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VEHICULAR DOOR HANDLE ASSEMBLY

Abstract

A vehicular exterior door handle assembly includes a base portion configured to mount at a vehicular door, a handle portion mounted at the base portion, and a switch mechanism disposed at the handle portion that includes a trigger element and a housing. When a force is applied at the housing, the housing moves toward the trigger element. As the housing moves toward the trigger element, at least one protrusion of a plurality of protrusions of the housing engage at least one protrusion of a plurality of protrusions of the trigger element and the trigger element moves at an angle relative to movement of the housing and actuates the switch mechanism. The switch mechanism, when actuated, operates a latch mechanism of the door.

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Background/Summary

CROSS REFERENCE TO RELATED APPLICATIONS [0001] The present application is a continuation of U.S. patent application Ser. No. 18/047,679, filed Oct. 19, 2022, now U.S. Pat. No. 12,297,671, which claims the filing benefits of U.S. provisional application Ser. No. 63/262,765, filed Oct. 20, 2021, which is hereby incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

[0002] The present invention relates to door handles for vehicles and, more particularly, to an exterior door handle for opening a side door of a vehicle.

BACKGROUND OF THE INVENTION

[0003] A door handle for a vehicle door typically includes a handle portion that is pivotable relative to a base portion, whereby pivotal movement of the handle portion pulls at a cable or rod to electrically trigger or move a latch mechanism to release the latch and open the door. It is also known to provide a static door handle, where the handle portion is fixedly attached or mounted relative to the base portion and a user actuates the latch mechanism to release the latch and open the door by grasping the handle portion.

SUMMARY OF THE INVENTION

[0004] A door handle assembly for a door of a vehicle includes a handle portion fixedly mounted at a door of a vehicle. For example, the handle portion may be fixedly mounted or attached at a base or mounting bracket at the door. The handle portion includes a switch mechanism, whereby actuation of the switch mechanism by a user releases a latch mechanism of the door to open the door. The switch mechanism is actuated when a user applies a force or input at an outer surface of the switch mechanism and the switch mechanism includes a multi-ramped trigger element so that it may be actuated by a user pressing at different locations along the outer surface of the switch mechanism.

[0005] For example, the switch mechanism may include an outer portion or button portion or outer or upper housing configured to receive a user input for actuating the switch mechanism. When the user presses the outer housing, protrusions at an inner side of the outer housing engage ramps of a trigger element of the switch mechanism and the protrusions at the inner side of the outer housing travel down the ramps of the trigger element. As the protrusions at the inner side of the outer housing travel down the ramps of the trigger element, the trigger element moves laterally and engages a microswitch of the switch mechanism to actuate the microswitch. When the microswitch is actuated, the latch mechanism of the door is released to open the door. The protrusions at the inner side of the outer housing and the ramps of the trigger element may span substantially the width of the switch mechanism so that a user input may be received substantially across the width of the switch mechanism to actuate the switch mechanism.

[0006] These and other objects, advantages, purposes and features of the present invention will become apparent upon review of the following specification in conjunction with the drawings.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. **1** is a perspective view of a vehicle with a door handle assembly mounted at a door of the vehicle;

[0008] FIG. **2** is a sectional view of a door handle assembly;

