



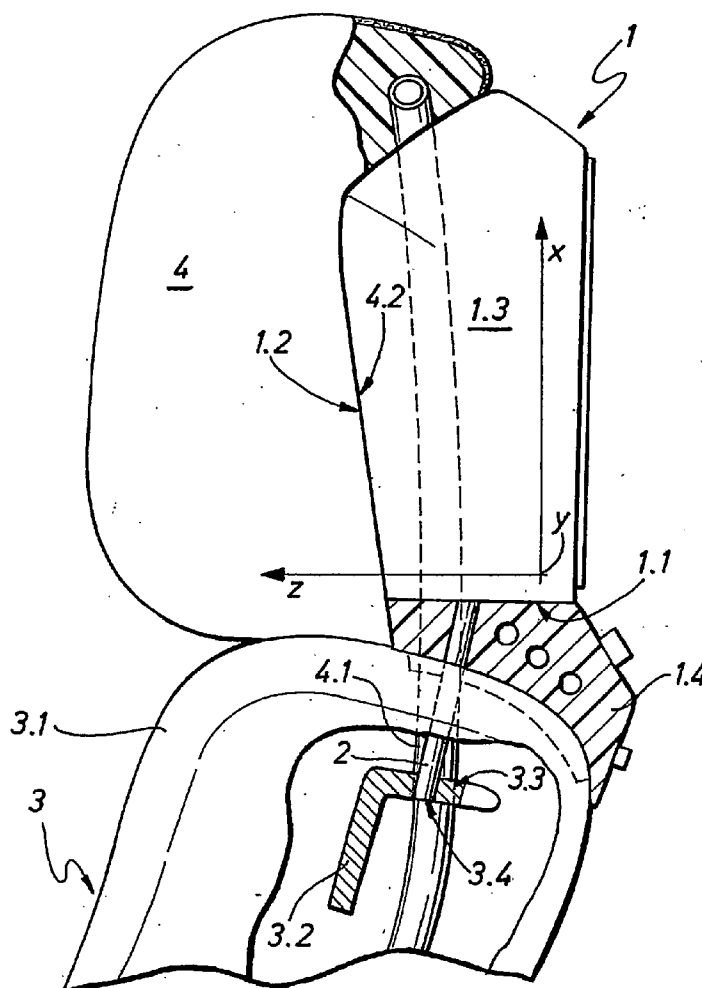
US 20070102972A1

(19) **United States**(12) **Patent Application Publication**
Dinkel et al.(10) **Pub. No.: US 2007/0102972 A1**(43) **Pub. Date: May 10, 2007**(54) **MONITOR INTEGRATED INTO THE
DRIVER'S SEAT, FOR REAR PASSENGERS**(30) **Foreign Application Priority Data**

Oct. 9, 2002 (EP) 02292489.8

(76) Inventors: **Emil Dinkel**, Renningen (DE);
Gerhard Franke, Weissach (DE);
Thorsten Klein, Sindelfingen (DE);
Bernd Schmidt, Wildberg-Sulz (DE)**Publication Classification**(51) **Int. Cl.**
A47C 31/00 (2006.01)(52) **U.S. Cl.** **297/217.3**Correspondence Address:
KENYON & KENYON LLP
ONE BROADWAY
NEW YORK, NY 10004 (US)(21) Appl. No.: **10/538,382**(22) PCT Filed: **Nov. 11, 2003**(86) PCT No.: **PCT/EP03/12574**§ 371(c)(1),
(2), (4) Date: **Nov. 7, 2006**(57) **ABSTRACT**

The invention relates to a monitor (1) that is fastened on a vehicle seat (3) of a motor vehicle. The monitor (1) is optically associated with the head restraint (4) and fastened on a frame part (3.2) of the backrest (3.1). The monitor (1) can be swiveled independently of the position of the head restraint (4). The arrangement of the head restraint (4) parallel to the monitor (1) inhibits the vibration of the monitor (1) during operation of the motor vehicle and prevents the rear passengers from being dazzled when watching the monitor at night.



