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A MOUNTING APPARATUS

[001] The invention relates to the technical field of support structures. More specifically, a mounting apparatus that allows an article to be mounted within a vehicle.

BACKGROUND OF THE INVENTION

[002] With the rollout of the latest Electronic Road Pricing (ERP) 2.0 initiative by the Road Transport Authority of Singapore, the use of a new on-board unit within a registered vehicle in Singapore is to be adopted. Embodiments of the new on-board unit include a “three-piece on-board unit”, which comprises a display unit, a processing unit, and an antenna unit.

[003] The conventional way for installing the display unit of the on-board unit within a vehicle is as shown in **FIG. 1**. In particular, this conventional way for installation of the display unit involves the use of a conventional ball-joint mount, as shown in **FIG. 2**. More specifically, the body of the display unit is mounted onto the conventional mount **800**, for the conventional mount **800** to then be attached to a dashboard of the vehicle. However, this conventional way of installation results in the display unit of the on-board unit being located at a lower windscreen portion of the vehicle, which causes the view of the driver to be blocked by the display unit of the on-board unit. Moreover, the conventional way for installation of the display unit may cause the display unit to block the visibility of the driver and become too near to the eyes of the driver, which presents a hazard to the driver. Furthermore, the touch screen functionalities of the display unit of the on-board unit may be made inaccessible to the driver as they are driving on the road. This is further aggravated by the bulkiness of the display unit, which may weaken the joints of the conventional mount **800** over time. Accordingly, an apparatus that can resolve these problems is much desired.

SUMMARY OF INVENTION

[004] The present invention intends to provide a mounting apparatus, comprising a body configured to hold at least one article and be attached to a receiving surface. The body comprises a sloped portion that allows the held article to be sloped at one or more angles

relative to the receiving surface when the mounting apparatus is attached onto the receiving surface.

[005] Preferably, the sloped portion of the mounting apparatus has a contoured geometry and includes at least one concave area, at least one convex area, or a combination thereof.

[006] Preferably, the body of the mounting apparatus includes a first part that receives the article to hold the article, and a second part that is to be attached onto the receiving surface. The first part includes at least one surface that is positioned substantially in between the article and the second part as the first part receives the article to hold the article.

[007] Preferably, regarding the apparatus, either one of the first part or the second part is incorporated with the sloped portion.

[008] Preferably, regarding the apparatus, the first part and the second part are separable pieces that are detachably attached to each other. In particular, the first part includes one or more receiving portions, and the second part includes one or more projecting portions; the first part includes one or more projecting portions, and the second part includes one or more receiving portions; or the first part includes a combination of one or more projecting portions and one or more receiving portions, and the second part includes a combination of one or more projecting portions and one or more receiving portions.

[009] Preferably, regarding the apparatus, the projecting portions each include a first segment comprising a protruding section, and a second segment that further extends therefrom in a direction that is perpendicular to the first segment.

[0010] Preferably, regarding the apparatus, the receiving portions are configured to receive the projecting portions, and the second part and the first part are made to move relative to each other along one or more directions for the projecting portions to engage with the receiving portions.

[0011] Preferably, regarding the apparatus, the surface of the first part is further surrounded by one or more sidewalls that extend from at least one edge of the surface of the first part.

[0012] Preferably, regarding the apparatus, any one or a combination of the surface of the first part and its sidewalls defines a space in which the article is fitted therewithin for the article, and/or portions thereof, to be held by the first part.

[0013] Preferably, regarding the apparatus, the body is further formed with a wiring-accommodating portion that is in the form of at least one aperture, at least one cut-out, or a combination thereof, that allows one or more wires and/or cables of the article to be retained therewithin.

[0014] Preferably, regarding the apparatus, the body is further formed with a fastener-accommodating portion that is at least one region that allows for accommodation of fasteners to enable the article to be fastened to the first part.

[0015] Preferably, regarding the apparatus, the article is a display unit of an on-board unit, and the receiving surface is an interior surface of a windscreen of a vehicle.

[0016] The present invention further intends to provide a kit of parts assembly, comprising a body configured to hold at least one article and be attached to a receiving surface. The body comprises one or more parts that are detachably attached to each other, in which the body comprises a sloped portion that allows the held article to be sloped at one or more angles relative to the receiving surface when the mounting apparatus is attached onto the receiving surface.

[0017] Preferably, regarding the kit, the sloped portion has a contoured geometry and includes at least one concave area, at least one convex area, or a combination thereof.

[0018] Preferably, regarding the kit, the body includes a first part that receives the article to hold the article, and a second part that is to be attached onto the receiving surface. The first part includes at least one surface that is positioned substantially in between the article and the second part as the first part receives the article to hold the article.

[0019] Preferably, regarding the kit, either one of the first part or the second part is incorporated with the sloped portion.

[0020] Preferably, regarding the kit, the article is a display unit of an on-board unit, and the receiving surface is an interior surface of a windscreen of a vehicle.

[0021] One skilled in the art will readily appreciate that the invention is well adapted to carry out the objects and obtain the ends and advantages mentioned, as well as those inherent therein. The embodiments described herein are not intended as limitations on the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] To facilitate an understanding of the invention, there is illustrated in the accompanying drawings the preferred embodiments from an inspection of which when considered in connection with the following description, the invention, its construction and operation and many of its advantages would be readily understood and appreciated.

[0023] **FIG. 1** illustrates a perspective view of the conventional way in which an article, being a display unit of an on-board unit, is mounted within a vehicle.

[0024] **FIG. 2** illustrates a perspective view of the conventional ball joint mount that is used for the mounting of the display unit of the on-board unit within the vehicle.

[0025] **FIG. 3** illustrates a simplified schematic drawing of a mounting apparatus of the present invention, according to a first example embodiment.

[0026] **FIG. 4** illustrates an overall perspective view of the mounting apparatus of the present invention, according to a first example embodiment.

[0027] **FIG. 5** illustrates a perspective front view of the mounting apparatus of the present invention, according to the first example embodiment.

[0028] **FIG. 6** illustrates a perspective rear view of the mounting apparatus of the present invention, according to the first example embodiment.

[0029] **FIG. 7** illustrates a front view of the mounting apparatus of the present invention, according to the first example embodiment.

[0030] **FIG. 8** illustrates a rear view of the mounting apparatus of the present invention, according to the first example embodiment.

[0031] **FIGS 9 – 10** illustrate perspective top views of the mounting apparatus of the present invention, according to the first example embodiment.

[0032] **FIG. 11** illustrates a perspective side view of mounting apparatus of the present invention, which are of the first example embodiment.

[0033] **FIG. 12** illustrates yet another perspective side view of the mounting apparatus of the present invention, according to the first example embodiment in which its sloped portion is sloped at an angle of substantially 10°.

[0034] **FIG. 13** illustrates yet another perspective side view of the mounting apparatus of the present invention, according to the embodiment of **FIG. 12**, with its sloped portion rested on a receiving surface.

