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(54) **METHOD AND APPARATUS FOR COUPLING AND DECOUPLING AN ELECTRONIC DEVICE WITH A SURFACE**

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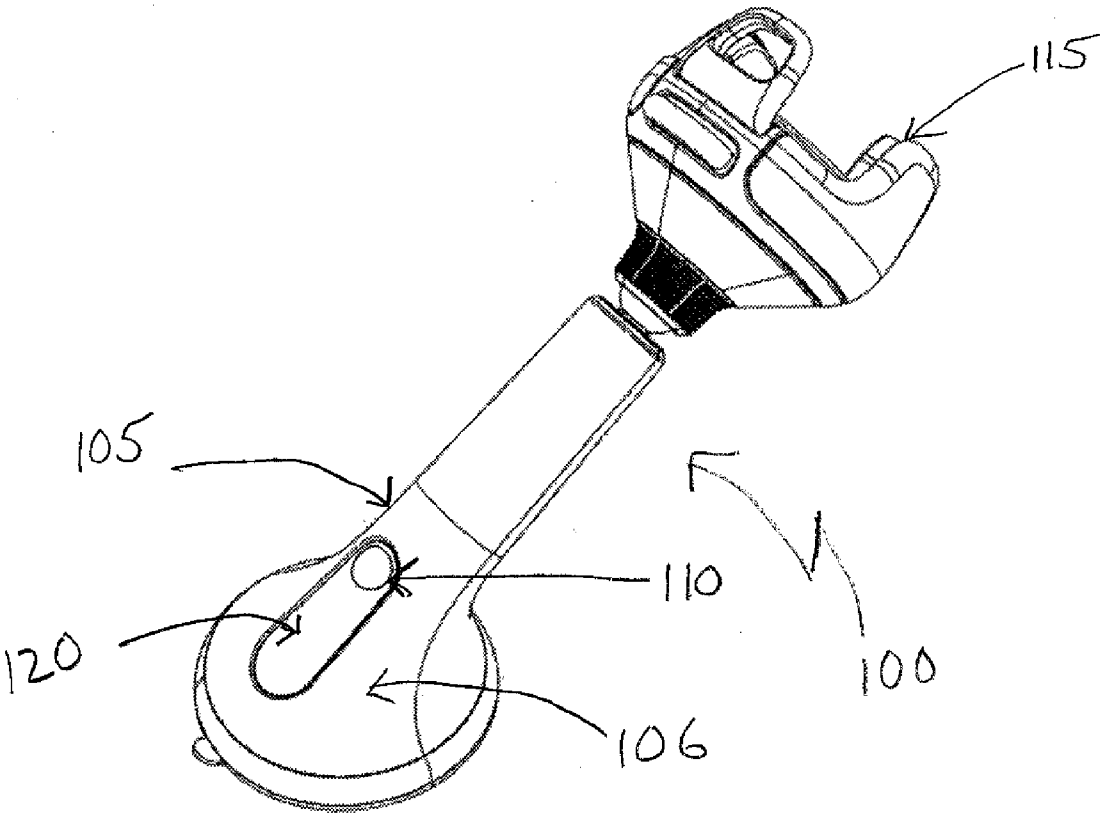
USPC **248/205.8**; 29/428

(57) **ABSTRACT**

An apparatus comprises a suction portion having a suction element and a protruded portion, a base portion having an opening for receiving said protruded portion, a lever having first and second ends, said lever coupled with said protruded portion, said lever capable of interfacing with said base portion and moving said suction portion with respect to said base portion into open and closed configurations, said lever having an open position and a closed position, said lever capable of causing said suction portion to move with respect to said base portion into said open configuration when said lever is pressed proximate to said first end, said lever capable of causing said suction portion to move with respect to said base portion into said closed configuration when said lever is pressed proximate to said second end.



