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UNIVERSAL SHROUD FOR PORTABLE ELECTRONIC DEVICE

FIELD OF THE INVENTION

[0001] Embodiments of the present invention relate generally to anti-theft devices, shrouds, and methods for protecting a portable electronic device from theft.

BACKGROUND OF THE INVENTION

[0002] A recent trend in work and retail store environments is to use smart devices, sometimes cellphones, but more often tablets, as customer service devices. This usage takes on two forms. One form is using a tablet as a kiosk where customers can interact with the device. This may be used to deliver information about the establishment or its products to the consumer, or to act as an interface for customer loyalty programs in lieu of plastic cards. A second usage is for retail store associates to carry such a device around the store to assist customers. The associate may use the device to display a layout of the store to show a customer where an item is, check on a price of an item, or access information regarding a product the customer is buying. In some stores, tablets are being used to check-out customers. Restaurants may use smart devices at a table for ordering or game playing. Hospitals may allow doctors and nurses to carry smart devices for mobile access to patient's health charts.

[0003] This trend requires customers, store associates and employees to interact with smart devices that tend to be fairly expensive. In some instances, the customer, store associate or employee may need to leave the smart device unattended for a period of time to perform another task. Thus, there is a need for an anti-theft device for protecting a portable electronic device from theft, while allowing a sufficient level of user interaction with the portable electronic device.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0004] Reference will now be made to the accompanying drawing figures wherein identical reference numerals denote the same or similar parts, elements, components, assemblies, subassemblies or the like throughout the various views. The attached drawing figures show exemplary embodiments of an anti-theft device 10 for protecting a portable electronic device 15,

for example, a tablet, against theft or unauthorized removal. As used herein, the term “tablet” is intended to include without limitation all types of portable, personal computers, for example, laptop, notebook, mini-notebook, sub-notebook and netbook type computers, as well as personal data assistant (PDA) and personal mobile communications (e.g., cell phone) type devices. The anti-theft device 10 may be suitable for use by customers or employees, such as a retail store associate, a teacher, a nurse, a doctor, a maintenance worker, or an airline pilot/attendant, in a variety of locations and environments.

[0005] FIG. 2 shows a portable electronic device 15, and in particular a tablet, for use with an anti-theft device 10 according to the invention. In one embodiment, the anti-theft device 10 includes a shroud 20, sleeve, or the like that is configured to be attached to the portable electronic device 15. The shroud 20 is configured to at least partially receive and surround the portable electronic device 15. According to one embodiment, the shroud 20 comprises a first portion 24 and a second portion 28 that are configured to engage with one another. First portion 24 and second portion 28 of shroud 20 may be made of a formable, substantially rigid material, such as hard plastic, composite, or thin sheet metal. First portion 24 includes peripheral sides and a peripheral end that overlies and enclose the opposite sides and an end of the portable electronic device 15. Likewise, second portion 28 is provided with peripheral sides and a peripheral end that overlies and enclose the opposite sides and the other end of the portable electronic device 15. First portion 24 and second portion 28 are secured together with portable electronic device 15 disposed therein and contained by the peripheral sides and peripheral ends by mechanical fasteners 30. Fasteners 30 may be provided with a tamper-proof head that requires a customized tool that is not readily available to others so that the fasteners cannot be easily removed by a potential thief. Alternatively, the fasteners 30 may be positioned on the first portion 24 and the second portion 28 so as to be inaccessible when the shroud 20 containing the portable electronic device 15 is locked in place on the dock 50, as will be described.

[0006] As previously mentioned, the anti-theft device 10 may further include a dock 50 for receiving and supporting the portable electronic device 15. The dock 50 may be configured to temporarily secure the portable electronic device 15 thereto. In turn, the dock 50 may be

configured to be fixed to a support surface, such as a fixture, a counter, a wall, or the like, for example, with one or more fasteners and/or adhesive. In some instances, the portable electronic device 15 is configured to be readily placed on the dock 50 and removed by an authorized user. For example, a retail store associate may utilize a portable electronic device 15 for point-of-sale transactions and wish to temporarily secure the device against theft or unauthorized removal. As such, the dock 50 may also be configured to be alarmed, locked, and/or otherwise secured so that unauthorized persons cannot remove the portable electronic device 15. In one embodiment, the dock 50 includes an alarming device (e.g., an alarm and monitoring electronics) configured to arm when the portable electronic device 15 is positioned within the dock, and to disarm when the portable electronic device is removed by an authorized user. The portable electronic device 15 may be operably engaged with the dock 50 and/or with an alarming device in a wireless manner (i.e., no tether is required), although wired means may be used if desired.

[0007] The dock 50 may include an alarm and monitoring electronics for activating the alarm in the event that the shroud 20 and the portable electronic device 15 are detached from the dock in an unauthorized manner. The monitoring electronics may be configured to monitor one or more sensors or switches and to activate an audible or visible alarm signal in response to a security event. Moreover, the dock 50 may include a processor or controller that is operably engaged with the monitoring electronics, a motor, switches, an alarm, etc.

[0008] FIGS. 10-11 show embodiments of a dock 50 configured to support and secure the shroud 20 and portable electronic device 15, although other shapes and configurations are possible for supporting a variety of portable electronic devices. For example, the shroud 20 may include a hub member 22 or other engagement member that is configured to mate with a corresponding engagement feature of the dock 50. Moreover, the dock 50 may be configured to support the portable electronic device 15 in one of a plurality of desired orientations (e.g., portrait or landscape). Alternatively, the shroud 20 may be configured to rotate about the dock so as to be positioned in any desired orientation (e.g., rotatable 360 degrees).

