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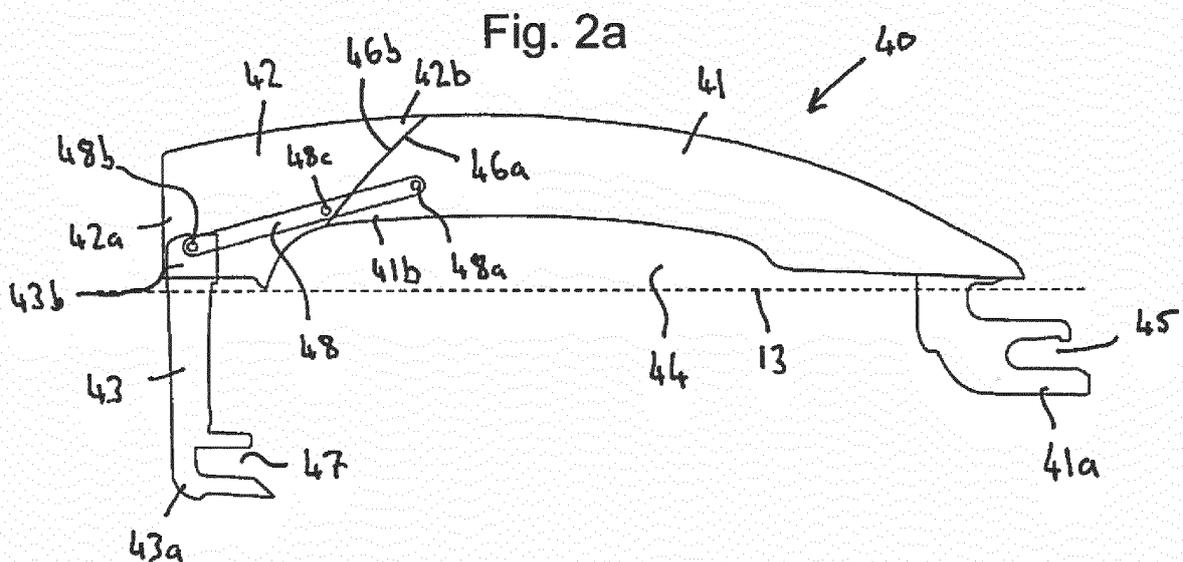
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(54) **A VEHICLE DOOR HANDLE ASSEMBLY**

(57) A vehicle door handle assembly (40) for a door (12) of a vehicle (10), the vehicle door handle assembly (40) comprising a first handle portion (41) and a second handle portion (42), the first and second handle portion (41, 42) together forming a graspable handle, wherein the vehicle door handle assembly (40) further comprises a door release member (43) to which each of the first and second handle portion (41, 42) are operatively coupled, wherein the first and second handle portion (41, 42) move together when the handle is pulled away from the vehicle

(10), the door release member (43) moving with the second handle portion (42) to release the door (12), and wherein the first handle portion (41) moves relative to the second handle portion (42) when the first handle portion (41) is pushed towards the vehicle (10), the door release member (43) being operatively coupled to the first handle portion (41) such that the movement of the first handle portion (41) relative to the second handle portion (42) causes movement of the door release member (43) to release the door (12).



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Description

Technical Field

[0001] The present disclosure relates to a vehicle door handle assembly for a door of a vehicle and particularly, but not exclusively, relates to a door handle assembly that may be pushed or pulled to open the door of the vehicle.

Background

[0002] Vehicle users often carry items when they approach their vehicle and might not have a spare hand to open a door of the vehicle. Previous solutions to this problem have included sensors beneath the vehicle that detect a foot and that will open the door of the vehicle upon such detection. However, such systems are expensive to install and maintain.

