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(54) **VEHICLE SEAT COMPRISING LATERAL CHEEKS**

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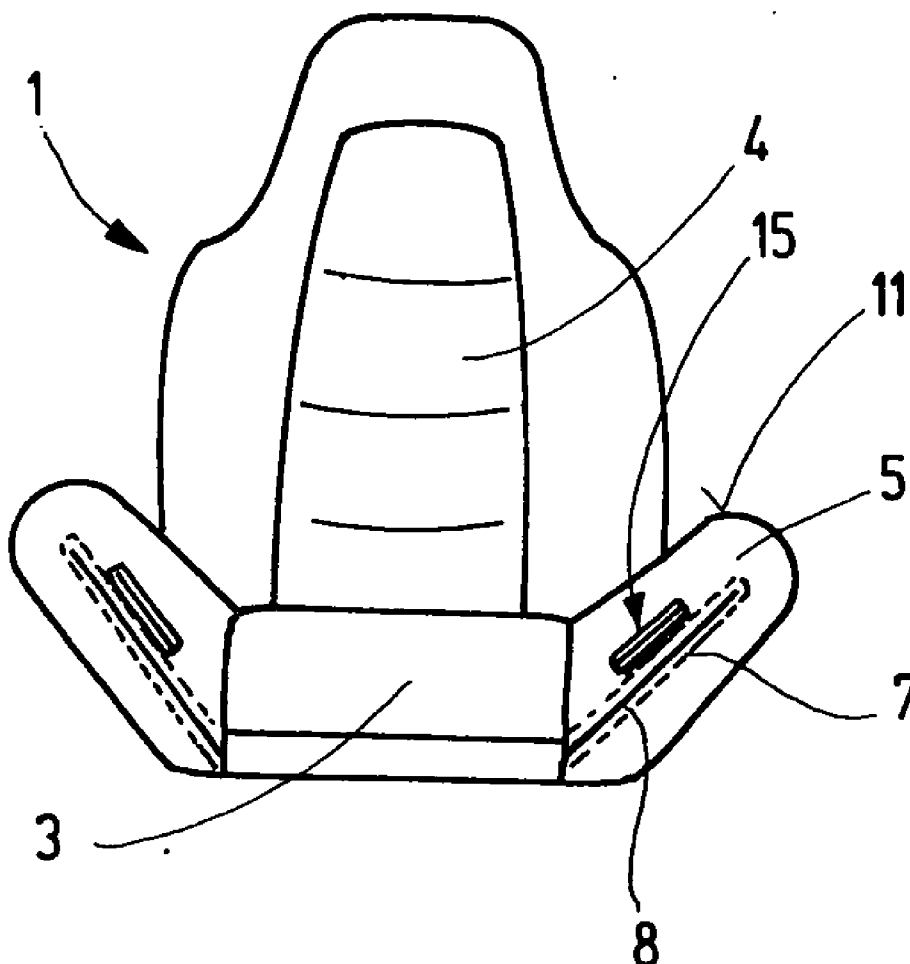
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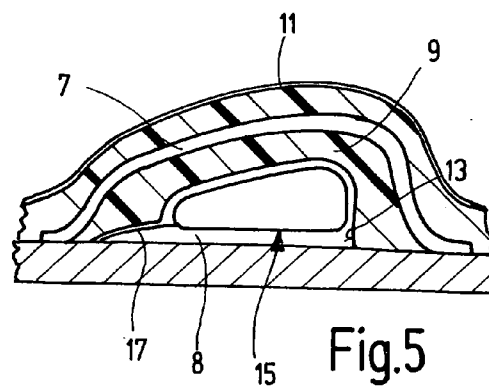
