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(54) **ERGONOMIC ACCESSORY FOR SMARTPHONES AND OTHER HAND-HELD PORTABLE ELECTRONIC DEVICES**

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H04M 1/02 (2006.01)
H05K 5/02 (2006.01)

(52) **U.S. Cl.**
CPC ***H04M 1/0283*** (2013.01); ***H05K 5/0204*** (2013.01)

(58) **Field of Classification Search**
CPC H04M 1/0283; H05K 5/0204
See application file for complete search history.

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(57) **ABSTRACT**

Injury to the digits, hand and wrist are associated with the frequent usage of portable hand-held electronic devices ("PEDs"), including but not limited to smartphones. This is true as well for injury to the neck and shoulder areas. The potential for injury to the digits, hand and wrist in particular is anticipated to be exacerbated by the larger smartphones, and especially the tablet-like smartphones. The ergonomic accessory of the invention has several embodiments whose design is intended to ameliorate if not prevent such injuries. Certain embodiments are partially or fully case-like in form so that they envelope to a greater or lesser degree, such hand-held electronic devices. Another embodiment attaches to a PED through an element of the PED such as the charging socket. The accessory also removably attaches the hand of the user or provides a secure holding surface for the user.

16 Claims, 22 Drawing Sheets

longer. The result of these adjustments will determine how far from the hand the decorative or technological element **406** will fall from the hand.

Having made all the dimensional adjustments described above, use of this embodiment of the present invention simply involves insertion of the preferred digit(s) through loop element **401***b* before, or after, connecting to the PED by way of connector element **402**.

The cord-to-PED connector element **402** (see FIG. **9**), in various of its possible manifestations, is shown in FIG. **11**. In one embodiment, the cord element, through segment **401***a* may be joined to a component connector element that is exact in size to an Apple "Lightning" element **402***a*, Apple 30-pin element **402***c*, or Micro-USB element **402***b* charge connector, thus enabling connection of the ergonomic accessory **400** directly to a PED via its charge port. Alternatively, the cord element may be connected indirectly to a PED into and through an external rechargeable battery pack **402***d* serving as a technological component. All manner of other technological component elements **402***e* through which the cord element may be connected to the PED indirectly may be imagined to be placed at this location as well. This connection of cord element may also be facilitated through use of a partial case-like element **402***f* which grasps the PED securely and to which the cord element is attached through a permanent or quick-disconnect arrangement. A connector element **402***g* designed to couple to the pop-up pin of an Apple iPod may alternatively be employed. As a further example, the cord element may be indirectly connectable to a PED, through incorporation into an ear phone jack assembly element **402***h*.

The ring element **403**, and the ring face element **404**, in two exemplary manifestations in terms of design, are illustrated in FIGS. **12A-12C**. Ring element **403***a* is intended to be of a more traditional ring shape and design. Ring element **403***b* is shown simply in a tubular shape through whose body, in a tunnel arrangement, the cord element **401** runs. The cross sectional view FIG. **12A**, illustrates how this tunnel concept is configured such that the ring body element **403**, however it may be designed, envelopes the cord element **401** in a loose way that permits the ring to travel, in slidable engagement, along the cord so as to make the adjustments in dimensions for the accessory of the invention **400** such that personal hand and digit dimensions can be accommodated as previously described. The ring element **403** is only partially circumferential in terms of surrounding the digit(s). When coupled to the cord element **401**, as it is formed into a loop element **401***b*, the ring/tether composite structure will be fully circumferential to the digit(s), thus securing the PED to the hand. The adjustments to the lengths of the various cord element **401** segments, previously elaborated on, provides for the variation in the degree of snugness of the cord loop element **401***b*. The ring **403** is flexible in construction and material selection so that its flexibly follows the circumferential dimension of the digit(s) of the user as the cord loop element **401***b* is adjusted in size.

When the ergonomic accessory of the invention **400** is worn, the user appears to be wearing a conventional ring, optionally a decorative ring or item of jewelry and fashion, rather than simply having a bare tether wrapped as a loop around the digit(s). Adding to this concept of the ring element **403** serving as an item of fashion, a ring face element **404** of various designs, such as **404***a* and **404***b*, may be incorporated into the ring by permanent attachment or as a removable (e.g., snap-on/snap-off) interchangeable element. The ring face may be made of any material, may be of any possible design and appearance, and may be etched or otherwise provided with a name, slogan, or any other written design or logo concept.