[0009] FIG. **3** is a sectional view of a handle portion of a door handle assembly with a switch mechanism;
[0010] FIG. **4** is a partial plan view of the handle portion of FIG. **3**, showing the engageable surface of the switch mechanism;
[0011] FIG. **5** is a sectional view of the switch mechanism of FIG. **3**, where the switch mechanism is in a default or extended state;
[0012] FIG. **6** is a sectional view of the switch mechanism of FIG. **3**, where the switch mechanism is in an engaged or depressed state;
[0013] FIG. **7** is a partial plan view of the handle portion of FIG. **3**, with the outer housing of the switch mechanism removed and where the switch mechanism is in the default or extended state;
[0014] FIG. **8** is a partial plan view of the handle portion of FIG. **3**, with the outer housing of the switch mechanism removed and where the switch mechanism is in the engaged or depressed state;
[0015] FIGS. **9**-**12** are sectional views of the switch mechanism of FIG. **3**, where the switch mechanism is in the default or extended state in FIGS. **9** and **11**, and the switch mechanism is in the engaged or depressed state in FIGS. **10** and **12**;
[0016] FIG. **13** is a sectional view of the switch mechanism of FIGS. **3**; and **3**.
[0017] FIG. **14** is an exploded view of the handle portion and switch mechanism of FIG.
DESCRIPTION OF THE PREFERRED EMBODIMENTS
[0018] Referring now to the drawings and the illustrative embodiments depicted therein, a vehicle door handle assembly **10** is mountable to a door **12***a* of a vehicle **12** and operable to release a latch mechanism (not shown) of the door **12***a* to open the vehicle door (FIG. **1**). The vehicle door handle assembly **10** includes a handle portion **14** that is disposed at the door and that is fixedly mounted at the door or to a bracket or base portion mounted to the door. The handle portion **14** is fixedly mounted or attached at the door or the bracket, whereby a user may grasp or press or pull the handle portion **14** to actuate and release the latch mechanism to open the door. For example, the handle portion **14** (or the bracket at which the handle portion is mounted) may include a button or switch mechanism **18**, whereby when the user grasps or presses or pulls the handle portion **14**, the user actuates the button or switch mechanism **18** to release the latch mechanism to open the door **12***a*. The switch mechanism **18** may have an actuating element **24** at which a user applies pressure, where a multiple-ramped trigger element **26** disposed within the switch mechanism **18** is configured to actuate an electronic switch device or microswitch **28** of the switch mechanism **18** responsive to the pressure applied by the user. The multiple-ramped trigger element **26** allows for actuating the electronic switch device or microswitch **28** of the switch mechanism **18** via the user applying pressure substantially anywhere along an outer surface of the actuating element, as discussed below.
[0019] Static door handles for vehicular doors, where a handle portion of the door handle assembly is static (i.e., non-movable or non-pivotable) or fixedly attached to a mounting or base portion of the door handle assembly, may be mounted at a vehicular door as a means for a user to actuate a latch mechanism to release a latch and open the vehicular door. Such static door handles may include e-latch static door handles, where a user grasps the static door handle portion and, when the user grasps the static door handle portion, the latch mechanism is electrically triggered to release the latch. For example, the user may press or actuate a button disposed at the static handle portion when the user grasps the static handle portion. Buttons on these handles and tailgates are desired to be large surfaces. This allows for quick and easy access to the vehicle as there is no searching for small buttons. However, some buttons for static door handles, such as that shown in FIG. **2**, may have a relative large dead zone, where the dead zone may be defined by an area of the button that appears to be actuatable by the user, and where force applied by a user at the dead zone may move or compress the button but does not translate to activation of the button or switch. In other words, when the user applies pressure or force at the dead zone, the switch is not activated despite the user compressing the button. This may cause switch mis-triggers (where the button is not activated

despite the user applying pressure at the button, or activation of the button may be delayed or require a forceful pressure from the user) and may be frustrating to users. As shown in FIG. **2**, the traditional switch mechanism **13** includes a centrally located microswitch **17** that, when engaged by a pressable outer portion of the switch mechanism, may allow a user to open the door. However, as shown by the arrows of FIG. **2**, pressure at the outer edges of the switch may not result in actuation of the microswitch. In other words, compressing the button at the outer edges may not activate the centrally located switch **17**.

[0020] As shown in FIGS. **3-14**, the door handle assembly **10** provides a switch mechanism that can be actuated by a user with reduced or minimal or eliminated dead zones. In other words, the user may apply pressure at substantially any position along the switch mechanism and the switch mechanism, responsive to the pressure applied by the user, will release or actuate the latch mechanism to open the vehicle door. The switch mechanism may be scaled to any size for any size static door handle application. The switch mechanism may be implemented on door handles having any suitable contoured surface, such as curved or flat handle surfaces. The switch mechanism is configured to have consistent response to forces across the whole surface of the switch mechanism.

