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COMPOSITE PROTECTIVE CASE FOR PHONES, OTHER PORTABLE ELECTRONIC DEVICES AND OTHER APPARATUS

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ABSTRACT

A composite case for an electronic device is provided. The composite case includes: a resilient portion dimensioned to cover two end portions of the electronic device and less than half of a back portion of the electronic device; and a rigid portion dimensioned to fit with the resilient portion, the rigid portion dimensioned to provide a cover for at least part of the back portion of the electronic device. A method of protecting an electronic device is provided. The method includes: attaching a rigid material to a resilient material; dimensioning both the rigid material and the resilient material to contain an electronic device; configuring the rigid material, but not the resilient material, to cover most or all of a back portion of the electronic device; and providing an opening to allow a screen portion of the electronic device to be accessed through the opening in the rigid and resilient material.

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**COMPOSITE PROTECTIVE CASE FOR PHONES,
OTHER PORTABLE ELECTRONIC DEVICES AND OTHER
APPARATUS**

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a divisional of Australian Patent Application No. 2014306814 filed on 12 August 2014, the entire content of which is incorporated herein by reference. This application claims priority to U.S. Provisional Patent Application No. 61/866,465 filed on 15 August 2013, the entire content of which is also incorporated hererin by reference.

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FIELD OF THE INVENTION

[0003] The present invention relates generally to protective cases. More particularly, the present invention relates to a protective case for a portable electronic device.

BACKGROUND OF THE INVENTION

[0004] There are a number of protective cases available for a variety of cellular phones, tablet computers, PDAs and other portable consumer electronic devices. The design and construction of these cases varies widely and they offer varying degrees of protection for the device based on their design. Some cases are constructed from a simple silicon or thermoplastic polyurethane (TPU) rubber molding that provides some basic protection against drops and scratches. Others are constructed from hard injected plastic such as polycarbonate (PC) and provide

similar protection. Cases are typically attached to the device through some mechanical means that seeks to impose a semi-permanent marriage of the case and the device.

[0005] The design and construction of the existing cases provide various levels of protection while also exhibiting various consumer features and benefits, as well as tradeoffs in use as viewed by the typical consumer. For example, rubber cases are economical and they provide basic protection against light drops and scratches. However, the rubber can often provide excessive unwanted grip, which makes insertion and removal of the device into a pants pocket or small purse difficult. Furthermore, when used for cellular phone cases, the rubber can become entangled in long hair when the device is being utilized to make a phone call. Rubber cases also tend to be bulky in design and do not lend themselves well to storage in tight spaces such as a pocket or small purse. Finally, some rubber materials tend to degrade over time, resulting in the case becoming loose or exhibiting an unpleasant appearance.

[0006] Conversely, depending on the design, hard plastic injection molded cases can often provide superior protection while facilitating easy insertion and retrieval from a pocket. Furthermore, these cases tend to impose a lower profile upon the device resulting in an overall smaller form factor which is desirable if the device is to be carried in a pocket or small purse. However, the hard cases can often impose significant stresses on the device if the device is dropped since the hard plastics provide little cushioning. This can be concerning in some cases as many state of the art devices employ sensitive touch screens and delicate buttons and switches. Many manufacturers of cases have sought to overcome the limitations of a single component design by coupling injection molded rubber and hard plastic components in a hybrid fashion in an attempt to achieve the protective benefits of each material while concurrently maintaining the unique positive consumer usability attributes of each.

[0007] In some cases, the rubber component is attached to the device and an injection molded hard plastic cover is mechanically attached to the anterior surface of the rubber to provide further protection while providing ease of entry

and egress into a pocket or purse. In other cases, an injection molded hard case is attached to the device while a supplementary rubber component is applied to the anterior of the hard case. In the designs employing two components, typically the inner component mechanically connects to the device, while the second outer component is mechanically attached to said first component.

[0008] In other embodiments of the two piece design approach, the rubber and hard plastic components are mechanically bonded. This is most often accomplished through a manufacturing process called over-molding in which one of the components is molded first, then the second component is molded over the first component resulting in a permanent mechanical bond between the two components.

[0009] In general, protective cases that employ two component designs provide superior protection, however are not without vulnerabilities and complications. For example, a violent drop can still result in the device separating from one or both of the protective elements described above, resulting in damage to the device. Also, a drop can result in the case components becoming separated from each other again resulting in damage to the device or a nuisance to the consumer. Furthermore, many cases employ elaborate mechanical means to attach all the components together resulting in frustration for the user when installing their device in the case or in the event the device needs to be intentionally removed from the protective case.

[0010] Another challenge of current case designs is that a current trend of ever increasing screen sizes and touch screen interfaces leaves little room for mechanical elements to retain the device within the case without compromising the accessibility to the touch screen itself.

[0011] It would be desirable to have a case that was capable of exhibiting the shock resistant benefits of a rubber inner case coupled with the consumer usability benefits of a hard plastic outer case as described above.

[0012] It would also be desirable to have a composite case that combined a rubber inner case and a hard plastic outer case in a way that formed a permanent bond between the two materials resulting in a protective system that provided the

protective features described above.

[0013] It would also be desirable to have a composite case in which the geometric shape of the constituent components was such as to maximize overall structural strength and impact resistance of the composite case while minimizing material weight and size.

[0014] It would also be desirable to have a case that provided a simple means to install and remove the device from the case yet exhibited a substantial mechanical means to retain the device in the case during use or the event of a drop.

[0015] It would also be desirable to have a case that provided ample protection of the device yet does not interfere with access to buttons, ports, or the device's touchscreen.

[0016] Accordingly, it is desirable to provide a cover that provides protective cushioning for an electronic device yet does not snag on clothing or hair.

SUMMARY OF THE INVENTION

[0017] In one broad form an aspect of the present invention seeks to provide a composite case for an electronic device comprising: a substantially rigid material comprising a substantially rigid portion coupled to a resilient material comprising a resilient portion, the substantially rigid and resilient portions defining the composite case having a back portion and side portions; the electronic device comprising a screen portion, a back portion, and end portions comprising a top portion, a bottom portion, and two side portions each of the two side portions spanning a distance between the top portion and the bottom portion, wherein the screen portion and the back portion are situated on opposite sides of the electronic device; the resilient portion being dimensioned to cover at least a portion of the top portion, the bottom portion, and the two side portions of the electronic device and less than half of the back portion of the electronic device when positioned in the composite case; and a substantially rigid portion dimensioned to fit with the resilient portion in a structural mating geometry provided in the back portion of

the composite case, the substantially rigid portion dimensioned to provide a cover for at least part of the back portion of the electronic device when positioned in the composite case, wherein the structural mating geometry stiffens the back portion of the composite case; wherein the electronic device is positioned in the composite case through an opening formed in the resilient portion opposite the back portion, and wherein at least part of the screen portion of the electronic device when positioned in the case is accessed through the opening and access to the at least part of the screen portion is not compromised by the resilient portion or the substantially rigid portion.

[0018] In one embodiment, the substantially rigid portion defines a honeycomb pattern.

[0019] In one embodiment, holes in the substantially rigid portion are filled with resilient material.

[0020] In one embodiment, a sidewall in the composite case is comprised partially of the substantially rigid portion and the resilient portion.

[0021] In one embodiment, the composite case further comprises actuators in the resilient portion of the sidewall dimensioned to align with actuators on an electronic device when the electronic device is contained in the composite case.

[0022] In one embodiment, the composite case further comprises a region of the substantially rigid portion that is raised toward an electronic device contained by the composite case.

[0023] In one embodiment, the region of the substantially rigid portion that is raised is generally rectangular with lines radiating from corners of the rectangle and a center portion of the rectangle.

[0024] In one embodiment, both the substantially rigid portion and the resilient portion define an open region that is aligned with a lens associated with a camera when an electronic device is contained by the composite case.

[0025] In one embodiment, the resilient portion further comprises a resilient border surrounding the open region.

[0026] In one embodiment, the substantially rigid portion is substantially transparent or substantially translucent.

[0027] In one embodiment, the resilient portion and the substantially rigid portion are dimensioned so that the resilient portion is flexed when it is engaged with the substantially rigid portion.

[0028] In one embodiment, the composite case further comprises an opening configured to provide access to an electronic port.

[0029] In one embodiment, the substantially rigid portion is made of a plastic material.

[0030] In one embodiment, the device comprises at least one button or at least one port, and wherein the resilient portion and the substantially rigid portion do not interfere with access to the at least one button or the at least one port of the electronic device, when positioned in the composite case.

[0031] In another broad form an aspect of the present invention seeks to provide a composite case for an electronic device comprising: the electronic device comprising a screen portion, a back portion, and end portions comprising a top portion, a bottom portion, and two side portions each of the two side portions spanning between the top portion and the bottom portion, wherein the screen portion and the back portion are situated on opposite sides of the electronic device, and wherein each of the two end portions are situated on opposite sides of the electronic device; a resilient portion comprising a back wall and a hole in the back wall, and dimensioned to cover at least a portion of the top portion, the bottom portion, and the two side portions of the electronic device and less than half of the back portion of the electronic device when positioned in the composite case; a substantially rigid portion dimensioned to fit with the resilient portion, the substantially rigid portion dimensioned to provide a cover for at least part of the back portion of the electronic device when positioned in the composite case; and an opening formed in the resilient portion opposite the back wall, wherein a mating geometry is provided between the substantially rigid portion and the hole.

[0032] It will be appreciated that the broad forms of the invention and their respective features can be used in conjunction, interchangeably and/or independently, and reference to separate broad forms is not intended to be limiting.

[0033] The foregoing needs are met, to a great extent, by the present invention, wherein in one aspect an apparatus is provided that in some embodiments provides a cover that provides protective cushioning for an electronic device yet does not snag on clothing or hair.

