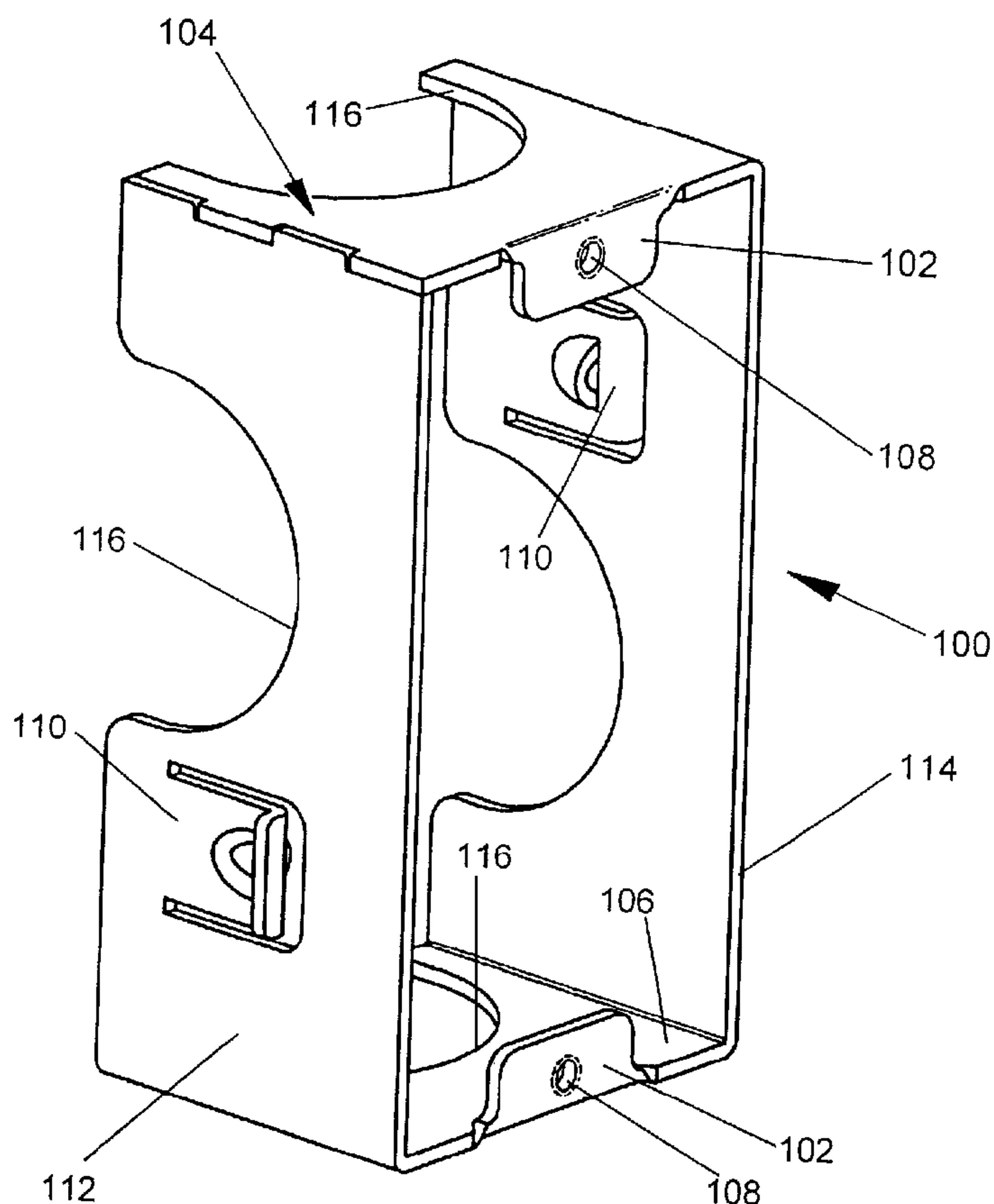




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 (54) Title: PULL OUT EXTENSION CONTAINED IN ELECTRICAL BOX



(57) **Abrégé/Abstract:**

An electrical outlet box extension comprising a perimetrical side wall with an inner surface and an outer surface having an open front face and an open rear face and defining an interior space, and having at least one outwardly protruding resilient tab located on the side wall outer surface. The box extension is designed for adjustable insertable receipt within an electrical outlet box for increasing the depth of the box.

**ABSTRACT**

[0039] An electrical outlet box extension comprising a perimetrical side wall with an inner surface and an outer surface having an open front face and an open rear face and defining an interior space, and having at least one outwardly protruding resilient tab located on the side wall outer surface. The box extension is designed for adjustable insertable receipt within an electrical outlet box for increasing the depth of the box.

**PULL OUT EXTENSION CONTAINED IN ELECTRICAL BOX**

**FIELD OF THE INVENTION:**

[0002] The present invention relates generally to a pull out extension contained in an electrical outlet box for housing electrical fixtures such as a switch or a receptacle. More particularly, the present invention relates to an extension for increasing the depth of an electrical box in certain applications such as for use on a concrete wall.

**BACKGROUND OF THE INVENTION:**

[0003] It has long been known to house electrical fixtures such as switches and receptacles in an electrical outlet box. The outlet box permits the insertion of electrical wires into the box which are terminated to electrical fixtures. The fixtures then may be mounted to the box which provides protection to the fixtures as well as the wires terminated therein. The outlet box is then mounted to a wall at a convenient location to provide access. Most outlet boxes accommodate one or more electrical fixtures, which terminate standard 110 volt electrical wires.

[0004] Outlet boxes are available in a variety of configurations and sizes. The selection of which type of box to use is dependant upon the specifics of the application. The most commonly employed box is a single-gang outlet box, also referred to as a standard outlet box. The single-gang box is ideal for applications in which only one receptacle is required for the application. Standard outlet boxes have opening dimensions of approximately 3" x 2-1/4" and are available in a variety of depths. Double-gang and triple-gang boxes are also available, and they typically have the capacity to hold two and three receptacles respectively. A four inch (4") square box is also commonly employed for multiple receptacle applications.

[0005] Typically, outlet boxes are mounted by affixing mounting ears to a wall stud or other structural member. In the usual application, the installer will offset the electrical box when installed on the wall studs in order to compensate for the thickness of any finishing material to be installed. The offset is intended to ensure the open face of the box is aligned flush with the finish material to conform to electrical codes. In addition, for some applications, such as exterior uses, there is a requirement to install electrical boxes on poured concrete walls, wherein the outlet box, may be mounted within a concrete structure. This is accomplished by attaching the box to a form in the desired location. The form is usually a wooden temporary structure used to contain the poured concrete in the desired shape that is removed after the concrete has hardened. The outlet box remains in the concrete after removal of the form.

[0006] However, in some applications the offset is insufficient to bring the open face of the box flush with the finish material. In these cases extensions must be installed by the electrician to bridge the gap between the box opening and the surface of the finish material. This



can occur, for example, when ceramic or stone tile are added to the sheet rock wall material. the prior art methods for providing an extension after the finish materials are installed involve squeezing the extension between the box and the wall finishing material and using longer than normal screws to install the electrical device such as a switch or receptacle. Alternately, the box may provide additional pretapped holes for affixing an extension which the installer may use for attaching the extension before installing the electrical device. In either case additional time consuming labor is needed to adapt the box for use and compliance with electrical codes.

**[0007]** Therefore, it would be desirable to have an extension for an electrical box that can be easily installed to extend the open front perimeter of the box after the finishing materials are installed such that the perimeter will be flush with the finished wall surface to conform to electrical code requirements.

**SUMMARY OF THE INVENTION:**

**[0008]** Applicant has overcome the shortcomings of prior art electrical outlet boxes by providing an extension device that can be installed within the electrical box and pulled out from the front of the box to increase the depth of the box, once it is set in place without the need for attaching a separate extension.

**[0009]** The present invention therefore provides an electrical outlet box extension comprising a generally rectangular perimetrical side wall with an inner surface and an outer surface having an open front face and an open rear face and defining an interior space. The

extension includes at least one outwardly protruding resilient tab located on the side wall outer surface.

**[0010]** More specifically, the present invention provides an electrical outlet box assembly. The assembly includes an electrical outlet box having a back wall, a perimetrical side wall surrounding the back wall, an open front face and a box interior. The side wall includes at least one cavity thereon. An extension includes a perimetrical side wall with an inner surface and an outer surface. The side wall of the extension includes at least one resilient tab. The resilient tab has an outwardly protruding lip adapted for cooperative engagement with the cavity of the outlet box for insertably accommodating the extension in the box.