[0021] The handle portion **14** may be fixedly mounted to the bracket or base portion mounted to the door or the handle portion **14** may be integrally formed with the bracket such that the handle portion **14** and bracket may be installed or mounted or attached or otherwise disposed at an exterior handle region of the vehicle door as a single unit. The switch mechanism **18** may be disposed in any suitable position at the handle portion **14** so that the switch mechanism **18**, with the door handle assembly **10** mounted at the door **12***a* of the vehicle **12**, is exposed exterior the door and accessible to a user so that a user may actuate the switch mechanism **18** by applying pressure at the switch mechanism.

[0022] As shown in FIGS. **3** and **4**, the handle portion **14** includes a bezel **16** and the switch mechanism **18** is inlaid or mounted or attached at the bezel **16** so that a portion of the switch mechanism **18** is exposed at an outer surface of the bezel **16** and a portion of the switch mechanism **18** is within or behind or disposed at an inner mounting surface **16***b* of the bezel **16**, where the inner surface of the bezel may be disposed at an inner cavity of the door **12***a* of the vehicle (such as within a door panel). The bezel **16** includes an aperture **16***a*, where a portion of the switch mechanism mounts to the inner mounting surface **16***b* of the bezel, such as via screws or other suitable fasteners, and the user actuatable portion or actuating element **24** of the switch mechanism protrudes through or is exposed at the aperture **16***a* so that the user may apply pressure to actuate the switch mechanism **18**.

[0023] The switch mechanism **18** includes a push housing that includes an inner housing portion **20** and an outer housing portion **22**. The inner housing **20** may be fixedly attached at the inner mounting surface **16***b* of the bezel **16** and the outer housing **22** may be movably attached at the inner housing **20** and protrudes through or is disposed at the aperture **16***a* of the bezel **16**. The actuating element or cover element **24** is disposed at or is integral with the outer housing portion **22**. The multi-ramped trigger element **26**, the electronic switch **28** (such as a microswitch), and a biasing member or spring **30** are disposed within the push housing between the inner housing **20** and the outer housing **22**. A trim portion or element **32** may be disposed at the aperture **16***a* of the bezel **16** and circumscribe the aperture **16***a*, and may optionally be integrally formed with the portion of the bezel **16** defining the aperture **16***a*. The switch mechanism **18** is configured to receive a pressure or touch or force from a user and translate the input received from the user into actuation of the microswitch **28**, whereby the latch mechanism of the door is released. The switch mechanism **18** is configured to receive and respond to the user input at any position of the switch mechanism exposed exterior the vehicle, thus eliminating or reducing dead zones.

[0024] The outer housing **22** mounts or attaches at the inner housing **20** and extends through the aperture **16***a* of the bezel **16** to be exposed exterior the vehicle. The actuating element **24** may be disposed at an outer surface of the outer housing **22** and attach at the inner housing **20** or the trim

element **32** to protect the switch mechanism from the environment exterior the vehicle. The user applies pressure at the actuating element **24** and the outer housing **22** to actuate the switch mechanism and the outer housing **22** moves or compresses into or toward the inner housing **20** when the user input or force is applied or received at the switch mechanism **18**.

