



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
22.01.2014 Bulletin 2014/04

(51) Int Cl.:
E05B 7/00 (2006.01) E05B 65/20 (2006.01)

(21) Application number: **13176729.5**

(22) Date of filing: **16.07.2013**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

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(30) Priority: **17.07.2012 SE 1250873**

(54) **Handle configuration**

(57) The present invention relates to a handle configuration (I; II; III; IV; V; VI) for a vehicle door (2) provided with an interior closing handle (10; 110; 210; 310; 410; 510) for operating said vehicle door (2), which door (2) is provided with operating means for causing an opening mechanism to put the door into an openable state, characterised in that said operating means comprises a lever arm element (22; 122; 222; 322; 422; 522) suspended

for articulation relative to said closing handle (10; 110; 210; 310; 410; 510) and adapted to being gripped at the same time as said closing handle (10; 110; 210; 310; 410; 510) in order to actuate a link configuration (132; 222b, 232; 332, 334; 432, 434; 522b, 532) which is situated in the closing handle and is part of said opening mechanism.

The present invention relates also to a vehicle door and a vehicle.

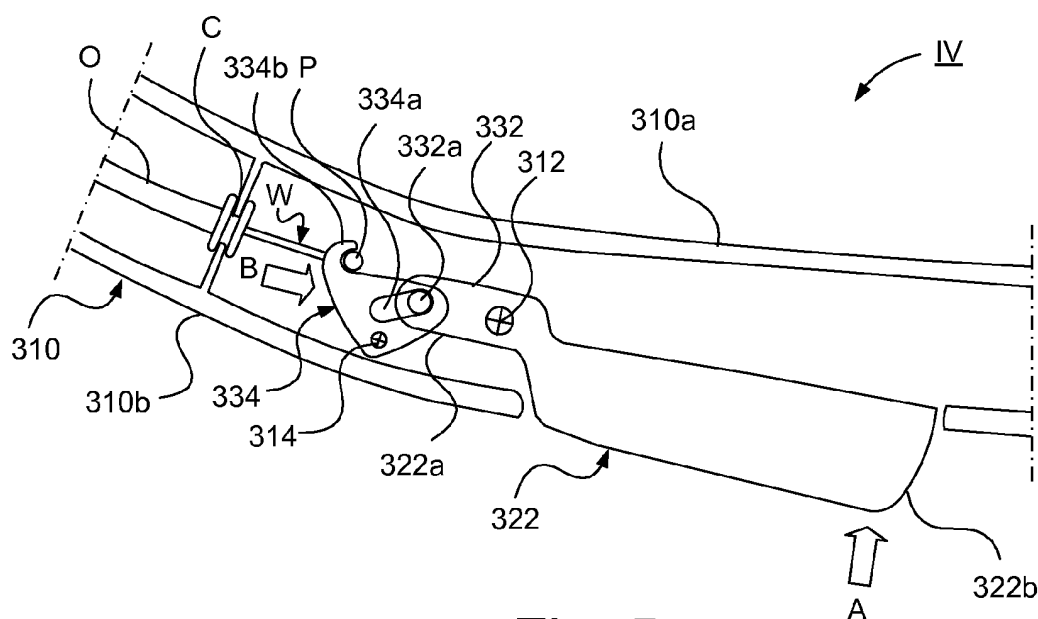


Fig. 5

Description

TECHNICAL FIELD

[0001] The invention relates to a handle configuration according to the preamble of claim 1. The invention relates also to a motor vehicle.

TECHNICAL FIELD

[0002] A vehicle door is equipped on the inside with opening means for causing an opening mechanism to put the door into an openable state. The opening means normally takes the form of a separate unit connected to a wire whereby, when the operating means is used for opening purposes, the opening mechanism imparts to the wire a pulling motion which puts the door into an openable state.

[0003] To operate the vehicle door, i.e. to open or close it, it is provided with an interior closing handle. This normally entails change of hand grip from the operating means to the closing handle, with consequent risk of losing control of the door between releasing the opening means and grasping the closing handle, e.g. when there is strong wind or the door is heavy or the like.

[0004] One solution to this is for the opening means to be situated close to the closing handle to make it possible to open the door with the same hand grip.

[0005] US20040094974, US20030052490, DE202009010762, DE102009052685, DE3000231 and GB779517 refer to door handles for vehicles where the opening means is situated close to the closing handle to allow the possibility of opening with the same hand grip.

OBJECT OF THE INVENTION

[0006] An object of the present invention is to propose a handle configuration for a vehicle door which affords the possibility of safe, easy and ergonomic opening and closing and is efficient with regard to space.

