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(54) **Title:** BRACKET MODULE FOR A HEADREST, HEADREST AND SEAT

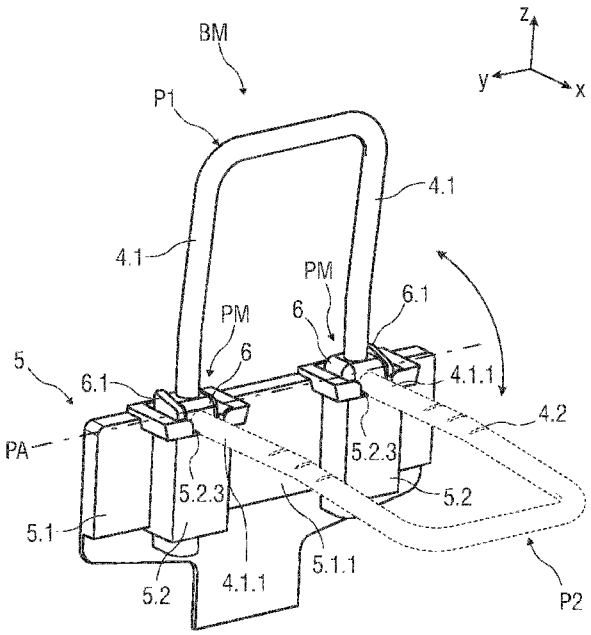

FIG 3

(57) **Abstract:** The invention relates to a bracket module (BM) for a headrest (4), comprising at least: - a bracket element (5.1) mountable to a seat structure, - wherein the bracket element (5.1) comprises a base portion (5.1.1) and at least one guiding sleeve (5.2) for receiving a headrest rod (4.1), - the base portion (5.1.1) and the guiding sleeve (5.2) are configured as one-piece structural element (5), wherein a pivot mechanism (PM) is arranged in the guiding sleeve (5.2) for pivoting the headrest rod (4.1) relative to the base portion (5.1.1). Further, the invention relates to a headrest (4) for a seat (1) and a seat (1), in particular vehicle seat.

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BRACKET MODULE FOR A HEADREST, HEADREST AND SEAT

BACKGROUND OF THE DISCLOSURE

The present disclosure relates generally to a bracket module for a headrest of a seat, in particular vehicle seat.

A conventional bracket module for a headrest comprises two bracket openings for receiving headrest rods. The bracket module is attached to a backrest of a seat. The bracket openings are usually provided with sleeves, in particular guide or sliding sleeves, for up and/or down movement of the headrest rods. The sleeves are usually configured as elongated tubes.

SUMMARY OF THE DISCLOSURE

It is an object of the present disclosure to provide a bracket module for a headrest having reduced weight than conventional bracket modules. A further object of the present disclosure is to provide a headrest with such a bracket module and a seat, in particular vehicle seat.

According to the disclosure, the object of the bracket module is solved by the features claimed in claim 1, the object of the headrest is solved by the features of claim 11 and the object of the seat is solved by the features of claim 15.

According to the disclosure, a bracket module for a headrest comprises at least a bracket element which is fixed to a seat and a guiding sleeve for receiving a headrest rod. Further, a pivot mechanism is arranged in the guiding sleeve for pivoting the headrest rod relative to the bracket element. Particularly, the bracket module comprises a bracket element mountable to a seat structure, in particular a backrest structure, wherein the bracket element comprises a base portion and at least one guiding sleeve for

receiving a headrest rod and wherein the base portion and the guiding sleeve are configured as one-piece structural element. A pivot mechanism enables a pivoting of the headrest rod relative to the base portion.

For example, the headrest comprises one headrest rod arranged in a transverse center portion of the headrest. Alternatively, the headrest comprises two in transverse direction spaced-apart headrest rods.

The present invention relates to an improved bracket module, wherein at least manufacturing, material and production costs are substantially reduced. In particular, a complexity of multi-piece pivoting headrest components is reduced, e.g. shortened bill of materials, while ensuring a height adjustment and pivot adjustment of the headrest to a user, particularly an occupant. The bracket module for a headrest is configured as a single entity incorporating common multi-piece headrest bracket components such as a separate bracket mounted to a backrest portion and a separate sleeve which has to be fixed to the bracket and/or inserted into the bracket for holding headrest rods. The defined headrest of this disclosure is configured as one part to be handled, e.g. for an easy and quick assembly such as a so called JIT (Just-In-Time) assembly by an installer. In particular, this configuration removes the need of adding a separate bezel or sleeve into a separate bracket, e.g. as a safety and headrest rod holding item. The need of tolerance consideration between multiple headrest holding and adjustment components and an additional orientation and fixation of multiple components within a backrest upper portion is removed.

In particular, the presented bracket module is mounted to the seat as one unitary component. Further, reducing components allows a compact design of the bracket module. Therefore, less assembly space is needed on, in or within the seat, particularly backrest of the seat.

With the substantially compact design of the bracket module, for instance, a tether/retaining strap/safety belt arrangement can be mounted within a mounting area in the seat.

Particularly, the bracket module comprises two spaced apart guiding sleeves, each for guiding and receiving one headrest rod. In particular, the bracket element comprises a base portion with two integrated in transverse direction spaced apart slots which are configured as guiding sleeves running in vertical direction of the bracket element for retaining headrest rods. For instance, the guiding sleeves are configured to guide the rods for height adjustment of the headrest. The pivot mechanism is configured to pivot the rods and so as the headrest relative to the bracket element. In particular, the pivot mechanism is integrated in the guiding sleeve, reducing assembly space and installation effort.

For instance, an occupant can adjust an angle of the headrest as desired to raise comfort. Further, the headrest can be adjusted into a substantially perpendicular position relative to the backrest. This position is for instance a non-use and stowing position of the headrest such that it allows the backrest to tilt forward without the headrest getting in the path or being damaged, when the tilted backrest is used as base of a cargo space.

Moreover, providing less component parts results in reduction of manufacturing and assembly time of the bracket module for a headrest. For instance, additional orientation, positioning and fixation of common separated sleeve components and separated pivot mechanisms to a bracket element are avoided. Thereby, redundant tests and verifications are removed.

In another embodiment, the pivot mechanism is integrated within an upper portion of the guiding sleeve. The pivot mechanism is arranged substantially in a plane of an upper portion of the seat, particularly of the backrest of the seat. The pivot mechanism pivots the headrest rods without moving the guiding sleeve and the bracket element. Therefore, no additional moving space within the backrest is needed. For instance, the upper portion of the guiding sleeve comprises one of a ledge or a retaining portion for arranging the pivot mechanism in a movable manner.

In another possible embodiment, the pivot mechanism comprises at least one of a pivotable housing element, such as a pivotable sleeve or a pivotable grommet. Further, the pivotable sleeve and/or the pivotable grommet comprise/s a through hole through which the headrest rods are guided. In particular, the pivot mechanism is arranged within the guiding sleeve in such a manner that the through hole corresponds with the guiding sleeve.

According to a further possible embodiment, the guiding sleeve comprises at least one of a pivot bearing unit coupling the pivot mechanism to the guiding sleeve. In particular, the pivot bearing unit is provided by the pivotable housing element. For example, the pivotable sleeve or the pivotable grommet is movable coupled to the guiding sleeve via bolts, pins, in particular metal pins, and/or other bearing elements. In particular, the pivot mechanism pivots the headrest rods around a pivot axis parallel to a transverse axis in view of the seat. The pivot axis is provided by the pivot bearing arranged within the upper portion of the guiding sleeve. In particular, the pivot bearing is arranged in the retaining portion of the guiding sleeve.