[0035] **FIG. 14** illustrates yet another perspective side view of the mounting apparatus of the present invention, according to a first example embodiment in which its sloped portion has a surface that is sloped at an angle of substantially 25°.

[0036] **FIG. 15** illustrates yet another perspective side view of the mounting apparatus of the present invention, according to the embodiment of **FIG. 14**, with a surface of the sloped portion rested on a receiving surface.

[0037] **FIGS 16 – 18** illustrate side views of the mounting apparatus of the present invention, according to the first embodiment in which its sloped portion is sloped at an angle of 10°.

[0038] FIGS 19 – 21 illustrate side views of the mounting apparatus of the present invention, according to a first embodiment in which its sloped portion is sloped at an angle of 25°.

[0039] FIGS 22 – 23 illustrate perspective rear views of the mounting apparatus of the present invention, according to a second example embodiment that is formed from an assembly of two parts.

[0040] FIGS 24 – 25 illustrate side views of the mounting apparatus of the present invention, according to the second example embodiment that is formed from a mating of two parts.

[0041] FIG. 26 illustrates a front view of a first part of the mounting apparatus of the present invention, according to the second example embodiment.

[0042] FIG. 27 illustrates a rear view of the first part of the mounting apparatus of the present invention, according to the second example embodiment.

[0043] FIG. 28 illustrates a front view of one receiving portion located at an upper portion of the first part of the mounting apparatus of the present invention, according to the second example embodiment.

[0044] FIG. 29 illustrates a front view of one receiving portion located at a bottom portion of the first part of the mounting apparatus of the present invention, according to the second example embodiment.

[0045] FIG. 30 illustrates a front view of a second part of the mounting apparatus of the present invention, according to the second example embodiment.

[0046] FIG. 31 illustrates a rear view of the second part of the mounting apparatus of the present invention, according to the second example embodiment.

[0047] FIGS 32 – 33 illustrate side views of the second part of the mounting apparatus of the present invention, according to the second example embodiment.

[0048] **FIG. 34** illustrates a perspective front view of one projecting portion of the second part of the mounting apparatus of the present invention, according to the second example embodiment.

[0049] **FIG. 35** illustrates a side view of the projecting portion of the second part of the mounting apparatus of the present invention, according to the second example embodiment.

[0050] **FIG. 36** illustrates a front view of the mounting apparatus of the second example embodiment of the present invention, in which the projecting portions of the second part are received by the receiving portions of the first part.

[0051] **FIG. 37** illustrates a rear view of the mounting apparatus of the second example embodiment of the present invention, in which the projecting portions of the second part are received by the receiving portions of the first part.

[0052] **FIG. 38** illustrates a front view of the mounting apparatus of the second example embodiment of the present invention, in which the projecting portions of the second part interlock with the receiving portions of the first part, for both parts to become mated.

[0053] **FIG. 39** illustrates a rear view of the mounting apparatus of the second example embodiment of the present invention, in which the projecting portions of the second part interlock with the receiving portions of the first part, for both pieces to become mated.

[0054] **FIG. 40** illustrates one projecting portion of the second part interlocking with one receiving portion of the first part, within the mounting apparatus of the present invention according to the second example embodiment.

[0055] **FIGS 41 – 42** illustrate perspective rear views of a second embodiment of the mounting apparatus of the present invention, in which the second part that is mated with the first part has a sloped portion that is sloped at an angle that is bigger than the embodiment of **FIGS 22 – 40**.

[0056] **FIG. 43** illustrates a front view of the second part of the second embodiment of the mounting apparatus of the present invention according to as shown in **FIGS 41 – 42**.

[0057] **FIG. 44** illustrates a rear view of the second part of the second embodiment of the mounting apparatus of the present invention according to as shown in **FIGS 41 – 42**.

[0058] **FIGS 45 – 46** illustrate side views of the second part of the second embodiment of the mounting apparatus of the present invention according to as shown in **FIGS 41 – 42**.

[0059] **FIG. 47** illustrates a front view of an alternative variant of the first part of the mounting apparatus of the present invention, according to the second example embodiment, in which the wiring-accommodating portion further provides a pathway that allows one or more wires/or cables of the article to reach the aperture to be retained therein.

[0060] **FIG. 48** illustrates a rear view of the first part of the mounting apparatus of the second example embodiment, according to the variant shown in **FIG. 47**.

[0061] **FIG. 49** illustrates a side view of an alternative variant of the first example embodiment, wherein the first part that holds the article is incorporated with the sloped portion instead of the second part.

[0062] **FIG. 50** illustrates a side view of an alternative variant of the first part of the second example embodiment, which is incorporated with the sloped portion.

[0063] **FIG. 51** illustrates a side view of an alternative variant of the first part of the example embodiment, which is without the sloped portion.

[0064] **FIG. 52** illustrates a side view of an alternative variant of the second example embodiment where the first part according to **FIG. 50** is mated with the second part according to **FIG. 51**.

[0065] FIGS 53 – 55 are various depictions of a display unit of an on-board unit being supported by the mounting apparatus of the present invention, with the mounting apparatus being attached onto an upper windscreen portion of a vehicle.

DETAILED DESCRIPTION OF THE INVENTION

[0066] The present invention relates to a mounting apparatus. More specifically, a mounting apparatus for mounting at least one article in a permanent, or semi-permanent, or non-permanent manner, on a receiving surface of a designated location. More specifically, the mounting apparatus holds the article, and may be subsequently installed on the receiving surface of the designated location. The mounting apparatus of the present invention may be regarded as a, part of a, or in the form of a, system or a kit, that allows for the secure mounting of the article to the receiving surface.

[0067] From hereon, it is to be noted that the term “article” may generally refer to any form of object or item that is of suitable dimensions that allows it to be held by the mounting apparatus of the present invention. Preferably, the article is a display unit of a three-piece on-board unit, which is capable of displaying one or more graphics thereon. Even so, it is to be noted that the article may not be limited to as such, and it may be, by way of example, a display unit for a navigation system, a smartphone, a mobile phone, a personal digital assistant (PDA), a radio-frequency (RF) device, a processing device, or the like.

[0068] From hereon, it is to be noted that the term “receiving surface” preferably refers to at least one surface of a designated location. The receiving surface may comprise interior locations of a vehicle such as a windscreen, a dashboard, a glovebox, or the like. With this, it is to be noted that the mounting apparatus, which holds the article, may be installed at various locations within an interior of the vehicle. In the instance where the article is a display unit of an on-board unit, the mounting apparatus provides a compact, adjustable, and aesthetically pleasing solution for its installation as it has a low-profile design. The design of the mounting apparatus allows it to accommodate different dashboard configurations and materials, thereby ensuring compatibility of the mounting apparatus across a wide range of vehicle models. Hence, the mounting apparatus may also be regarded as a vehicular mount. Even so, it is to be noted that the designated location of the receiving surface may not be

limited to as described, and it may be installed at any other surfaces of any other applicable locations besides interior locations of a vehicle.