Statements of Invention

[0003] According to an aspect of the present disclosure, there is provided a vehicle door handle assembly for a door of a vehicle (such as a motor vehicle), the vehicle door handle assembly comprising a first handle portion and a second handle portion,

wherein the vehicle door handle assembly further comprises a door release member to which each of the first and second handle portions are operatively coupled,

wherein the first and second handle portions move together when the handle is pulled away from the vehicle, the door release member moving with the second handle portion to release the door, and

wherein the first handle portion moves relative to the second handle portion when the first handle portion is pushed towards the vehicle, the door release member being operatively coupled to the first handle portion such that the movement of the first handle portion relative to the second handle portion causes movement of the door release member to release the door.

[0004] The first and second handle portions may together form a graspable handle. The first handle portion may be substantially elongate. The first handle portion may provide a majority of the graspable handle.

[0005] The vehicle door handle assembly may further comprise a pivot member that may operatively couple the door release member to each of the first and second handle portions. The pivot member may pivot about a pivot point on the second handle portion. A first end of the pivot member may be coupled to the first handle portion. A second end of the pivot member may be coupled to the door release member. The pivot point may be provided between the first and second ends of the pivot

member.

[0006] The first handle portion may be pivotally connectable to the vehicle at an end opposite to the second handle portion.

5 [0007] Each of the first and second handle portions may comprise an engaging surface at an interface between the first and second handle portions. An interaction between the engaging surfaces may cause the second handle portion to move with the first handle portion when
10 the handle is pulled away from the vehicle. The engaging surfaces of the first and second handle portions may be configured to disengage when the first handle portion is pushed towards the vehicle. The engaging surfaces of the first and second handle portions may be angled, e.
15 g. relative to a direction in which the handle is pulled. For example, the engaging surfaces of the first and second handle portions may be wedge shaped. The engaging surface of the second handle portion may overlap the engaging surface of the first handle portion.

20 [0008] The vehicle door handle assembly may comprise a locating member provided on one of the first and second handle portions. The vehicle door handle assembly may further comprise a recess provided on the other of the first and second handle portions. The recess may
25 receive the locating member. The locating member and recess may cooperate so as to link the first and second handle portions together, e.g. in an initial position and when the handle is pulled. The locating member and recess may move apart when the first handle portion is pushed. The locating member and recess may be provided at the interface between the first and second handle
30 portions.

[0009] The door release member may be configured to be retracted from the vehicle when the first handle portion is pulled or pushed relative to the vehicle. The door release member may be configured to connect to a door release mechanism.

[0010] A door, e.g. of a vehicle, such as a motor vehicle, may comprise the above-mentioned vehicle door handle assembly. The door may be biased away from a closed position such that the door may open at least partially upon release of a door release mechanism to which the door handle assembly may connect.

[0011] The door may slide and/or rotate when it opens.
45 The door may provide access to a cabin of the vehicle and/or a cargo space of the vehicle (e.g. boot, trunk or any other cargo area).

[0012] A vehicle, such as a motor vehicle, may comprise the above-mentioned vehicle door handle assembly or the above-mentioned door.

[0013] To avoid unnecessary duplication of effort and repetition of text in the specification, certain features are described in relation to only one or several aspects or embodiments of the invention. However, it is to be understood that, where it is technically possible, features described in relation to any aspect or embodiment of the invention may also be used with any other aspect or embodiment of the invention.

Brief Description of the Drawings

[0014] For a better understanding of the present invention, and to show more clearly how it may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1 is a pictorial representation of a motor vehicle comprising a sliding door shown in a partially open configuration; and

Figures 2a, 2b and 2c (collectively Figure 2) are schematic side views of a vehicle door handle assembly according to an example of the present disclosure with Figures 2a, 2b and 2c showing the vehicle door handle assembly in a neutral (initial) position, a pulled open position and a pushed open position respectively.

Detailed Description

[0015] With reference to Figure 1, the present disclosure relates to a vehicle, such as a motor vehicle 10, comprising a door 12. The door 12 may provide access to a cabin of the vehicle and/or a cargo space of the vehicle (e.g. boot, trunk or any other cargo area). As depicted, the door 12 may translate, e.g. slide, when it opens, although in other arrangements the door may rotate or rotate and slide as it moves between open and closed positions.

