BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen
(D) [ ] No distribution

D E C I S I O N
of 8 October 2004

Case Number: T 0010/03 - 3.2.1

Application Number: 96201993.1

Publication Number: 0783986

IPC: B60G 21/055

Language of the proceedings: EN

Title of invention:
Vehicle roll control system

Applicant:
Delphi France Automotive Systems

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56, 111(1)

Keyword:
"Novelty (yes)"
"Inventive step (no)"
"Decision re appeals - exercise of discretion"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0010/03 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 8 October 2004

Appellant: Delphi France Automotive Systems
Immeuble Vision Defense,
89, Boulevard National
F-92257 La Garenne-Colombes (FR)

Representative: Denton, Michael John
Delphi European Headquarters
64 avenue de la Plaine de France
Paris Nord II
BP 60059,
Tremblay-en France
F-95972 Roissy Charles de Gaulle Cédex (FR)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 5 August 2002 refusing European application No. 96201993.1 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: S. Crane
Members: J. Osborne
S. U. Hoffmann

Summary of Facts and Submissions

I. The appeal is directed against the decision of the Examining Division posted 5 August 2002 to refuse European patent application No. 96 20 1993.1 (EP-A-0 783 986).

II. During the examination of the application *inter alia* the following prior art documents played a role:

D1: DE-A-1 755 637;

D2: GB-A-2 284 184 (cited in the description).

During the course of the examination proceedings the Division raised objections of lack of novelty with respect to each of D1 and D2 and also lack of inventive step with respect to a combination of D2 and D1. In its decision it found that the subject-matter of claim 1 lacked novelty with respect to D1.

III. The Board issued a communication pursuant to Article 110(2) EPC in which it introduced an additional prior art document of which it was aware:

D7: US-A-5 362 094

and indicated its provisional opinion that the subject-matter of claim 1 on which the decision was based was novel but lacked inventive step.

IV. During oral proceedings held on 8 October 2004 the appellant requested that the decision under appeal be

set aside and that a patent be granted on the basis of the documents underlying the impugned decision.

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

"A vehicle roll control system (22,24) for a vehicle (10) having a pair of wheels (12,16) each rotatable on an axle (14,18), comprising a torsion bar (26); a first arm (28) extending substantially perpendicular to the torsion bar, the first arm being fixed to the torsion bar at one end (38) and being connectable to one of the axles at the other end (42); a second arm (30) extending substantially perpendicular to the torsion bar, the second arm being rotatably mounted on the torsion bar at one end (44) and being connectable to the other axle at the other end (48); and rotation control means (32,34) connected to the torsion bar and to the second arm between its ends; characterised in that the second arm (30) is normally freely rotatably mounted on the torsion bar (26) at the one end (44) of the second arm; and in that the rotation control means (32, 34) is actuable on detection of a predetermined vehicle condition to adjustably control the variable rotational position of the second arm relative to the torsion bar."

VI. The appellant argued essentially as follows:

The subject-matter of claim 1 differs from the disclosure of D1 by the features set out in the characterising portion. According to D1 there is a direct, mechanical, rigid connection between the first and second arms so that the latter can never be "normally freely rotatably mounted" on the torsion bar.

Furthermore, the actuator has only three possible operating conditions, moving to a fully extended position, to a fully contracted position and locked. It follows that the subject-matter of claim 1 is novel with respect to D1.

As regards inventive step, the feature that the second arm is normally freely rotatably mounted is not known from either of D1 and D7. The aim of the invention when beginning from D2 is to improve the system by providing active roll control. The system according to D7 is fundamentally different from that of D2 and the skilled person would not consider combining the teaching of the two documents. Moreover, the notion of decoupling the anti-roll bar during straight running was new at the priority date of the application.

Reasons for the Decision

1. The application relates to a system which comprises a torsion bar for controlling roll of a vehicle chassis relative to a two-wheeled axle. Such an anti-roll bar is provided in order to resist lateral inclination of the chassis during cornering and conventionally is in the form of a U-shaped torsion bar mounted between the chassis and the wheels. However, during straight line travel of the vehicle over surface irregularities the anti-roll bar is twisted by relative vertical movement of the two wheels between which it is mounted, thereby interfering with the normal action of the vehicle suspension. In the system according to the application one arm of the torsion bar is rotatably mounted relative to the remainder of the bar under the

influence of an actuator ("rotation control means"). By allowing the actuator to move freely free rotation of the second arm relative to the torsion bar can be achieved. In this way it is possible "normally", i.e. during travel in a straight line, to prevent the anti-roll bar from interfering with the operation of the vehicle suspension. Application of variable force by means of the actuator during cornering controls rotation of the arm relative to the remainder of the bar and provides the possibility of providing adjustable roll stiffness.

