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(54) **CASE WITH ROTATABLE HANDLE AND  
MAGNETS FOR PORTABLE ELECTRONIC  
DEVICES**

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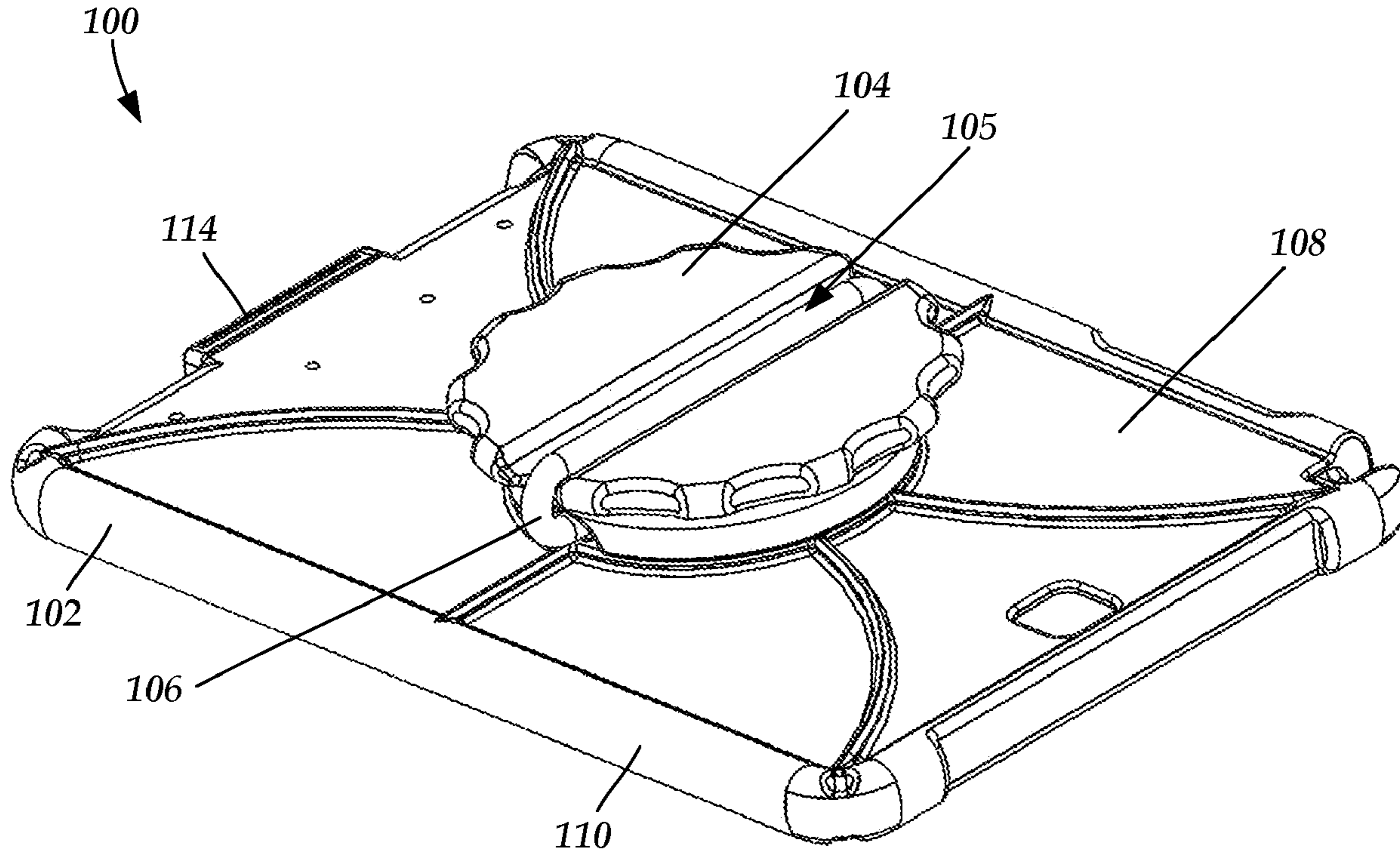
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(57) **ABSTRACT**

A case for a portable electronic device includes a case shell having a back panel and at least one side wall extending from the back panel to form a cavity, in combination with the back panel, for receiving the portable electronic device; a handle coupled to a back panel of the case shell; and at least one magnet positioned within the handle and configured for mounting the case and portable electronic device, when present, on an external surface made of a material attracted to the at least one magnet.



