United States Patent	12391205
Kind Code	B2
Date of Patent	August 19, 2025
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Vehicle seat back provided with an airbag device and method of assembly such a seat back

Abstract

A vehicle seat back comprising a seat back frame with a pillar, an airbag device and a side airbag, the airbag device comprising at least one airbag and an airbag support for attaching the airbag to the seat back frame, and the side airbag comprising a side airbag trim and at least one side airbag trim support for attaching the side airbag to the seat back frame, wherein the trim support and the airbag support comprise at least one assembly point for their attachment to the pillar of the seat back frame.

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Appl. No.: **17/989078**

Filed: **November 17, 2022**

Prior Publication Data

Document Identifier	Publication Date
US 20230158989 A1	May. 25, 2023

Foreign Application Priority Data

FR	2112283	Nov. 19, 2021

Publication Classification

Int. Cl.: **B60R21/207** (20060101)

U.S. Cl.:

CPC **B60R21/207** (20130101);

Field of Classification Search

CPC: B60R (21/207); B60N (2/4235)

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Background/Summary

PRIORITY CLAIM
(1) This application claims priority to French Patent Application No. FR2112283, filed Nov. 19, 2021, which is expressly incorporated by reference herein.
BACKGROUND
(2) The present disclosure relates to a vehicle seat back, in particular a motor vehicle seat back. A method for assembling such a seat back as well as a vehicle seat comprising such a seat back are also described.
SUMMARY
(3) According to the present disclosure, a vehicle seat back comprises a seat back frame with a pillar, an airbag device and a side bolster, the airbag device comprising at least one airbag and an

airbag support for attaching the airbag to the seat back frame, and the side bolster comprising a side bolster trim and at least one side bolster trim support for attaching the side bolster to the seat back frame, wherein the trim support and the airbag support comprise at least one assembly point for their attachment to the pillar of the seat back frame.
(4) In illustrative embodiments, the assembly point may be common to the trim support and the airbag support for their joint attachment to the pillar of the seat back frame.
(5) Thus, advantageously, the assembly formed by the trim support and the airbag support, and therefore more generally by the side bolster, including the trim of the side bolster and the airbag device, is assembled more easily due to the presence of the at least one common assembly point.
(6) In illustrative embodiments, the vehicle seat back comprises one or more of the following features, taken alone or in combination: the trim support, at least at the assembly point, is arranged between the pillar of the seat back frame and the airbag support, the trim support and the airbag support are attached to the seat back frame, at the assembly point, by common attachment means, the trim support and the airbag support comprise, for their attachment on the pillar of the seat back frame, two common assembly points: a first point for an upper attachment on the pillar and a second point for a lower attachment on the pillar, the upper attachment being arranged higher than the lower attachment in a vertical direction, the seat back may further comprise a deflector attached to the pillar, the deflector comprising the two assembly points common to the trim support and the airbag support, the side bolster trim comprises a run-off line for airbag deployment the deflector further comprises a border, the border being arranged along the run-off line and diverging from the run-off line for the deployment of the airbag between the border and the run-off line, the trim support comprises a guide wall configured to direct the deployment of the airbag toward the run-off line, the trim support and the airbag support comprise different materials, the trim support preferably being made of plastic material and the airbag support being made of metallic materials.
(7) In illustrative embodiments, a method of assembling a vehicle seat back comprising a seat back frame, an airbag device comprising at least one airbag and an airbag support for attaching the airbag, and a side bolster comprising a side bolster trim and at least one side bolster trim support (**40**) for its attachment to the seat back frame, the method comprising: preassembling the airbag support of the airbag device with the trim support of the side bolster, attaching the assembly formed, on the one hand, by the side bolster comprising the side bolster trim and the trim support, and on the other hand the airbag device on the seat back frame, by at least one assembly point for attaching the trim support and the airbag support to the seat back frame pillar.
(8) Furthermore, the assembly point may be common to the trim support and the airbag support, and the method may comprise:
(9) preassembling the airbag support of the airbag device with the trim support of the side bolster, comprises matching the common assembly point between the trim support and the airbag support.
(10) Additionally, the seat back may comprise a deflector, the method further comprising: preassembling the deflector on the assembly formed, on the one hand, by the side bolster comprising the side bolster trim and the trim support and, on the other hand, the airbag device, attaching the assembly formed by the side bolster, the airbag device and the deflector on the seat back frame by the at least one common assembly point of the trim support and the airbag support for their attachment on the pillar of the seat back frame.
(11) In illustrative embodiments, also disclosed is a motor vehicle seat comprising a seat bottom with a seat bottom frame and a seat back as described above.
(12) Additional features of the present disclosure will become apparent to those skilled in the art upon consideration of illustrative embodiments exemplifying the best mode of carrying out the disclosure as presently perceived.

