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**Datasheet for the decision
of 29 November 2007**

Case Number: T 0654/06 - 3.2.01

Application Number: 02002450.1

Publication Number: 1241060

IPC: B60R 22/195

Language of the proceedings: EN

Title of invention:
Three-point seat belt system

Patentee:
BREED AUTOMOTIVE TECHNOLOGY, INC.

Opponent:
Autoliv Developement AB

Headword:
-

Relevant legal provisions:
EPC Art. 56, 84

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
-



Case Number: T 0654/06 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 29 November 2007

Appellant: BREED AUTOMOTIVE TECHNOLOGY, INC.
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 2 March 2006
revoking European patent No. 1241060 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: J. Osborne
Members: C. Narcisi
T. Karamanli

Summary of Facts and Submissions

- I. The appeal is directed against the decision posted 2 March 2006 revoking European patent No. 1 241 060.
- II. The opposition division found that the subject-matter of claim 1 as then on file did not involve an inventive step in the light of a combination of the following state of the art documents on which the opponent relied during the appeal procedure:

D1: DE-U-299 22 854

D5: US-A-4 008 909.

- III. At oral proceedings held on 29 November 2007 the appellant (patent proprietor) requested that the decision under appeal be set aside and the patent maintained on the basis of the sole request comprising claims 1 to 4 filed during the oral proceedings. The respondent requested that the appeal be dismissed.

- IV. Claim 1 according to the appellant's request reads:

"A three point seat belt system provided on a motor vehicle front seat (1) comprising

- a tightening drive (3) to be fastened to the vehicle front seat (1) and engaging an anchoring point of the seat belt to be fastened to the front seat (1);

characterized in that the seat belt further comprises:

- a belt buckle which is fastened on one side of the seat;
- a webbing deflection point (7) to be secured to the side of the seat substructure (4), which lies opposite

the seat side on which the belt buckle is fastened;

wherein

- the webbing deflection point (7) is fastened in the region of the seat substructure (4), in which the back rest and the seat surface meet;
- a belt webbing part (6) guided from the lap belt (2) through the webbing deflection point (7), wherein
 - a guiding surface (13), around which the belt webbing part (6) guided through the webbing deflection point (7) is guided, is oriented, with regard to the tightening pulling direction, at a firmly predetermined angle, at which the belt webbing is guided essentially centrally through a belt slot (8) of the webbing deflection point (7); and
 - a drive element (5) of said tightening drive (3) securely connected to the end of the belt webbing part (6) guided through the webbing deflection point (7);

wherein

- the tightening drive (3) is a linear tightener having
 - a cylinder and a therein guided piston to which the drive element (5) is connected."

V. The respondent's objections as regards amendments made to the claim after grant may be summarised as follows:

Claim 1 specifies a three-point seat belt system provided on a seat. This implies that all anchorages are on the seat. However, according to the description the shoulder anchorage is on the B-pillar, resulting in a lack of clarity. Moreover, in some figures the guiding surface evidently is not oriented as defined in the claim.

VI. The appellant's rebuttal of these arguments was essentially as follows:

The belt is delivered together with the seat and mounted to it at the lower anchorages and it is only these with which the invention is concerned. The upper anchorage may be to either the B-pillar or the seat back. As regards the orientation of the guiding surface as presently claimed this is shown clearly in figure 5 and the figures 1 to 4 relate to the positioning of the pre-tensioning device.

VII. As regards inventive step the appellant essentially submitted the following:

The closest state of the art is known from D1 and the problem solved by the subject-matter of present claim 1 is to achieve efficient and quick tightening of the lap belt portion by a fixed relationship between the buckle, a linear pre-tensioner and a webbing guiding surface between the lap belt and the pre-tensioner. D1 relates to the provision of a releasable coupling between a pre-tensioner and the end of the belt to permit the former to be pre-fitted to the seat before installation in the vehicle. It does not concern itself with the problem addressed by the present patent. The coupling in D1 means that the pre-tensioner is not securely connected to the belt, as presently claimed. Moreover, whilst the pre-tensioner is connected to the seat itself, the webbing guiding surface is mounted to the vehicle body so that a fixed orientation of the guiding surface to the pulling direction is not present. D1 also does not disclose that the buckle is fixed on the seat. As regards the pre-tensioner itself, the rotary

one disclosed in D1 is less efficient than a linear one as claimed because of the film-spool effect. Moreover, the linear pre-tensioner disclosed in D5 is in all positions mounted not on the seat as presently claimed but on the body.