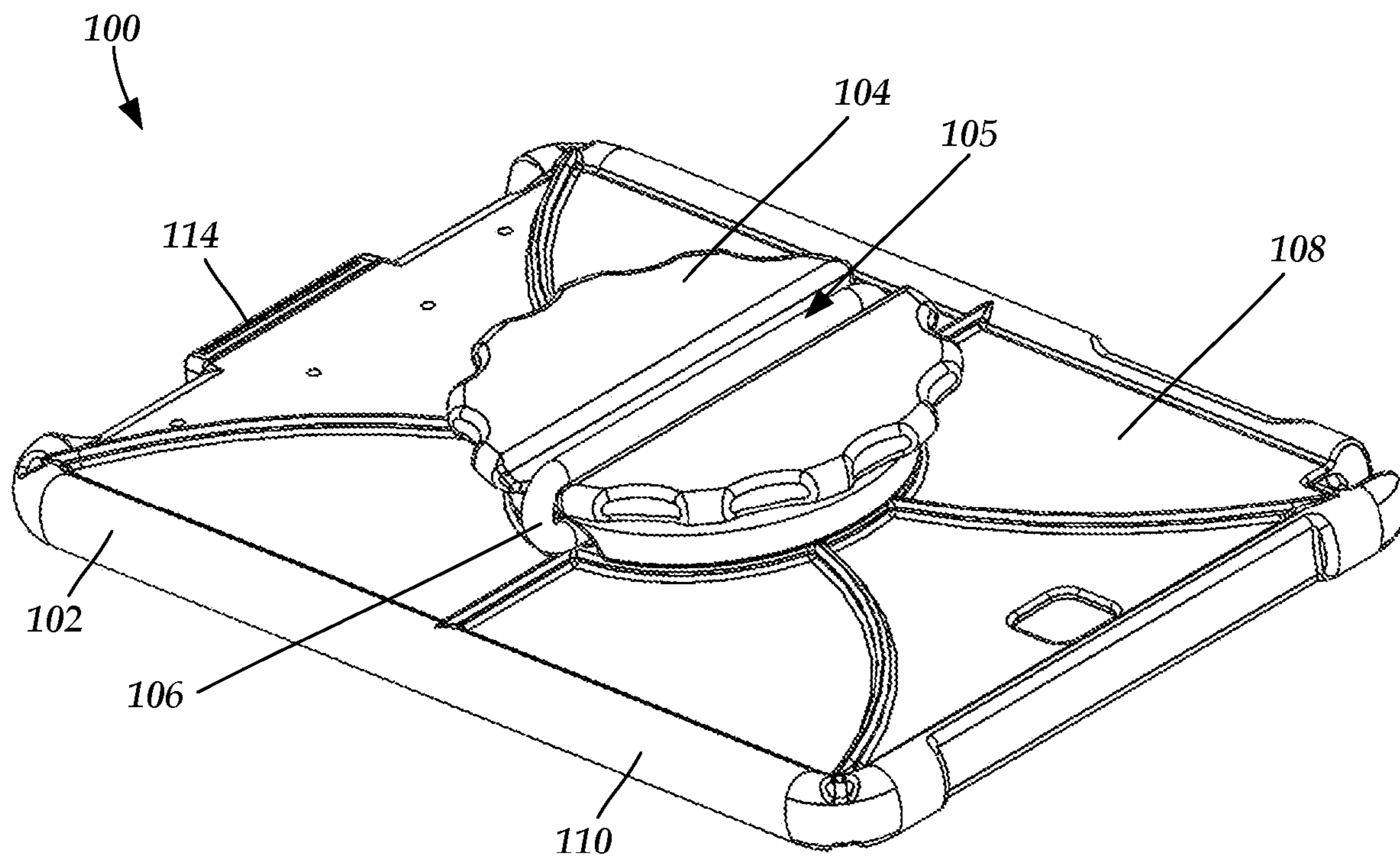


Fig. 1A

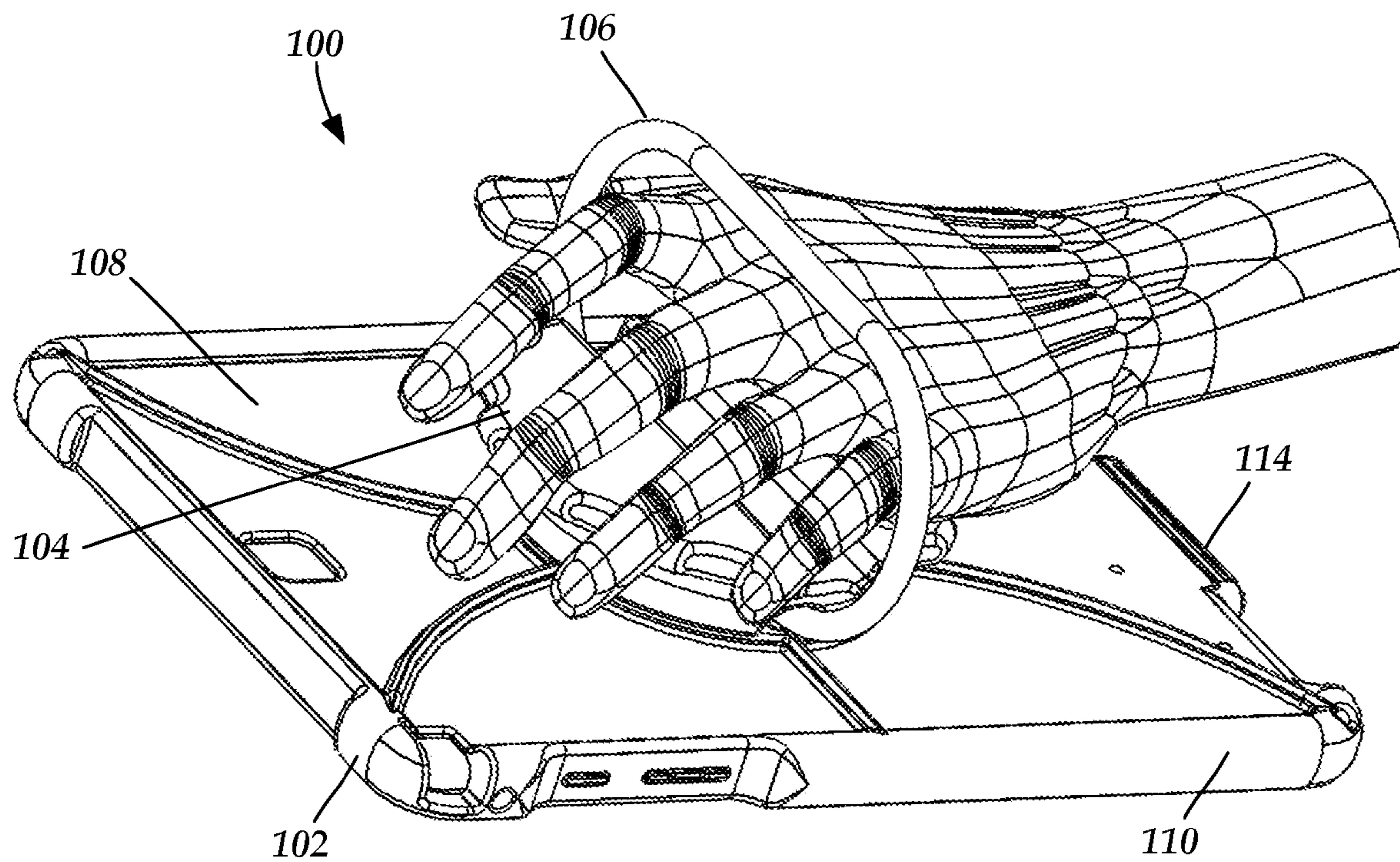


