



US012604956B2

(12) **United States Patent**
Dining et al.

(10) **Patent No.:** **US 12,604,956 B2**
(45) **Date of Patent:** **Apr. 21, 2026**

(54) **PROTECTIVE CASE FOR PORTABLE ELECTRONIC DEVICE**

(71) Applicant: **Jefferson Street Holdings, LLC**,
Boulder, CO (US)

(72) Inventors: **Elizabeth Joy Dining**, Boulder, CO (US); **Erin Joy Watt**, Boulder, CO (US); **Zachary Conrad**, Denver, CO (US); **Cameron James Brown**, Vail, CO (US); **Jeremy Kerbs**, Westminster, CO (US)

(73) Assignee: **Jefferson Street Holdings, LLC**,
Boulder, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **17/878,372**

(22) Filed: **Aug. 1, 2022**

(65) **Prior Publication Data**

US 2022/0361639 A1 Nov. 17, 2022

Related U.S. Application Data

(63) Continuation of application No. 17/060,261, filed on Oct. 1, 2020, now Pat. No. 11,399,606, which is a continuation of application No. 16/128,808, filed on Sep. 12, 2018, now Pat. No. 10,820,675, which is a continuation of application No. 15/291,985, filed on Oct. 12, 2016, now Pat. No. 10,327,524, which is a
(Continued)

(51) **Int. Cl.**
A45C 11/00 (2006.01)
A45F 5/00 (2006.01)
H04B 1/3888 (2015.01)

(52) **U.S. Cl.**
CPC **A45C 11/00** (2013.01); **A45F 5/00** (2013.01); **H04B 1/3888** (2013.01); **A45C 11/002** (2025.01); **A45C 11/003** (2025.01)

(58) **Field of Classification Search**

CPC **A45C 11/00**; **A45C 2011/002**; **A45C 2011/003**; **A45F 5/00**; **H04B 1/3888**
USPC **206/320**, **581**, **385**, **453**; **455/90.3**; **361/679.01**; **224/191**
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

D107,221 S 11/1937 Dewsbury
D331,922 S 12/1992 Gloton
(Continued)

FOREIGN PATENT DOCUMENTS

CA 297752 9/2016
EP 3261947 1/2016
(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 29/544,756, U.S. Pat. No. D. 790,524, filed Nov. 5, 2015.
(Continued)

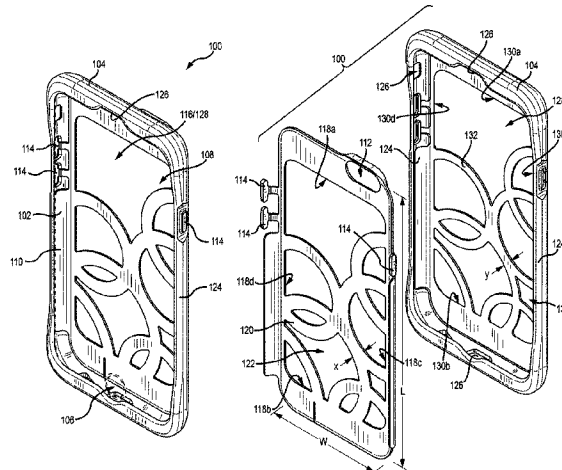
Primary Examiner — Rafael A Ortiz

(74) *Attorney, Agent, or Firm* — FisherBroyles LLP; Ian R. Walsworth

(57) **ABSTRACT**

A case for an electronic device includes a panel having a plurality of turned edges. Certain of the plurality of turned edges comprise different heights that may expose certain elements or portions of the corresponding electronic device. The panel may further comprise an opening for exposing a speaker, microphone, camera, audio jack, button, tab or other element of the electronic device.

14 Claims, 17 Drawing Sheets



Related U.S. Application Data

continuation of application No. 15/043,227, filed on Feb. 12, 2016, now Pat. No. 9,480,319, which is a continuation of application No. 14/632,927, filed on Feb. 26, 2015, now Pat. No. 9,300,768.

(56)

References Cited

U.S. PATENT DOCUMENTS

D501,849 S 2/2005 Widiaman et al.
 D508,182 S 8/2005 Colonello
 D524,806 S 7/2006 Eguchi
 D574,836 S 8/2008 Koh et al.
 D575,056 S 8/2008 Tan
 D593,635 S 6/2009 Fitzpatrick et al.
 D606,525 S 12/2009 Chen et al.
 D606,530 S 12/2009 Ferrari
 D606,533 S 12/2009 de Jong et al.
 D607,445 S 1/2010 Ferrari et al.
 D616,429 S 5/2010 Nuovo
 D632,682 S 2/2011 Fahrendorff et al.
 D634,313 S 3/2011 Fitzpatrick et al.
 D641,347 S 7/2011 Fathollahi
 8,016,107 B2 9/2011 Emsky
 D646,672 S 10/2011 Fathollahi
 D654,043 S 2/2012 Pan et al.
 D655,699 S 3/2012 Bau
 D666,585 S 9/2012 Zheng et al.
 D668,660 S 10/2012 Norfolk
 D671,928 S 12/2012 Li
 D671,932 S 12/2012 Azoulay
 D674,801 S 1/2013 Wharram
 D685,360 S 7/2013 Chen et al.
 D685,361 S 7/2013 Goradesky
 D685,776 S 7/2013 Bau
 D685,785 S 7/2013 Seoc et al.
 D687,427 S 8/2013 Peterson
 D689,851 S 9/2013 Chang et al.
 8,584,835 B2 11/2013 Still
 8,616,422 B2 12/2013 Adelman
 D703,648 S 4/2014 Magness et al.
 D704,684 S 5/2014 Yeh et al.
 D705,768 S 5/2014 Melanson
 D706,256 S 6/2014 Ward et al.
 D707,683 S 6/2014 Nam-Su
 D708,895 S 7/2014 Hoyord et al.
 D710,345 S 8/2014 Chang
 D712,389 S 9/2014 Namminga
 D713,831 S 9/2014 Kim et al.
 D716,280 S 10/2014 Macrina et al.
 D717,782 S 11/2014 Lee
 D718,290 S 11/2014 Whitten et al.
 8,879,723 B2 11/2014 Hong
 D719,143 S 12/2014 Vidovic
 D719,144 S 12/2014 Eulette
 D723,017 S 2/2015 Song
 8,950,582 B2 2/2015 Chang
 8,960,634 B2 2/2015 Le Gette et al.
 D724,596 S 3/2015 Sirichai
 D725,116 S 3/2015 Li
 8,971,974 B2 3/2015 Weaver, III
 D726,169 S 4/2015 Powell et al.
 D728,552 S 5/2015 Kim
 9,027,814 B2 5/2015 Tages et al.
 D733,154 S 6/2015 Armstrong et al.
 D735,174 S 7/2015 Wengreen
 D735,184 S 7/2015 Lee et al.
 D737,522 S 8/2015 Lavigne et al.
 D742,868 S 11/2015 Odhwani et al.
 D742,869 S 11/2015 Odhwani et al.
 9,185,953 B2 11/2015 Whitten et al.
 9,197,275 B2 11/2015 Fathollahi et al.
 9,295,174 B2 3/2016 Witter
 9,300,768 B1 3/2016 Dining et al.
 9,314,078 B1* 4/2016 Haymond H04M 1/185
 D755,188 S 5/2016 Burmester

9,326,587 B2 5/2016 Gronewoller et al.
 9,399,316 B2 7/2016 Chang
 D764,451 S 8/2016 Hung et al.
 9,419,670 B2 8/2016 Fathollahi
 D765,638 S 9/2016 Gaylord et al.
 9,480,319 B2 11/2016 Dining et al.
 D780,164 S 2/2017 Lee
 D790,523 S 6/2017 Watt
 9,780,824 B2* 10/2017 Saks H04M 1/185
 10,820,675 B2 11/2020 Dining
 10,848,194 B2 11/2020 Fathollahi
 2009/0080153 A1 3/2009 Richardson et al.
 2009/0230161 A1 9/2009 Emsky
 2010/0072334 A1* 3/2010 Le Gette F16M 11/10
 29/428
 2010/0113111 A1 5/2010 Wong et al.
 2011/0228458 A1 9/2011 Richardson et al.
 2012/0199501 A1* 8/2012 Le Gette F16M 11/10
 206/45.24
 2012/0241330 A1 9/2012 Still
 2012/0294469 A1 11/2012 Weaver, III
 2012/0325882 A1 12/2012 Tages et al.
 2013/0032617 A1 2/2013 Adelman et al.
 2013/0292269 A1 11/2013 Taes
 2013/0292378 A1 11/2013 Tages
 2014/0049142 A1* 2/2014 Magness H05K 5/02
 264/273
 2014/0069825 A1 3/2014 Macrina et al.
 2014/0078671 A1 3/2014 Hong
 2014/0216973 A1* 8/2014 Chang B65D 81/022
 206/521
 2014/0287802 A1* 9/2014 Walker H04B 1/3888
 455/575.1
 2014/0315603 A1 10/2014 Fathollahi et al.
 2014/0360893 A1 12/2014 Whitten et al.
 2015/0053730 A1 2/2015 Saks
 2015/0076187 A1 3/2015 Cohen
 2015/0080064 A1* 3/2015 Park H04M 1/04
 455/575.1
 2015/0194995 A1 7/2015 Fathollahi
 2015/0195938 A1* 7/2015 Witter B65D 81/022
 206/521
 2015/0201723 A1* 7/2015 Rayner F16M 13/04
 224/191
 2015/0207911 A1 7/2015 Lin
 2015/0264822 A1 9/2015 Poon
 2016/0044148 A1 2/2016 Pizzo et al.
 2016/0062515 A1 3/2016 Bae
 2016/0249719 A1 9/2016 Dining
 2017/0027293 A1 2/2017 Dining
 2017/0034932 A1 2/2017 Rostami

FOREIGN PATENT DOCUMENTS

EP 3092541 B1 7/2019
 JP 2012182200 A 9/2012
 JP 2014204419 A 10/2014
 KR 101204815 S 3/2012
 KR 200462589 Y1 9/2012
 KR 300719406 12/2013
 KR 2020140003032 5/2014
 TW 1483691 B 5/2015
 WO 2010054246 A1 5/2010
 WO WO-2013154302 A1* 10/2013 H04B 1/3888
 WO WO2016138134 9/2016

OTHER PUBLICATIONS

U.S. Appl. No. 29/544,754, U.S. Pat. No. D. 790,523, filed Nov. 5, 2015.
 U.S. Appl. No. 15/291,985, U.S. Pat. No. 10,327,524, filed Oct. 12, 2016.
 U.S. Appl. No. 14/632,927, U.S. Pat. No. 9,300,768, filed Feb. 26, 2015.
 U.S. Appl. No. 29/544,757, U.S. Pat. No. D. 790,525, filed Nov. 5, 2015.

(56)

References Cited

OTHER PUBLICATIONS

U.S. Appl. No. 16/128,808, U.S. Pat. No. 10,820,675, filed Sep. 12, 2018.

U.S. Appl. No. 15/043,227, U.S. Pat. No. 9,480,319, filed Feb. 12, 2016.

U.S. Appl. No. 17/060,261, U.S. Pat. No. 11,399,606, filed Oct. 1, 2020.

International Search Report and Written Opinion for International (PCT) Patent Application No. PCT/US16/19364, mailed May 2, 2016 8 pages.

Notice of Allowance for U.S. Appl. No. 14/632,927, mailed Nov. 25, 2015 15 pages.

Notice of Allowance for U.S. Appl. No. 15/043,227, mailed Sep. 16, 2016. 11 pages.

Official Action for U.S. Appl. No. 14/632,927, mailed Oct. 27, 2015 10 pages.

Official Action for U.S. Appl. No. 29/544,754, mailed Feb. 7, 2017, 7 pages.

Official Action for U.S. Appl. No. 29/544,754, mailed Sep. 26, 2016, 11 pages.

Official Action for U.S. Appl. No. 29/544,756, mailed Feb. 6, 2017, 7 pages.

Official Action for U.S. Appl. No. 29/544,756, mailed Sep. 26, 2016, 11 pages.

Official Action for U.S. Appl. No. 29/544,757, mailed Feb. 3, 2017, 7 pages.

Official Action for U.S. Appl. No. 29/544,757, mailed Sep. 26, 2016, 11 pages.

Complaint concerning infringement of U.S. Pat. No. 9,480,319. *Jefferson Street Holdings Intellectual Property LLC v. SEIDIO*. Civil Action No. 5:18-cv-110. U.S. District Court for the S.D. of TX. Aug. 3, 2018.

Rearth Ringke Slim Case for the iPhone 4/4s. <https://www.youtube.com/watch?v=23puVDvuT78>. Dec. 26, 2011.

Rearth Ringke Slim for Samsung Galaxy Nexus Case Review. <https://www.youtube.com/watch?v=XT5cgDUMZNw>. Feb. 19, 2012.