**[0011]** The box side wall may include a plurality of spaced apart cavities thereon. The resilient tab of the extension is resiliently positionable within one of the pluralities of cavities for adjustably positioning the extension with respect to the box.

**[0011.1]** In accordance with one aspect of the present invention, there is provided an electrical outlet box extension, the extension comprising: a generally rectangular perimetrical side wall with an inner surface and an outer surface having an open front face and an open rear face and defining an interior space, wherein said perimetrical side wall is formed by a pair of opposing side wall portions and a pair of opposing end wall portions; at least one resilient tab located on said outer surface of each opposing side wall portion, said resilient tab further having an outwardly protruding lip; and at least one notch at a predetermined location on said side wall.

**BRIEF DESCRIPTION OF THE DRAWINGS:**

**[0012]** Figure 1 is a perspective view of the assembled electrical box extension according to the present invention.

**[0013]** Figure 2 is a perspective view of the partially assembled electrical box extension according to the present invention in an unfolded position.

[0014] Figure 3 is a front plan view of the electrical box extension according to the present invention.

[0015] Figure 4 is a side plan view of the electrical box extension according to the present invention.

[0016] Figure 5 is a partial cross sectional view of the electrical box extension according to the present invention along section A-A of Figure 3 with the extension in the retracted position.

[0017] Figure 6 is a partial cross sectional view of the electrical box extension according to the present invention along section A-A of Figure 3 with the extension in the extended position.

[0018] Figure 7 is a perspective view of an alternate embodiment of the electrical box extension according to the present invention.

[0019] Figure 8 is a perspective view of an alternate embodiment of a feature of the electrical box extension according to the present invention.

[0020] Figure 9 is a front view of an alternate embodiment of the electrical box extension according to the present invention.



[0021] Figure 10 is a side view of an alternate embodiment of the electrical box extension according to the present invention.

[0022] Figure 11 is a cross sectional view of an alternate embodiment of the electrical box extension according to the present invention along section B-B of Figure 9 with the extension in the retracted position.

[0023] Figure 12 is a cross sectional view of an alternate embodiment of the electrical box extension according to the present invention along section B-B of Figure 9 with the extension in the extended position.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS:**

[0024] There will be detailed below the preferred embodiments of the present invention with reference to the accompanying drawings. Like members are designated by like reference characters in all figures.

[0025] Turning now to Figures 1 and 2, there is shown a perspective view of the outlet box extension according to the present invention. The extension, which is a generally rectangular frame 100, typically made of a metallic material, which may be a folded sheet metal. The extension has ears 102 located on the top 104 and bottom walls 106, each having tapped holes 108 for mounting an electrical device within the electrical box. Because the ears 102 and holes 108 are mounted on the extension frame 100 the holes 108 are closer to the device that will be installed in the extension allowing the use of shorter screws which provide a stronger and

more stable mounting within the electrical box. The extension is held in place by tabs 110, which are resilient deformable structures that protrude from the side wall 112 and 114 of frame 100. The tabs 110 are snapped into cavities in the electrical box as will be shown in Fig. 3-6. Also shown in Figure 1 are generally hemispherical notches 116, which are placed to clear the space in the box adjacent to knockouts and therefore allow penetration and insertion of conduit and connectors within the box.

[0026] Referring specifically to Figure 2, there is shown the extension according to the present invention wherein the extension frame 100 is depicted in an unfolded view in order to more clearly show the locking mechanism for holding together the folded sheet metal material. As shown the locking system is made up of teeth 120 and notches 122 for cooperatively engaging each other. This locking system provides a secure attachment that will withstand the pull force during extension but not require a welding operation.

[0027] Turning now to Figures 3-6, the extension frame 100 according to the present invention is shown. In the view of Figure 3, tabs 110 are visible extending from the exterior of sidewall 112 and 114. As more clearly depicted in Figure 4, the tab 110 is made up of components having an elastic resilient support portion 202 a locking lip 204 for cooperatively engaging a cavity in the electrical box and an embossed opening 206, which may be used by the installer to change the position of locking lip 204 by bending the resilient support portion 202 with a long nose pliers or screw driver.

[0028] Referring to Figures 5 and 6, the extension frame 100 is shown in position with respect to an electrical box 208. Box 208 may be an assembled outlet box having a back wall 208a, a perimetrical side wall 208b, and a box interior 208c opening to a front face 208d. Electrical box 208 includes cavities 210, 212 and 214. The cavities are located on the inner surface of the box wall. Once the box has been installed with the extension frame 100 nested within the box such that the extension is flush with the box opening, the extension can be pulled outside the box until tab 110 and particularly lip 204 snap into cavities 210, 212 or 214 in the inner surface of the electrical box. By providing several cavities on the inside box wall, the extension can be snapped and adjusted in different positions. Therefore the extension according to the present invention can be used for different thickness finishing material.

[0029] In Figure 5, locking lip 204 is cooperatively engaged in cavity 214, wherein the extension is flush with the electrical box opening. By resiliently deforming resilient support portion 202, lip 204 is disengaged from cavity 214 and extension frame 100 is free to translate with respect to box 208. While not shown in the cross section depicted, it should be understood by one skilled in the art that a complementary tab and cavity are located on the adjacent side wall of electrical box 208 to provide a secure and stable lock.

[0030] With reference to Figure 6, the extension shown is fully extended. The locking lip 204 is cooperatively engaged in cavity 210, wherein the extension is in the fully extended position such that the extension front edge 216 is extended a distance 218 from the front edge 220 of the electrical box. By resiliently deforming resilient support portion 202, lip 204 is disengaged from cavity 214 and extension frame 100 is free to translate with respect to box 208.



While not shown in the cross section depicted, it should be understood by one skilled in the art that a complementary tab and cavity are located on the adjacent side wall of electrical box 208 to provide a secure and stable lock. It should be further noted that an intermediate position exists wherein lip 208 would engage cavity 214.

[0031] Turning to Figure 7, there is shown an alternate embodiment of the pull out extension according to the present invention, designed to be used for electrical boxes in concrete wall. In this embodiment, the extension 300 is provided with protrusions 310. In this embodiment, the extension must be flush with the electrical box when the box is fastened to a form prior to pouring concrete. After the concrete has hardened and the form removed the box will be flush with the concrete wall. In cases where a finishing material is added to the concrete wall such as ceramic tile or stone, the extension can be pulled out of the box to correspond to the additional depth of the finishing material. The extension 300 according to the present embodiment is held in place by the friction between protrusions 310 and the interior of the box wall. No cavity is provided in the box for the initial nested position, but only for the extended position. This embodiment can be typically used, for example when the thickness of the finishing material is known prior to the installation of the box.

[0032] Turning to Figure 8 there is shown an alternate embodiment of the locking attachment for holding extension frame in the generally rectangular shape. In Figure 8, there is shown a portion of the extension according to the present invention wherein the extension frame 100 depicted has interwoven locking tabs 400 that cooperatively engage each other at the outside wall the extension frame 100. This locking system provides a secure attachment that will



withstand the pull force during extension but not require a welding operation. However, it should be noted that the locking system as depicted could be welded, wherein the locking system can be located in the corner of the extension or on one of the side walls.

**[0033]** Another alternate embodiment of the present invention is shown Figures 9-12. In this embodiment the extension is made of a single unitary plastic part. As shown in Figure 9, tab 110 extends beyond the outside wall of extension frame 500, and also incorporates a flange 502 on the interior of tab 110. Holes 504 are provided on the flange 502 for use by the installer to resiliently bend the tab 100 to change its position. This can be done with a screw driver or long nose pliers.

**[0034]** As more clearly depicted in Figure 10, the tab 501 is made up of components having an elastic resilient support portion 506 a locking lip 505 for cooperatively engaging a cavity in the electrical box.