Fig. 1B

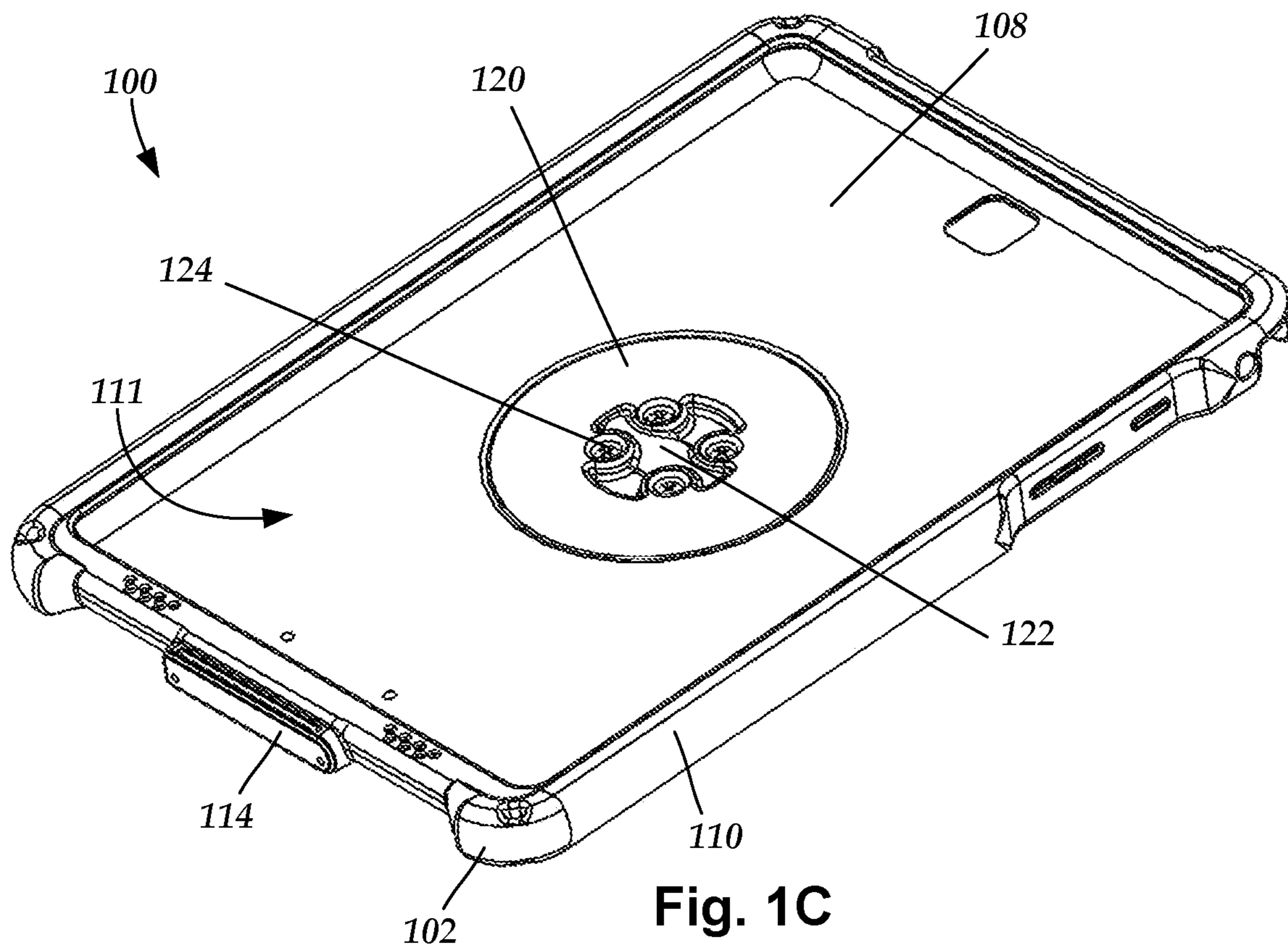


Fig. 1C

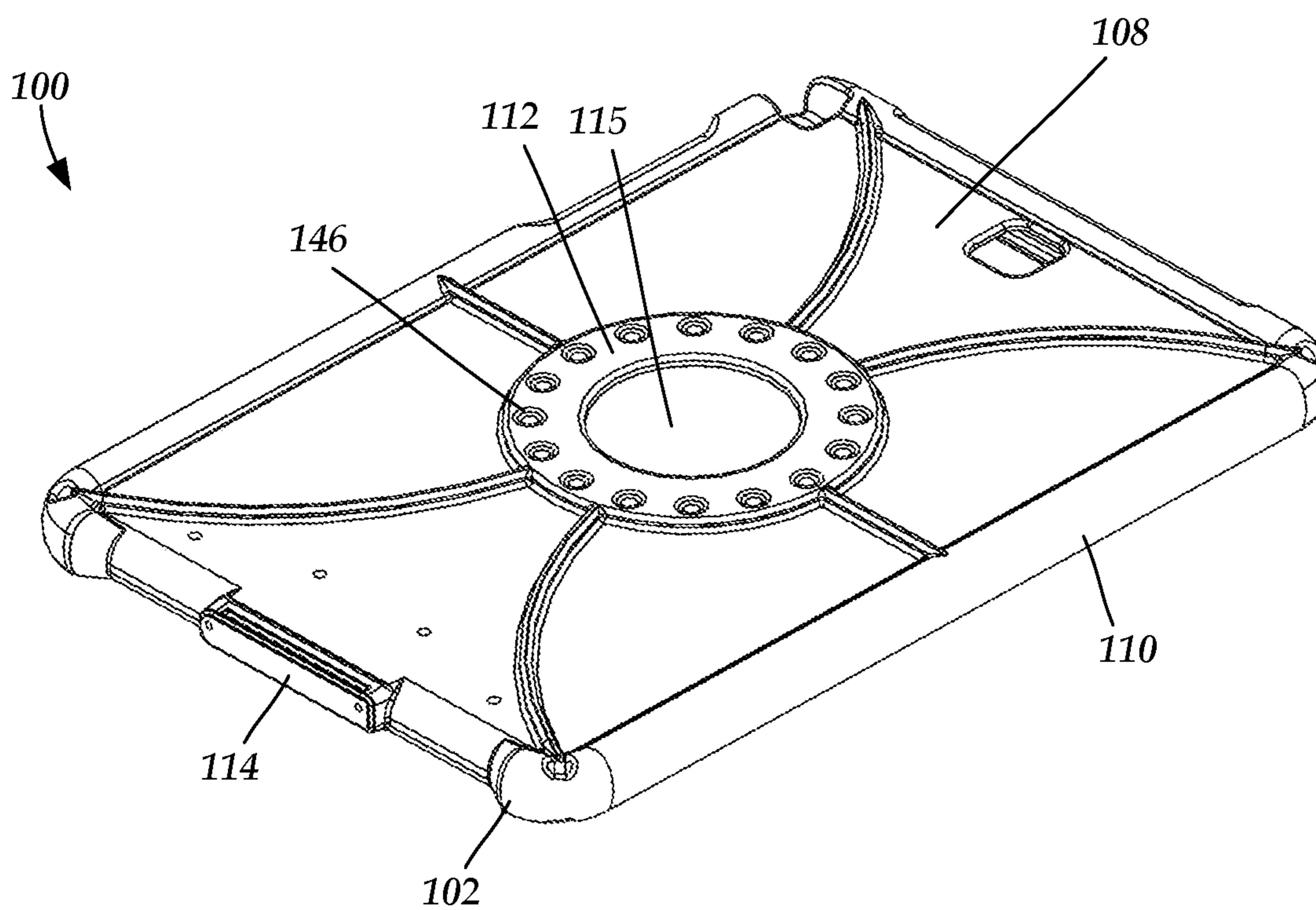