[0034] In accordance with one embodiment of the present invention, a composite case for an electronic device is provided. The composite case includes: a resilient portion dimensioned to cover two end portions of the electronic device and less than half of a back portion of the electronic device; and a rigid portion dimensioned to fit with the resilient portion, the rigid portion dimensioned to provide a cover for at least part of the back portion of the electronic device.

[0035] In accordance with another embodiment of the present invention, a method of protecting an electronic device is provided. The method includes: attaching a rigid material to a resilient material; dimensioning both the rigid material and the resilient material to contain an electronic device; configuring the rigid material, but not the resilient material, to cover most or all of a back portion of the electronic device; and providing an opening to allow a screen portion of the electronic device to be accessed through the opening in the rigid and resilient material.

[0036] In accordance with yet another embodiment of the present invention, a composite case for an electronic device is provided. The composite case may include: a resilient portion dimensioned to cover two end portions of the electronic device and less than half of a back portion of the electronic device; and a rigid portion dimensioned to fit with the resilient portion, the rigid portion dimensioned to provide a cover for at least part of the back portion of the electronic device; a region in the rigid portion defining honeycomb shapes; a region of the rigid portion that is raised toward an electronic device contained by the case; and wherein the raised region is generally rectangular with lines radiating from corners of the rectangle and a center portion of the rectangle.

[0037] There has thus been outlined, rather broadly, certain embodiments of the invention in order that the detailed description thereof herein may be better understood, and in order that the present contribution to the art may be better

appreciated. There are, of course, additional embodiments of the invention that will be described below and which will form the subject matter of the claims appended hereto.

[0038] In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of embodiments in addition to those described and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein, as well as the abstract, are for the purpose of description and should not be regarded as limiting.

[0039] As such, those skilled in the art will appreciate that the conception upon which this disclosure is based may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0040] FIG. 1 is a left, front, perspective view of an embodiment in accordance with the present disclosure.

[0041] FIG. 2 is a left, front, perspective view of an embodiment in accordance with the present disclosure housing a typical cell phone.

[0042] FIG. 3 is a left, front, perspective view of a typical cell phone used for illustrative purposes.

[0043] FIG. 4 is a left, front, perspective exploded view of components present in some embodiments.

[0044] FIG. 5 is a right, rear, perspective exploded view of components present in some embodiments.

[0045] FIG. 6 is a mid-plane cross sectional view of a case assembly in accordance with some embodiments housing a typical cell phone.

[0046] FIG. 7 is a right, rear, perspective view of an embodiment in accordance with this disclosure.

[0047] FIG. 8 is a rear, isometric view of a case according to an embodiment.

[0048] FIG. 9 is a front, isometric view of a case according to an embodiment.

[0049] FIG. 10 is a front, exploded, isometric view of a case according to an embodiment.

[0050] FIG. 11 is a front, isometric view of a case according to an embodiment.

[0051] FIG. 12 is a rear, isometric view of a case according to an embodiment.

[0052] FIG. 13 is a front, exploded, isometric view of a case according to an embodiment.

[0053] FIG. 14 is a front, isometric view of a portion of a case according to an embodiment.

[0054] FIG. 15 is a front, isometric view of a portion of a case according to an embodiment.

DETAILED DESCRIPTION

[0055] The embodiments in accordance with the invention will now be described with reference to the drawing figures, in which like reference numerals refer to like parts throughout. An embodiment in accordance with the present invention provides a cover for a portable electronic device such as a smart phone or any other portable electronic device. The cover is made of multiple parts, a hard part and a resilient part. The resilient part provides cushioning for the electronic device and the hard part provides protection as well as a relatively slick surface to make the cover easy to put in and out of a pocket, purse, and does not entangle with long hair.

[0056] Embodiments in accordance with the present invention can be applied to several modifications of cases as they pertain to cell phones, tablet

computers, PDAs and numerous other portable electronic devices. For illustration purposes, an embodiment in accordance with the present invention is shown as a cell phone case although other devices would employ similar details, features and benefits.

[0057] The following description, and the figures to which it refers, are provided for the purposes of describing examples and specific embodiments of the invention only and are not intended to exhaustively describe all possible examples and embodiments of the invention.

[0058] A two part composite case is provided to encapsulate and protect a variety of cellular phones, tablet computers PDAs and numerous portable consumer electronic devices. Some embodiments include a two-part case made of an injection molded TPU rubber inner case and an injection molded polycarbonate outer case.

[0059] The polycarbonate outer case, in some embodiments, features a base that protects the rear of the device, and two parallel side walls that protrude vertically from the base. The geometry of the TPU rubber at the ends of the case for bumpers that encapsulate the entire ends of the device and provide added protection in the event of a drop.

[0060] The inner case and outer case are manufactured in an over molding manufacturing process that provides a permanent bond between said inner case and outer case forming a two-piece composite case protective system. When the device is installed inside the composite case, the case and device are substantially coexistent through a mechanical means so that a protective system is established that provides resistance to impacts, sharp objects, shock and scratches to the device.

[0061] Although the example and embodiment used herein may refer to a cellular phone application, this is by way of example rather than limiting. The present invention is intended to also be used with PDAs, smartphones, tablet computers, electronic games, gaming devices, internet browsing devices, portable computing devices and other numerous consumer electronic devices.

[0062] In addition to the composite combination of the TPU inner case and the polycarbonate outer case, some embodiments employ several unique design elements that act together forming a system to provide the following benefits: maximize protection of the device being housed within the case, facilitate easy installation and removal of the device from the case, provide easy access to all device buttons and ports, and accomplish all this through an efficient mechanical design that minimizes weight and size of the device and case assembly.

[0063] Referring to FIG. 1 in one embodiment, a device case 10 is shown housing a cellular phone device 20 in FIG. 2. The particular phone device 20 separately shown in FIG. 3 is for illustrative purposes only and various embodiments are applicable to other phone designs as well as other portable consumer electronic devices as described earlier. The case is comprised of two components including a TPU soft rubber inner case 30 and a polycarbonate (PC) hard plastic injection molded outer case 40 shown in an exploded view in FIG. 4. The outer case 40 features a base and two parallel side walls 160 that protrude vertically from the base. The inner case 30 and outer case 40 are manufactured in a manufacturing process called over molding. In this process, the PC outer case 40 is injection molded first and then the TPU inner case 30 is molded around the outer case 40. This process forms a permanent mechanical bond between the inner case and outer case resulting in the composite case assembly shown in FIG. 1.

[0064] FIG. 5 shows a right rear exploded view of the case components. The surfaces 50 of the inner case 30 that bonds with the surfaces 60 of the outer case 40 is illustrated in FIGS. 4 and 5. This interface between the inner case 30 and outer case 40 is further illustrated in the mid-plane cross sectional view shown in FIG. 6. As described earlier, the inner case 30 provides a soft impact resistant layer of protection for the device 20. This is illustrated in FIG. 6 as the inner case 30 is shown to encapsulate the device 20. The outer case 40 provides an outer structural stiffness to the case and resistance to knocks or sharp objects. The outer case also facilitates certain consumer usage benefits including easy insertion and

removal of the case 10 from a pocket and no tangling of the rubber with hair during phone calls.

[0065] FIG. 7 illustrates a right rear view of an embodiment of the device case 10 and highlights the unique geometric design 80A formed in the rear of the outer case 40. The shape illustrated is present in some embodiments, other variations of this geometry may be proposed that offer similar behavior as this would be apparent to those skilled in the art. The inside of this geometric design 80B carries through to the inside of the outer case 40 and is illustrated in FIG. 4. An appropriate mating geometry 90 shown in FIG. 5 results in the inner case 30 during the over molding process and forms the interface 70 of the two materials seen in FIG. 6. This geometric design 80A of the outer case and resulting interface 70 with the inner case 30 is shown in the cross-sectional view of FIG. 6. The unique shape of the geometric design 80A formed in the outer case 40 acts to stiffen and strengthen the outer case structure in an efficient fashion so as to minimize size and weight.

[0066] This concept will be familiar to those skilled in the art of mechanical design and strength of materials. The mating geometry 90 in the inner case is also a means to accommodate the geometric design 80B without having to provide a continuous surface on the inside of the case 100 (FIG. 1) thereby resulting in minimal thickness and weight of the overall case 10. This is further illustrated in FIG. 6 as the overall thickness 110 of the rear of the case 10 is minimized given the interaction of the two individual case components 30, 40 while maximizing strength. The view in FIG. 1 that shows the inside surface 60 of the case 10 where the device 20 sits also illustrates the resulting exposure of the outer case 40 showing through the mating geometry 90 of the inner case 30.

[0067] In addition to the inherent protective benefits of the composite design of the case 10, the components also feature other details that further contribute to the protective abilities and utility of the case 10. When combined, the unique respective designs of the inner case 30 and parallel walls 160 of the outer case 40 result in exposed rubber bumpers 120 shown in FIG. 2 on each end of the case that correspond to the top and bottom ends of the device 20. In some

embodiments, the bumpers 120 may be part of the resilient inner portion 30. The geometry of the bumpers 120 provides additional protection for the device 20 in the event of a drop. The bumpers 120 also feature appropriate buttons 130 and ports 140 shown in FIG. 1 to allow interaction with the device 20. Furthermore, the flexible TPU rubber bumpers 120 facilitate easy insertion of the device 20 into the case 10.

[0068] Conversely, the flexible design also allows easy removal of the device 20 by providing a means to stretch the bumpers 120 away from the device 20 thereby allowing access to the device 20 body for removal.