[0009] The dock 50 may include a mechanical mechanism or sensor, such as a pressure or plunger switch, operably engaged with the alarm and monitoring electronics that is configured to

activate in response to engagement and disengagement with the portable electronic device 15 and/or the shroud 20. Likewise, the dock 50 may include a mechanical mechanism or sensor that is configured to sense if the dock has been removed from a support surface in an unauthorized manner. The authorized user may utilize a key, pass code, or the like to disarm the alarm and monitoring electronics. In some embodiments, the dock 50 is configured to power and/or charge a portable electronic device 15 that is docked on the dock. In this case, the anti-theft device 10 may include a power cord coupled to the dock 50, inductive charging functionality, or contact charging functionality. For example, the dock 50 may pass power to the portable electronic device 15 via the shroud 20 that is connected to a power input port of the portable electronic device via a connector 36. In one embodiment, FIG. 11 shows a dock 50 electrically connected to a cable 30 that may be coupled to an external power source (not shown). When the shroud 20 is docked on the dock 50, the dock is configured to pass power to the shroud and/or the portable electronic device 15. The cable 30 may also provide power to the alarm and/or monitoring electronics within the dock 50. An LED or other signaling device may be used to indicate that the anti-theft device 10 is armed. In addition, the alarm and monitoring electronics may be configured to generate an alarm signal (e.g., an audible and/or visible alarm) in response to unauthorized removal of the portable electronic device 15 and/or shroud 20 from the dock 50.

[0010] In one embodiment, FIG. 3 shows a shroud 20 that includes one or more electrical contact(s) 34 for electrically communicating with the dock 50, and a connector 36 at one end for engaging a power and/or input port on the portable electronic device 15. The contacts 34 may be located on the hub member 22 in some cases, or in other embodiments, the contacts may be located on any other desired location on the shroud 20. The shroud 20 may include one or more electrical conductors (e.g., power and ground) extending between the contact(s) 34 and the connector 36. In some cases, the conductors are contained within a cable 38. The connector 36 may be any suitable connector configured to engage a power and/or input port of the portable electronic device 15, for example a micro-USB connector. The electrical contact between the contacts 34 of the shroud 20 and the corresponding contacts 53 provided on the dock 50 may also define a detectable sense loop that is in electrical connection with the monitoring electronics. Thus, should the shroud 20 be removed from the dock 50 in an unauthorized manner

(e.g., without first disarming the monitoring electronics with a key), the monitoring electronics may sense the break in the sense loop and generate an alarm signal. The cable 38 allows flexibility in engaging the connector 36 with the input port of the portable electronic device 15, which may depend on the device manufacturer or model. For example, some input ports are located at the bottom of the portable electronic device 15, while others may be on the side or top of the device. Thus, the cable 38 provides a more adaptable manner in which to accommodate different types and styles of portable electronic devices 15.

[0011] In some embodiments, the anti-theft device 10 comprises a lock mechanism 40 for securing the portable electronic device 15 on the dock 50. The lock mechanism 40 may include any combination of electrical, magnetic, inductive, and/or mechanical interaction. For example, the lock mechanism 40 may be configured to automatically lock when the portable electronic device 15 is positioned onto the dock 50. In the various embodiments shown in FIGS. 10-11, the dock 50 may include one or more fingers 42 that are configured to extend and retract relative to the dock. For example, the dock 50 may include a pair of opposing fingers 42 at radially opposite locations. Alternatively, or in addition, the dock 50 may include any number of fingers 42, for example, a plurality of fingers spaced equidistantly from one another around the periphery of the dock. The fingers 42 may be configured to automatically extend outwardly to engage the shroud 20 when the shroud with the portable electronic device 15 is placed onto the dock 50.

[0012] In order to release the shroud 20 and the portable electronic device 15 from the dock 50, an authorized user could use an electronic key or other suitable security means (e.g. a pass code) to disarm the alarming device (e.g., alarm and monitoring electronics) and/or disengage the lock mechanism 40. For example, FIGS. 10-11 show that the dock 50 includes a port 55A for communicating with an electronic key for arming and/or disarming the alarming device.

[0013] An unlocking feature for removing the portable electronic device 15 or disarming the alarming device may take many forms, including those discussed above. One embodiment is an electronic key utilizing radio frequencies, infrared, or some other electronic means to communicate with the monitoring electronics of the dock 50 and/or the alarming device to allow

the portable electronic device 15 to be released. For example, the dock 50 may include a port 55A for receiving a signal from the electronic key having a unique identifying code recognizable by the dock, but otherwise unrecognizable by other docks not associated with the code (e.g., in other departments or stores). In some embodiments, the portable electronic device 15 can be armed, disarmed, and/or silenced with the key, which may utilize mechanical, wireless, and/or electrical communication between the portable electronic device and the security key. In additional embodiments, the portable electronic device 15 and/or dock 50 may include near field communication (NFC) functionality and be configured to communicate with the key or an alarming device having NFC functionality for arming and disarming the portable electronic device and/or dock. Alternatively, the alarming device may include “screen swipe” functionality and be configured to sense particular movement or motion of the portable electronic device 15 and/or the key to arm or disarm the portable electronic device and/or dock 50. Likewise, the portable electronic device 15 and/or key may include biometric functionality for recognizing a particular user to arm or disarm the portable electronic device and/or dock.

[0014] Additional features of the anti-theft device 10 may provide a more universal solution for different types, sizes, and styles of portable electronic devices 15. In some embodiments, the anti-theft device 10 may include one or more adapters that allow the shroud 20 to accommodate different sizes, styles, and types of portable electronic devices 15. The adapters may be located within the shroud 20 so as to not be accessible when the shroud is assembled and the portable electronic device 15 secured therein. For example, anti-theft device 10 may include one or more posts 52 that are configured to engage the shroud 20 for accommodating portable electronic devices 15 that are of different lengths. In the illustrated embodiments, a pair of posts 52 are configured to engage each of the first portion 24 and second portion 28, although any number of posts may be used. The posts 52 are configured to engage opposite ends of the portable electronic device 15, and different sized posts may be used depending on the length of the portable electronic device. Thus, a longer portable electronic device 15 may require shorter or no posts 52 in comparison to a shorter portable electronic device. The posts 52 may be configured to engage the shroud 20 in any suitable manner, such as via a press fit in corresponding openings provided in the shroud. Thus, the shroud 20 may include one or more

openings or receptacles that are configured to at least partially receive and secure the posts therein. The posts 52 may be various sizes and configurations and in one example are cylindrical in shape. Additionally, the posts 52 may be formed of any desired material, such as a flexible plastic material.