Fig. 1D

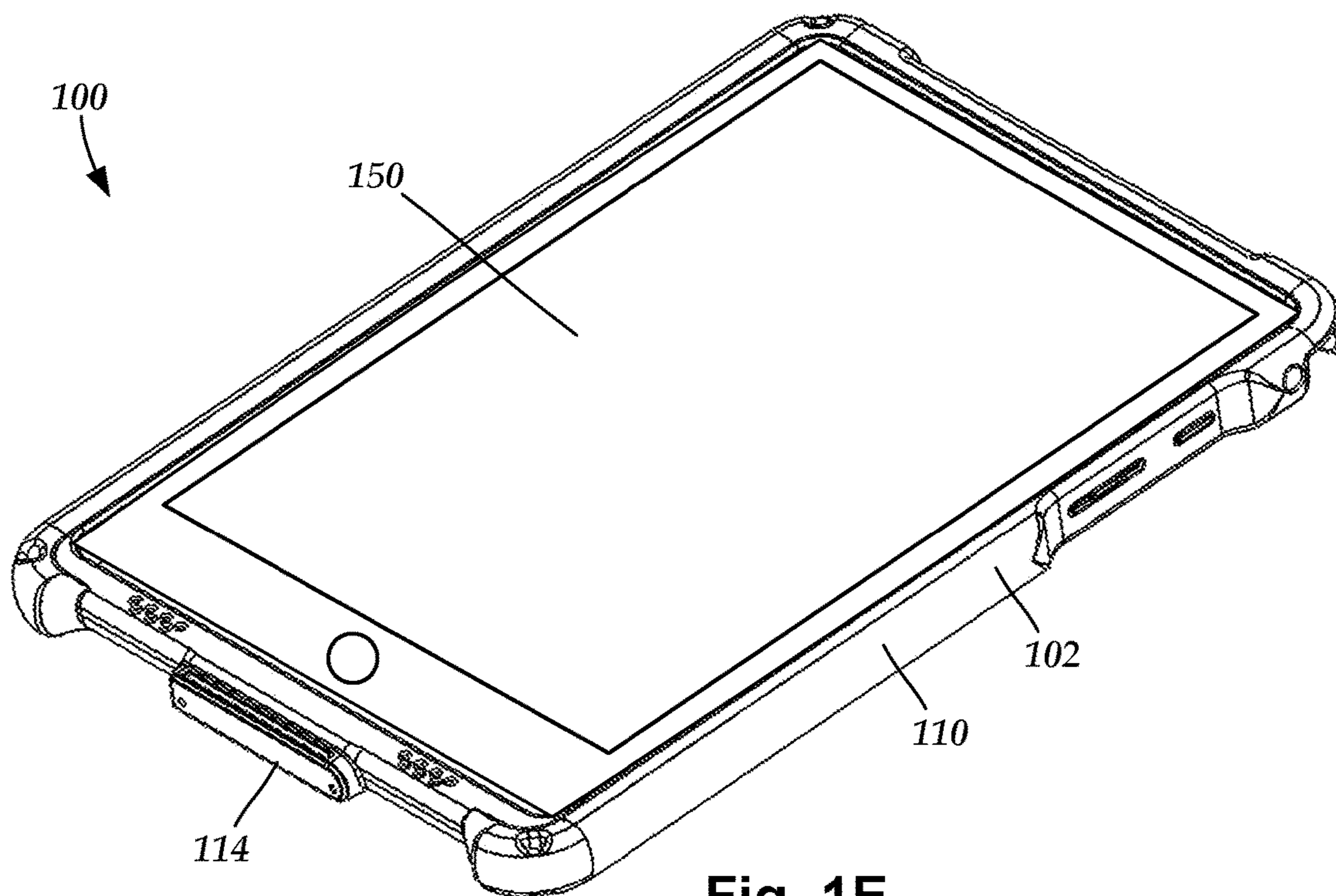


Fig. 1E

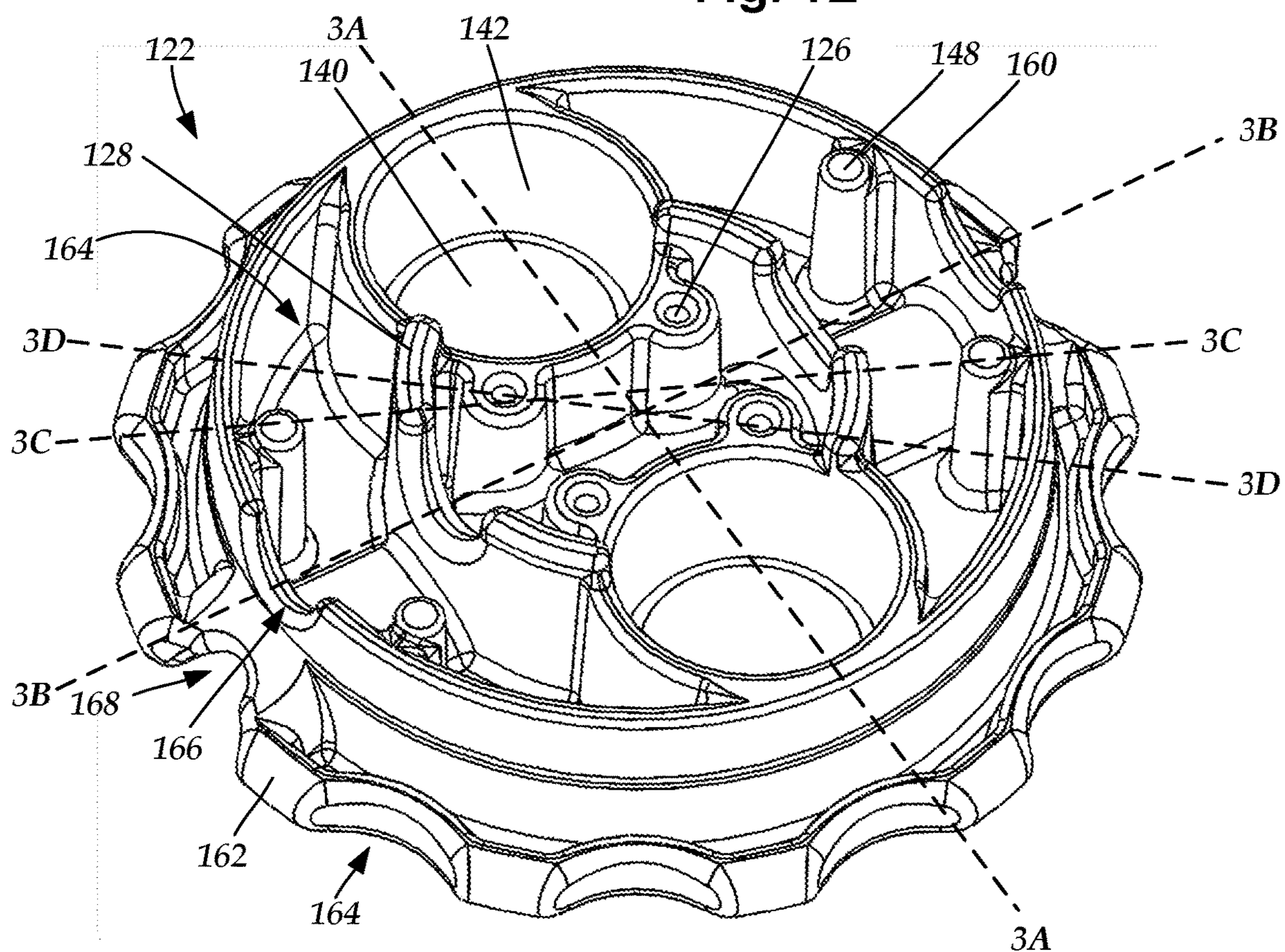