**[0035]** Referring to Figures 11 and 12, the extension frame 500 is shown in position with respect to electrical box 518 (shown in phantom). Box 518 may be an assembled electrical box having a back wall 518a, a perimetrical side wall 518b, a box interior 518c, opening to a front face 518d. Electrical box 518 only includes cavities 510, 512 and 514. The cavities are located on the inner surface of the box wall. Once the box has been installed with the extension frame 500 nested within the box such that the extension is flush with the box opening, the extension can be pulled outside the box until lip 508 snap into cavities 510, 512 or 514 in the inner surface of the electrical box 518. By providing several cavities on the inside box wall, the extension can

be snapped and adjusted in different positions. Therefore the extension according to the present invention can be used for different thickness finishing material

[0036] In Figure 11, locking lip 505 is cooperatively engaged in cavity 514, wherein the extension is flush with the electrical box opening. By resiliently deforming resilient support portion 506, lip 508 is disengaged from cavity 514 and extension frame 500 is free to translate with respect to box. While not shown in the cross section depicted, it should be understood by one skilled in the art that a complementary tab and cavity are located on the adjacent side wall of electrical box 518 to provide a secure and stable lock.

[0037] With reference to Figure 12, the extension shown is fully extended. The locking lip 508 is cooperatively engaged in cavity 510, wherein the extension is in the fully extended position such that the extension front edge 520 is extended a distance 522 from the front edge 524 of the electrical box 518. By resiliently deforming resilient support portion 506, lip 508 is disengaged from cavity 514 and extension frame 500 is free to translate with respect to box 518. While not shown in the cross section depicted, it should be understood by one skilled in the art that a complementary tab and cavity are located on the adjacent side wall of electrical box 518 to provide a secure and stable lock. It should be further noted that an intermediate position exists wherein lip 508 would engage cavity 514.

[0038] Various changes to the foregoing described and shown structures would now be evident to those skilled in the art. Accordingly, the particularly disclosed scope of the invention is set forth in the following claims.

**What is Claimed is:**

1. An electrical outlet box extension, the extension comprising:
  - a generally rectangular perimetrical side wall with an inner surface and an outer surface having an open front face and an open rear face and defining an interior space, wherein said perimetrical side wall is formed by a pair of opposing side wall portions and a pair of opposing end wall portions;
  - at least one resilient tab located on said outer surface of each opposing side wall portion, said resilient tab further having an outwardly protruding lip; and
  - at least one notch at a predetermined location on said side wall;
  - wherein the perimetrical side wall is adapted to be installed within an electrical outlet box comprising a back wall and a box side wall surrounding said back wall, said box side wall defining an open front face and a box interior and said box having a depth extending between the back wall and open front face;
  - wherein in perimetrical side wall is adapted to be pulled out of the interior of the electrical outlet box to increase the depth of the box; and
  - wherein the at least one resilient tab is adapted to engage one or more cavities on an interior surface of the box side wall.
2. The electrical outlet box extension of claim 1 wherein said extension is formed of metallic sheet metal.



3. The electrical outlet box extension of claim 2 wherein said sheet metal is joined at a corner to form said generally rectangular perimetrical side wall.

4. The electrical outlet box extension of claim 3 wherein said sheet metal is joined by a dovetail joint.

5. The electrical outlet box extension of claim 3 wherein said sheet metal is joined by overlapping interwoven tabs.

6. The electrical outlet box extension of claim 1 wherein said extension is formed of a unitary piece of plastic.

7. The electrical outlet box extension of claim 1 wherein said resilient tab includes an opening for insertion of a tool to plastically deform said resilient tab.

8. An electrical outlet box assembly comprising:

an electrical outlet box having a back wall and a box side wall surrounding said back wall, said box side wall defining an open front face and a box interior, said side wall having at least two cavities thereon and said box having a depth extending between the back wall and open front face; and

an extension including a perimetrical side wall with an inner surface and an outer surface having an open front face and an open rear face and defining an interior space, said extension having at least one resilient tab located on said side wall outer surface, said resilient tab further



having an outwardly protruding lip adapted to cooperatively engage either of said at least two cavities of said outlet box for insertably accommodating and adjustably positioning said extension in said box;

wherein the perimetrical side wall is adapted to be installed within the interior of the electrical outlet box; and

wherein the perimetrical side wall is adapted to be pulled out of the electrical outlet box to increase the depth of the box.

9. An electrical outlet box assembly of claim 8 wherein said box side wall includes a plurality of spaced apart cavities on said side wall.

10. An electrical outlet box assembly of claim 8 wherein said box and said extension have a generally rectangular configuration.

11. An electrical outlet box assembly of claim 10 wherein said extension is formed from flat sheet metal folded into said rectangular configuration.