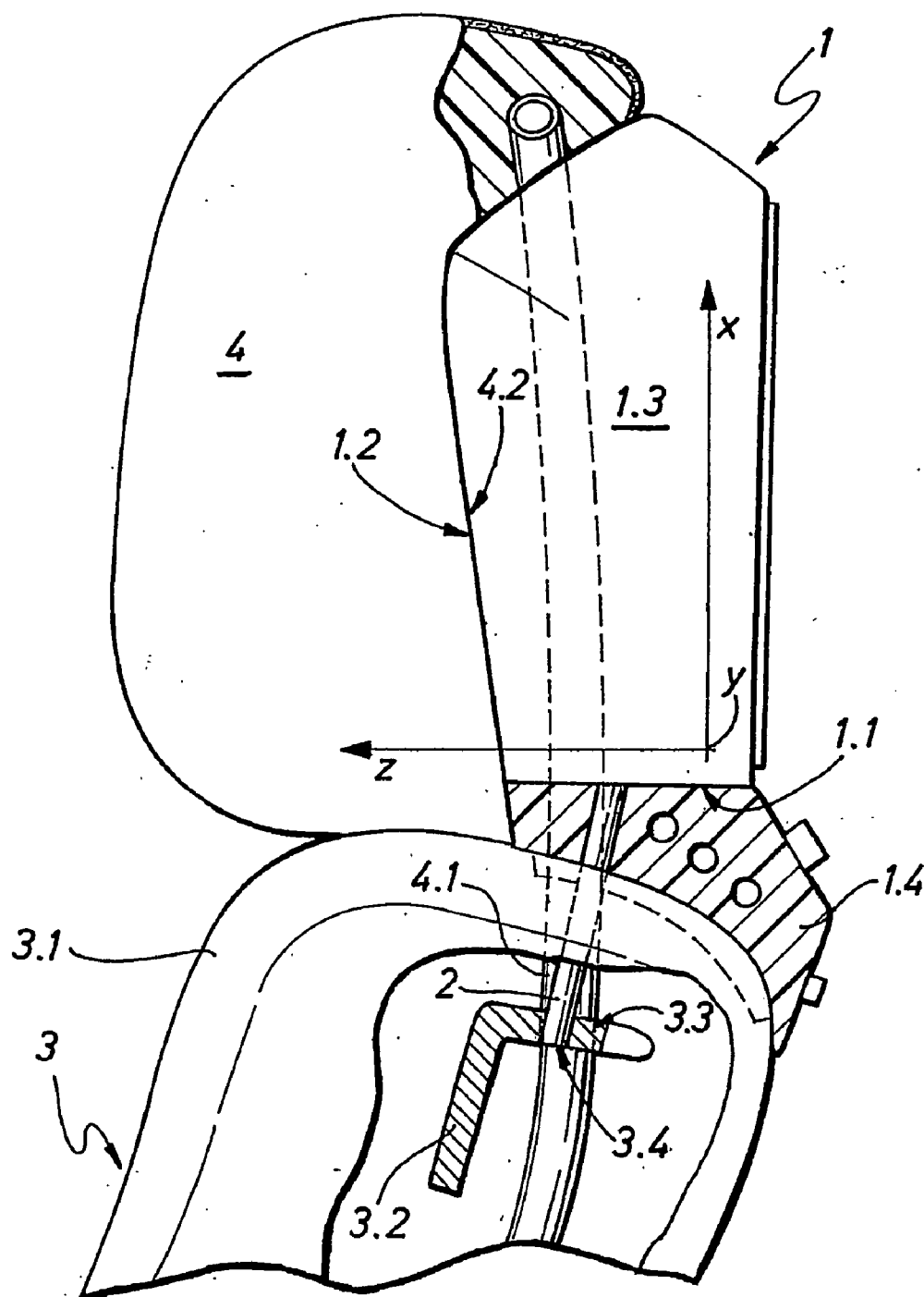


Fig. 1

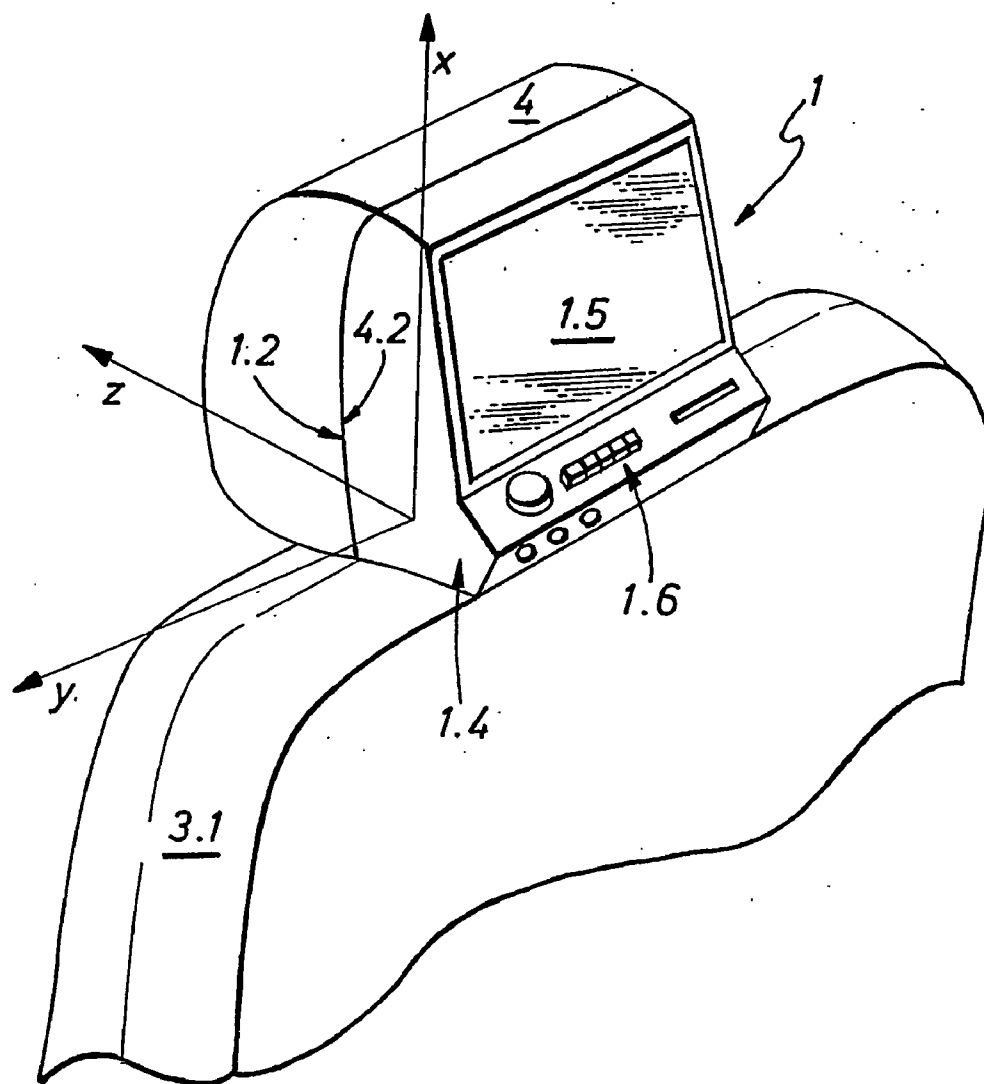


Fig. 2

MONITOR INTEGRATED INTO THE DRIVER'S SEAT, FOR REAR PASSENGERS

FIELD OF THE INVENTION

[0001] The present invention relates to a monitor for a motor vehicle having a fastening device and a power and signal supply, the monitor being arranged in a form-fitting fashion on a backrest of a vehicle seat by the fastening device, and the vehicle seat having a head restraint with an extendable holder.

BACKGROUND INFORMATION

[0002] A fastening console for a mobile display screen that is used for rapid and secure mounting in the rear of the automobile is described in German Published Patent Application No. 199 43 696. The fastening console is clamped together by hand around at least one head restraint holder of a vehicle by two limbs that are produced from metal or hard plastic and are joined together by a pin, and by a clamping bolt and a hand lever connected to it. The structure thus formed constitutes a support for fastening the display screen stably.

SUMMARY

[0003] According to an example embodiment of the present invention, a vehicle seat may be provided with a monitor such that the monitor may be reliably and permanently associated with the head restraint while at the same time avoiding conflicting goals in front and in back as regards the position of the head restraint.

[0004] A housing part of the monitor may be connected directly via the fastening device to a frame part of the backrest of the vehicle seat, and the monitor being mounted in a direction of a horizontally extending z-axis directly behind the head restraint on the backrest of the vehicle seat.

[0005] This may result in a very stable and secure connection between the monitor and the vehicle seat. A rear passenger would impact against the backrest in the event of a rear-end crash. A collision between the rear passenger and the monitor may therefore be ruled out. In the event of such an accident, the monitor itself is additionally secured by the head restraint. Moreover, unpleasant vibrations and shaking may be prevented by the fact that the monitor bears against the head restraint.

[0006] The head restraint may be used to the full by the front passenger, that is to say may also be adjusted for height, without the rear passengers being adversely affected. The position of the monitor is retained upon adjustment of the head restraint, and conflicting goals may be avoided. It may be assured that no disturbing gap may occur between the head restraint and the backrest as a result of which the rear passenger may be dazzled by oncoming vehicles when watching the monitor.

[0007] A rear side, facing the monitor, of the head restraint may extend parallel to the rear housing side of the monitor. It is also taken into account that the rear side of the head restraint is not of flat, but of cambered arrangement. The monitor and the head restraint may thereby form a unit optically and in terms of safety.