Alternatively, the ring element **403**, or the ring element **403**/ring face element **404** complex, rather than serving as a fashion element, may comprise a technologic element connecting wirelessly to a PED.

FIG. **13** illustrates certain and various functional elements of the ergonomic accessory of the present invention **400** appended to the cord element at its segmental **401***d* end. This is the end of the cord element located furthest from the cord element segment **401***a* which connects, to a PED by way of a cord connection element **402**. Such functional elements may include an ornamental tassel or pendant, or other item of fashion or jewelry **406***a*. When the ergonomic accessory of the present invention is affixed to the hand via the fingerlet loop element **401***b*, exemplary decorative/technological elements **406***a*-**406***d* in their various possible decorative or technological manifestations, will hang suspended from the hand. The decorative/technological elements, as illustrated in FIG. **13**, may also be comprised of technological components including, but not limited to, connector elements **406***b*, flash drive elements **406***c*, or external rechargeable battery pack elements **406***d*. To the extent that technological elements may be appended at this end of the cord element, the cord itself may need to be comprised of a flexible electrical cable capable of carrying electrical current, digital signals or other information or signals to and from a PED.

FIG. **14**, in an illustrative way, identifies the several loci **402**, **403**/**404** and **406**, for technological elements incorporated into or otherwise appended to, the ergonomic accessory of the present invention **400** which, in this respect, serves as a general platform for wearable technology.

In a ninth embodiment, ergonomic accessory **500** is illustrated in FIGS. **15**A, B and C as it would appear prior to its affixation to a PED. FIG. **15**A is a plan elevation, FIG. **15**B is a bottom end elevation and FIG. **15**C is a side elevation. Ergonomic accessory **500** is generally comprised of a base layer **501**, a backing layer **510** and a pocket **504**. In a preferred embodiment the base layer **501**, backing layer **510** and pocket **504** can be made of a single piece of adhesive backed material.

Base layer **501** comprises a plastic film underlayment over which screen protector **507** (see also FIGS. **16-18**) is affixed. Screen protector **507** may be comprised of plastic or glass. Openings **502** and **503** are provided to allow access to PED control buttons and it is understood that these as well as additional openings can be provided in whatever locations are required for a particular PED. The pocket **504**, also referred to as a blister pocket, secures the buttress **505** within the ergonomic accessory and receives tether **506**. Referring to FIGS. **19**A, C and D, openings **512** and **513** are provided in pocket **504** and these openings line up with openings **514** and **515** in buttress **505** when the buttress is received in the pocket. The openings receive ends A and B of tether **506** and the tether is secured therein to the ergonomic accessory **500** by adhesive or other suitable means.

FIG. **18** is a section view taken along section line A-A in FIG. **15**A and FIG. **16** is an enlarged view of the encircled portion of FIG. **18**. Adhesive backing **508** secures the buttress **505** within pocket **504** and the same or similar adhesive backing is provided on the underside **511** of backing layer **510** and on the underside **516** of base layer **501**. As noted above, base layer **501**, pocket **504** and backing layer **510** can be made of one unitary piece of material which is adhesive backed.

PED **509** is illustrated in FIG. **17** wherein the ergonomic accessory **500** has been affixed thereto. Base layer **501** is adhered to the screen side of the PED and backing layer **510** is adhered to the back of the PED.

FIGS. **19**A-D illustrate screen saver **507** and the elements of the invention. After the ergonomic accessory **500** is affixed to the PED the screen saver **507** is affixed to the upper surface of base layer **501**.

FIG. **20** depicts the manner in which the ergonomic accessory **500** is affixed to the PED **509**. First the elements of the ergonomic accessory are assembled. Then the base layer **501** is affixed to the screen of PED **509** and then the screen saver **507** is affixed to the base layer. Backing layer **510** then is folded under the PED and affixed to the back of the PED. The screen saver **507** can be affixed to the base layer **501** before or after the backing layer is affixed to the back of the PED.

FIG. **21**A is a top perspective view of a PED having the ergonomic accessory of the invention affixed thereto. And FIG. **21**B is a bottom perspective view of a PED having the ergonomic accessory of the invention affixed thereto.