[0069] The inner case 30 also features a lip 150 molded into the TPU rubber that holds the device 20 in place when installed in the case 10 as shown in FIG. 6. When removing the device 20, stretching the rubber lip 150 away from the device 20 allows the device to be pried out the case 10. The parallel orientation of the vertical side walls 160 of the polycarbonate exterior case 40 are also allowed to flex away from the device 20 further facilitating removal of the device 20. It will be appreciated that embodiments have been described here above with reference to certain examples or embodiments as shown in the drawings. Various additions, deletions, changes and alterations may be made to the above-described embodiments and examples without departing from the intended spirit and scope of this invention. Accordingly, it is intended that all such additions, deletions, changes and alterations be included within the scope of any claims that are granted in connection with this specification.

[0070] FIG. 8 illustrates another embodiment of a case 10 for an electronic device 20. The case 10 includes a resilient portion 30 and a relatively hard portion 40. In FIG. 8, a rear portion or back 175 of the case 10 is shown. An electronic device or cell phone 20 is located in the case 10. The case 10 has an open section 176 in the back 174 of the hard portion 40 of the case 10 thereby exposing the electronic device 20. In addition to exposing the device 20, the open section 176 also exposes a flashbulb 172 and camera lens 170 associated with electronic device 20. In other embodiments, an open section 176 may be located anywhere in the case 10 to expose features such as a camera lens 170, flash 172 or any other

features of electronic device 20 which are desired to be exposed in order for those features to work. The open section 176 is not limited to the location illustrated in FIG. 8 but maybe moved to provide exposure of any device 20 features desired to be exposed.

[0071] The case 10 includes a resilient anchors 178 that extend through holes 188 in the hard portion 40 of the case 10. The resilient anchors 178 may be dimensioned and configured to contact the electronic device 20 to help secure and cushion the electronic device 20 within the case 10. In some embodiments, the resilient anchors 178 may be press fit with in the holes 188 in the hard portion 40 of the case 10.

[0072] In the embodiment shown in FIG. 8, the hard portion 40 of the case 10 also includes a geometric design 80A. The geometric design 80A may be dimensioned so that the part of the hard case 40 that is part of the geometric design 80A is closer to the electronic device 20 then the remaining portions of the hard portion 40 as shown. In other words, this geometric design 80A may appear to be embossed to form a dent in the back of the hard portion 40 of the case 10. In other embodiments, the geometric design 80A may be raised with respect to the back 174 of the hard portion 40. In such embodiments, the geometric design 80A will be farther away from the electronic device 20 then the rest of the hard portion 40 of the case 10.

[0073] As shown in FIG. 8, the case 10 includes a resilient portion 30 which include bumpers 120. The bumpers 120 include an upper bumper 180 and the lower bumper 182. In some embodiments, the bumpers 120 are located above and below the hard portion 40 of the case 10. As a result, the bumpers 120 provide some protection against impact at the top and bottom of the case 10.

[0074] The hard portion 40 of the case 10 may also include a side portion 184. The side portion 184 may have openings to provide for feature appropriate buttons 130 formed in the resilient portion 30 of the case 10. As previously described, the feature appropriate buttons 130 allow a user to activate features on the electronic device 20 without actually having to contact the electronic device and provide protection for actuators located on the electronic device 20. The

resilient portion 30 may also provide openings or ports 142 allow access to ports or plug-ins on electronic device 20. As such, the side wall 184 of the hard portion 40 is also open to provide access.

[0075] FIG. 9 illustrates a front 177 of the case 10. The electronic device 20 is removed in order to better illustrate features of the case 10. The upper bumper 180 and lower bumper 182 are illustrated. The back side of the geometric design 80B is also illustrated. The back side of the geometric design 80B contacts a corresponding hole formed in the shape of appropriate mating geometry 90 in the resilient portion 30 of the case 10 to accommodate the back side of the geometric design 80B. The resilient portion 30 has the back wall 183. In some embodiments, the back wall 183 may form honeycomb shape structure 187 similar to that shown in FIG. 10.

[0076] An open section 186 in the resilient portion 30 of the case 10 is also shown. As one of ordinary skill the art will appreciate after reviewing this disclosure, the open section 186 and the resilient portion 30 is co-located with the open section 176 in the hard portion 40 in order to provide an opening to expose features of the electronic device 20 such as, for example, but not limited to, a camera lens 170 and flash 172 in the electronic device 20 as described above with respect to FIG. 8. In addition to the open section 186, the resilient portion 30, the open port 140, and the resilient portion 30, as well as the feature appropriate buttons 130 are also shown. A side 184 of the hard case 40 is shown as well as the corresponding section of the resilient portion 30.

[0077] FIG. 10 is an exploded isometric view of a case 10 in accordance with one embodiment. The hard plastic portion 40 is shown separated from the resilient portion 30 in order to better show the features of each. Of course, the case 10 is normally assembled as shown in FIGS. 8 and 9 but is only shown an exploded view for clarity. The open section 176 in the hard portion 40 is illustrated. The holes 188 in the hard case 40 can also be seen. The hard portion 40 also contains an absent portion 190 located above the sidewalls 24 of the hard case 40. The absent portion 190 allows the feature appropriate buttons 130 and a port 140 in the resilient portion 30 contact a phone or other device 20 when such a

device 20 is located in the case 10. A second sidewall 192 of the hard portion 40 is shown located opposite the first sidewall 184. The geometric design 80B can also be seen in the hard portion 40.

[0078] The resilient portion 30 of the case 10 is also shown. The open section 186, the upper bumper 180 and lower bumper 182 are also illustrated. The feature appropriate buttons 130 and access port 140 may be seen on the left-hand side of the resilient portion 30 shown on FIG. 10. The appropriate mating geometry 90 that corresponds to the geometric design 80B may be seen in the open section 194 of the resilient portion 30. The honeycomb structure 187 located on the back wall 183 of the resilient portion 30 is illustrated. In some embodiments, the polygons of the honeycomb structure 187 may be raised up from the surface of the back wall 23. In other embodiments, polygons of the honeycomb structure 187 may be sunk with respect to the back wall 183 of the resilient portion 30 and the borders between the polygons may be raised up.

[0079] FIGS. 11 and 12 are assembled views of a case 10 according to another embodiment. FIG. 13 is an exploded view of the case 10. The case shown to be in FIGS. 11, 12, and 13 may have some features with different reference numerals than shown in FIGS. 1 through 10. However, unless stated otherwise below, these features perform the same or similar functions as corresponding features discussed above and shown in FIGS. 1 to 10.

[0080] The case 10 is shown in an exploded view to better show various features of the case 10. The following description will be with respect to FIGS. 11 through 13. FIG. 11 shows the front 177 of the case 10. FIG. 12 shows the back 175 of the case 10. As shown in FIGS. 11, 12, and 13, the case 10 includes a hard portion 204 and a resilient portion 206. In some embodiments, the hard portion 204 and the resilient portion 206 may be made of the same materials as the hard portion 40 and the resilient portion 30 described above. In other embodiments, other types of materials may also be used in accordance with the present disclosure. In some embodiments, the hard portion 204 may substantially be made of a translucent or transparent material. In other embodiments, the hard portion 204 may be made of a colored material and may be available in a variety of colors.

[0081] The case 10 includes an actuator 196 located on the upper bumper 180. The actuator 196 on the case 10 permits a user to manipulate an actuator located on the electronic device such as a phone. As a result, the actuator 196 will be located on the case 10 in an area that corresponds to an actuator on an electronic device 20, for which the case 10 is designed. An open portion 176 is located in both the hard portion 204 and the resilient portion 206 to allow exposure to components such as camera lens 170 and flash 172 of electronic device 20 (not shown in FIGS. 11, 12 and 13) similar to as previously described. The resilient portion 206 also includes ports 140 and feature appropriate buttons or actuators 130.

[0082] The bumpers 180 and 182 of the resilient portion 206 of the case 10 are illustrated. The opening 140 and feature appropriate buttons 130 are also shown. The open section 218 of the side 184 of the hard portion 204 is illustrated as well as the side 184 of the hard portion 204. An opposite sidewall 192 in the hard portion 204 also is seen. An open portion to 218 in the resilient portion 30 is also shown. The resilient pads 212 are located in holes 188 and the hard portion 204 are also shown. The geometric shape 202 in the back wall 183 of the hard portion 204 is also illustrated as well as the honeycomb pattern 210. As mentioned above, in some embodiments. The polygons associated with the honeycomb pattern 210 are raised, in other embodiments the borders between the polygons in the honeycomb pattern 210 may be raised instead. As a result, the honeycomb pattern 210 can either be in a positive or negative relief configuration. The honeycomb structure 210 may provide additional, rigidity, strength or stiffness to the hard portion 204. As result, the honeycomb structure 210 may allow the hard portion 204 to be lighter.

[0083] The resilient portion 206 of the case to 10 may also include a resilient front lip 214. The resilient lip 214 extends around the circumference of the open section 186 in the case 10. The open section 186 permits a screen associated with electronic device 20 (not shown in FIGS. 11-13) to be seen, and, in the case of a touchscreen, manipulated through the case 10.

[0084] Figs 14 and 15 are side-by-side comparison isometric views of the resilient portion 30 (FIG. 14) of one embodiment and the resilient portion 206 of a second embodiment (FIG. 15) where the hard case 40 and 204 are not shown. The resilient portion 206 of FIG. 15 lacks the back wall 183 of the resilient portion 30 shown in FIG. 14. Because there is no back wall 183 in FIG. 15, the honeycomb pattern 210 is also absent as well as the appropriate mating geometry 90. The side wall 184 shown in FIG. 14 is also absent in the embodiment shown in FIG. 15 having only a cutout portion 219 and the resilient front lip 214 present in the embodiment shown in FIG. 15.