2. The system according to D1, as accepted by the appellant, comprises the features defined in the preamble of present claim 1.

2.1 In the embodiment of the D1 system a tube surrounds the torsion bar and transmits the rotational position of the first arm to a linkage connected to the internal member of a hydraulic valve whose housing is fixedly mounted with respect to the second arm. Relative rotation between the first and second arms results in movement of the valve member within its housing. The valve controls the supply of hydraulic pressure to an actuator which is carried on a mounting arm fixed on the torsion bar at its end adjacent the second arm. The actuator piston rod is connected to the second arm such that operation of the actuator controls rotation of the second arm relative to the torsion bar.

2.2 During "normal" travel of the vehicle the valve member closes the supply lines to the upper and lower chambers of the actuator which is thereby locked and prevents the second arm from rotating about the end of the

torsion bar. It follows that the first characterising feature of claim 1, that the second arm is normally freely rotatably mounted on the torsion bar, is not present in the system of D1 and the subject-matter of the claim is novel with respect to this document (Article 54 EPC).

3. The contested decision restricts itself to consideration of novelty with respect to D1. Nevertheless, during the examination procedure the Examining Division had also expressed its negative opinion in respect of both novelty and inventive step with respect to D2. Furthermore the appellant did not request that the case be remitted for further examination in the event that the impugned decision were set aside. Under these conditions the Board has decided to exercise its discretion in accordance with Article 111(1) EPC and continue the procedure by examining inventive step.

4. In the application as originally filed the appellant started from prior art according to D2 and the appellant accepts that this is an appropriate starting point for considering inventive step of present claim 1. Indeed, in the described embodiment the physical arrangement of the rotational control means (a linear hydraulic actuator) and the mounting of the second arm on the end of the torsion bar is identical with that described in the present application and D2 discloses all of the features of the preamble of present claim 1. The operation of the D2 system differs, however, in as far as on detection of a predetermined vehicle condition it provides only for either allowing or substantially preventing rotation of the second arm

relative to the torsion bar; when the actuator is locked the anti-roll bar acts in the conventional way and there is no provision for variably adjusting roll stiffness. When no roll control is required fluid is allowed to flow freely between the two chambers of the actuator, thereby allowing rotation of the second arm relative to the torsion bar.

As set out in the present application, the system according to D2 suffers in that it provides only a limited amount of roll control. The subject-matter of present claim 1 differs from that of D2 by the characterising features which solve the problem of improving on the system according to D2 by increasing the amount of roll control.

4.1 D7 relates to a roll control system employing a conventional U-shaped anti-roll bar wherein the end of at least one arm of the bar is connected with a suspension control arm by means of a linear hydraulic actuator. By varying the pressure in the actuator its length can be adjusted in order to change the relative rotational positions of the two arms and thereby vary the roll resistance to provide a desired ride and handling level (column 1, lines 46 to 50 and 56 to 60). D7 furthermore proposes avoiding transmitting wheel motions to the anti-roll bar when no roll control is desired (column 3, lines 37 to 40). D7 therefore discloses the principle of an anti-roll bar normally isolated from suspension movements by virtue of a freely movable actuator which upon the application of variable pressure when desired adjusts the amount of roll control. In the Board's view the skilled person wishing to increase the amount of roll control provided

by the system according to D2 would adapt the hydraulic circuitry to provide the increased range of control as taught in D7 and thereby arrive at the subject-matter of present claim 1 without the need to exercise inventive skill.

4.2 The appellant argues that the skilled person would not consider D7 when seeking to improve the system according to D2 because the former relates to a different form of roll control arrangement, a so-called drop-link system having actuators located between the ends of the anti-roll and the suspension, which requires operating pressures different from those of D2 and the present application. The Board cannot accept this argument because the operating pressures are relevant only to the detail design of the hydraulic system. There is no aspect of the system according to D7 which would hinder the skilled person from applying the same principle to the system of D2. Doing so would involve no more than the design of a suitable hydraulic circuit for the actuator according to D2, which would fall within the normal activity of the skilled person.

4.3 The Board therefore concludes that the subject-matter of 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 S. Crane