What is claimed is:

1. An ergonomic accessory for a portable hand-held electronic device, wherein the portable hand-held electronic device has a screen side, an opposite back side, a length defined between a bottom edge and an opposite top edge and a side edge connecting the screen side and the opposite back side along the length between the bottom edge and the opposite top edge, the accessory comprising:

a film layer having a length defined between a bottom edge of the film layer and an opposite top edge of the film layer and a width defined between a first side edge of the film layer and an opposite second side edge of the film layer, wherein the film layer is partitioned along the length of the film layer to provide a first width portion and a second width portion provided between the first width portion and a third width portion, wherein the second width portion and the third width portion is foldable with respect to the first width portion such that first width portion contacts the screen side, the second width portion folds around the side edge and the third width portion folds around the opposite back side of the portable hand-held electronic device when the accessory and the portable hand-held electronic device are joined together; and

a tether provided at the second width portion of the film layer such that the tether is secured to the second width portion of the film layer and extends outwardly away from the second width portion of the film layer and the side edge of the portable hand-held electronic device when the accessory and the portable hand-held electronic device are joined together, wherein the tether is configured to receiving at least one finger of a user of the portable hand-held electronic device when the accessory and the portable hand-held electronic device are joined together and the accessory couples the at least one finger of the user to the portable hand-held electronic device.

2. The accessory according to claim **1**, wherein the film layer is a plastic film underlayment for affixing a screen protector for the portable hand-held electronic device thereto.

3. The accessory according to claim **2**, wherein the screen protector is affixed to the plastic film underlayment of the film layer and comprises plastic or glass.

4. The accessory according to claim **1**, further comprising:

a screen protector affixed to a top side of film layer opposite with respect to the screen side of the portable hand-held electronic device when the accessory and the portable hand-held electronic device are joined together.

5. The accessory according to claim **1**, wherein the first width portion of the film layer is affixed to the screen side of the portable hand-held electronic device and the third width portion of the film layer is affixed to the screen side of the portable hand-held electronic device when the accessory and the portable hand-held electronic device are joined together.

6. The accessory according to claim **1**, wherein film layer comprises an adhesive film for affixing the accessory to the portable hand-held electronic device when the accessory and the portable hand-held electronic device are joined together.

7. The accessory according to claim **1**, further comprising:

ends of the tether are received within a pocket of the second width portion of the film layer such that the tether is secured to the accessory via the ends of the tether and the pocket.

8. The accessory according to claim **7**, further comprising:

A buttress received in the pocket of the second width portion for securing the tether to the accessory.

9. An ergonomic accessory for a portable hand-held electronic device, wherein the portable hand-held electronic device has a screen side, an opposite back side, a length defined between a bottom edge and an opposite top edge and a side edge connecting the screen side and the opposite back side along the length between the bottom edge and the opposite top edge, the accessory comprising:

a base layer having a first width defined between a first edge of the base layer and an opposite second edge of the base layer;

a backing layer having a second width defined between a first edge of the backing layer and an opposite second edge of the backing layer;

a pocket connecting the opposite second edge of the base layer to the first edge of the backing layer such that the base layer extends in a first direction across the first width of the base layer, the backing layer extends in the first direction across the second width of the backing layer and the pocket extends in a second direction between the base and backing layers, wherein the first direction is different than the second direction; and

a tether extends outwardly away from the pocket and the side edge of the portable hand-held electronic device when the accessory and the portable hand-held electronic device are joined together, the tether is configured to receiving at least one finger of a user of the portable hand-held electronic device when the accessory and the portable hand-held electronic device are joined together and the accessory couples the at least one finger of the user to the portable hand-held electronic device.

10. The accessory according to claim **9**, wherein the base layer, the backing layer and the pocket are made of a single piece of material.

11. The accessory according to claim **10**, wherein the single piece of material is a single piece of adhesive backed material.

12. The accessory according to claim **9**, further comprising:

a screen protector, comprising plastic or glass, affixable to the base layer, wherein the base layer is a plastic film underlayment for the screen protector.