12. An electrical outlet box assembly of claim 11 wherein said flat sheet metal is joined by a dovetail joint.

13. An electrical outlet box assembly of claim 11 wherein said sheet metal is joined by overlapping interwoven tabs.

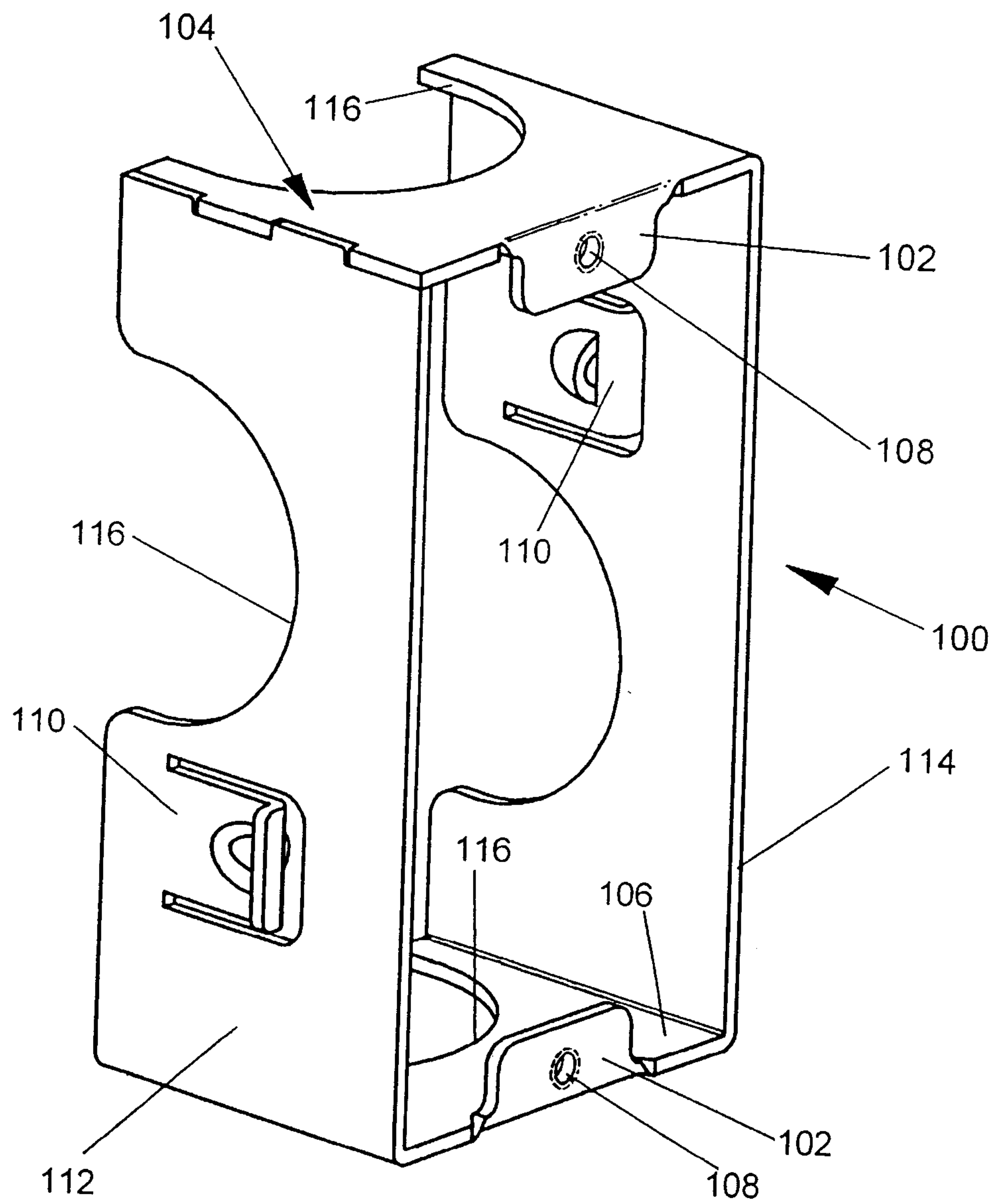


FIG. 1

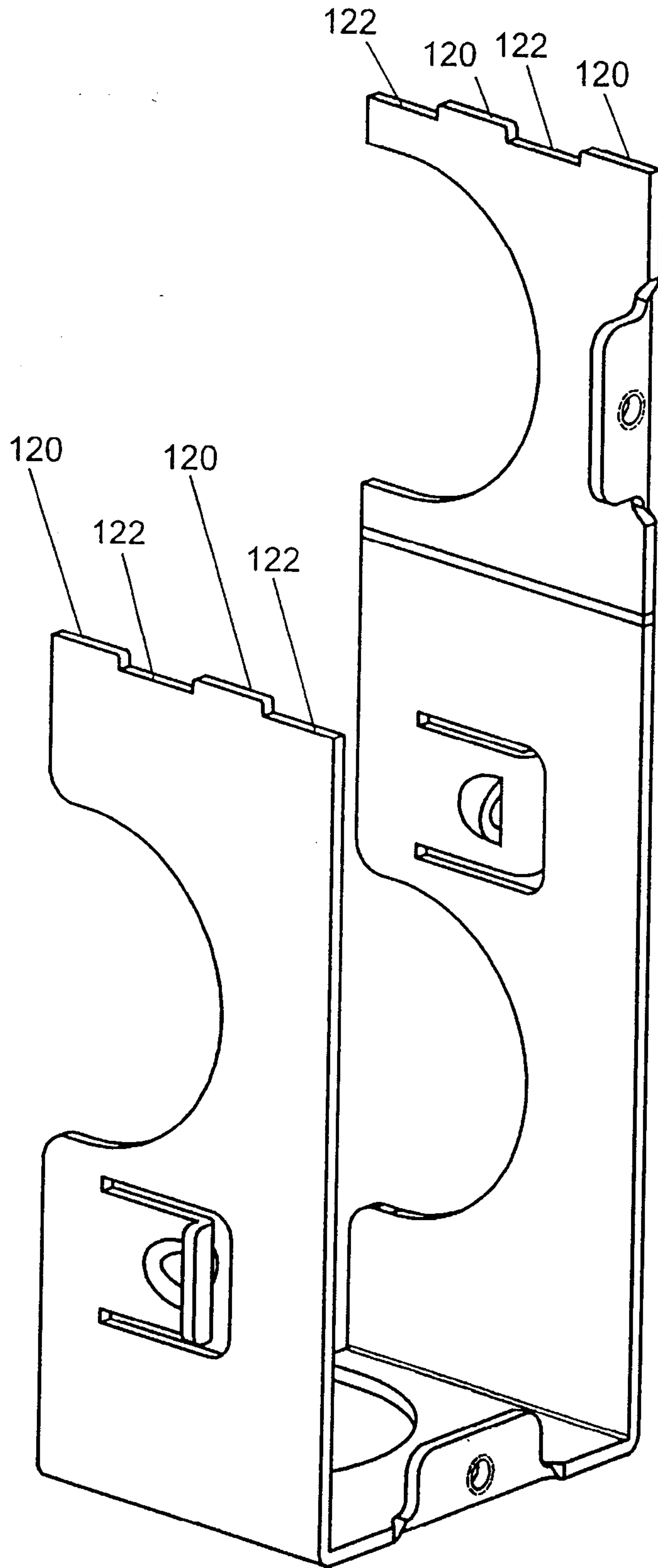


FIG. 2