SUMMARY OF THE INVENTION

[0007] These and other objects indicated by the description set out below are achieved by a handle configuration, a vehicle door and a vehicle of the kind indicated in the introduction which further present the features indicated in the characterising part of the attached independent claim 1. Preferred embodiments of the handle configuration are defined in the attached dependent claims 2-9.

[0008] The invention achieves the objects with a handle configuration for a vehicle door provided with an interior closing handle for operating said door and with operating means for causing an opening mechanism to put the door into an openable state, which operating means comprises a lever arm element suspended for articulation relative to said closing handle and adapted to being

gripped at the same time as said closing handle in order to actuate a link configuration situated in it of said opening mechanism. Easy and ergonomic opening and closing are thus made possible in that a single hand grip involving no change of hand grip is made possible by said articulated lever arm element, resulting in safer operation of the vehicle door. Such a handle configuration with said lever arm element preferably situated at the underside of the closing handle will lead the operator when operating the closing handle to intuitively grip round the closing handle's lever arm element when opening the door and to grip on the side of the lever arm element when closing the door. The result is a handle configuration which is efficient with regard to space in that the link configuration is situated in the closing handle whereby said lever arm element articulated relative to the closing handle helps to facilitate compactness of the link configuration in the closing handle. In one embodiment of said handle configuration said lever arm element partly protrudes from the closing handle, facilitating the opening operation in that the lever arm element is readily accessible and leads the operator intuitively and in a tactile way to perform said opening operation when gripping the closing handle.

[0009] In one embodiment of said handle configuration said opening mechanism comprises a wire device adapted to being subjected to pulling motion by said link configuration in order to put the vehicle door into an openable state, resulting in an effective way of putting the door into an openable state.

[0010] In one embodiment of said handle configuration said link configuration is an integral part of said lever arm element, which means that few parts are needed, making cost-effective manufacture possible.

[0011] In one embodiment of said handle configuration said link configuration is part of said lever arm element, with consequent scope for different designs of the link configuration when it is a separate part of the lever arm element.

[0012] In one embodiment of said handle configuration said lever arm element is suspended for articulation at its one end and has a pivotable free end, with consequent scope for efficient operation of the lever arm element.

[0013] In one embodiment of said handle configuration said link configuration comprises said pivotable end of the lever arm element, resulting in effective pulling motion of said wire.

[0014] In one embodiment of said handle configuration said link configuration comprises part of said lever arm element close to said one end, resulting in effective pulling motion of said wire.

[0015] In one embodiment of said handle configuration said link configuration comprises a separate link arm element adapted to actuating said wire device, with consequent scope for different designs of the link configuration depending on the formation of the closing handle.

DESCRIPTION OF DRAWINGS

[0016] The present invention will be better understood by reading the detailed description set out below in conjunction with the attached drawings, in which the same reference notations are used for similar items throughout the various views,

Fig. 1 schematically illustrates a motor vehicle according to an embodiment of the present invention,

Fig. 2a is a schematic side view of a handle configuration according to an embodiment of the present invention,

Fig. 2b is a schematic cross-sectional view A-A of the handle configuration in Fig. 2a,

Fig. 3 is a schematic side view of a handle configuration according to an embodiment of the present invention,

Fig. 4 is a schematic side view of a handle configuration according to an embodiment of the present invention,

Fig. 5 is a schematic side view of a handle configuration according to an embodiment of the present invention,

Fig. 6 is a schematic side view of a handle configuration according to an embodiment of the present invention, and

Fig. 7 is a schematic side view of a handle configuration according to an embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS

[0017] Fig. 1 illustrates schematically a motor vehicle 1 according to an embodiment of the present invention. The vehicle here exemplified is a heavy vehicle in the form of a truck. It may alternatively be any suitable vehicle, e.g. a bus or a car. The vehicle is equipped with a door 2 provided with an interior closing handle 10 for operating said door according to the present invention.

[0018] Fig. 2a is a schematic side view of a handle configuration I according to an embodiment of the present invention, and Fig. 2b a cross-section A-A of the handle configuration I in Fig. 2a.

[0019] The handle configuration according to Fig. 2a comprises an interior closing handle 10 for operating a vehicle door, which handle is consequently intended to be situated on the inside of the door.

[0020] The handle configuration I comprises an opening means 20 for using an undepicted opening mechanism to put the vehicle door into an openable state. Said

opening means comprises a lever arm element 22 suspended for articulation about a pivot 12 in said closing handle and adapted to being gripped at the same time as said closing handle 10 in order to actuate a link configuration situated in it of said opening mechanism. Figs. 3-7 depict various embodiments of a handle configuration II; III; IV; V; VI with different forms of said link configuration.

