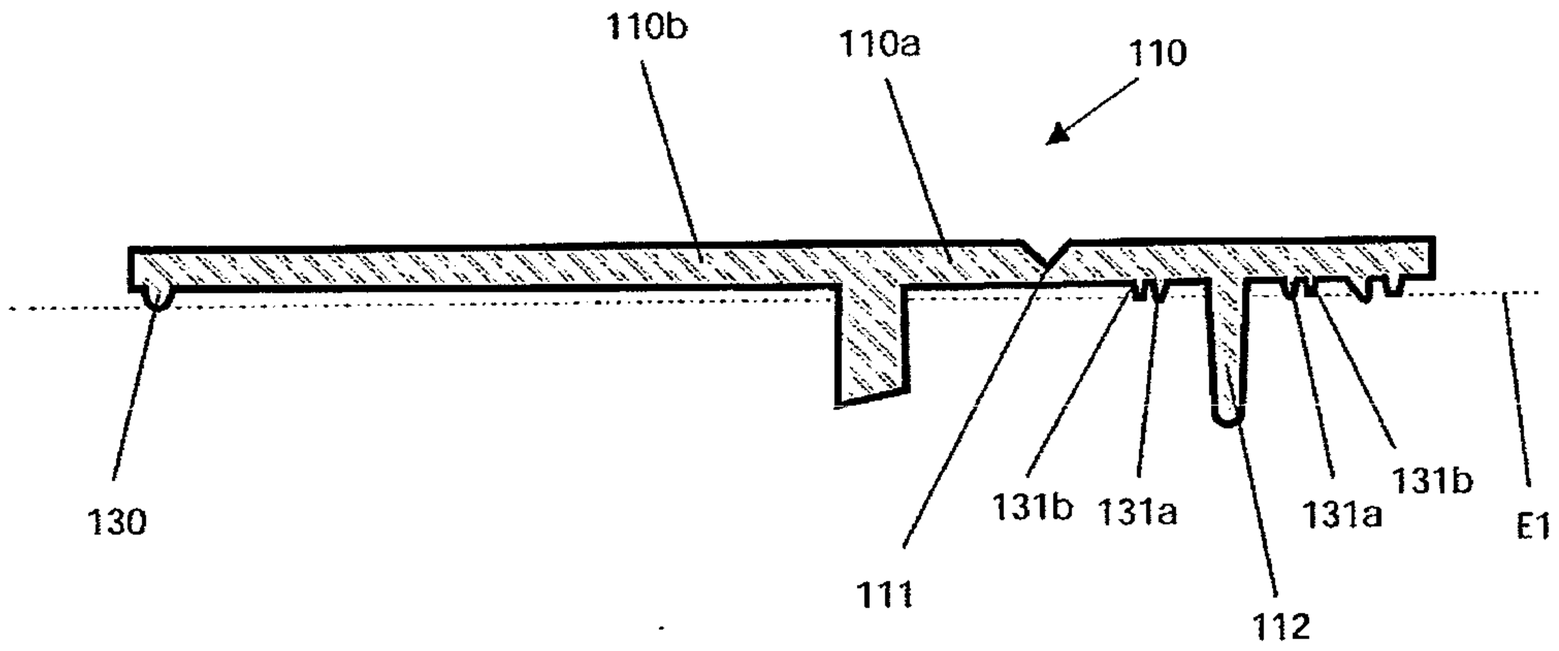


Fig. 3

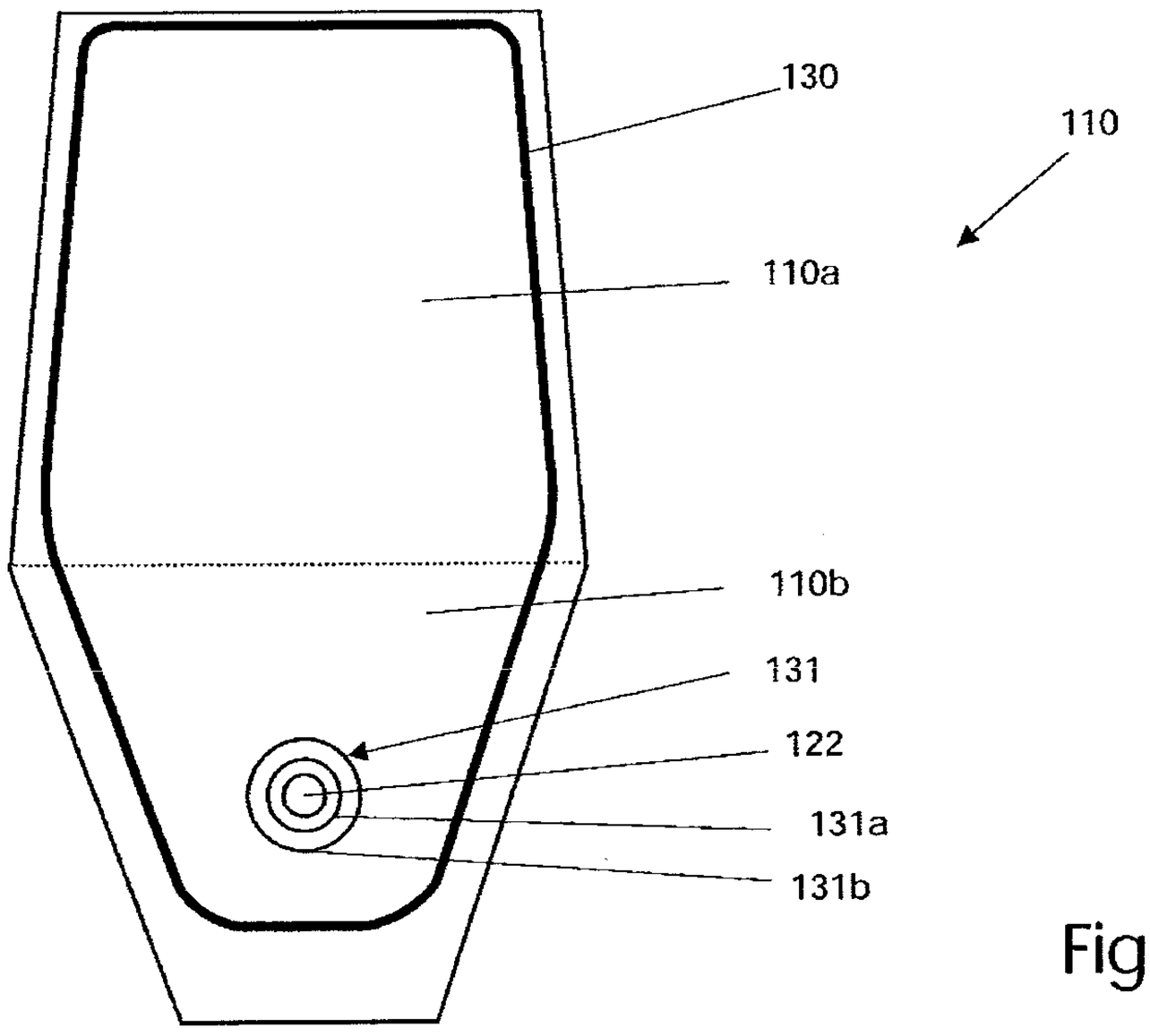