[0085] The resilient portion 206 shown in FIG. 15 is been trimmed down in order to take advantage of the aesthetic appeal and technical advantages provided by a hard plastic case 204 (not shown in FIG. 15). Other alterations of the resilient portion 206 may also be made in accordance with various embodiments.

[0086] Lines 228 and 230 of FIG. 14 show portions of the resilient case 30 in FIG. 14 and are removed in the resilient portion 206 of FIG. 15.

[0087] The many features and advantages of the invention are apparent from the detailed specification, and thus, it is intended by the appended claims to cover all such features and advantages of the invention which fall within the true spirit and scope of the invention. Further, since numerous modifications and variations will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation illustrated and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

[0088] The reference in this specification to any prior publication (or information derived from it), or to any matter which is known, is not, and should not be taken as an acknowledgment or admission or any form of suggestion that that prior publication (or information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

[0089] Throughout this specification and claims which follow, unless the context requires otherwise, the word “comprise”, and variations such as “comprises” or “comprising”, will be understood to imply the inclusion of a stated integer or group of integers or steps but not the exclusion of any other integer or group of integers.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A composite case for an electronic device comprising:
 - a substantially rigid material comprising a substantially rigid portion coupled to a resilient material comprising a resilient portion, the substantially rigid and resilient portions defining the composite case having a back portion and side portions;
 - the electronic device comprising a screen portion, a back portion, and end portions comprising a top portion, a bottom portion, and two side portions each of the two side portions spanning a distance between the top portion and the bottom portion, wherein the screen portion and the back portion are situated on opposite sides of the electronic device;
 - the resilient portion being dimensioned to cover at least a portion of the top portion, the bottom portion, and the two side portions of the electronic device and less than half of the back portion of the electronic device when positioned in the composite case; and
 - a substantially rigid portion dimensioned to fit with the resilient portion in a structural mating geometry provided in the back portion of the composite case, the substantially rigid portion dimensioned to provide a cover for at least part of the back portion of the electronic device when positioned in the composite case, wherein the structural mating geometry stiffens the back portion of the composite case;
 - wherein the electronic device is positioned in the composite case through an opening formed in the resilient portion opposite the back portion, and wherein at least part of the screen portion of the electronic device when positioned in the case is accessed through the opening and access to the at least part of the screen portion is not compromised by the resilient portion or the substantially rigid portion.

2. The composite case of claim 1, wherein the substantially rigid portion

defines a honeycomb pattern.

3. The composite case of claim 1 or claim 2, wherein holes in the substantially rigid portion are filled with resilient material.
4. The composite case of any one of claims 1 to 3, a sidewall in the composite case comprised partially of the substantially rigid portion and the resilient portion.
5. The composite case of claim 4, further comprising actuators in the resilient portion of the sidewall dimensioned to align with actuators on an electronic device when the electronic device is contained in the composite case.
6. The composite case of any one of claims 1 to 5, further comprising a region of the substantially rigid portion that is raised toward an electronic device contained by the composite case.
7. The composite case of claim 6, wherein the region of the substantially rigid portion that is raised is generally rectangular with lines radiating from corners of the rectangle and a center portion of the rectangle.
8. The composite case of any one of claims 1 to 7, wherein both the substantially rigid portion and the resilient portion define an open region that is aligned with a lens associated with a camera when an electronic device is contained by the composite case.
9. The composite case of claim 8, wherein the resilient portion further comprises a resilient border surrounding the open region.
10. The composite case of any one of claims 1 to 9, wherein the substantially rigid portion is substantially transparent or substantially

translucent.

11. The composite case of any one of claims 1 to 10, wherein the resilient portion and the substantially rigid portion are dimensioned so that the resilient portion is flexed when it is engaged with the substantially rigid portion.

12. The composite case of any one of claims 1 to 11, further comprising an opening configured to provide access to an electronic port.

13. The composite case of any one of claims 1 to 12, wherein the substantially rigid portion is made of a plastic material.

14. The composite case of any one of claims 1 to 13, wherein the device comprises at least one button or at least one port, and wherein the resilient portion and the substantially rigid portion do not interfere with access to the at least one button or the at least one port of the electronic device, when positioned in the composite case.

15. A composite case for an electronic device comprising:
the electronic device comprising a screen portion, a back portion, and end portions comprising a top portion, a bottom portion, and two side portions each of the two side portions spanning between the top portion and the bottom portion, wherein the screen portion and the back portion are situated on opposite sides of the electronic device, and wherein each of the two end portions are situated on opposite sides of the electronic device;

a resilient portion comprising a back wall and a hole in the back wall, and dimensioned to cover at least a portion of the top portion, the bottom portion, and the two side portions of the electronic device and less than half of the back portion of the electronic device when positioned in the composite case;

a substantially rigid portion dimensioned to fit with the resilient portion,

the substantially rigid portion dimensioned to provide a cover for at least part of the back portion of the electronic device when positioned in the composite case; and

an opening formed in the resilient portion opposite the back wall, wherein a mating geometry is provided between the substantially rigid portion and the hole.