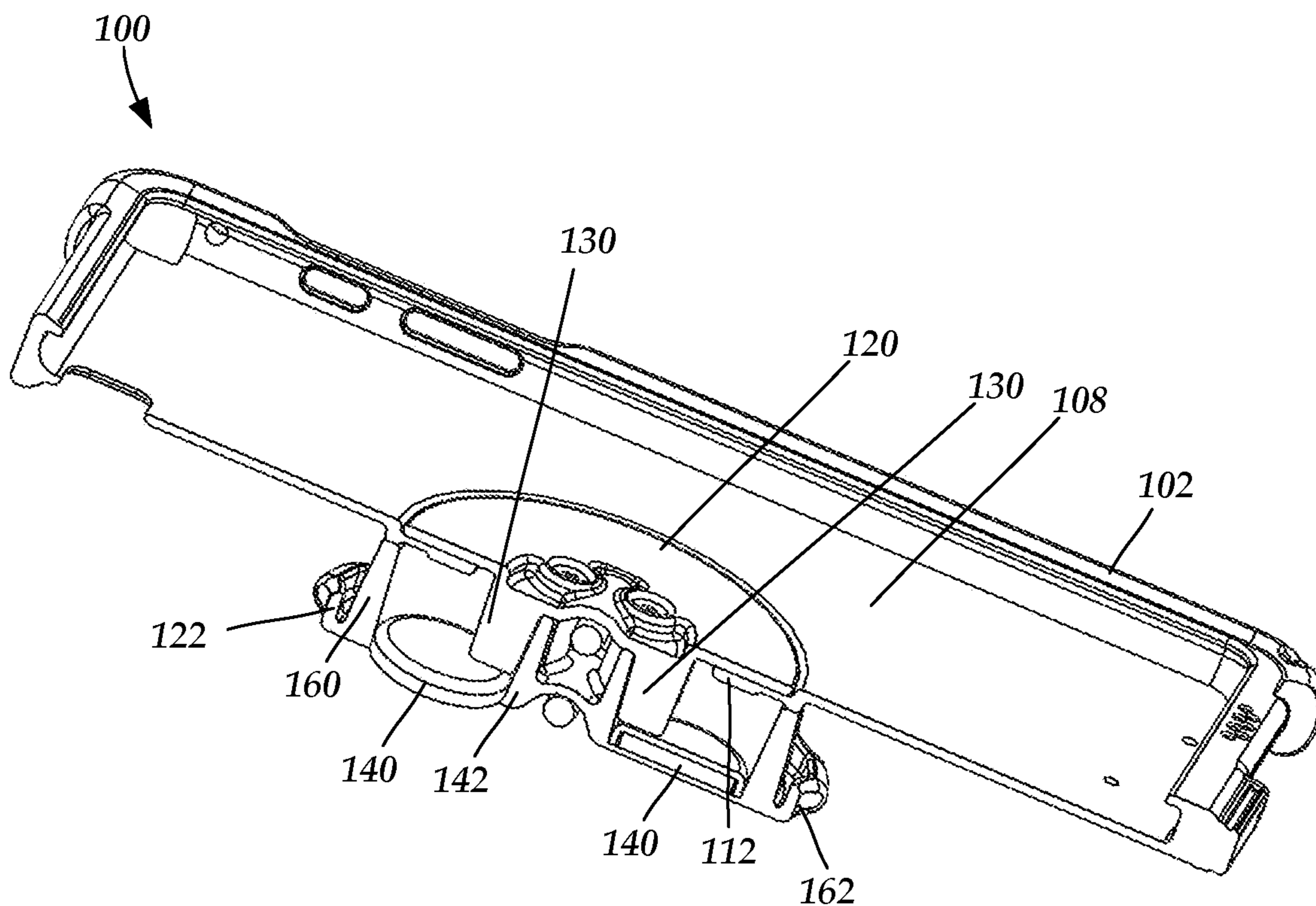
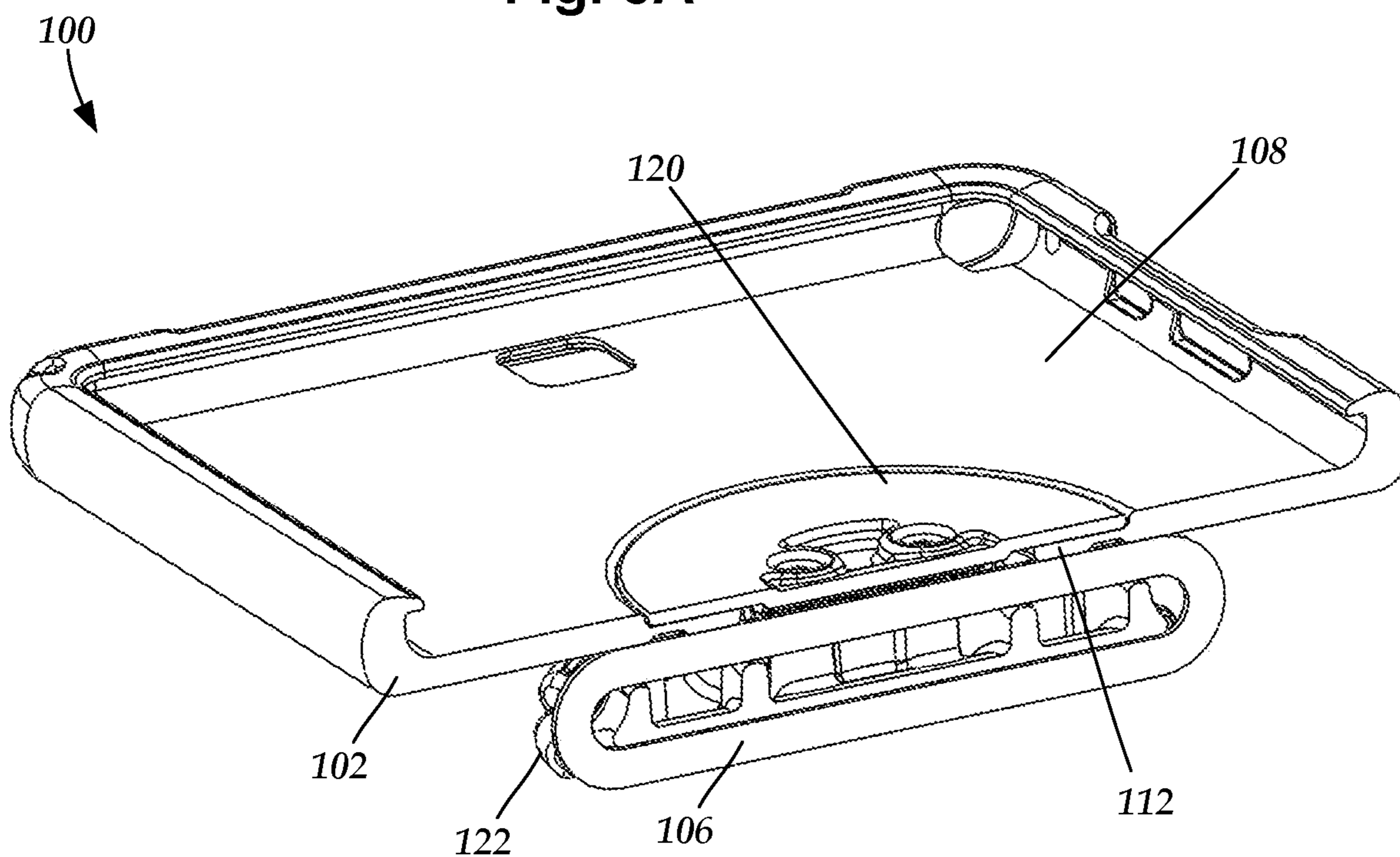