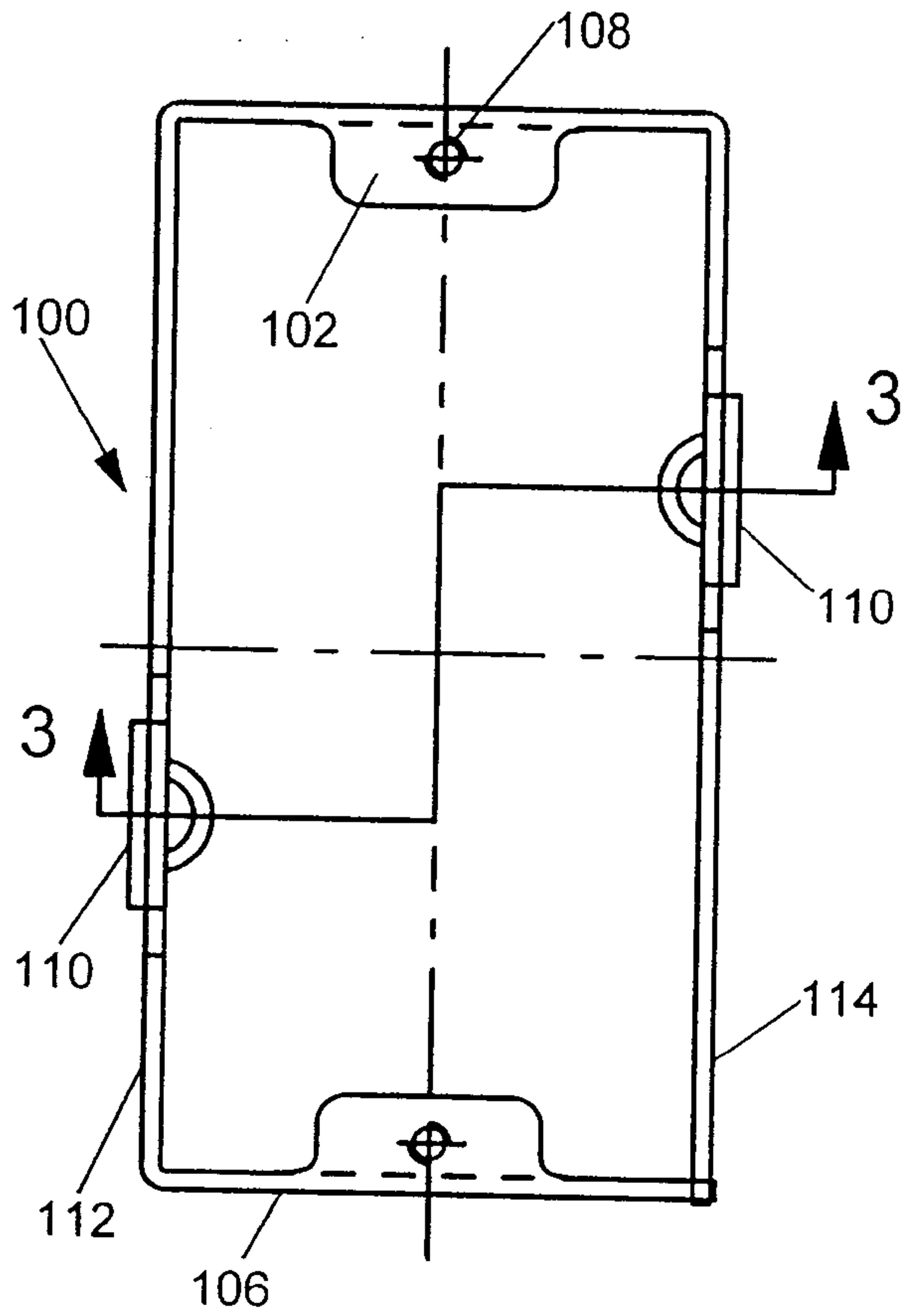


FIG. 3

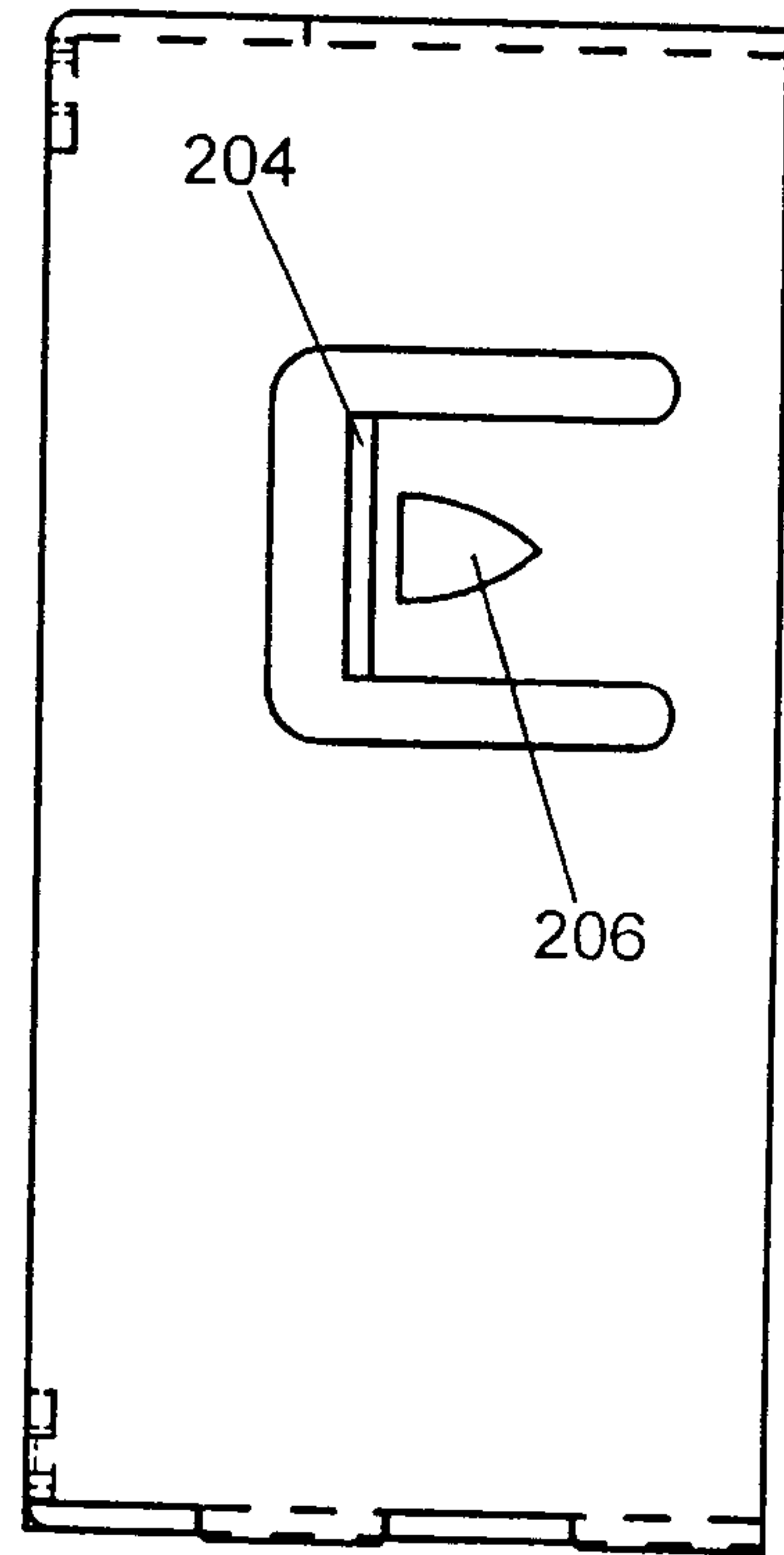


FIG. 4

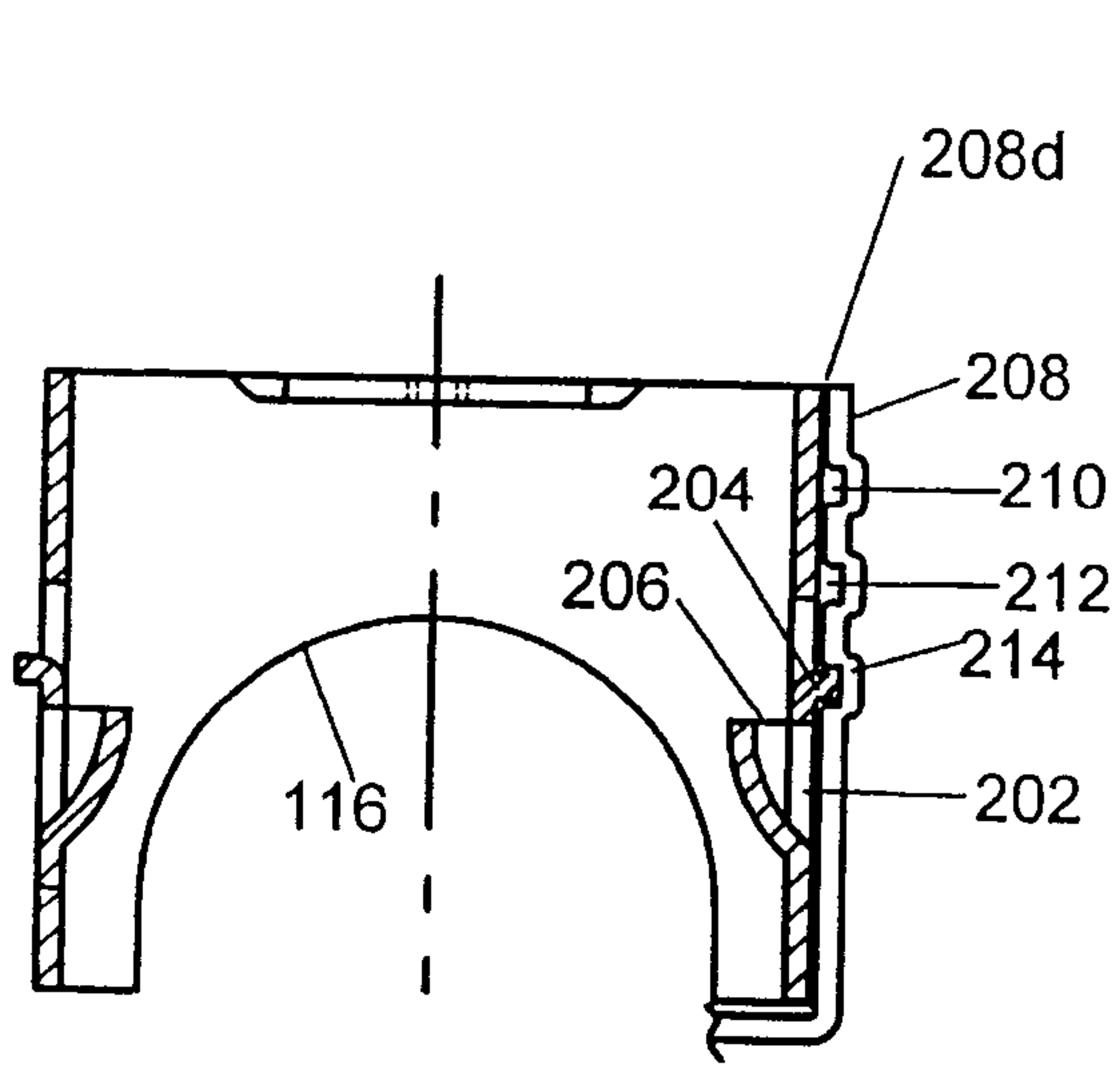


FIG. 5

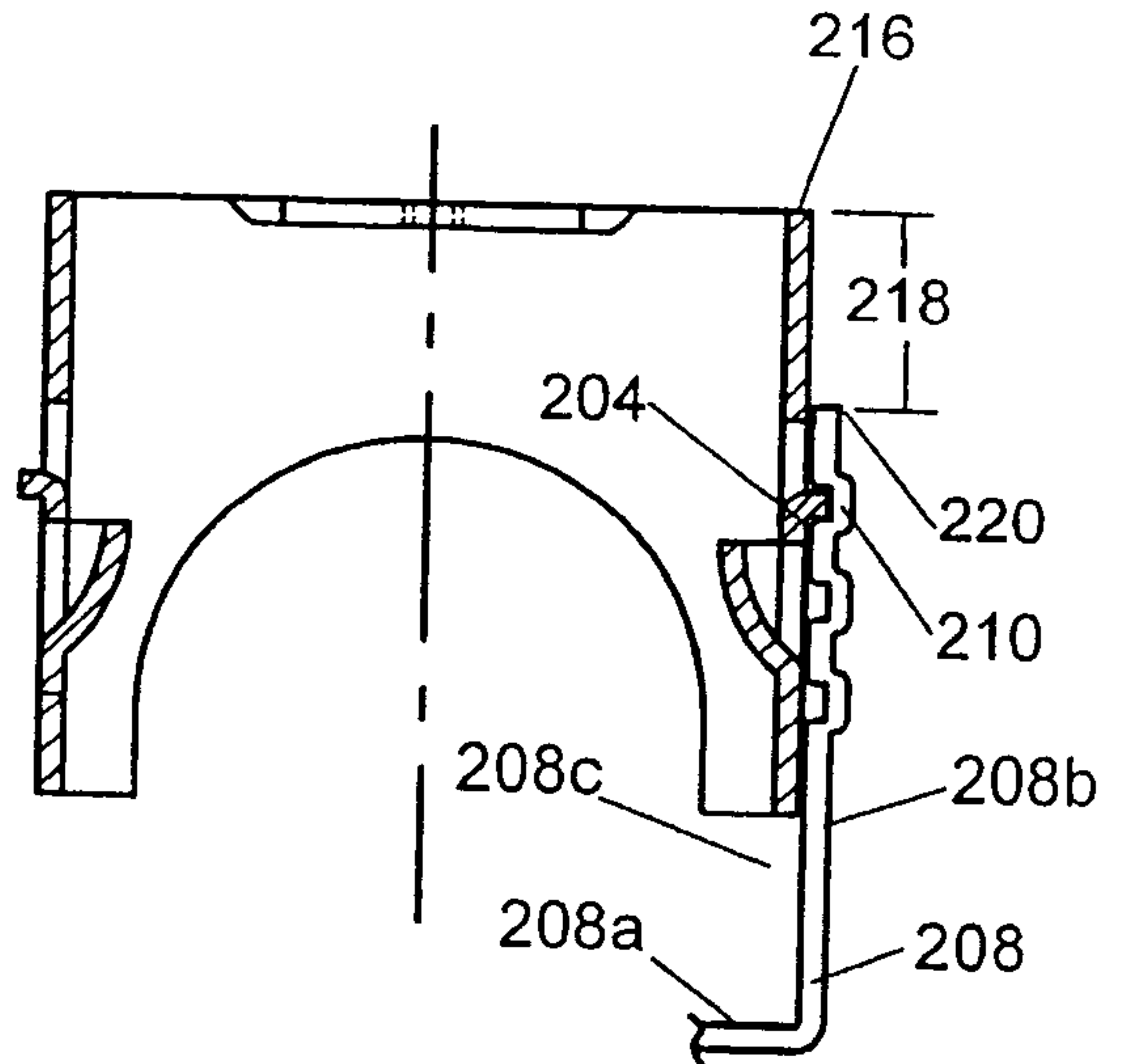