[0016] As depicted, the door 12 may be provided at a side of the motor vehicle 10, although it may be provided at other positions, such as the rear of the motor vehicle. The door 12 may selectively cover an aperture 14 in a body structure 16 of the motor vehicle 10. The sliding door 12 may be provided in addition to other doors of the vehicle, such as a pivotably openable front door 18.

[0017] The motor vehicle 10 may comprise one or more guide tracks 20A, 20B, 20C, which may guide the door 12 during opening and closing of the door. A first guide track 20A may be provided at or towards the top of the door 12. A second guide track 20B may be provided at an intermediate point between the top and bottom of the door 12. A third guide track 20C may be provided at or towards the bottom of the door 12. Although three guide tracks are shown, it will be appreciated that any number of guide tracks may be provided and they may be provided at other locations than those shown in Figure 1. Alternatively, the door may be coupled to the vehicle 10 by virtue of one or more hinges.

[0018] The door 12 comprises a handle assembly 40, which is configured to allow a user to selectively release the door 12 from a locked state. The handle assembly 40 also provides a graspable handle for the user to move the door between open and closed positions.

[0019] With reference to Figure 2, details of the handle assembly 40 will now be described. As depicted, the handle assembly 40 comprises a first handle portion 41 and

a second handle portion 42. The first and second handle portions 41, 42 may together form the graspable handle, e.g. defining an opening 44 between the handle and a surface 13 of the door 12. The first handle portion 41 may be substantially elongate and the first handle portion 41 may provide a majority of the graspable handle. However, in alternative arrangements, the second handle portion 42 may provide a majority of the graspable handle or the first and second handle portions 41, 42 may provide similarly sized portions of the graspable handle.

[0020] The first handle portion 41 may be pivotally connectable to the vehicle 10 at a first end 41a of the first handle portion. The first handle portion 41 may be predominantly outside the vehicle 10. However, the first end 41a of the first handle portion 41 may extend into the vehicle (e.g. behind the surface 13 of the door 14). As shown, the first end 41a may comprise an opening 45 for receiving a shaft (not shown) about which the first handle portion 41 may rotate.

[0021] The first handle portion 41 further comprises a second end 41b opposite the first end 41a. The first handle portion 41 engages the second handle portion 42 at the second end 41b of the first handle portion 41. In particular, the first handle portion 41 may comprise a first engaging surface 46a at the second end 41b. The second handle portion 42 may comprise a second engaging surface 46b at a second end 42b of the second handle portion 42. The first and second engaging surfaces 46a, 46b may engage one another at an interface between the first and second handle portions.

[0022] The second engaging surface 46b of the second handle portion 42 may overlap the first engaging surface 46a of the first handle portion 41, e.g. when facing the handle assembly from outside the vehicle 10. By way of example, the first and second engaging surfaces 46a, 46b of the first and second handle portions 41, 42 may be angled, e.g. relative to a direction in which the handle is pulled. For example, the first and second engaging surfaces 46a, 46b may be wedge shaped.

[0023] As depicted in Figure 2b, an interaction between the first and second engaging surfaces 46a, 46b may cause the second handle portion 42 to move with the first handle portion 41 when the handle is pulled away from the vehicle. In other words, the first and second handle portions 41, 42 move together when the handle is pulled away from the vehicle 10.

[0024] By contrast, as depicted in Figure 2c, the first and second engaging surfaces 46a, 46b may be configured to disengage when the first handle portion 41 is pushed towards the vehicle 10. In other words, the first handle portion 41 moves relative to the second handle portion 42 when the first handle portion is pushed towards the vehicle 10.

