US 20030168897A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2003/0168897 A1

Braun et al. (43) Pub. Date: Sep. 11, 2003

(54) VEHICLE SEAT HAVING A BEARING DEVICE

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(21) Appl. No.: **10/354,375**

(22) Filed: **Jan. 30, 2003**

Related U.S. Application Data

(63) Continuation of application No. PCT/EP02/02938, filed on Mar. 16, 2002.

(30) **Foreign Application Priority Data**

Mar. 28, 2001 (DE)..... 101 15 243.4

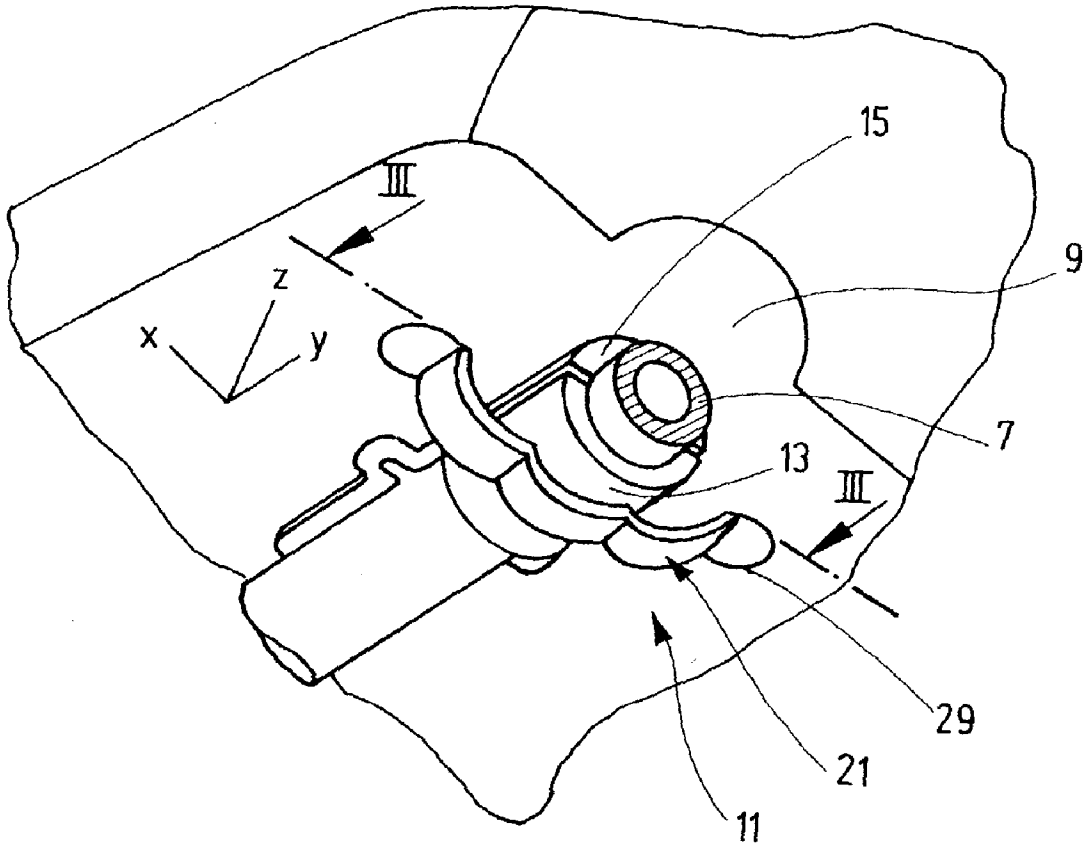
Publication Classification

(51) **Int. Cl.**[7] **A47C 1/02**

(52) **U.S. Cl.** **297/325**

(57) **ABSTRACT**

A vehicle seat, in particular a motor vehicle seat, has a bearing device (**11**) between two components (**7, 9**) which are at least slightly moveable relative to each other. The bearing device (**11**) has at least one elastic fastening element (**21**) for connecting the two components (**7, 9**) transversely to the direction of movement.



