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**Datasheet for the decision
of 3 March 2009**

Case Number: T 0864/07 - 3.2.01

Application Number: 01937114.5

Publication Number: 1303710

IPC: F16F 7/108

Language of the proceedings: EN

Title of invention:

A method for damping vibrations and a method for mounting the device

Patentee:

Trelleborg Forsheda Sweden AB

Opponent:

Carl Freudenberg KG

Headword:

-

Relevant legal provisions:

RPBA Art. 12(4)

Relevant legal provisions (EPC 1973):

EPC Art. 54, 56, 114(2)

Keyword:

"Novelty (yes)"

"Inventive step (yes)"

"Late submitted material - document admitted (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0864/07 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 3 March 2009

Appellant: Carl Freudenberg KG
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D-69469 Weinheim (DE)

Representative: -

Respondent: Trelleborg Forsheda Sweden AB
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 26 March 2007
rejecting the opposition filed against European
patent No. 1303710 pursuant to Article 102(2)
EPC 1973.

Composition of the Board:

Chairman: S. Crane
Members: J. Osborne
G. Weiss

Summary of Facts and Submissions

I. The appeal is directed against the decision posted 26 March 2007 to reject the opposition against European patent No. 1 303 710.

II. The appellant relied upon the following state of the art introduced during the opposition procedure:

E1: US-A-2 951 674;

E2: US-A-5 180 147.

With its statement setting out the grounds of appeal the appellant also cited *inter alia*:

E4: DE-A-39 25 761.

III. During oral proceedings held on 3 March 2009 the appellant requested that the decision under appeal be set aside and that the patent be revoked. The respondent requested that the appeal be dismissed (main request) or, in the alternative, that the patent be maintained in amended form on the basis of the claims according to auxiliary requests 1 to 4 filed with a letter dated 2 February 2009.

IV. Claim 1 as granted (in accordance with the respondent's main request) reads as follows:

"Device of the frequency tuned resonance damper kind, for dampening vibrations in a vibration surface (21) consisting of one or more elastic dampening elements (1-4) with a set axis of symmetry (24) and a vibration

body (5) supported by said dampening element, said dampening element and said dampening body together being tuned to dampen the vibrations of said surface within a selected frequency range by means of vibrations in the surface bringing the vibration body into vibrations which are phase shifted essentially across the symmetry axis of the dampening elements relative to the vibrational movements of the surface, and in so doing creates forces which counteract the vibrations of the surface, with the device exhibiting first holding organs (22, 31) for holding said dampening elements at the vibration surface (21), and second holding organs (23, 32) for holding the vibration body (5) at said dampening elements characterized in that said first holding organs (22, 31) comprise first mutually co-operating form grip organs for form grip between said dampening elements (1-4) and the vibration surface (21) or an intervening fastening element (10) which is fixedly attached to the vibration surface, and in that said second holding organ (23, 32) comprise second mutually co-operating form grip organs for form grip between said dampening elements and the vibration body, in that both the first and the second form grip organs comprise a recess with gripping surfaces (25-30, 33-35) for transferring vibrations, in that said at least one dampening element (1-4) exhibit an inwards facing cavity (49) which forms an opening (50) in a base surface (51) of the dampening element, in that said at least one dampening element can be tuned to the desired frequency range by choice of dimensions of the cross sectional area of the dampening element in combination with choice of material of the dampening element and optionally inserting a tuning

core (65) into the cavity, said core having a suitable hardness."

Claims 2 to 11 specify features additional to those of claim 1.

V. The appellant's submissions may be summarised as follows:

The opposition division was wrong to find that the subject-matter of claim 1 as granted is novel with respect to E1. In particular, it was wrong in finding that the feature "device of the frequency tuned resonance damper kind" was not merely a definition of intended use and that E1 did not disclose how that device would behave in response to vibrations perpendicular to the axis of symmetry of the damping elements. The skilled person knows that any spring-mass system mounted on a surface has a particular resonant frequency and therefore is "tuned" to a particular frequency. The behaviour of the system disclosed in E1 in response to vibrations perpendicular to the axis of symmetry of the damping elements is also implicit for the skilled person. Although the mass in the system according to E1 has an alternative primary function, this is not excluded by the present claim.

E4 also fully anticipates the subject-matter of claim 1. It explicitly discloses the elastic mounting of an airbag module in a steering wheel in order to act as a frequency-tuned resonance damper. The damping elements are in the form of tubular elastic bushes, each of which is mounted by means of a rivet which together with the bush forms a "form grip organ" at each end of

the bush. By virtue of its tubular form each bush comprises an inwardly-directed cavity.