[0015] Moreover, the anti-theft device 10 may include various adapters for accommodating portable electronic devices 15 of different thicknesses. For instance, the anti-theft device may include one or more brackets 54 for such purpose. The brackets 54 are configured to engage the shroud 20 and to extend outwardly from an inner surface thereof. In the illustrated embodiments, a pair of brackets 54 are configured to engage each of the first portion 24 and second portion 28. The brackets 54 are configured to engage a rear surface and in some cases, also the opposite edges, of the portable electronic device 15, and different sized brackets may be used depending on the thickness of the portable electronic device. In some instances, each bracket 54 is generally L-shaped, and the end may include a raised portion 56 that is configured to engage an edge of the portable electronic device 15. Thus, a thicker portable electronic device 15 may require shorter or no brackets 54 in comparison to a thinner portable electronic device. The brackets 54 may be configured to engage the shroud 20 in any suitable manner, such as via a press fit and/or fasteners. For example, each bracket 54 may include one or more recesses configured to align with protrusions on the shroud 20 (or vice versa), such as raised ridges, and an opening for receiving a fastener for engagement with the shroud. Additionally, the brackets 54 may be formed of any desired material, such as metal.

[0016] The anti-theft device 10 may also include one or more resilient members 58 that are configured to engage a rear surface of the portable electronic device 15 for a more secure fit when placed within the shroud 20. The resilient members 58 may be resilient so as to be compressible when engaged with the shroud 20 and configured to return to its original length when not engaged. The resilient members 58 may be secured directly to the shroud 20, such as with an adhesive, and may be located at any desired location on the shroud.

[0017] In addition, the anti-theft device 10 may allow for flexibility in the location of an audio jack 60. In this regard, similar to the location of the input port of the portable electronic

device 15, the audio jack port on the portable electronic device may be located at different locations depending on the type of style of the device. In order to accommodate different locations for the audio jack port, the audio jack 60 may be connected to a cable 62 and plug 64. The shroud 20 may include one or more receptacles or openings for receiving and engaging the plug 64. In the illustrated embodiment, the shroud 20 includes four openings for four possible locations of the plug 64, although any number is possible. Thus, the plug 64 may be inserted within any one of the openings depending on the location of the audio jack port on the portable electronic device 15. The plug 64 is configured to receive and connect to an input audio jack for use by a user for establishing communication with the audio jack 60 engaged with the portable electronic device 15. With respect to locations on the shroud 20 that are not engaged with the plug 64, inserts 66 may be engaged in the openings, such as in an interference fit, for covering the remaining unused openings.

[0018] Therefore, embodiments of the present invention may provide for a universal solution for an anti-theft device that accommodates different sizes, styles, and types of portable electronic devices. The ability to provide a universal solution is complicated given the wide variety of portable electronic devices, including tablets. Typically a custom shroud is used to protect a tablet, which becomes expensive and impractical for the various types of tablets. As such, embodiments of the present invention facilitate secure engagement with the shroud while at the same time allowing one shroud to be used for any number of different portable electronic devices. Furthermore, each of the adapters is inaccessible once the shroud is assembled and the portable electronic device inserted therein. Thus, no adapters or fasteners for securing the adapters to the shroud are accessible thereby providing a more secure engagement between the portable electronic device and the shroud.

[0019] In one particular embodiment, the electronic key discussed above is similar to that disclosed in U.S. Patent No. 7,737,845, entitled Programmable Key for a Security System for Protecting Merchandise, the entire disclosure of which is incorporated herein by reference. In some embodiments, the shroud, dock, and/or electronic key are similar to that disclosed in U.S. Application No. 14/059,735, filed on October 22, 2013 and entitled Display Stand for a Tablet Computer, and U.S. Application No. 14/300,476, filed on June 10, 2014 and entitled Anti-Theft

Device for Portable Electronic Device, the entire disclosures of which are incorporated by reference herein.

[0020] The foregoing has described one or more embodiments of an anti-theft device for protecting a portable electronic device, for example, a tablet, from theft or unauthorized removal. Those of ordinary skill in the art will understand and appreciate that numerous variations and modifications of the invention may be made without departing from the spirit and scope of the invention. Accordingly, all such variations and modifications are intended to be encompassed by the appended claims.

That which is claimed is:

1. A shroud for securing a portable electronic device comprising:
a first portion and a second portion configured to at least partially receive and engage a portable electronic device; and
one or more adapters disposed within the first portion and/or the second portion for securing the portable electronic device therein, the one or more adapters configured to accommodate a plurality of different sizes of portable electronic devices.
2. The shroud of Claim 1, wherein the one or more adapters comprise posts configured to accommodate portable electronic devices having different lengths.
3. The shroud of Claim 1, wherein the one or more adapters comprise brackets configured to accommodate portable electronic devices having different thicknesses.
4. The shroud of Claim 1, further comprising a cable and a connector engaged with the first portion or the second portion and configured to electrically connect to the portable electronic device.
5. The shroud of Claim 4, wherein the connector is configured to engage an input port of the portable electronic device for providing power thereto.
6. The shroud of Claim 4, further comprising one or more electrical contacts operably engaged with the cable.
7. The shroud of Claim 4, wherein the connector is an audio jack configured to engage an audio jack port of the portable electronic device.
8. The shroud of Claim 7, wherein one end of the cable comprises the audio jack and the opposite end of the cable comprises a plug, and wherein the plug is configured to engage the first portion or the second portion.
9. The shroud of Claim 8, wherein the plug is configured to engage with an input audio jack for communication with the audio jack and the portable electronic device.
10. The shroud of Claim 1, wherein the one or more adapters are disposed within the first portion and/or the second portion so as to not be accessible when the first and second portion are engaged with one another and to the portable electronic device.
11. The shroud of Claim 1, wherein the one or more adapters are configured to

releasably engage the first portion and/or the second portion.