In particular, the pivot mechanism is provided by the pivot bearing unit, wherein the pivot bearing unit comprises at least a mounting bracket to

couple the pivot mechanism to the guiding sleeve. Further, the pivot bearing unit comprises at least a hinge element which is substantially arranged above the guiding sleeve. Particularly, the hinge element protrudes from an upper end of the guiding sleeve. For instance, the hinge element protrudes from an upper surface of a backrest when the bracket module is mounted to the backrest. That means the hinge element is arranged substantially above a plane of an upper portion of the backrest when mounted. The headrest rods, in particular their lower ends, are coupled to the hinge element of the pivot bearing unit for pivoting around a pivot axis. In this case, the pivot mechanism is configured as an external pivot. It is to be understood that the pivot bearing unit can be part of the pivotable housing element, such as a pivot grommet.

In another embodiment, the hinge element is provided by the pivotable housing element, whereas the hinge element is arranged substantially in the plane of an upper portion of the backrest. In this case, the pivot mechanism is configured as an internal pivot.

According to a further possible embodiment, the pivot mechanism is coupled to an operating element for releasing and/or locking of the headrest rods. For instance, the operating element is a button, particularly a pushbutton, and/or a lever-like element. When operating the operating element, the headrest rods are height adjustable and pivotable relative to the bracket element. For example, the operating element interacts with spring elements and/or latch elements arranged within the pivot mechanism, in particular in the pivotable housing element. By actuating the operating element, the latch elements are moved away from the headrest rods such that the headrest rods are enabled to be adjusted or vice versa. Moreover, the operating element can be configured as a common latch system provided within the pivotable housing element.

According to a further embodiment, the bracket element and the guiding sleeve are configured as a one-piece structural element. The one-piece structural element is partially or fully made of resin and/or other synthetic material. Thereby, a weight of the presented bracket module with integrated sleeve is reduced. Additionally, the one-piece structural element is formed robust to be mounted to the seat. Further, the one-piece structural element comprises cushioning, shock-absorbing properties generated by the resin material. Thereby, additional safety components for the headrest rods arrangement are reduced.

For example, at least the guiding sleeve is made of resin. Therefore, the headrest rods are protective received within the guiding sleeve. Additionally, by using synthetic material, particularly resin, such as rattling noise cancellation can be realized.

According to a further embodiment, the guiding sleeve and the bracket element are configured as one-piece moulding part. By means of an injection mould, integration of a plurality of attachment points within one moulding step is realized. For instance, the attachment points comprise at least attachment points for the pivot mechanism to the one-piece structural element and attachment points for the bracket element to the seat.

According to another embodiment, a cover element is coupled to the one-piece structural element. In particular, the cover element is configured as a closeout panel. To improve an optical appearance of the bracket module to the occupant, the cover element is configured as an ornamental cover element. For instance, the cover element is made of synthetic material. Further, the one-piece structural element and so as the pivot mechanism are covered and protected by the cover element such that negative effecting of external influences is avoided. The cover element comprises at least one through hole for receiving the guiding sleeve. For instance, the

through hole is provided to hold the guiding sleeve in a desired position with respect to the seat.

A further object of the invention refers to a headrest for a seat, in particular vehicle seat, comprising at least a headrest cushion, headrest rods and an above described bracket module.

According to an embodiment of the headrest, a pivot mechanism is provided in a lower region of the headrest rods.

In particular, the headrest rods are configured in a substantially U-shaped form. That means, the headrest rods are coupled with each other in a connecting region, in particular an upper region of a reverse U-shaped form, wherein free ends, in particular legs of the headrest rods are received within the guiding sleeves. Particularly, the coupled upper region of the headrest rods is configured to be covered by the headrest cushion.

For example, each headrest rod comprises a pivot mechanism in form of a hinge portion such that the headrest rod is pivotable at the hinge portion relative to the bracket module. The hinge portion is arranged in a lower region, particularly at a lower end portion, of the headrest rod. When the hinge portion is positioned in an upper portion of the guiding sleeve, the headrest rod is enabled to pivot about the hinge portion. In particular, when the headrest rods are pulled in a direction out of the guiding sleeves till the hinge portion reaches the upper portion of the guiding sleeve, the headrest is enabled to be pivoted relative to the bracket module and the backrest at the hinge portion.

In another embodiment, when the headrest rods are pulled in a direction out of the guiding sleeves till the hinge portion reaches an open end above the

upper portion of the guiding sleeve, the headrest is enabled to be pivoted relative to the bracket module and the backrest at the hinge portion.

Furthermore, the object of the invention refers to a seat, in particular vehicle seat, comprising at least a backrest and a headrest and a bracket module for mounting the headrest to the backrest.

According to an embodiment of the seat, the backrest comprises at least a backrest support element having a recess in which the bracket module is arranged. The backrest support element is one of a backrest frame or a foam pad.

BRIEF DESCRIPTION OF THE DRAWINGS

The present disclosure will become more fully understood from the detailed description given herein below and the accompanying drawings which are given by way of illustration only, and thus, are not limitative of the present disclosure, wherein:

Figure 1 shows an embodiment of a seat, in particular a vehicle seat,

Figure 2 shows an exploded view of an embodiment of a backrest of the seat having a bracket module for mounting a headrest to the seat,

Figure 3 shows a perspective view of an embodiment of the bracket module with headrest rods in different positions,

Figure 4A shows a perspective view of an embodiment of the bracket module with headrest rods in a stowed position,

Figure 4B shows a perspective view of another embodiment of the bracket module with another embodiment of headrest rods in a stowed position,

Figure 5 shows a perspective view of an embodiment of the bracket module mounted to the seat,

Figure 6 shows a sectional view of an embodiment of the backrest having the bracket module and headrest rods in different positions, and

Figure 7 shows a rear view of an embodiment of the bracket module mounted to the backrest.

Corresponding parts are marked with the same reference symbols in all figures.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Figure 1 shows an embodiment of a seat 1, in particular a vehicle seat.

For a better understanding of subsequent descriptions of the seat 1 a coordinate system is shown in further figures. The coordinate system comprises a longitudinal axis x, a transverse axis y and a vertical axis z in relation to a vehicle, in which the seat 1 is positionable.

The seat 1 comprises a seat pan 2, a backrest 3 and a headrest 4. In particular, the headrest 4 is movable with respect to the backrest 3. For instance, the headrest 4 is height adjustable and pivotable with respect to the backrest 3.

Figure 2 shows an exploded view of an embodiment of the backrest 3 of the seat 1 having a bracket module BM for mounting the headrest 4 to the seat 1.

For instance, the backrest 3 comprises a backrest support element 3.1, such as a backrest frame. In the shown embodiment, the backrest support element 3.1 is a foam pad. The backrest support element 3.1 comprises a recess 3.1.1, such as a cut-out portion, in which the bracket module BM is arranged. Further, the backrest 3 comprises a trim cover element 3.2 to cover the backrest support element 3.1. The trim cover element 3.2 has a corresponding shape to the shape of the backrest support element 3.1. Therefore, the trim cover element 3.2 comprises a corresponding recess 3.2.1 for arranging the bracket module BM.

The bracket module BM comprises a bracket element 5.1 mounted to the seat 1, particularly to the backrest 3. According to another embodiment, the bracket module BM can be attached to a not shown frame structure of the backrest 3.

Further, the bracket module BM comprises two guiding sleeves 5.2 each for receiving a headrest rod 4.1. In particular, the headrest rods 4.1 are height adjustable arranged within the guiding sleeves 5.2.