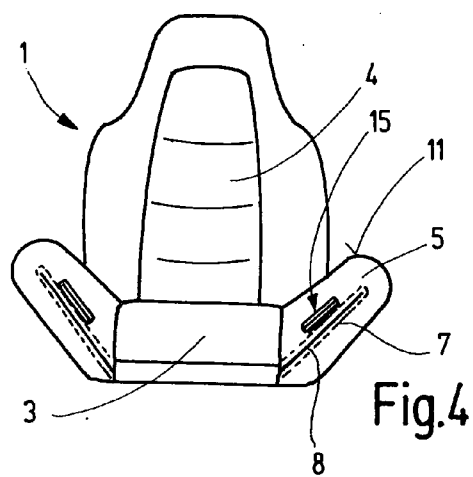
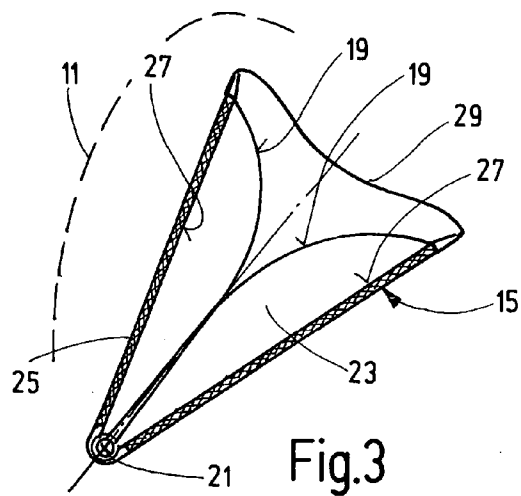
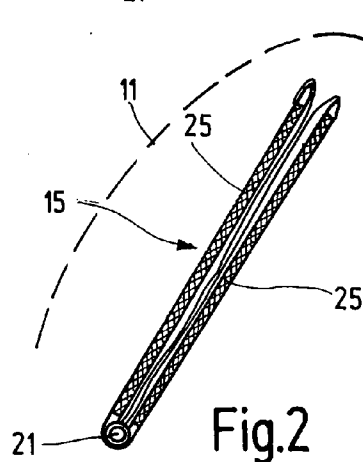
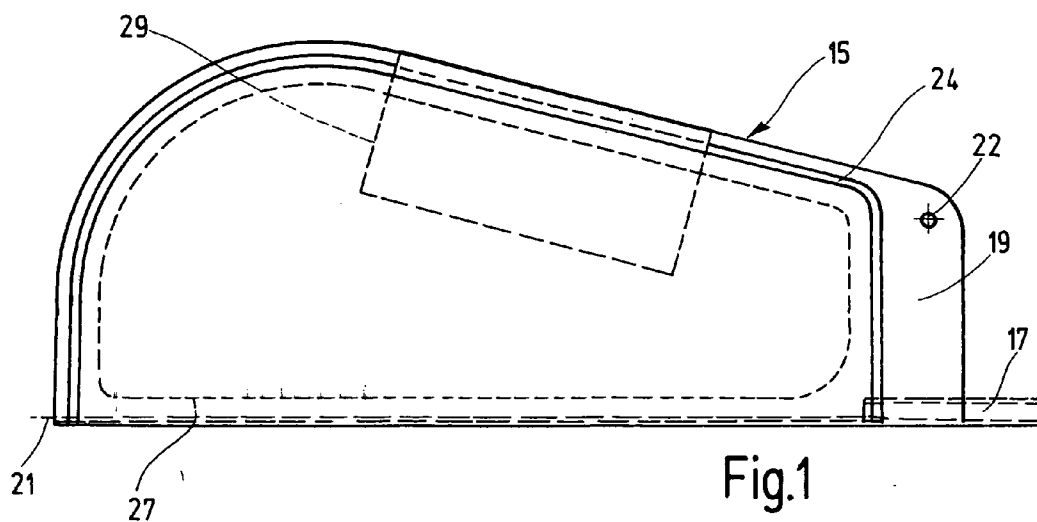
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(57) **ABSTRACT**