[0021] Said closing handle 10 has an upper side 10a and an underside 10b and a substantially oval cross-section.

[0022] Said lever arm element 22 partly protrudes from, and is arranged to run along part of, the closing handle. It is arranged to run along part of the underside of said closing handle in order to facilitate operation by the fingers gripping round the closing handle. Said lever arm element has a long narrow configuration, is suspended for articulation at its one end 22a and has a pivotable free end 22b.

[0023] The handle configuration I comprises a wire device W adapted to being subjected to pulling motion by said link configuration in order to put the vehicle door into an openable state. The handle configuration in one variant is connected to an opening configuration of the opening mechanism, not depicted, which configuration is situated close to the rear part of the vehicle door.

[0024] Fig. 3 is a schematic side view of a handle configuration II for a vehicle door according to an embodiment of the present invention.

[0025] The handle configuration II comprises an interior closing handle 110 for operating said vehicle door. The handle configuration II comprises an opening means 120 for causing an opening mechanism to put the door into an openable state.

[0026] Said opening mechanism comprises a link configuration 130 situated in the closing handle 110. Said opening mechanism comprises a wire device W adapted to being subjected to pulling motion by said link configuration in order to put the vehicle door into an openable state.

[0027] Said opening means 120 comprises a lever arm element 122 suspended for articulation relative to said closing handle and adapted to being gripped at the same time as said closing handle 110 in order to actuate the link configuration 130 situated in it of said opening mechanism. Said lever arm element 122 is arranged for articulation about a pivot 112 connected to the closing handle in one end region of the lever arm element. Said lever arm element is consequently suspended for articulation at its one end 122a and has a pivotable free opposite end 122b. Said lever arm element partly protrudes from the closing handle.

[0028] Said link configuration 130 is an integral part of said lever arm element 122. Said lever arm element is arranged to run along and partly protrude from the underside of said closing handle 110.

[0029] The lever arm element 122 has a link portion 132 which is part of the link configuration 130 and which

runs from the lever arm element's one articulated end region substantially at right angles to the lever arm element's main direction of extent and consequently at right angles to the main direction of extent of the closing handle 110 and to the closing handle's upper side 110a.

[0030] Said link portion 132 of the lever arm element is connected, close to its end region, to said wire device W via a wire end part P. The wire of the wire device W is arranged to run in through an enclosure O via a wire mounting C to which said enclosure O for the wire is fastened, which wire is arranged for movement relative to the enclosure and is adapted to being led to an opening configuration situated close to the rear part of the vehicle door.

[0031] Said wire device W is arranged to run in the closing handle 110 from said link portion 132 in the same direction as the lever arm element 122.

[0032] External force applied in the direction of the arrow A when gripping round the closing handle's underside 110b on said pivotable free end 122b is arranged to be transmitted via the lever arm element's link portion 132 to the wire device for said pulling motion of the wire device in the direction of the arrow B. Said wire device W in one variant is arranged to spring back so that the lever arm element pivots back to its original position.

[0033] Fig. 4 is a schematic side view of a handle configuration III according to an embodiment of the present invention.

[0034] The handle configuration III in this embodiment differs from the handle configuration II in the embodiment in Fig. 3 in the formation of the lever arm element 222 and the link configuration 230. In this case the link configuration forms part of said lever arm element.

[0035] Said link configuration 230 comprises a separate link arm element 232 arranged to act upon said wire device W. Said separate link arm element is arranged for pivoting in the closing handle 210 about a pivot 214 which is firmly connected to the closing handle. Said separate link arm element is situated at the pivotable free end 222b of said lever arm element 222. Said link arm element has a first end portion 232a abutting against an upper part of the lever arm element 222. Said link arm element has a second end portion 232b situated at a distance from the first end portion 232a, towards the upper side 210a of the closing handle.

[0036] Said separate link arm element 232 is connected, close to its second end portion 232b, to said wire device W via a wire end part P of the wire device. Said wire device is arranged to run in the closing handle from said link arm element 232 in the same direction as the lever arm element 222, towards and past the articulated end 222a of the lever arm element.

[0037] Said lever arm element 222 is adapted to cooperating with said separate link arm element 232 in such a way that external force applied in the direction of the arrow A, when gripping round the underside 210b of the closing handle, on said pivotable free end 222b so that the lever arm element pivots about the pivot 212 is ar-

ranged to be transmitted from the lever arm element to the link arm element 232 and via the link arm element to the wire device W for said pulling motion of the wire device in the direction of the arrow B.