[0069] From hereon, it will be understood that, although the terms first, second, etc. may be used herein to describe various elements, components, regions, layers or sections, these elements, components, regions, layers or sections should not be limited by these terms. These terms are only used to distinguish one element, component, region, layer or section from another region, layer or section. Thus, a first element, component, region, layer or section discussed below could be termed a second element, component, region, layer or section without departing from the teachings of the present invention.

[0070] From hereon as well, spatially relative terms, such as “top”, “bottom”, “longitudinal”, “lateral”, “vertical”, “upper”, “lower”, and the like, may be used herein for ease of description to describe one element or feature's relationship to another element or feature as illustrated in the figures. It will be understood that the spatially relative terms are intended to encompass different orientations of the assembly in use or operation, in addition to the orientation depicted in the figures. For example, if the assembly in the figures is turned over, elements described as “upper” other elements or features would then be oriented “lower” the other elements or features. Thus, the exemplary term “upper” can encompass both an orientation of above and below. The device may be otherwise oriented and the spatially relative descriptors used herein interpreted accordingly.

[0071] From hereon as well, is to be noted that the cover may be described with reference to orthogonal axes that include a first axis, a second axis, and a third axis. The first axis corresponds to an x-axis or an axis that is along a lateral extent of apparatus, the second axis corresponds to a y-axis or an axis that is along a longitudinal extent of the apparatus, and the third axis corresponds to a z-axis or an axis that is along a vertical extent or depth of the apparatus.

[0072] The invention will now be described in greater detail, by way of example, with reference to the figures. For ease of reference, some common reference numerals or series of numerals will be used throughout the figures when referring to the same or similar features

common to the figures. It is to be noted that certain reference numerals may be omitted after initially indicated, as they are readily understood based on the figures as presented.

[0073] **FIGS 3 – 11** illustrate the mounting apparatus of the present invention according to a first example embodiment **100**. In particular, **FIG. 3** illustrates its simplified schematic drawing, **FIG. 4** illustrates its overall perspective view, **FIG. 5** illustrates its perspective front view, **FIG. 6** illustrates its perspective rear view, **FIG. 7** illustrates its front view, **FIG. 8** illustrates its rear view, **FIG. 9** illustrates its first perspective top view, **FIG. 10** illustrates its second perspective top view, and **FIG. 11** illustrates its perspective side view. It is to be noted that the mounting apparatus of the first embodiment **100** may be one that is integrally formed as a single piece via additive manufacturing processes that may include any form of three-dimensional (3D) printing techniques. The material composition of the mounting apparatus of the first embodiment **100** may be a durable and weather-resistant material, which may be, by way of example, acrylonitrile styrene acrylate (ASA) plastics, acrylonitrile butadiene styrene (ABS) plastics, or the like.

[0074] With reference to **FIGS 3 – 10**, the mounting apparatus of the first embodiment **100** may substantially have a rigid or a semi-rigid body that is configured to hold at least one article **900** (i.e., the display unit of a three-piece on-board unit) and be attached to a receiving surface. The body is substantially trapezoidal (when viewed from its side) and comprises a sloped portion that allows the held article **900** to be sloped at one or more angles relative to the receiving surface when the mounting apparatus is attached onto the receiving surface.

[0075] With reference to **FIGS 3 – 11**, the mounting apparatus of the first embodiment **100** may generally comprise a first part **110** and a second part **120**. The first part **110** is configured to hold at least one article **900**. The second part **120** is one that is configured to be attached to the receiving surface. The second part **120** may be incorporated with the sloped portion that allows the article **900** held by the first part **110** to be sloped at one or more angles as the mounting apparatus of the first embodiment **100** is installed on the receiving surface of the designated location via the second part **120** being attached thereto.

[0076] With reference to **FIGS 3 – 11**, within the mounting apparatus of the first embodiment **100**, the first part **110** may comprise a first surface **111** that is regarded as its

front-facing surface and a second surface **112** that is regarded as its rear-facing surface. These surfaces **111**, **112** may be generally planar, but may be formed with a certain degree of roughness and/or indents. The first surface **111** may be surrounded by one or more sidewalls **113** that extend perpendicularly from lateral and/or longitudinal edges of the first surface **111**. These sidewalls **113** may be in substantial connection with each other. Furthermore, free ends of the sidewalls **113** may be formed with inward projections that are relatively parallel with respect to the first surface **111**. It is to be noted that the first surface **111** may be one that is positioned substantially in between the article **900** and the second part **120** as the first part **110** receives the article **900** for its holding.

[0077] With reference to **FIGS 3 – 11**, within the mounting apparatus of the first embodiment **100**, it is to be noted that there is one lateral edge of the first surface **111** that may be without a sidewall that extends therefrom, and instead, there is a rod-like structure **114** that connects two opposing sidewalls **113** that extend from longitudinal edges of the first part **110**, with the rod-like structure **114** being at a distance away from the aforementioned lateral edge at a length that is substantially equivalent to the lateral length of the sidewalls **113**. This defines an opening **115** in which at least one article **900** may be received by being slotted therethrough for the article **900** to be held by the first part **100**.

[0078] With reference to **FIGS 3 – 11**, for the mounting apparatus of the first embodiment **100**, the first part **111** may further comprise a wiring-accommodating portion **116**. The wiring-accommodating portion **116** may be defined by at least one recess or cut-out **116a** formed through the surfaces **111**, **112** of the first part **111** from the opening **115**.

[0079] With reference to **FIGS 3 – 11**, for the mounting apparatus of the first embodiment **100**, at least one article **900** may be held by the first part **111** by entering the opening **115** for the article **900** to be fitted within a space that is defined by any one or a combination of the first surface **111**, the sidewalls **113**, and the rod-like structure **114**. More specifically, one or more sides of the article **900** may be substantially adjacent to the sidewalls **113**, and one portion of the article **900** may be substantially adjacent or near to the first surface **111** of the first part **110**, however, there may be slight gap between the article **900** and the sidewalls **113** and the first surface **111** so that ventilation may be provided to the article **900** for thermal dissipation of the article **900**. It is to be noted that the sidewalls **113** and the first

surface **111** may further contribute in improving the acoustic performance of the article **900** as they may interact with sound waves emitted by the article **900** (if any). Furthermore, the projections of the sidewalls **113** and the rod-like structure **114** may allow the article **900** to be further retained within the aforementioned space for its protection. Furthermore, the first surface **111** may substantially cover portions or an entirety of at least one side of the article **900**. Moreover, the recess or cut-out **116a** of the wiring-accommodating portion **116** may allow one or more wires and/or cables of the article **900** (if any) to be bundled and/or retained within the edges of the recess or cut-out **116a** to provide integrated wire management for the article **900**. The first part **110** of the mounting apparatus of the first embodiment **100** may provide easy and secure mounting of the article **900** thereto, eliminating the need for wire ties or other mechanical fasteners. The first part **110** of the mounting apparatus of the first embodiment **100** may also be shaped to secure the article **900** to reduce a risk of the article **900** detaching or escaping from the space that is defined by any one or a combination of the first surface **111**, the sidewalls **113**, and the rod-like structure **114**. In the case where the article **900** is in the form of a display unit for an on-board unit, the display unit may be mounted onto the mounting apparatus of the first embodiment **100** in a manner such that its display screen faces away from the first surface **111** of the first part **110** to provide a user (i.e., a driver) easy access to the display screen.