FIG. 6



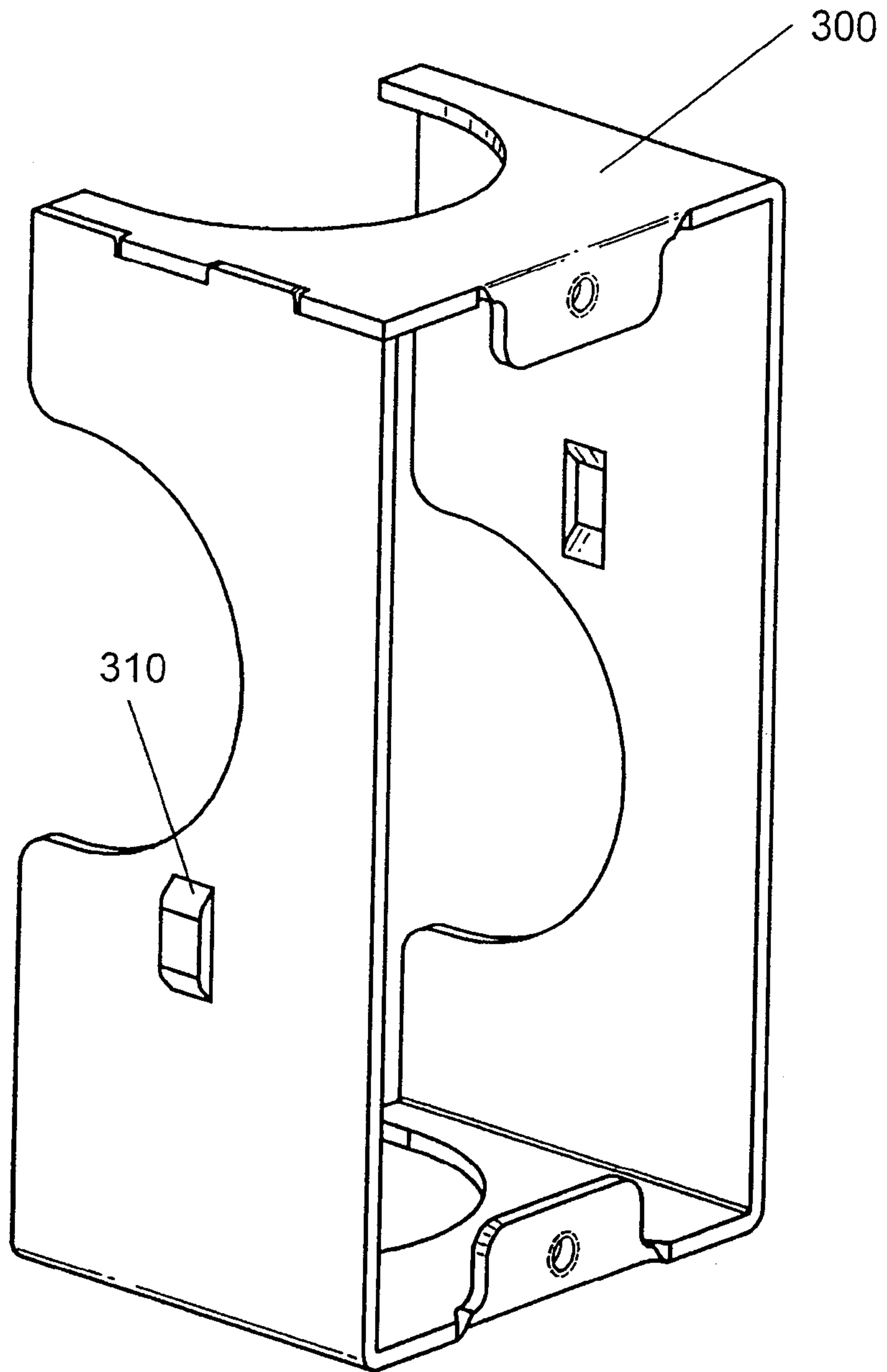


FIG. 7

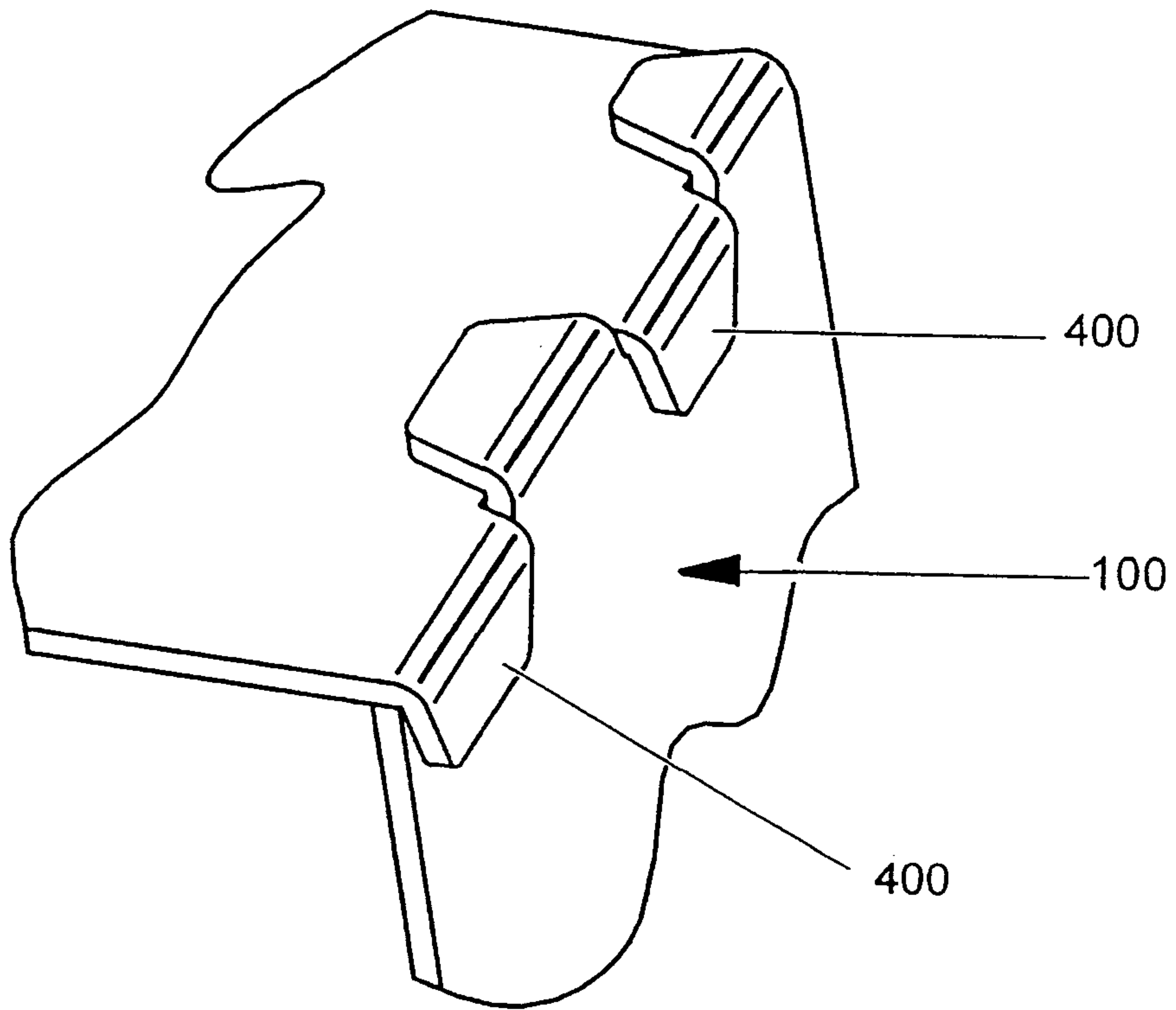


FIG. 8

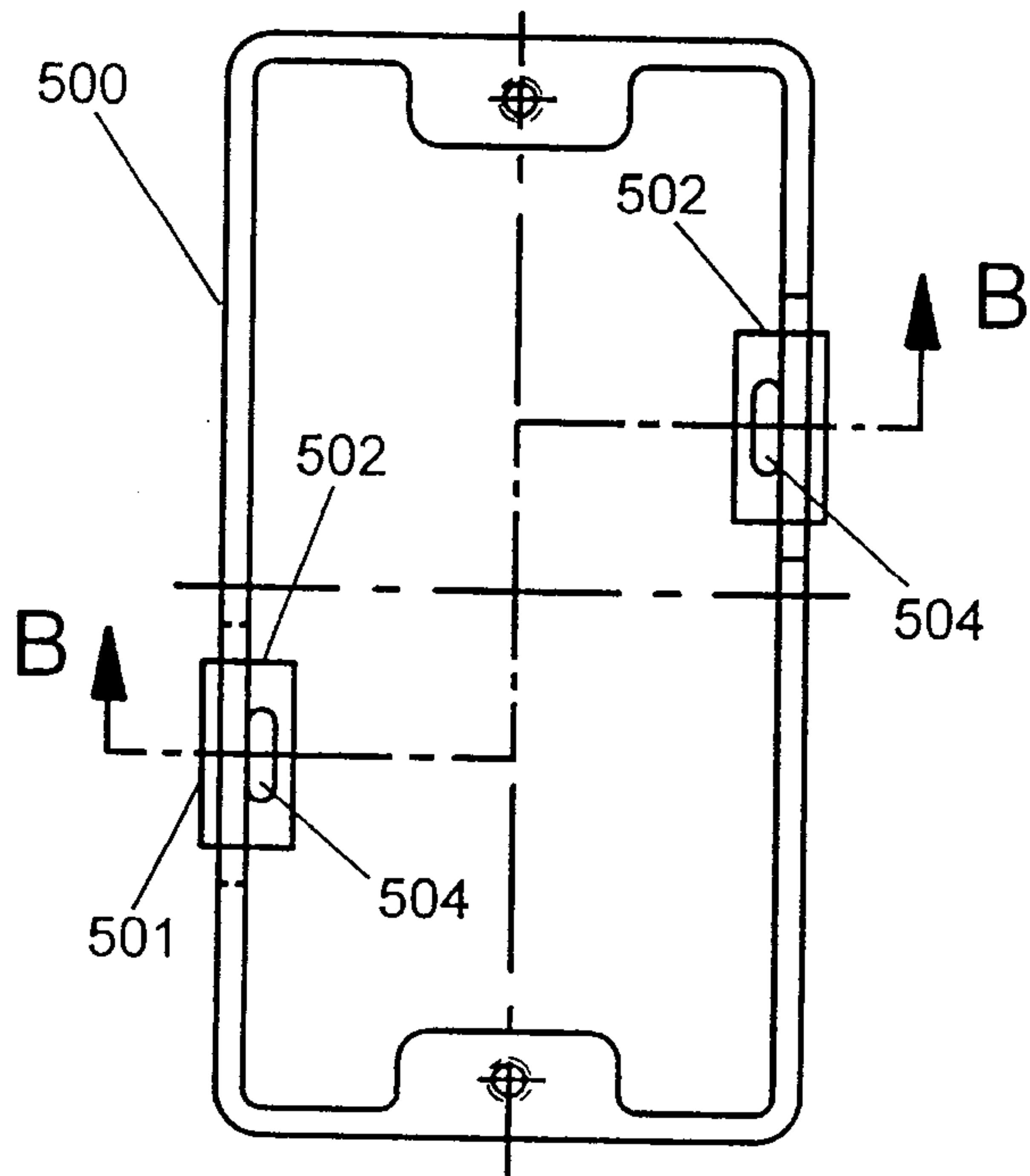