[0038] The force applied on the lever arm element's said pivotable free end 222b is arranged to be transmitted as a result of the upper portion of said pivotable end being applied forcefully to the link arm element's first end portion 232a so that it rotates, whereupon the second end portion 232b subjects the wire device W to said pulling motion. Said wire device in one variant is arranged to spring back so that the lever arm element pivots back to its original position.

[0039] Fig. 5 is a schematic side view of a handle configuration IV according to an embodiment of the present invention.

[0040] The handle configuration IV in this embodiment differs from the handle configuration III in the embodiment in Fig. 4 in the formation of the lever arm element 322 and the link configuration 330. In this case the link configuration forms part of said lever arm element.

[0041] Said lever arm element 322 is arranged for articulation about a pivot 312 situated at one end 322a of the lever arm element and firmly connected to the closing handle 310. Said lever arm element has at said pivot 312 as part of the link configuration 330 a link portion 332 running in the direction of extent of the closing handle away from the lever arm element's pivotable free end 322b. Said link portion has in the end region a pivot 332a. The closing handle has an upper side 310a and an underside 310b.

[0042] Said link configuration 330 comprises a separate link arm element 334 arranged to act upon said wire device W. Said separate link arm element is arranged for pivoting in the lower region of the closing handle about a pivot 314 which is firmly connected to the closing handle.

[0043] Said separate link arm element 334 has an oblong slotlike aperture 334a in which said pivot 332a of the link portion 332 is arranged to run. Said separate link arm element is pivotably connected for articulation to the link portion 332 at said pivot 332a. Said link arm element has in line with the link portion 332 an end portion 334b situated at a distance from said aperture 334a and said pivot 314 firmly connected to the closing handle.

[0044] Said separate link arm element 334 is connected, close to its end portion 334b, to said wire device W via a wire end part P. Said wire device W is arranged to run in the closing handle from, and in line with, said link portion 332.

[0045] Said link portion 332 of the lever arm element is adapted to cooperating with said separate link arm element 334 in such a way that external force applied in the direction of the arrow A, when gripping round the closing handle's underside 310b, on said pivotable free end 322b is arranged to be transmitted from the link portion 332 to the link arm element 334 and via the link arm element to the wire device W for said pulling motion of

the wire device W in the direction of the arrow B.

[0046] The force applied on said pivotable free end 322b of the lever arm element is arranged to be transmitted as a result of the pivot of the link portion 332 causing the separate link arm element 334 to pivot about the pivot 332a while at the same time running in the slotlike aperture 334a, whereupon the end portion 334b imparts said pulling motion to the wire device W. In one variant said wire device W is arranged to spring back so that the lever arm element pivots back to its original position.

[0047] Fig. 6 is a schematic side view of a handle configuration V according to an embodiment of the present invention.

[0048] The handle configuration V in this embodiment differs from the handle configuration IV in the embodiment in Fig. 5 in the formation of the lever arm element 422 and the link configuration 430. In this case the link configuration forms part of said lever arm element.

[0049] Said lever arm element 422 is arranged for articulation about a pivot 412 situated at one end 422a of the lever arm element and firmly connected to the closing handle 410. Said lever arm element has at said pivot an L-shaped link portion 432 with a first portion 432a arranged to run from the lever arm element's pivotable free end 422b in the closing handle's direction of extent, and a second portion 432b arranged to run from said first portion 432a substantially at right angles to the closing handle's direction of extent towards the closing handle's upper region. Said link portion 432 of the lever arm element has adjacent to the closing handle's upper side 410a a pivot 432c situated in the end region of its second portion 432b.

[0050] Said link configuration 430 comprises a separate link arm element 434 arranged to act upon said wire device W. Said separate link arm element has an oblong slotlike aperture 434a in which said pivot 432c of the link portion 432 is arranged to run. Said separate link arm element is pivotably connected for articulation to the link portion 432 at said pivot 432c. Said separate link arm element is pivotably connected for articulation at a pivot 434b which is firmly connected to the closing handle.

[0051] Said separate link arm element has an end portion 434b adjacent to the closing handle's underside 410b at a distance from, and substantially opposite to, said aperture 434a.

[0052] Said separate link arm element is connected, close to its end portion 434b, to said wire device W via a wire end part P. Said wire device is arranged to run in the closing handle 410 from said link portion 432 in the longitudinal extent of the closing handle.

[0053] Said link portion 432 of the lever arm element 422 is adapted to cooperating with said separate link arm element 434 in such a way that external force applied in the direction of the arrow A, when gripping round the closing handle's underside 410b, on said pivotable free end 422b is arranged to be transmitted from the link portion 432 to the link arm element 434 and via the link arm element to the wire device W for said pulling motion of

the wire device W in the direction of the arrow B.

