

DESCRIPTION

Mineproof seat device

- 5 The invention is concerned with a mineproof seat device and with a mineproof seat supporting frame which has at least one attachment to a vehicle structure or vehicle chassis via guide tubes or the like and at least one belt with a tear-open seam.
- 10 A large number of seat supporting frames, seat attachments by means of belts, etc. are known from the prior art.
- 15 For instance, EP 2 208 634 A1 describes a shock-absorbing seat frame, in particular for a military vehicle, having a vehicle seat which is fastened to the seat support bracket which is arranged horizontally and can be displaced in the vertical direction. In order to
- 20 achieve a situation where, if great acceleration forces occur, such as occur in the case of mine explosions, for example, said acceleration forces are absorbed at least partially by the seat device, an energy-distorting element is incorporated into a bracket
- 25 support which holds the seat support bracket, in such a way that the energy-absorbing element is extended from a rest position into another position, with the result that the seat height changes with respect to the vehicle roof or the vehicle ceiling, and the spacing is
- 30 increased. Here, the bracket support is connected fixedly to the vehicle roof.
- DE 10 2008 063 804 A1 also describes a mineproof seat supporting frame. This is a supporting frame for the
- 35 mineproof integration of commercially available seat devices. In accordance with the mine loading which is to be expected, the supporting frame can be fastened rigidly by means of belts or via crash elements to a vehicle roof and via belts at the bottom to the floor,

and serves to receive a conventional seat which for its part has its own adjusting options and/or functional actuators.

5 EP 0 078 479 A1 discloses an energy-absorbing seat apparatus which can be fastened to a side wall, of a helicopter here.

DE 101 30 623 A1 discloses various telescopic shock-
10 absorbing variants for a subframe of a seat shell.

The seat which is described in EP 1 916 148 A1 for an armored vehicle has a seat frame which is connected to a suspension system which is fastened to the vehicle
15 roof, this connection taking place on the sides.

EP 1 593 542 B1 describes an articulated suspension of a suspension linkage for receiving a seat cover on the vehicle roof. The elastic suspension belt has at least
20 one loop which is sewn separately with a defined tear resistance as energy-absorbing predetermined breaking point.

DE 10 2008 028 872 A1 is based on a further seat
25 system. Here, the seat can be suspended via a belt suspension system, in particular on the roof of the vehicle. The belt can be rolled up by means of a rolling apparatus in order to raise the seat.

30 Further seat systems which can be fastened by means of belts can be gathered, inter alia, from EP 2 103 478 A2, DE 10 2004 009 557 B3, DE 10 2007 006 013 A1, DE 10 2008 005 422 B3, DE 10 2007 019 348 B3, DE 10 2004 062 350 B3, US 3,314,720 A, WO 2009/12537 A1 and WO
35 2008/086967 A1. US 6,378,939 B1 discloses the fastening to a seat frame.

DE 10 2007 002 816 B3 specifies a safety seat having holding belts which are sewn by means of a seam. The seam is selected in such a way that the seam can experience an at least identical extension as the belt
5 band without tearing.

DE 60 2005 002 282 T2 specifies a tear-open element which tears open on account of a pressure or a shock wave.

10

The invention sets the object of indicating a mineproof seat supporting frame which realizes decoupling of the seat and its attachment and vehicle structure and brings about the reduction in the energy which acts on
15 the occupants.

The object is achieved by way of the features of patent claim 1. Advantageous refinements are specified in the subclaims.

20

The solution is based on the concept of incorporating at least one, preferably a plurality of holding belts which are connected to the seat supporting frame in addition to guide tubes which for their part, however,
25 can and/or have to absorb only driving-dynamic and/or crash loads which act in the horizontal plane. Said belts have at least one tear-open seam. In the case of an explosion, said seams tear open when a defined loading is reached and allow a defined travel. This can
30 be brought about, for example, by a loop in the belt (sewn with a tear-open seam). When the defined travel is used up, the belt extension brakes the impact of the seat and the occupants. Instead of a loop which allows the travel, the belt can also consist of a plurality of
35 belts of different lengths. The shortest belt with a tear-open seam would tear in the case of mine explosions, whereas the longer belt catches the seat and occupants after a defined travel. The force which

acts on the occupants is reduced as a result. It goes without saying that the tearing open or the tear-open force can be set with regard to a permissible loading of the occupants by the number of seams, the seam
5 geometry and the material of the seam, individually or else in combination.