Description

BRIEF DESCRIPTIONS OF THE DRAWINGS

(1) The detailed description particularly refers to the accompanying figures in which:

(2) FIG. **1** schematically shows a side view of an example of a vehicle seat;

(3) FIG. **2** schematically shows a side view of an example of a side part of a vehicle seat;

(4) FIG. **3** schematically shows, in perspective view, an example of a seat back frame equipped with an example of a side airbag device, which can be implemented in the vehicle seat of FIG. **1**; and

(5) FIG. **4** schematically shows a sectional view along the axis A-A of the vehicle seat example of FIG. **2**.

DETAILED DESCRIPTION

(6) In the various figures, the same references designate identical or similar elements. For the sake of conciseness, only the elements that are useful for understanding the described embodiment are shown in the figures and are described in detail below.

(7) In the following description, when referring to absolute position qualifiers, such as “front,” “rear,” “top,” “bottom,” “left,” “right,” etc., or relative position qualifiers, such as “above,” “below,” “upper,” “lower,” etc., or to qualifiers of orientation, such as “horizontal,” “vertical,” etc., reference is made, unless otherwise specified, to the orientation of the figures or of a vehicle seat in its normal usage position.

(8) In particular, the longitudinal direction X means the longitudinal direction of the seat. The longitudinal direction of the seat is considered to be the same as the longitudinal direction of the motor vehicle in which the seat is mounted. This longitudinal direction X corresponds to the normal direction of advance of the vehicle. The longitudinal direction X is horizontal. The transverse direction Y of the seat thus corresponds to the transverse or lateral direction of the motor vehicle. This transverse direction corresponds to a direction perpendicular to the normal direction of advance of the vehicle. The transverse direction Y is horizontal. Finally, the vertical direction Z is a vertical direction of the seat, perpendicular to the longitudinal and transverse directions.

(9) FIG. **1** schematically shows a motor vehicle seat **10** mounted on a slide mechanism **12**.

(10) The seat **10** comprises a seat bottom **13**, with a seat bottom frame **14** and a seat bottom trim **15**, on which a seat back **16**, with a seat back frame **17** and a seat back trim **18**, is mounted. The seat back frame **17** here is pivoting about a transverse axis A, with respect to the seat bottom frame **14**. To do this, a hinge mechanism **20** is arranged between the seat bottom frame **14** and the seat back frame **17**.

(11) The seat back trim **18** may further comprise a central bolster that comprises a central trim (not shown), and of two side bolsters that respectively comprise two side bolster trims **19**, and Each side bolster is arranged on the seat back frame **17**, laterally, on either side of the central bolster. The trim (of the central bolster or the side bolsters) typically forms a padding, for example an expanded foam, conferring the softness and the comfort of the seat

(12) The seat bottom **13** is mounted on movable sections **22**, also called slides or male sections, via feet **24**, **26**. Each movable section **22** is part of a slide **12** and is associated with a fixed section **28**. The fixed section **28** is also called “rail” or “female section.” The fixed section **28** is attached to the floor **30** of a motor vehicle.

(13) According to the illustrated example, the seat **10** can also comprise a headrest **34**. The headrest **34** may also comprise a headrest frame and headrest trim.

(14) In the following, we provide more detailed descriptions of examples of seat backs **16** that can be implemented in the seat **10** of [FIG. **1**], with reference to FIG. **2** to **4**.