Fig. 4

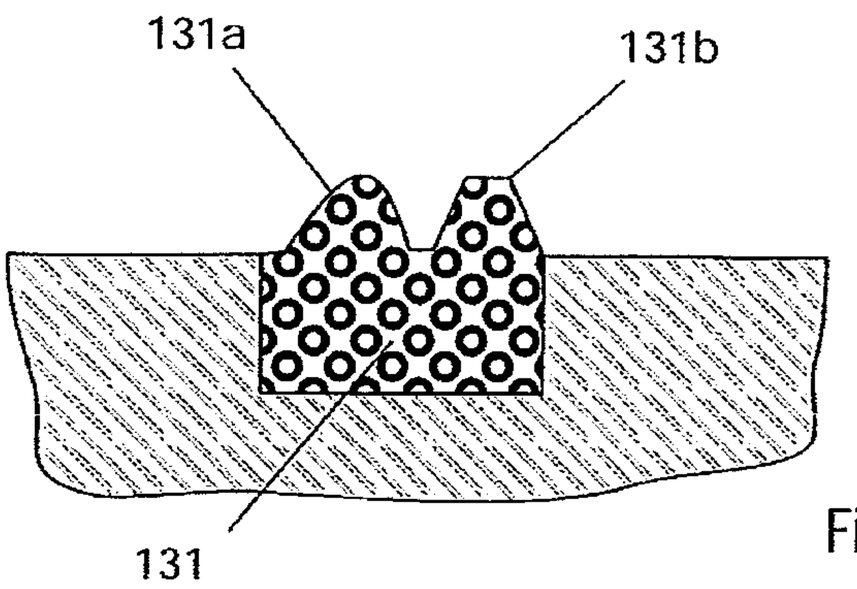


Fig. 5

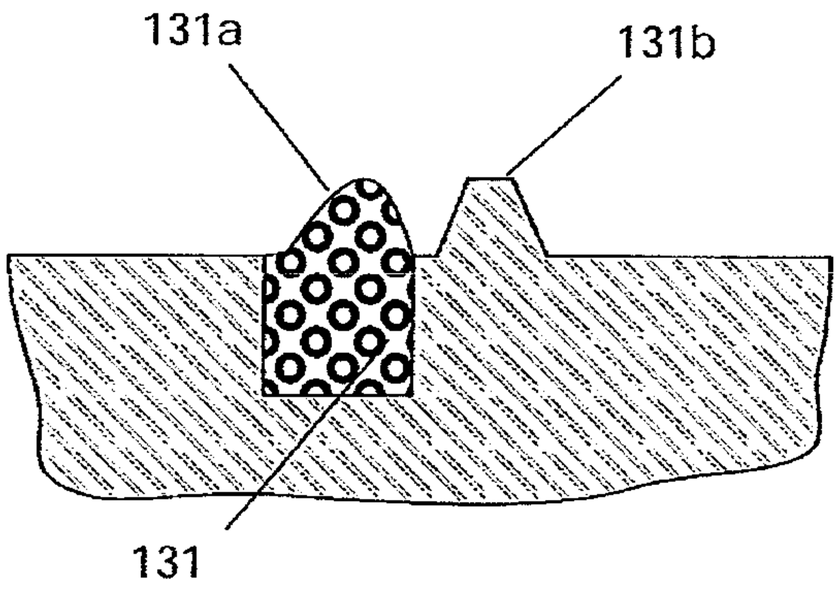