In particular, the bracket module BM comprises a one-piece structural element 5. The one-piece structural element 5 comprises the bracket element 5.1 and the two guiding sleeves 5.2. The guiding sleeves 5.2 are

configured as integrated slots in the bracket element 5.1. Therefore, the bracket element 5.1 comprises a base portion 5.1.1 which is mountable to the backrest 3, for example by means of fixation elements 13 such as screws or the like. The base portion 5.1.1 is a plate-like element. The guiding sleeves 5.2 are running in a vertical direction.

Furthermore, the bracket module BM comprises a pivot mechanism PM which is integrated in each of the guiding sleeves 5.2 for pivoting the headrest rods 4.1 relative to the bracket element 5.1. As an example, the pivot mechanism PM is manually operable. The height adjustment is also manually performable. A height adjustment mechanism HM is also integrated in each of the guiding sleeves 5.1.

In another embodiment, the pivot adjustment and/or the height adjustment are/is electrically driven. In particular, the headrest 4 can be provided with a not shown drive that is fixed indirectly or directly to the pivot mechanism PM, the height adjustment mechanism HM and/or to the guiding sleeve 5.2.

Further, the pivot mechanism PM is integrated within an upper portion 5.2.1 of each guiding sleeve 5.2. In particular, the pivot mechanism PM is provided by a pivotable housing element 6, such as a pivotable sleeve or a pivotable grommet. The housing element 6 is configured to pivot around a pivot axis PA relative to an opening of the upper portion 5.2.1 of each guiding sleeve 5.2. The headrest rods 4.1 are each guided through the pivotable housing element 6 and then received within the guiding sleeve 5.2. In particular, the pivot mechanism PM is provided in a lower region of the headrest rods 4.1. Further, each guiding sleeve 5.2 comprises a cavity 5.2.3 facing in a direction towards the backrest 3. The cavity 5.2.3 is a slot, recess or gap. Each cavity 5.2.3 is configured to receive a part of the headrest rod 4.1 when the headrest 4 is pivoted into a stowed position,

whereas the headrest rod 4.1 is positioned substantially vertical to a backrest front surface.

It is to be understood that the housing element 6 is also configured providing the height adjustment mechanism HM. Each headrest rod 4.1 comprises a number of commonly used height fixation points 4.2 such as cut-outs. The height fixation points 4.2 can be engaged by a common latch/locking system provided by the housing element 6.

The headrest rods 4.1 are configured in a substantially U-shaped form. That means, the headrest rods 4.1 are coupled with each other in an upper region, free ends of the headrest rods 4.1 are received within the guiding sleeves 5.2. Particularly, the coupled upper region of the headrest rods 4.1 is configured to be covered by a headrest cushion.

In particular, each pivotable housing element 6 is movable coupled to the upper portion 5.2.1 by means of a pivot bearing unit PB. Particularly, the pivot bearing unit PB couples the pivotable housing element 6 movable, i.e. pivotable to each guiding sleeve 5.2. Therefore, the pivot bearing unit PB comprises bearing elements 7, such as pins and bolts, particularly metal pins and bolts, and/or other hinge, joint elements. The bearing elements 7 engage the respective guiding sleeve 5.2 and the housing element 6 such that the housing element 6 is pivotable hold on the guiding sleeve 5.2. For example, each upper portion 5.2.1 of the respective guiding sleeve 5.2 comprises a through hole 5.2.1.1 which corresponds with a recess 6.2 or opening of the housing element 6, wherein the bearing element 7 is arranged within the through hole 5.2.1.1 engaging the recess 6.2. For example, the pivot bearing units PB are provided on left and/or right sides of each pivotable housing element 6. Further, the pivotable housing element 6 comprises a not further shown locking system to lock the headrest rods 4.1 in a desired position relative to the bracket element 5.1. Particularly, the

pivot mechanism PM is arranged substantially in a plane of an upper portion of the backrest 3. In this case, the pivot mechanism PM is configured as an internal pivot.

The upper portions 5.2.1 of the guiding sleeves 5.2 provide a pivot axis PA for the pivot mechanism PM. The pivot axis PA is an axis parallel to the transverse axis y. In particular, the bearing elements 7 are configured to provide the pivot axis PA.

Further, the upper portion 5.2.1 of each guiding sleeve 5.2 comprises a retaining portion 5.2.2, such as a retaining recess or a ledge, for coupling the pivot mechanism PM, particularly its pivotable housing element 6, to the guiding sleeve 5.2. For instance, to secure the pivotable housing element 6 within the retaining portion 5.2.2, in particular to limit unwanted movement of the pivotable housing element 6, e.g. in a vertical direction, fixation elements 9 are provided within the retaining portion 5.2.2.

Moreover, the bracket module BM comprises a cover element 8 which is coupled to the one-piece structural element 5. In particular, the cover element 8 covers the recesses 3.1.1, 3.2.1 of the backrest support element 3.1 and the trim cover element 3.2. Additionally, the cover element 8 covers and protects the one-piece structural element 5 and the pivot mechanisms PM. Particularly, the cover element 8 is configured as a closeout panel. For example, the cover element 8 comprises an ornamental design to improve visual appearance of the backrest 3. The cover element 8 is configured as a plastic topper element.

For instance, the cover element 8 comprises two cavities 8.1 which are arranged spaced apart from each other. In particular, each cavity 8.1 is formed in a front area of the cover element 8, particularly in an area facing towards the occupant. The cavities 8.1 are for example slots, recesses or

gaps. Each cavity 8.1 is positioned corresponding with positions of each headrest rod 4.1. Therefore, when pivoting the headrest rods 4.1 into a stowed position, whereas the headrest rods 4.1 are positioned substantially vertical to a backrest front surface, the headrest rods 4.1 are located in the cavities 8.1. In particular, the headrest 4 can be placed in a most vertical manner relative to the backrest 3 when its headrest rods 4.1 are arranged within the cavities 8.1 and without bumping the cover element 8.

According to an embodiment, the bracket element 5.1 and the guiding sleeves 5.2 are configured as a one-piece structural element 5. The one-piece structural element 5 is e.g. made of synthetic material, in particular resin material. For example, the one-piece structural element 5 is a one-piece moulding part.

Further, the backrest 3 comprises a safety bracket 10 for a tether and/or retaining belt which can be attached to a rear side of the bracket module BM. For instance, a tether can be attached to the safety bracket 10 for items stored in a cargo space of the vehicle. Additionally or optionally, the safety bracket 10 is provided to guide through a retaining belt for an occupant.

The backrest 3 is one of an adjustable backrest 3, particularly tiltable and stowable backrest 3, wherein a cargo space behind the backrest 3 in an upright position can be extended when the backrest 3 is folded down. By pivoting the headrest 4 to a stowed position, wherein the headrest 4 is substantially arranged perpendicular to the backrest 3, the headrest 4 is substantially directing towards the seat pan 2. The headrest 4 is stowed safely without affected, particularly damaged, by items stored on a rear surface side of the backrest 3.

Figure 3 shows a perspective view of an embodiment of the bracket module BM with headrest rods 4.1 in different positions P1, P2. For instance, position P1 is an upright, use position of the headrest 4. Position P2 is a stowed position of the headrest 4 when the backrest 3 is intended to be folded down, i.e. towards the seat pan 2.

According to a further embodiment, the headrest 4, particularly its headrest rods 4.1, can be fixed in any position between the positions P1 and P2. Therefore, the headrest 4 can be adjusted into a position for comfort improvement for the occupant.

In particular, each or one of the pivotable housing elements 6 comprises an operating element 6.1 for releasing and/or locking of the headrest rods 4.1 in a desired position. For instance, the operating element 6.1 is a button and/or comprises a locking bar to lock the headrest rods 4.1 in a non-operating state and to release the headrest rods 4.1 for height and/or pivot adjustment in an operating state.