[0025] The handle assembly 40 further comprises a door release member 43 to which each of the first and second handle portions 41, 42 are operatively coupled. The door release member 43 may be configured to be retracted from the vehicle 10 when the first handle portion

41 is pulled or pushed relative to the vehicle. The door release member 43 may be substantially elongate and may extend from one side of the door surface 13 to the other side of the door surface 13. The door release member 43 may extend in a direction that is approximately perpendicular to a direction in which the first handle portion 41 extends. The door release member 43 may slide relative to the vehicle 10 and one or more guides (not shown) may be provided to constrain movement of the door release member 43. The door release member 43 may extend away from a first end 42a of the second handle portion 42 (the first end 42a being opposite the second end 42b).

[0026] The door release member 43 may be configured to connect to a door release mechanism (not depicted). The door release member 43 may comprise an opening 47 at a first end 43a that connects to the door release mechanism. Retraction of the door release member 43 may release the door release mechanism from a locked state.

[0027] The handle assembly 40 may further comprise an elongate pivot member 48 that may operatively couple the door release member 43 to each of the first and second handle portions 41, 42. The pivot member 48 may pivot about a pivot point 48c on the second handle portion 42. A first end 48a of the pivot member 48 may be pivotally coupled to the first handle portion 41. A second end 48b of the pivot member 48 may be pivotally coupled to the door release member 43, e.g. at a second end 43b of the door release member (opposite the first end 43a). The pivot point 48c may be provided between the first and second ends 48a, 48b of the pivot member 48.

[0028] The pivot member 48 may extend across the interface between the first and second handle portions 41, 42 with the interface being between the pivot point 48c and the first end 48a of the pivot member 48. The pivot member 48 may be provided between side walls of the first and second handle portions 41, 42 and within respective cavities defined by the first and second handle portions. As such, the pivot member 48 may be substantially concealed from view.

[0029] With reference to Figure 2c, the handle assembly 40 may further comprise a locating member 49a provided on the first handle portion 41. A corresponding recess 49b may be provided on the second handle portion 42. The recess 49b may receive the locating member 49a. The locating member and recess 49a, 49b may be provided at the interface between the first and second handle portions. In an alternative arrangement, the locating member and recess may be provided on the second and first handle portions respectively. The locating member and recess 49a, 49b may cooperate so as to link the first and second handle portions 41, 42 together, e.g. in an initial position (depicted in Figure 2a) and when the collective handle is pulled (depicted in Figure 2b). The locating member and recess 49a, 49b may move apart when the first handle portion 41 is pushed (as depicted in Figure 2c).

[0030] Operation of the handle assembly 40 will now be described. Figure 2a depicts an initial neutral position for the handle. As shown in Figure 2b, when the handle assembly 40 is pulled, the engaging surface 46a of the first handle portion 41 engages the engaging surface 46b of the second handle portion 42 and the first and second handle portions 41, 42 move together. This in turn causes the second handle portion 42 to move away from the vehicle surface 13, thereby causing retraction of the door release member 43 and release of the locking mechanism. The pivot member 48 has not rotated relative to the second handle portion 42 due to the first and second handle portions moving together. By contrast, as shown in Figure 2c, when the first handle portion 41 is pushed, the first and second engaging surfaces 46a, 46b move apart and the relative movement of the first and second handle portions 41, 42 causes the pivot member 48 to rotate about the pivot point 48c. This in turn results in the retraction of the door release member 43 and release of the locking mechanism.

[0031] Although not depicted, it will be appreciated that at least one biasing element (e.g. a spring) may be provided to urge the first handle portion 41 into the neutral position shown in Figure 2a from deviations either side of the neutral position. At least one further biasing element (e.g. spring) may also be provided to urge the second handle portion 42 or door release member 43 into the neutral position.

[0032] Furthermore, the door 12 may be biased away from a closed position such that the door may open at least partially upon release of the door release mechanism. As such, when the first handle portion 41 is pushed, the door release mechanism may unlock the door and the door may unclench away from its closed position. A biasing mechanism for the door that biases the door away from the closed position, may exert a force that exceeds the pushing force exerted on the first handle portion in the event that such forces are antagonistic. A user may therefore be able to unlock and open the door with their body (e.g. without using their hands). The handle assembly 40 also has a compact form factor, which advantageously minimises air resistance.