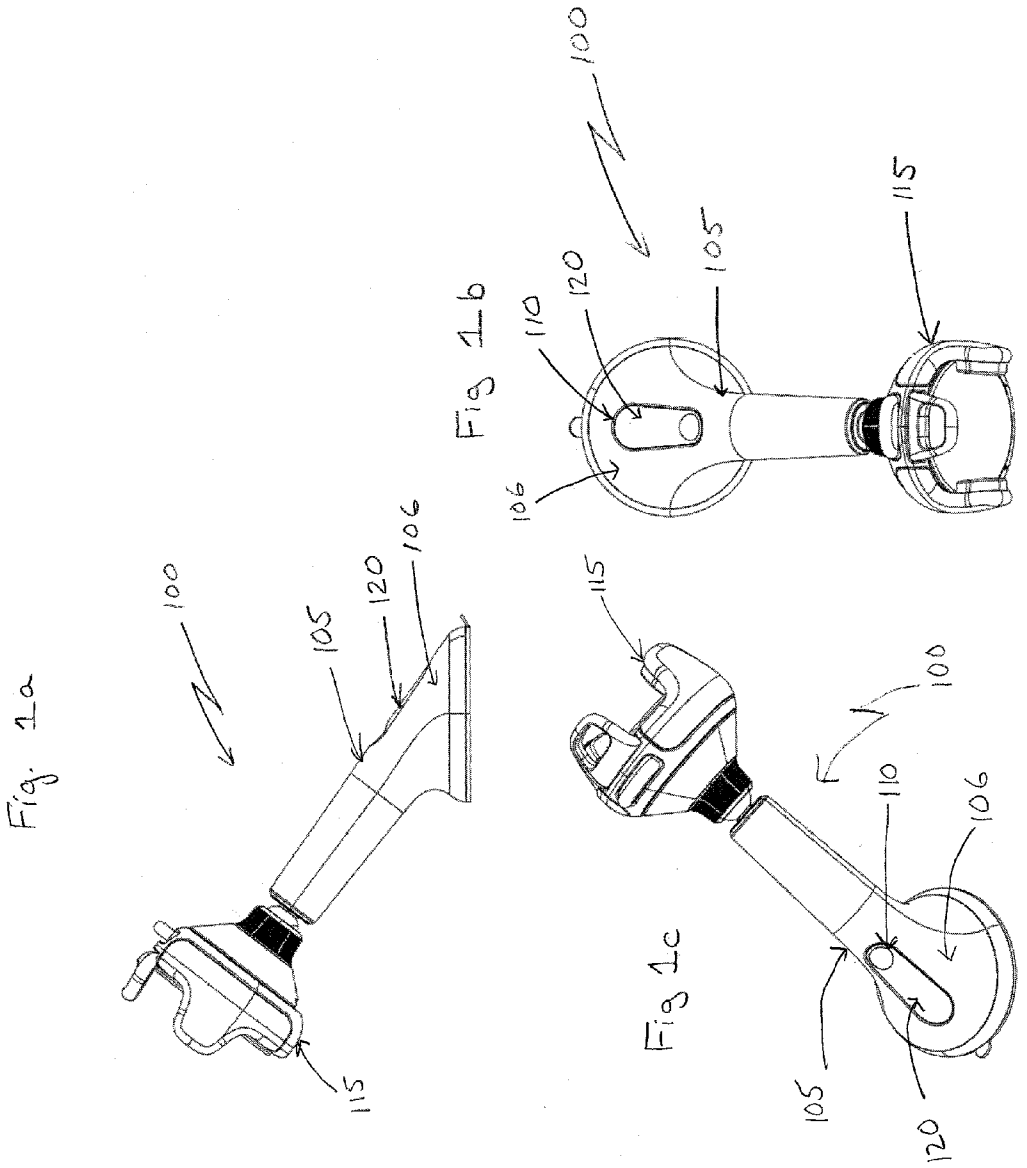


Fig. 1a

Fig 1b

Fig 1c

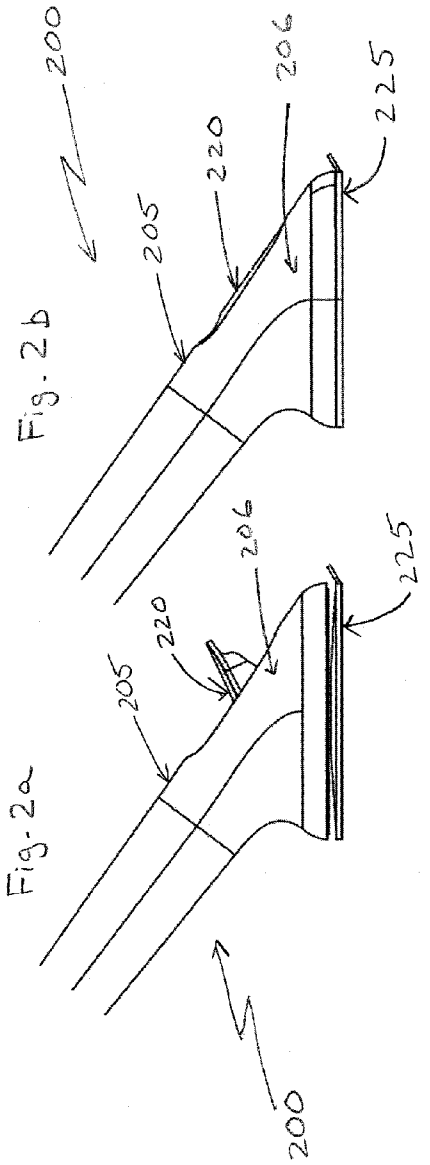


Fig. 2a

Fig. 2b