[0080] With reference to **FIGS 3 – 10**, within the mounting apparatus of the first embodiment **100**, the second part **120** may be generally located at a second surface **112** of the first part **110** (i.e., behind the first surface **111** of the first part **110**). In particular, the second part **120** is one that includes at least one sloped portion **121** that has a surface **121a** that is sloped relative to at least one surface **111**, **112** of the first part **110** at one or more angles. It is preferred that the surface **121a** of the sloped portion **121** of the second part **120** and at least one surface **111**, **112** of the first part **110** are substantially non-parallel with respect to each other. It is to be noted that the sloped portion **121** may have a first region that may be more specifically a first longitudinal edge of the surface **121a** and a second region that may be more specifically a second longitudinal edge of the surface **121a**. The first region of the sloped portion **121** may be relatively nearer to the first part **110** compared to the second region of the sloped portion **121**. This allows the one portion of the article **900** to be nearer to the receiving surface and another portion of the article **900** to be further away from the receiving surface as it is held by the first part **110**. Furthermore, the second region of the

sloped portion **121** may be further supported by one or more struts, which project from the second surface **112** of the first part **110**.

[0081] It is to be noted that, within the mounting apparatus of the first embodiment **100**, the surface **121a** of the sloped portion **121** of the second part **120** may be one that is to be applied with a bonding means to allow the mounting apparatus of the first embodiment **100** to be installed at a designated location, in which the surface **121a** of the sloped portion **121** is to be adhered to a receiving surface of the designated location. The bonding means, by way of example, may be an adhesive layer, double-side adhesive tape, or the like. The surface **121a** of the sloped portion **121** of the second part **120** may have a certain degree of roughness so that it has a larger surface area to allow the bonding means to adhere it to the receiving surface of the designated location.

[0082] It is to be noted that, within the mounting apparatus of the first embodiment **100**, the surface **121a** of the sloped portion **121** of the second part **120** may have a contoured geometry for it to include at least one concave area, at least one convex area, or a combination thereof. More specifically, the surface **121a** of the sloped portion **121** may exhibit at least one degree of curvature when the apparatus is viewed from its sides. Preferably, in a case where the designated location is an interior surface of a windscreen of a vehicle, the surface **121a** of the sloped portion **121** may have be convex so that it may conform to the interior surface of the windscreen as the sloped portion **121** is attached thereto.

[0083] In certain embodiments, it is to be stated that the surface **121a** of the sloped portion **121** may include one or more areas that are raised along a direction of the surface normal of the surface **121a** and/or one or more areas that are recessed along a direction of the surface normal of the surface **121a**. By way of example, the surface **121a** of the sloped portion **121** may have at least two raised areas and one recessed area therebetween, along at least one direction across the surface **121a**, which may be from top to bottom.

[0084] **FIG. 12 – 13** and **FIGS 16 – 18** illustrate a mounting apparatus of the first embodiment **100**, wherein its second part **120** includes a sloped portion **121** that has a surface **121a** that is sloped at an angle that is substantially 10 degrees with respect to the surfaces **111**, **112** of the first part **110**. In particular, **FIG. 12** illustrates its perspective side view, **FIG.**

13 illustrates its perspective side view with its sloped portion **121** rested on a receiving surface, **FIG. 16** illustrates its first side view, **FIG. 17** illustrates its second side view, and **FIG. 18** illustrates a schematic diagram of the second side view that further shows the 10-degree angle.

[0085] **FIG. 14 – 15** and **FIGS 19 – 21** illustrate side views of a mounting apparatus of the first embodiment **100**, wherein its second part **120** includes a sloped portion **121** that has a surface **121a** that is sloped at an angle that is substantially 25 degrees with respect to the surfaces **111**, **112** of the first part **110**. In particular, **FIG. 14** illustrates its perspective side view, **FIG. 15** illustrates its perspective side view with its sloped portion **121** rested on a receiving surface, **FIG. 19** illustrates its first side view, **FIG. 20** illustrates its second side view, and **FIG. 21** illustrates a schematic diagram of the second side view that further shows the 25-degree angle.

[0086] Hence, based on the mounting apparatus of the first embodiment **100** as illustrated in **FIG. 12 – 13**, **FIGS 16 – 18**, **FIG. 14 – 15** and **FIGS 19 – 21**, the sloped portion **121** of the second part **120** substantially provides an adjustable mounting mechanism that enables precise positioning of the mounting apparatus of the first embodiment **100** within the interior of the vehicle to avoid interference with vehicle controls and driver visibility. It is to be noted that the angle between the surface **121a** of the sloped portion **121** of the second part **120** and the surfaces **111**, **112** of the first part **110** may include any other angles besides the aforementioned angles such as at least one angle from a set of acute angles, a right angle, any one angle from a set of obtuse angles, or the like.

[0087] **FIGS 22 – 25** illustrate the mounting apparatus of the present invention according to a second example embodiment **200**. In particular, **FIG. 21** illustrates its first perspective rear view, **FIG. 22** illustrates its second perspective rear view, **FIG. 24** illustrates its first side view, and **FIG. 25** illustrates its second side view.

[0088] With reference to **FIGS 22 – 25**, the mounting apparatus of the second embodiment **200** may substantially have a rigid or a semi-rigid body that is configured to hold at least one article **900** (i.e., the display unit of a three-piece on-board unit) and be attached to a receiving surface. The body comprises a sloped portion that allows the held article **900** to be sloped at

one or more angles relative to the receiving surface when the mounting apparatus is attached onto the receiving surface.

[0089] With reference to **FIGS 22 – 25**, the mounting apparatus of the second embodiment **200** may generally comprise a first part **210** and a second part **220**. The first part **210** is configured to hold at least one article **900**. The second part **220** is one that is configured to be attached to the receiving surface. The second part **220** may be incorporated with the sloped portion that allows the article **900** held by the first part **210** to be sloped at one or more angles as the mounting apparatus of the second embodiment **200** is installed on the receiving surface of the designated location via the second part **220** being attached thereto.

[0090] It is to be noted that the mounting apparatus of the second embodiment **200** may be in the form of a kit of parts, as the first part **210** and the second part **220** may be separable pieces that can be detachably attached to each other. When the parts **210**, **220** are assembled, the mounting apparatus may have a substantially trapezoidal body (when viewed from its sides). Each part **210**, **220** is integrally formed as a single piece via additive manufacturing processes that may include any form of three-dimensional (3D) printing techniques. The material composition of the parts **210**, **220** of the mounting apparatus of the second embodiment **200** may be a durable and weather-resistant material, which may be, by way of example, acrylonitrile styrene acrylate (ASA) plastics, acrylonitrile butadiene styrene (ABS) plastics, or the like.