As an alternative, the tear-open seam can also be provided, however, by adhesive bonding, welding, etc.,
10 also in combination with sewing, etc. It would then have to be ensured here that the tearing open is ensured at a defined loading.

The principle is to be explained briefly using a simply
15 illustrated exemplary embodiment. In the drawing:

fig. 1 shows a slightly perspective illustration of a seat supporting frame with guide tubes and holding belt,
20

fig. 2 shows an enlarged illustration of the attachment from fig. 1, and

fig. 3 shows a sectional illustration in the section B-B from fig. 2.
25

Figure 1 shows a seat device 10 with a seat supporting frame 2 for receiving a seat 11, which seat device 10 is mounted axially displaceably in guide tubes 1 (in
30 two guide tubes here) and is connected via them to the vehicle roof 4 of a vehicle which is not shown in greater detail.

Further lower attachments are by belts which are not
35 shown in greater detail, as disclosed in DE 10 2008 063 804 A1. The absorbing of driving-dynamic forces or driving-induced loads is made possible by way of the displaceable mounting. Furthermore, the seat supporting

frame 2 is provided with at least one holding belt 3 which preferably has only one loop 5 and has at least one tear-open seam 6.

- 5 Fig. 2 shows an enlarged illustration of the vehicle roof attachment and fig. 3 shows an illustration of a possible fastening of the holding belt 3 to the seat supporting frame 2.
- 10 Tear-resistant material which can be of textile origin is provided as belt material. Leather, textile/leather combinations and the like can likewise be used, preferably polyester.
- 15 For a preferred lightweight construction, the seat supporting frame 2 can be constructed from GRP (glass fiber reinforced plastic) or CRP (carbon fiber reinforced plastic) or the structure can be wrapped with them.

CLAIMS

1. A mineproof seat (10) for use in a vehicle wherein the mineproof seat includes:

at least one downwardly depending guide tube (1), adapted to be fitted to the vehicle ceiling (4);

a seat supporting frame (2) for receiving a seat (11); connected to at least one guide tube such that it is axially displaceable relative thereto and

at least one holding belt (3) functionably connectable to the vehicle ceiling and the seat supporting frame, to suspend the seat supporting frame relative to at least one downwardly depending guide to prevent axial movement of the seat supporting frame in a downward direction when the mineproof seat is normally being used, the or each holding belt being provided with at least one tear-open seam (6) which tears open in the case of an explosion when a defined loading is reached to cause movement of the seat supporting relative to at least one guide tube for a defined travel.

2. The mineproof seat as claimed in claim 1, wherein the or each tear-open seam of the or each holding belt connects together a portion of the respective holding belt folded back on itself and the defined travel is dictated by the length of the folded portion.

3. The mineproof seat as claimed in claim 1 or claim 2, wherein the tear-open seam is adhesively bonded, welded and/or sewn.

4. The mineproof seat as claimed in any one of the preceding claims, wherein the tear-open force can be set by the number of seams, the seam geometry and/or the material of the seam.

5. The mineproof seat as claimed in claim 4, wherein the belt material is a material which is tear-resistant per se, and in that it can be of textile origin, but also leather, nylon/leather and the like.

6. The mineproof seat as claimed in any one of the preceding claims, wherein the or each holding belt is/are fastened to the vehicle roof via a loop (5).

7. The mineproof seat as claimed in any one of claims 1 to 5, wherein the seat supporting frame is constructed from GRP and/or CRP or the structure is wrapped with them.

8. The mineproof seat as claimed in any one of the preceding claims, wherein a plurality of holding belts are connected to the supporting frame.

9. The mineproof seat as claimed in any one of claims 2 to 8, wherein instead of a folded portion, each holding belt is of a different lengths in which only the shortest belt contains a tear-open seam adapted to tear in the case of a mine explosion, whereas the longer belt would remain unaffected and catch the seat occupant after a defined travel dictated by the length of the longer belt.

10. The mineproof seat as claimed in any one of the preceding claims, wherein the mineproof seat incorporates a pair of downwardly depending guide tubes.

11. The mineproof seat as claimed in any one of the preceding claims, wherein the mineproof seat incorporates a seat.

12. A vehicle incorporating a mineproof seat as claimed in any one of the preceding claims.

13. An armoured road going vehicle incorporating a mineproof seat as claimed in any one of claims 1 to 11.