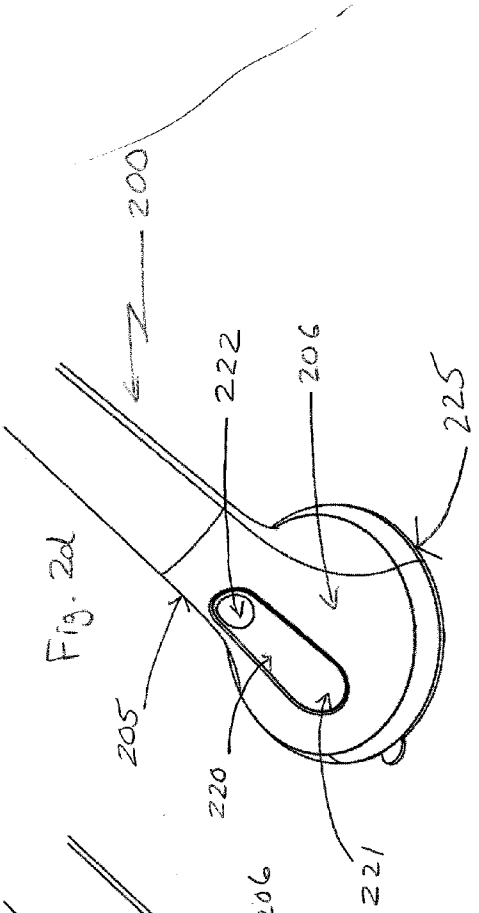


Fig. 2d

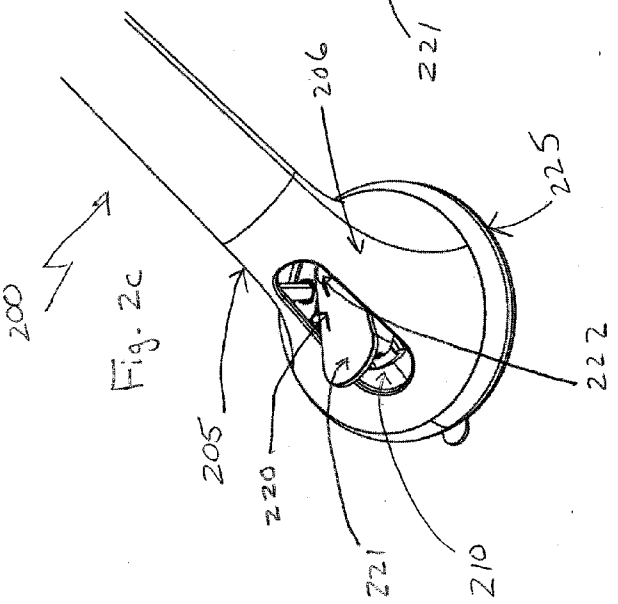
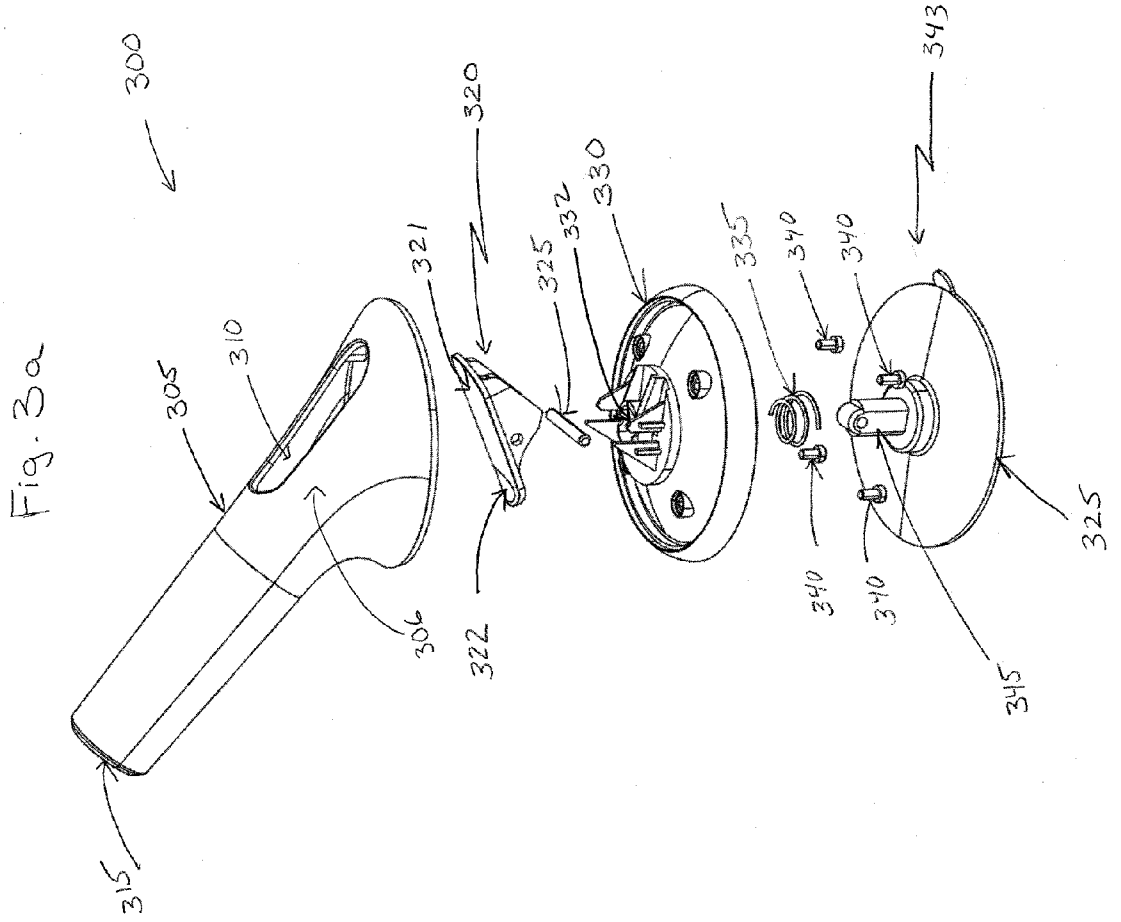