In the case of a vehicle seat, in particular a motor vehicle seat, comprising at least one pair of lateral cheeks provided on a seat cushion and/or a backrest, the lateral cheeks contain at least one chamber unit (15) with an inflatable chamber which is enclosed by flexible walls (19), at least one firm plate (27) is arranged within the chamber.





VEHICLE SEAT COMPRISING LATERAL CHEEKS**CROSS-REFERENCE TO RELATED APPLICATION**

[0001] The present application is a continuation of International Application PCT/EP2005/001490, which was filed Feb. 15, 2005. The entire disclosure of International Application PCT/EP2005/001490, which was filed Feb. 15, 2005, is incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to a vehicle seat, in particular a motor vehicle seat, having at least one pair of adjustable lateral cheeks provided on a seat cushion and/or a backrest, with each of the lateral cheeks containing at least one chamber unit having an inflatable chamber that is enclosed by flexible walls.

[0003] In the case of a known vehicle seat of the type described immediately above, sheet-metal wings are coupled to the structure in the lateral cheeks. In order to adjust the lateral cheeks, the sheet-metal wings are pivoted by inflating bubbles that serve as chamber units. The production of adjustable lateral cheeks of this type is complicated. Furthermore, a vehicle seat is known in which the bubbles are provided without the pivotable sheet-metal wings. In this case, greatly localized bulging of the lateral cheeks arises during the inflation.

BRIEF SUMMARY OF SOME ASPECTS OF THE INVENTION

[0004] The present invention is based on the object of improving a vehicle seat of a type mentioned above. In accordance with one aspect of the present invention, a vehicle seat, in particular a motor vehicle seat, includes a seat cushion, a backrest, and at least one pair of adjustable lateral cheeks. The lateral cheeks are operatively connected to the seat cushion and/or the backrest, so that the lateral cheeks are capable of being adjusted with respect to the seat cushion and/or the backrest. At least one of the lateral cheeks contains at least one chamber unit. The chamber unit includes an inflatable chamber that is enclosed by flexible walls, and at least one firm plate that is positioned within the chamber.

[0005] Because at least one firm plate is arranged within the chamber, i.e. the flexible walls of the chamber enclose the firm plate, firstly an extensive enlargement of the lateral cheek is achieved during inflation of the chamber, and, secondly, the production of the vehicle seat is simplified because of the omission of the pivotable sheet-metal wings, which reduces the costs for the vehicle seat. The plate is arranged loosely in the chamber. The chamber unit is designed as a unit and can therefore be fitted in a simple manner. The chamber unit fits gently into the padded material of the lateral cheek, even in the inflated state, because of the flexible walls of the chamber. The chamber unit is produced preferably by means of connection of two walls along their edge, so that the plate can be inserted before the connection takes place.

[0006] For a simple enlargement of the chamber unit, the chamber unit has two wings that can be folded with respect to each other about a common central axis. In order to

restrict an unfolding movement, a connecting tab is provided between those two edges of the wings which are spaced apart from the central axis. In order, firstly, to achieve the extensive enlargement of the lateral cheek and, secondly, to obtain a good support, one plate is preferably arranged in each wing. The chamber extends continuously into both wings so that the chamber can be inflated at both wings. The wings are folded up preferably flat in an empty state (e.g., uninflated state) of the chamber unit, and the wings are unfolded in an inflated state of the chamber unit. The wall which is situated on the inside in the empty state of the chamber unit bulges within the chamber unit during inflation of the chamber, in order to push the wings apart. The inflated state is to be understood as meaning the state in which the chamber is inflated completely or to the maximum. A tube for inflating the chamber is guided into the chamber preferably in the region of the central axis, since the central axis does not change its position during unfolding of the wings.

[0007] Other aspects and advantages of the present invention will become apparent from the following.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The invention is explained in more detail below with reference to an exemplary embodiment that is illustrated in the drawings, in which:

[0009] FIG. 1 shows a side view of a chamber unit,

[0010] FIG. 2 shows an end view of the chamber unit in the empty state with the profile of the cover indicated by dashed lines,

[0011] FIG. 3 shows an end view of the chamber unit in the inflated state with the profile of the cover indicated by dashed lines,

[0012] FIG. 4 shows a diagrammatic front view of an example of a vehicle seat, and

[0013] FIG. 5 shows a side view of the chamber unit in the lateral cheek which has been sectioned longitudinally.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENT

[0014] In a vehicle seat **1**, which is designed as a sports seat for a motor vehicle, each of the seat cushion **3** and backrest **4** respectively include a pair of adjustable lateral cheeks **5**. All of the lateral cheeks **5** provided are in principle of identical construction and so only a lateral cheek **5** provided on the seat cushion **3** is described below as an example.

[0015] The lateral cheek **5** running in the longitudinal direction of the seat cushion **3** is provided with a structural element **7**, in the present case a steel bracket, that is attached fixedly at both of its ends to a seat frame supporting the seat cushion **3**. The structural element **7** supports sheet metal **8** that closes the area between the structural element and the seat frame. The structural element **7** is enclosed on all sides by a padded foam part **9** which in turn is covered by a cover **11** having a textile basis or made from leather. At least the cover **11** is cut in such a manner that an enlargement of the volume of the lateral cheek **5** is possible.

