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D E C I S I O N
of 31 January 2006

Case Number: T 1071/03 - 3.2.01

Application Number: 97301026.7

Publication Number: 0791534

IPC: B62M 9/12

Language of the proceedings: EN

Title of invention:

Elastomer coated coil spring and chain derailleur employing same

Patentee:

SHIMANO INC.

Opponent:

SRAM Deutschland GmbH

Headword:

-

Relevant legal provisions:

EPC Art. 56, 123(2)

RPBA Art. 10b(1)

Keyword:

"Amendments - added subject-matter (no) "

"Inventive step - no"

"Late-filed requests - disregarded"

Decisions cited:

-

Catchword:

-



Case Number: T 1071/03 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 31 January 2006

Appellant: SRAM Deutschland GmbH
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
18 August 2003 concerning maintenance of
European patent No. 0791534 in amended form.

Composition of the Board:

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

Summary of Facts and Submissions

- I. The opponent's appeal is directed against the decision posted 18 August 2003 according to which the opposition division found that, account being taken of the amendments made by the patent proprietor during the opposition proceedings, the European patent No. 0 791 534 and the invention to which it relates meet the requirements of the EPC.
- II. The following prior art cited during the opposition proceedings also played a role during appeal:
- D1: EP-A-0 653 346
- D7: EP-A-0 655 386.
- III. During oral proceedings held on 31 January 2006 the appellant requested that the impugned decision be set aside and the patent revoked in its entirety. The patent proprietor requested that the appeal be dismissed (main request) or in the alternative that the patent be maintained as granted (first auxiliary request), or in amended form on the basis of the claims according to the second auxiliary request submitted with a letter dated 30 December 2005 or as a further alternative with a new claim 1 directed to any two or any one of the alternative options specified in the characterising clause of claim 1 of the second auxiliary request.

IV. Claim 1 as approved by the opposition division (present main request) reads as follows, wherein wording added in comparison with the claim as granted is indicated in italics:

"A chain derailleur comprising:

a base member (3);

a link mechanism (5) having:

a first member (16) connected to said base member (5), said first member (16) having first and second pivot axes (24,30) defined thereon;

first and second links (18,22), said first link (18) mounted for pivotal movement to said first member (16) at said first pivot axis (24), said second link (22) mounted for pivotal movement to said first member (16) at said second pivot axis (30);

a second member (20) having third and fourth pivot axes (26,28) defined thereon, said first link (18) mounted for pivotal movement to said second member at said third pivot axis (26), said second link (22) mounted for pivotal movement to said second member at said fourth pivot axis (28);

a coil spring (50,35) mounted within said link mechanism (5) *inside a volume defined between said first and second links (18,22)* urging said first and fourth pivot axes (24,28) toward one another; and

a second spring (52,60,60a,60b,60c,75) mounted within said link mechanism (5) *inside said volume defined between said first and second links (18,22)* to further urge said first and fourth pivot axes (24,28) toward one another;

characterised in that:

said coil spring (35,50) has a first and a second end, said first end being connected to said first member (16) adjacent to said first pivot axis (24) and said second end being connected to said second member (20) adjacent to said fourth pivot axis (28)."

Claim 1 according to the respondent's second auxiliary request differs from that of its main request essentially by the addition of the following wording which forms the characterising clause:

"said second spring is selected from the group consisting of: a torsion spring (60,60a,60b,60c), a second coil spring (75) disposed concentrically within said coil spring, and an elastomeric coating (52) formed on said coil spring (50)".

V. The appellant argued essentially as follows:

Claim 1 according to the main request contains amendments in comparison with the claim as granted which were not disclosed in the description as originally filed. Moreover, they were not clearly and unambiguously derivable from the drawings in accordance with the requirements set out by case law. The term "within" in claim 1 as originally filed may have

different meanings only one of which is given by the wording added to the claim. However, that meaning is not supported by the disclosure of the drawings. It follows that the amendments offend the provision of Article 123(2) EPC.

The closest published prior art for consideration of inventive step is known from D1 which discloses all features of the subject-matter of claim 1 according to the main request except those of the coil spring and its connection adjacent the first and fourth pivot axes. The problem solved by these novel features relates to reduction of the load applied by torsion springs when soiled. The skilled person would readily appreciate this problem and would find in D7 the solution, to replace a torsion spring by a coil spring. The respective figures 2 of D1 and D7 are almost identical except for the provision in the latter of a "storage" feature. The skilled person when installing a coil spring in D1 would be left merely with the task of finding appropriate positions at which to connect the spring. In this respect it should be noted that according to the patent specification the coil spring need be attached only near to the respective pivot axes.