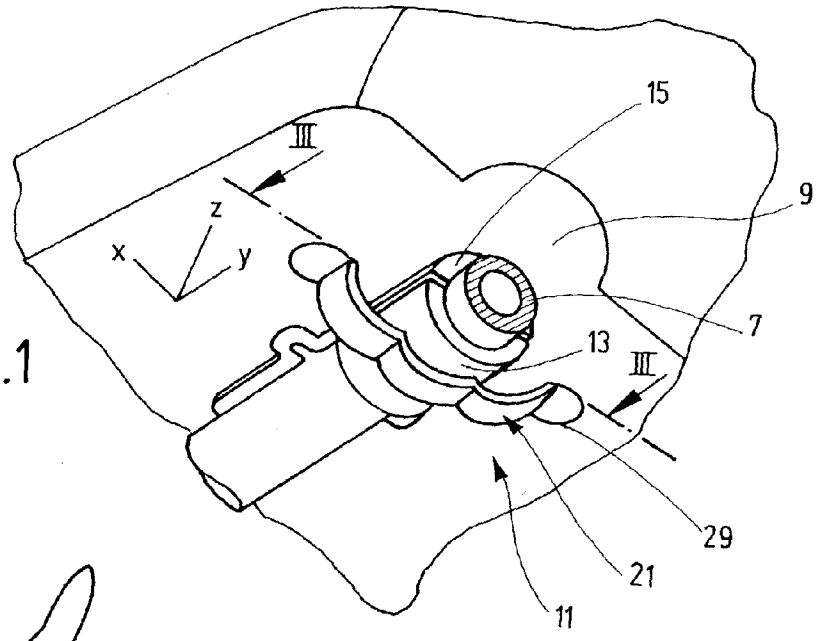


Fig.1

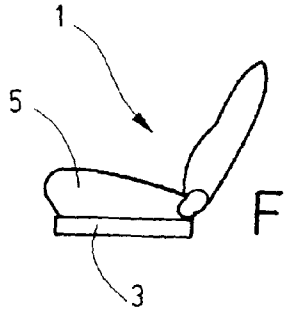


Fig.2

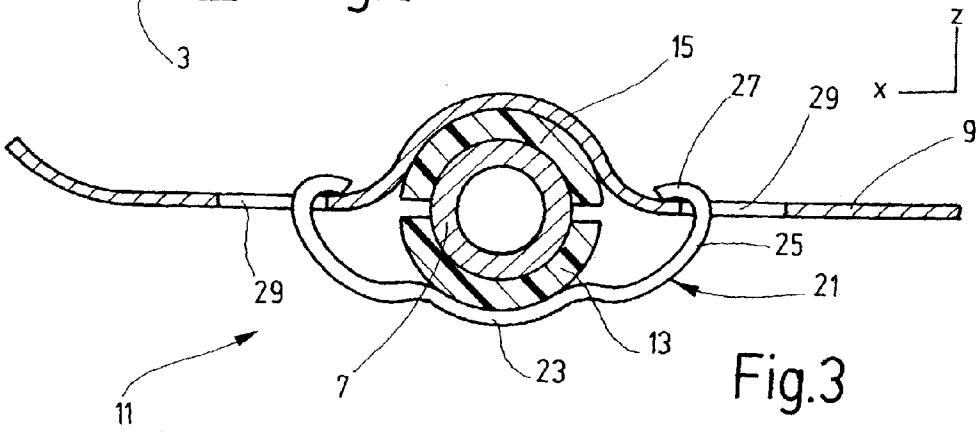


Fig.3

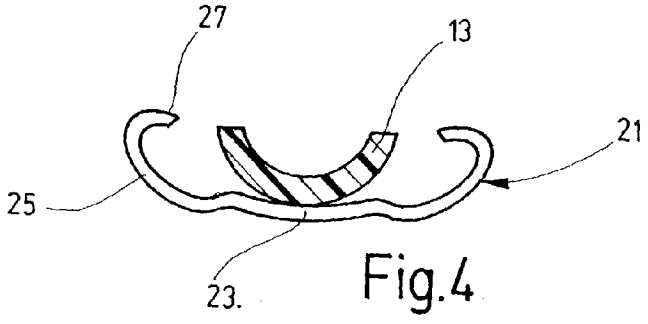


Fig.4

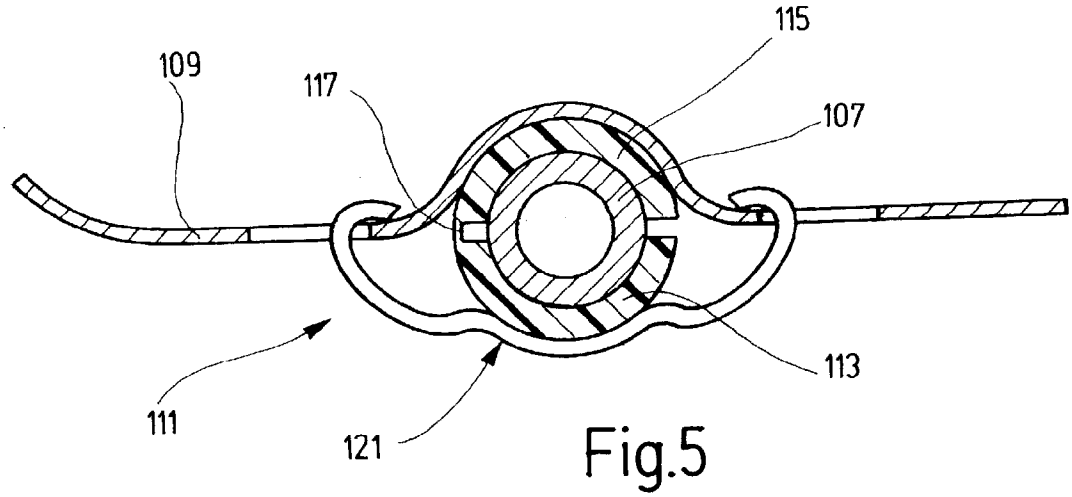


Fig.5

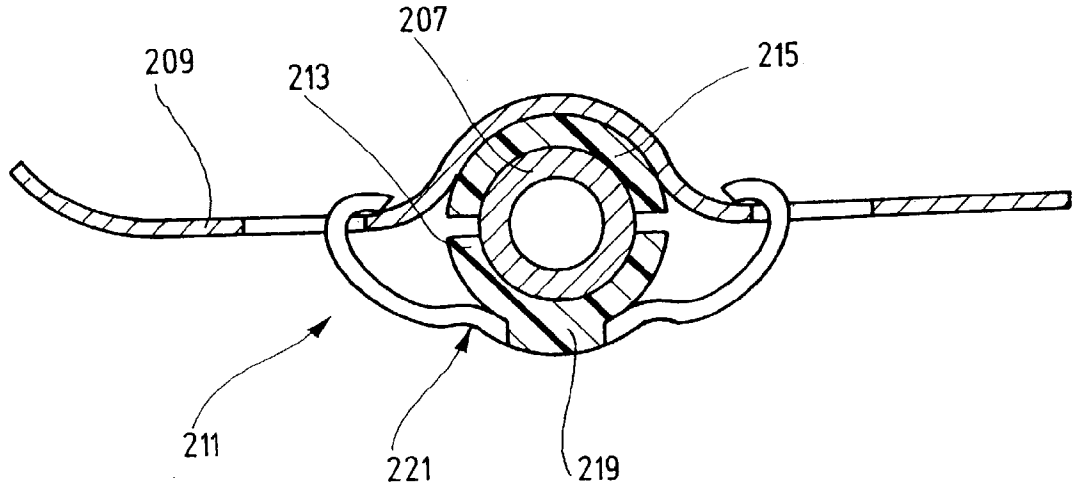


Fig.6

VEHICLE SEAT HAVING A BEARING DEVICE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This is a continuation of PCT/EP02/02938, which was filed Mar. 16, 2002, published in German, and is entirely incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to a vehicle seat, in particular a motor vehicle seat, having a bearing device between two components which are at least slightly moveable relative to each other, with the bearing device having at least one fastening element for connecting the two components transversely to the direction of movement.

[0003] In the case of a vehicle seat of this type, a seat shell is mounted pivotably at the front on a transverse tube of a seat frame and resiliently at the rear on the seat frame. When loaded by an occupant, the seat shell pivots slightly about the transverse tube. A rigid fastening clamp is provided as the bearing device, with the clamp surrounding the transverse tube from below and being fastened to the seat shell by means of clips. From above, the seat shell rests on the transverse tube via a counterbearing. This design leaves something to be desired.

BRIEF SUMMARY OF THE INVENTION

[0004] One aspect of the present invention is the provision of an improved vehicle seat, in particular a motor vehicle seat, having a bearing device between two components which are at least slightly moveable relative to each other, with the bearing device having at least one fastening element for connecting the two components transversely to the direction of movement, and the fastening element being of elastic design.