Fig. 5a

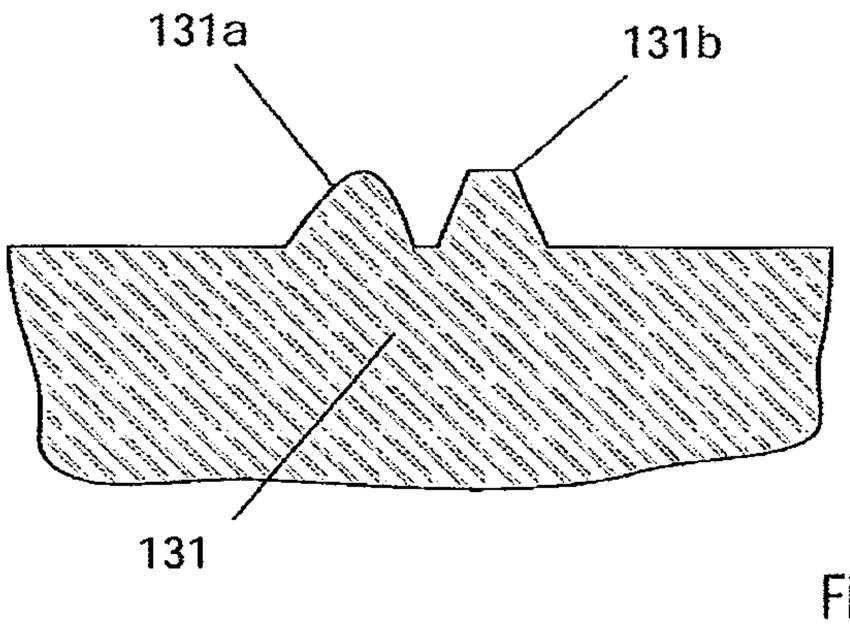