[0091] **FIGS 26 – 27** illustrate the first part **210** of the mounting apparatus of the second embodiment **200**. In particular, **FIG. 26** illustrates its front view, while **FIG. 27** illustrates its rear view.

[0092] With reference to **FIGS 26 – 27**, within the mounting apparatus of the second embodiment **200**, the first part **210** may comprise a first surface **211** that is regarded as its front-facing surface and a second surface **212** that is regarded as its rear-facing surface. These surfaces **211**, **212** may be generally planar, but may be formed with a certain degree of roughness and/or indents. The first surface **211** may be surrounded by one or more sidewalls **213** that extend perpendicularly from edges (e.g., lateral and/or longitudinal edges) of the first surface **211**. These sidewalls **213** may be in substantial connection with each

other. It is to be noted that the first surface **211** may be one that is positioned substantially in between the article **900** and the second part **220** as the first part **210** receives the article **900** for its holding.

[0093] With reference to **FIGS 26 – 27**, for the mounting apparatus of the second embodiment **200**, the first part **211** may comprise a wiring-accommodating portion **216**. The wiring-accommodating portion may be defined by at least one aperture **216a** formed through the surfaces **211**, **212** of the first part **211**.

[0094] With reference to **FIGS 26 – 27**, for the mounting apparatus of the second embodiment **200**, the first part **211** may comprise a fastener-accommodating portion. The fastener-accommodating portion may be formed on the first part **211** in a manner such that there is a raised area **217a** is formed on the first surface **211** and a corresponding recessed area **217b** is formed on the second surface **212**. The fastener-accommodating portion further formed with one or more apertures **217c** at or near its corners, which are through the surfaces **211**, **212**.

[0095] With reference to **FIGS 26 – 27**, for the mounting apparatus of the second embodiment **200**, at least one article **900** may be held by the first part **211** by being fitted within a space defined by any one or a combination of the first surface **211** and the sidewalls **213**. More specifically, sides of the article **900** may be substantially adjacent to the sidewalls **213**, and one portion of the article **900** may be substantially adjacent to the first surface **211** of the first part **210**, however, there may be slight gap between the article **900** and the sidewalls **213** and the first surface **211** so that ventilation may be provided to the article **900** for thermal dissipation of the article **900**. It is to be noted that the sidewalls **213** and the first surface **211** may further contribute in improving the acoustic performance of the article **900** as they may interact with sound waves emitted by the article **900** (if any). Furthermore, the apertures **217c** of the fastener-accommodating portion **217** may enable the article **900** to be securely attached to the first part **211** by use of fasteners known in the art such as screws, bolts, or the like. Moreover, the aperture **216a** of the wiring-accommodating portion **216** may allow one or more wires and/or cables of the article **900** (if any) to be bundled and/or retained therewithin to provide integrated wire management for the article **900**. The first part **210** of the mounting apparatus of the first embodiment **200** may also be shaped to secure the

article **900** to reduce a risk of the article **900** detaching or escaping from the space that is defined by any one or a combination of the first surface **211** and the sidewalls **213**. In the case where the article **900** is in the form of a display unit for an on-board unit, the display unit may be mounted onto first part **210** of the mounting apparatus of the second embodiment **200** in a manner such that its display screen faces away from the first surface **211** of the first part **210** to provide a user (i.e., a driver) easy access to the display screen.

[0096] With reference to **FIGS 26 – 27**, for the mounting apparatus of the second embodiment **200**, the first part **210** may comprise one or more receiving portions **218**. These receiving portions **218** are to allow the second part **220** to mate with the first part **210**. These receiving portions **218** may each be defined by at least one aperture formed through the surfaces **211**, **212** of the first part **211**. As shown in **FIGS 26 – 27**, there may be up to four receiving portions **218**. A set of two receiving portions **218** may be located adjacent to one longitudinal edge of the surfaces **211**, **212** that corresponds to an upper portion of the first part **210**, while another set of two receiving portions **218** may be located adjacent to an opposing longitudinal edge of the surfaces **211**, **212** that corresponds to a lower portion of the first part **210**. Furthermore, these receiving portions **218** may be substantially aligned to each other. It is to be noted that the receiving portions **218** located on the upper portions of the first part **210** and the receiving portions **218** located on the lower portions of the first part **210** are substantially symmetrical along a longitudinal axis of the first part **210**, or alternatively, substantially asymmetrical along a longitudinal axis of the first part **210**.

[0097] With reference to **FIGS 26 – 27**, for the mounting apparatus of the second embodiment **200**, the receiving portions **218** of the first part **210** may define corners that correspond to a region on the first part **210**, wherein the fastener-accommodating portion may be located within or partially located within the aforementioned region and the wiring-accommodating portion **216** may be located outside of the aforementioned region.

[0098] **FIGS 28 – 29** specifically illustrate the structure of the receiving portions **218** that may be included within the first part **210** of the mounting apparatus of the second embodiment **200**. In particular, **FIG. 28** illustrates one receiving portion **218** that is located on the upper portion of the first part **210**, whereas **FIG. 29** illustrates one receiving portion

218 that is located on the lower portion of the first part **210**. The receiving portion **218** may have one or more edges that form a substantially tapered outline.

[0099] With reference to **FIGS 28 – 29**, the receiving portion **218** may include a first longitudinal edge **2181**, a second longitudinal edge **2182**, and a third longitudinal edge **2183**. In particular, a length between the first longitudinal edge **2181** and the second longitudinal edge **2182** may substantially define a first width, and a length between the first longitudinal edge **2181** and the third longitudinal edge **2183** may substantially define a second width.

[00100] With reference to **FIGS 28 – 29**, the receiving portion **218** may include a first lateral edge **2184**, a second lateral edge **2185**, and a third lateral edge **2186**. In particular, the first lateral edge **2184** may have a length that corresponds to the first width and the third lateral edge **2186** may have a length that corresponds to the second width. The second lateral edge **2185** is a transitional edge that provides a transition between the second longitudinal edge **2182** and the third longitudinal edge **2183**.

[00101] With reference to **FIGS 28 – 29**, the third longitudinal edge **2183** of the receiving portion **218** may include a first section **2183a**, a second section **2183b**, and a third section **2183c**, wherein the second section **2183b** is between the first section **2183a** and the third section **2183c** and relatively recessed compared to them. Furthermore, the first section **2183a** of the third longitudinal edge **2183** exhibits a positive curvature. It is to be noted that the first section **2183a** of the third longitudinal edge **2183** and the second lateral edge **2185** meet and form a corner that is substantially aligned to, above, or below the second section **2183b** of the third longitudinal edge **2183**. It is also to be noted that the third section **2183c** of the third longitudinal edge **2183** and the third lateral edge **2186** meet.