Early Adopter _ Reviews, Galaxy S2 LTE Case Ringke Slim Ringke Slim CD Man. <http://cdmanii.com/2646>. Nov. 17, 2011. (Machine Translated from Korean).

Complaint concerning infringement of patent U.S. Pat. No. 9,480,319. *Jefferson Street Holdings Intellectual Property LLC v. TECH21 Inc.* Civil Action No. 5:18-cv-806. U.S. District Court for the W.D. of TX. Aug. 3, 2018.

Complaint concerning infringement of patent U.S. Pat. No. 9,480,319. *Jefferson Street Holdings Intellectual Property LLC v. AMZER Group Inc.* Civil Action No. 5:18-cv-111. U.S. District Court for the S.D. of TX. Aug. 3, 2018.

Amended complaint concerning infringement of patent U.S. Pat. No. 9,480,319. *Jefferson Street Holdings Intellectual Property LLC v. TECH21 UK Inc.* Civil Action No. 5:18-cv-806. U.S. District Court for the W.D. of TX. Nov. 2, 2018.

Complaint concerning infringement of patent U.S. Pat. No. 9,480,319. *Jefferson Street Holdings Intellectual Property LLC v. Rearth USA.* Civil Action No. 2:18-cv-338. U.S. District Court for the E.D. of TX. Aug. 3, 2018.

Bouwmeester, "Did Spigen Just Unveil the Samsung Galaxy S6 Ahead of Samsung Unpacked?" <https://techaeris.com/2015/02/23/spigen-just-unveil-samsung-galaxy-s6-ahead-samsung-unpacked/>. Feb. 23, 2015, 3 pages.

Office Action from CA2977522. Dec. 14, 2018. 3 pages.

Notice of Allowance from CA2977522. Jan. 16, 2019. 1 page.

Non-final Office Action from U.S. Appl. No. 17/060,261, filed Jan. 25, 2022. 13 pages.

Final Office Action from U.S. Appl. No. 17/060,261, filed Mar. 8, 2022. 13 pages.

<https://www.lm.cz/anymode-kickstand-case-ochranny-kryt-pro-samsung-galaxy-s-iii-galaxy-s3-neo-modra-pebble-blue-d25789/> (Kick Stand Case). Accessed Dec. 2023.

<https://www.youtube.com/watch?v=EbOB-V-ubNk> (Flip Case); published May 6, 2013.

<https://www.youtube.com/watch?v=g0t2FHqjDnY> (Simple Case); published Jul. 2, 2012.

https://www.youtube.com/watch?v=mfqZ0L-p_BE (Samsung Mesh (Coin Case); published Jun. 14, 2012.

<https://www.youtube.com/watch?v=wqyOFrx8VU> (Coin Case); published Aug. 27, 2012.

<https://www.youtube.com/watch?v=yJaGmbPEzJI> (Flip Case); published Apr. 23, 2013.

<https://www5.picturepush.com/photo/a/8552418/img/8552418.jpg> (Simple Case).

https://www.amazon.com/Samsung-Incipro-Protective-Edge-SilverCharcoal/dp/B00P8L0AO2/ref=cm_cr_arp_d_product_top?ie=UTF8&th=1. Accessed Sep. 2023.

<https://www.mobilefun.co.uk/blog/2015/01/top-5-galaxy-note-edge-cases/>. Accessed Sep. 2023.

<https://www.mobilefun.co.uk/encase-flexishield-samsung-galaxy-note-edge-gelcase-purple-51035-reviews>. Accessed Sep. 2023.

<https://www.mobilefun.co.uk/encase-flexishield-samsung-galaxy-note-edge-gel-case-purple51035#p1>. Accessed Sep. 2023.

<https://www.businesswire.com/news/home/20140107005096/en/OtterBox-Blends-Protection-and-Style-with-New-Symmetry-Series>. Jan. 7, 2014.

<https://www.cnet.com/tech/mobile/samsung-unveils-galaxy-note-4-note-edge/>. Accessed Sep. 2023.

<https://www.samsung.com/us/mobile/phones/galaxy-note/samsung-galaxy-note-edge-at-tcharcoal-black-sm-n915azkatt/>. Accessed Sep. 2023.

https://web.archive.org/web/20150221223435/http://www.phonearena.com:80/news/SamsungGalaxy-S6-Edge-rumor-round-up-features-price-release-date-and-all-we-know-so-far_id65689. Feb. 2015.

<https://www.cnet.com/tech/mobile/lg-display-prototype-smartphone-curved-edges/>. Accessed Sep. 2023.

<https://web.archive.org/web/20150209080214/https://www.zdnet.com/article/leaked-galaxys6-photo-shows-dual-edged-handset/>. Feb. 2015.

https://www.amazon.com/dp/B00U0MDTEM/ref=emc_b_5_t. Accessed Sep. 2023.

https://www.amazon.com/dp/B00U0MII3O/ref=emc_b_5_t. Accessed Sep. 2023.

<https://www.amazon.com/Samsung-Incipro-Absorbing-DualPro-Edge-Black/dp/B00TSF3GZY>. Accessed Sep. 2023.

<https://www.androidheadlines.com/2015/03/incipio-announces-new-line-cases-samsung-galaxys6-galaxy-s6-edge.html>. Mar. 2015.

<https://www.cnet.com/reviews/samsung-galaxy-s6-preview/>.

<https://www.androidheadlines.com/2015/03/speck-announces-new-cases-coming-samsung-galaxy-s6-galaxy-s6-edge-htc-one-m9.html>. Accessed Sep. 2023.

Request for Ex Parte ReExamination of U.S. Pat. No. 11,399,606. 78 pages. Oct. 5, 2023.

Grant of Reexamination U.S. Appl. No. 90/019,267. 14 pages. Nov. 13, 2023.

Non-Final Office Action from U.S. Appl. No. 90/019,267. 17 pages. Feb. 15, 2024.

Request for Ex Parte ReExamination of U.S. Pat. No. 10,820,675. 40 pages. Oct. 5, 2023.

Grant of Reexamination U.S. Appl. No. 90/019,268. 14 pages. Nov. 13, 2023.

Non-Final Office Action from U.S. Appl. No. 90/019,268. 37 pages. Feb. 20, 2024.

Request for Ex Parte ReExamination of U.S. Pat. No. 10,327,524. 36 pages. Oct. 5, 2023.

Grant of Reexamination U.S. Appl. No. 90/019,269. 18 pages. Nov. 3, 2023.

Non-Final Office Action from U.S. Appl. No. 90/019,269. 12 pages. Feb. 26, 2024.

Request for Ex Parte ReExamination of U.S. Pat. No. 9,480,319. 31 pages. Oct. 5, 2023.

Grant of Reexamination U.S. Appl. No. 90/019,270. 13 pages. Nov. 3, 2023.

Non-Final Office Action from U.S. Appl. No. 90/019,270. 16 pages. Feb. 15, 2024.

* cited by examiner

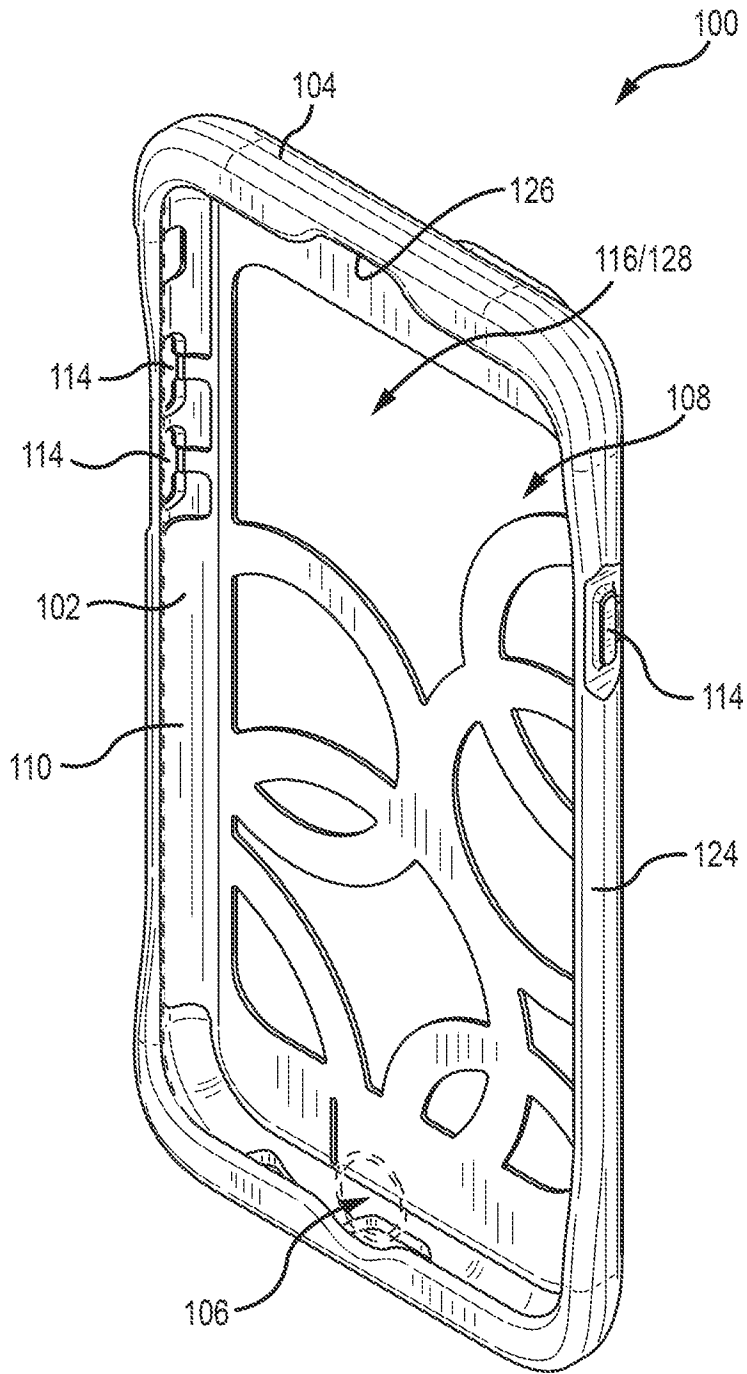
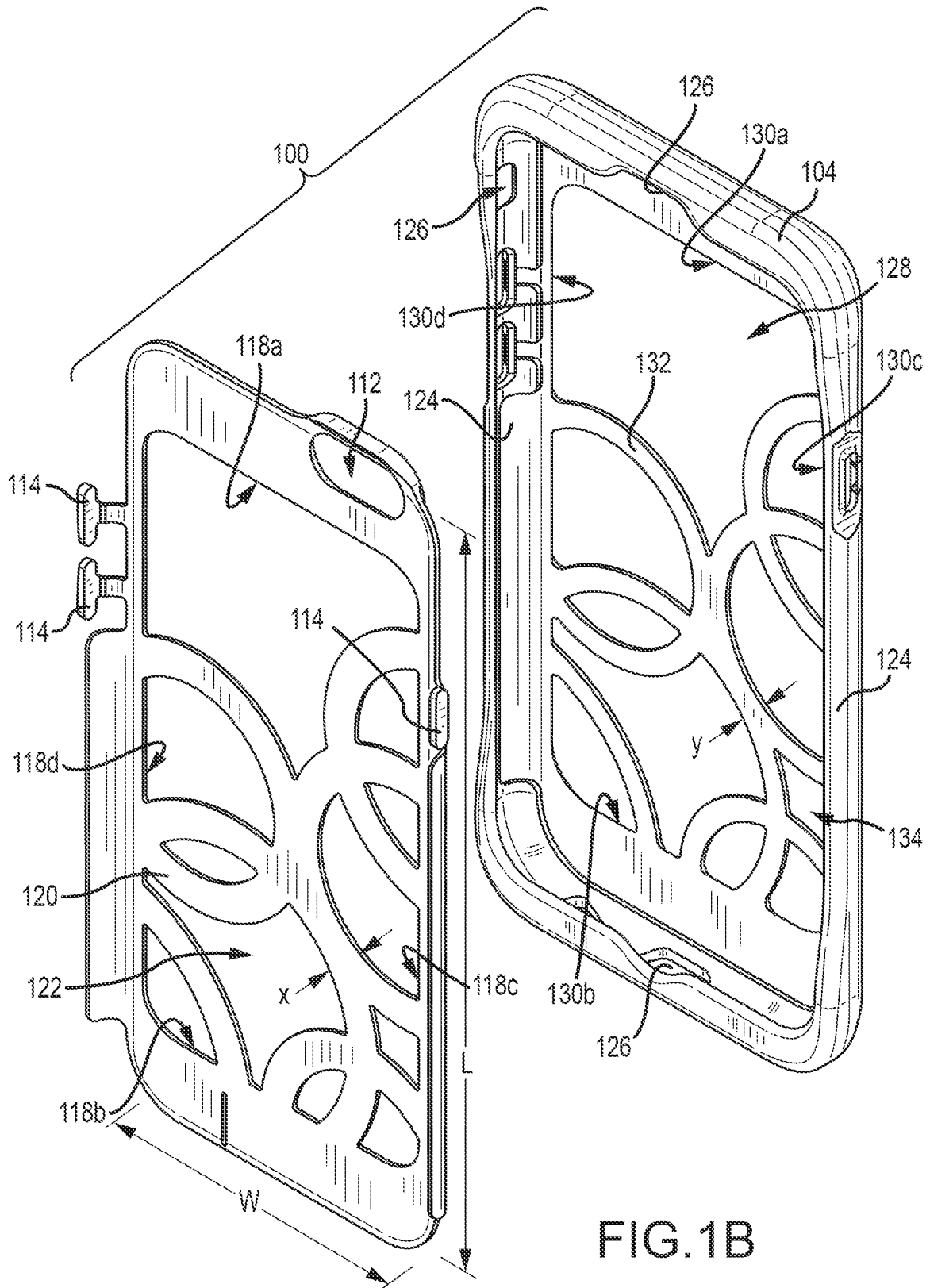