[0025] As shown in FIGS. **5-8**, the trigger **26** is disposed between the outer housing **22** and the inner housing **20** and includes an array or series of ramps **26***a* across the length of the trigger **26**. The array of ramps **26***a* correspond to an array or series of protrusions or teeth **22***a* extending or protruding from an inner surface of the outer housing **22**, where each protrusion **22***a* is configured to engage a corresponding ramp **26***a* of the trigger **26**. The protrusions **22***a* and ramps **26***a* are configured so that, when the outer housing **22** is in an extended or not actuated state (i.e., not pressed by a user, such as shown in FIG. **5**), the protrusions **22***a* are positioned at or near the top or peak of corresponding ramps **26***a* and, when the outer housing **22** is in a depressed or actuated state (i.e., when pressed by a user, such as shown in FIG. **6**), the protrusions **22***a* have travelled along the ramps **26***a* and are positioned at or near or toward the bottom or depression of corresponding ramps **26***a*. Thus the housing is movable or compressible between an extended state, where the outer housing **22** and inner housing **20** are at a default position relative to one another and define an interior volume of the housing, and a depressed or compressed or actuated state, where the pressure or force from the user input moves the outer housing toward or into the inner housing, thus reducing the interior volume of the housing and causing the protrusions of the outer housing to move along the trigger element, which in turn causes the trigger element **26** to translate in a direction along the housing.

[0026] In other words, as the outer housing **22** moves into or toward the inner housing **20**, the trigger element **26** moves laterally within the housing to actuate the microswitch **28**. The lateral movement of the trigger element **26** relative to the compression of the outer housing **22** reduces the necessary footprint of the switch mechanism **18** and ensures that an input at any position along the outer housing **22** that causes the outer housing **22** to compress inward (i.e., to move in a cross-vehicle direction) will cause the trigger element **26** to translate laterally relative to the inward movement (i.e., to move in a direction along a longitudinal axis of the vehicle or in a vertical direction or other direction that is generally normal or perpendicular to the inward compression direction) and actuate the microswitch. The trigger element **26** may move in a direction at any suitable non-zero angle relative to the direction of movement of the outer housing **22**, such as at an angle that is between **45** degrees and 135 degrees relative to the movement of the outer housing **22**, such as between 80 degrees and 100 degrees. Optionally, the trigger element **26** may move in a direction that is perpendicular or substantially perpendicular (i.e., at a 90 degree angle or at a substantially 90 degree angle) relative to the direction of movement of the outer housing **22**.

[0027] Although the switch mechanism **18** is shown with the trigger element **26** including the series of ramps and the outer housing **22** including the series of protrusions engaging and travelling along the ramps, it should be understood that the outer housing **22** may include a series of ramps and the trigger element **26** may include a series of corresponding protrusions. Optionally, both the outer housing and the trigger element may include corresponding series of ramps that engage and travel along each other when the outer housing is pressed by a user. Any suitable interface that translates pressure or force from the user at the outer housing (and resulting inward movement of the outer housing) to lateral movement of the trigger element within the housing may be employed.

[0028] When the actuating element **24** and outer housing **22** receive the user input, the force from the user input depresses at least a portion of the outer housing **22** toward and optionally into at least a portion of the inner housing **20** fixedly mounted at the bezel. The movement of the outer housing **22** toward the inner housing **20**, with the protrusions **22***a* engaging the ramps **26***a*, causes the protrusions **22***a* to travel along the ramps **26***a*. As the protrusions **22***a* travel along the ramps **26***a*, and because lateral movement of the protrusions and the outer housing is limited, the trigger element **26** is translated or moved laterally within the inner housing **20** by the force of the

protrusions **22***a* travelling along the ramps **26***a*. In other words, the force of the user input is transferred to lateral or longitudinal movement of the trigger element **26**. The trigger element may move along a longitudinal axis **21** of the housing (as shown in FIG. **13**) that is generally perpendicular or normal to movement of the outer housing **22** relative to the inner housing **20**. For example, in FIGS. **5** and **6**, as the outer housing **22** moves downward relative to the inner housing **20**, the trigger element **26** moves to the left and actuates the microswitch **28**. FIGS. **7** and **8** depict the switch mechanism **18** and show the lateral movement of the trigger element **26** within the housing as the switch mechanism is engaged and moves between the default or extended state (FIG. **7**) and the engaged or depressed state (FIG. **8**).