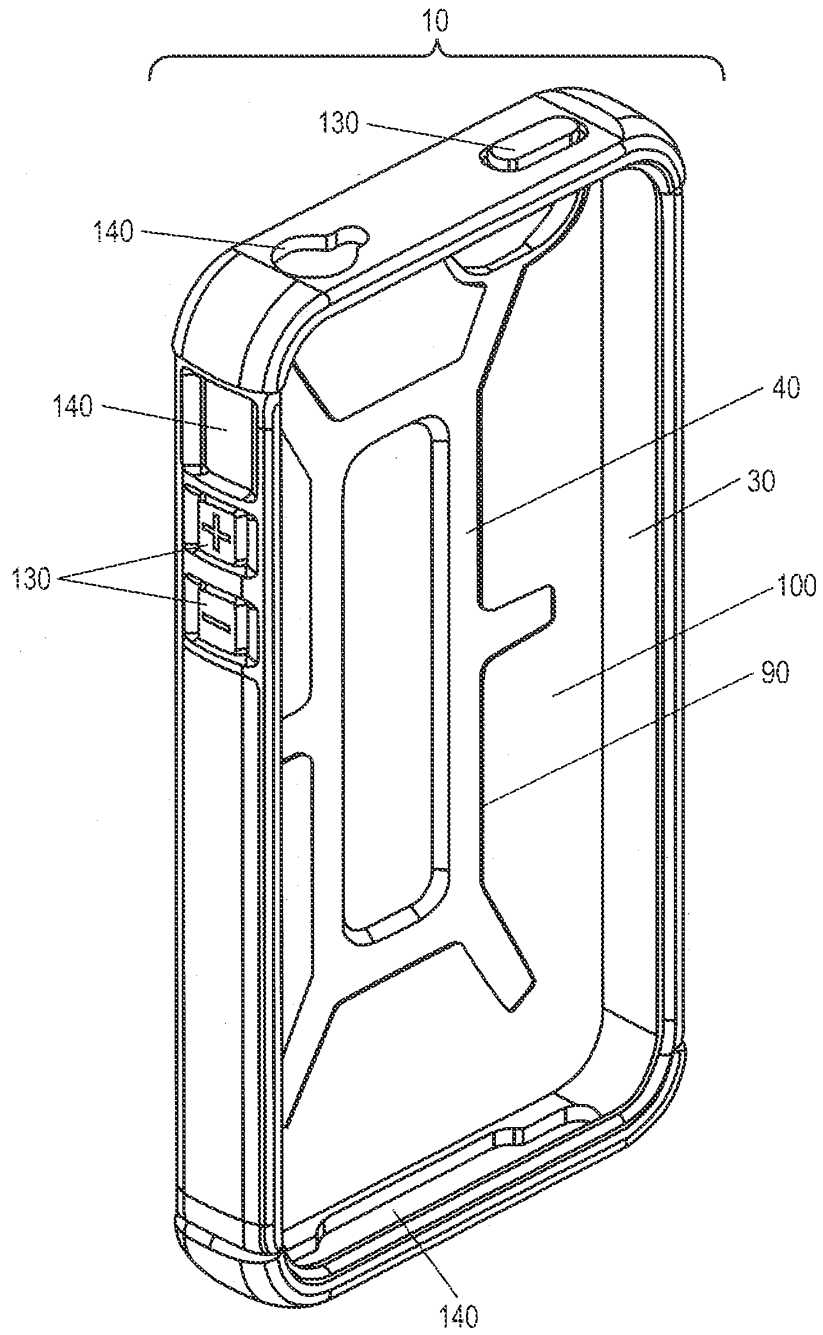


FIG. 1

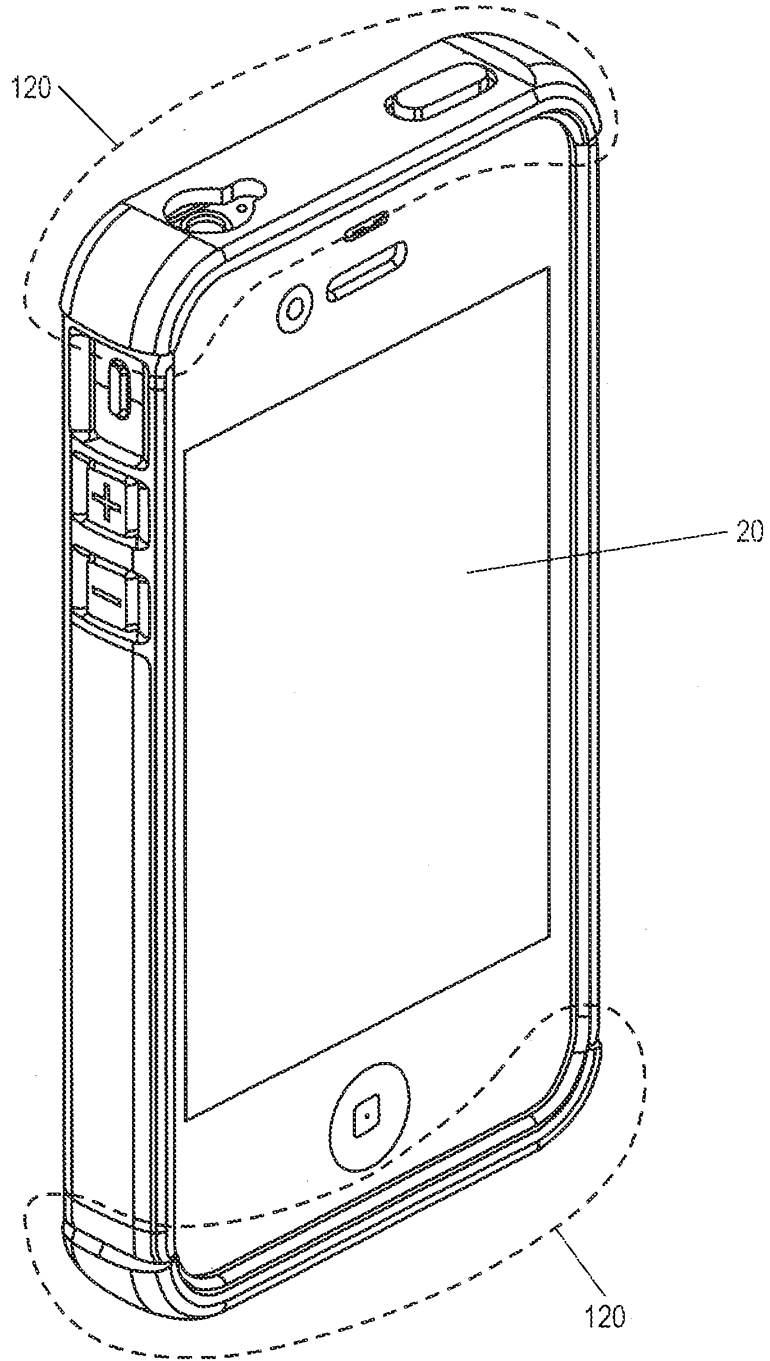


FIG. 2

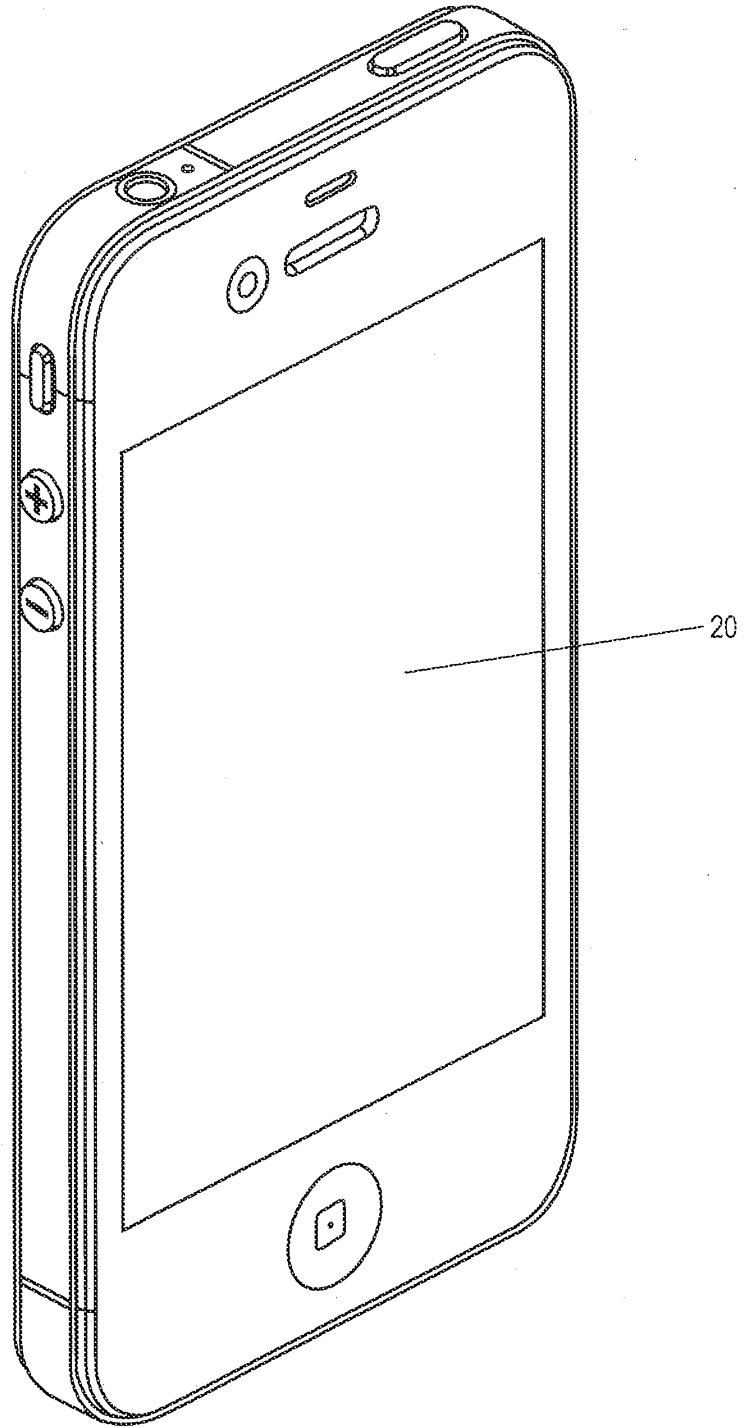


FIG. 3

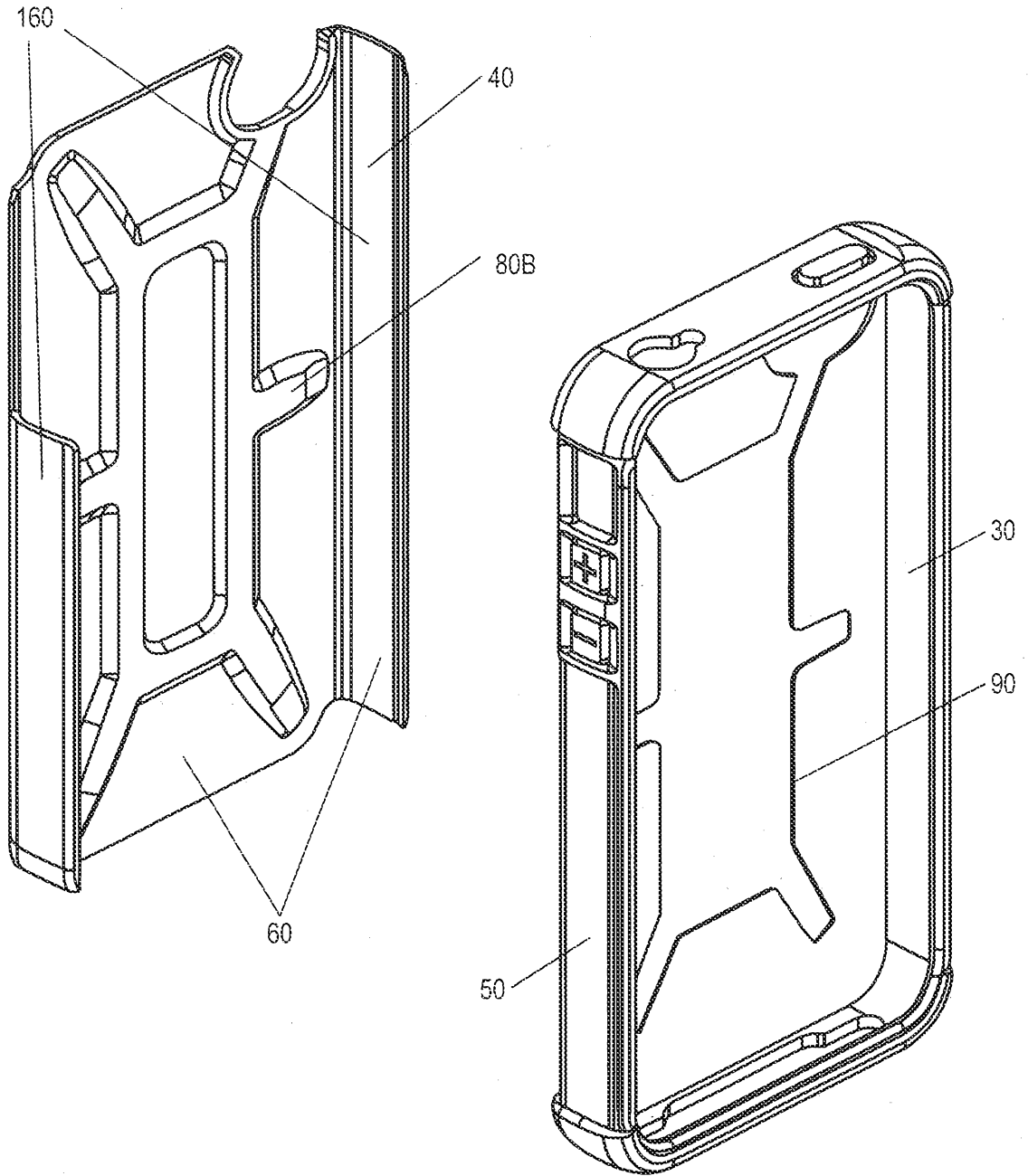