FIG. 1A



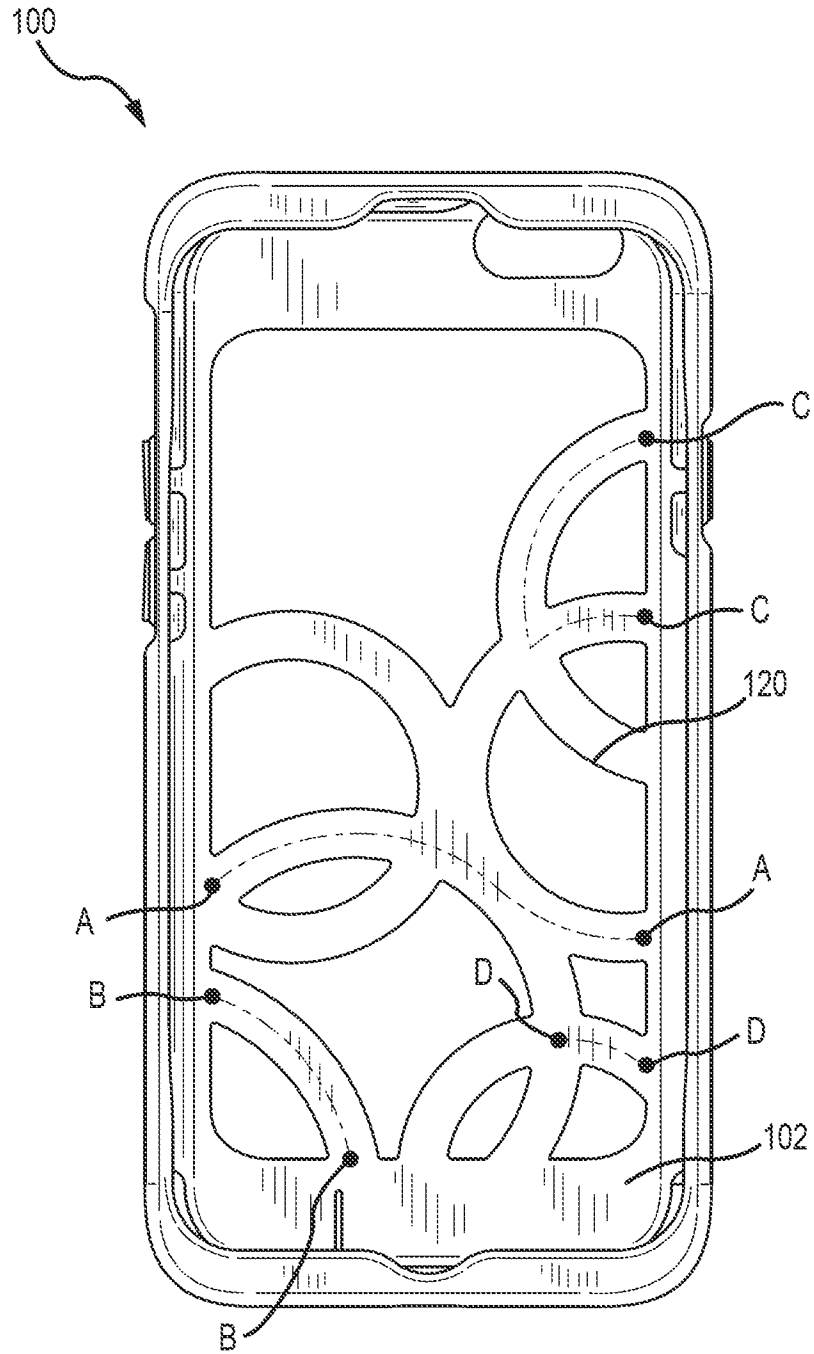


FIG.1C

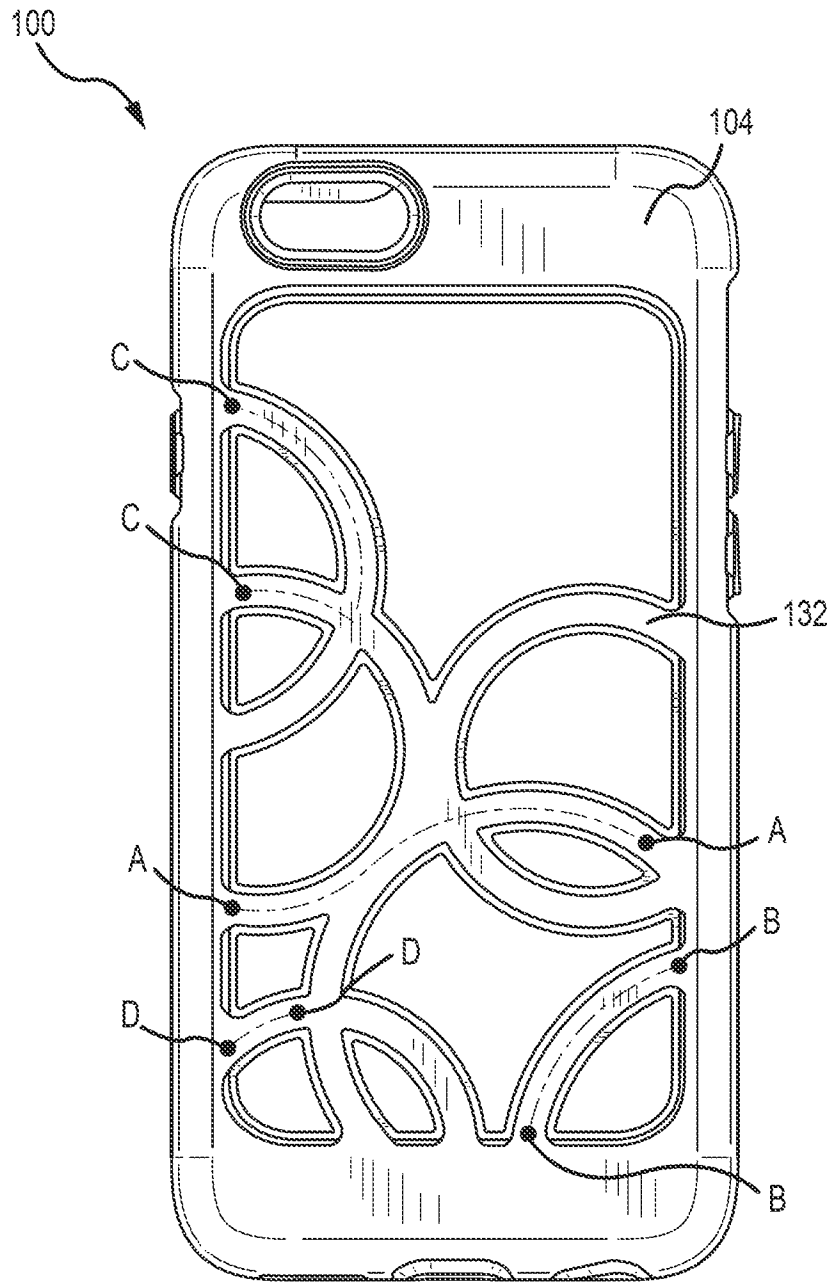


FIG.1D

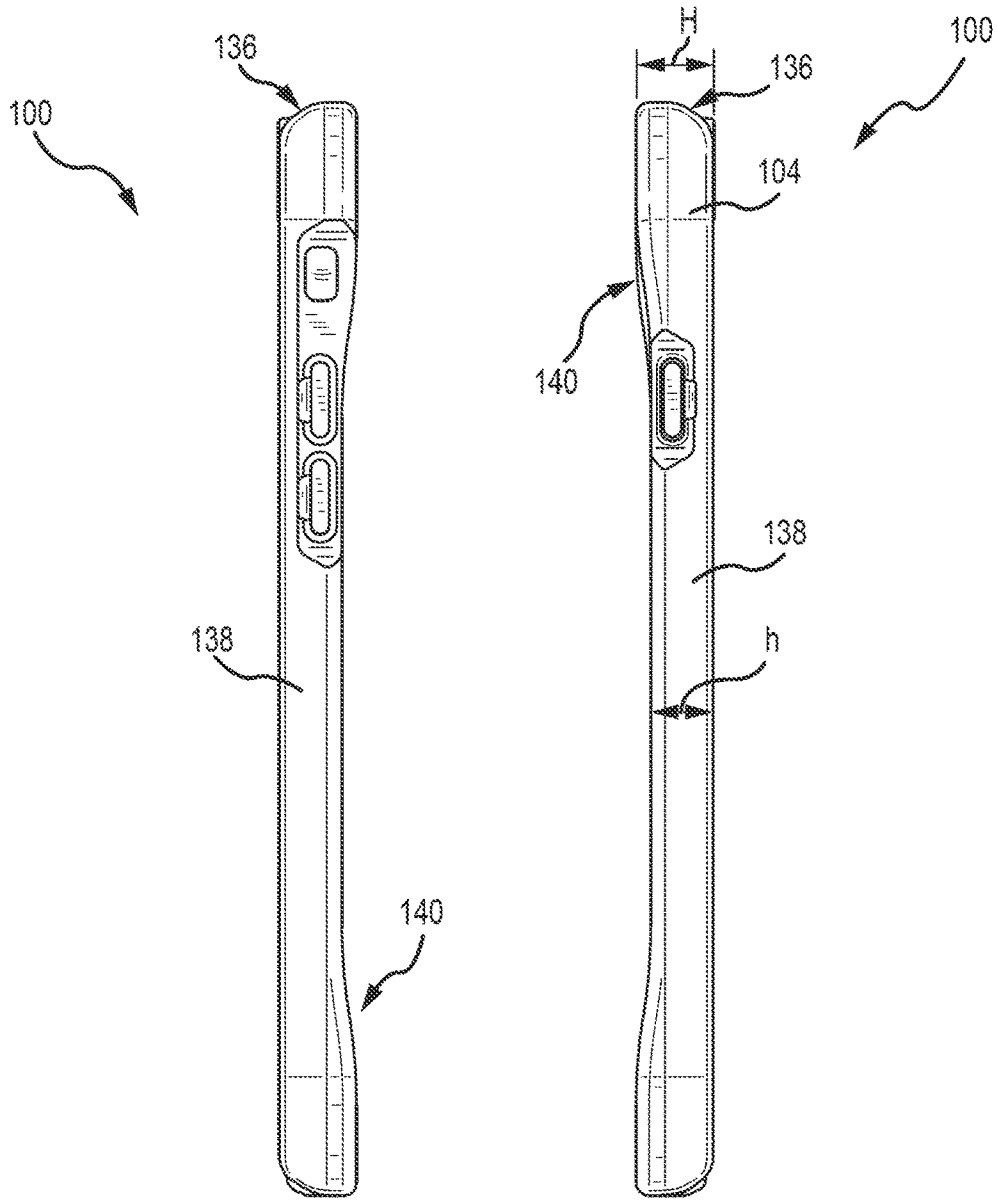


FIG. 1E

FIG. 1F

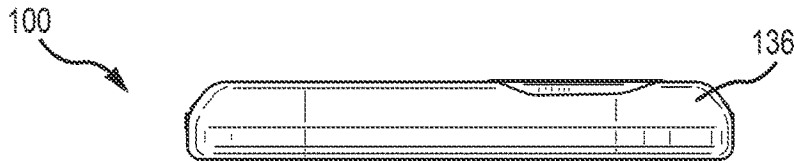


FIG. 1G

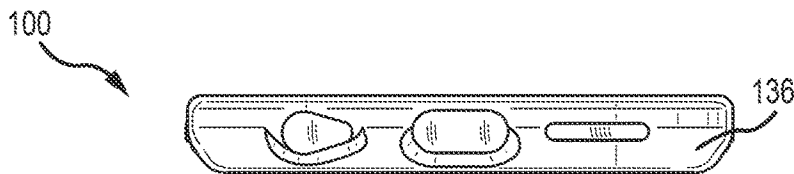