[00102] **FIGS 30 – 33** illustrate the second part **220** of the mounting apparatus of the second embodiment **200**. In particular, **FIG. 31** illustrates its front view, **FIG. 32** illustrates its rear view, **FIG. 32** illustrates its first side view, and **FIG. 33** illustrates its second side view.

[00103] With reference to **FIGS 30 – 33**, within the mounting apparatus of the second embodiment **200**, the second part **220** may include at least one sloped portion **221** that has a surface **221a** that is sloped relative to at least one lateral edge located on a front side of the

second part **220** at one or more angles. The front side of the second part **220** further comprises one or more ribs that provide reinforcement to the sloped portion **221**.

[00104] With reference to **FIGS 30 – 33**, within the mounting apparatus of the second embodiment **200**, the second part **220** may further include one or more projecting portions **222**. These projecting portions **222** are to allow the second part **220** to mate with the first part **210**. These projecting portions **222** project outwardly from the front side of the second part **220** in which they project away from the sloped portion **221** in a direction that is non-parallel to the surface normal of the surface **221a** of the sloped portion **211**. As shown in **FIGS 27 – 30**, there may be up to four projecting portions **222**. A set of two projecting portions **222** may be located adjacent to a first longitudinal edge of the front side of the second part **220** that corresponds to an upper portion of the second part **220**, while another set of two projecting portions **222** may be located adjacent to a second longitudinal edge of the front side of the second part **220** that corresponds to a lower portion of the second part **220**. Furthermore, these projecting portions **222** may be substantially aligned to each other. It is to be noted that the projecting portions **222** located on the upper portions of the second part **220** and the projecting portions **222** located on the lower portions of the second part **220** are substantially symmetrical along a longitudinal axis of the second part **220**, or alternatively, substantially asymmetrical along a longitudinal axis of the second part **220**.

[00105] **FIGS 34 – 35** specifically illustrate the structure of the projecting portions **222** that are included within the second part **220** of the mounting apparatus of the second embodiment **200**. In particular, **FIG. 34** illustrates a perspective front view of one projecting portion **222** that is located on the upper portion of the second part **220**, whereas **FIG. 35** illustrates a side view of one projecting portion **222** that is located on the upper portion of the second part **220**.

[00106] With reference to **FIGS 34 – 35**, and the previous figures **FIGS 30 – 33**, the projecting portion **222** may have a body that has a first segment **2221** and a second segment **2222**. For each projecting portion **222**, its first segment **2221** may be one that vertically extends from the front side of the second part **220**, and its second segment **2222** may be one that is in continuum with the first segment **2221** but further extends in a direction that is preferably perpendicular to the first segment **2221**. For each projecting portion **222**, its

second segment **2222** may extend away from one longitudinal edge of the front side of the second part **220** that is adjacent thereto. This allows the projecting portion **222** to be a substantially hook-like structure.

[00107] With reference to **FIGS 34 – 35**, for each projecting portion **222**, their first segment **2221** may have a first region that faces away from one longitudinal edge of the front side of the second part **220** that is adjacent thereto. This first region may be formed with a protruding section **2221a** that is substantially raised with respect to other sections on the first region.

[00108] **FIGS 36 – 37** illustrate the mounting apparatus of the second embodiment **200** prior to the mating of the first part **210** and the second part **220** for their assembly. In particular, **FIGS 36 – 37** illustrate projecting portions **222** of the second part **220** being received by the receiving portions **218** of the first part **210**. More specifically, the projecting portions **222** of the second part **220** are inserted through the receiving portions **218** for each projecting portions **222** to be at a space substantially defined between the first longitudinal edge **2181** and the second longitudinal edge **2182** of each receiving portion **218**. While doing so, the second segment **2222** of each projecting portion **222** may protrude from the first surface **211** of the first part **210**.

[00109] **FIGS 38 – 39** illustrate the mounting apparatus of the second embodiment **200** in which the first part **210** and the second part **220** are mated for their assembly. Whereas, **FIG. 40** specifically illustrates the configuration that allows the first part **210** and the second part **220** to become mated. In particular, after the projecting portions **222** of the second part **220** are received by the receiving portions **218** of the first part **210** as per **FIGS 33 – 34**, the second part **220** may be made to move relative to the first part **210** through sliding. More specifically, as the second part **220** and the first part **210** may be moved relative to each other along one or more directions for the projecting portions **222** to engage with the receiving portions **217**. More specifically, the projecting portions **222** of the second part **220** may enter a space defined between the first longitudinal edge **2181** and the third longitudinal edge **2183** of the receiving portion, the protruding section **2221a** of each projecting portion **222** may come into contact with the first section **2183a** of the third longitudinal edge **2183** of the receiving portion **218**. When a force is applied upon the first part **210** or the second part **220** for a further relative movement between these parts **210**, **220**, the projecting portion **2221a**

shall eventually reach the second section **2183b** of the third longitudinal edge **2183** and becomes engaged therewithin since the second section **2183b** of the third longitudinal edge **2183** is relatively recessed compared to the other sections **2183a**, **2183c**. The remaining regions of the first region along the first segment **2221** on the projecting portion **222** become adjacent to the other sections of the third longitudinal edge **2183**. This enables the projecting portion **222** of the second part **210** to become interlocked with the receiving portion **218** of the first part **210** for them to become mated as illustrated in **FIG. 40**.

[00110] For the first part **210** and the second part **220** to disengage from each other, a force may be applied upon the first part **210** or the second part **220** for there to be at least one relative movement between these parts **210**, **220** that are in directions that are opposite from before. This may allow each projecting portion **222** to move away from the second section **2183b** of the third longitudinal edge **2183** and escape therefrom. With that, the projecting portions **222** may return to the space substantially defined between the first longitudinal edge **2181** and the second longitudinal edge **2182** of each receiving portion **218**. The first part **210** and the second part **220** may then disengage from each other thereafter.

[00111] With reference to **FIGS 22 – 40**, as the first part **210** and the second part **220** of the mounting apparatus of the second embodiment **200** become mated, the second part **220** may be generally located at a second surface **212** of the first part **210** (i.e., behind the first surface **211** of the first part **210**). In particular, the second part **220** is one that includes the sloped portion **221** that has a surface **221a** that is sloped relative to at least one surface **211**, **212** of the first part **210** at one or more angles. The surface **221a** of the sloped portion **221** of the second part **220** and at least one surface **211**, **212** of the first part **210** are substantially non-parallel with respect to each other. It is to be noted that the sloped portion **221** may have a first region that may be more specifically a first longitudinal edge of surface **221a** and a second region that may be more specifically a second longitudinal edge of **221a**. The first region of the sloped portion **221** may be relatively nearer to the first part **110** compared to the second region of the sloped portion **221**. This allows the one portion of the article **900** to be nearer to the receiving surface and another portion of the article **900** to be further away from the receiving surface as it is held by the first part **210**.