When operating the operating elements 6.1 the headrest rods 4.1 can be moved for height adjustment, i.e. in vertical direction. When the headrest rods 4.1 are partially pulled out of the guiding sleeves 5.2, in particular when an end portion 4.1.1 of the headrest rods 4.1 reaches the respective housing element 6, the headrest rods 4.1 are enabled to pivot about the pivot axis PA. A not shown locking bar can engage the end portion 4.1.1, whereas by pivoting the headrest 4 about the pivot axis PA, each housing element 6 pivots about the pivot axis PA following the pivot movement of the headrest 4, particularly of the headrest rods 4.1.Therefore, the end portions 4.1.1 of the headrest rods 4.1 comprise a pivot fixation point 4.3 as shown in **figure 2**.

Figure 4A shows a perspective view of a further possible embodiment of the bracket module BM with headrest rods 4.1. In particular, the headrest rods 4.1 are shown in the stowed position P2.

The pivot mechanism PM is provided in the lower region of the headrest rods 4.1. The pivotable housing elements 6 comprises the pivot bearing unit PB, wherein the pivot bearing unit PB is partially arranged in the guiding sleeves 5.2 and partially outside the guiding sleeves 5.2.

The pivot bearing unit PB comprises at least a mounting bracket 11 to couple the pivot mechanism PM to each guiding sleeve 5.2. Further, the pivot bearing unit PB comprises at least a hinge element 12 which is substantially arranged above each guiding sleeve 5.2. Particularly, the hinge element 12 protrudes from an upper end portion of each guiding sleeve 5.2. For instance, the hinge element 12 protrudes from an upper surface of the backrest 3 when the bracket module BM is mounted to the backrest 3. Particularly, the hinge element 12 comprises a bolt, a pin or any other joint element which couples the lower ends of the U-shaped headrest rods 4.1 in a movable manner with respect to each guiding sleeve 5.2.

The headrest rods 4.1, in particular their lower ends, are coupled to the hinge elements 12 of the pivot bearing unit PB for pivoting around the pivot axis PA. Particularly, the hinge element 12 is arranged above a plane of an upper portion of the backrest 3 when mounted. In this case, the pivot mechanism PM is configured as an external pivot. Thereby, the pivot axis PA is provided above a plane of an upper portion of the backrest 3. In the shown embodiment, the pivot axis PA is provided above the cover element 8 when mounted to the bracket element 5.1 and to the guiding sleeves 5.2.

Figure 4B shows a perspective view of an alternative embodiment of the bracket module BM and an alternative embodiment of the headrest rods 4.1 in a stowed position P2. In the shown embodiment, the headrest rods 4.1 comprise each a pivot mechanism PM provided in a lower region, in particular at end portions 4.1.1 of the headrest rods 4.1.

In particular, the headrest rods 4.1 are configured in a substantially U-shaped form, wherein free ends, in particular legs of the headrest rods 4.1 are received within the guiding sleeves 5.2.

The housing elements 6 are not shown in detail for better understanding of the below described functions.

For example, each headrest rod 4.1 comprises a integrated pivot mechanism PM' in form of a hinge portion HP such that the headrest rod 4.1 is pivotable at the hinge portion HP relative to the bracket module BM so as the base portion 5.1.1 and the respective guiding sleeve 5.2. The hinge portion HP is arranged in an overall lower region, particularly at a lower end portion 4.1.1, of the headrest rod 4.1. In particular, the hinge portion HP is provided between the end portion 4.1.1 and an upper portion 4.1.2 of the headrest rod 4.1. The hinge portion HP comprises a hinge coupling element 14, such as a pin or bolt which connects both portions 4.1.1 and 4.1.2 of the headrest rod 4.1 by means of engaging through holes.

When the hinge portion HP is positioned in an upper portion 5.2.1 of the guiding sleeve 5.2, in particular, when the hinge portion HP is arranged within the housing element 6, the headrest rod 4.1 is enabled to pivot about the hinge portion HP. For example, the housing element 6 is still configured as a pivotable housing element 6. Particularly, the upper portion 4.1.2 of the headrest rod 4.1 is pivotable relative to the lower, end portion 4.1.1 of the

headrest rod 4.1 about the hinge portion HP. The hinge portion HP defines a pivot axis PA.

In particular, when the headrest rods 4.1 are pulled in a direction out of the guiding sleeves 5.2 till each hinge portion HP reaches the upper portion 5.2.1 and/or the housing element 6 of the respective guiding sleeve 5.2, the headrest 4 is enabled to be pivoted relative to the bracket module BM and the backrest 3. For instance, the end portions 4.1.1 are still arranged and guided within each corresponding guiding sleeve 5.2. The housing elements 6 can be pivoted together with the upper portions 4.1.2 of the headrest rods 4.1.

According to a further embodiment, when the headrest rods 4.1 are pulled out of the guiding sleeves 5.2 till the hinge portions HP are positioned above the housing elements 6, the housing elements 6 can engage the end portions 4.1.1 of the headrest rods 4.1, and the upper portions 4.1.2 of the headrest rods 4.1 can be pivoted relative to their lower, end portions 4.1.1.

Figure 5 shows a perspective view of an embodiment of the bracket module BM mounted to the seat 1, in particular to its backrest 3.

Figure 6 shows a sectional view of an embodiment of the backrest 3 having the bracket module BM and headrest rods 4.1 in different positions P1. In particular, **figure 5** shows the headrest rods 4.1 in the most upright, use position P1, whereas the headrest rods 4.1 are inserted into the guiding sleeves 5.2, extending less from a top surface of the backrest 3.

According to an embodiment, the headrest rods 4.1 are for example pulled out of the guiding sleeves 5.2 till end portions 4.1.1 of the headrest rods 4.1 are adjacent the pivot mechanisms PM, to enable pivot adjustment of the headrest 4 from the upright, use position P1 to the stowed position P2. In

this upward position of the headrest rods 4.1, the pivotable housing elements 6 are enabled to pivot around the pivot axis PA.

Figure 7 shows a rear view of an embodiment of the bracket module BM mounted to the backrest 3.

List of References

1	seat
2	seat pan
3	backrest
3.1	backrest support element
3.1.1	recess
3.2	trim cover element
3.2.1	recess
4	headrest
4.1	headrest rod
4.1.1	lower, in particular end portion
4.1.2	upper portion
4.2	height fixation point
4.3	pivot fixation point
5	one-piece structural element
5.1	bracket element
5.1.1	base portion
5.2	guiding sleeve
5.2.1	upper portion
5.2.1.1	through hole
5.2.2	retaining portion
5.2.3	cavity
6	housing element
6.1	operating element
6.2	recess
7	bearing element
8	cover element
8.1	cavity
9	fixation element
10	safety bracket
11	mounting bracket

12	hinge element
13	fixation element
14	hinge coupling element
BM	bracket module
HM	height adjustment mechanism
HP	hinge portion
P1, P2	position
PA	pivot axis
PB	pivot bearing unit
PM	pivot mechanism
PM'	pivot mechanism
x	longitudinal axis
y	transverse axis
z	vertical axis

Claims

1. A bracket module (BM) for a headrest (4), comprising at least:
- a bracket element (5.1) mountable to a seat structure,
- wherein the bracket element (5.1) comprises a base portion (5.1.1) and at least one guiding sleeve (5.2) for receiving a headrest rod (4.1),
- the base portion (5.1.1) and the guiding sleeve (5.2) are configured as one-piece structural element (5),
wherein a pivot mechanism (PM) is arranged in the guiding sleeve (5.2) for pivoting the headrest rod (4.1) relative to the base portion (5.1.1).