FIG. 1H

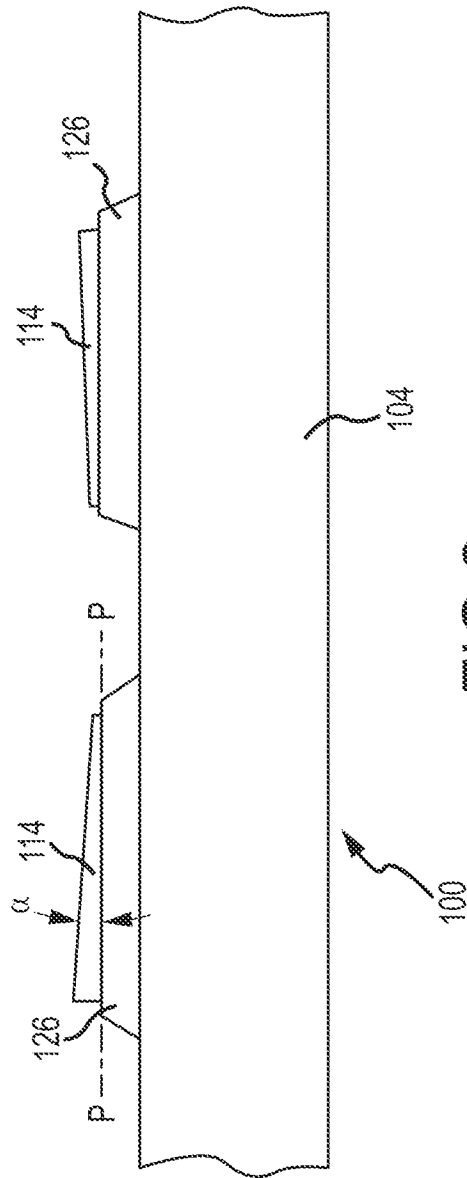


FIG. 2

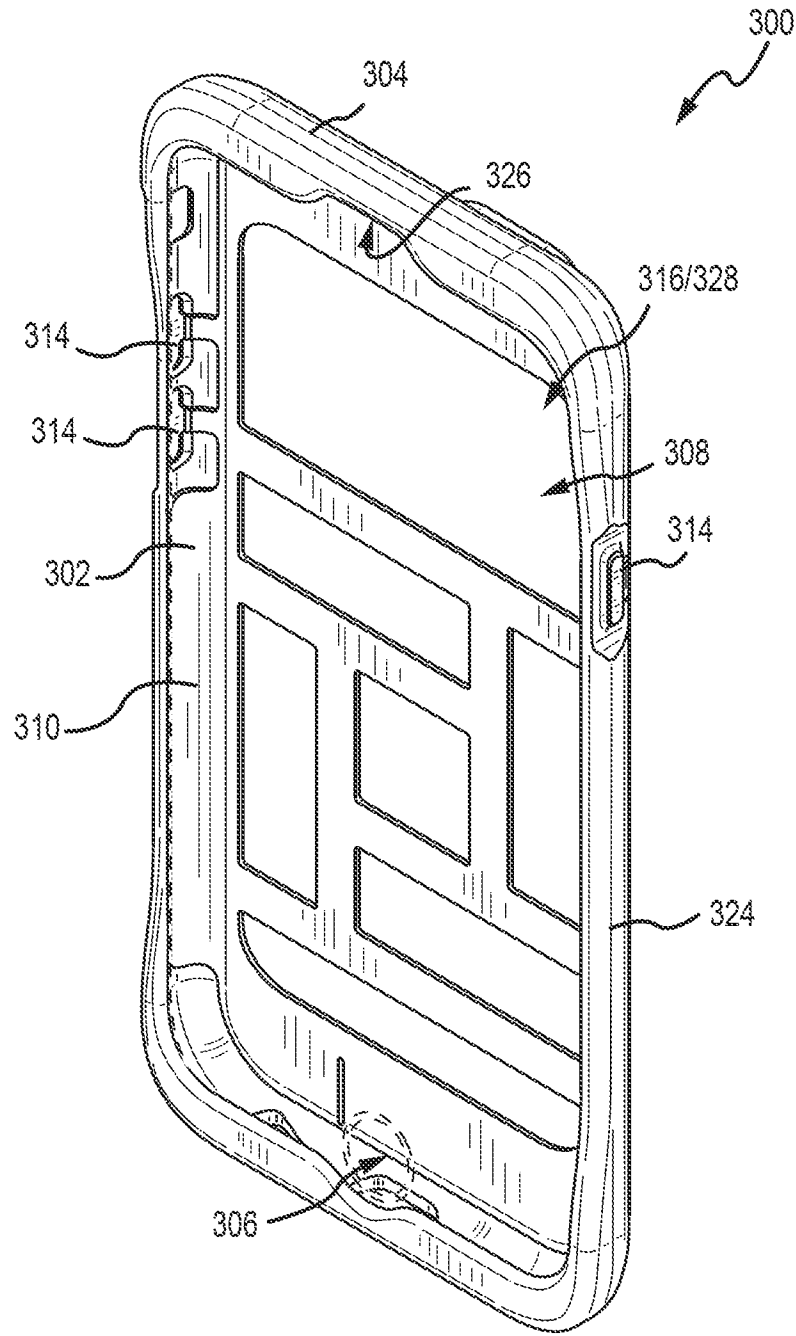


FIG.3A

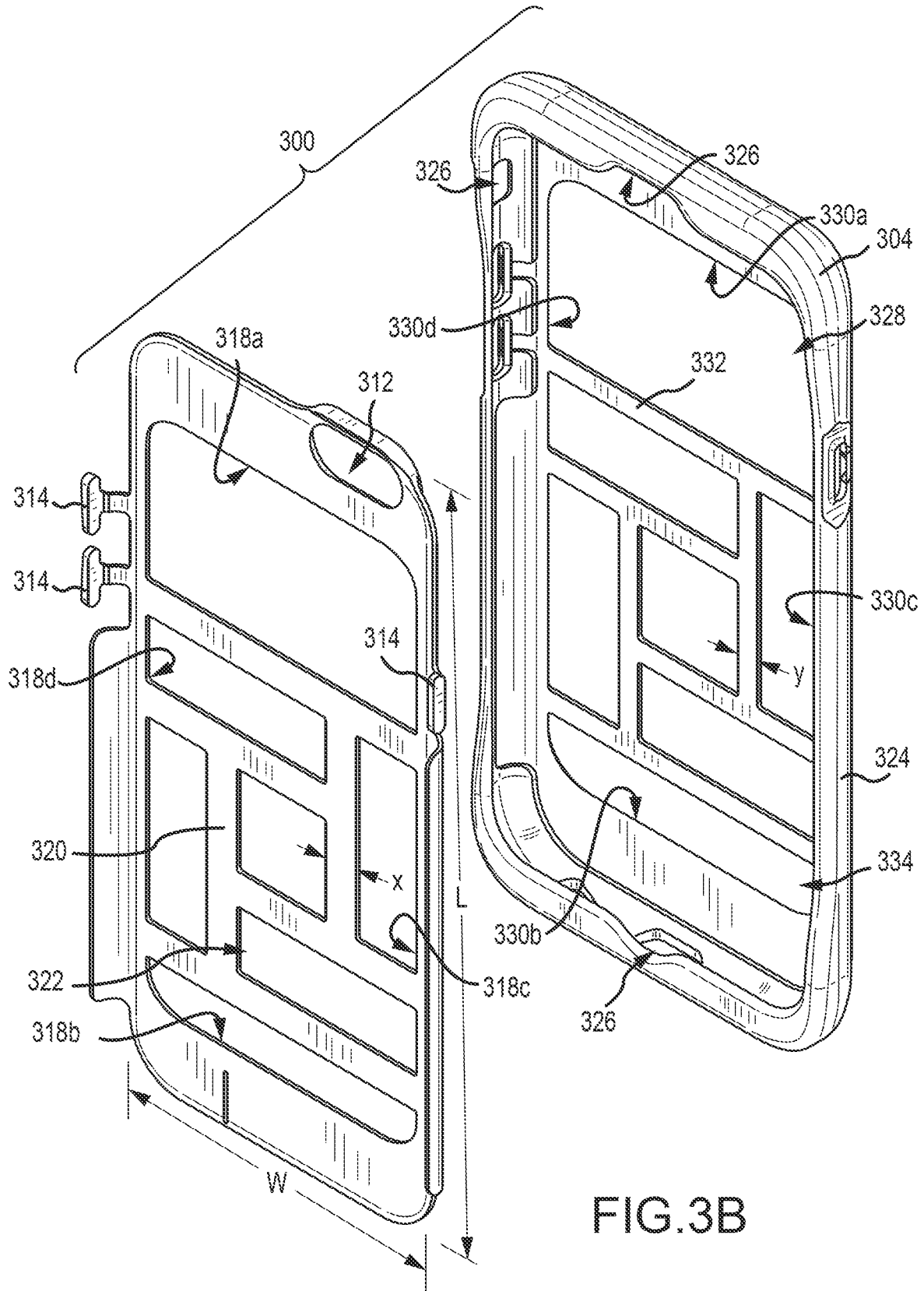


FIG.3B

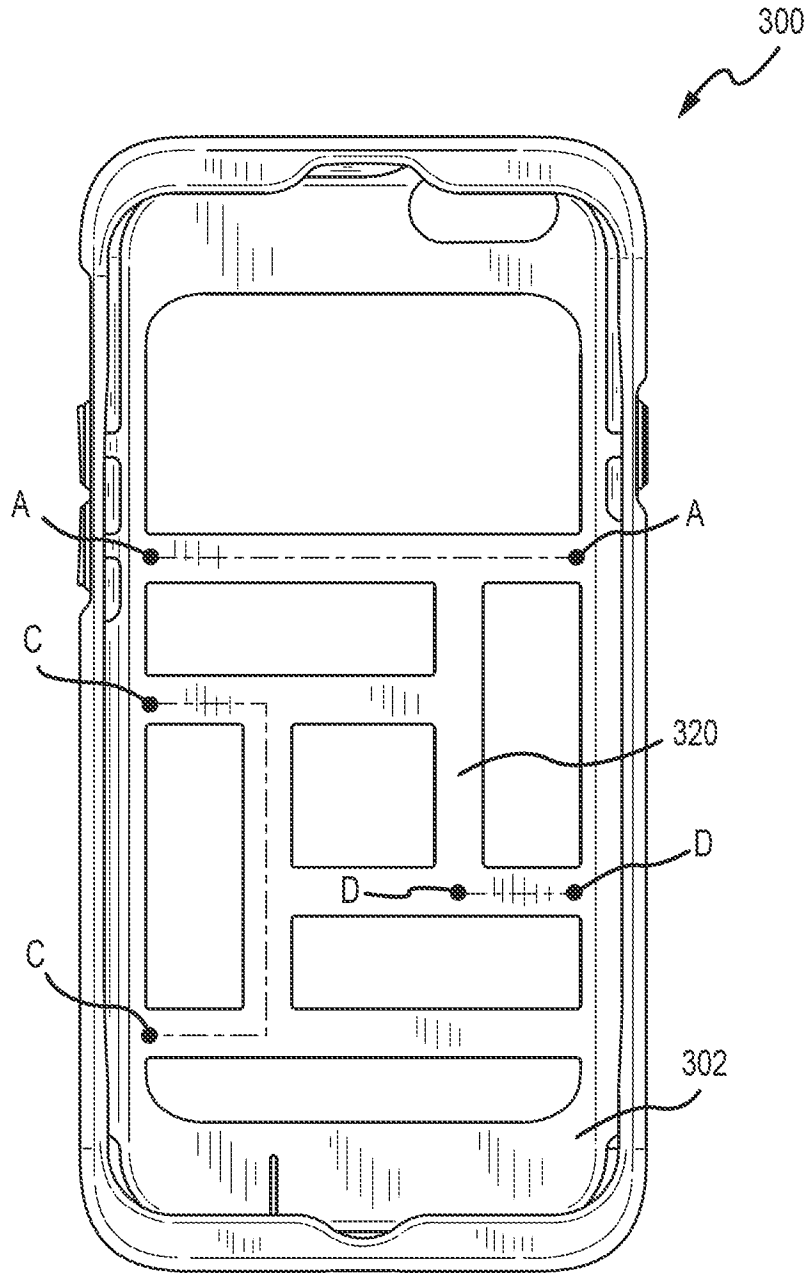


FIG.3C

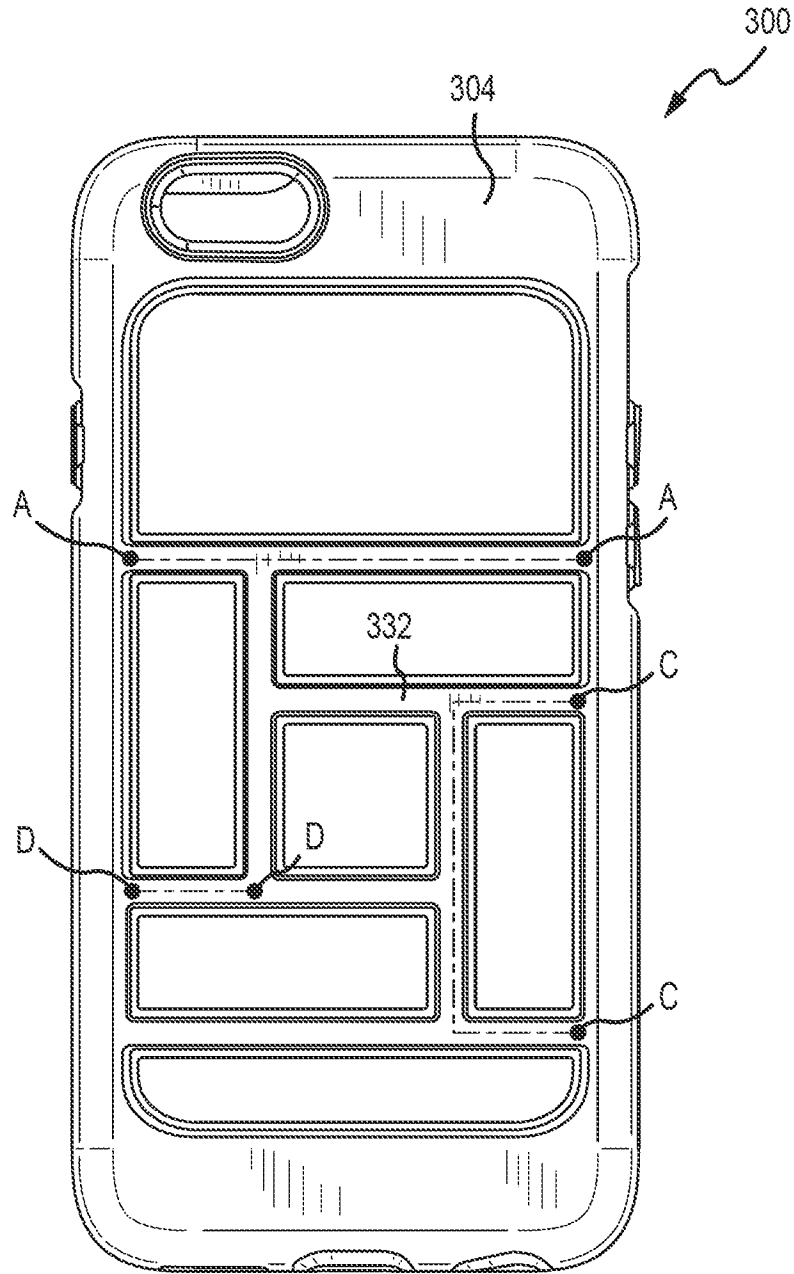