FIG. 9

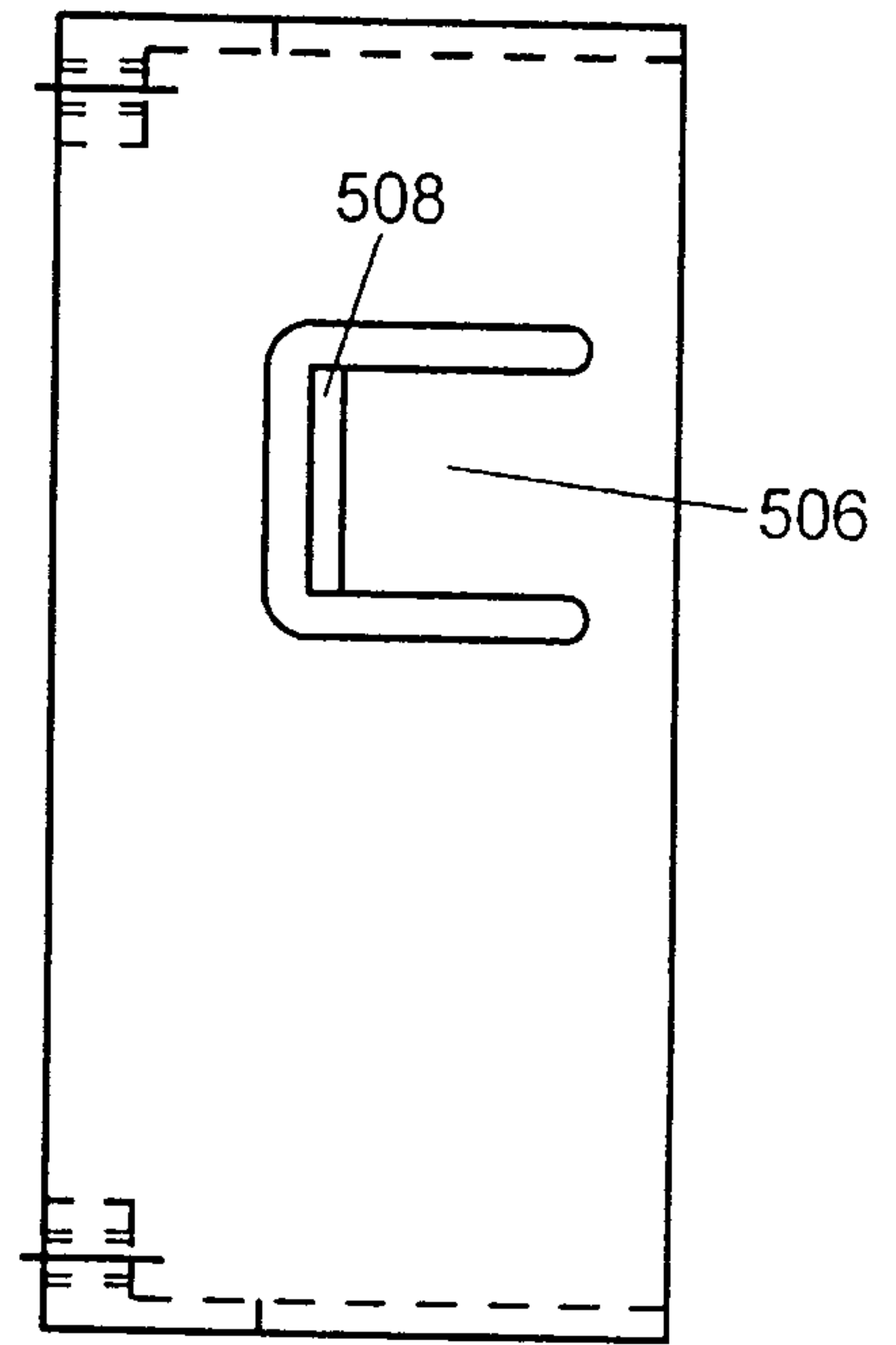


FIG. 10

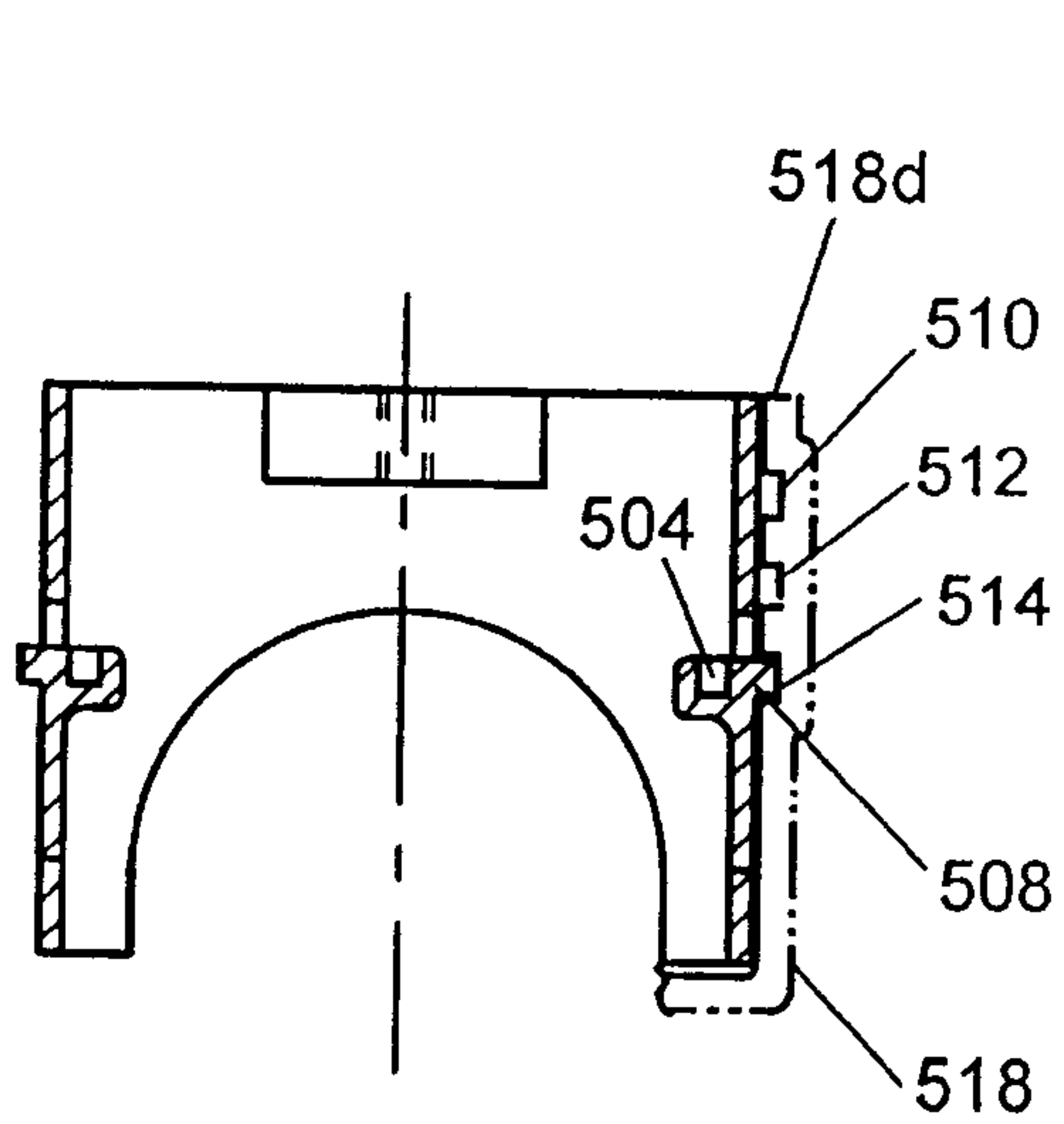


FIG. 11

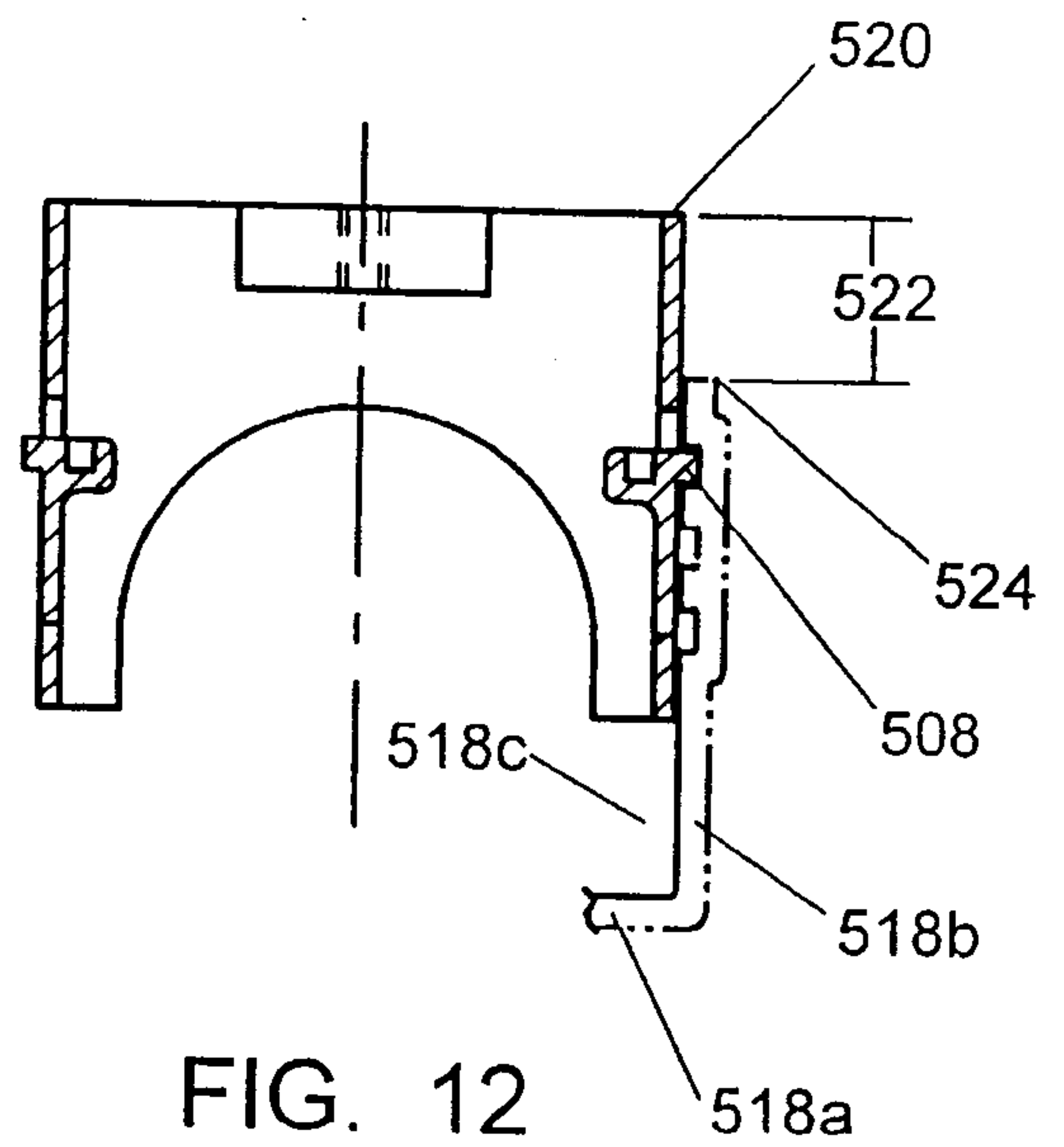


FIG. 12