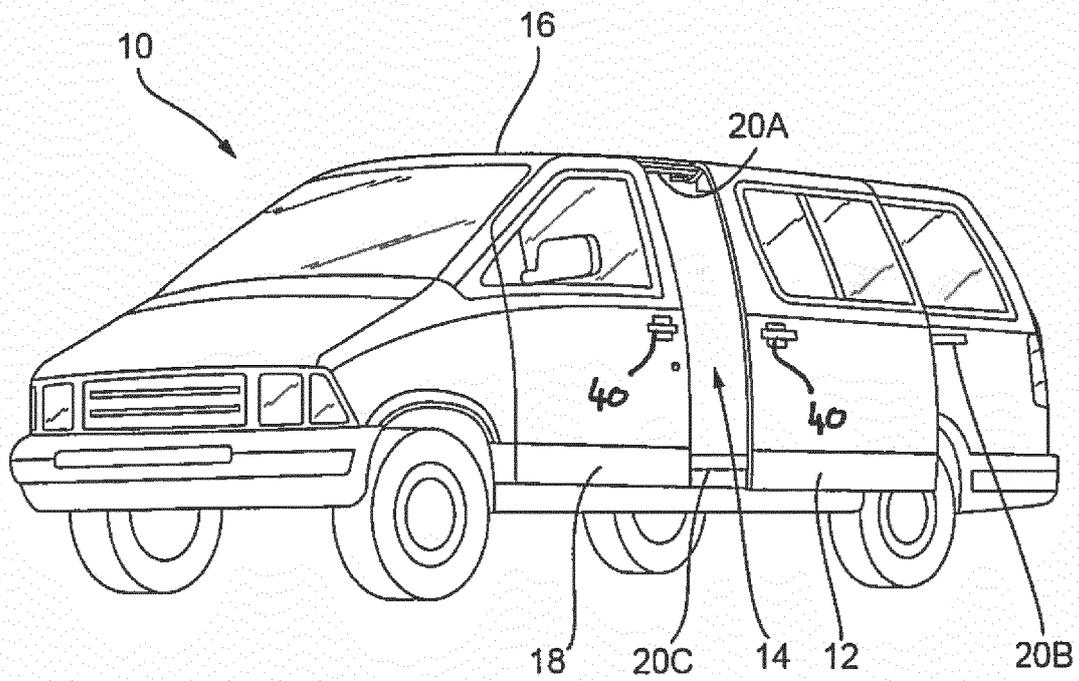
[0033] It will be appreciated by those skilled in the art that although the invention has been described by way of example, with reference to one or more examples, it is not limited to the disclosed examples and alternative examples may be constructed without departing from the scope of the invention as defined by the appended claims.