FIG.3D

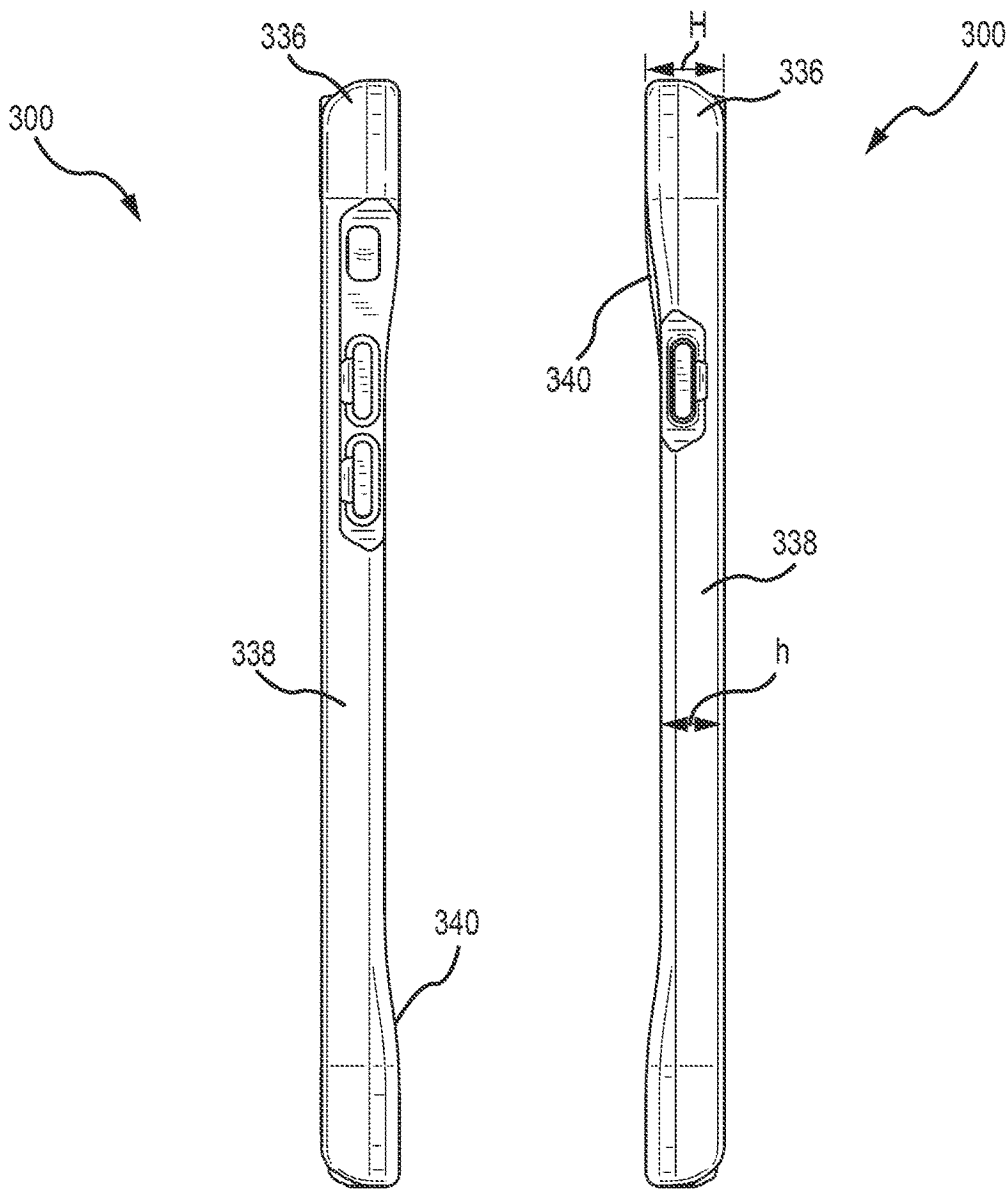


FIG. 3E

FIG. 3F

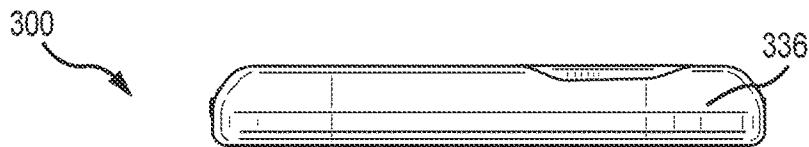


FIG. 3G

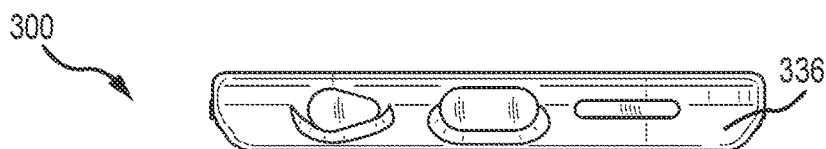


FIG. 3H

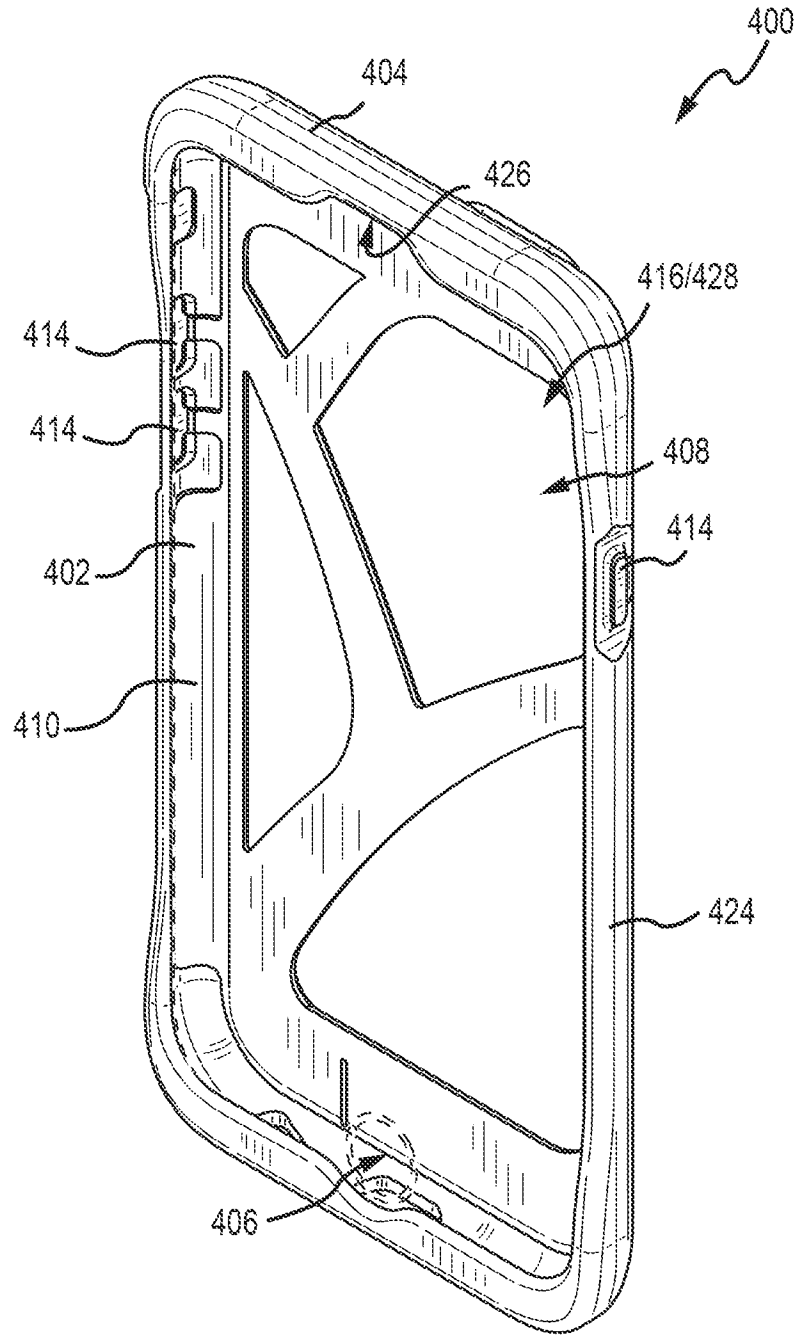
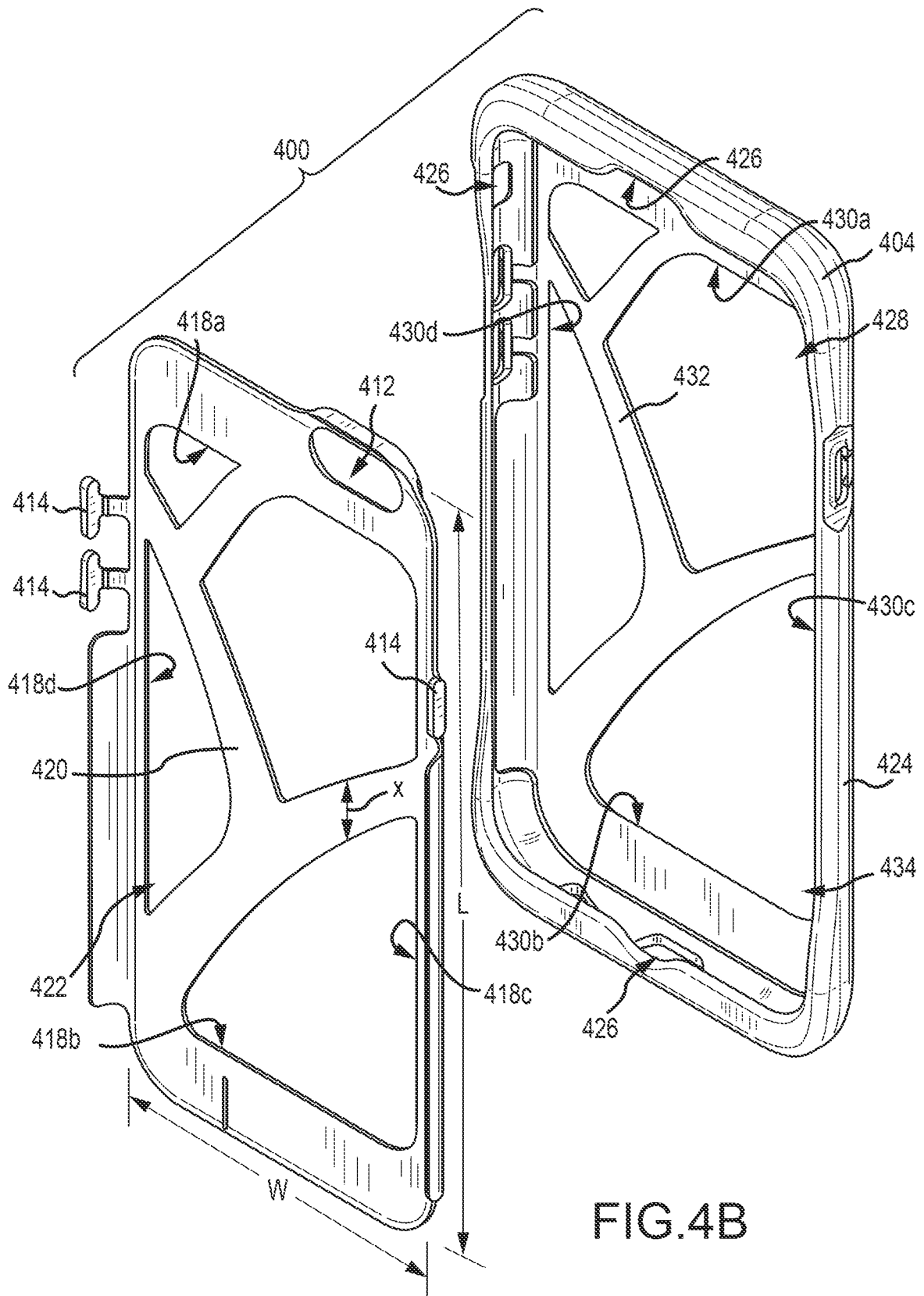