12. An anti-theft device for securing a portable electronic device from unauthorized removal or theft, the anti-theft device comprising:

a shroud configured to at least partially receive a portable electronic device therein;

one or more adapters disposed within the shroud for securing the portable electronic device therein, the one or more adapters configured to accommodate a plurality of different sizes of portable electronic devices; and

a dock comprising a lock configured to releasably engage the shroud, the dock configured to engage the shroud in a locked configuration so as to prevent removal of the shroud and the portable electronic device from the dock and to disengage the shroud in an unlocked configuration so as to allow the shroud and the portable electronic device to be removed from the dock.

13. The anti-theft device of Claim 12, wherein the shroud comprises a first portion and a second portion that are configured to engage one another to secure the portable electronic device therein.

14. The anti-theft device of Claim 12, wherein the portable electronic device comprises a tablet.

15. The anti-theft device of Claim 12, wherein the one or more adapters are disposed within the shroud so as to not be accessible when the shroud is engaged with the portable electronic device.

16. The anti-theft device of Claim 12, wherein the lock is configured to cooperate with a key for unlocking the shroud and the portable electronic device from the dock.

17. The anti-theft device of Claim 16, wherein the lock comprises an electronic lock configured to communicate with an electronic key.

18. The anti-theft device of Claim 1, wherein the shroud and the dock each comprises one or more electrical contacts for transferring power to the portable electronic device.

19. A method for securing a portable electronic device from unauthorized removal or theft, the method comprising:

securing one or more adapters within a shroud for accommodating one of a plurality of

different sizes of portable electronic devices;

positioning the portable electronic device within the shroud; and

locking the shroud and the portable electronic device to a dock so as to prevent removal of the shroud and the portable electronic device from the dock.

20. The method of Claim 19, further comprising unlocking the shroud from the dock with an electronic key so as to allow the shroud and the portable electronic device to be removed from the dock.

21. The method of Claim 19, further comprising displaying the shroud and the portable electronic device in one of a plurality of predetermined display orientations.

22. The method of Claim 19, wherein securing comprises securing one or more posts to the shroud to accommodate a length of the portable electronic device.

23. The method of Claim 19, wherein securing comprises securing one or more brackets to the shroud to accommodate a thickness of the portable electronic device.

24. The method of Claim 19, further comprising engaging a plug within one of a plurality of receptacles defined in the shroud, the plug operably engaged with an audio jack configured to engage an audio jack port of the portable electronic device.

25. The method of Claim 24, further comprising engaging an input audio jack with the plug for communication with the audio jack and the portable electronic device.

26. The method of Claim 19, wherein securing comprises securing the one or more adapters within the shroud so as to not be accessible when the shroud is engaged with the portable electronic device.

ABSTRACT

An anti-theft device for protecting a portable electronic device from theft or unauthorized removal in a retail environment is provided. The anti-theft device includes a shroud configured to at least partially receive a tablet computer therein and one or more adapters disposed within the shroud for securing the portable electronic device therein. The one or more adapters are configured to accommodate a plurality of different sizes of portable electronic devices. The anti-theft device also includes a dock comprising a lock configured to releasably engage the shroud. The dock is configured to engage the shroud in a locked configuration so as to prevent removal of the shroud and the portable electronic device from the dock and to disengage the shroud in an unlocked configuration so as to allow the shroud and the portable electronic device to be removed from the dock.