(15) As illustrated in [FIG. **2**], the seat back frame **17** comprises a first pillar **17***a*, a second pillar **17***b*, a first crosspiece **17***c*, hereinafter called “lower crosspiece **17***c*,” and a second crosspiece **17***d*, hereinafter called “upper crosspiece **17***d*.” The pillars **17***a*, **17***b* and the crosspieces **17***c*, **17***d* form a seat back frame **17** in the form of a housing. To do this, the pillars **17***a*, **17***b* and the crosspieces

17*c*, **17***d* can be attached together, in particular welded together. Alternatively, the seat back frame **17** is in one piece, the latter for example being molded.

(16) The first pillar **17***a* is intended to be arranged as centrally as possible in the motor vehicle, while the second pillar **17***b* is intended to be arranged closest to a lateral side of the vehicle. The lower crosspiece **17***c* is intended to be the closest crosspiece to the hinge device **20**, the hinge device even being able to be attached on the lower crosspiece **17***c*. The upper crosspiece **17***d* is intended to be the closest crosspiece to the headrest **34**.

(17) In the remainder of the description, the present disclosure is arbitrarily described with reference to the first pillar **17***a*. However, the present disclosure may alternatively or additionally be implemented on the second pillar **17***b*.

(18) As illustrated in this [FIG. **2**], the first pillar **17***a* comprises an upper attachment **26** and a lower attachment **27**. The upper and lower attachments **26**, **27** are through holes provided to receive attachment means **60**, as described below. In the vertical direction Z, the upper attachment **26** is provided in the upper part of the first pillar **17***a* and the lower attachment **27** is provided in the lower part of the first pillar **17***a*, the upper attachment **26** being positioned higher than the lower attachment **27**, relative to the vertical direction Z.

(19) As illustrated in [FIG. **2**] and in more detail in [FIG. **3**], a side bolster is arranged on the first pillar **17***a*. In [FIG. **2**], it can be seen that the side bolster trim **19** comprises, in the longitudinal direction X, an outer edge **19***a* and an inner edge **19***b*. The inner edge **19***b* is designed to be arranged in contact with, or in the immediate vicinity of, a rear part of a vehicle seat, such as for example a vehicle seat rear shell. The inner edge **19***b* is preferably a trim section that is attached to the trim support **40**, in particular on which the seat back foam is overmolded. The inner edge **19***b* is also preferably arranged in line with the first pillar **17***a*.

(20) In addition, advantageously, the inner edge **19***b* of the side bolster trim **19** can constitute a run-off line for a side bolster device **36** (detailed below). Alternatively, the run-off line (inner edge **19***b*) can be completed by a guide wall or inclined wall **19***c*. The guide wall **19***c*, visible in the sectional view of [FIG. **4**] along the axis A-A illustrated in [FIG. **2**], directs the deployment of an airbag of the side bolster device **36** toward the run-off line. This wall **19***c* is produced by a trim section of the seat back side bolster, which preferably belongs to a trim support **40**. The wall **19***c* thus separates the airbag zone from the rear face of the foam and the seat back side bolster trim and thus provides deployment of the airbag toward the run-off line, without tearing the foam.

(21) Furthermore, in addition to the side bolster trim **19**, the side bolster comprises a trim support **40** for attaching the side bolster trim **19** on the first pillar **17***a*. [FIG. **3**] shows the trim support **40** without the side bolster trim **19**. The trim support is preferably made of plastic material. The trim support **40** is attached to the first pillar **17***a* via two assembly points **41**, **42**. More specifically, the trim support **40** is attached to the first pillar **17***a* via a first point **41** and a second point **42**. The first point **41** is provided to cooperate with the upper attachment **26** arranged on the first pillar **17***a*, and the second point **42** is provided to cooperate with the lower attachment **27** arranged on the first pillar **17***a*. The first and second points **41**, **42** cooperate with the upper **26** and lower **27** attachments, respectively, via the attachment means **60**. The attachment means **60** are for example bolt-nut assemblies or rivets. The attachment means **60** thus allow the solid attachment of the trim support **40** (and therefore of the side bolster trim **19**) on the first pillar **17***a*.