[0029] Because the protrusions **22***a* and ramps **26***a* are spaced along the length of the switch mechanism **18**, the user input may be received at virtually any position along the actuating element and/or outer housing **22** to cause lateral movement of the trigger **26**. Engagement of one or more protrusions **22***a* with one or more ramps **26***a* is sufficient to cause lateral movement of the trigger **26**. Thus, a user need not provide the input at the center of the actuating element **24** and outer housing **22** or substantially across the length of the outer housing **22** to actuate the switch mechanism. A user input at substantially any position along the actuating element **24** and outer housing **22** causes the motion of the protrusions **22***a* necessary to engage the ramps **26***a* and move the trigger **26** laterally to actuate the switch mechanism **18**.

[0030] The lateral movement of the trigger **26** within the inner housing **20** depresses or engages or actuates the microswitch **28**. The microswitch may be disposed within a recess or cavity **26***b* of the trigger **26** between the ramps **26***a* and a surface of the inner housing **20** so as to not reduce the area of the switch mechanism **18** where the ramps **26***a* may be disposed. The microswitch **28** may be electrically connected to the latch mechanism of the door, such as via an electrical connection at the switch mechanism **18**, so that actuation of the microswitch **28** releases the latch mechanism to open the door.

[0031] The spring **30** may also be disposed within or along the trigger **26**, where the spring **30** biases or urges the trigger along the longitudinal axis **21** toward the extended state. Thus, when the actuating element **24** is pressed or moved by the user input, the trigger translates along the actuating element in a direction against the spring force (e.g., in a direction that compresses the coil spring). After receiving the user input to actuate the microswitch **28**, the spring biases or urges the trigger **26** in the opposite lateral direction to move the trigger back to its initial position, which moves the protrusions **22***a* back along the ramps **26***a* and thus back toward the extended state where the actuating element at the outer housing **22** is positioned to receive another user input. Because the spring **30** biases the protrusions **22***a* outward along the ramps **26***a,* the user input must overcome the biasing force of the spring **30** to actuate the switch mechanism **18**. This prevents false or unintended actuation of the switch mechanism **18**, such as due to unintended grasping of the handle portion. The spring **30** may be configured to provide a desired biasing force.

[0032] Optionally, the ramps **26***a* and protrusions **22***a* may also be shaped or configured or otherwise optimized as desired. For example, a steeper slope of the ramps **26***a* may result in easier actuation of the latch mechanism **18** as the protrusions **22***a* travel along the ramps, but more difficult biasing of the outer housing **22** toward the extended state as the protrusions travel back up the ramps. Furthermore, the protrusions **22***a* may have shaped or curved or rounded ends to assist in smoother travel of the protrusions **22***a* along the ramps **26***a*.

[0033] In the illustrated example, the outer housing **22** has a slightly concave outer surface at which the user input is received, with the actuation element **24** conforming to the outer surface of the outer housing **22**. Optionally, the outer housing **22** (and optionally the seal or cover or actuating element **24** at the outer housing **22**) may be shaped or configured in any suitable manner. For example, the outer housing **22** may be configured to be flush with or substantially conform to an outer surface of the door at the handle portion, such as a curved or flat outer surface of the door or handle portion. Optionally, the outer housing **22** may be recessed from or protrude at least slightly

from the outer surface of the door at the handle portion. The seal or cover or actuating element **24** may be a separate component with the outer housing **22** or may be integrated with the outer housing **22**