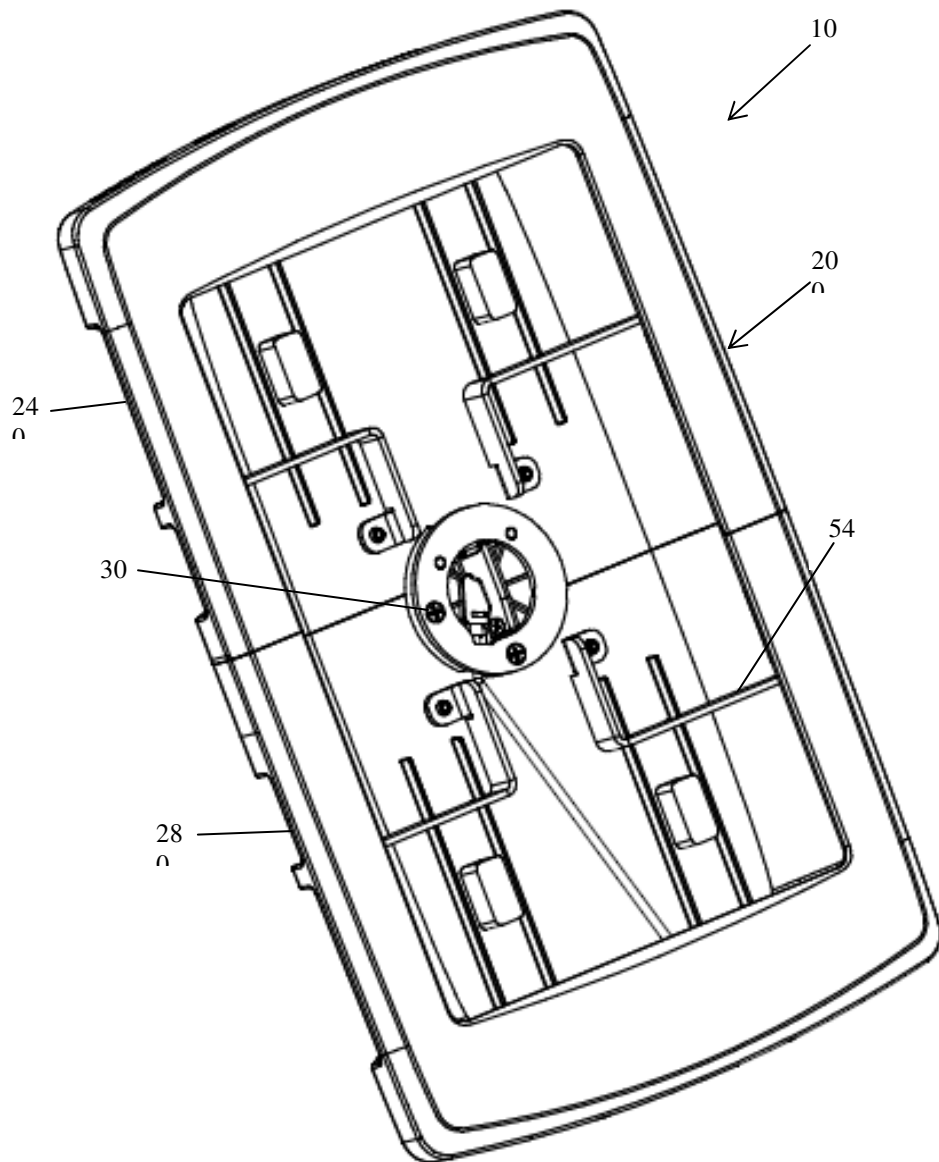


FIGURE 1

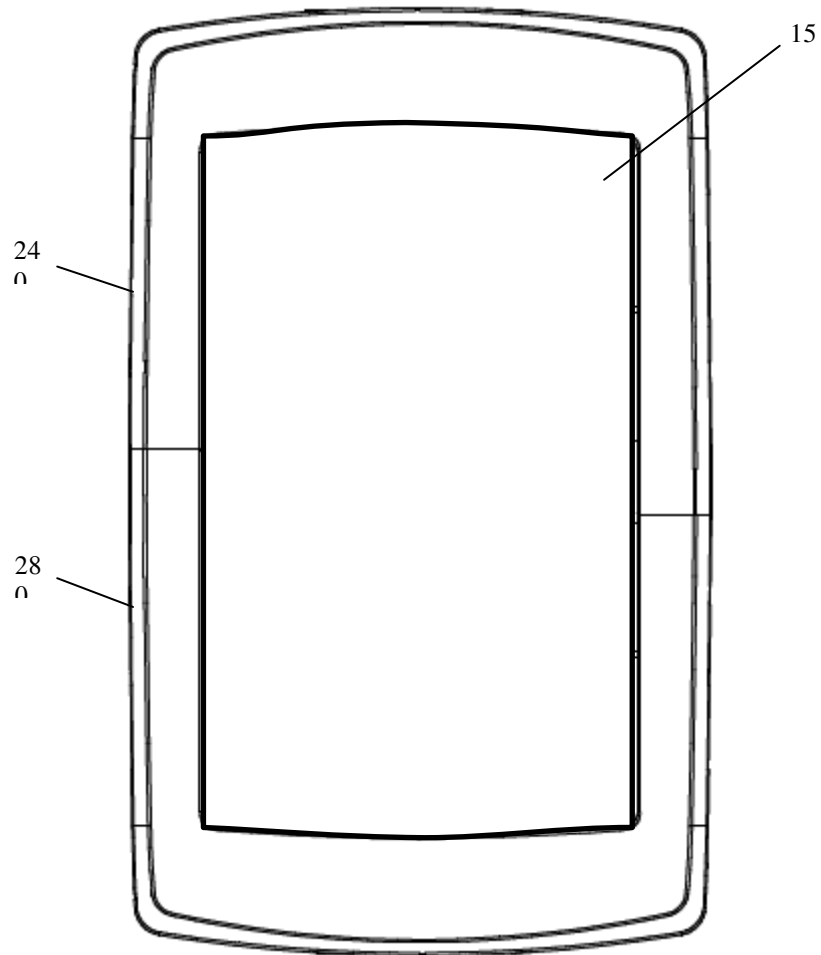


FIGURE 2

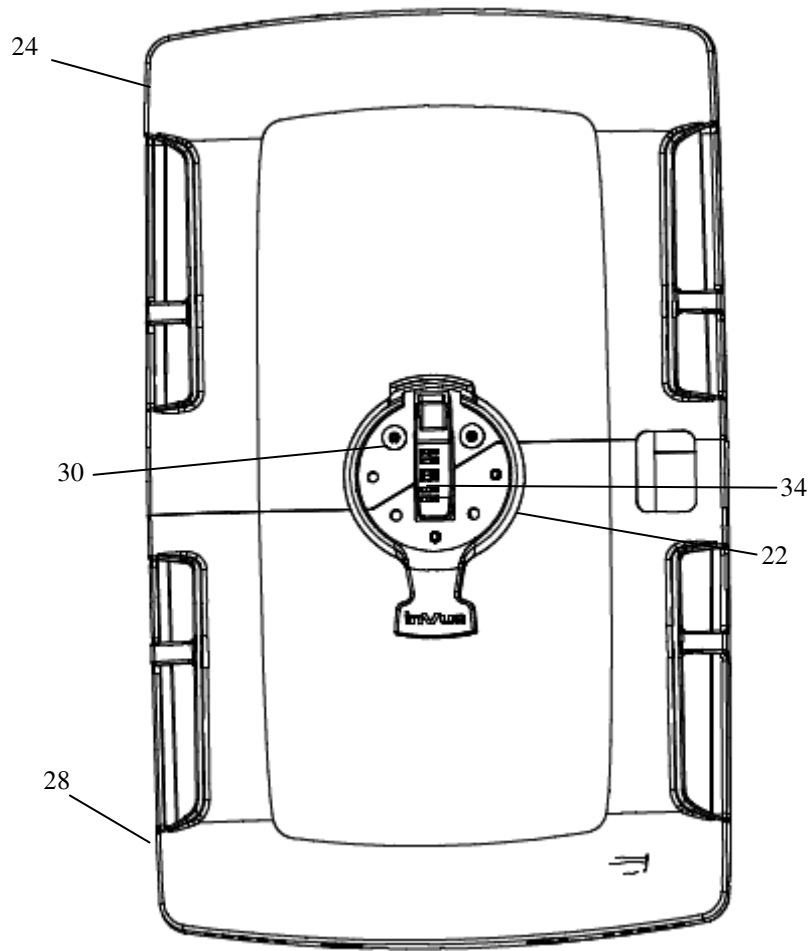