As regards the second auxiliary request, the combination of the coil and torsion springs fails to contribute to a solution of the set problem and is rendered obvious by the combination of D1 and D7 alone. The concentric arrangement of two coil springs is rendered obvious by D1 and D7 together with the general technical knowledge of the skilled person. The elastomer coated spring represents nothing more than a

spring dipped in elastomeric paint and is normal in the art.

VI. The respondent's reply to the above arguments may summarised as follows:

Original claim 1 defines the spring as being "within" the link mechanism. The meaning of this term as "inside the volume of" the mechanism is clear to the skilled person in the light of the description and drawings, in particular the problem to be solved of increasing spring force without increasing the size of the link structure. The amendment included in claim 1 approved by the opposition division merely repeats the meaning of "within". The drawings are schematic and provide support for this meaning of the term.

The appellant correctly determines the features by which the subject-matter of claim 1 according to the main request differs from the closest prior art according to D1. The objective problem to be solved is "to provide a high long term biasing force without having to increase the size of the structure". D7 encourages the skilled person to increase the size of the torsion springs. In contrast to D1, D7 relates to a particular mechanism in which the spring provides a low return force and exhibits a minimal change in rate. It is this low force which renders important the maintenance of the spring performance when soiled.

Also each of the alternative features of claim 1 according to the second auxiliary request is not obvious. The claimed mechanism having both a torsion spring and a coil spring exhibits a combination of high

force provided by the former and reliability provided by the latter. If the skilled person were to combine the teachings of D1 and D7 he would replace both torsion springs; the torsion spring could not operate with the "storage" feature. The first alternative feature of a concentric arrangement of coil springs provides optimum use of the otherwise wasted space within the outer spring. Moreover, there is no evidence that such an arrangement of springs is known. The second alternative feature of an elastomeric coating provides for an increase in spring force without increasing the space requirement. No prior art document renders such a solution obvious.

Reasons for the Decision

Main request

1. The patent relates to a derailleur mechanism for changing the gear ratio on a cycle by transferring a chain between rotating sprockets over which the chain is moving. The chain is guided onto a selected sprocket by a wheel which is carried by a parallelogram linkage positionable under the opposing influences of cable tension and biasing spring force. The cable is tensioned by the cyclist in order to urge the chain to move in one direction across the set of sprockets. Release of the cable tension permits the spring to urge the chain to return in the opposite direction.

Addition of subject-matter (Article 123(2) EPC)

2. The preamble of claim 1 as granted essentially corresponds to claim 1 as originally filed, differing only by the addition of reference numerals. Original claim 1 therefore specified two springs "mounted within" the link mechanism. During the opposition procedure this specification of the mounting of the springs was supplemented by the wording "inside said volume defined between said first and second links". The appellant takes the view that the meaning of the supplementary wording does not find a basis in the original disclosure.
- 2.1 The appellant's view is that "within" may mean either "part of" or "inside of" and that it follows that this term does not unambiguously disclose the latter meaning. However, the term "within" follows the verb "mounted" and so relates to the mounting of the springs. The correct linguistic interpretation of the claim therefore is that the specification that each spring is "mounted within" the linkage is a definition of their location.
- 2.2 Whilst the drawings of the application as originally filed when considered in isolation may not unambiguously disclose the feature that the coil spring is mounted inside the volume of the link mechanism, there is no aspect of them which in any way indicates the contrary so that they are wholly consistent with the above interpretation. Moreover, in the acknowledgement of prior art in the description it is stated that it would be desirable to increase the magnitude of the spring force and consequently the

diameter of the spring itself but that this is restricted by limitations on the size of the derailleur, thereby implying that the spring is mounted inside the volume of the link mechanism.

- 2.3 On the basis of the foregoing the board is satisfied that the skilled person when reading the original application when taken as a whole would understand that the springs were located inside a volume defined between the first and second links. The board therefore finds that the amendment made to claim 1 does not contravene the requirement of Article 123(2) EPC.

Inventive step

3. The Board agrees with the parties that the closest prior art for consideration of inventive step is that disclosed by D1. This relates to a derailleur comprising a link mechanism having first and second members and links respectively and four pivot axes all as defined in present claim 1. Two torsion springs mounted within the link mechanism provide the biasing force. One torsion spring is mounted on the first pivot axis and acts on the first link and the first member to urge them apart. Similarly, the second torsion spring mounted on the fourth pivot axis acts on the second link and the second member. Both springs act to urge the first and fourth pivot axes toward one another.

- 3.1 The subject-matter of present claim 1 differs from that of D1 by the features that one spring is a coil spring which has a first and a second end, the first end being connected to the first member adjacent to the first

pivot axis and the second end being connected to the second member adjacent to the fourth pivot axis.