2. The bracket module (BM) according to claim 1, wherein the pivot mechanism (PM) is arranged substantially within an upper portion (5.2.1) of the guiding sleeve (5.2).

3. The bracket module (BM) according to claim 1 or 2, wherein the pivot mechanism (PM) comprises at least one of a pivotable housing element (6), such as a pivotable sleeve or a pivotable grommet.

4. The bracket module (BM) according to any one of the preceding claims, wherein the guiding sleeve (5.2) comprises at least one of a pivot bearing unit (PB) coupling the pivot mechanism (PM) rotatable to an upper portion (5.2.1) of the guiding sleeve (5.2).

5. The bracket module (BM) according to claims 1 to 3, wherein the guiding sleeve (5.2) comprises at least one of a pivot bearing unit (PB) comprising a mounting bracket (11) which is coupled to the guiding sleeve (5.2) and a hinge element (12) which is substantially arranged above the guiding sleeve (5.2).

6. The bracket module according to claim 4 or 5, wherein the pivot bearing (PB) is arranged within the upper portion (5.2.1) of the guiding sleeve (5.2).

7. The bracket module (BM) according to any one of the preceding claims, wherein the pivot mechanism (PM) is coupled to an operating element (6.1) for releasing and/or locking of the headrest rod (4.1).

8. The bracket module (BM) according to any one of the preceding claims, wherein the one-piece structural element (5) is at least partially made of synthetic material.

9. The bracket module (BM) according to any one of the preceding claims, wherein a cover element (8) is coupled to the one-piece structural element (5).

10. The bracket module (BM) according to claim 9, wherein the cover element (8) is configured as a closeout panel.

11. A headrest (4) for a seat (1), in particular vehicle seat, comprising at least a headrest cushion, at least a headrest rod (4.1) to which the headrest cushion is mounted and a bracket module (BM) according to one of the preceding claims.

12. The headrest (4) according to claim 11, wherein the headrest rod (4.1) comprises a hinge portion (HP) such that the headrest rod (4.1) is pivotable at the hinge portion (HP) relative to the bracket module (BM).

13. The headrest (4) according to claim 12, wherein the hinge portion (HP) is arranged in a lower region, particularly at a lower end portion (4.1.1),

of the headrest rod (4.1).

14. The headrest (4) according to claim 12 or 13, wherein when the hinge portion (HP) is positioned in an upper portion (5.2.1) of the guiding sleeve (5.2), the headrest rod (4.1) is enabled to pivot about the hinge portion (HP).

15. A seat (1), in particular vehicle seat, comprising at least a backrest (3) and a headrest (4) according to claim 11 and a bracket module (BM) according to one of the claims 1 to 10 for mounting the headrest (4) to the backrest (3).

16. The seat (1) according to claim 15, wherein the backrest (3) comprises at least a backrest support element (3.1) having a recess (3.2.1) in which the bracket module (BM) is arranged.

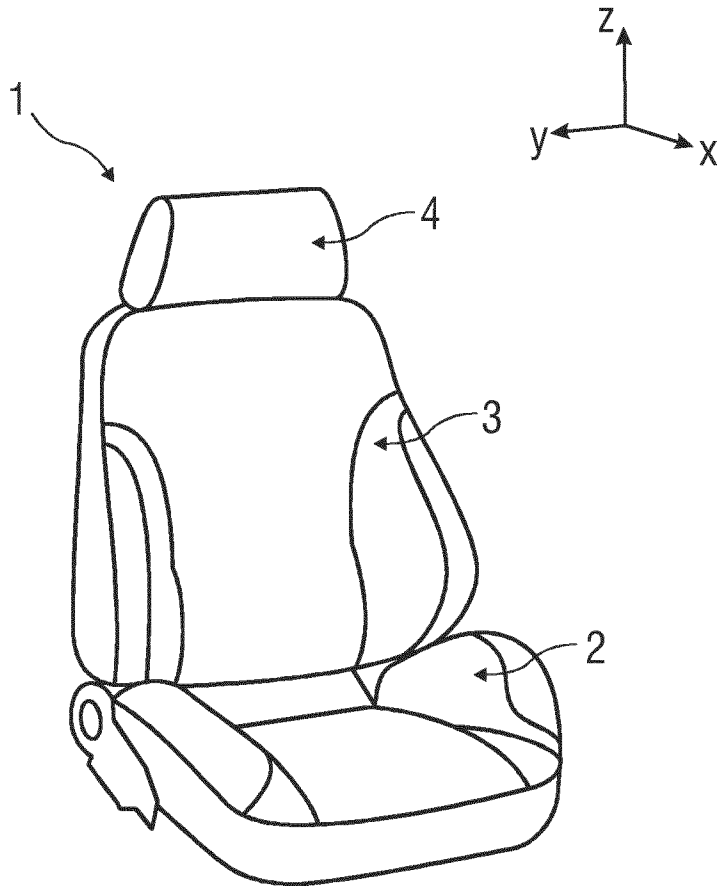

FIG 1

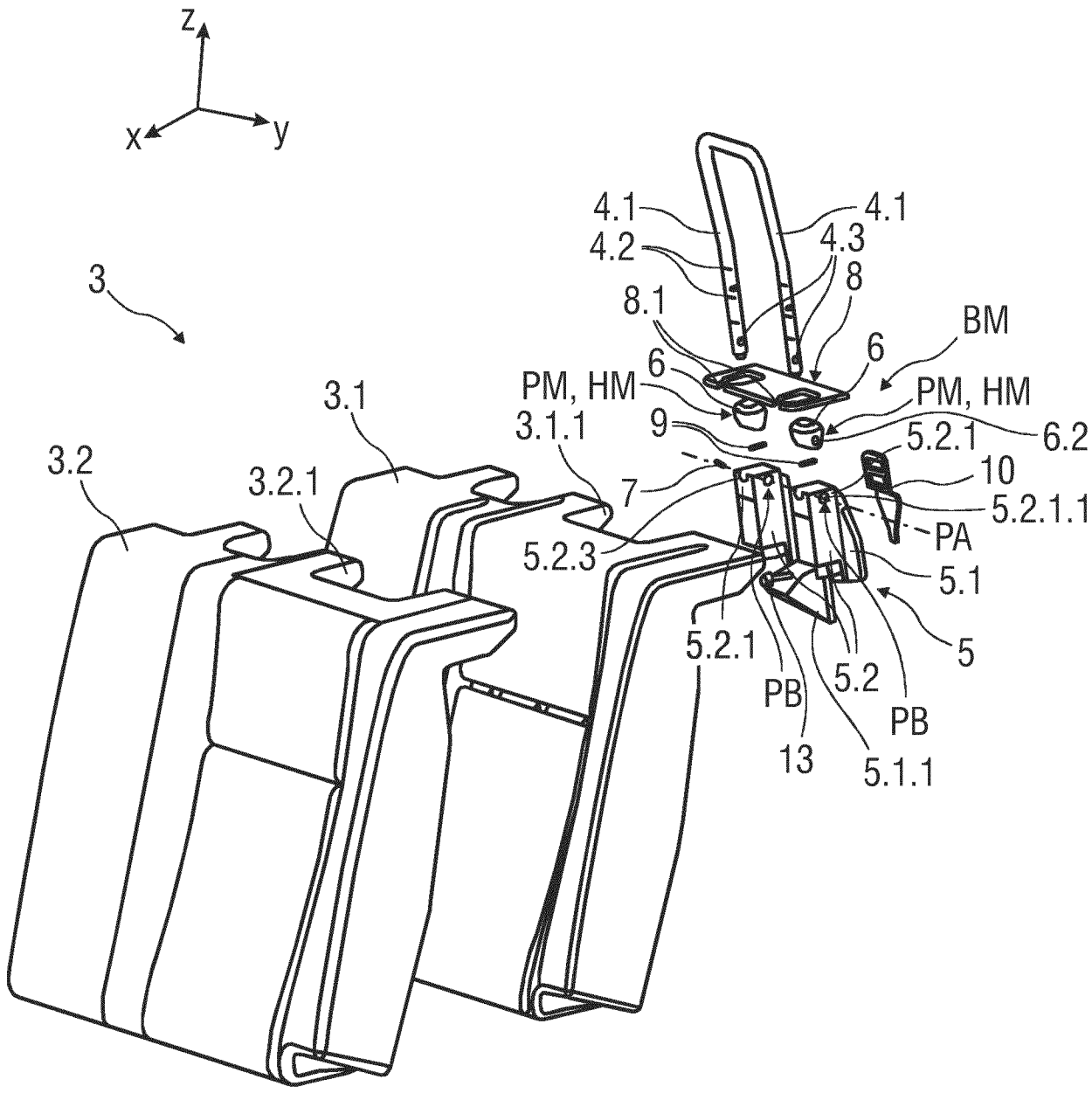
z
x
y
3
4.1
4.1
4.2
4.3
8
8.1
BM
6
6
PM, HM
PM, HM
3.1
3.1.1
9
5.2.1
6.2
3.2
3.2.1
7
10
5.2.1.1
5.2.3
PA
5.1
5
5.2.1
PB
5.2
PB
13
5.1.1