[0008] An additional possibility is that the rear side, facing the monitor, of the head restraint may bear against the rear

housing side of the monitor. The monitor is adapted to the head restraint and is stabilized by the head restraint because it bears against the latter. In the case of a rear-end crash, no additional impulse may be transmitted from the head restraint onto the monitor, and the monitor may be additionally secured by the head restraint.

[0009] A sliding layer may be introduced between the rear side of the head restraint and the rear housing side of the monitor, and the head restraint may be extended in the direction of an x-axis arranged perpendicularly to the z-axis. The freedom of movement of the head restraint when being retracted and extended is restricted by the monitor bearing against the head restraint. The sliding layer may ensure the freedom of movement required for retracting and extending the head restraint.

[0010] The frame part of the backrest may have at least one bearing or a bearing arrangement for the holder of the head restraint and at least one bearing or a bearing arrangement for the fastening device of the monitor. It may ensure that the head restraint is mechanically decoupled from the monitor. Holders conventional for head restraints may be applied for fastening the monitor.

[0011] It may be provided that the housing of the monitor has cutouts and/or bores for the holder of the head restraint. In this example embodiment, the head restraint is not cushioned on its rear side, and so the holders are not covered. The monitor covers the holders in the direction of the rear passenger. The housing of the monitor has the cutouts required for this purpose.

[0012] An adapter may be introduced between the monitor and the backrest, the adapter being connected to the frame part of the backrest via the fastening device. The adapter is mounted on the backrest and fastened securely on the frame part of the backrest. The energy and signal supply is routed underneath the adapter. The mounting of the monitor covers the fastenings for the adapter and the electrical connections for optical and for safety reasons. It may be easy to exchange the monitor.

[0013] The energy and signal supply of the monitor may extend downward in the backrest. Introduced inside the backrest in the region of the monitor's fastening device is a cable channel that is guided into the middle console in conjunction with further cables introduced into the vehicle seat. Cabling that is disturbing optically and in terms of safety and extends outside the vehicle seat may thereby be avoided.

[0014] The monitor may be swiveled about a y-axis arranged perpendicular to the z-axis and to the x-axis. This results in the possibility of setting the viewing angle of the rear passenger in relation to the monitor with reference to his/her body size and seated position.

[0015] Example embodiments of the present invention may provide the above-described features in terms both of safety and operation as regards a monitor arranged in the head restraint or in the backrest.

[0016] Further aspects and details hereof are explained in more detail below in the following description, and with reference to the appended Figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIG. 1 is a cross-sectional view in an xz-plane between the holders of the head restraint.

[0018] FIG. 2 is a perspective view of a monitor according to an example embodiment of the present invention.

DETAILED DESCRIPTION

[0019] The vehicle seat 3 partially illustrated in FIG. 1 has a backrest 3.1 with a frame. A frame part 3.2, illustrated in the upper region of the backrest 3.1, of the frame serves the purpose of fastening the head restraint 4.

[0020] The head restraint 4 is mounted in the frame part 3.2 via two holders 4.1, each in a bearing 3.3, and may be adjusted in height relative to the vehicle seat 3 in the direction of the x-axis. The bearing 3.3 is arranged as a plain bearing.

[0021] Provided behind the head restraint 4 in the direction of the z-axis is a monitor 1 that is mounted on the backrest 3.1 via an adapter 1.4 and is fastened on the frame part 3.2 of the vehicle seat 3. The rear side 4.2 of the head restraint 4 extends parallel to the rear housing side 1.2 of the monitor 1. The monitor 1 bears against the head restraint 4 and is stabilized by the head restraint 4.

[0022] The housing 1.3 of the monitor 1 has a housing part 1.1 that is mounted on the adapter 1.4. The adapter 1.4 is connected in a form-fitting fashion to the frame part 3.2 via a fastening device 2. For this purpose, the frame part 3.2 has a bearing 3.4 into which the fastening device 2 is introduced.

[0023] By mounting the monitor 1, the contacts to the energy and signal supply are closed and covered together with the fastening device 2. Consequently, in the event of a rear-end crash, the risk of injury due to projecting fastening objects, contacts or cables may be minimized.