[0016] A chamber unit **15** is arranged in a pocket **13** of the padded part **9**. The chamber unit **15** is flat in the empty state

and is arranged at least approximately in a plane. The plane is defined by the structural element 7 and its area of sheet metal 8, and is oriented obliquely with respect to the horizontal. From a bellows (not illustrated) or the like, a tube 17 leads via a valve to the chamber unit 15. The chamber unit 15 has two film-like, flexible, but non-expandable walls 19 of soft plastic that are cut symmetrically with respect to a central axis 21 during production, rest flat on each other, are pre-positioned by control holes 22, and are welded to each other at the edge by means of a weld seam 24—with a closed, inherently continuous chamber 23 being formed—with the outwardly extending tube 17 being welded in at the central axis 21.

[0017] The central axis 21 defines two wings 25 of the chamber unit 15 that are folded onto each other in the empty state of the chamber unit 15. The chamber 23 extends into both wings 25. Two flat plates 27 are respectively arranged loosely within the wings 25, namely within the wings' portions of the chamber 23. The flat plates 27 are symmetrical to each other, and they are at least approximately parallel to each other in the empty state of the chamber unit 15. The plates 27 are composed of a firm plastic. A connecting tab 29 is provided between those edges of the chamber unit 15 or of the wings 25 which are spaced apart from the central axis 21. The connecting tab 29 is welded at its ends to the edge regions of the walls 19. The connecting tab 29 is folded up in the center in the empty state of the chamber unit 15. The connecting tab 29 is made from the same material as the walls 19. Transversely to the central axis 21, the connecting tab 29 has approximately the same width as one wing 25.

[0018] The empty state of the chamber unit 15 corresponds to an outwardly opened position of the lateral cheek 5, which is then as a rule aligned at a distance from the occupant's thigh. In order to laterally support the thigh for a sporty driving mode (to laterally support the upper body in the case of a lateral cheek 5 in the backrest), the setting of the lateral cheek 5 may be changed, for which purpose the chamber unit 15 is brought in each case into an inflated state. To this end, air is supplied to the chamber 23 via the tube 17, i.e. the chamber 23 is inflated. Owing to the folded position of the wings 25 and the resultant folding of the wall 19 situated on the inside, the supplied air fills the region of the chamber 23 between the mutually facing wings 25, i.e. the region situated on the inside. The wall 19 which is situated on the outside and is already taut remains virtually unchanged. The wall 19 situated on the inside bulges within the chamber unit 15 during deployment, so that those regions of the chamber 23 which are situated on the inside in the respective wings 25 push away from each other and push the wings 25 apart, i.e. the chamber unit 15 unfolds about the central axis 21 until the connecting tab 29 is stretched and the unfolding movement is restricted at approximately 60° between the wings 25. The chamber unit 15 has therefore reached its inflated state.

[0019] The volume of the chamber unit 15 is enlarged with the inflation of the chamber 23. Because the chamber unit 15 is supported on the sheet metal 8, the enlarging of the chamber unit 15 simultaneously causes displacement of the padded part 9 on the inside of the lateral cheek 5 and movement of the cover 11. As part of evening itself out, the moving cover 11 compresses the padded part 9 on the outer side of the lateral cheek 5. In the process, the lateral cheek 5 places itself in a desired manner against the thigh. Since,

because of the plates 27, the chamber unit 15 remains essentially flat towards the outside, the displacing of the padded part 9 and the bearing against the thigh take place over a large area, which improves the support in comparison to a spherical enlargement of a bubble and feels more comfortable than such an enlargement.

[0020] It will be understood by those skilled in the art that while the present invention has been discussed above with reference to exemplary embodiments, various additions, modifications and changes can be made thereto without departing from the spirit and scope of the invention as set forth in the following claims.

What is claimed is:

1. A vehicle seat, comprising:

a seat cushion;

a backrest; and

at least one pair of adjustable lateral cheeks operatively connected to at least one of the seat cushion and the backrest, so that the lateral cheeks are capable of being adjusted with respect to at least one of the seat cushion and the backrest, wherein at least one lateral cheek of the lateral cheeks contains at least one chamber unit, and wherein the chamber unit includes an inflatable chamber that is enclosed by flexible walls, and at least one firm plate positioned within the chamber.