FIG 2

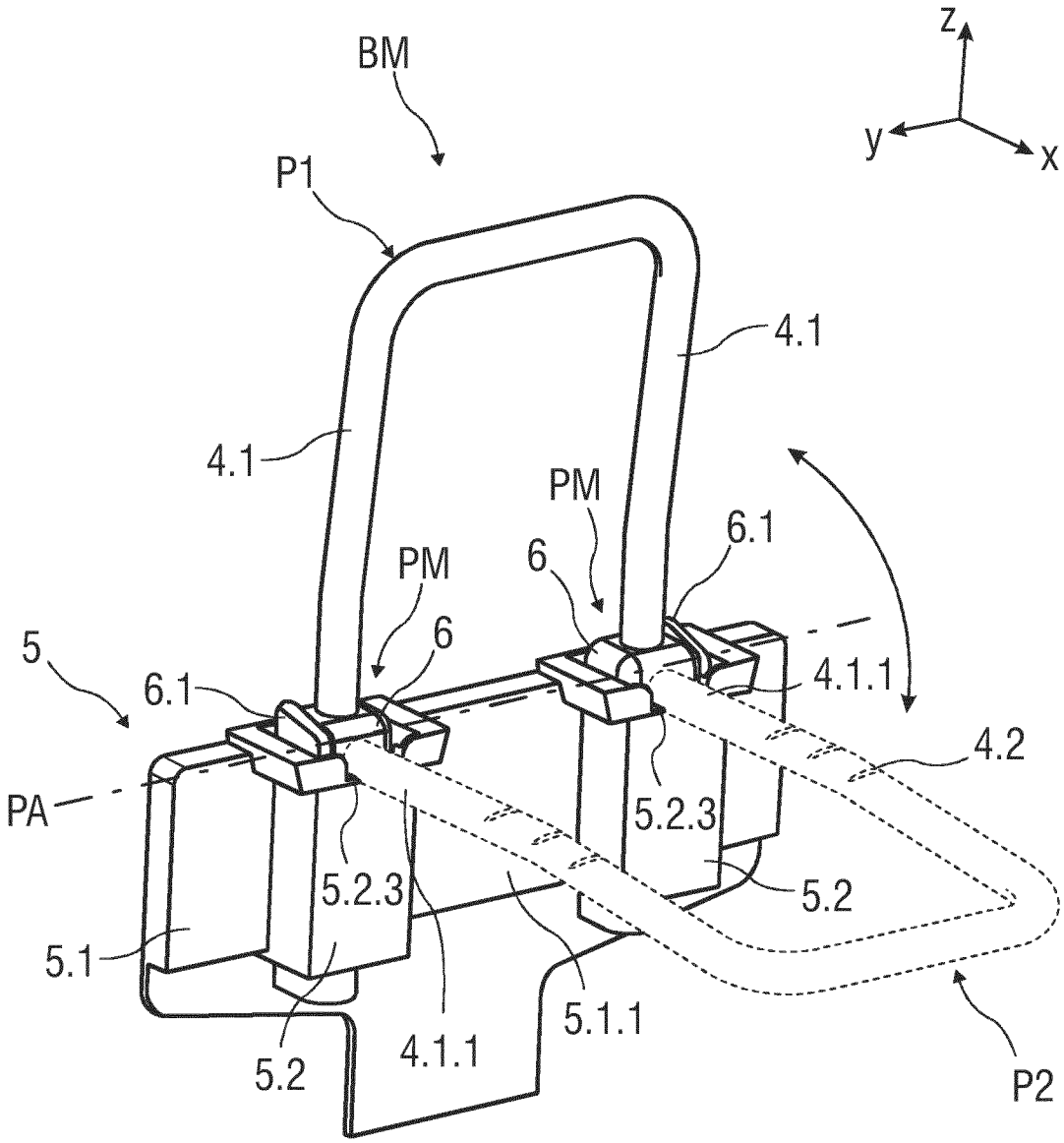

FIG 3

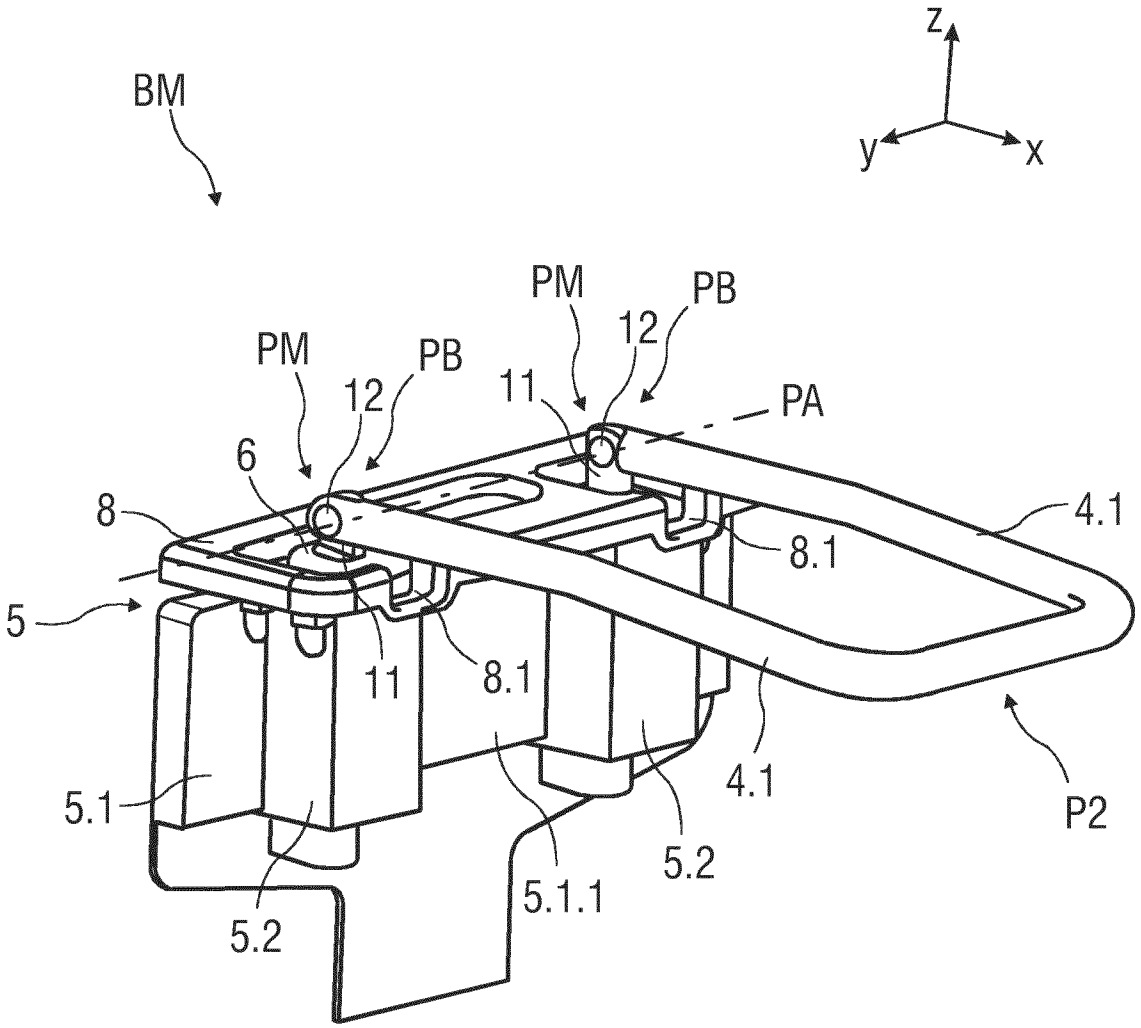

FIG 4A

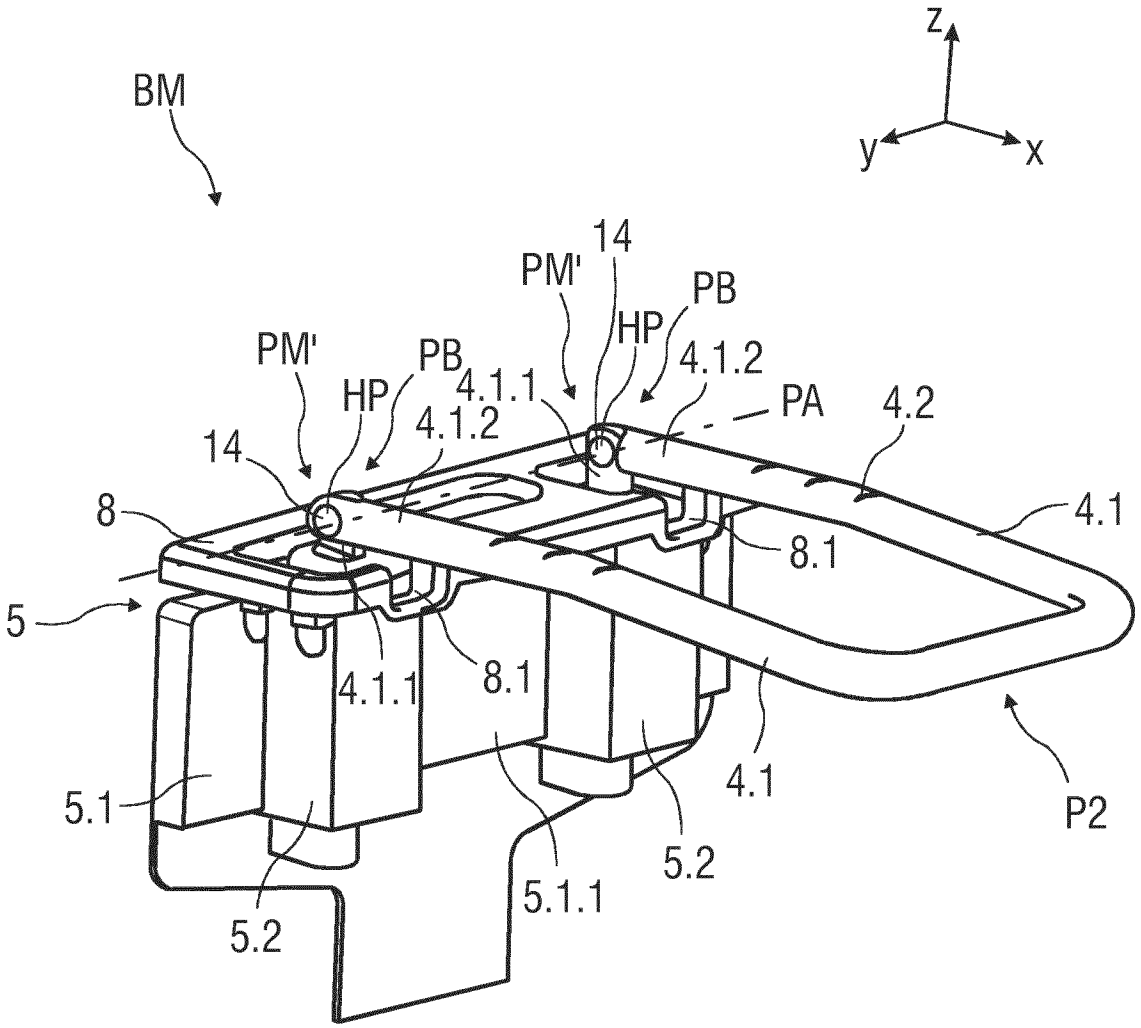
BM
z
y
x
14
PM'
PB
HP
4.1.2
4.1.1
PA
4.2
PM'
PB
HP
4.1.2
14
8
4.1
8.1
5
4.1.1
8.1
5.1
4.1
P2
5.2
5.1.1
5.2