(22) Therefore, according to the present disclosure, the attachment of the side bolster trim **19** to a pillar of the frame **17** uses only two attachment points.

(23) FIG. **3** further illustrates a side airbag device **36**, arranged on the first pillar **17***a*. Alternatively, the side airbag device **36** can be arranged on the second pillar **17***b*.

(24) Here, the side airbag device **36** comprises an airbag **44** and an airbag **44** inflation cartridge **46**. The airbag **44** and the cartridge **46** are arranged in a pouch **38**, or sleeve. The pouch **38** is made of non-woven textile material. The cartridge **46** is in fluid communication with the airbag **44**. The pouch **38** is shaped to open in the event the airbag **44** is deployed.

(25) The side airbag device **36** further comprises an airbag support **50**, to be arranged on the first pillar **17***a*. The cartridge **46** is for example attached to the airbag support **50**, on a plate **51**.
(26) The airbag support **50** extends longitudinally in the vertical direction Z, between an upper end of the airbag support **53** and a lower end of the airbag support **52**. The airbag support is preferably made of metallic material, such as for example steel. The airbag support **50** is attached to the first pillar **17***a* via the two assembly points **41**, **42**, also provided for attaching the trim support **40** to the first pillar **17***a*. The first point **41** may be provided toward the upper airbag support end **53** and the second point **42** may be provided toward the lower airbag support end **52**. The trim support **40** and the airbag support **50** thus comprise two common assembly points for their common attachment to the first pillar **17***a*. In other words, the airbag support **50** and the trim support **40** are both attached together on the pillar, by common assembly points.
(27) Furthermore, the airbag support **50** is arranged on the trim support **40**. It is therefore understood that, once the airbag support **50** and the trim support **40** are attached on the pillar, the trim support **40** is arranged between the airbag support **50** and the pillar. In other words, the airbag support **50** is arranged on the trim support **40**, which in turn is arranged on the pillar. The airbag support **50** is therefore superimposed on the trim support **40**, which is superimposed on the pillar.
(28) Alternatively, the side airbag device **36** may comprise an intermediate plate (not shown) on which the plate **51** supporting the cartridge **46** is attached. The intermediate plate can for example be made of metal, such as steel for example. The intermediate plate is attached to the airbag support **50**. Described another way, the cartridge **46** is attached to the first pillar **17***a* via the intermediate plate, which in turn is attached to the airbag support **50**. Provision can also be made for the intermediate plate to have at least one assembly point **41** and/or **42** common to the airbag support **50**. f
(29) It can thus be noted that the assembly of the trim support **40** and the airbag support **50** on a pillar is particularly easy, since the assembly uses only two assembly points, these points being common, i.e. identical, to the trim support **40** and the airbag support **50**. In other words, only the two assembly points **41**, **42** allow the trim support **40** and the airbag support **50** to be attached to a pillar of the frame **17**.
(30) Alternatively, a deflector **70** can be attached to the first pillar **17***a*. In this case, as visible in FIG. **2**, the deflector **70** is arranged above the side airbag device **36**. In other words, the deflector **70** envelops the side airbag device **36**.
(31) The deflector **70** extends longitudinally in the vertical direction Z, between an upper end of the deflector **73** and a lower end of the deflector **72**. The deflector **70** is attached to the first pillar **17***a* via the two assembly points **41**, **42**, also provided for attaching the trim support **40** and the airbag support **50** to the first pillar **17***a*. The first point **41** may be provided toward the upper deflector support end **73** and the second point **42** may be provided toward the lower deflector support end **72**. The trim support **40**, the airbag support **50** and the deflector **70** thus comprise two common assembly points for their common attachment to the first pillar **17***a*.
(32) The deflector **70** is configured to direct the deployment of the airbag **44**. A border **71**, or trim section, is arranged on the deflector **70**. The border **71** is further arranged along the inner edge **19***c* of the side bolster **19**. The border **71** can be of complementary shape to the inner edge **19***b*, and thus follow the shape of the side bolster trim **19**. The airbag **44** deploys along the border **71**. Preferably, the deflector **70** may be a one-layer polyurethane coating. The deflector **70** comprises a semi-rigid material, such as polyurethane for example. In the event the airbag **44** is deployed, the border **71**, due to the flexibility of the deflector **70**, moves away from the run-off line of the side bolster trim **19** to allow the airbag **44** to deploy.
(33) We will now describe a method of assembling the seat back **16** of the vehicle seat. The method is described here with reference to the first pillar **17***a*, but can also be implemented on the second pillar **17***b*.
(34) In general, the method comprises attaching the side bolster to the first pillar **17***a*, including the