FIGURE 3

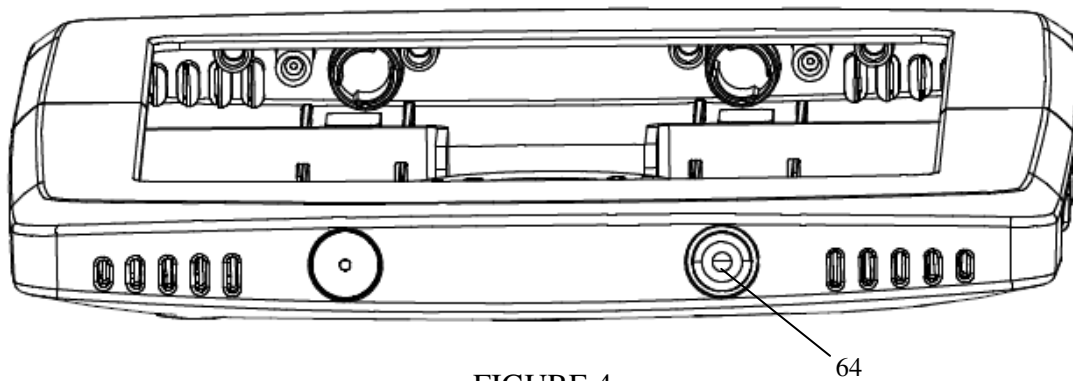


FIGURE 4

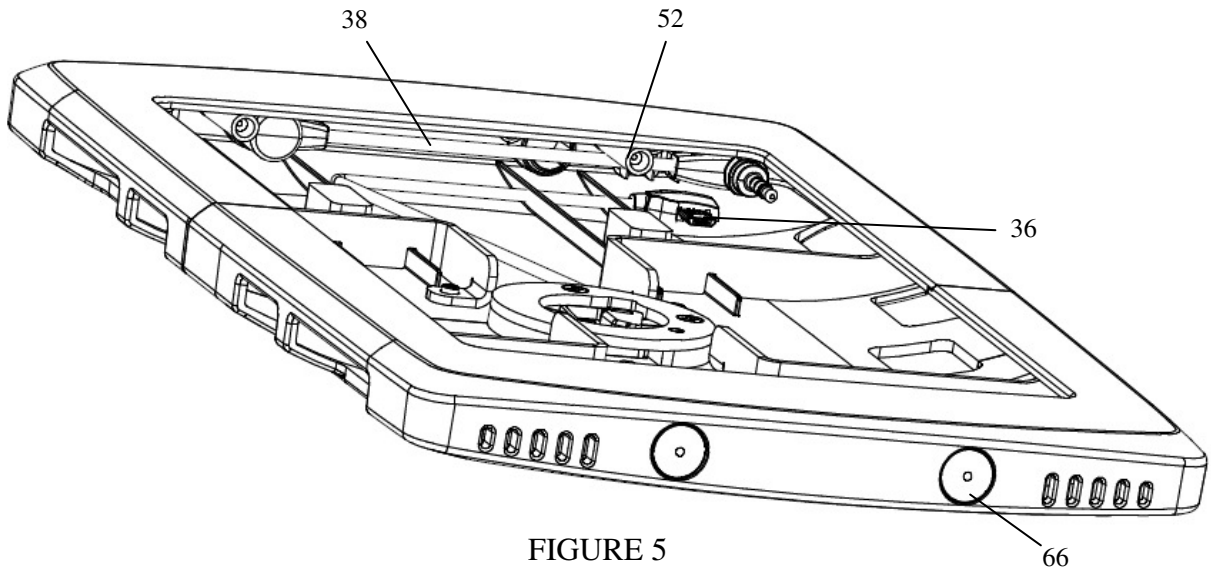


FIGURE 5

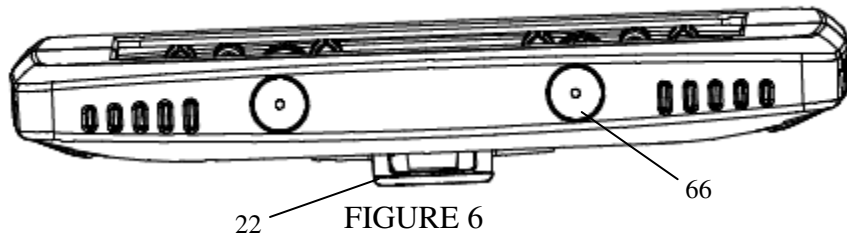