[00112] It is to be noted that, within the mounting apparatus of the second embodiment **200**, the surface **221a** of the sloped portion **221** of the second part **220** is one that is to be applied with a bonding means to allow the mounting apparatus of the second embodiment **200** to be installed at a designated location, in which the surface **121a** of the sloped portion **221** is to be adhered to a receiving surface of the designated location. The bonding means, by way of example, may be an adhesive layer, double-side adhesive tape, or the like. The sloped portion **221** of the second part **220** may have a certain degree of roughness so that it has a larger surface area to allow the bonding means to adhere it to a receiving surface of the designated location.

[00113] It is to be noted that, within the mounting apparatus of the second embodiment **200**, the surface **221a** of the sloped portion **221** of the second part **220** may have a contoured geometry for it to include at least one concave area, at least one convex area, or a combination thereof. More specifically, the surface **221a** of the sloped portion **221** may exhibit at least one degree of curvature when the apparatus is viewed from its sides. Preferably, in a case where the designated location is an interior surface of a windscreen of a vehicle, the surface **221a** of the sloped portion **221** may have a convex shape so that it may conform to the interior surface of the windscreen as the sloped portion **121** is attached thereto.

[00114] In certain embodiments, it is to be stated that the surface **221a** of the sloped portion **221** may further include one or more areas that are raised along a direction of the surface normal of the surface **221a** and/or one or more areas that are recessed along a direction of the surface normal of the surface **221a**. By way of example, the surface **221a** of the sloped portion **221** may have at least two recessed areas and one raised area therebetween, along at least one direction across the surface **121a**, which may be from top to bottom.

[00115] **FIGS 41 – 42** illustrate perspective rear views of the mounting apparatus of the second embodiment **200**, in which the first part **210** that is mated with the second part **220** that has a sloped portion having an angle that is bigger than the one shown in **FIGS 22 – 40**. **FIGS 43 – 46** each illustrate a view of the second part **220** as presented in **FIGS 41 – 42**, wherein **FIG. 43** illustrates its front view, **FIG. 44** illustrates its rear view, **FIG. 45** illustrates its first side view, and **FIG. 46** illustrates its second side view. **FIGS 43 – 46** intend to show that within the mounting apparatus of the second embodiment **200**, a first part **210** of the

same may be mated together with one or more second parts **220** that have a sloped portion **221** that has a surface sloped at different angles. In particular, the mounting apparatus of the second embodiment **200** shall provide an option to a user (i.e., a driver) to swap the second part **220** for changing at least one angle that corresponds to a degree of sloping for the article **900** within the first part **210** based on their needs and requirements, while still using the first part **210** of the same.

[00116] **FIGS 47 – 48** illustrate views of an alternative variant of the first part **210** of the mounting apparatus of the second embodiment **200**. In particular, **FIG. 47** illustrates its front view, while **FIG. 48** illustrates its rear view. As shown in **FIGS 47 – 48**, this alternative variant of the first part **210** may be substantially similar to the first part **210** that was previously described based on **FIGS 22 – 40**. However, within the first part **210** as shown in **FIGS 47 – 48**, its wiring-accommodating portion **216** is shaped differently in which that is a cut-out **216b** that extends from either longitudinal edge of the surfaces **211**, **212** of the first part **210** to reach the aperture **216a**. With this, as the article **900** is held by the first part **210** as illustrated in **FIGS 44 – 45**, the cut-out **216b** shall provide a pathway that allows one or more wires/or cables of the article **900** to reach the aperture **216a** and be retained within the edges defined by the aperture **216a**. It is also to be noted that the first part **210** as illustrated in **FIGS 47 – 48** may similarly be used with one or more swappable second parts **220** for changing at least one angle that corresponds to a degree of sloping for the article **900** within this first part **210** based on the needs and requirements of the user.

[00117] **FIG. 49** illustrates a side view of an alternative variant of the first example embodiment **100**, wherein the first part **110** that holds the article **900** is incorporated with a sloped portion instead of the second part **120**. In this alternative variant, the surface of the second part **120** that is to be attached to the receiving surface lacks a slope and may be perceived to lack a slope. However, within the first part **110** that holds the article **900**, its sloped portion may be such that there is at least one angle θ between (i) a plane parallel to the surface of the second part **120** that is to be attached to the receiving surface and (ii) the first surface **111**, which allows the held article **900** to be sloped at one or more angles relative to the receiving surface when the mounting apparatus is attached thereto via the second part **120**.

[00118] Alternatively, besides the configuration described in Paragraph [00117], the first surface **111** may be a plane that is substantially parallel to the surface of the second part **120** that is to be attached to a receiving surface, and there may be a sloped protrusion that extends from the first surface **111** such that there is at least one angle between (i) a plane parallel to the surface of the second part **120** that is to be attached to the receiving surface and (ii) a surface of the sloped protrusion in which the article **900** becomes adjacent therewith while being held by the first part **110**, which allows the held article **900** to be sloped at one or more angles relative to the receiving surface when the mounting apparatus is attached thereto via the second part **120**. The sloped protrusion may entirely extend across the longitudinal portions of the first part **110** or portions thereof.

[00119] These configurations described in Paragraphs [00117] and [00118] allow one portion of the article **900** to be nearer to the receiving surface and another portion of the article **900** to be further away from the receiving surface as it is held by the first part **110**.

[00120] FIGS 50 – 52 illustrate side views of an alternative variant of the second example embodiment **200**, wherein the first part **210** that holds the article **900** is incorporated with a sloped portion instead of the second part **220**. More specifically, FIG. 50 illustrates a side view of its first part **210**, FIG. 51 illustrates a second view of its second part **220**, and FIG. 52 illustrates a side view of the first part **210** and the second part **220** that are assembled by the projecting portions **222** being received by the receiving portions **218**. In this alternative variant, the surface of the second part **220** that is to be attached to the receiving surface lacks a slope and may be perceived to lack a slope. However, within the first part **210** that holds the article **900**, its sloped portion may be such that there is at least one angle θ between (i) a plane parallel to the surface of the second part **220** that is to be attached to the receiving surface and (ii) the first surface **211**, which allows the held article **900** to be sloped at one or more angles relative to the receiving surface when the assembled mounting apparatus is attached thereto via the second part **120**.

[00121] Alternatively, besides the configuration described in Paragraph [00120], the first surface **211** may be a plane that is substantially parallel to the surface of the second part **220**, and there may be a sloped protrusion that extends from the first surface **211** such that there is at least one angle between (i) a plane parallel to the surface of the second part **120** that is

to be attached to the receiving surface and (ii) a surface of the sloped protrusion in which the article **900** becomes adjacent therewith while being held by the first part **210**, which allows the held article **900** to be sloped at one or more angles relative to the receiving surface when the mounting apparatus is attached thereto via the second part **220**. The sloped protrusion may extend across longitudinal portions of the first part **210** or portions thereof.

[00122] These configurations described in Paragraphs [00120] and [00121] allow one portion of the article **900** to be nearer to the receiving surface and another portion of the article **900** to be further away from the receiving surface as it is held by the first part **210**.