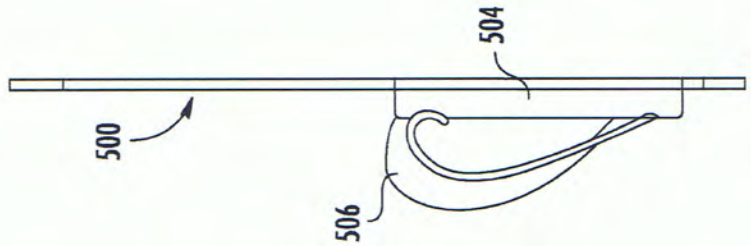

FIG. 15C

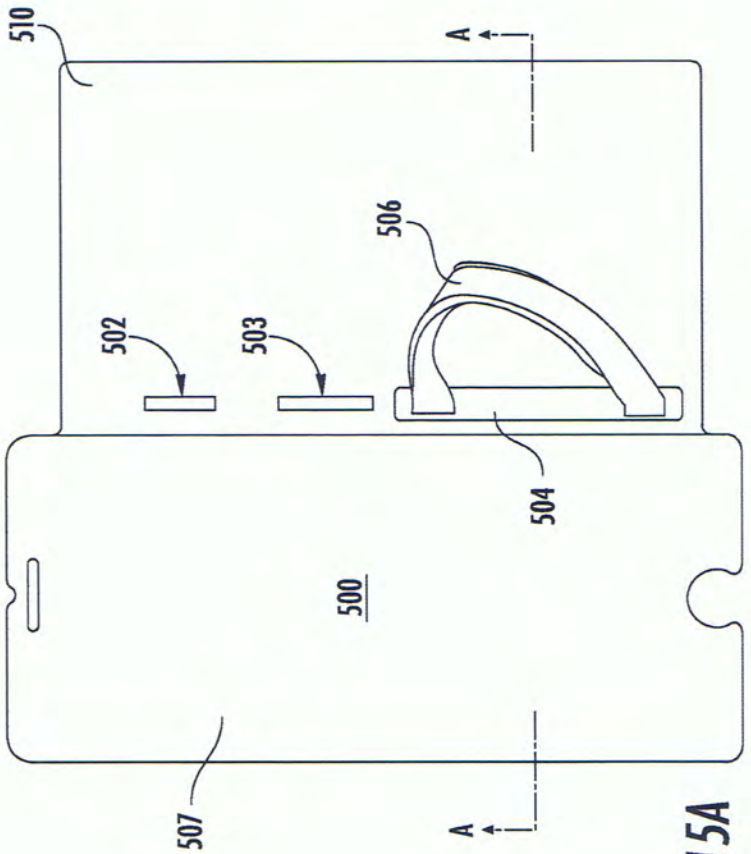

FIG. 15A

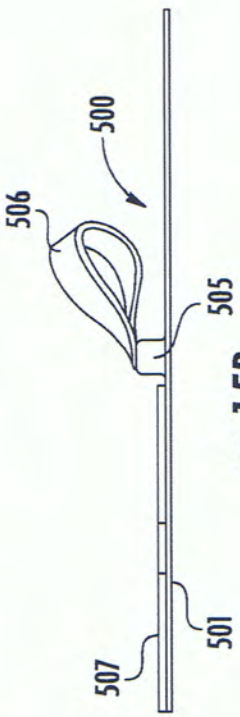