[0054] The force applied on said pivotable free end 422b of the lever arm element is arranged to be transmitted as a result of the pivot 432c of the link portion 432 causing the separate link arm element 434 to pivot about the pivot 432c while at the same time running in the slotlike aperture 434a, whereupon its end portion 434b imparts said pulling motion to the wire device W. In one variant said wire device W is arranged to spring back so that the lever arm element pivots back to its original position.

[0055] Fig. 7 is a schematic side view of a handle configuration VI according to an embodiment of the present invention.

[0056] The handle configuration in this embodiment differs from that in the embodiment in Fig. 4 in the formation of the lever arm element 522 and the link configuration 530. In this case the link configuration forms part of said lever arm element.

[0057] Said link configuration 530 comprises a separate link arm element 532 arranged to act upon said wire device W. Said separate link arm element is arranged for pivoting in the closing handle 510 about a pivot 514 which is firmly connected to, and situated adjacent to the upper side 510a of, the closing handle. Said separate link arm element is situated at the pivotable free end 522b of said lever arm element 522. Said separate link arm element has a first end portion 532a abutting against an upper part of the lever arm element. Said separate link arm element has a second end portion 532b situated at a distance from the first end portion 532a.

[0058] Said separate link arm element 532 is connected, close to its second end portion 532b, to said wire device W via a wire end part P. Said wire device is arranged to run in the closing handle 510 from said separate link arm element away from said articulated end 522a of the lever arm element.

[0059] Said lever arm element 522 is adapted to cooperating with said separate link arm element 532 in such a way that external force applied in the direction of the arrow A, when gripping round the underside 510b of the closing handle, on said pivotable free end 522b is arranged to be transmitted from the lever arm element to the link arm element 532 and via the link arm element to the wire device W for said pulling motion of the wire device in the direction of the arrow B.

[0060] The force applied on said pivotable free end 522b of the lever arm element is arranged to be transmitted as a result of the upper part of said pivotable end being applied forcefully against the link arm element's first end portion 532a so that it rotates, whereupon the second end portion 532b imparts said pulling motion to the wire device W. Said wire device in one variant is arranged to spring back so that the lever arm element pivots back to its original position.

[0061] The foregoing description of the preferred embodiments of the present invention is provided for illustrative and descriptive purposes. It is not intended to be

exhaustive, nor to restrict the invention to the variants described. Many modifications and variations will obviously suggest themselves to one skilled in the art. The embodiments have been chosen and described in order best to explain the principles of the invention and their practical applications and thus make it possible for one skilled in the art to understand the invention for different embodiments and with the various modifications appropriate to the intended use.

Claims

1. A handle configuration (I; II; III; IV; V; VI) for a vehicle door (2) provided with an interior closing handle (10; 110; 210; 310; 410; 510) for operating said vehicle door (2), which door (2) is provided with operating means for causing an opening mechanism to put the door into an openable state, **characterised in that** said operating means comprises a lever arm element (22; 122; 222; 322; 422; 522) suspended for articulation relative to said closing handle (10; 110; 210; 310; 410; 510) and adapted to being gripped at the same time as said closing handle (10; 110; 210; 310; 410; 510) in order to actuate a link configuration (132; 222b, 232; 332, 334; 432, 434; 522b, 532) which is situated in the closing handle and is part of said opening mechanism.
2. A handle configuration according to claim 1, in which said lever arm element (22; 122; 222; 322; 422; 522) partly protrudes from the closing handle (10; 110; 210; 310; 410; 510).
3. A handle configuration according to claim 1 or 2, in which said opening mechanism comprises a wire device (W) adapted to being subjected to pulling motion by said link configuration (132; 222b, 232; 332, 334; 432, 434; 522b, 532) in order to put the vehicle door into an openable state.
4. A handle configuration according to any one of claims 1-3, in which said link configuration (132) is an integral part of said lever arm element (122).
5. A handle configuration according to any one of claims 1-3, in which said link configuration (222b, 232; 332, 334; 432, 434; 522b, 532) is part of said lever arm element (122; 222; 322; 422; 522).
6. A handle configuration according to any one of claims 1-5, in which said lever arm element (22; 122; 222; 322; 422; 522) is suspended for articulation at its one end (22a; 122a; 222a; 322a; 422a; 522a) and has a pivotable free end (22b; 122b; 222b, 322b; 422b; 522b).
7. A handle configuration according to claim 6, in which

said link configuration (222b, 232; 522b, 532) comprises said pivotable free end (222b, 522b) of the lever arm element (222, 522).