[00123] It is to be noted that in certain alternative variants of the second example embodiment **210**, the first part **210** may be the one that includes one or more projecting portions, and the second part **220** may be the one that includes one or more corresponding receiving portions. The shape and structure of the projecting portions and the receiving portions may be substantially similar to those previously described.

[00124] It is to be noted that in certain alternative variants of the second example embodiment **210**, the first part **210** may be the one that includes a combination of one or more projecting portions and one or more receiving portions, and the second part **220** may be one that includes a combination of one or more projecting portions and one or more receiving portions that corresponds to the projecting portions and receiving portions of the first part **210**. The shape and structure of the projecting portions and the receiving portions may be substantially similar to those previously described.

[00125] **FIGS 53 – 55** illustrates the mounting apparatus **100, 200** that has an article **900** mounted thereonto (i.e., a display unit of an on-board unit), being installed on a designated location that corresponds to an interior location of a vehicle. In particular, **FIGS 53** and **55** illustrate a front view of the mounting apparatus **100, 200** together with the article **900**, while **FIG. 54** illustrates a side view of the mounting apparatus **100, 200** together with the article **900**.

[00126] With reference to **FIGS 53 – 55**, the designated location in which the mounting apparatus **100, 200** is to be installed thereon is more specifically a windscreen or windshield

of the vehicle. Hence, the mounting apparatus **100, 200** allows relocation of the article **900** from its conventional location, which obstructs the view of the driver. Furthermore, the mounting apparatus **100, 200** can provide an aesthetic integration with the interior location of the vehicle. In particular, the mounting apparatus **100, 200** has a slim profile and a customizable finish that ensures seamless integration of the mounting apparatus **100, 200** with the interior design of the vehicle.

[00127] It is to be noted that the surface of the sloped portion of the mounting apparatus **100, 200** that may be attached to a receiving surface or be adjacent to the article **900** may be any other shape besides rectangular as illustrated, for example, it may be circular, or the like.

[00128] It is to be noted that the individual technical features or a combination of technical features described for the mounting apparatus **100, 200** may be incorporated within various embodiments or variants of the mounting apparatus **100, 200** if so desired.

[00129] With this, a mounting apparatus **100, 200** that allows at least one article to be mounted thereto without the need to modify the article has been presented and described. It is to be noted that, as the article is mounted by the mounting apparatus **100, 200**, the mounting apparatus **100, 200** may further function as a protective cover that provides reinforcement to the article as well as impact mitigation to the article, for protecting the body and external components of the article (e.g., the screen of the display unit of the on-board unit). Furthermore, the mounting apparatus **100, 200** may further protect the article from the external environment by shielding one or more portions or the entirety of the article **900** from ultraviolet radiation. In the case where the article is in the form of a display unit of an on-board unit, the mounting apparatus **100, 200** of the present invention addresses the limitations of generic mounting solutions by offering a vehicle-compatible and high-performance alternative that is applicable in automotive aftermarket industries, particularly for premium car installations. The present disclosure includes as contained in the appended claims, as well as that of the foregoing description. Although this invention has been described in its preferred form with a degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangements of parts may be resorted to without departing from the scope of the invention.

CLAIMS

1. A non-articulated mounting apparatus, comprising
a body including:
a first part configured to receive and hold at least one article; and
a second part configured to be attachable to a receiving surface;
the body comprising a sloped portion having a surface, the sloped portion being able to allow the or each held article to be sloped at an angle relative to the receiving surface when the mounting apparatus is attached to the receiving surface via the surface of the sloped portion;
wherein the first part includes a first front-facing surface and a second rear-facing surface, that overlies the first front-facing surface in a parallel spaced apart relationship, the front-facing surface being positioned substantially in between the or each article to be held and the second part, the second part forming both the second rear-facing surface and the sloped portion, their respective surfaces being in a non-overlying relationship, the angle of the slope being relative to the face of the second rear-facing surface.
2. The mounting apparatus according to claim 1, wherein the sloped portion has a contoured geometry and includes at least one concave area, at least one convex area, or a combination thereof.
3. The mounting apparatus according to claim 1 or claim 2, wherein the sloped portion comprises more than one slope.
4. The mounting apparatus according to any one of the preceding claims, wherein the first part and the second part are detachably mountable to each other.
5. The mounting apparatus according to claim 4, wherein the first and second part are provided with complementary connecting members in the form of projecting portions and receiving portions that engage with each other by relative movement of the first part and second part after the projecting portions have been received by the receiving portions.
6. The mounting apparatus according to any one of the preceding claims, wherein the first front-facing surface of the first part is surrounded by one or more sidewalls that extend from

the or each edge of the first front-facing surface and that the or each sidewall terminates in an overhand to define a rabbet depth to enable the or each article to be held by the first part.

7. The mounting apparatus according to claim 6, wherein one lateral edge of the first front-facing surface is without a sidewall, and a rod-like structure connects respective terminal ends of two opposing sidewalls to define a mouth or opening through which the or each article is to be inserted.

8. The mounting apparatus according to any one of the preceding claims, wherein the body is further formed with a wiring-accommodating portion in the form of an aperture, cut-out or combination thereof, to allow one or more wires and/or cables of the or each article to be retained therewithin and wherein the wiring-accommodating portion passes through both the first front-facing and second rear-facing surface.

9. The mounting apparatus according to any one of the preceding claims, wherein the body is further formed with a fastener-accommodating portion that is at least one region that allows for accommodation of fasteners to enable the or each article to be fastened to the first part.

10. The mounting apparatus according to any one of the preceding claims, wherein the article is a display unit of an on-board unit.

11. The mounting apparatus according to any one of the preceding claims, wherein the receiving surface is an interior surface of a windscreen of a vehicle.

12. The mounting apparatus according to any one of the preceding claims, wherein the first front-facing surface and the second rear-facing surface are both flat faces.

13. A vehicle incorporating the mounting apparatus according to any one of the preceding claims.

14. A non-articulated kit of parts assembly, comprising
a body including:
a first part configured to receive and hold at least one article; and
a second part configured to be attachable to a receiving surface;

the body comprising a sloped portion having a surface, the sloped portion being able to allow the or each held article to be sloped at an angle relative to the receiving surface when the mounting apparatus is attached to the receiving surface via the surface of the sloped portion;

wherein the first part includes a first front-facing surface and a second rear-facing surface, that overlies the first front-facing surface in a parallel spaced apart relationship, the front-facing surface being positioned substantially in between the or each article to be held and the second part, the second part forming both the second rear-facing surface and the sloped portion, their respective surfaces being in a non-overlying relationship, the angle of the slope being relative to the face of the second rear-facing surface.

15. The kit according to claim 14, wherein the sloped portion has a contoured geometry and includes at least one concave area, at least one convex area, or a combination thereof.

16. The kit according to claim 14 or claim 15, wherein the sloped portion comprises more than one slope.

17. The kit according to any one of claims 14 to 16, wherein the article is a display unit of an on-board unit.

18. The kit according to any one of claims 14 to 17, wherein the receiving surface is an interior surface of a windscreen of a vehicle.