[0034] Thus, the door handle assembly provides a sealed switch that is scalable to any size application, provides consistent push effort across the surface of the switch, may fit a tight or small or reduced packaging space, provides a universal design that is applicable to both the passenger side and the driver side of the vehicle, and provides hard stops with large surface areas for added durability of the switch. The switch mechanism is integrated or otherwise disposed at a static door handle assembly where the handle portion of the door handle assembly is fixedly attached and non-pivotable relative to a bracket or base portion or the door. When the user grasps or presses or pulls the handle portion, the user applies a force or input at the switch mechanism and actuates the switch mechanism to release the latch mechanism to open the door. The switch mechanism includes an outer portion or housing that receives the user input and protrusions of the outer portion engage ramps of a trigger element of the switch mechanism and travel along the ramps when the outer housing portion receives the user input. As the protrusions travel along the ramps, the trigger element moves laterally and engages a microswitch to actuate the microswitch to release the latch mechanism to open the door. The switch mechanism may include a spring or biasing element to bias the protrusions back along the ramps and bias the outer housing from a depressed state toward an extended state. Optionally, the protrusions of the outer housing portion may comprise ramped surfaces and the trigger element may comprise non-ramped protrusions. Optionally, both the outer housing portion and the trigger element may comprise correspondingly ramped surfaces.

[0035] The door handle assembly **10** may comprise any suitable type of door handle assembly, and may include or incorporate aspects of the door handle assemblies described in U.S. Pat. Nos. 6,349,450; 6,550,103; 6,907,643; 7,407,203; 8,786,401; 8,801,245 and/or 8,333,492, and/or U.S. Publication Nos. US-2010-0088855 and/or US-2010-0007463, which are hereby incorporated herein by reference in their entireties. The handle assembly may comprise any suitable type of vehicle door handle assembly, such as a strap type vehicle door handle assembly (having a strap mounted at the door and where the switch mechanism is disposed on the strap or the base portion mounted at the door) or such as a paddle type vehicle door handle assembly (having a paddle or the like where the switch mechanism is disposed at the paddle) or other type of vehicle door handle assembly such that the switch mechanism is engageable by a user exterior the vehicle. For example, the switch mechanism may be disposed at a strap type vehicle door handle, where the actuation element is exposed at any exterior surface of the strap mounted at the door, such as an inward-facing exterior surface of the strap facing inward toward the vehicle door or an outward-facing exterior surface of the strap facing outward away from the vehicle door. Optionally, the switch mechanism may be disposed at an outer surface of the vehicle door, such that the actuation element is exposed at an exterior surface of the door along the side of the vehicle or the actuation element may be exposed at an exterior surface of the door within a pocket of the door and thus recessed from the side of the vehicle.

[0036] The door handle assembly is thus operable to open the vehicle door when a user grasps the door handle portion at the side of the vehicle door. The door handle assembly may also be operable in conjunction with a passive keyless entry or other sensing system that is operable to determine whether or not the person at the vehicle door is authorized for entry into the vehicle, and may only open the vehicle door when that system recognizes the user or key fob or transmitting device associated with the owner or authorized user of the vehicle. Optionally, the door handle assembly may be associated with or in communication with a door zone module, such as by utilizing aspects of the vehicle door systems described in U.S. Publication No. US-2010-0007463, which is hereby incorporated herein by reference in its entirety.

[0037] Optionally, the door handle assembly may include a soft touch handle portion, such as utilizing the principles described in U.S. Pat. Nos. 6,349,450; 6,550,103 and/or 6,907,643, which

are hereby incorporated herein by reference in their entireties. Optionally, the door handle assembly may include an antenna or the like, such as for sensing or transmitting signals, such as described in U.S. Pat. No. 6,977,619, which is hereby incorporated herein by reference in its entirety.
[0038] Changes and modifications to the specifically described embodiments may be carried out without departing from the principles of the present invention, which is intended to be limited only by the scope of the appended claims as interpreted according to the principles of patent law.