Fig. 2c

Fig. 3a


300
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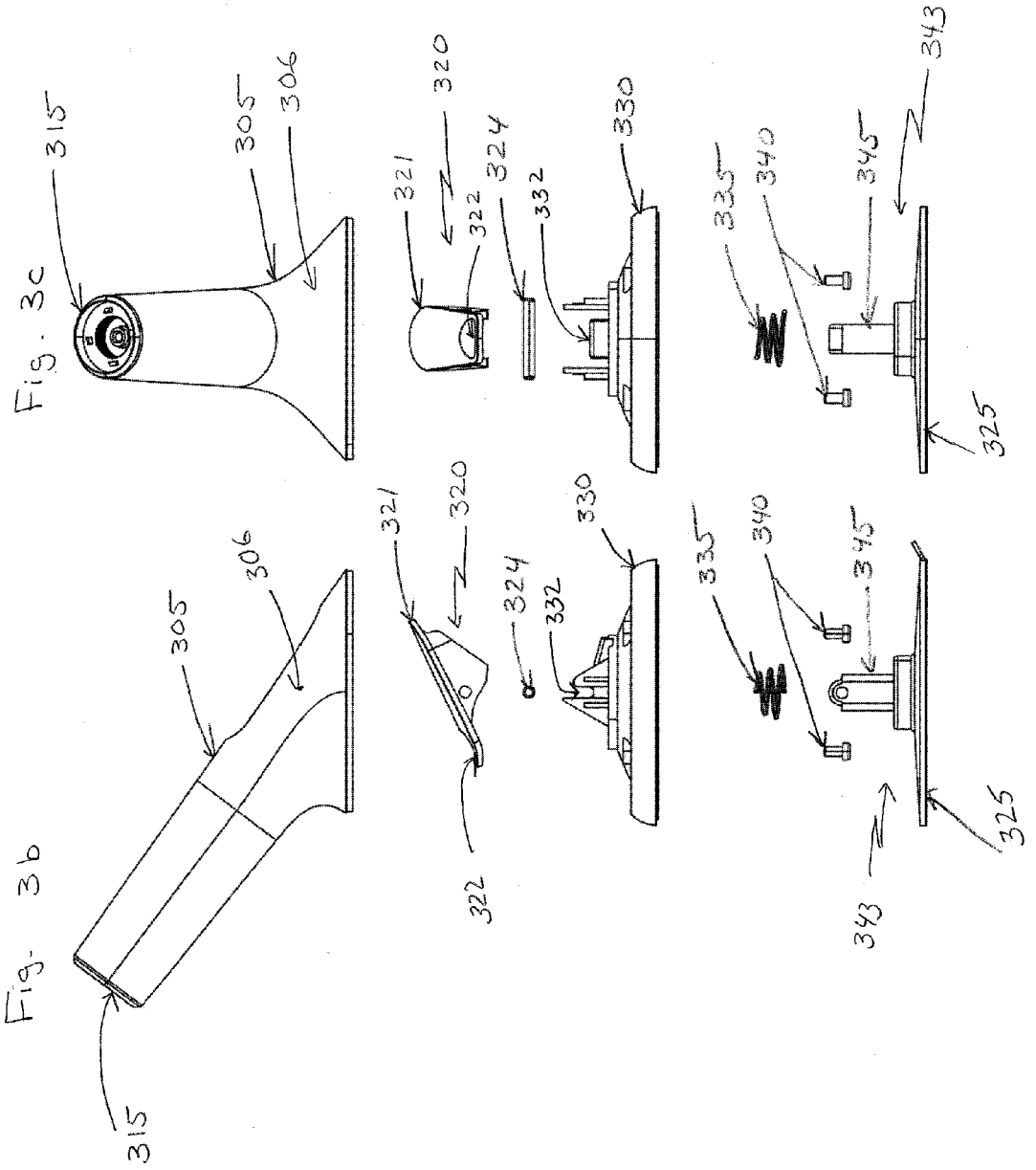
Fig. 3c
315
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Fig. 3b
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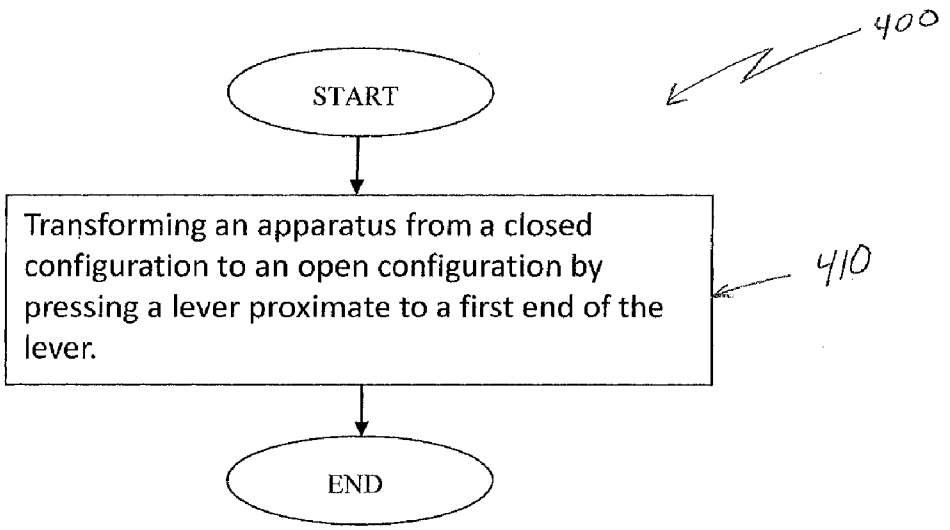
343
325

Fig. 4


400
START
Transforming an apparatus from a closed configuration to an open configuration by pressing a lever proximate to a first end of the lever.
410
END

METHOD AND APPARATUS FOR COUPLING AND DECOUPLING AN ELECTRONIC DEVICE WITH A SURFACE

TECHNICAL FIELD

[0001] The present application relates generally to a method and apparatus for coupling and decoupling an electronic device with a surface.