side bolster trim **19** and the trim support **40** on which the side airbag device **36** is pre-mounted (or pre-assembled). The assembly including the side bolster and the side airbag device **36** is thus attached to the first pillar **17***a* in a single assembly step. The mounting of the side airbag device **36** can therefore be done simultaneously with the attachment of the side bolster (including the trim of the side bolster **19** and the trim support **40**) on the first pillar **17***a*. This results in a simplification and time saving of the assembly method of the seat back.

(35) More specifically, the method comprises: preassembling the side airbag device **36** with the trim support **40**. In particular, the side airbag device **36** is placed on the trim support **40** so that the assembly points coincide, that is to say, a single first assembly point **41** and a single second assembly point **42**.

(36) Then, the method comprises: attaching the assembly formed on the one hand by the side bolster, including the trim support **40** and the side bolster trim **19**, and on the other hand, the side airbag device **36** on the seat back frame **17**. In particular, the first assembly point **41** and the second assembly point **42** of the assembly formed by the trim support **40** and the side airbag device **36** are made to correspond with the upper attachment **26** and the lower attachment **27**, respectively, of the first pillar **17***a*. The assembly formed by the trim support **40** and the side airbag device **36** is then attached on the seat back frame **17**, using the attachment means **60**, provided to cooperate with the first and second assembly points **41**, **42**, at the upper attachment **26** and the lower attachment **27**.

(37) Additionally, the method may comprise: preassembling the deflector **70** on the assembly formed by the trim support **40** and the side airbag device **36**. The deflector **70** is in this case mounted on the trim support **40**, above the side airbag device **36**. This results in a single first assembly point **41** and a single second assembly point **42**. The assembly formed by the trim support **40**, the side airbag device **36** and the deflector **70** is then attached as outlined in the previous paragraph.

(38) The method described, according to the present disclosure, therefore makes it possible to prepare, on the one hand, the elements to be attached on a pillar of the seat back frame **17** before, on the other hand, attaching them on the pillar. It is thus not necessary to provide the pillar from the start of the seat back assembly method; the preparatory steps can be prepared at a distance from the frame before attaching, in one piece, the side trim and airbag elements on the pillar of the frame.

(39) A comparative seat back may be provided with a side airbag device. Such a device may be attached to a pillar of the seat back frame. Such a side airbag device may aim to limit the risk of the seat's occupant colliding with the door, or even the central pillar of the passenger compartment of the vehicle, or else may aim to limit the risk of head-to-head impacts of the occupants of two seats arranged transversely one beside the other in the motor vehicle when located on the centermost pillar of the vehicle when located on the other pillar, on the inside.

(40) However, the manufacture of such a comparative seat, in particular comprising positioning the device inside a cover before attaching it to the frame, complicates the assembly of the airbag device. Under these conditions, the side airbag device may be attached in a dedicated mounting step on the pillar of the seat back frame.

(41) It appeared that because of this dedicated mounting step, the assembly of the various elements that constitute the seat back is particularly complex and time-consuming.

(42) In addition, such an airbag device determines the profile of the seat, which makes it necessary to design the seat according to the size of the airbag device.

(43) The present disclosure improves the situation.