[0005] The elastic design of the fastening element allows it to bear in a play-free manner against at least one of the parts to be supported. The fastening element is preferably also fitted under prestress in the bearing device in order to simultaneously compensate for tolerances and be rattle-free in the driving mode, i.e. to prevent annoying noises in the bearing device. The fastening element is preferably designed as a spring clamp, another spring element or as another elastic element.

[0006] The design according to the invention is particularly advantageous if the fastening element at least partially surrounds the first component of the bearing device in the circumferential direction, with the first component forming the axis for a pivoting movement, and the fastening element being fastened to the pivotable, second component. In order to simplify the installation, the fastening element is attached directly, i.e. without screwing or clips or other additional fastening elements, to the pivotable, second component.

[0007] A bearing shell provided for reducing the friction is preferably made of a different material than the components which can be pivoted relative to each other. The bearing shell can be arranged between the fastening element and/or the pivotable, second component, on the one hand, and, on the other hand, the first component, in the radial direction thereof, the component forming the axis for the pivoting movement, and can virtually completely surround the first component. The bearing shell may be of multi-part or single-part design. A bearing shell of this type can be attached to the fastening element.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The invention is explained in greater detail below with reference to three exemplary embodiments illustrated in the drawings, in which:

[0009] **FIG. 1** shows a perspective, sectioned partial view of the first exemplary embodiment,

[0010] **FIG. 2** shows a schematic side view of the vehicle seat,

[0011] **FIG. 3** shows a vertical section through the bearing device according to the invention along the line III-III, in **FIG. 1**,

[0012] **FIG. 4** shows an illustration of the spring clamp according to the invention and of the bearing shell corresponding to **FIG. 3**, but in the unstressed state before installation,

[0013] **FIG. 5** shows an illustration corresponding to **FIG. 3** for the second exemplary embodiment, and

[0014] **FIG. 6** shows an illustration corresponding to **FIG. 3** for the third exemplary embodiment.

DETAILED DESCRIPTION OF THE INVENTION

[0015] A vehicle seat **1** for a motor vehicle has in its seat part a seat frame **3** which supports a seat cushion **5** in the manner described below. The directional details used refer to the customary arrangement of the vehicle seat **1** in the motor vehicle and its customary direction of travel (x-direction). In its front region, the seat frame **3** has, as a first component, a hollow cylindrical transverse tube **7** which runs horizontally and transversely to the direction of travel (i.e. in the y-direction) and to which the front region of the seat shell **9** is fastened, as a second component. The seat shell **9** in turn supports the seat cushion **5**. In order to connect the seat shell **9** to the transverse tube **7**, a bearing device **11** is provided on both end sections of the transverse tube **7**. The bearing device **11** can be used to pivot the seat shell **9** at least over a certain angular region relative to the transverse tube **7** if, for example, the rear region of the seat shell **9** is mounted resiliently and is pivoted by an occupant.