FIG. 4

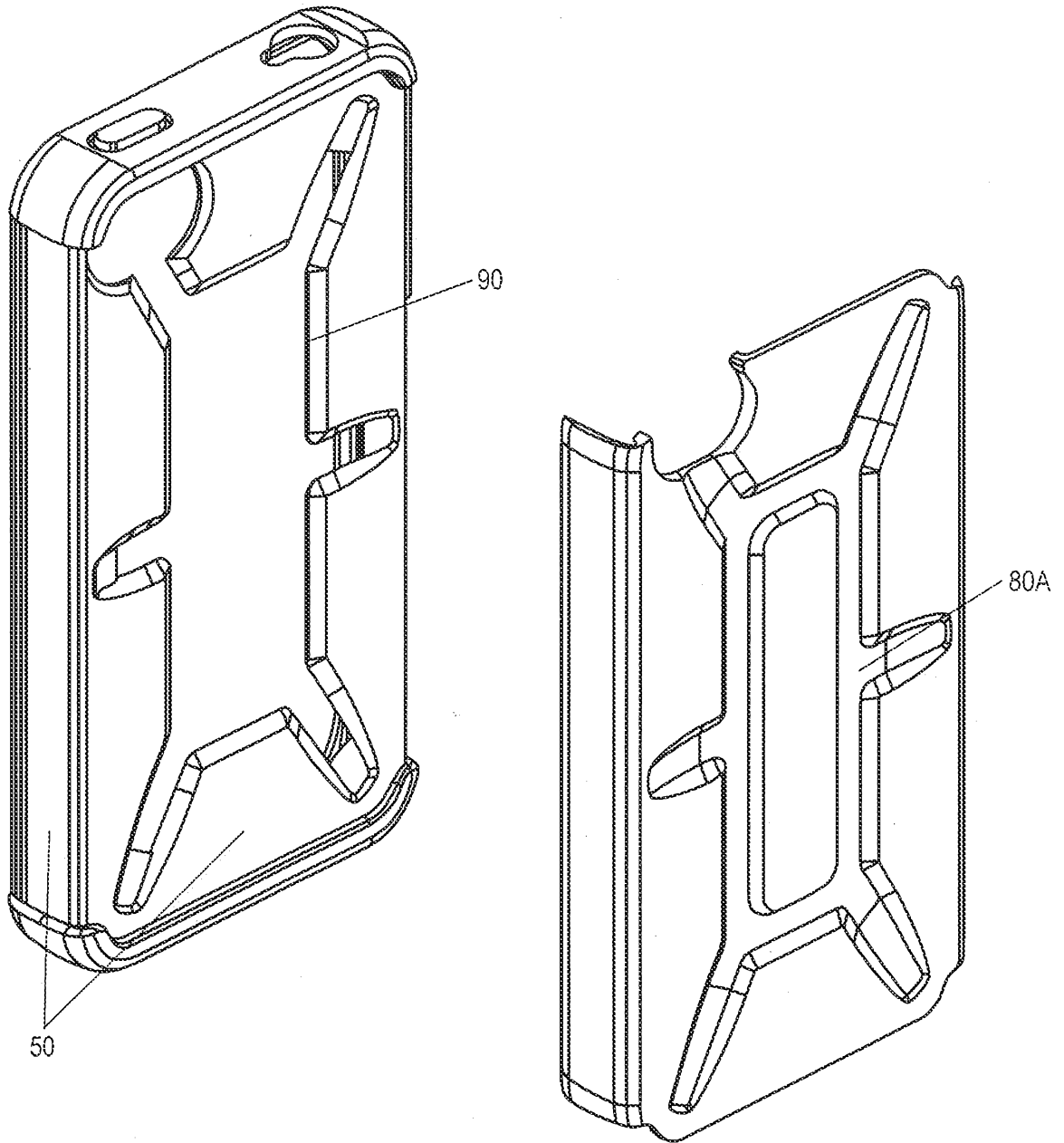


FIG. 5

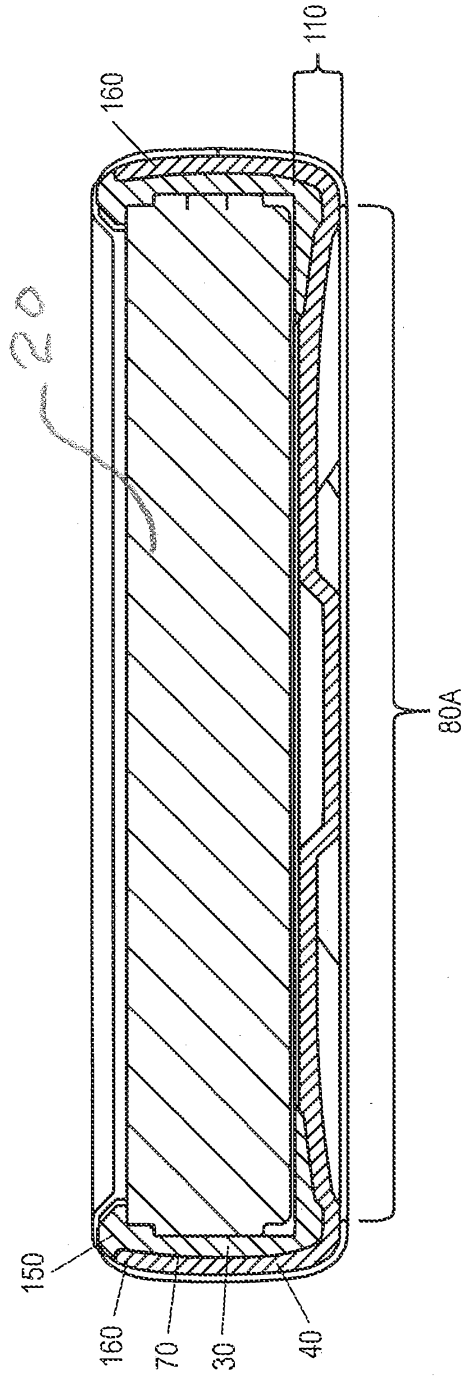


FIG. 6

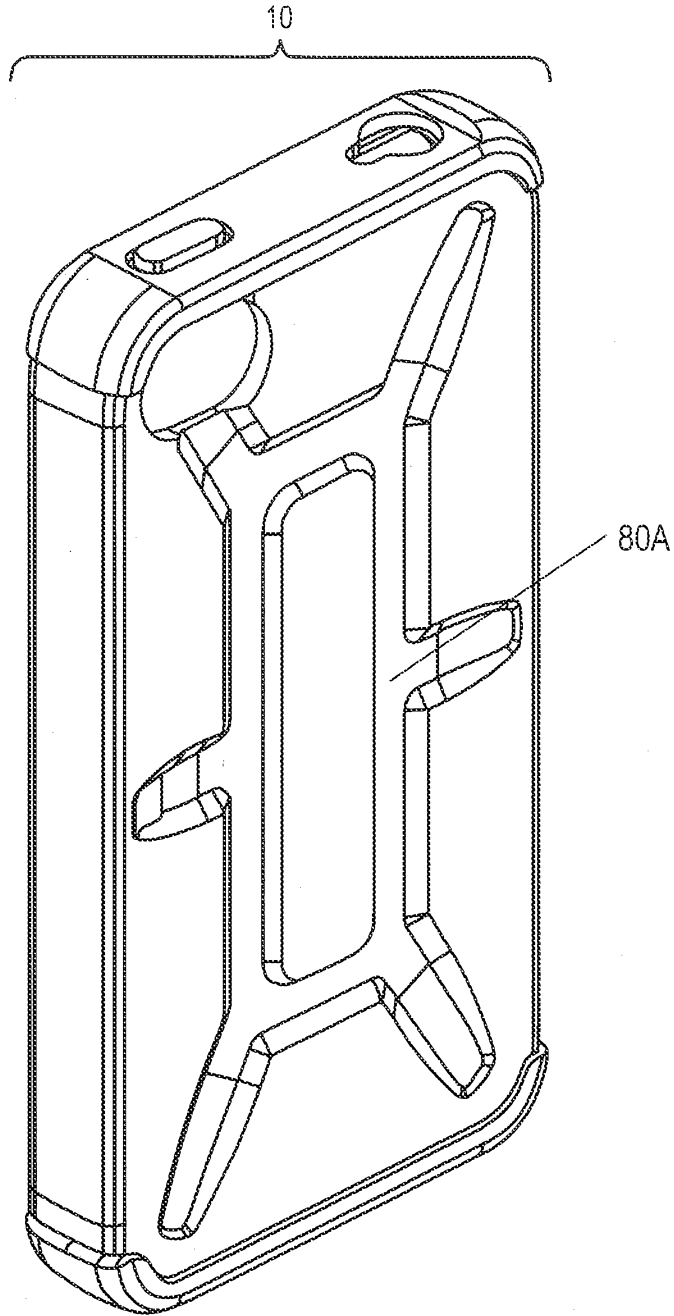


FIG. 7

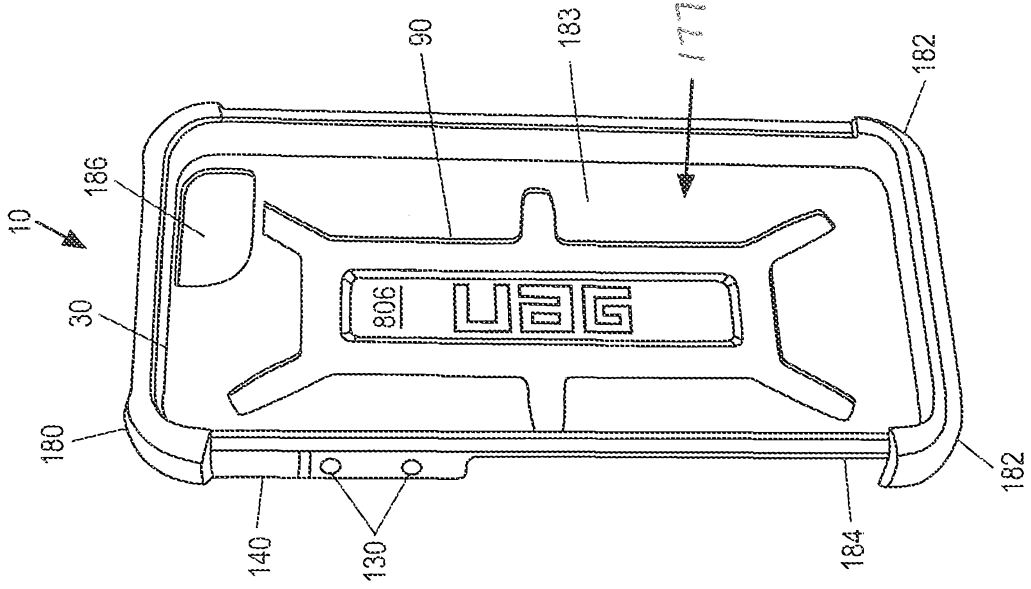