FIG 4B

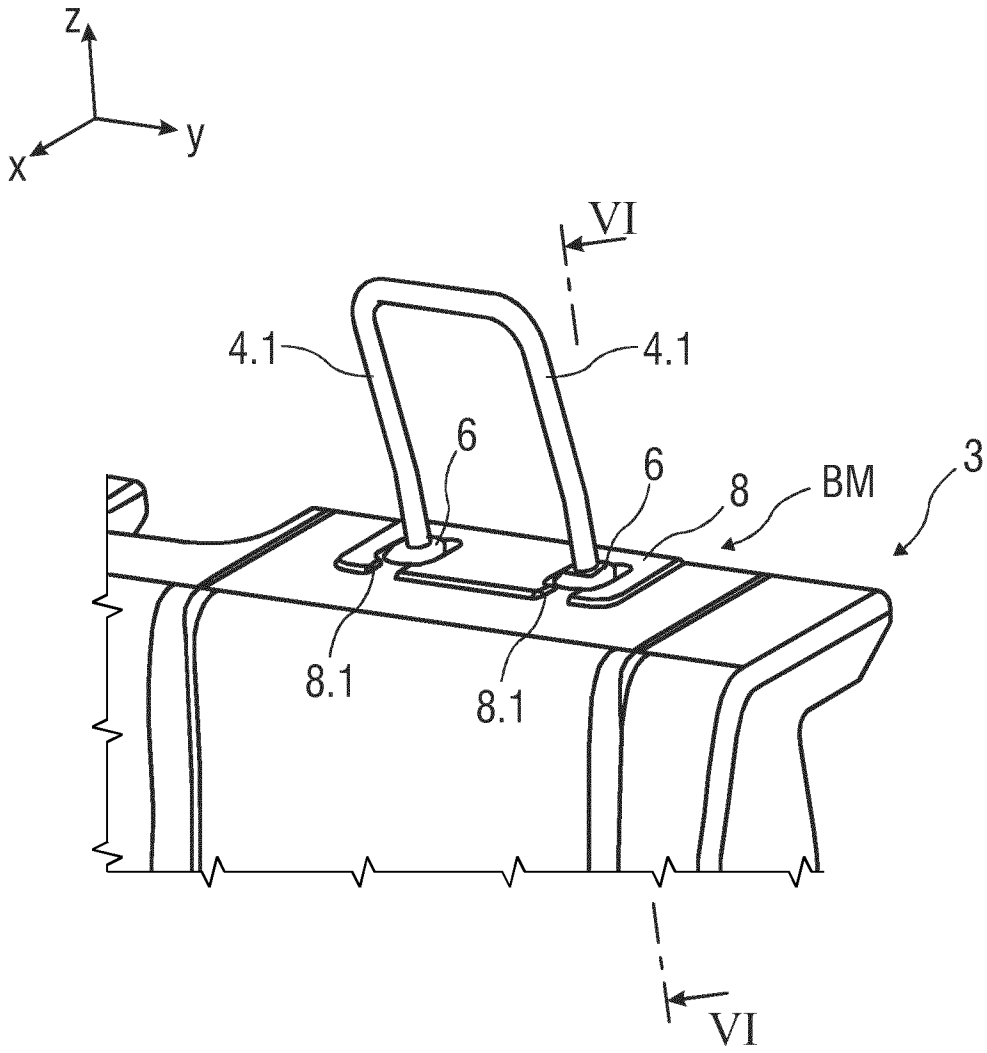

FIG 5

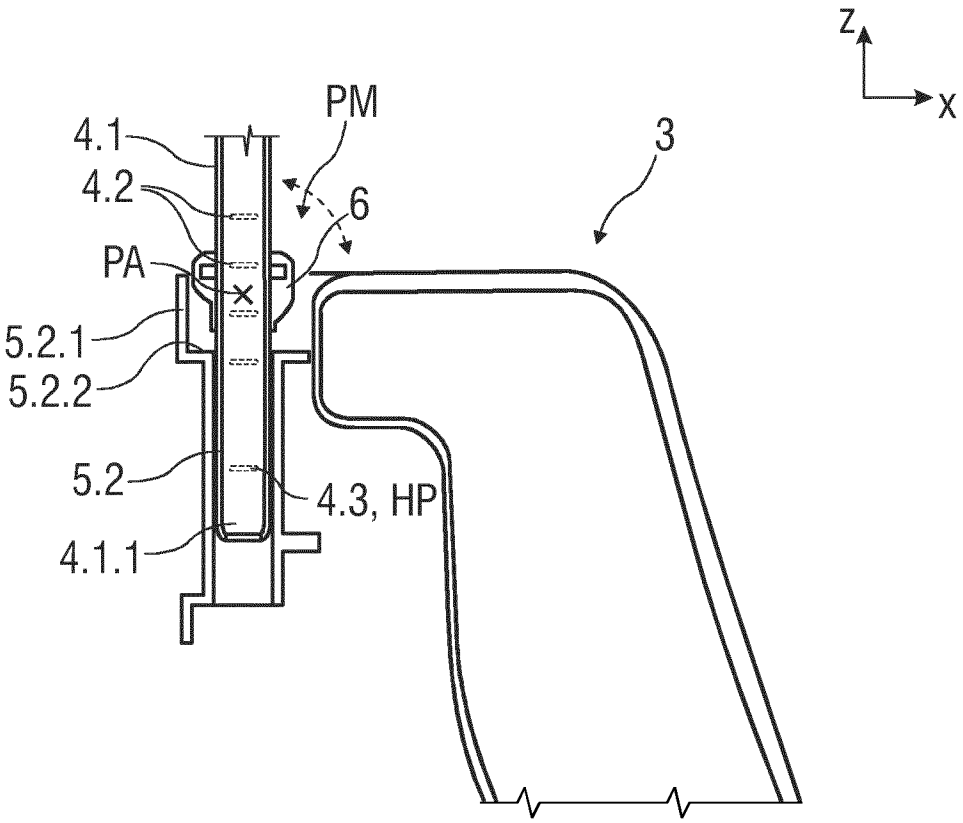

FIG 6

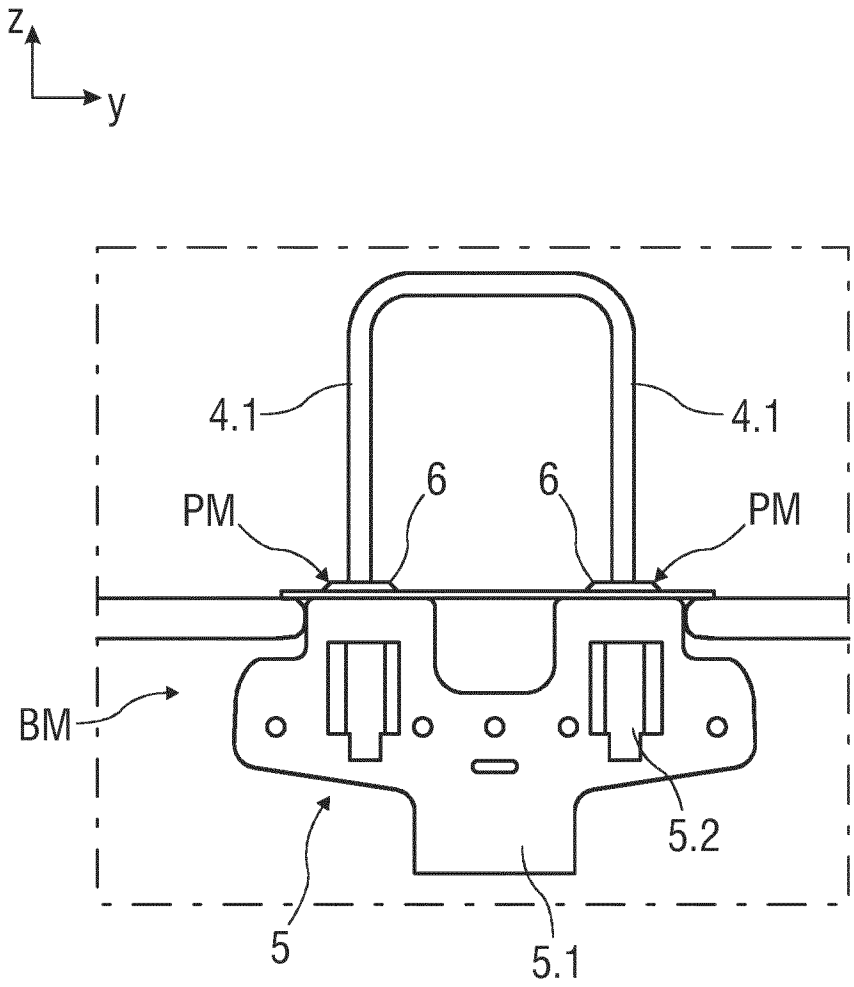

FIG 7

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2019/067761

A. CLASSIFICATION OF SUBJECT MATTER
INV. B60N2/856 B60N2/818
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B60N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 198 07 730 A1 (AISIN SEIKI [JP]) 27 August 1998 (1998-08-27)	1-4, 6-11,15, 16
Y	column 2, line 27 - column 5, line 56; figures 1-10	5,12-14

Y	JP 2010 279424 A (TOYOTA BOSHOKU CORP) 16 December 2010 (2010-12-16) figures 9,9a,9b	5,12-14

X	JP 2016 028918 A (FUJI HEAVY IND LTD) 3 March 2016 (2016-03-03) figures 1-6	1,2,4, 6-11,15, 16

X	JP H05 26609 U (.) 6 April 1993 (1993-04-06) figures 1-5	1,2,5, 11-16

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
25 September 2019	08/10/2019

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Lotz, Klaus-Dieter

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2019/067761

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