BACKGROUND

[0002] Various types of electronic devices such as global positioning receivers, mobile communication devices and radar detectors are used in automobiles. Electronic devices are routinely mounted to various surfaces within the automobile such as a dashboard or a windshield. Some electronic devices are mounted within automobiles using a suction mechanism.

SUMMARY

[0003] Various aspects of examples of the invention are set out in the claims.

[0004] According to a first aspect of the present invention, an apparatus comprises a suction portion having a suction element and a protruded portion, a base portion having an opening for receiving said protruded portion, a lever having first and second ends, said lever coupled with said protruded portion, said lever capable of interfacing with said base portion and moving said suction portion with respect to said base portion into open and closed configurations, said lever having an open position and a closed position, said lever capable of causing said suction portion to move with respect to said base portion into said open configuration when said lever is pressed proximate to said first end, said lever capable of causing said suction portion to move with respect to said base portion into said closed configuration when said lever is pressed proximate to said second end, and a housing portion for housing at least said base portion having an exterior surface and an opening for said lever, said lever being substantially flush with said housing portion when said lever is in said closed position.

[0005] According to a second aspect of the present invention, a method comprises transforming an apparatus from a closed configuration to an open configuration by pressing a lever proximate to a first end of said lever, wherein said apparatus comprises a suction portion having a suction element and a protruded portion, a base portion having an opening for receiving said protruded portion, said lever having said first end and a second end, said lever coupled with said protruded portion, said lever capable of interfacing with said base portion and moving said suction portion with respect to said base portion into open and closed configurations, said lever having an open position and a closed position, said lever capable of causing said suction portion to move with respect to said base portion into said open configuration when said lever is pressed proximate to said first end, said lever capable of causing said suction portion to move with respect to said base portion into said closed configuration when said lever is pressed proximate to said second end.

[0006] According to a third aspect of the present invention, an apparatus, comprises a coupling means for coupling a device with a surface having a protruded portion, a base portion having an opening for receiving said protruded portion, a decoupling means having first and second ends, said decoupling means coupled with said protruded portion, said decoupling means capable of interfacing with said base portion and moving said coupling means with respect to said base portion into open and closed configurations, said decoupling means having an open position and a closed position, said decoupling means capable of causing said coupling means to move with respect to said base portion into said open configuration when said decoupling means is actuated proximate to said first end, said decoupling means capable of causing said coupling means to move with respect to said base portion into said closed configuration when said decoupling means is actuated proximate to said second end.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] For a more complete understanding of example embodiments of the present invention, reference is now made to the following descriptions taken in connection with the accompanying drawings in which:

[0008] FIG. **1***a* is a side view of an apparatus comprising an electronic device coupler according to an example embodiment of the invention;

[0009] FIG. **1***b* is a top view of the apparatus of FIG. **1***a* according to an example embodiment of the invention;

[0010] FIG. **1***c* is a perspective view of the apparatus of FIG. **1***a* according to an example embodiment of the invention;

[0011] FIG. **2***a* is a side view of an apparatus comprising a lever in an open position according to an example embodiment of the invention;

[0012] FIG. **2***b* is a side view of the apparatus of FIG. **2***a* comprising a lever in a closed position according to an example embodiment of the invention;

[0013] FIG. **2***c* is a perspective view of the apparatus of FIG. **2***a* comprising a lever in an open position according to an example embodiment of the invention;

[0014] FIG. **2***d* is a perspective view of the apparatus of FIG. **2***a* comprising a lever in a closed configuration according to an example embodiment of the invention;

[0015] FIG. **3***a* is an exploded perspective view of an apparatus according to an example embodiment of the invention;

[0016] FIG. **3***b* is an exploded side view of an apparatus according to an example embodiment of the invention;

[0017] FIG. **3***c* is an exploded front view of an apparatus according to an example embodiment of the invention; and

[0018] FIG. **4** is flow diagram illustrating a method according to an example embodiment of the invention.

DETAILED DESCRIPTION OF THE DRAWINGS

[0019] An example embodiment of the present invention and its potential advantages are understood by referring to FIGS. **1** through **4** of the drawings.

[0020] FIG. **1***a* is a side view of an apparatus **100** comprising an electronic device coupler such as electronic device coupler **115** according to an example embodiment of the invention. FIG. **1***b* is a top view of the apparatus **100** of FIG. **1***a* according to an example embodiment of the invention. FIG. **1***c* is a perspective view of the apparatus **100** of FIG. **1***a* according to an example embodiment of the invention. In an embodiment, apparatus **100** comprises a base portion and a housing portion **105** for housing at least the base portion. In an embodiment, the housing portion **105** has an exterior surface **106** and an opening such as opening **110** for a lever such as lever **120**.

[0021] In an embodiment, an apparatus such as apparatus **100** couples an electronic device such as a GPS receiver, communication device, radar detector, and/or the like with a surface such as an interior surface within an automobile, for example, a dashboard or windshield. Apparatus **100** may couple an electronic device in any way including the use of a clamping mechanism, fastener, bolt and/or any other type of coupling mechanism. In an embodiment, apparatus **100** couples electronic device with a surface using a suction mechanism.