FIG. 9

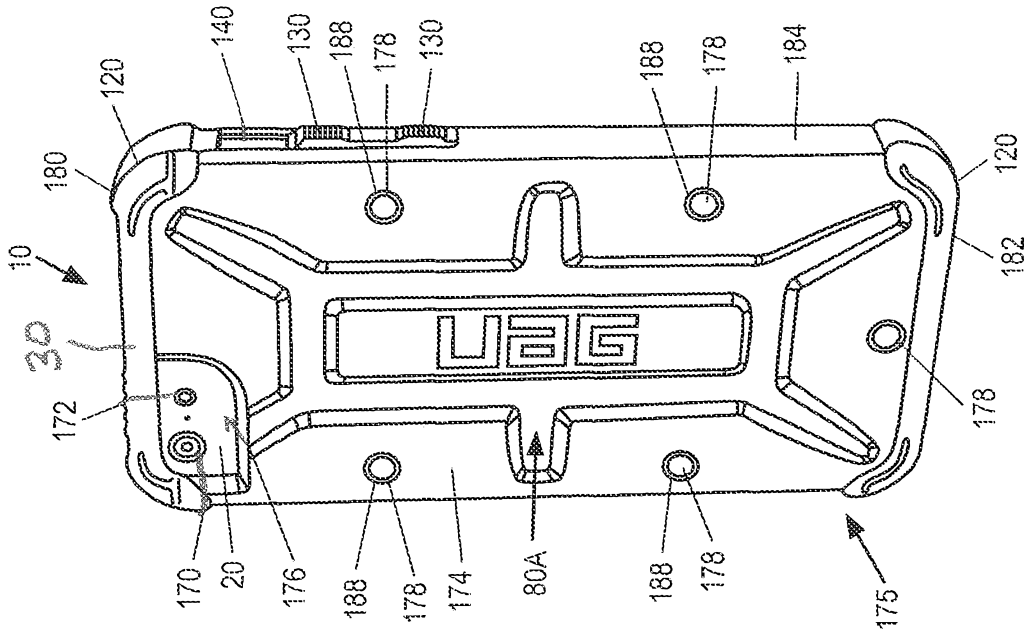


FIG. 8

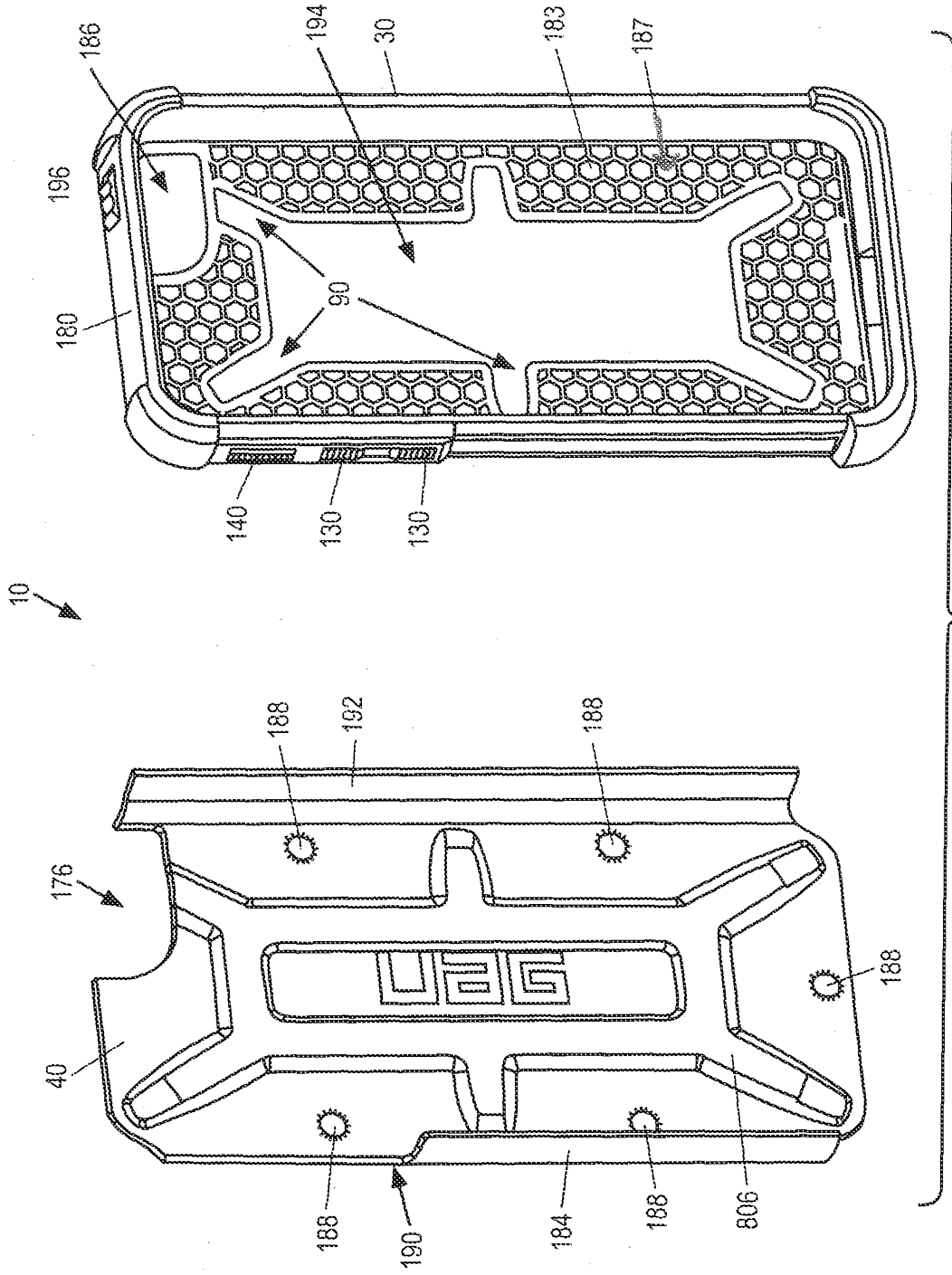


FIG. 10

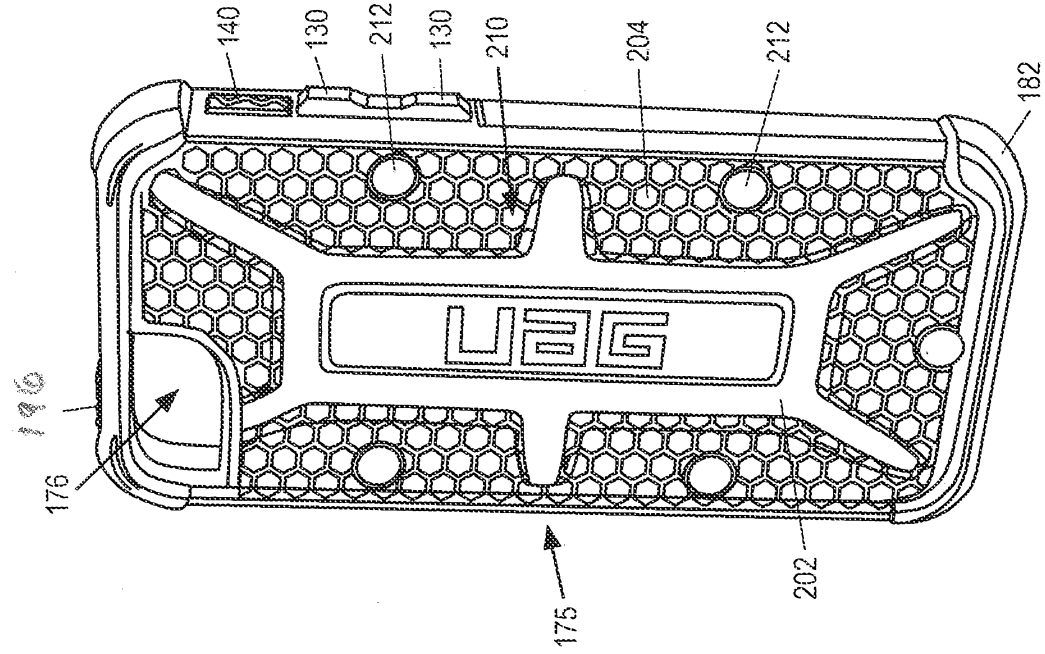


FIG. 11