Alternatively, if E2 were considered as forming the closest state of the art the skilled person would recognise that the outer housing would be superfluous if the damping elements according to E1 were employed.

VI. The respondent's rebuttal was essentially as follows:

E4 is late-filed and not *prima facie* relevant and therefore should be disregarded. In particular, there is no cavity since the rivet occupies the bore of the elastic element.

E1 does not anticipate the subject-matter of claim 1. As set out in decisions T 411/98 and T 312/94 a disclosure is prejudicial to novelty of a claim only if the subject-matter is clearly and unmistakably derivable as a whole. A frequency-tuned resonance damper is a known device which functions by removing energy from the system and the vibrating body must be capable of being subject to vibration at high amplitude. By comparison, what the appellant considers to be the vibrating body in the system according to E1 is an electrical component which the teaching of E1 aims to protect from vibration. Moreover, the teaching of E1 concerns vibration parallel to the axis of symmetry of each elastic element. It is silent as regards vibration perpendicular to that direction but teaches that there is preferably clearance between each form-grip organ and the corresponding surface.

As regards inventive step, E2 is the closest state of the art and discloses the features in the preamble of claim 1. The problem solved is to provide a more cost-effective and easily tuned arrangement. E1 does not concern itself with that problem and therefore provides the skilled person with no encouragement to combine the teachings. Even if he were to combine them, the teaching of E1 to provide the clearance would prevent him from arriving at the subject-matter of claim 1.

Reasons for the Decision

1. The patent relates to a frequency-tuned resonance damper which, as accepted by both parties, is a device which *per se* is well known in the art. A damper of this type functions to counter resonant vibration of a body by elastically coupling a mass to the body in such a way that the mass will oscillate out-of-phase with the body at the resonant frequency. The damper according to present claim 1 is intended to counter vibration parallel to the plane of a surface on which it is mounted and the mass ("vibrating body") is connected to the surface by means of at least one elastic element ("dampening element"). The characteristics of the elastic element and the mass are selected in order to tune the system to provide the desired resonant frequency. In accordance with present claim 1 the elastic elements comprise recesses at each end for attachment to the mass and to the surface and a cavity into which a core may be inserted for influencing the stiffness of the elastic element.

Later-filed evidence

2. E4 was first brought forward together with the statement setting out the grounds of appeal. Article 12(4) RPBA (OJ EPO 2007, 536) sets out the basis for appeal proceedings "without prejudice to the power of the Board to hold inadmissible ... evidence ... which could have been presented ... in first instance proceedings". That power is provided by Article 114(2) EPC 1973 according to which the board has the discretion to disregard *inter alia* evidence which is not submitted in due time.
 - 2.1 In the present case no amendment to the claims had been requested during the opposition procedure and it follows that at the time of filing of the appeal the claims as granted were the sole basis for consideration. Since the filing of E4 was not occasioned by amendment to the claims it could have been presented during the first instance proceedings and so was not filed in due time.
 - 2.2 The appellant argues that E4 should be admitted because it discloses the whole of the subject-matter of claim 1. However, E4 is not so relevant. In particular, recesses for attachment of the tubular elastic elements are present only in combination with a rivet which occupies the bore of the tube. It follows that there is no combination of form-grip organs and an inwardly facing cavity as required by present claim 1.
 - 2.3 The board therefore disregards E4. Further evidence was first brought forward by the appellant in its statement setting out the grounds of appeal. Since the appellant

did not contest the board's announced intention to disregard it due to lack of relevance the matter need not be considered further.

Main request

Novelty

3. E1 relates to a system for providing a shock-absorbing and vibration-damping mounting of a base plate to a support plate by means of projectile-shaped elastic members having circumferential grooves at each end for engaging in holes in the respective plates. Each elastic member has an inwardly facing cavity. One aim of the teaching of E1 is to prevent vibrations and shocks perpendicular to the support surface from being transmitted to the base plate and thereby protect equipment mounted on the base plate. In the described embodiment the equipment is a voltage regulator in a motor vehicle. One of the grooves in each elastic body is deeper at its base than at the periphery. In this way vibrations are isolated by contact through the narrower, outer portion whilst shocks resulting in greater movement of the elastic body relative to the base plate meet with increased resistance due to deflection of the groove wall. The inner peripheral walls of all of the grooves preferably are radially spaced from the adjacent walls of the holes.