FIG. 4A



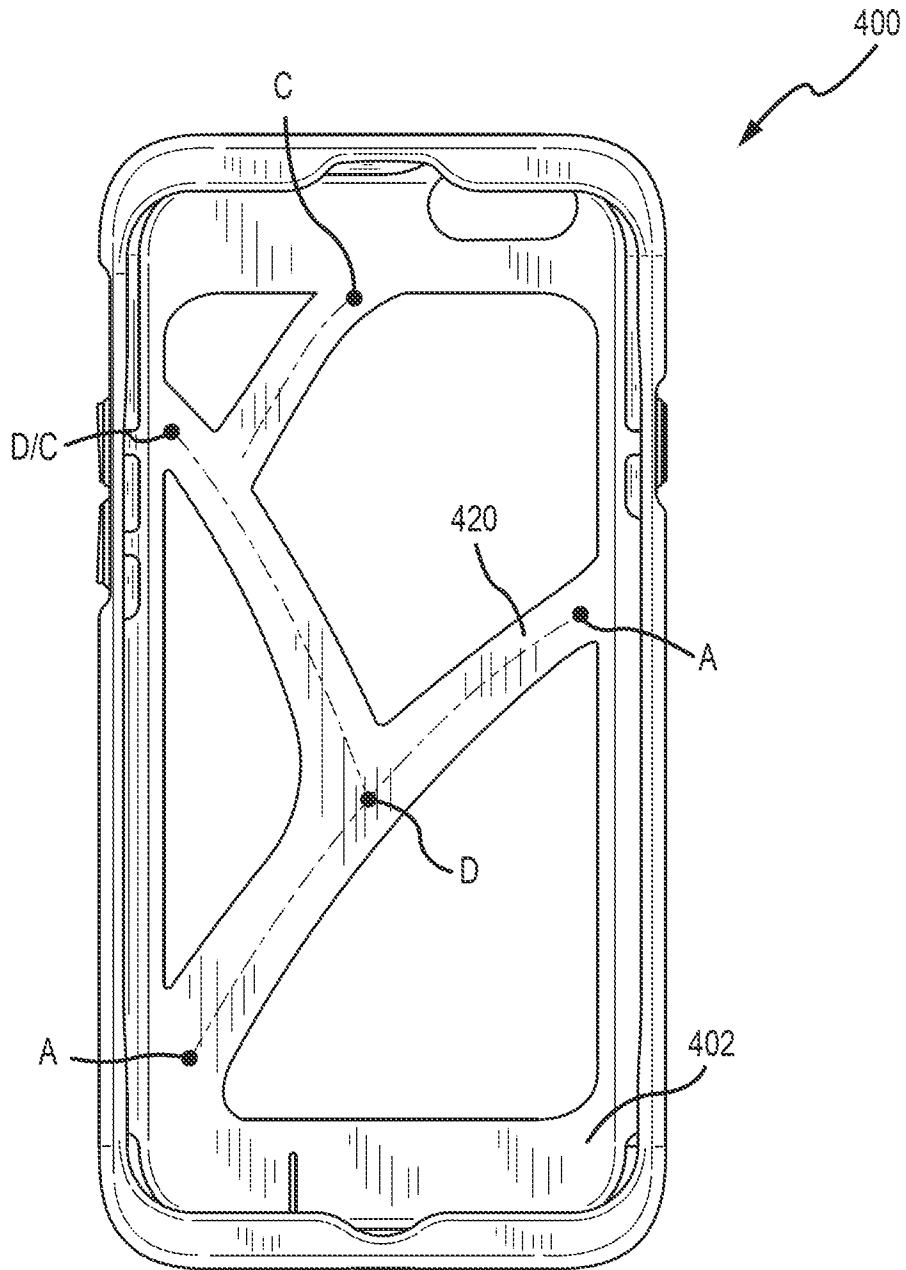


FIG. 4C

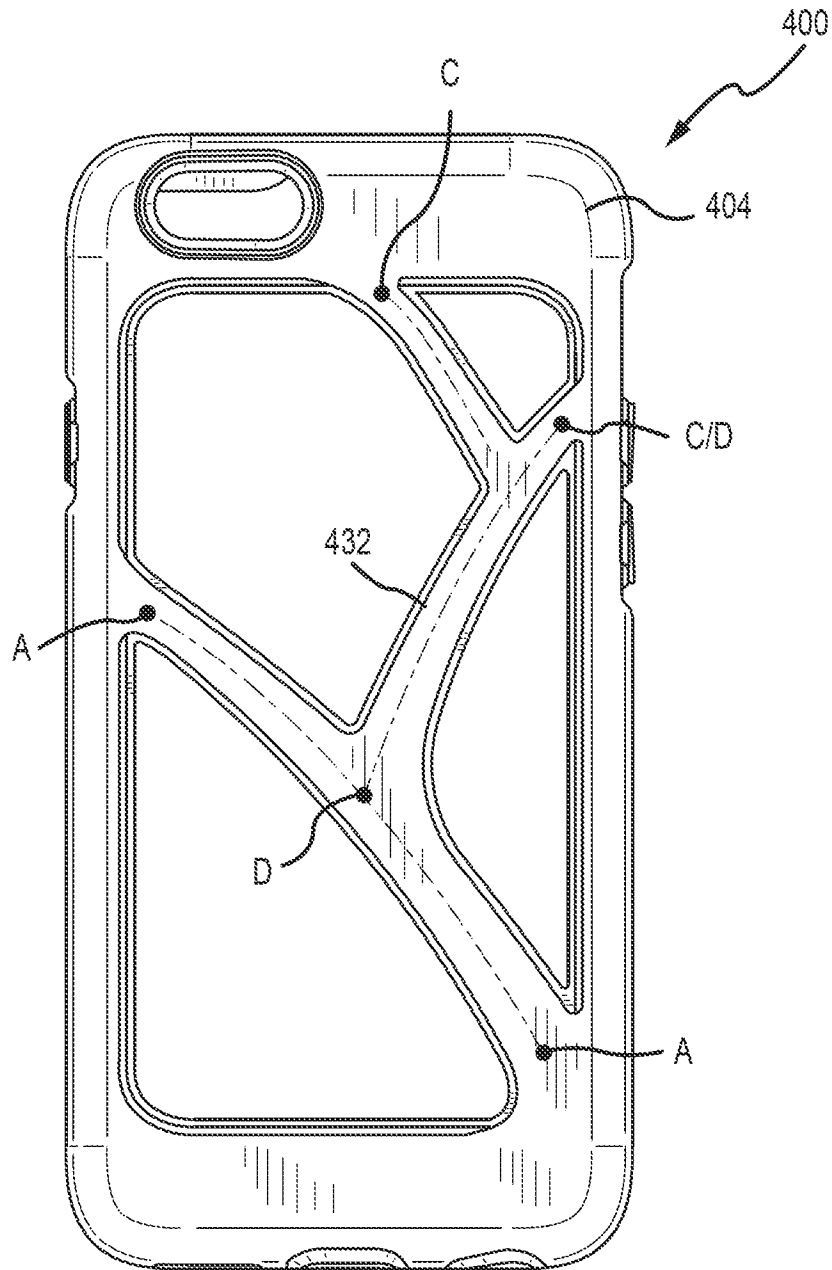


FIG.4D

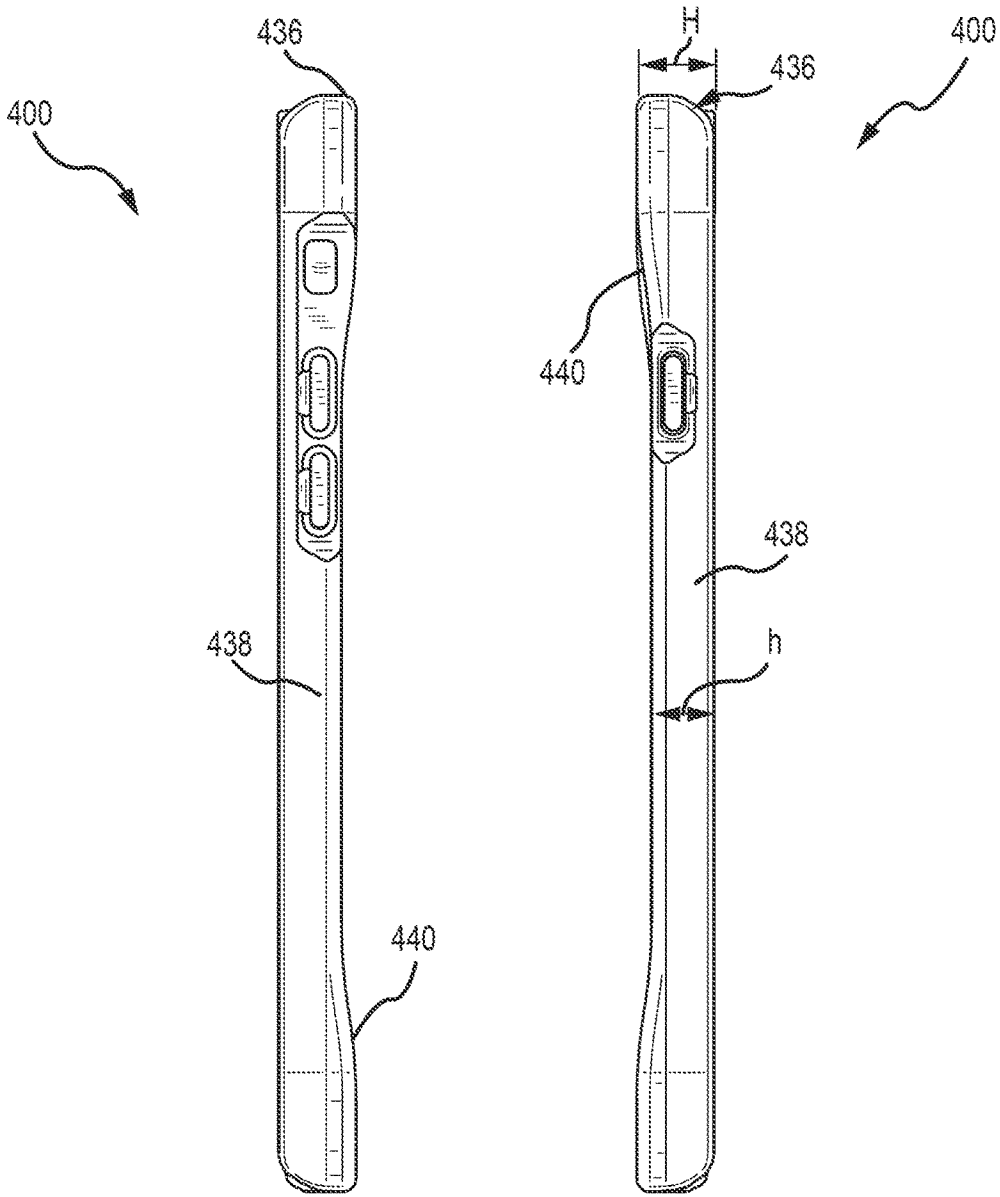


FIG. 4E

FIG. 4F



FIG. 4G

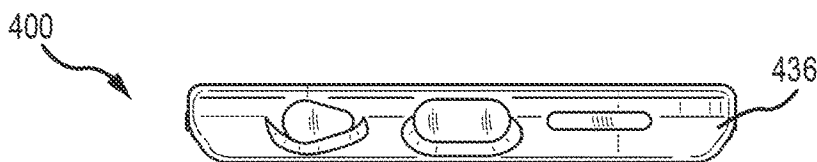


FIG. 4H

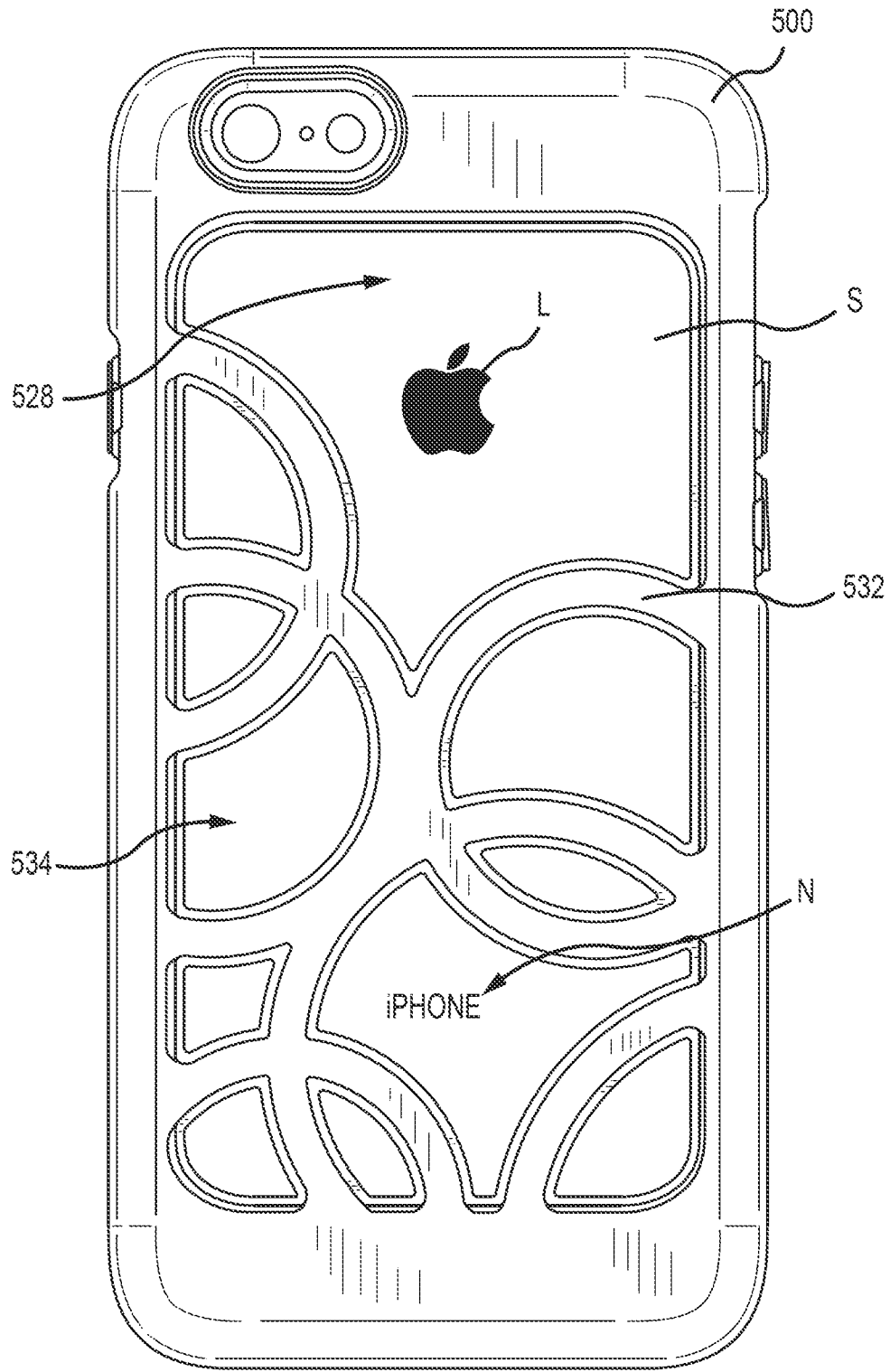


FIG.5

PROTECTIVE CASE FOR PORTABLE ELECTRONIC DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is a continuation of U.S. patent application Ser. No. 17/060,261, filed on Oct. 1, 2020 and issued as U.S. Pat. No. 11,399,606 on Aug. 2, 2022, which is a continuation of U.S. patent application Ser. No. 16/128,808, filed on Sep. 12, 2018 and issued as U.S. Pat. No. 10,820,675 on Nov. 3, 2020, which is a continuation of U.S. patent application Ser. No. 15/291,985, filed on Oct. 12, 2016 and issued as U.S. Pat. No. 10,327,524 on Jun. 25, 2019, which is a continuation of U.S. patent application Ser. No. 15/043,227, filed on Feb. 12, 2016 and issued as U.S. Pat. No. 9,480,319 on Nov. 1, 2016, which is a continuation of U.S. patent application Ser. No. 14/632,927, filed on Feb. 26, 2015 and issued as U.S. Pat. No. 9,300,768 on Mar. 29, 2016. The entire disclosures of the above-referenced applications are hereby incorporated by reference as if fully stated herein.

INTRODUCTION

Smartphones, tablets, personal digital assistants and other electronic devices are somewhat fragile. The housings and electronics located therein can be damaged by dropping, while screens can be scratched when placed face-down on a surface. A variety of protective cases that substantially surround the device are available. These cases, however, are often bulky, unsightly, and can limit access to the device screen or control buttons.

SUMMARY OF THE INVENTION

In one aspect, the technology relates to a case for an electronic device, the case having: a rigid layer including a plurality of turned edges; and a resilient layer disposed primarily on a first side of the rigid layer, wherein the resilient layer includes a plurality of enveloping edges that substantially envelop the turned edges. In an embodiment, the rigid layer defines a central opening and further includes a plurality of rigid bridges at least partially spanning the central opening, wherein each of the plurality of rigid bridges include a rigid bridge width; and the resilient layer defines a central window and further includes a plurality of resilient bridges at least partially spanning the central window and substantially aligned with each of the plurality of rigid bridges, wherein each of the plurality of resilient bridges include a resilient bridge width less than the rigid bridge width. In another embodiment, each of the plurality of rigid bridges and each of the plurality of resilient bridges define a shape including at least one of a straight bar, a curved bar, a curvilinear bar, a substantially circular bar, a wave bar, and an ellipsoidal bar. In yet another embodiment, at least one of the plurality of rigid bridges extends between opposing edges of the central opening. In still another embodiment, at least one of the plurality of rigid bridges extends between adjacent edges of the central opening.

In another embodiment of the above aspect, at least one of the plurality of rigid bridges extends between a single edge of the central opening. In an embodiment, a first rigid bridge of the plurality of rigid bridges extends from a first edge of the central opening to a second rigid bridge of the plurality of rigid bridges. In another embodiment, the resilient layer includes: two short outer edges, each having a first

height; and two long outer edges having lengths greater than the two short outer edges, wherein each of the two long outer edges has a second height less than the first height. In yet another embodiment, the resilient layer defines a taper from the first height to the second height. In still another embodiment, the resilient layer defines a step from the first height to the second height.

In another embodiment of the above aspect, includes a rigid tab extending therefrom, and wherein the resilient layer defines an aperture substantially aligned with at least a portion of the tab. In an embodiment, the portion of the tab includes an enlarged portion. In another embodiment, the enlarged portion includes an enlarged portion axis and wherein the aperture defines an aperture plane, and wherein the enlarged portion axis is misaligned from the aperture plane. In yet another embodiment, the rigid layer is at least one of ABS, PVC, polyethylene, silicone, and thermoplastic elastomer. In still another embodiment, the resilient layer includes at least one of silicone, rubber, and thermoplastic elastomer. In another embodiment, the rigid layer is rigid relative to the resilient layer.

In another aspect, the technology relates to A protective case for an iPhone 6 smartphone, wherein the protective case defines a plurality of gaps on a surface of the protective case, wherein at least one of a logo and a word is visible through at least one of the plurality of gaps.

BRIEF DESCRIPTION OF THE DRAWINGS

There are shown in the drawings, embodiments which are presently preferred, it being understood, however, that the technology is not limited to the precise arrangements and instrumentalities shown.

FIG. 1A is a perspective view of a protective case for an electronic device in accordance with one embodiment of the technology.

FIG. 1B is an exploded perspective view of the protective case of FIG. 1A.