[0022] FIG. **2***a* is a side view of an apparatus **200** comprising a lever **220** in an open position according to an example embodiment of the invention. FIG. **2***b* is a side view of apparatus **200** of FIG. **2***a* comprising a lever **220** in a closed position according to an example embodiment of the invention. FIG. **2***c* is a perspective view of apparatus **200** of FIG. **2***a* comprising a lever **220** in an open position according to an example embodiment of the invention. FIG. **2***d* is a perspective view of apparatus **200** of FIG. **2***a* comprising a lever in a closed configuration according to an example embodiment of the invention.

[0023] In an embodiment, apparatus **200** comprises a suction portion having a suction element **225**, a base portion, a lever **220** and a housing portion **205** for housing at least the base portion. In an embodiment, the lever is capable of interfacing with the base portion and moving the suction portion with respect to the base portion into open and closed configurations. The lever **220** has an open position as shown in FIGS. **2***a* and **2***c*. Further, lever **220** has a closed position as shown in FIGS. **2***b* and **2***d*. In an embodiment, lever **220** is capable of causing the suction portion to move with respect to the base portion into an open configuration when lever **220** is pressed proximate to an end such as end **222**. In an embodiment, lever **220** is capable of causing the suction portion to move with respect to the base portion into a closed configuration when lever **220** is pressed proximate to an end such as end **221**.

[0024] In an embodiment, the housing portion **205** has an exterior surface **206** and an opening such as opening **210** for a lever such as lever **220**. In an embodiment, according to FIGS. **2***b* and **2***d*, lever **220** is substantially flush with housing portion **205** when lever **220** is in a closed position.

[0025] In an embodiment, an apparatus **200** couples an electronic device such as a GPS receiver, communication device, radar detector, and/or the like with a surface such as an interior surface within an automobile, for example, a dashboard or windshield. In an embodiment, apparatus **200** comprises an electronic device coupler such as electronic device coupler **215** for removeably coupling an electronic device with the apparatus **200**. Apparatus **200** may couple an electronic device in any way including the use of a clamping mechanism, fastener, bolt and/or any other type of coupling mechanism. In an embodiment, apparatus **200** couples electronic device with a surface using a suction mechanism such as a suction portion having a suction element **225**. In an embodiment, a suction portion is capable of detachably coupling the apparatus to a surface when lever **220** is in a closed position. In an embodiment, the suction portion is capable of detaching apparatus **200** from a surface when lever **220** is in an open position.

[0026] In an embodiment, lever **220** is capable of being pressed with a finger proximate to end **222** to cause the suction portion to move to an open configuration. In an embodiment, lever **220** is capable of being pressed with a finger proximate to end **221** to cause the suction portion to move to a closed configuration. In an embodiment, lever **220** is capable of being pressed with a finger proximate to end **222** to cause the suction portion to move to an open configuration and the lever **220** is further capable of being pressed with the same finger proximate to end **221** to cause the suction portion to move to a closed configuration.

[0027] In an embodiment, apparatus **200** of FIGS. **2***a*, **2***b*, **2***c* and **2***d* is apparatus **100** of FIGS. **1***a*, **1***b* and **1***c*.

[0028] FIG. **3***a* is an exploded perspective view of an apparatus **300** according to an example embodiment of the invention. FIG. **3***b* is an exploded side view of an apparatus **300** according to an example embodiment of the invention. FIG. **3***c* is an exploded front view of an apparatus according to an example embodiment of the invention.

[0029] In an embodiment, apparatus **300** comprises a suction portion **343** having a suction element **325** and a protruded portion **345**, a base portion **330** having an opening **332** for receiving protruded portion **345** and a lever **320** having end **322** and end **321**. In an embodiment, lever **320** is coupled with the protruded portion **345**. In an embodiment, the lever **320** is capable of interfacing with the base portion **330** and moving the suction portion **343** with respect to the base portion **330** into open and closed configurations. In an embodiment, the lever **320** has an open position such as the open position of FIG. **2***c* and a closed position such as the closed position of FIG. **2***d*. In an embodiment, the lever **320** is capable of causing the suction portion **343** to move with respect to the base portion **330** into an open configuration when the lever **320** is pressed proximate to end **322**. In an embodiment, the lever is capable of causing suction portion **343** to move with respect to base portion **330** into a closed configuration when lever **320** is pressed proximate to said end **321**. In an embodiment, apparatus **300** further comprises a housing portion **305** for housing at least said base portion **330** having an exterior surface **306** and an opening **310** for lever **320**. In an embodiment, lever **320** is substantially flush with exterior surface **306** when lever **320** is in a closed position.

[0030] In an embodiment, when lever **320** is pressed at end **322**, lever **320** pushes protruded portion **345** and moves apparatus **300** toward an open configuration. In an embodiment, when lever **320** is pressed at end **321**, lever **320** pulls protruded portion **345** and moves apparatus **300** toward a closed configuration.

[0031] In an embodiment, apparatus **300** further comprises a pin **324** coupled with protruded portion **345** and lever **320**. In an embodiment, apparatus **300** further comprises at least one fastener such as screws **340** for coupling base portion **330** with housing portion **305**.

[0032] In an embodiment, apparatus **300** couples an electronic device such as a GPS receiver, communication device, radar detector, and/or the like with a surface such as an interior surface within an automobile, for example, a dashboard or windshield. In an embodiment, apparatus **300** comprises an electronic device coupler such as electronic device coupler **315** for removeably coupling an electronic device with the apparatus **300**. Apparatus **300** may couple an electronic device in any way including the use of a clamping mechanism, fastener, bolt and/or any other type of coupling mechanism.