[0016] In the first exemplary embodiment, each bearing device **11** comprises an approximately semicylindrical, short plastic bearing shell **13** which extends virtually half way around the transverse tube **7** in the circumferential direction thereof, runs in the axial direction of the transverse tube **7** and bears against the transverse tube **7** on the lower side thereof. The radius of curvature of the inner side of the bearing shell **13** approximately corresponds to that of the outer side of the transverse tube **7**. Lying opposite the bearing shell **13** on the upper side of the transverse tube **7** is an approximately likewise semicylindrical counterbearing **15** which has the same radius of curvature of the inner side, but a somewhat longer length in the y-direction. The counterbearing **15** lies in a semicylindrically curved socket on the lower side of the seat shell **9** and is fastened to the latter by means of a clip connection. The counterbearing **15** is thus

arranged between the seat shell **9** and the transverse tube **7**, in the radial direction of the transverse tube.

[**0017**] As a fastening element extending transversely to the direction of movement, the bearing device **11** has a spring clamp **21** between the seat shell **9** and transverse tube **7**. The spring clamp keeps the bearing shell **13** in contact with the transverse tube **7**, i.e. with respect to the transverse tube **7** in the radial direction thereof. The integral, mirror-symmetrical spring clamp **21**, which is formed from spring steel in the manner of a leaf spring, has a central section **23** and a respective side section **25** laterally adjoining the central section (in front of it and behind it in the x-direction). In the fitted, stressed state of the spring clamp **21**, the central section **23** rests on the downwardly pointing (i.e. counter to the z-direction) outer side of the bearing shell **13** and in an unstressed state before installation has a slightly larger radius of curvature than this outer side of the bearing shell **13**.

[**0018**] Each side section **25** is curved upward from the central section **23** and merges into an inwardly curved hook **27**. During installation, the side section **25** is pushed from below with its hook **27** through an opening **29** in the seat shell **9**, which opening is situated in front of or behind the transverse tube **7** in the x-direction, the spring clamp **21** first of all being bent upward somewhat, i.e. being stressed, until the hook **27** is pushed through completely and engages behind the seat shell **9** in the edge region of the opening **29**. The spring clamp **217** is relaxed slightly as a result, but remains prestressed. The seat shell **9** can now rotate relative to the transverse tube **7**, for example in the case of the above-mentioned loading by means of an occupant. The bearing shell **13** and the counterbearing **15** are kept in contact with the transverse tube **7** by the spring clamp **21**, with tolerances being compensated for in such a manner that the seat shell **9** is not mounted too stiffly, but also with no annoying rattling noises arising.

[**0019**] A second exemplary embodiment largely coincides with the first exemplary embodiment, so that parts which are identical and act in an identical manner bear reference numbers which are incremented by 100. In the second exemplary embodiment, the bearing device **111** has the same spring clamp **121** between the transverse tube **107** and seat shell **109**, but the bearing shell **113** and the counterbearing **115** are designed as a common injection molded plastic part and are connected to each other by a thin film hinge **117**. As a result, the bearing shell **113** is pre-positioned in the radial direction before the spring clamp **121** is attached.

[**0020**] A third exemplary embodiment likewise largely coincides with the first exemplary embodiment, so that parts which are identical and act in an identical manner bear reference numbers incremented by **200**. In the third exemplary embodiment, the bearing device **211** has the same counterbearing **215** between the transverse tube **207** and seat shell **209**, but the bearing shell **213** is fastened to the otherwise unchanged spring clamp **221** by means of a clip connection **219**. The bearing shell is also already brought into a predefined position before installation.