8. A handle configuration according to claim 6, in which said link configuration (132; 332; 334; 432, 434) comprises a portion (132; 332; 432) of said lever arm element (122; 322; 422) close to said one end.
9. A handle configuration according to any one of claims 5-8, in which said link configuration (222b, 232; 332, 334; 432, 434; 522b, 532) comprises a separate link arm element (232; 334; 434; 532) arranged to act upon said wire device (W).
10. A vehicle door (2) provided with a handle configuration (I; II; III; IV; V; VI) according to any one of claims 1-9.
11. A vehicle (1) provided with a vehicle door (2) according to claim 10.

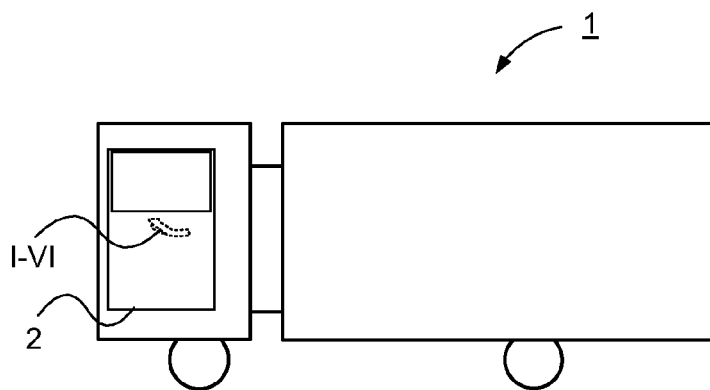


Fig. 1

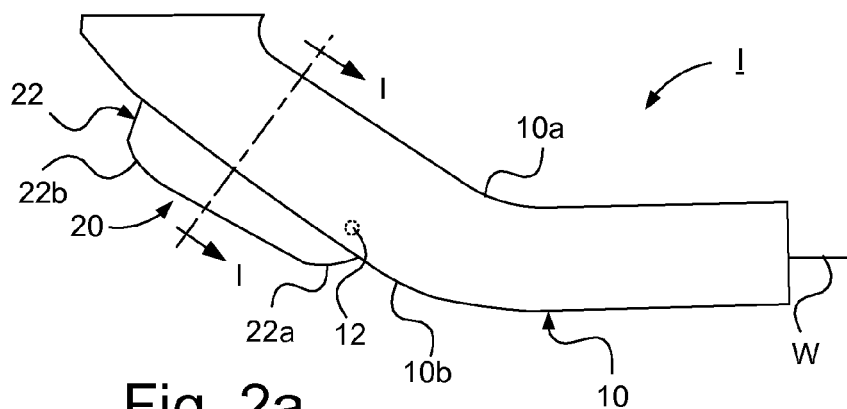


Fig. 2a

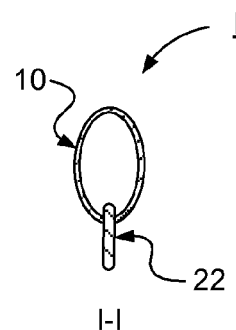


Fig. 2b

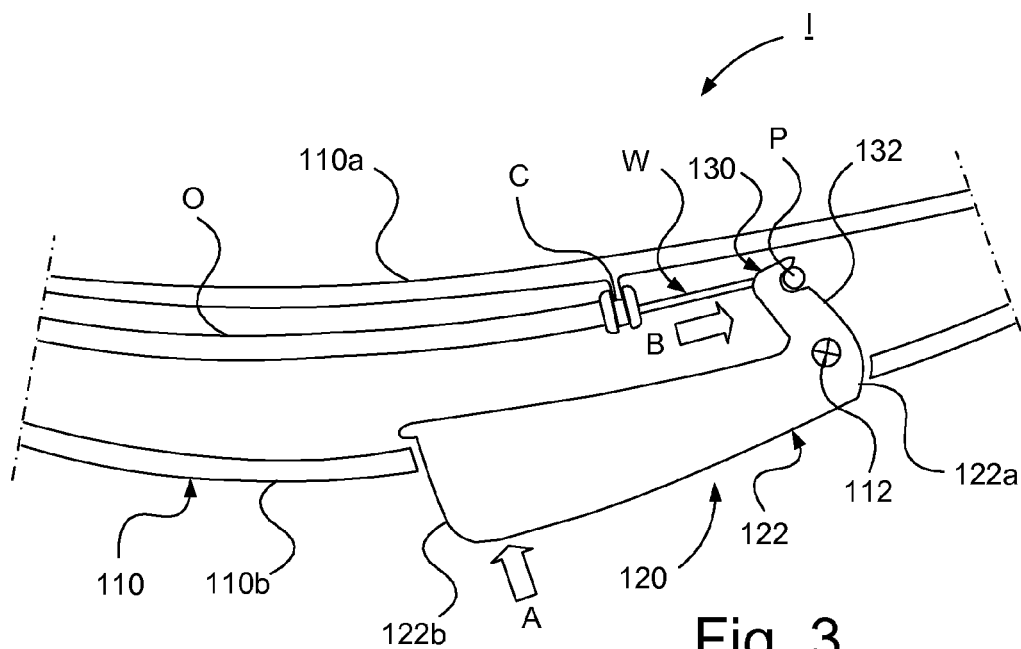
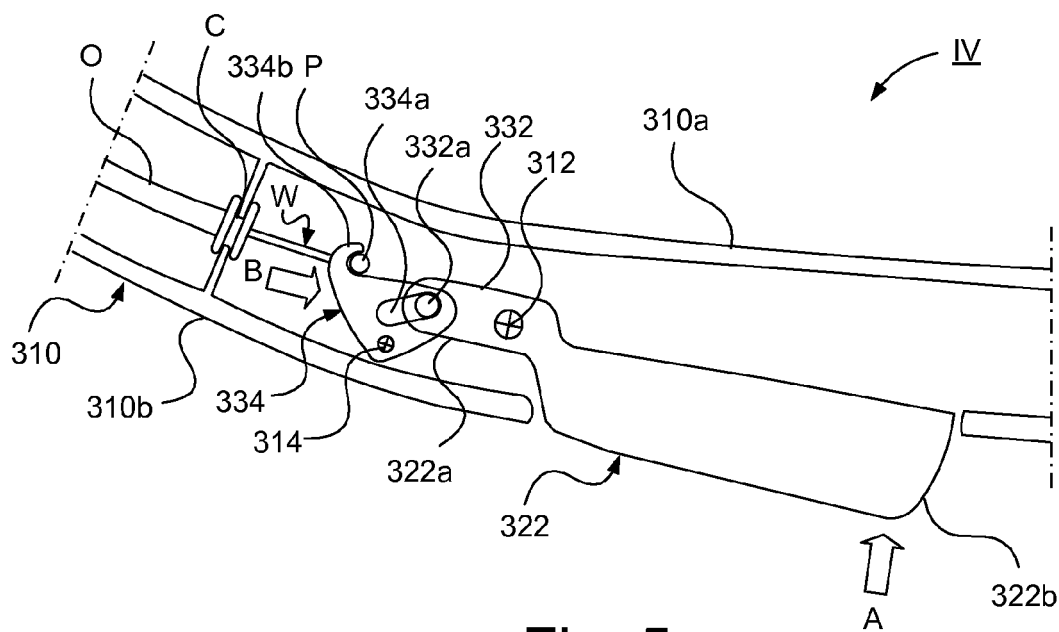
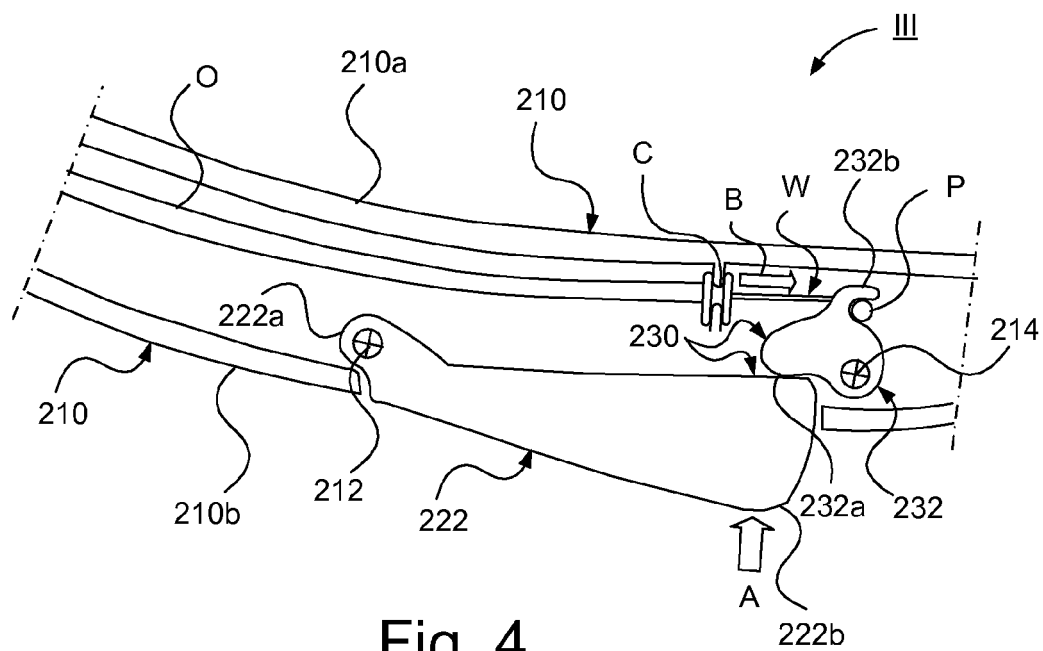