FIGS. 1C-1H are various views of the protective case of FIG. 1A.

FIG. 2 is an enlarged partial side view of the protective case of FIG. 1A.

FIGS. 3A-3H are various views of a protective case for an electronic device in accordance with another embodiment of the technology.

FIGS. 4A-4H are various views of a protective case for an electronic device in accordance with another embodiment of the technology.

FIG. 5 is a rear view of an iPhone 6 smartphone disposed in a protective case.

DETAILED DESCRIPTION

FIGS. 1A-1H are various view of a protective case **100** for an electronic device in accordance with one embodiment of the technology. FIGS. 1A-1H are described simultaneously and not all components or parts described herein are necessarily identified in every figure. The protective case **100** includes two layers, an inner rigid layer **102** or structure and an outer resilient layer **104** or shell. The case **100** is configured to substantially surround a smartphone, tablet, personal digital assistant, or other electronic device. An edge of the smartphone, and a lower, central button **106** thereof are depicted in dashed lines in FIG. 1A. For clarity, however, the protective cases described herein will be described in the context of a smartphone such as an iPhone 6. Thus, the term "inner" refers to the layer that is generally closest to the

smartphone. The term “outer” generally refers to the layer that is disposed on the opposite side of the inner layer from the smartphone. The inner layer **102** and outer layer **104** may form a completed unitary part and may be bonded with adhesive so as to prevent separation between the two layers. In an alternative embodiment, one of the layers (i.e., the inner layer **102**) may first be formed through known injection molding processes, then placed in a mold for the outer layer **104**, which is then formed along with the inner layer **102** into a single unitary part, where the two layers are bonded due to an interaction between the materials of the two layers.

The inner layer **102** is formed of a generally rigid plastic such as ABS, PVC, polyethylene, silicone, thermoplastic elastomer (TPE), or other like plastics. Other materials, including metals such as titanium or aluminum may also be utilized. The inner layer **102** is configured to protect the smartphone when placed in the receiver **108** of the case **100** by effectively forming an exoskeleton to absorb and distribute impacts along the inner layer **102**. Since the inner layer **102** is at least partially deformed during insertion of the smartphone into the receiver **108**, materials that are elastically deformable without breaking may be desirable.

The outer layer **104** is formed of a generally resilient material such as silicone, rubber, and TPE. As used herein, the terms “rigid” and “resilient” describe material properties of the two layers relative to each other. That is, the rigid material utilized in the inner layer **102** is generally more rigid than the resilient material used in the outer layer **104**. Thus, the outer layer **104** and the inner layer **102** may be manufactured of the general type of material, but due to manufacturing techniques, use of additives, etc., the materials of the layers may display different properties. The outer layer **104** is configured to cushion the smartphone and therefore dampen shocks and strikes that may occur when the smartphone is dropped or otherwise strikes a hard surface such as a floor or sidewalk. Additionally, the outer layer **104** may be manufactured of a material or coated with a layer that resists scuffing. The relative softness of the outer layer **104** prevents the smartphone from sliding on smooth surfaces, such as tables, automobile dashboards, etc. Resistance to sliding also helps reduce the likelihood of damage to the smartphone, since the device is less likely to slide off a surface when acted upon by an external force, such as a stray elbow or a curious pet. Additionally, the resilient outer layer **104** helps ensure the smartphone may be gripped more easily.

The inner rigid layer **102** or structure is generally planar and includes a number of turned or curved outer edges **110**. In the depicted embodiment, the turned edges **110** are disposed along the lengths *L* of the inner layer **102**, although the turned edges **110** may alternatively or additionally be disposed along the width *W* of the inner layer **102**. The turned edges **110** may provide support for the outer layer **104** proximate a lower side edge of the outer layer **104**. Generally, the curvature of the turned edges **110** is configured to match the contours of the smartphone received in the receiver **108**. The inner layer **102** may define one or more openings **112**, recesses, apertures, or contours that leave uncovered elements of the smartphone such as the speaker, microphone, camera, charging port, audio jack, screen, buttons, etc. In other embodiments, such as that depicted, the inner layer **102** includes a number of tabs **114** integral therewith. The tabs **114** extend from the inner layer **102** and include a portion that is configured to be substantially aligned with one or more buttons disposed on the smartphone. The tabs **114** are configured so as to be elastically

deformable such that a user of the device can actuate the associated button without having to remove the protective case **100**. Further functionality of the tabs **114** is described in more detail below.