FIGURE 6

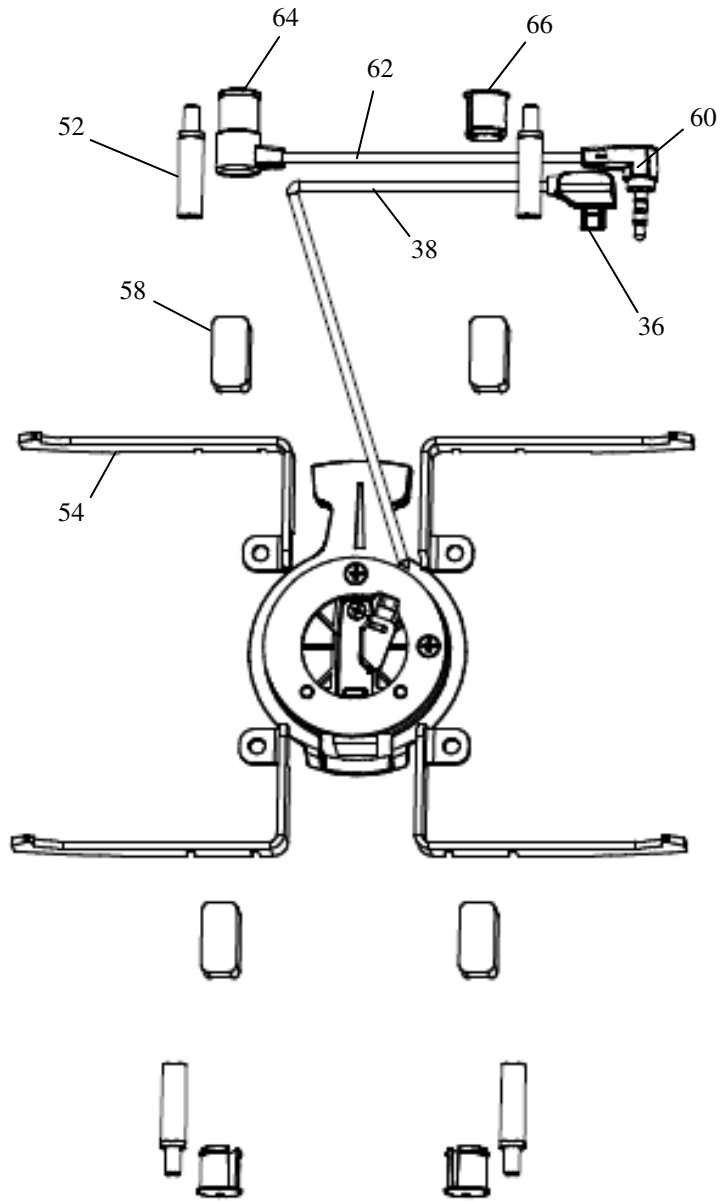


FIGURE 7

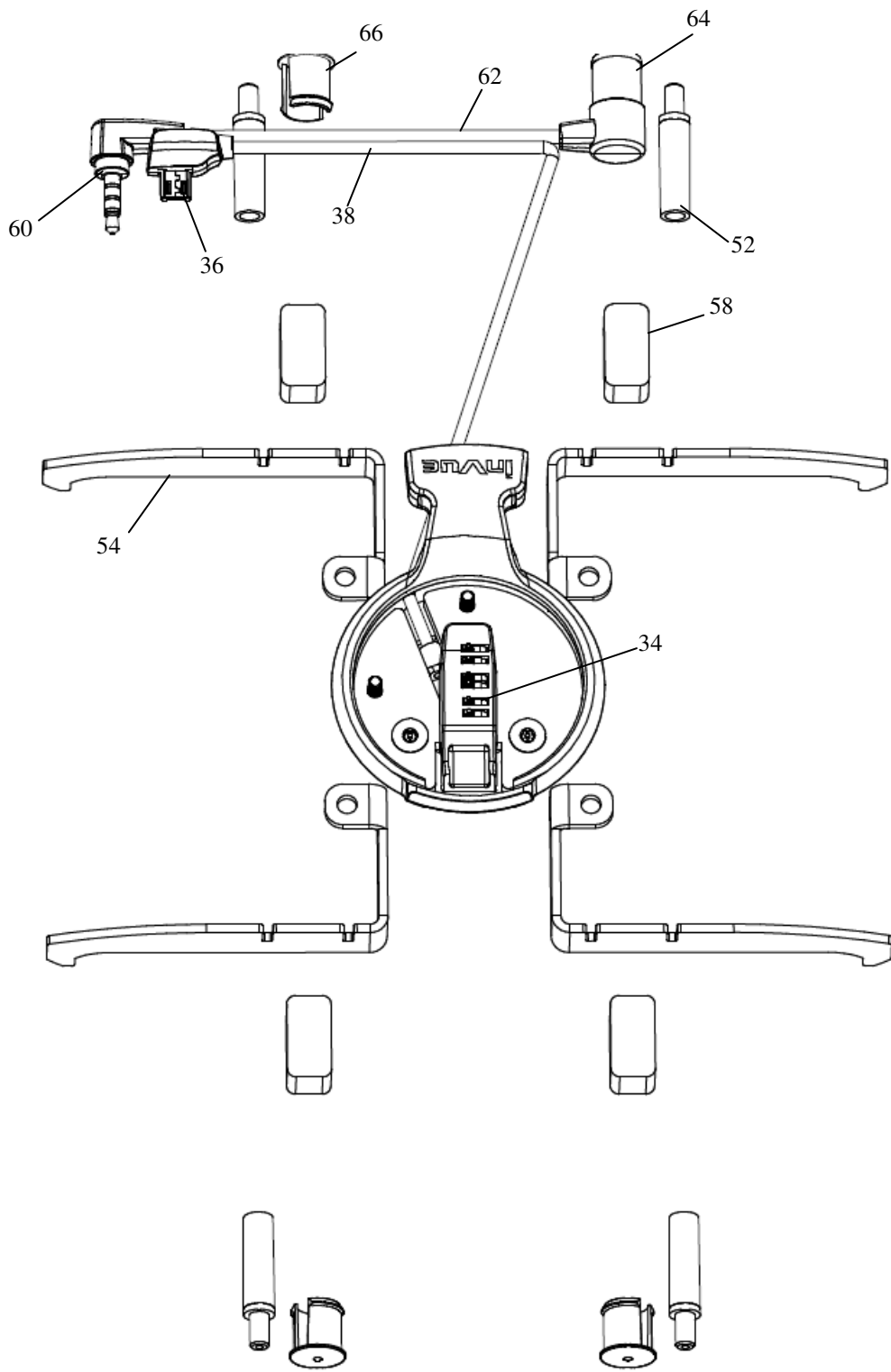


FIGURE 8