[0033] In an embodiment, apparatus **300** couples electronic device with a surface using a suction mechanism such as a suction portion **343** having a suction element **325**. In an embodiment, a suction portion **343** is capable of detachably coupling the apparatus to a surface when at least one of lever

320 is in a closed position and apparatus **300** is in a closed configuration. In an embodiment, the suction portion **343** is capable of detaching apparatus **300** from a surface when at least one of lever **320** is in an open position and apparatus **300** is in an open configuration. In an embodiment, lever **320** protrudes through opening **332** when lever **320** is in an open position as shown in FIG. **2***c*.

[0034] In an embodiment, lever **320** is capable of being pressed with a finger proximate to end **322** to cause the suction portion to move to an open configuration. In an embodiment, lever **320** is capable of being pressed with a finger proximate to end **321** to cause suction portion **325** to move to a closed configuration. In an embodiment, lever **320** is capable of being pressed with a finger proximate to end **322** to cause suction portion **325** to move to an open configuration and the lever **320** is further capable of being pressed with the same finger proximate to end **321** to cause suction portion **325** to move to a closed configuration.

[0035] In an embodiment, apparatus comprises a resilient member such as spring **330** positioned with protruded portion **345** capable of biasing suction portion **343** toward an open configuration.

[0036] In an embodiment, a contour of an exterior surface of lever **320** is substantially similar to a contour of exterior surface **306** of housing portion **305**.

[0037] In an embodiment, apparatus **300** of FIGS. **3***a*, **3***b* and **3***c* is apparatus **100** of FIGS. **1***a*, **1***b* and **1***c*. In an embodiment, apparatus **300** of FIGS. **3***a*, **3***b* and **3***c* is apparatus **200** of FIGS. **2***a*, **2***b*, **2***c* and **2***d*.

[0038] FIG. **4** is flow diagram illustrating a method **400** according to an example embodiment of the invention. In an embodiment, at **410**, a method **400** comprises transforming an apparatus such as apparatus **100** of FIG. **1***a* from a closed configuration such as the closed configuration of FIG. **2***d* to an open configuration such as the open configuration of FIG. **2***c* by pressing a lever such as lever **220** of FIG. **2***d* proximate to a first end of said lever such as end **322**. In the embodiment, the apparatus such as apparatus **300** of FIG. **3** comprises a suction portion **343** having a suction element **325** and a protruded portion **345**, a base portion **330** having an opening **332** for receiving protruded portion **345** and a lever **320** having end **322** and end **321**. In an embodiment, lever **320** is coupled with the protruded portion **345**. In an embodiment, the lever **320** is capable of interfacing with the base portion **330** and moving suction portion **343** with respect to the base portion **330** into open and closed configurations. In an embodiment, the lever **320** has an open position such as the open position of FIG. **2***c* and a closed position such as the closed position of FIG. **2***d*. In an embodiment, the lever **320** is capable of causing the suction portion **343** to move with respect to the base portion **330** into an open configuration when the lever **320** is pressed proximate to end **322**. In an embodiment, the lever is capable of causing suction portion **343** to move with respect to the base portion into a closed configuration when the lever **320** is pressed proximate to end **321**.

[0039] In an embodiment, the method **300** further comprises transforming the apparatus such as apparatus **300** from an open configuration to a closed configuration by pressing a lever such as lever **320** proximate to a second end such as end **321**. In an embodiment, apparatus **300** further comprises a housing portion **305** for housing at least said base portion **330** having an exterior surface **306** and an opening **310** for lever **320**.

[0040] In an embodiment, lever **320** is capable of being pressed with a finger proximate to end **322** to cause the suction portion to move to an open configuration. In an embodiment, lever **320** is capable of being pressed with a finger proximate to end **321** to cause suction portion **325** to move to a closed configuration. In an embodiment, lever **320** is capable of being pressed with a finger proximate to end **322** to cause suction portion **325** to move to an open configuration and the lever **320** is further capable of being pressed with the same finger proximate to end **321** to cause suction portion **325** to move to a closed configuration.

[0041] In an embodiment, lever **320** is substantially flush with exterior surface **306** when lever **320** is in a closed position. In an embodiment, apparatus **300** is capable of coupling with a surface when the apparatus is in the closed configuration.

[0042] In an embodiment, an apparatus comprises a coupling means such as coupling means **343** of FIG. **3***a* for coupling a device with a surface having a protruded portion such as protruded portion **345**. In the embodiment, the apparatus further comprises a base portion such as base portion **330** having an opening for receiving the protruded portion and a decoupling means having first and second ends such as lever **320**; the decoupling means coupled with the protruded portion. In the embodiment, the decoupling means is capable of interfacing with the base portion and moving the coupling means with respect to the base portion into open and closed configurations. In the embodiment, the decoupling means has an open position and a closed position and is capable of causing the coupling means to move with respect to the base portion into the open configuration when the decoupling means is actuated proximate to the first end such as end **322**. In the embodiment, decoupling means is capable of causing the coupling means to move with respect to said base portion into a closed configuration when said decoupling means is actuated proximate to the second end such as end **321**.

[0043] Without in any way limiting the scope, interpretation, or application of the claims appearing below, a technical effect of one or more of the example embodiments disclosed herein is to provide an apparatus and method for coupling and decoupling an electronic device to a surface by a pressing a lever. Another technical effect of one or more of the example embodiments disclosed herein is to provide an apparatus and method for coupling and decoupling an electronic device to a surface by a pressing a lever using a finger. Another technical effect of one or more of the example embodiments disclosed herein is to provide an apparatus and method for coupling and decoupling an electronic device to a surface by a pushing a lever with limited force.