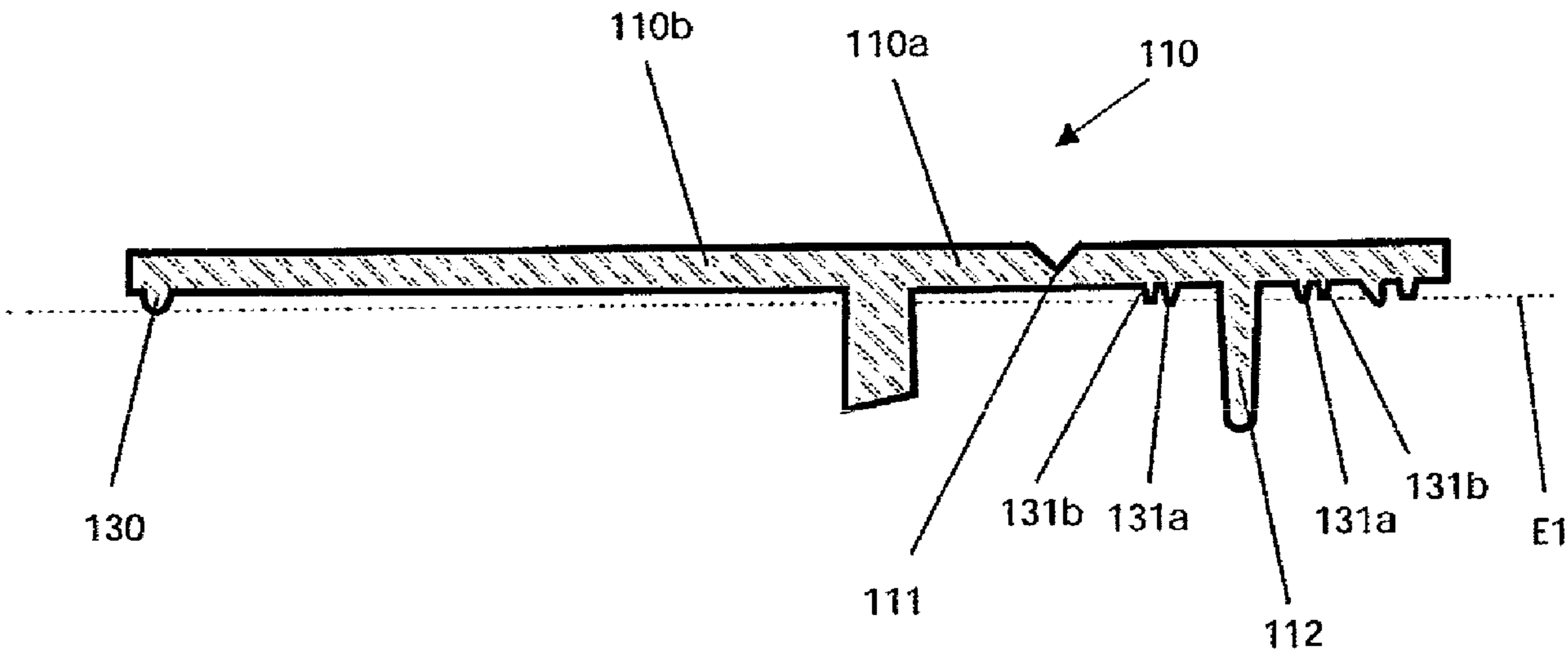


Fig. 5b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