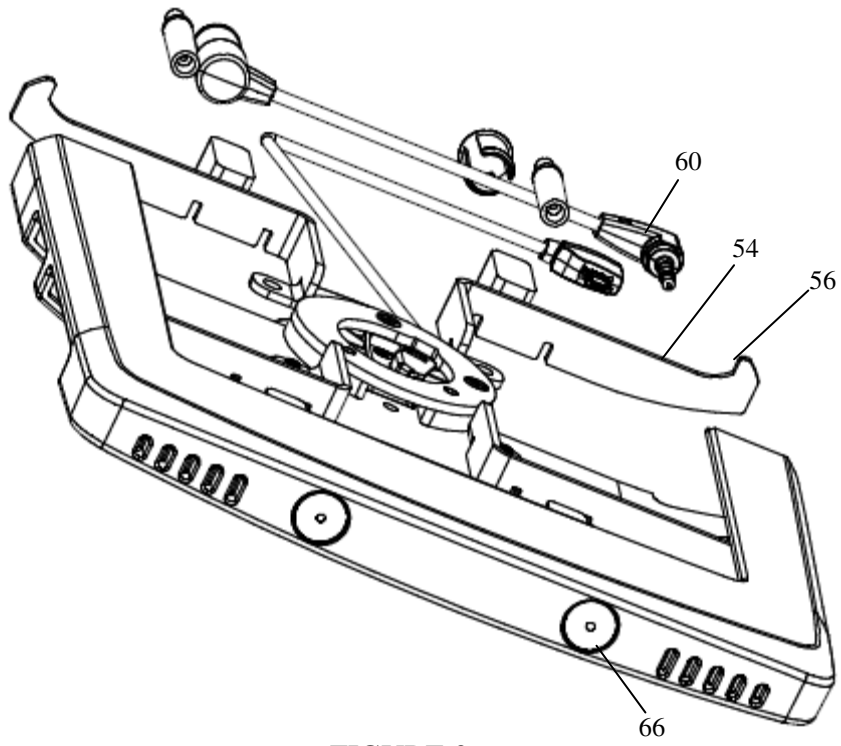


FIGURE 9

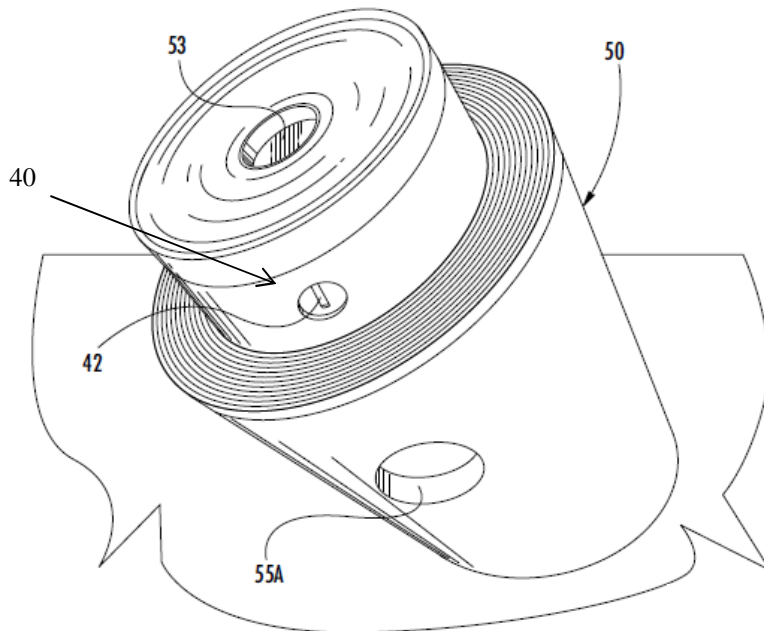


FIGURE 10

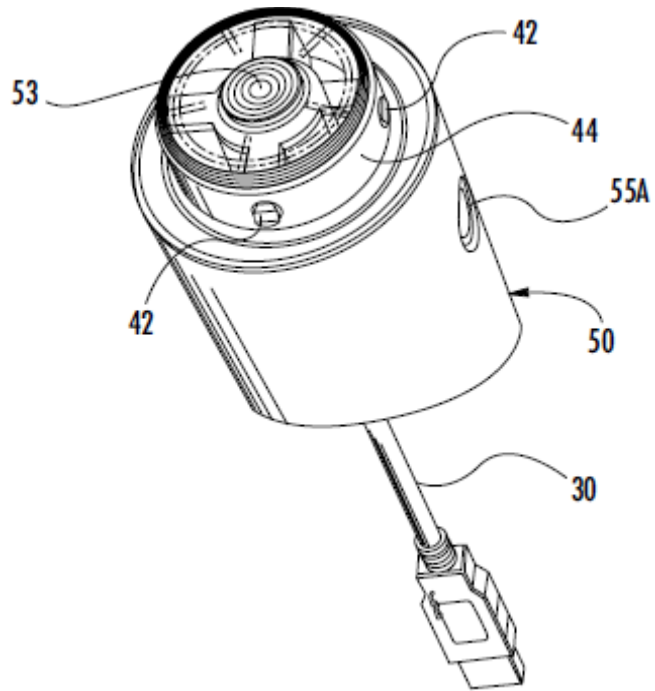


FIGURE 11