[0024] As illustrated in FIG. 2, the monitor 1 is associated with the head restraint 4 optically and in terms of safety. The monitor 1 is mounted on the backrest 3.1 of the vehicle seat 3 and firmly connected to the backrest 3.1. In the event of a rear-end crash, a rear passenger impacts on the backrest 3.1. A collision of the rear passenger with the monitor 1 may thereby be ruled out. In addition, the head restraint 4 stabilizes the monitor 1 with regard to vibrations produced by the driving dynamics of the engine and chassis. In order to maximize this stabilization, the monitor 1 bears with the entire rear housing side 1.2 against the rear side 4.2 of the head restraint 4.

[0025] The head restraint 4 may be adjusted for height in the direction of the x-axis independently of the position of the monitor 1. In this case, the monitor 1 may be swiveled about the y-axis in order to enable the rear passenger to set the viewing angle in relation to the display screen 1.5.

[0026] Due to the firm arrangement of the monitor 1 on the backrest 3.1, it may be that the rear passenger is not dazzled by oncoming vehicles when watching the monitor at night. This is achieved because no gap is formed between the head restraint 4 and the monitor 1.

[0027] The adapter 1.4 additionally has an operator panel 1.6 for the monitor 1.

LIST OF REFERENCE NUMERALS

[0028] 1 Monitor

[0029] 1.1 Housing part

[0030] 1.2 Rear housing side

[0031] 1.3 Housing

[0032] 1.4 Adapter

[0033] 1.5 Display, display screen

[0034] 1.6 Operator panel

[0035] 2 Fastening device

[0036] 3. Vehicle seat

[0037] 3.1 Backrest

[0038] 3.2 Frame part

[0039] 3.3 Bearing, bearing arrangement

[0040] 3.4 Bearing, bearing arrangement

[0041] 4 Head restraint

[0042] 4.1 Holder

[0043] 4.2 Rear side

1 to 8. (canceled)

9. A monitor for a motor vehicle, comprising:

a fastener device adapted to fasten the monitor in a form-fitting manner on a backrest of a seat of the motor vehicle, the seat including a head restraint with an extendable holder, the monitor arranged in a direction of a horizontally-extending z-axis directly behind the head restraint on the backrest;

a power and signal supply; and

a housing part directly connected by the fastener device to a frame part of the backrest, the frame part of the backrest including at least one bearing for the holder of the head restraint and at least one bearing for the fastener device of the monitor.

10. The monitor according to claim 9, wherein a rear side of the head restraint facing the monitor extends parallel to a rear housing side of the monitor.

11. The monitor according to claim 9, wherein a rear side of the head restraint facing the monitor bears against a rear housing side of the monitor.

12. The monitor according to claim 9, further comprising a sliding layer arranged between a rear side of the head restraint and a rear housing side of the monitor, the head restraint extendable in a direction of an x-axis arranged perpendicular to the z-axis.

13. The monitor according to claim 9, wherein a housing of the monitor includes at least one of (a) cutouts and (b) bores for the holder of the head restraint.

14. The monitor according to claim 9, further comprising an adapter arranged between the monitor and the backrest, the adapter connected by the fastener device to the frame part of the backrest.

15. The monitor according to claim 9, wherein the power and signal supply extends downwardly in the backrest.

16. The monitor according to claim 12, wherein the monitor is swivelable about a y-axis arranged perpendicular to the z-axis and to the x-axis.

17. A motor vehicle, comprising:

a vehicle seat including a backrest and head restraint with an extendable holder, the backrest including a frame part having at least one bearing for the holder of the head restraint; and

a monitor including:

a fastener device adapted to fasten the monitor in a form-fitting manner on the backrest of the vehicle seat, the monitor arranged in a direction of a horizontally-extending z-axis directly behind the head restraint on the backrest, the frame part including at least one bearing for the fastener device; and

a power and signal supply.

18. The motor vehicle according to claim 17, wherein a rear side of the head restraint facing the monitor extends parallel to a rear housing side of the monitor.

19. The motor vehicle according to claim 17, wherein a rear side of the head restraint facing the monitor bears against a rear housing side of the monitor.

20. The motor vehicle according to claim 17, further comprising a sliding layer arranged between a rear side of the head restraint and a rear housing side of the monitor, the head restraint extendable in a direction of an x-axis arranged perpendicular to the z-axis.

21. The motor vehicle according to claim 17, wherein a housing of the monitor includes at least one of (a) cutouts and (b) bores for the holder of the head restraint.

22. The motor vehicle according to claim 17, further comprising an adapter arranged between the monitor and the backrest, the adapter connected by the fastener device to the frame part of the backrest.

23. The motor vehicle according to claim 17, wherein the power and signal supply extends downwardly in the backrest.

24. The motor vehicle according to claim 20, wherein the monitor is swivelable about a y-axis arranged perpendicular to the z-axis and to the x-axis.

* * * * *