2. The vehicle seat as claimed in claim 1, wherein:

the walls include

(a) a first wall having an edge, and

(b) a second wall having an edge; and

the chamber is formed by the first wall and the second wall being connected to one another, whereby the chamber unit comprises a connection between the first wall and the second wall;

the connection extends along the edge of the first wall; and

the connection extends along the edge of the second wall.

3. The vehicle seat as claimed in claim 1, wherein:

the chamber unit comprises two wings, and

the wings are configured for being folded with respect to one another about a common central axis.

4. The vehicle seat as claimed in claim 3, wherein:

the chamber unit further includes a connecting tab;

the two wings includes a first wing and a second wing;

the first wing includes an edge that is spaced apart from the central axis;

the second wing includes an edge that is spaced apart from the central axis; and

the connecting tab is between the edge of the first wing and the edge of the second wing.

5. The vehicle seat as claimed in claim 3, wherein:

the two wings includes a first wing and a second wing;

the plate is a first plate;

the first plate is positioned in the first wing;

the chamber unit further includes a second plate positioned within the chamber; and

the second plate is positioned in the second wing.

6. The vehicle seat as claimed in claim 3, wherein the chamber extends continuously into both wings.

7. The vehicle seat as claimed in claim 3, wherein:

the wings are in a folded together configuration with respect to one another during an uninflated state of the chamber unit, and

the wings are in an at least partially unfolded configuration with respect to one another in an inflated state of the chamber unit.

8. The vehicle seat as claimed in claim 7, wherein:

the walls include

(a) a first wall having an edge, and

(b) a second wall having an edge;

the chamber is formed by the first wall and the second wall being connected to one another, whereby the chamber unit comprises a connection between the first wall and the second wall;

the connection extends along the edge of the first wall;

the connection extends along the edge of the second wall;

the first wall is positioned inwardly from the second wall during the uninflated state of the chamber unit; and

the first wall is configured for bulging within the chamber unit during inflation of the chamber, so that the bulging first wall pushes the wings apart..

9. The vehicle seat as claimed in claim 8, wherein:

the two wings includes a first wing and a second wing;

the first wing includes an edge that is spaced apart from the central axis;

the second wing includes an edge that is spaced apart from the central axis; and

the chamber unit further includes a tab operatively connected between the edge of the first wing and the edge of the second wing for restricting more than a predetermined amount of unfolding of the wings with respect to one another about the common central axis.

10. The vehicle seat as claimed in claim 3, wherein a tube for inflating the chamber communicates with the chamber at a position that is proximate the central axis.

11. The vehicle seat as claimed in claim 2, wherein:

the chamber unit comprises two wings, and the wings are configured for being folded with respect to one another about a common central axis.

12. The vehicle seat as claimed in claim 3, wherein the wings are operatively connected to one another in a manner that restricts more than a predetermined amount of unfolding of the wings with respect to one another about the common central axis.

13. The vehicle seat as claimed in claim 4, wherein the connecting tab is adapted for restricting more than a predetermined amount of unfolding of the wings with respect to one another about the common central axis.

14. The vehicle seat as claimed in claim 4, wherein:

the plate is a first plate;

the first plate is positioned in the first wing;

the chamber unit further includes a second plate positioned within the chamber; and

the second plate is positioned in the second wing.

15. The vehicle seat as claimed in claim 4, wherein the chamber extends continuously into both wings.

16. The vehicle seat as claimed in claim 5, wherein the chamber extends continuously into both wings.

17. The vehicle seat as claimed in claim 4, wherein:

the wings are in a folded together configuration with respect to one another during an uninflated state of the chamber unit, and

the wings are in an at least partially unfolded configuration with respect to one another in an inflated state of the chamber unit.

18. The vehicle seat as claimed in claim 5, wherein:

the wings are in a folded together configuration with respect to one another during an uninflated state of the chamber unit, and

the wings are in an at least partially unfolded configuration with respect to one another in an inflated state of the chamber unit.

19. The vehicle seat as claimed in claim 6, wherein:

the wings are in a folded together configuration with respect to one another during an uninflated state of the chamber unit, and

the wings are in an at least partially unfolded configuration with respect to one another in an inflated state of the chamber unit.

20. The vehicle seat as claimed in claim 6, wherein a tube for inflating the chamber communicates with the chamber at a position that is proximate the central axis.

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