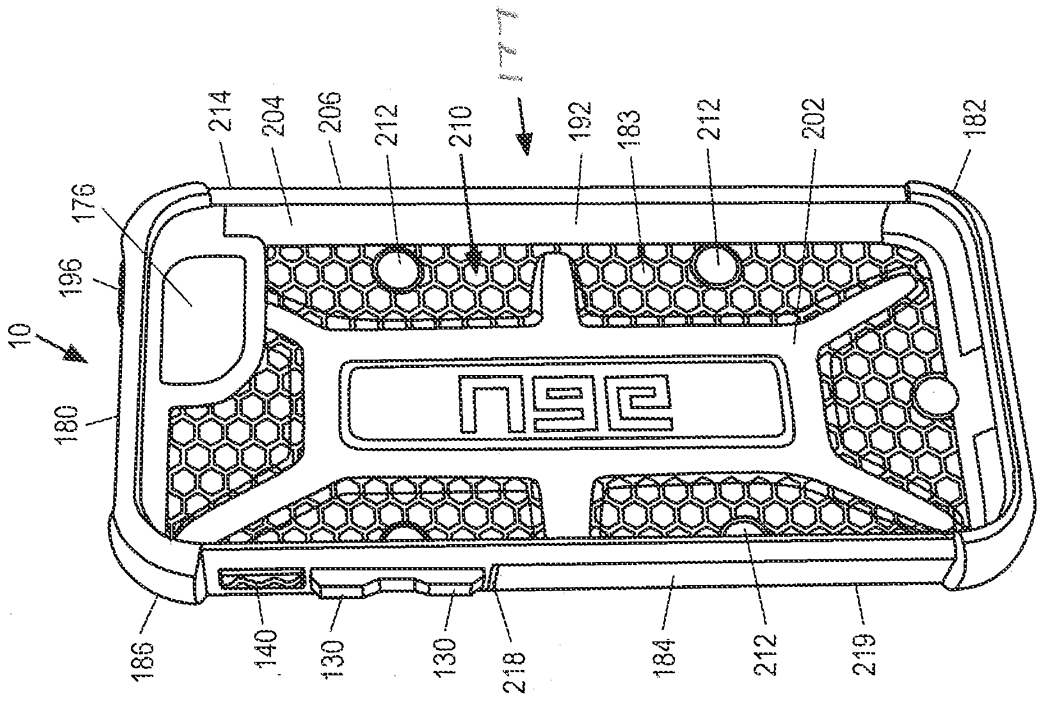


FIG. 12

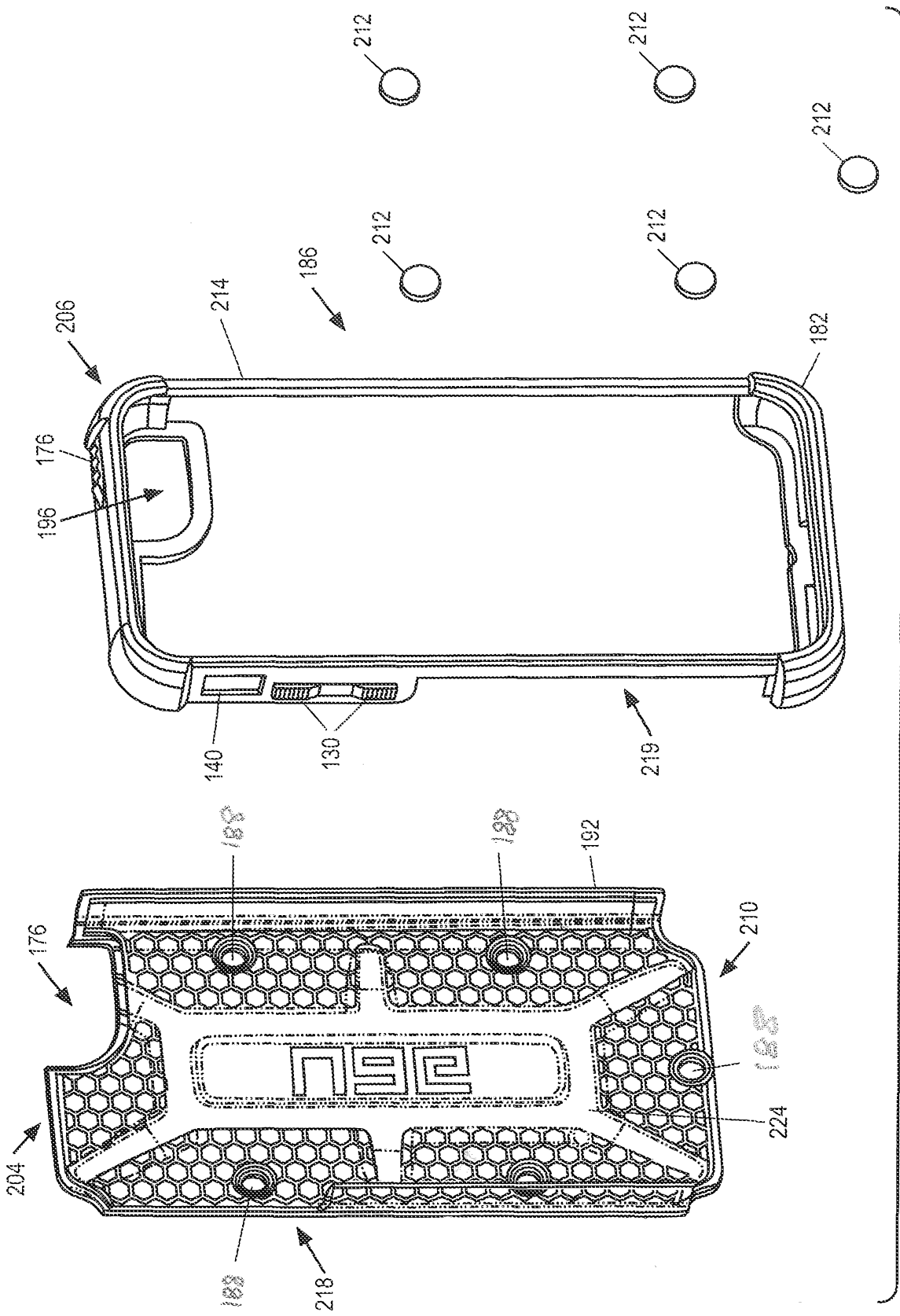


FIG. 13

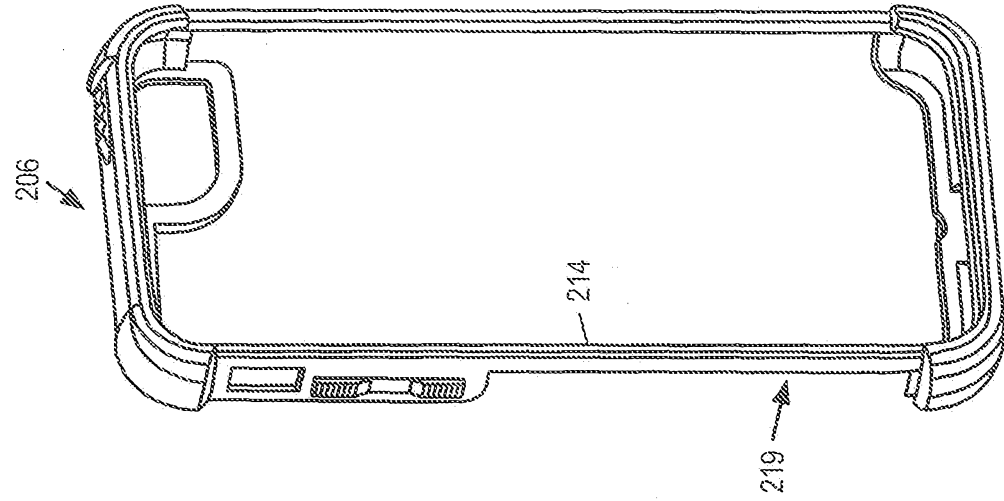


FIG. 15

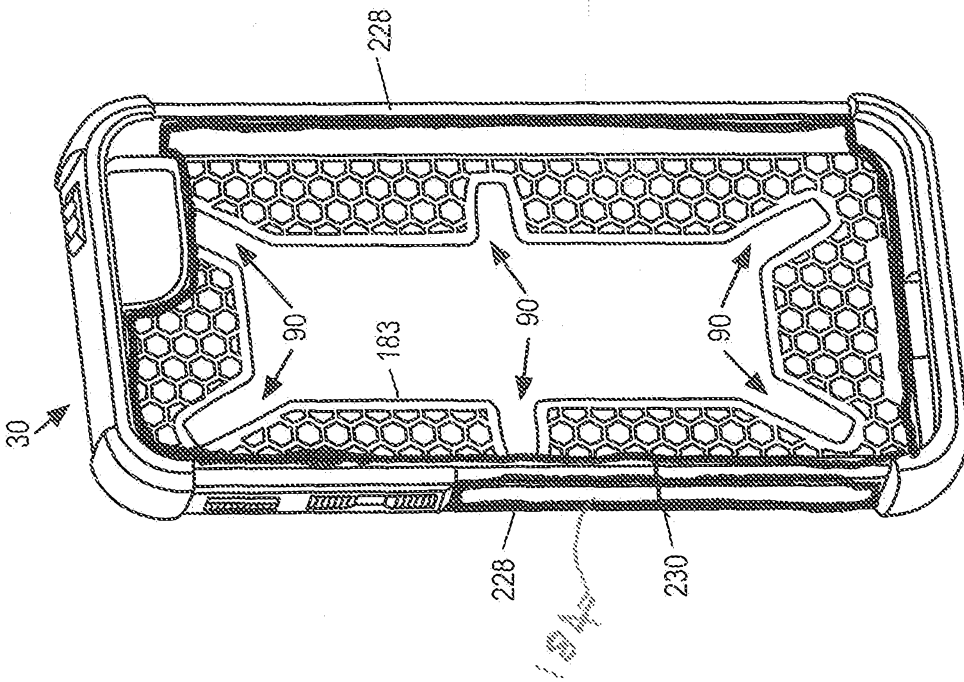


FIG. 14