FIG. 15B

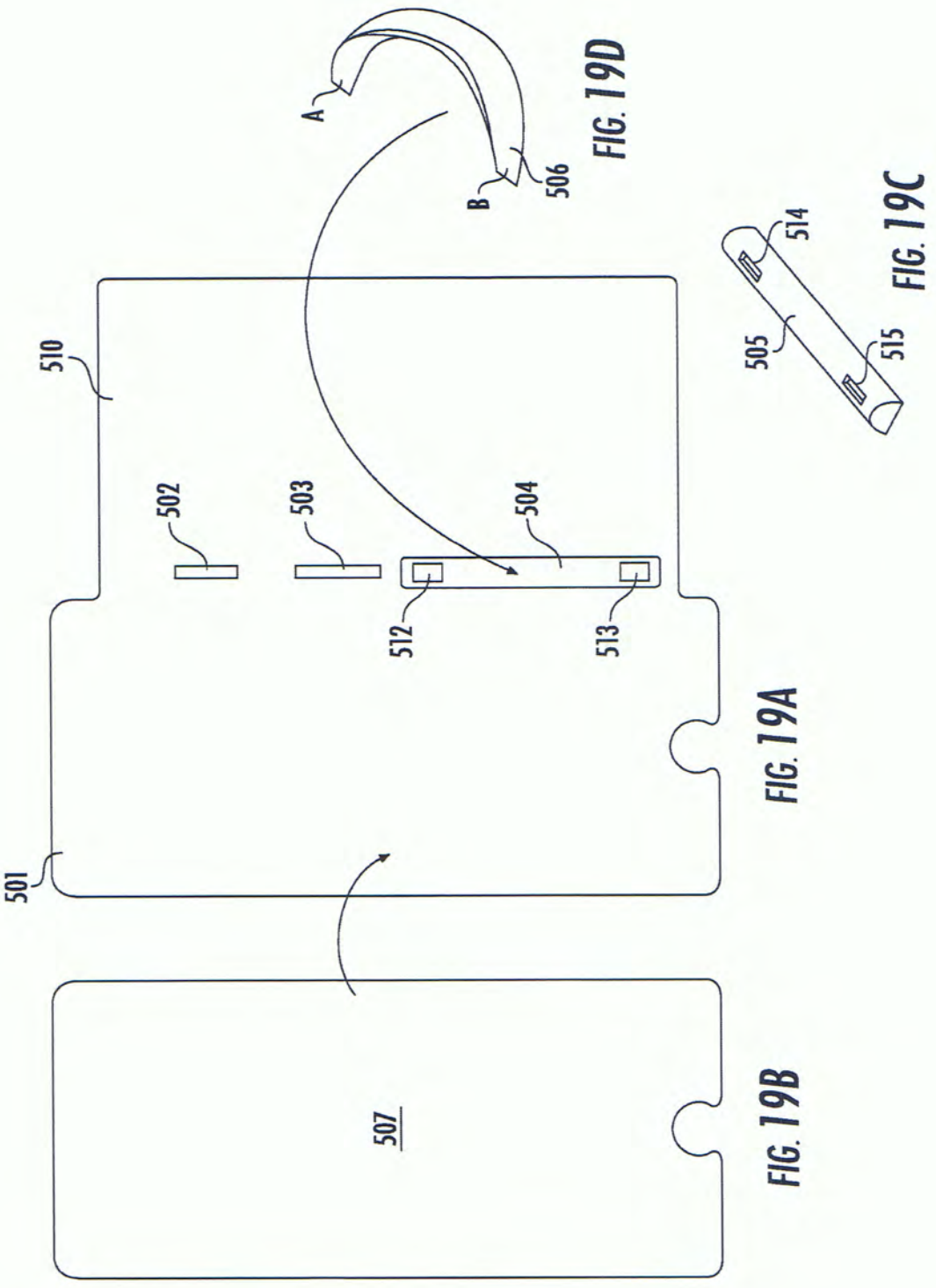

FIG. 19D

FIG. 19C

FIG. 19A

FIG. 19B

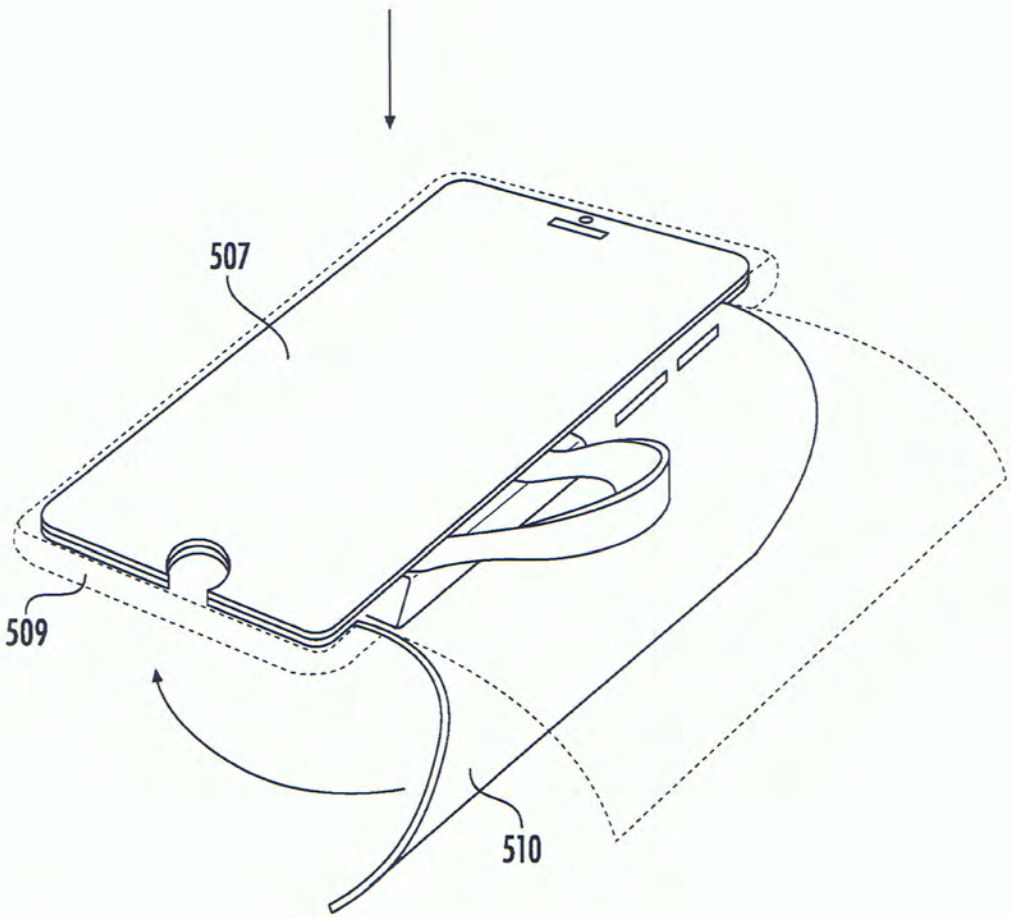