VIII. In respect of inventive step the respondent replied essentially:

The problem addressed by D1 is not important since that is the closest state of the art. The fundamental teaching of D1 is that the pre-tensioner should be mounted on the seat. It follows that when in D1 it is stated that both the pre-tensioner and the guiding surface are mounted on the "Sockel", they are both in a fixed position relative to each other and the seat. D1 is silent regarding the mounting of the buckle but it would be the first choice of the skilled person to mount it on the seat because that is where the guiding surface is mounted. The presently claimed central guiding of the belt is shown in D1 figure 2. The passage of the lap belt over a wearer's abdomen would be at essentially a fixed angle. Since the position of the belt to both sides of the guiding surface always would be essentially the same there would be no reason to provide for movement of the guiding surface. The coupling feature in D1 is a disclosure of the feature of present claim 1 according to which the drive element and the belt are "securely connected"; this feature does not specify whether it may be releasable. The feature of a linear pre-tensioner is known from e.g. D5 and is a technical equivalent of the rotary pre-tensioner disclosed in D1.

Reasons for the Decision

Amendments to claim 1

1. The respondent raised objections that amendment to the claims after grant resulted in a lack of clarity (Article 84 EPC).
 - 1.1 In as far as the respondent's objections were in part relating to consistency between claim 1 and the description they would have been relevant if the patent were maintained in amended form. Since this is not the case they are not relevant to the present decision and so will not be considered further.
 - 1.2 As regards the claim when considered in isolation the board finds that the amendments in comparison with the claim as granted do not introduce any lack of clarity. In particular, the board finds that the wording "a guiding surface ... is oriented ... at a firmly predetermined angle" clearly defines that the guiding surface is at a fixed orientation.

Inventive step

2. The patent relates to the arrangement of a three-point (lap and diagonal) safety belt on a vehicle front seat. The lap portion of such a belt typically passes between a fixed anchorage on one side of the seat and a guiding loop on a buckle on the other side. From there the belt passes upwards across the wearer's chest to a running loop mounted on the B-pillar, from where it typically passes downwards to an emergency locking retractor.

Whilst the diagonal portion of the belt is tensioned by the retractor this tension has minimal effect on the lap portion. The tension in the lap portion therefore is primarily dependent on how the wearer adjusts the belt. In order to ensure effective restraint of a wearer a pre-tensioner may be provided which in response to the sensing of sufficiently high decelerations of the vehicle tightens the lap portion of the belt before the wearer begins to move relative to the seat. Present claim 1 is particularly concerned with achieving efficient pre-tensioning.

3. The board is in agreement with both parties that the closest state of the art is known from D1 which relates to a belt system for a vehicle front seat in which a pre-tensioner is provided for a lap belt. In the embodiment of figure 2 a rotary pre-tensioner is mounted close to the front and at the side of the seat, below the cushion. It is coupled to the end of the belt which passes over a guiding surface which is provided in a slot and mounted at the base of the seat back, and from there across the lap of the wearer. D1 aims to solve the problem that it is desired to mount the pre-tensioner on the seat before the latter is installed in the vehicle body. The solution is a coupling between the pre-tensioner and the belt end for connecting them when the seat is installed in the vehicle. Whilst the problem solved by the present patent is not addressed in D1, it would be addressed by the skilled person when putting the teaching into effect. The absence in D1 of any reference to the present problem is no indicator of the presence or otherwise of an inventive step in the subject-matter of present claim 1.

3.1 An essential feature of D1 is that the pre-tensioner is mounted on the seat, see particularly page 1, final full sentence. In the embodiment of figure 2 the pre-tensioner is stated to be attached below the seat surface to the seat pedestal ("Sockel des Fahrzeugsitzes") whilst the guiding surface is also attached to the same part and at the same height. In the board's view the overall teaching of D1 can only be understood as being that both the pre-tensioner and the guiding surface are attached to the seat. The appellant takes the view that D1 in page 2, first paragraph and page 3, lines 6, 7 teaches that the parts of the belt system other than the pre-tensioner, thereby including the guiding surface, are attached to the vehicle body. However, there is neither an explicit statement to this effect nor any indication of how any relative movement between the pre-tensioner and the guiding surface could be accommodated. The statement in D1 that the pre-tensioner mounted on the seat would be connected to the other parts of the belt already mounted in the vehicle is not tantamount to saying that all other parts of the belt system are mounted to the vehicle body. This interpretation of D1 is in accordance with the appellant's own interpretation of present claim 1 in as far as it argued during the oral proceedings that the feature that the belt system is provided on a seat would include an arrangement in which the upper anchorage would be attached directly to the vehicle.