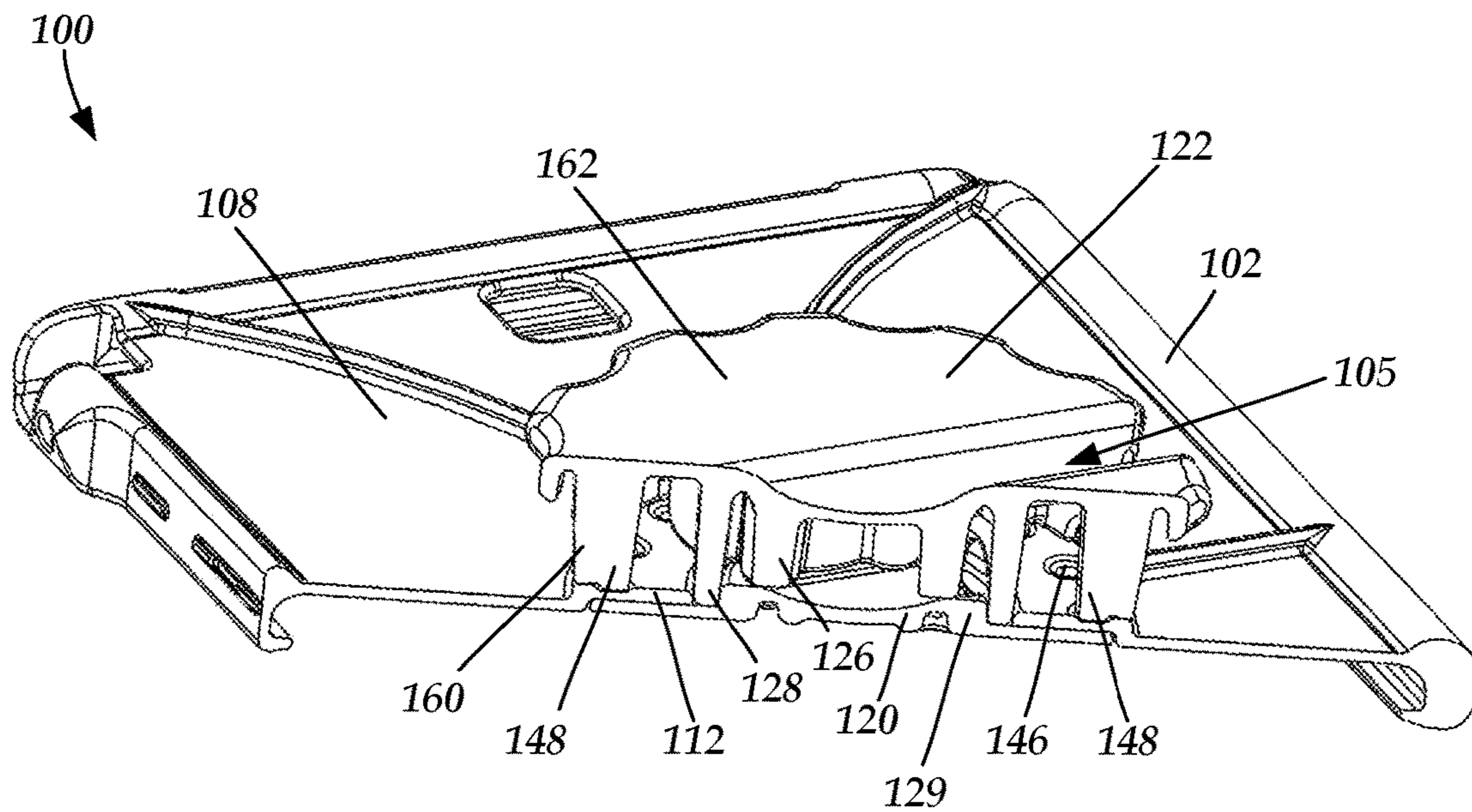
Fig. 2



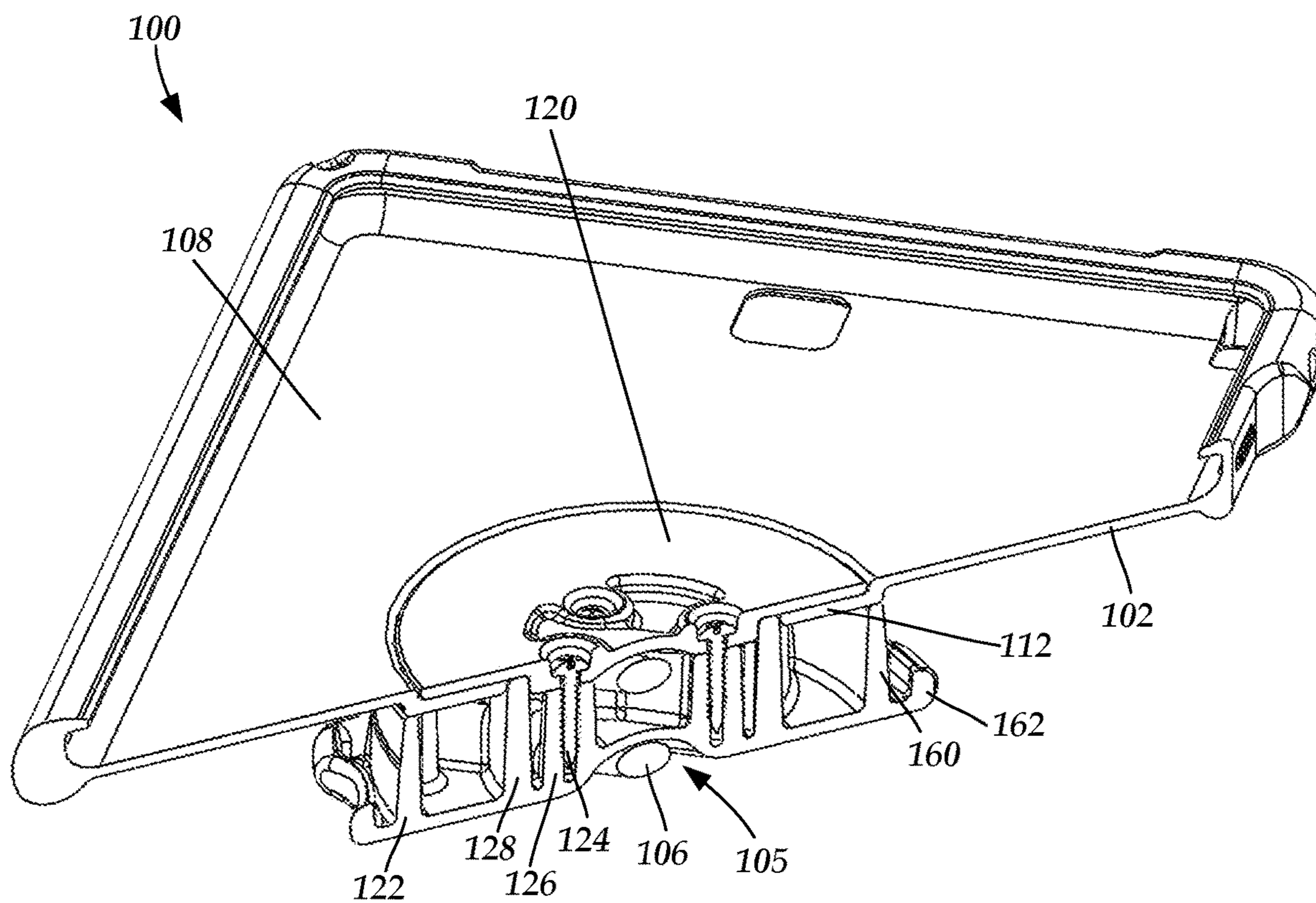
**Fig. 3A**



**Fig. 3B**



**Fig. 3C**



**Fig. 3D**

**CASE WITH ROTATABLE HANDLE AND  
MAGNETS FOR PORTABLE ELECTRONIC  
DEVICES**

FIELD OF THE INVENTION

**[0001]** The present invention relates generally to a case for a portable electronic device and methods of making and using. The present invention is also directed to a portable electronic device case with a handle, which may be rotatable, and magnets and methods of making and using.

BACKGROUND OF THE INVENTION

**[0002]** Handheld portable electronic device (i.e., mobile devices) are generally well-known. Some electronic devices, such as tablets and cellular telephones, are able to rotate their display between a portrait view and landscape view. These and other portable electronic devices are often mounted in a protective case, some cases have hand, arm, or wrist bands that allow the electronic device to be carried on the user's hand or arm for convenience and easy access. However, conventional hand, arm, or wrist bands are limited in their ability to provide flexibility of either supporting on an external fixed surface or mounting on a user's appendage such as a hand, wrist, or arm.

SUMMARY OF THE INVENTION

**[0003]** The present invention is a case for a portable electronic device, the case having a case shell with a back panel and at least one side wall extending from the back panel to form a cavity, in combination with the back panel, for receiving the portable electronic device; a handle coupled to a back panel of the case shell; and at least one magnet positioned within the handle and configured for mounting the case and portable electronic device, when present, on an external surface made of a material attracted to the at least one magnet.

**[0004]** In at least some embodiments, the case shell is rotatable relative to the handle. In at least some embodiments, the handle includes a plurality of scalloped indents around a perimeter of the handle.

**[0005]** In at least some embodiments, the case further includes a hand strap attached to the case shell or handle and configured for fitting around a hand of a user engaging the handle. In at least some embodiments, the handle defines a strap channel to receive a portion of the strap when it is not fit around a hand of the user. In at least some embodiments, the handle includes a handle base, wherein a portion of the hand strap resides within the handle base.