(44) Vehicle (**10**) seat back (**16**) comprising a seat back frame (**17**) with a pillar (**17***a*, **17***b*), an airbag device (**36**) and a side bolster, the airbag device (**36**) comprising at least one airbag (**44**) and an airbag support (**50**) for attaching the airbag (**44**) to the seat back frame (**17**), and the side bolster comprising a side bolster trim (**19**) and at least one side bolster trim support (**40**) for attaching the side bolster to the seat back frame (**17**), wherein the trim support (**40**) and the airbag support (**50**)

comprise at least one assembly point (**41**, **42**) for their attachment to the pillar (**17***a*, **17***b*) of the seat back frame (**17**).

Claims

1. A vehicle seat back comprising a seat back frame with a pillar, an airbag device and a side bolster, the airbag device comprising at least one airbag and an airbag support for attaching the airbag to the seat back frame, and the side bolster comprising a side bolster trim and at least one side bolster trim support for attaching the side bolster to the seat back frame, wherein the trim support and the airbag support comprise at least one assembly point for their attachment to the pillar of the seat back frame, wherein the side bolster trim comprises a run-off line for deployment of the airbag, wherein the seat back further comprises a deflector attached to the pillar, the deflector comprising a border, the border being arranged along the run-off line, and wherein, in the event the airbag is deployed, the border, due to the flexibility of the deflector, moves away from the run-off line of the side bolster trim to allow the airbag to deploy.
2. The seat back of claim 1, wherein the trim support, at least at the assembly point, is arranged between the pillar of the seat back frame and the airbag support.
3. The seat back of claim 1, wherein the assembly point is common to the trim support and the airbag support for their joint attachment to the pillar of the seat back frame.
4. The seat back of claim 3, wherein the trim support and the airbag support are attached to the seat back frame, at the assembly point, by common attachment means.
5. The seat back of claim 3, wherein the trim support and the airbag support comprise, for their attachment on the pillar of the seat back frame, two common assembly points: a first point for an upper attachment on the pillar and a second point for a lower attachment on the pillar, the upper attachment being arranged higher than the lower attachment in a vertical direction.
6. The seat back of claim 5, wherein the deflector comprises the two assembly points common to the trim support and the airbag support.
7. The seat back of claim 1, wherein the trim support comprises a guide wall configured to direct the deployment of the airbag toward the run-off line.
8. The seat back of claim 1, wherein the trim support and the airbag support comprise different materials, the trim support preferably being made of plastic material and the airbag support being made of metallic materials.
9. A method of assembling a vehicle seat back comprising a seat back frame, an airbag device comprising at least one airbag and an airbag support for attaching the airbag, and a side bolster comprising a side bolster trim and at least one side bolster trim support for its attachment to the seat back frame, wherein an assembly point is common to the trim support and the airbag support, the seat back further comprising a deflector, the method comprising preassembling the airbag support of the airbag device with the trim support of the side bolster by matching the common assembly point between the trim support and the airbag support, preassembling the deflector on the assembly formed, on the one hand, by the side bolster comprising the side bolster trim and the trim support and, on the other hand, the airbag device, attaching the assembly formed by the side bolster, the airbag device and the deflector on the seat back frame by the at least one common assembly point of the trim support and the airbag support for their attachment on the pillar of the seat back frame.
10. A motor vehicle seat comprising a seat bottom with a seat bottom frame and a seat back according to claim 1.
11. The method of claim 9, wherein the vehicle seat further comprises a seat bottom with a seat bottom frame.
12. A vehicle seat back comprising a seat back frame with a pillar, an airbag device and a side bolster, the airbag device comprising at least one airbag and an airbag support for attaching the

airbag to the seat back frame, and the side bolster comprising a side bolster trim and at least one side bolster trim support for attaching the side bolster to the seat back frame, wherein the trim support and the airbag support comprise at least one assembly point for their attachment to the pillar of the seat back frame, wherein the assembly point is common to the trim support and the airbag support for their joint attachment to the pillar of the seat back frame, wherein the trim support and the airbag support comprise, for their attachment on the pillar of the seat back frame, two common assembly points: a first point for an upper attachment on the pillar and a second point for a lower attachment on the pillar, the upper attachment being arranged higher than the lower attachment in a vertical direction, further comprising a deflector attached to the pillar, the deflector comprising the two assembly points common to the trim support and the airbag support, the deflector being structurally independent from the trim support and the airbag support.