[0044] If desired, the different functions discussed herein may be performed in a different order and/or concurrently with each other. Furthermore, if desired, one or more of the above-described functions may be optional or may be combined.

[0045] Although various aspects of the invention are set out in the independent claims, other aspects of the invention comprise other combinations of features from the described embodiments and/or the dependent claims with the features of the independent claims, and not solely the combinations explicitly set out in the claims.

[0046] It is also noted herein that while the above describes example embodiments of the invention, these descriptions should not be viewed in a limiting sense. Rather, there are several variations and modifications which may be made

without departing from the scope of the present invention as defined in the appended claims.

What is claimed is:

1. An apparatus, comprising:

a suction portion having a suction element and a protruded portion;

a base portion having an opening for receiving said protruded portion;

a lever having first and second ends, said lever coupled with said protruded portion, said lever capable of interfacing with said base portion and moving said suction portion with respect to said base portion into open and closed configurations, said lever having an open position and a closed position, said lever capable of causing said suction portion to move with respect to said base portion into said open configuration when said lever is pressed proximate to said first end, said lever capable of causing said suction portion to move with respect to said base portion into said closed configuration when said lever is pressed proximate to said second end; and

a housing portion for housing at least said base portion having an exterior surface and an opening for said lever, said lever being substantially flush with said exterior surface when said lever is in said closed position.

2. An apparatus according to claim **1**, wherein said suction portion capable of detachably coupling said apparatus to a surface when a lever is moved to a closed position.

3. An apparatus according to claim **1**, wherein said suction portion capable of detaching said apparatus from a surface when a lever is moved to an open position.

4. An apparatus according to claim **1**, wherein said lever protrudes through said opening for said lever when said lever is in said open position.

5. An apparatus according to claim **1**, wherein said lever capable of being pressed with a finger proximate to said first end to cause said suction portion to move to said open configuration.

6. An apparatus according to claim **1**, wherein said lever capable of being pressed with a finger proximate to said second end to cause said suction portion to move to said closed configuration.

7. An apparatus according to claim **1**, wherein said lever capable of being pressed with a finger proximate to said first end to cause said suction portion to move to said open configuration and wherein said lever capable of being pressed with said finger proximate to said second end to cause said suction portion to move to said closed configuration.

8. An apparatus according to claim **1**, further comprising a resilient member positioned with said protruded portion capable of biasing said suction portion toward said open configuration.

9. An apparatus according to claim **1**, further comprising an electronic device coupler for removeably coupling an electronic device with said apparatus.

10. An apparatus according to claim **1**, wherein a contour of an exterior surface of said lever is substantially similar to a contour of said exterior surface of said housing portion.

11. An apparatus according to claim **1**, wherein said apparatus is capable of detachably coupling to a surface when said apparatus is in said closed configuration.

12. A method, comprising:

transforming an apparatus from a closed configuration to an open configuration by pressing a lever proximate to a first end of said lever;

wherein said apparatus comprises

a suction portion having a suction element and a protruded portion;

a base portion having an opening for receiving said protruded portion;

said lever having said first end and a second end, said lever coupled with said protruded portion, said lever capable of interfacing with said base portion and moving said suction portion with respect to said base portion into open and closed configurations, said lever having an open position and a closed position, said lever capable of causing said suction portion to move with respect to said base portion into said open configuration when said lever is pressed proximate to said first end, said lever capable of causing said suction portion to move with respect to said base portion into said closed configuration when said lever is pressed proximate to said second end.

13. A method according to claim **12**, further comprising transforming said apparatus from an open configuration to a closed configuration by pressing said lever proximate to said second end of said lever.

14. A method according to claim **12**, wherein said apparatus further comprises a housing portion for housing at least said base portion having an exterior surface and an opening for said lever.

15. A method according to claim **12**, wherein said lever capable of being pressed with a finger proximate to said first end to cause said suction portion to move to said open configuration.

16. A method according to claim **12**, wherein said lever capable of being pressed with a finger proximate to said second end to cause said suction portion to move to said closed configuration.

17. A method according to claim **12**, wherein said lever capable of being pressed with a finger proximate to said first end to cause said suction portion to move to said open configuration and wherein said lever capable of being pressing with said finger proximate to said second end to cause said suction portion to move to said closed configuration.

18. A method according to claim **14**, wherein a contour of an exterior surface of said lever is substantially similar to a contour of said exterior surface of said housing portion.

19. A method according to claim **12**, wherein said apparatus is capable of coupling with a surface when said apparatus in said closed configuration.

20. An apparatus, comprising:

a coupling means for coupling a device with a surface having a protruded portion;

a base portion having an opening for receiving said protruded portion;

a decoupling means having first and second ends, said decoupling means coupled with said protruded portion, said decoupling means capable of interfacing with said base portion and moving said coupling means with respect to said base portion into open and closed configurations, said decoupling means having an open position and a closed position, said decoupling means capable of causing said coupling means to move with respect to said base portion into said open configuration

when said decoupling means is actuated proximate to said first end, said decoupling means capable of causing said coupling means to move with respect to said base portion into said closed configuration when said decoupling means is actuated proximate to said second end.

* * * * *