Claims

1. A vehicular exterior door handle assembly, the vehicular exterior door handle assembly comprising: a base portion configured to mount at a door of a vehicle equipped with the vehicular exterior door handle assembly; a handle portion mounted at the base portion; a switch mechanism disposed at the handle portion; wherein the switch mechanism comprises a trigger element and a housing; wherein, when a force is applied at the housing, the housing moves toward the trigger element; wherein the housing comprises a plurality of protrusions, and wherein the trigger element comprises a plurality of protrusions, and wherein the plurality of protrusions of the housing extend toward the plurality of protrusions of the trigger element; wherein, as the housing moves toward the trigger element, at least one protrusion of the plurality of protrusions of the housing engages at least one protrusion of the plurality of protrusions of the trigger element and the trigger element moves at an angle relative to movement of the housing and actuates the switch mechanism; and wherein, with the base portion mounted at the door of the vehicle, the switch mechanism, when actuated, operates a latch mechanism of the door to open the door.
2. The vehicular exterior door handle assembly of claim 1, wherein the plurality of protrusions of the trigger element comprises ramped protrusions, and wherein, as the housing moves toward the trigger element, the plurality of protrusions of the housing engage ramped surfaces of the ramped protrusions.
3. The vehicular exterior door handle assembly of claim 1, wherein the plurality of protrusions of the housing comprises ramped protrusions, and wherein, as the housing moves toward the trigger element, the plurality of protrusions of the trigger element engage ramped surfaces of the ramped protrusions.
4. The vehicular exterior door handle assembly of claim 3, wherein the plurality of protrusions of the trigger element comprises ramped protrusions, and wherein, as the housing moves toward the trigger element, ramped surfaces of the ramped protrusions of the trigger element engage ramped surfaces of the ramped protrusions of the housing.
5. The vehicular exterior door handle assembly of claim 1, wherein individual protrusions of the plurality of protrusions of the housing are spaced from one another so as to span length of the housing.
6. The vehicular exterior door handle assembly of claim 5, wherein the individual protrusions of the plurality of protrusions of the trigger element are spaced from one another so as to span length of the trigger element.
7. The vehicular exterior door handle assembly of claim 1, wherein a region of the housing is engageable by a user to apply the force to actuate the switch mechanism, and wherein the region spans length of the housing, and wherein the housing moves toward the trigger element responsive to the user applying the force at any part of the region of the housing.
8. The vehicular exterior door handle assembly of claim 1, wherein the switch mechanism comprises a biasing element, and wherein the biasing element biases the trigger element away from actuating the switch mechanism.
9. The vehicular exterior door handle assembly of claim 1, wherein, responsive to at least one protrusion of the plurality of protrusions of the housing engaging at least one protrusion of the plurality of protrusions of the trigger element, the trigger element moves in a direction parallel to a

longitudinal axis of the housing.

10. The vehicular exterior door handle assembly of claim 1, wherein, with the vehicular exterior door handle assembly mounted at the vehicle, the force is applied when a user grasps the handle portion.

11. The vehicular exterior door handle assembly of claim 1, wherein, with the vehicular exterior door handle assembly mounted at the vehicle, the housing is exposed exterior the vehicle.

12. The vehicular exterior door handle assembly of claim 1, wherein the handle portion comprises an aperture, and wherein the switch mechanism is mounted at the handle portion so the housing protrudes at least partially through the aperture.

13. The vehicular exterior door handle assembly of claim 12, wherein a cover element is disposed at an outer surface of the housing so that no portion of the housing is exposed exterior the vehicle.

14. The vehicular exterior door handle assembly of claim 1, wherein the angle is between 80 degrees and 100 degrees.

15. The vehicular exterior door handle assembly of claim 1, wherein the plurality of protrusions of the housing are arranged in a longitudinal direction of the housing.

16. The vehicular exterior door handle assembly of claim 1, wherein the plurality of protrusions of the trigger element are arranged in a longitudinal direction of the trigger element.