3.2 The presence of a coupling between the pre-tensioner in D1 and the belt webbing is not relevant to present claim 1 since it does not specify the absence of such a coupling. In particular, the feature that the drive element of the pre-tensioner is "securely connected" to

the belt webbing merely denotes a reliable connection which implicitly is provided by the coupling in D1.

3.3 The subject-matter of claim 1 differs from the disclosure of D1 by the following features:

- that the belt system is three-point;
- that the belt buckle is fastened on the seat;
- that the guiding surface is oriented at a predetermined angle; and
- that the pre-tensioner is a linear actuator comprising a cylinder and piston.

The contribution of each of these features to inventive step will be considered below.

3.4 All of the features of the belt system according to present claim 1 with the exception that the belt system is three-point relate to the lap portion. The patent specification is silent about the possible presence of any further pre-tensioning devices in the system. The diagonal portion of the belt therefore must be considered as having no influence on the tensioning of the lap portion and the three-point feature is to be considered alone when determining inventive step.

3.4.1 The skilled person is aware that in an installation to which the teaching of D1 would be particularly applicable, the front seat of a conventional passenger car, the three-point belt is almost universal. It therefore would be an automatic choice for him to

complete the teaching of D1 by applying it to a three-point belt system.

- 3.5 There is no interaction between the form of the pre-tensioner and any of the other features in influencing the tensioning of the lap portion. Any contribution to inventive step of this feature therefore also is to be considered independently of the remaining features.
- 3.5.1 It is acknowledged in the patent specification that linear pre-tensioners were known *per se* and D5 is evidence that such a device was known. The mounting of the pre-tensioner in D5 on the vehicle body is not relevant to the present case since the essential teaching in D5 is directed to the pre-tensioner itself, not its application. Linear and rotary actuators as presently claimed and as disclosed in D1 respectively are technical equivalents of whose respective advantages and disadvantages the skilled person would be aware. Indeed, in the description of the patent specification it is merely stated that the pre-tensioner "in the represented embodiments is a linear belt tightener", thereby implying that an alternative type may be employed without important consequence. A decision by the skilled person to employ a linear pre-tensioner in the system according to D1 therefore would not involve an inventive step.
- 3.5.2 The appellant argues that the claimed linear tensioner is more efficient than the rotary one of D1. However, any such advantage would be applicable also to the system of D1 and its benefit in the presently claimed system would be independent of and in addition to those of the remaining features.

3.6 The feature relating to the mounting of the buckle on the seat also does not interact with any other features in influencing the tensioning of the lap portion. Under standardised test conditions a fixed location of the buckle relative to the seat may help to achieve a consistent location of the lap portion which logically would have an interaction with the feature of the angle of the guiding surface. However, under realistic conditions the hip region of the wearer would essentially isolate the two sides of the lap portion and the belt's "run" over the wearers hip region would be more relevant than a fixed location of the buckle in determining the angle at which the belt approaches the guiding surface. Indeed, in the description of the patent specification as granted, in which the problem was similarly defined as to guarantee "a very tautly tightening of the lap belt" (*sic*) it was stated that the buckle may be mounted either to the seat or to the vehicle structure.

3.6.1 It was well known to the skilled person at the priority date of the present patent that the mounting of a seat belt buckle on the seat not only is more convenient for the seat occupant than mounting it on the vehicle body but also offers greater repeatability in restraining occupants irrespective of seat position adjustment. D1 already teaches that the guiding surface be mounted to the seat, which therefore implicitly is sufficiently strongly coupled with the vehicle structure to withstand the forces applied by the lap portion. It therefore would be the first choice of the skilled person to similarly mount the buckle.

- 3.7 The final differentiating feature is that of the fixed angle of the guiding surface leading to essentially central positioning of the belt in the slot. In respect of this feature D1 discloses the guiding surface being mounted on the seat structure but is silent as regards its attachment. The belt is illustrated passing from the coupling with the pre-tensioner, centrally, in the conventional way, over the guiding surface and into the lap portion. The skilled person who wishes to put the teaching of D1 into effect has only two possible ways to mount the guide surface on the seat, rotatably or fixedly. In the absence of any technical prejudice, which has not been alleged, the simple choice of one of those two ways cannot form the basis of an inventive step. Even if the skilled person's first choice would be for a rotatable mounting, if during operation of the pre-tensioner it were found that the belt moves into the end of the slot and thereby runs less freely, it would not require inventive activity to try the only other possibility, a fixed mounting as presently claimed.
- 3.8 It follows from the foregoing that the subject-matter of present claim 1 does not involve an inventive step (Article 56 EPC).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

A. Vottner

J. Osborne