**[0006]** In at least some embodiments, the handle includes a handle base and a mounting disc attached, or attachable, to the handle base with a portion of the back panel between the handle base and the mounting disc to couple the handle to the back panel. In at least some embodiments, the back panel of the case shell defines an opening and the handle base and mounting disc are configured for fastening to each other through the opening. In at least some embodiments, the back panel includes a handle support disposed around a perimeter of the opening. In at least some embodiments, the handle support defines a plurality of depressions and the handle base includes at least one pin configured to engage the depressions, wherein the case shell is rotatable relative to the handle by applying force to disengage the at least one pin from the depressions and rotate the case shell relative to the

handle allowing the at least one pin to reengage the depressions at a rotation stop point. In at least some embodiments, the at least one pin includes a pair of pins disposed opposite each other.

**[0007]** In at least some embodiments, the handle base includes a plurality of abutment structures that extend into the opening and abut the handle support when the handle is attached to the case shell. In at least some embodiments, the mounting disc includes at least one elevated portion that abuts the abutment structures when the handle is attached to the case shell.

**[0008]** In at least some embodiments, the handle base includes at least one magnet holder structure configured to receive and hold the at least one magnet in the handle. In at least some embodiments, the mounting disc includes at least one pin configured for insertion in the at least one magnet holder structure when the handle is attached to the case shell.

**[0009]** Another embodiment is an arrangement that includes any of the cases described above and a portable electronic device configured for insertion into the case.

**[0010]** A further embodiment is a method of using any of the cases described above. The method includes attaching a handle base of the case to a mounting disc of the case and inserting the portable electronic device into the case.

**[0011]** In at least some embodiments, the method further includes attaching the case to a surface using the at least one magnet. In at least some embodiments, the method further includes rotating the case shell and portable electronic device relative to the handle. In at least some embodiments, the handle further includes a hand strap, the method further including inserting a hand of the user into the hand strap.

BRIEF DESCRIPTION OF THE DRAWINGS

**[0012]** The foregoing aspects and many of the attendant advantages of this invention will become more readily appreciated as the same becomes better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

**[0013]** FIG. 1A is a bottom perspective view of one embodiment of a case with a case shell and a handle coupled to the case shell, according to the invention;

**[0014]** FIG. 1B is a bottom perspective view of the case of FIG. 1A with a user's hand engaging the handle, according to the invention;

**[0015]** FIG. 1C is a top perspective view of the case of FIG. 1A with the mounting disc of the handle disposed in the cavity of the case shell, according to the invention;

**[0016]** FIG. 1D is a bottom perspective view of the case shell of the case of FIG. 1A without the handle, according to the invention;

**[0017]** FIG. 1E is a top perspective view of the case of FIG. 1A with a portable electronic device disposed in the case shell, according to the invention;

**[0018]** FIG. 2 is a top perspective view of a handle base of the handle of the case of FIG. 1A, according to the invention, FIG. 2 includes lines illustrating cross-sectional cuts of FIGS. 3A to 3D through the handle base;

**[0019]** FIG. 3A is a top perspective cross-sectional view of the case of FIG. 1A illustrating magnets within the handle base, according to the invention;

**[0020]** FIG. 3B is another top perspective cross-sectional view of the case of FIG. 1A illustrating a hand strap and the handle base, according to the invention;

[0021] FIG. 3C is a bottom perspective cross-sectional view of the case of FIG. 1A illustrating elements of the handle and case that facilitate alignment, according to the invention; and

[0022] FIG. 3D is a further top perspective cross-sectional view of the case of FIG. 1A illustrating attachment of the handle base and mounting disc to the case shell, according to the invention.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0023] The present invention relates generally to a case for a portable electronic device and methods of making and using. The present invention is also directed to a portable electronic device case with a handle, which may be rotatable, and magnets and methods of making and using.

[0024] FIGS. 1A to 1E illustrate a case 100 for a portable electronic device 150 (FIG. 1E). The case 100 includes a case shell 102 and a handle 104 attached to the case shell. In at least some embodiments, the case shell 102 is rotatable relative to the handle 104 (or vice versa). In at least some embodiments, the handle 104 includes a hand strap 106 for fitting over the hand or fingers of a user, as illustrated in FIG. 1B, to facilitate retention of the case and portable electronic device by the user. In at least some embodiments, the handle 104 defines a channel 105 within which the hand strap 106 can lie when the hand strap is not extended around a hand of a user. In at least some embodiments, the hand strap 106 can fit, or be modified to fit, around a wrist or arm. The case 100 can be designed for a variety of different portable electronic devices including, but not limited to, mobile phones, cellular phones, tablets, laptop computers, personal digital assistants, or the like or any other suitable portable electronic device.

[0025] The case 100 includes a back panel 108 and at least one sidewall 110 that, in combination, define a cavity 111 (FIG. 1C) for receiving the portable electronic device 150, as illustrated in FIG. 1E. The case 100 also includes an opening 115 in the back panel 108 and a handle support 112 surrounding the opening, as illustrated in FIG. 1D.

[0026] Examples of cases 100 for a portable electronic device 150 that can include, or be modified to include, the handle 104 presented herein are described in U.S. Pat. Nos. 9,195,279; 9,331,444; 9,529,387; 9,602,639; 9,632,535; 9,706,026; 10,389,399; 10,050,658; 10,054,984; 10,454,515; 10,630,334; 10,666,309; 10,778,275; 10,812,643; 11,029,731; 11,076,032; 11,165,458; 11,277,506; and 11,289,864 and U.S. Patent Applications Publication Nos. 2021/0391678 and 2021/0392773, all of which are incorporated herein by reference in their entireties. In at least some embodiments, the case 100 includes an adapter 114 for coupling the case 100 and portable electronic device 150 to a docking cradle or other docking arrangement. However, it will be understood that covers without an adapter can also be used.

[0027] The handle 104 includes a mounting disc 120, as illustrated in FIG. 1C, and a handle base 122, as illustrated in FIG. 2. The handle base 122 includes an outer wall 160, a gripping flange 162 disposed over the outer wall 160, and an interior cavity 164 defined by the outer wall and gripping flange. In at least some embodiments, the gripping flange 162 includes one or more scalloped indents 164 to facilitate gripping and operation of the handle by a user. In at least some embodiments, the outer wall 160 defines opposing

openings 166 and the gripping flange 162 defines opposing indents 168 and the channel 105 for the hand strap 106.

[0028] In at least some embodiments, the hand strap 106 forms a loop (see, FIG. 3B) that extends through the interior cavity 164 of the handle base 122. In at least some embodiments, the hand strap 106 is formed of a stretchable polymeric or other material or includes a spring (preferably encased in a polymer sheath), such as an extension spring, which permits reversible stretching to receive the hand of the user, as illustrated in FIG. 1B. Any other suitable hand strap 106 can be used including, but not limited to, hand straps that do not appreciably stretch and can be made of materials such as plastics, fabric, leather, or the like or any combination thereof.

[0029] In at least some embodiments, the handle base 122 includes at least one magnet 140 disposed in a cavity 144 defined by a magnet holder structure 142. In the illustrated embodiments, the handle base 122 includes two magnets 140 and two magnet holder structures 142 in the form of cylinders, as illustrated in FIG. 2. In at least some embodiments, the magnet holder structures 142 may also facilitate alignment or attachment of the handle 104 to the case shell 102, as described in more detail below.