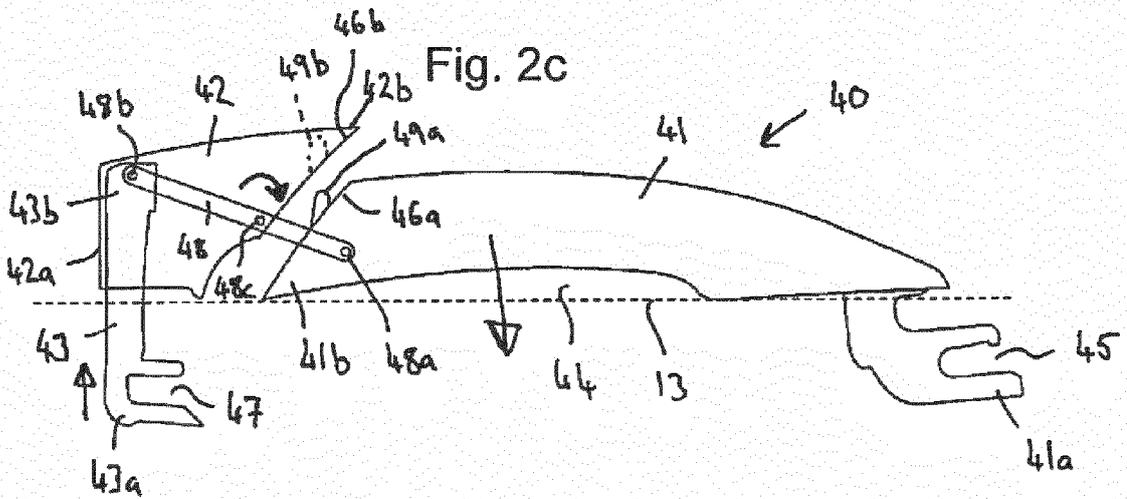
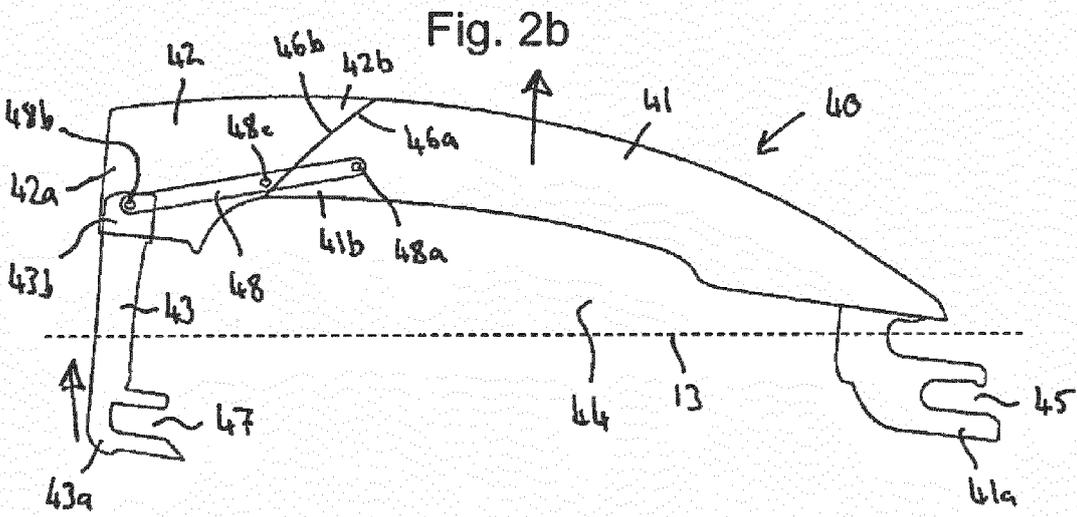
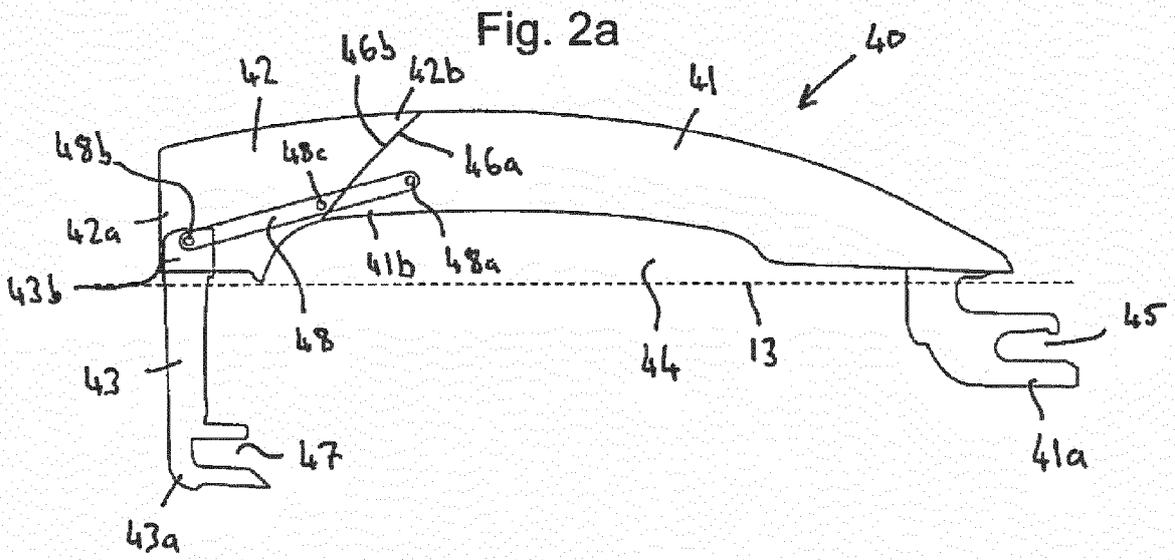
Claims