3.1 The appellant rightly argues that any spring mass system has a resonant frequency but concludes that if in a device built in accordance with E1 the support plate were to be subjected to vibrations perpendicular to the axis of symmetry of the elastic members at the

resonant frequency of the system consisting of the voltage regulator and elastic members, that system would effectively become a frequency-tuned resonance damper. The board cannot agree with that conclusion. The designation 'frequency-tuned resonance damper' implies a system which is specifically designed for the purpose of damping resonance at a selected frequency. Indeed, claim 1 explicitly specifies the damping element and damping body together as "being tuned" to damp the vibrations of the surface "within a selected frequency range", see lines 7,8 in the claim as set out under point IV above. Any resonance damping which might be achievable by the system disclosed in E1, on the other hand, is wholly indeterminate since the disclosure contains no values for the relevant parameters of the system. The mass of the voltage regulator according to E1 would be essentially determined by its duty and the skilled person when putting into effect the teaching of E1 would choose the characteristics of the elastic members in accordance with their duty of isolating in a direction parallel to their axes of symmetry, carrying the weight of the regulator and providing a secure mounting capable of withstanding accidental knocks. The resultant system would possess a resonant frequency in the direction perpendicular to the axes of symmetry but any resonance damping effect would be the purely coincidental result of the application of vibration having that same frequency. The device according to E1 therefore cannot be regarded as a frequency-tuned resonant damper system.

- 3.2 The appellant argues that this distinction between the subject-matter of claim 1 and the device of E1 would merely be one of designation and therefore not capable

of bestowing novelty. In its broadest terms the argument of the appellant treats both the claimed and the prior art devices as abstract, identical mass-spring systems. The logical outcome, from its point of view, is that all requirements of claim 1 must be met. There might be circumstances where such a line of argument is appropriate but this is not one of them. For it to have any chance of success the appellant would have had to demonstrate at the very least that the coincidental situation in which the voltage regulator of E1 would vibrate at its resonant frequency in a direction transverse to the axes of the elastic mounting members is one which could realistically arise in practice. This the appellant has failed to do. It is apparent that the essential teaching of E1 relates to the isolation of forced vibrations transmitted parallel to the axis of symmetry of the elastic members. In the coincidental situation suggested by the appellant, on the other hand, the support plate would vibrate in a direction perpendicular to the axis of symmetry. However, the skilled person when following the teaching of E1 has been made aware that the voltage regulator is susceptible to damage from vibration. From his general technical knowledge he would moreover be aware that the damage caused by resonant vibrations in a device potentially would be far greater than that resulting from forced vibrations. If there were a risk of the support plate carrying the voltage regulator exciting it at its resonant frequency the skilled person therefore would take measures to avoid it happening, thereby preventing the coincidental situation suggested by the appellant.

3.3 On the basis of the foregoing the board concludes that the subject-matter of claim 1 is new with respect to E1 (Article 54 EPC 1973).

Inventive step

4. The closest state of the art for consideration of inventive step is known from E2. The skilled person wishing to provide a frequency-tuned resonance damper would not consider E1 as his starting point since, as set out above in respect of novelty, the voltage regulator is fundamentally unsuited to function as the vibrating body in such a damper.

4.1 E2 relates to a frequency-tuned resonance damper comprising an oscillating body supported by elastic elements within a housing. The elastic elements may take various forms such as flanges, a tubular element or blister-like projections and provide damping in directions both perpendicular and parallel to the surface on which the housing is mounted. The elastic elements and the housing are specifically adapted to each other. Both the parties and the board are in agreement that the disclosure of E2 is correctly reflected in the preamble of present claim 1. The features of the characterising portion of claim 1 solve the problem of providing a frequency-tuned resonance damper which is simpler to produce and more easily adapted to a variety of applications.

4.2 The skilled person faced with the set problem would receive no motivation from the teaching of E1 to modify the system of E2 in such a way as to arrive at the subject-matter of present claim 1. Firstly, the

explicit teaching of E1 is not directed towards a frequency-tuned resonance damper and, as already explained in respect of novelty, the skilled person would not recognise any implicit teaching to the effect that the voltage regulator could act as a vibration body in a frequency-tuned resonance damper. Secondly, whilst E2 provides for damping in two mutually perpendicular planes E1 addresses vibration in only one plane. Even if the skilled person were to choose to provide damping in only one plane, the isolation provided by the teaching of E1 is in a direction perpendicular to the damping in accordance with present claim 1.

- 4.3 The board therefore finds that the subject-matter of present claim 1 involves an inventive step (Article 56 EPC 1973). Since claims 2 to 11 contain all features of claim 1 the same finding applies equally to them. Under these circumstances it is not necessary to consider the respondent's auxiliary requests.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

A. Vottner

S. Crane