[**0021**] Modifications are also conceivable, in which a suitable coating of the transverse tube and spring clamp renders the bearing shells and counterbearings unnecessary.

That which is claimed:

1. A vehicle seat, comprising:

a bearing device mounted between components such that the components are, via the bearing device, at least slightly moveable relative to each other in a direction of movement, the bearing device having at least one elastic fastening element connecting the components transversely to the direction of movement.

2. A vehicle seat according to claim 1, wherein the fastening element is elastically deformed, and thereby stressed, while the fastening element is connecting the components.

3. A vehicle seat according to claim 2, wherein the fastening element is a spring clamp.

4. A vehicle seat according to claim 1, wherein:

the components include a first component and a second component,

the second component is mounted, by the bearing device, for pivoting about a pivot axis relative to the first component,

the first component forms the pivot axis, and

the fastening element is fastened to the second component and at least partially surrounds a circumference of the first component.

5. A vehicle seat according to claim 4, wherein the fastening element is attached directly to the second component.

6. A vehicle seat according to claim 1, wherein the bearing device further includes at least one bearing shell positioned between the fastening element and the first component, with the bearing shell being positioned radially with respect to the first component.

7. A vehicle seat according to claim 6, wherein the bearing shell is a first bearing shell and the bearing device further includes a second bearing shell formed separately from the first bearing shell, and the first and second bearing shells together virtually completely surround a circumference of the first component.

8. A vehicle seat according to claim 6, wherein the bearing shell is integrally formed and virtually completely surrounds a circumference of the first component.

9. A vehicle seat according to claim 6, wherein the bearing shell is attached to the fastening element.

10. A vehicle seat according to claim 6, wherein the bearing shell is manufactured from a material different from the components.

11. A vehicle seat according to claim 1, wherein a first of the components and the bearing device together substantially completely surround a circumference of a second of the components.

12. A vehicle seat according to claim 5, wherein the fastening element includes a hook that extends through an opening in the second component for attaching the fastening element to the second component.

13. A vehicle seat according to claim 2, wherein the bearing device further includes at least one bearing shell positioned between the fastening element and the first component, with the bearing shell being positioned radially with respect to the first component.

14. A vehicle seat according to claim 3, wherein the bearing device further includes at least one bearing shell positioned between the fastening element and the first component, with the bearing shell being positioned radially with respect to the first component.

15. A vehicle seat according to claim 4, wherein the bearing device further includes at least one bearing shell positioned between the fastening element and the first component, with the bearing shell being positioned radially with respect to the first component.

16. A vehicle seat according to claim 15, wherein the bearing shell is a first bearing shell and the bearing device further includes a second bearing shell formed separately from the first bearing shell, and the first and second bearing shells together at least nearly completely surround a circumference of the first component.

17. A vehicle seat according to claim 15, wherein the bearing shell is integrally formed and at least nearly completely surrounds the a circumference of the first component.

18. A vehicle seat according to claim 15, wherein the bearing shell is manufactured from a material different from the two components.

19. A vehicle seat, comprising:

a seat shell carrying a seat cushion;

a seat frame including an elongate component that extends along an axis and at least partially carries the seat shell; and

a bearing device by which the seat shell is mounted to the seat frame for pivoting about the axis, wherein:

the bearing device has at least one elastic fastening element extending transversely to the axis and connecting the seat shell to the elongate component,

the fastening element is elastically deformed, and thereby stressed, while the fastening element is connecting the seat shell to the elongate component, and

the bearing device and the seat shell together substantially completely surround a circumference of the elongate component.

20. A vehicle seat according to claim 19, wherein the fastening element includes a spring clamp that is elastically deformed and thereby exerting force, the force at least partially causes the spring clamp to be fastened to the seat shell in a manner that connects the seat shell to the elongate component.

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