1. A vehicle door handle assembly for a door of a vehicle, the vehicle door handle assembly comprising a first handle portion and a second handle portion, wherein the vehicle door handle assembly further comprises a door release member to which each of

- the first and second handle portions are operatively coupled,
 wherein the first and second handle portions move together when the handle is pulled away from the vehicle, the door release member moving with the second handle portion to release the door, and wherein the first handle portion moves relative to the second handle portion when the first handle portion is pushed towards the vehicle, the door release member being operatively coupled to the first handle portion such that the movement of the first handle portion relative to the second handle portion causes movement of the door release member to release the door.
2. The vehicle door handle assembly of claim 1 further comprising a pivot member that operatively couples the door release member to each of the first and second handle portions.
 3. The vehicle door handle assembly of claim 2, wherein the pivot member pivots about a pivot point on the second handle portion.
 4. The vehicle door handle assembly of claim 2 or 3, wherein a first end of the pivot member is coupled to the first handle portion and a second end of the pivot member is coupled to the door release member.
 5. The vehicle door handle assembly of claims 3 and 4, wherein the pivot point is provided between the first and second ends of the pivot member.
 6. The vehicle door handle assembly of any of the preceding claims, wherein the first handle portion is pivotally connectable to the vehicle at an end opposite to the second handle portion.
 7. The vehicle door handle assembly of any of the preceding claims, wherein each of the first and second handle portions comprises an engaging surface at an interface between the first and second handle portions, wherein an interaction between the engaging surfaces causes the second handle portion to move with the first handle portion when the handle is pulled away from the vehicle.
 8. The vehicle door handle assembly of claim 7, wherein the engaging surfaces of the first and second handle portions are configured to disengage when the first handle portion is pushed towards the vehicle.
 9. The vehicle door handle assembly of claim 7 or 8, wherein the engaging surfaces of the first and second handle portions are angled relative to a direction in which the handle is pulled.
 10. The vehicle door handle assembly of any of the preceding claims further comprising:
 - a locating member provided on one of the first and second handle portions; and
 - a recess provided on the other of the first and second handle portions, wherein the recess receives the locating member and the locating member and recess cooperate so as to link the first and second handle portions together, the locating member and recess moving apart when the first handle portion is pushed.
 11. The vehicle door handle assembly of any of the preceding claims, wherein the door release member is configured to be retracted from the vehicle when the first handle portion is pulled or pushed relative to the vehicle.
 12. The vehicle door handle assembly of any of the preceding claims, wherein the door release member is configured to connect to a door release mechanism.
 13. A door comprising the vehicle door handle assembly of any of the preceding claims.
 14. The door of claim 13, wherein the door is biased away from a closed position such that the door opens at least partially upon release of a door release mechanism to which the door handle assembly connects.
 15. A vehicle comprising the door of claim 13 or 14.

Fig. 1





ANNEX TO THE EUROPEAN SEARCH REPORT
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