The inner layer **102** defines a central opening **116** that exposes a substantial portion of the received smartphone. The central opening **116** is defined by a plurality of edges **118**. In the depicted embodiment, a top edge **118a** is substantially unbroken while the bottom **118b**, right **118c**, and left **118d** edges are broken by the intersection of one or more bridges **120**. The bridges **120** at least partially span the central opening **116** and may be arranged for both decorative and functional purposes. The bridges **120** preserve rigidity of the inner layer **102** and provide a protective feature whereby loads generated by drops or strikes are distributed throughout the inner layer **102**. The thickness of the bridges **120** also helps limit scratches to the back surface of the smartphone. The bridges **120** may be configured, sized, and arranged so as to leave a substantial portion of the rear surface of the smartphone exposed, so as to leave visible logos, labels, or other marks on the smartphone, via gaps **122** between the bridges **120**. The gaps **122** result in a reduced amount of inner layer material required, which reduces product weight and material costs, while the bridges **120** still provide protection as described above. Additionally, the gaps **122** may aid in dissipation of heat generated by the device.

The bridges **120** define a bridge width *X* and may be formed in any number of shapes and sizes. For example, shapes such as straight bars, curved bars, curvilinear bars, substantially circular bars, wave-shaped bars, ellipsoidal bars, or other configurations may be utilized. In the depicted embodiment, curved bars are primarily utilized. A number of different configurations of bridges **120** that completely or partially span the central opening **116** are depicted in the figures. For example, bridge **120** defined by path A-A spans the central opening **116** from a first edge to an opposing edge thereof. The bridge **120** defined by path B-B spans the central opening **116** from a first edge to an adjacent edge thereof. The bridge **120** defined by path C-C spans the central opening **116** from a first location to a second location on a single edge of the central opening **116**. Additionally, the bridge **120** defined by path D-D spans the central opening **116** from an edge of the central opening **116** to a second bridge **120** disposed within the central opening **116**. Other bridge configurations are depicted further herein and still others are contemplated.

The outer resilient layer **104** or shell includes enveloping edges **124** that substantially surround or envelop the turned edges **110** of the inner layer **102**. The enveloping edges **124** also envelope at least a portion of the smartphone received in the receiver **108**, which allows the smartphone to be held in place within the receiver. In the depicted embodiment, the enveloping edges **124** are larger at the top and bottom edges of the smartphone. Generally, the curvature of the enveloping edges **124** is configured to match the contours of the smartphone received in the receiver **108**. The outer layer **104** may define one or more openings **126**, recesses, apertures, or contours that leave uncovered elements of the smartphone such as the speaker, microphone, camera, charging port, audio jack, screen, buttons, etc. In general, these openings **126**, etc., are substantially aligned with corresponding openings **112** in the inner layer **102**. Certain of these openings **126** are aligned with portions of the tabs **114** described above, leaving these tabs **114** accessible for actuation by a

user of the device. Further structural relationships between the tabs 114 and associated openings 126 are described below.

Similar to the inner layer 102, the outer layer 104 also defines a central window 128 that exposes a substantial portion of the received smartphone. The central window 128 is defined by a plurality of edges 130. In the depicted embodiment, a top edge 130a is substantially unbroken while the bottom 130b, right 130c, and left 130d edges are broken by the intersection of one or more bridges 132. The bridges 132 at least partially span the central window 128 and may be arranged for both decorative and functional purposes. The bridges 132 provide cushioning for the smartphone. The thickness of the bridges 132 also helps limit scratches to the back surface of the smartphone. The bridges 132 may be configured, sized, and arranged so as to leave a substantial portion of the rear surface of the smartphone exposed, so as to leave visible logos, labels, or other marks on the smartphone, via gaps 134 between the bridges 132. The gaps 134 result in a reduced amount of outer layer material required, which reduces product weight and material costs, while the bridges 132 still provide protection as described above. Additionally, the bridges 132 are substantially aligned with an associated bridge formed on the inner layer 104. The gaps 122 may also aid in dissipation of heat generated by the device.

The width Y of the bridges 132 formed as part of the resilient outer layer 104 may be slightly narrower or less wide than the bridges 120 formed as part of the inner layer 102. Similarly, the edges 130 of the central window 128 may be slightly larger than those of the central opening 116 defined by the inner layer 102. These differences in width allow the inner layer 102 to be slightly visible beyond the outer layer 104, for aesthetic and other purposes. Bridge 132 shapes such as straight bars, curved bars, curvilinear bars, substantially circular bars, wave-shaped bars, ellipsoidal bars, or other configurations may be utilized. In the depicted embodiment, curved bars are primarily utilized. A number of different configurations of bridges 132 that completely or partially span the central opening are depicted in the figures. For example, bridge 132 defined by path A-A spans the central window 128 from a first edge to an opposing edge thereof. The bridge 132 defined by path B-B spans the central window 128 from a first edge to an adjacent edge thereof. The bridge 132 defined by path C-C spans the central window 128 from a first location to a second location on a single edge of the central window 128. Additionally, the bridge 132 defined by path D-D spans the central window 128 from an edge of the central window 128 to a second bridge 132 disposed within the central window 128. Other bridge configurations are depicted further herein and still others are contemplated.

The outer layer 104 is further configured to protect the screen of the smartphone while increasing accessibility thereto. In the depicted embodiment, the outer resilient layer 104 has different heights at different portions about its perimeter. For example, the portions 136 of the outer layer 104 at the short outer edges of the smartphone (e.g., the upper and lower edges) have a height H that is greater than the portions 138 of the outer layer 104 proximate the longer outer edges of the smartphone (e.g., the side edges), which have a height h. The increased height H at the upper and lower portions 136 allow the smartphone display to be raised from a surface when placed face-down thereon. This helps prevent scratches to the display. Additionally, the reduced height h at the side portions 138 allows the screen to be completely accessed by the user, for finger-swiping, icon

selection, and other actions. Additionally, screens that extend very close to the side edges of the smartphone may be completely visible due to the reduced height h of the outer layer 104 at the side portions 138. In certain embodiments, the height h of the outer layer 104 is flush with the display of the smartphone. The transition 140 between the higher top/bottom height H and the lower side height h may be a smooth transition, as depicted, or a step.

FIG. 2 is an enlarged partial side view of the protective case 100 of FIG. 1A. In this view, the tabs 114 of the inner layer are depicted, as well as openings 126 of the outer layer 104 that substantially surrounds the tabs 114. Enlarged portions of the depicted tabs 114 are aligned with two buttons on the smartphone that control volume (one button is configured to increase volume, while the other button is configured to decrease volume). As can be seen, openings 126 defined by the outer layer 104 substantially surround the tabs 114. The perimeters of the openings 126 substantially form a plane identified by P. The enlarged portions of the tabs 114 define an axis and are pitched at an angle α relative to the plane P. The pitch may be due to difference thickness of the enlarged portion along the axis, or the enlarged portion may be of a consistent thickness, but pitched. This pitch or misalignment gives the user the tactile feel of a rocker switch, allowing the user to more easily identify which button is which, and actuate the buttons appropriately. Unlike covers that cover smartphone buttons with a resilient layer, it has been discovered that a more rigid tab over a smartphone button more easily actuates that button.

FIGS. 3A-3H are various views of a protective case 300 for an electronic device in accordance with another embodiment of the technology. The protective case 300 depicted in these figures includes features substantially similar to the previously-presented embodiment, with regard to materials, layer configurations, tabs, etc. Accordingly, the components of this case 300 are identified by numbers similar to those utilized in FIGS. 1A-1H, above, but are not necessarily described further. The bridges 320/332 in these figures, however, are in the form of substantially straight bars. A number of different configurations of bridges 320 that completely or partially span the central opening 316 are depicted in the figures. For example, bridge 320 defined by path A-A spans the central opening 316 from a first edge to an opposing edge thereof. The bridge 320 defined by path C-C spans the central opening 316 from a first location to a second location on a single edge of the central opening 316. Additionally, the bridge 320 defined by path D-D spans the central opening 316 from an edge of the central opening to a second bridge 320 disposed within the central opening 316.

FIGS. 4A-4H are various views of a protective case 400 for an electronic device in accordance with another embodiment of the technology. The protective case 400 depicted in these figures includes features substantially similar to the previously-presented embodiments, with regard to materials, layer configurations, tabs, etc. Accordingly, the components of this case 400 are identified by numbers similar to those utilized in FIGS. 1A-1H, above, but are not necessarily described further. The bridges 420 in these figures, however, are in the form of curvilinear bars that have a varied width across their lengths. A number of different configurations of bridges 420 that completely or partially span the central opening 416 are depicted in the figures. For example, bridge 420 defined by path A-A spans the central opening 416 from a first edge to an opposing edge thereof. The bridge 420 defined by path B-B spans the central opening 416 from a first edge to an adjacent edge thereof. The bridge 420 defined

by path C-C spans the central opening 416 from a first location to a second location on a single edge of the central opening 416. Additionally, the bridge 420 defined by path D-D spans the central opening 416 from an edge of the central opening 416 to a second bridge 420 disposed within the central opening 416.

FIG. 5 is a rear view of an iPhone 6 smartphone S disposed in a protective case 500. As described in more detail above, the case 500 includes a number of bridges 532 that span a central window 528 of the case 500. Between the bridges 532, a number of gaps 534 are defined. In the depicted embodiment, the gaps 534 are configured and arranged so as leave both the Apple™ logo L and iPhone™ name N visible. This visibility can help preserve brand recognition in the eye of the consumer.

While there have been described herein what are to be considered exemplary and preferred embodiments of the present technology, other modifications of the technology will become apparent to those skilled in the art from the teachings herein. The particular methods of manufacture and geometries disclosed herein are exemplary in nature and are not to be considered limiting. It is therefore desired to be secured in the appended claims all such modifications as fall within the spirit and scope of the technology. Accordingly, what is desired to be secured by Letters Patent is the technology as defined and differentiated in the following claims, and all equivalents.

What is claimed is:

1. A case designed for a corresponding electronic device, comprising:
 a layer comprising a base;
 an opening in the base; and
 a plurality of edges extending from the base and configured to receive and hold the corresponding electronic device;
 wherein the plurality of edges comprises a first and second edge adapted to correspond to a first side and second side of the corresponding electronic device and a third and fourth edge adapted to correspond to an upper side and a lower side of the corresponding electronic device;
 wherein the first and second edges comprise a major height H and a minor height h where the major height H and minor height h are measured from the base;
 wherein the minor height h is continuous along the first and second edges;
 wherein the major height His reduced to a minor height h by at least one transition portion;
 wherein the third and fourth edges comprise the major height H that is the same or greater than the height of the at least one transition portion;
 wherein the major height His continuous along the third and fourth edges; and
 wherein at least a portion of one of the first and second edges comprising minor height h comprises a tab adapted to correspond to a button on an edge of the corresponding electronic device.

2. The case of claim 1, wherein the minor height h is adapted to expose at least a portion of the corresponding edges of the corresponding electronic device.

3. The case of claim 2, wherein the height profiles of the first and second edges are symmetrical.

4. The case of claim 1, wherein the minor height h is adapted to expose at least a portion of a screen of the corresponding electronic device.

5. The case of claim 4, wherein the height profiles of the first and second edges are symmetrical.

6. The case of claim 1, wherein the height profiles of the first and second edges are symmetrical.

7. The case of claim 6, wherein the edges are substantially perpendicular to the base.

8. A case designed for a corresponding electronic device comprising:

a layer comprising a base;
 an opening in the base; and
 a plurality of edges;

wherein the plurality of edges comprises a first and second edge adapted to correspond to a first side and second side of the corresponding electronic device and a third and fourth edge adapted to correspond to an upper side and a lower side of the corresponding electronic device;

wherein the first and second edges comprise a major height H and a minor height h where the major height H and minor height h are measured from the base;

wherein the major height His greater than the height of the corresponding electronic device received within the case;

wherein the minor height h is continuous along the first and second edges;

wherein the major height His reduced to a minor height h by at least one transition portion;

wherein the third and fourth edges comprise the major height H that is the same or greater than the height of the at least one transition portion;

wherein the major height His continuous along the third and fourth edges; and

wherein a portion of at least one of the first and second edges comprising minor height h comprises a tab adapted to correspond to a button on an edge of the corresponding electronic device.

9. The case of claim 8, wherein the minor height h is adapted to expose at least a portion of the corresponding edges of the corresponding electronic device.

10. The case of claim 9, wherein the height profiles of the first and second edges are symmetrical.

11. The case of claim 8, wherein the minor height h is adapted to expose at least a portion of a screen of the corresponding electronic device.

12. The case of claim 11, wherein the height profiles of the first and second edges are symmetrical.

13. The case of claim 8, wherein the height profiles of the first and second edges are symmetrical.

14. The case of claim 13, wherein the edges are substantially perpendicular to the base.

* * * * *