FIG. 20

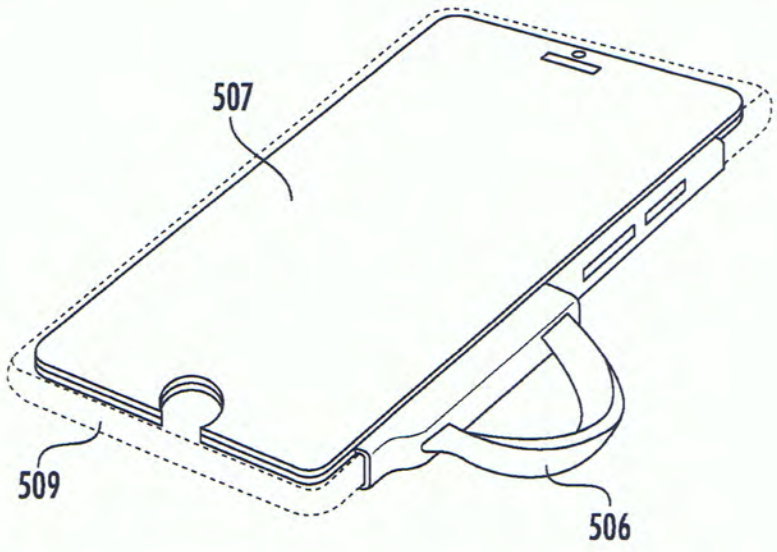

FIG. 21A

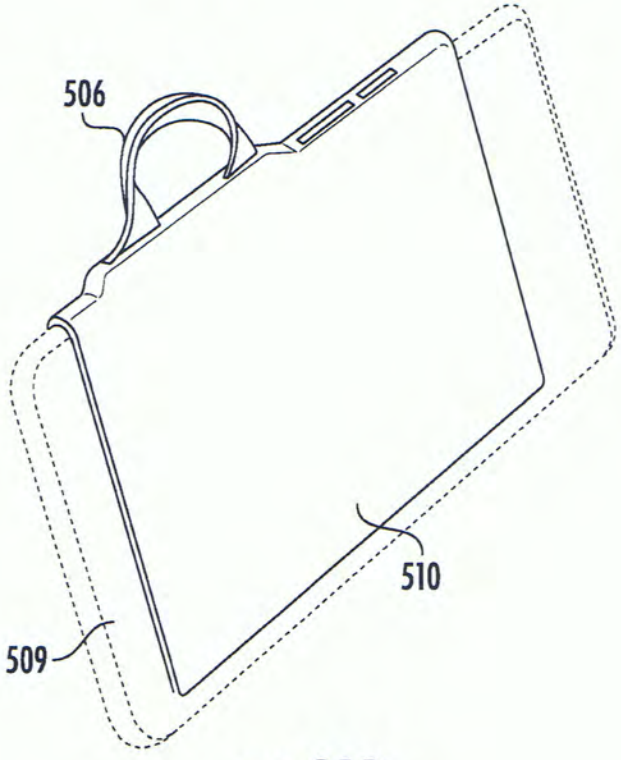

FIG. 21B