Fig. 3



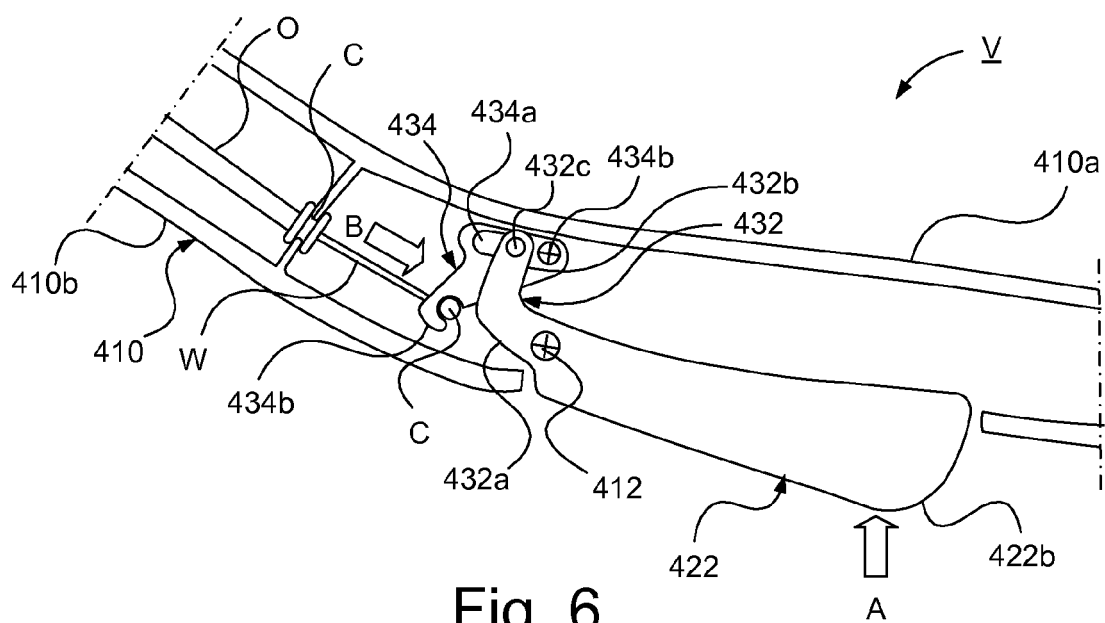


Fig. 6

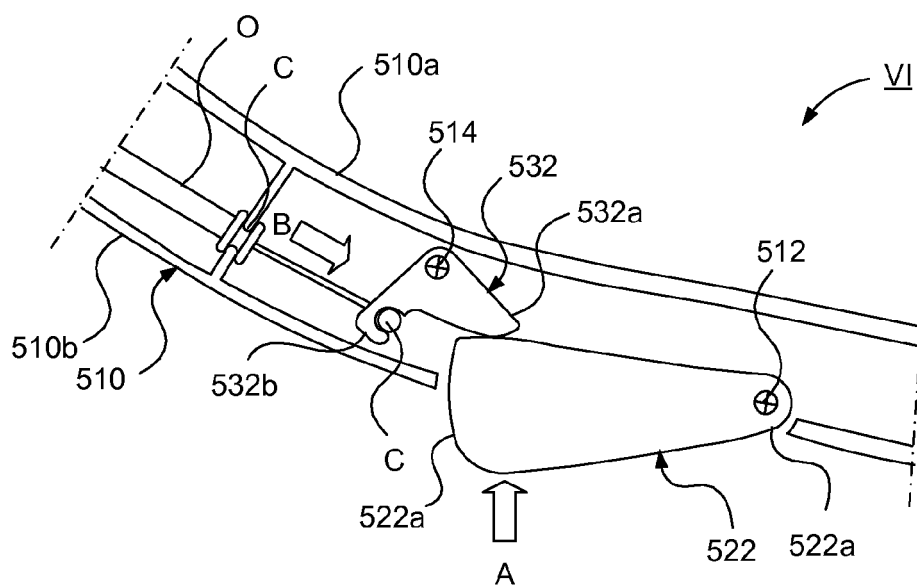


Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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