17. A vehicular exterior door handle assembly, the vehicular exterior door handle assembly comprising: a base portion configured to mount at a door of a vehicle equipped with the vehicular exterior door handle assembly; a handle portion mounted at the base portion; a switch mechanism disposed at the handle portion; wherein the switch mechanism comprises a trigger element and a housing; wherein, when a force is applied at the housing, the housing moves toward the trigger element; wherein the housing comprises a plurality of protrusions arranged in a longitudinal direction of the housing, and wherein the trigger element comprises a plurality of protrusions arranged in a longitudinal direction of the trigger element, and wherein the plurality of protrusions of the housing extend toward the plurality of protrusions of the trigger element; wherein, as the housing moves toward the trigger element, at least one protrusion of the plurality of protrusions of the housing engages at least one protrusion of the plurality of protrusions of the trigger element and the trigger element moves at an angle relative to movement of the housing and actuates the switch mechanism; wherein the switch mechanism comprises a biasing element, and wherein the biasing element biases the trigger element away from actuating the switch mechanism; and wherein, with the base portion mounted at the door of the vehicle, the switch mechanism, when actuated, operates a latch mechanism of the door to open the door.

18. The vehicular exterior door handle assembly of claim 17, wherein the plurality of protrusions of the trigger element comprises ramped protrusions, and wherein, as the housing moves toward the trigger element, the plurality of protrusions of the housing engage ramped surfaces of the ramped protrusions.

19. The vehicular exterior door handle assembly of claim 17, wherein the plurality of protrusions of the housing comprises ramped protrusions, and wherein, as the housing moves toward the trigger element, the plurality of protrusions of the trigger element engage ramped surfaces of the ramped protrusions.

20. The vehicular exterior door handle assembly of claim 17, wherein a region of the housing is engageable by a user to apply the force to actuate the switch mechanism, and wherein the region spans length of the housing, and wherein the housing moves toward the trigger element responsive to the user applying the force at any part of the region of the housing.

21. The vehicular exterior door handle assembly of claim 17, wherein, with the vehicular exterior door handle assembly mounted at the vehicle, the housing is exposed exterior the vehicle.

22. A vehicular exterior door handle assembly, the vehicular exterior door handle assembly comprising: a base portion configured to mount at a door of a vehicle equipped with the vehicular exterior door handle assembly; a handle portion mounted at the base portion; a switch mechanism

disposed at the handle portion; wherein the switch mechanism comprises a trigger element and a housing; wherein the handle portion comprises an aperture, and wherein the switch mechanism is mounted at the handle portion so the housing protrudes at least partially through the aperture; wherein, when a force is applied at the housing, the housing moves toward the trigger element; wherein the housing comprises a plurality of protrusions, and wherein the trigger element comprises a plurality of protrusions, and wherein the plurality of protrusions of the housing extend toward the plurality of protrusions of the trigger element; wherein, as the housing moves toward the trigger element, at least one protrusion of the plurality of protrusions of the housing engages at least one protrusion of the plurality of protrusions of the trigger element and the trigger element moves at an angle relative to movement of the housing and actuates the switch mechanism, and wherein the angle is between 80 degrees and 100 degrees; and wherein, with the base portion mounted at the door of the vehicle, the switch mechanism, when actuated, operates a latch mechanism of the door to open the door.

23. The vehicular exterior door handle assembly of claim 22, wherein the plurality of protrusions of the trigger element comprises ramped protrusions, and wherein, as the housing moves toward the trigger element, the plurality of protrusions of the housing engage ramped surfaces of the ramped protrusions, and wherein the plurality of protrusions of the housing comprises ramped protrusions, and wherein, as the housing moves toward the trigger element, the plurality of protrusions of the trigger element engage ramped surfaces of the ramped protrusions.

24. The vehicular exterior door handle assembly of claim 22, wherein a region of the housing is engageable by a user to apply the force to actuate the switch mechanism, and wherein the region spans length of the housing, and wherein the housing moves toward the trigger element responsive to the user applying the force at any part of the region of the housing.

25. The vehicular exterior door handle assembly of claim 22, wherein the plurality of protrusions of the housing are arranged in a longitudinal direction of the housing, and wherein the plurality of protrusions of the trigger element are arranged in a longitudinal direction of the trigger element.