[0030] Any suitable magnet 140 can be used. In at least some embodiments, the magnet(s) 140 in the handle base 122 of the handle 104 are arranged to mount the case 100 and portable electronic device 150 on an external surface made of a material attracted to the magnet(s). For example, in at least some embodiments, the magnet(s) 140 facilitate attachment of the case 100 and portable electronic device 150 to the door of a refrigerator or other appliance with a metal door. The magnet(s) 140 are selected to maintain the position of the case 100 and portable electronic device 150 in position when placed on the external surface, particularly when placed on a vertical surface.

[0031] FIGS. 3A to 3D are cross-sectional views of the case 100, mounting disc 120, and handle base 122. FIG. 2 includes dotted lines indicating the cross-sectional cuts of FIGS. 3A and 3D relative to the handle base 122. The mounting disc 120 fits into the cavity 111 of the case 100 and is attached, through the opening 115 in the back panel 108 of the case 100, to the handle base 122 using fasteners 124, as illustrated in FIGS. 1C and 3D, which engage fastener retainers 126 (FIGS. 2 and 3D) in the handle base 122. For example, the fasteners 124 can be screws and the fastener retainers 126 can include an interior threading to receive the screw as the screw is driven into the fastener retainer using a tool such as a screwdriver. In at least some embodiments, the fastener retainers 126 are coupled to the magnet holder structure(s) 142 to form a unified body, as illustrated in FIG. 2.

[0032] In at least some embodiments, the mounting disc 120 includes one or more mounting pins 130 that extend through the opening 115 and into the cavity 144 of the magnet holder structure(s) 142, as illustrated in FIG. 3A. In at least some embodiments, the mounting pin(s) 130 may engage or push against the magnet(s) 140 and may facilitate retention of the magnets in the handle base 102. Other methods for magnet retention that can be used additionally or alternatively include, but are not limited to, friction fit, adhesive, insert molding, or the like or any combination thereof. In at least some embodiments, the mounting pins 130 engage the magnet holder structure(s) 142. In at least



some embodiments, this engagement can facilitate alignment of the handle base **122** with the mounting disc **120**.

**[0033]** The handle support **112** is disposed, at least in part, between the mounting disc **120** and the handle base **122**, as illustrated in FIGS. 3A to 3D. In at least some embodiments, the handle base **122** includes two or more abutment structures **128** (where, optionally, pairs of the abutment structures are disposed opposite each other) that, when the handle **104** is disposed on the case **100**, extend into the opening **115** and abut the handle support **112**, as illustrated in FIG. 3D. This arrangement can facilitate alignment of the handle base **122** with the case **100**. In addition, in at least some embodiments, an elevated portion **129** of the mounting disc **120** can abut the abutment structures, as illustrated in FIG. 3C, to further facilitate the alignment of the handle base **122** and mounting disc **120** with the case **100**.

**[0034]** In at least some embodiments, the case shell **102** can rotate relative to the handle **104**. In at least some embodiments, the case shell **102** and handle support **112** can rotate with the handle base **122** and mounting disc **120** remaining stationary. Alternatively, the handle base **122** and mounting disc **120** can rotate with the handle support **112** remaining stationary.

**[0035]** In at least some embodiments, the handle support **112** includes depressions **146** (FIG. 1D) and the handle base **122** includes one or more pins **148** that extend beyond the outer wall **160** so that the pins can engage the depressions in the handle support and resist rotation of the case shell **102** relative to the handle base **122**. In at least some embodiments, the pins **148** and depressions **146** are arranged so that application of force by a user will disengage the pins **148** from the depressions **146** in which the pins reside and permit rotation of the case shell **102** relative to the handle base **122** with reengagement of the pins and depressions when the force is removed. In at least some embodiments, the length of the pins **148** and the number of pins can influence the amount of force needed to rotate the case shell **102** relative to the handle base **122**. In FIG. 2, the illustrated handle base **122** include four pins **148**. In at least some embodiments, the pins **148** and depressions **146** are arranged so that the weight and torque of the portable electronic device **150** and case **100** alone will not rotate the case shell **102** relative to the handle base **122**.

**[0036]** Other methods can be used to limit rotation absent force applied by the user. In at least some embodiments, one or both of the handle base **122** or the mounting disc **120**, in combination with the handle support, provide surface resistance (e.g., friction) to rotation so that the rotation ideally only occurs when intended by the user. Application of force by the user can overcome the surface resistance to allow rotation.

**[0037]** The above specification provides a description of the structure, manufacture, and use of the invention. Since many embodiments of the invention can be made without departing from the spirit and scope of the invention, the invention also resides in the claims hereinafter appended.

What is claimed as new and desired to be protected is:

**1.** A case for a portable electronic device, the case comprising:

a case shell comprising a back panel and at least one side wall extending from the back panel to form a cavity, in combination with the back panel, for receiving the portable electronic device;

a handle coupled to a back panel of the case shell; and at least one magnet positioned within the handle and configured for mounting the case and portable electronic device, when present, on an external surface made of a material attracted to the at least one magnet.

**2.** The case of claim **1**, wherein the case shell is rotatable relative to the handle.

**3.** The case of claim **1**, further comprising a hand strap attached to the case shell or handle and configured for fitting around a hand of a user engaging the handle.

**4.** The case of claim **3**, wherein the handle defines a strap channel to receive a portion of the strap when it is not fit around a hand of the user.

**5.** The case of claim **3**, wherein the handle comprises a handle base, wherein a portion of the hand strap resides within the handle base.

**6.** The case of claim **1**, wherein the handle comprises a handle base and a mounting disc attached, or attachable, to the handle base with a portion of the back panel between the handle base and the mounting disc to couple the handle to the back panel.

**7.** The case of claim **6**, wherein the back panel of the case shell defines an opening and the handle base and mounting disc are configured for fastening to each other through the opening.

**8.** The case of claim **7**, wherein the back panel comprises a handle support disposed around a perimeter of the opening.

**9.** The case of claim **8**, wherein the handle support defines a plurality of depressions and the handle base comprises at least one pin configured to engage the depressions, wherein the case shell is rotatable relative to the handle by applying force to disengage the at least one pin from the depressions and rotate the case shell relative to the handle allowing the at least one pin to reengage the depressions at a rotation stop point.

**10.** The case of claim **9**, wherein the at least one pin comprises a pair of pins disposed opposite each other.

**11.** The case of claim **8**, wherein the handle base comprises a plurality of abutment structures that extend into the opening and abut the handle support when the handle is attached to the case shell.

**12.** The case of claim **11**, wherein the mounting disc comprises at least one elevated portion that abuts the abutment structures when the handle is attached to the case shell.

**13.** The case of claim **6**, wherein the handle base comprises at least one magnet holder structure configured to receive and hold the at least one magnet in the handle.

**14.** The case of claim **13**, wherein the mounting disc comprises at least one pin configured for insertion in the at least one magnet holder structure when the handle is attached to the case shell.

**15.** The case of claim **1**, wherein the handle comprises a plurality of scalloped indents around a perimeter of the handle.

**16.** An arrangement, comprising:

the case of claim **1**; and

a portable electronic device configured for insertion into the case.

**17.** A method of using the case of claim **6**, the method comprising:

attaching the handle base to the mounting disc; and inserting the portable electronic device into the case.

**18.** The method of claim **17**, further comprising attaching the case to a surface using the at least one magnet.

**19.** The method of claim **17**, further comprising rotating the case shell and portable electronic device relative to the handle.

**20.** The method of claim **17**, wherein the handle further comprises a hand strap, the method further comprising inserting a hand of the user into the hand strap.

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