- 3.1.1 In all of the embodiments according to the present patent the coil spring is a tension spring and this is implicit also from the feature in the claim of the urging together of the pivot axes adjacent to which the spring is connected. As set out in the original application, a torsion spring such as is used in D1 suffers from the disadvantage that friction in the mutually contacting coils causes wear resulting in degradation of the spring's characteristics. The replacement of one of those torsion springs by a tension coil spring therefore has the effect of avoiding a reduction in spring force over an extended period of time. The connection of the spring between points adjacent the first and fourth pivot axes has the effect of providing the most efficient application of force. There is no interaction between these effects. The improved consistency of force over an extended period of time achievable with a tension coil spring is independent of the position at which the force is applied to the mechanism. It follows that the features relating to the form of the spring and its installation are merely juxtaposed and are to be considered separately for assessment of inventive step. The corresponding problems are to improve the consistency of application of a bias force over an extended period of time and to install a spring in an efficient manner.
- 3.1.2 The respondent argues that the problem to be solved is to provide a high long term biasing force without having to increase the size of the structure. However, the presently claimed features would not necessarily

result in a higher biasing force than in the mechanism according to D1. Indeed, there is no suggestion in the present patent or indeed in the application as originally filed that there was any desire to increase the biasing force provided by the mechanism according to D1 when operating as intended.

3.2 D7 also relates to a derailleur mechanism and both D7 and the earlier prior art from which it begins comprise a feature which relates to the blocking of the movement of the linkage which may occur for example if there is an attempt to change gear whilst the chain and sprockets are stationary. Essentially the cable is connected to the link mechanism via a spring one end of which is connected to the linkage through a pivotal member. The spring, which according to the earlier prior art is a torsion spring, urges the first and fourth pivot axes toward one another, stores the energy transmitted by the cable if the link mechanism is blocked and releases it again when the link mechanism becomes free. D7 teaches that the performance of torsion springs degrades with time and proposes that, in order to avoid accommodating this degradation by providing an initially stronger spring, a tension coil spring may be used.

3.3 The skilled person who experiences the problem of degradation of the spring performance in the derailleur according to D1 would learn from D7 that an improvement could be made by using a tension coil spring in place of a torsion spring. It would remain for him to install the spring in the link mechanism of D1. He would not be hampered in this action by the fact that the link mechanism according to D7 is more complex by virtue of

the energy storage function since the duty of the spring in the normal, unblocked operation is the same as it would be in the mechanism according to D1. He would, however, need to select appropriate locations for connecting the spring since the pivotal member to which the spring is connected in the mechanism according to D7 is not present in that according to D1. It falls within the normal competence of the skilled person to select the optimum arrangement for connection of the spring with it acting between the first and fourth pivot axes.

- 3.4 The respondent argues that the skilled person when following the teaching of D7 would not merely adopt the alternative spring construction but would choose the entire mechanism including the pivotal member. The board disagrees. The provision of a spring-loaded pivotal member to store energy when the link mechanism is blocked is acknowledged by D7 as already being known from the prior art. The essential teaching of D7 is directed not to the energy storage function but to the use of a tension coil spring thereby avoiding the need to provide a torsion spring of higher strength. The respondent further argues that D7 relates to a mechanism requiring a low return force. The board disagrees also with this argument. The teaching in D7 relating to a "relatively weak" spring compares the high spring force provided by a torsion spring having sufficient reserve to ensure satisfactory gear-change performance after degradation and the lower but more consistently available spring force which may be provided when using the proposed tension coil spring. It is stated that this lower force is suitable to operate shift arrangements having pre-determined shift

positions but there is no suggestion that this latter force is lower than that conventionally desired in a correctly functioning derailleur mechanism.

- 3.5 On the basis of the foregoing the board concludes that the subject-matter of claim 1 does not involve an inventive step.

First auxiliary request

4. This request reverts to claim 1 as granted for the eventuality that the board would find that the amendments made according to the main request contravene the requirements of Article 123(2) EPC. As set out under 2 above the subject-matter resulting from the amendments was disclosed by the wording "within said link mechanism" contained in claim 1 as granted. It follows that the subject-matter of claim 1 according to this request is identical to that according to the main request and so lacks inventive step for the same reasons as set out above.

Second auxiliary request

5. As set out above, D7 renders obvious the replacement of a torsion spring in the link mechanism according to D1 by a tension coil spring. The link mechanism according to D1 contains two torsion springs and it would be obvious for the skilled person to replace either one or both of these by the same number of tension coil springs, depending on such factors as the space available. The respondent argues that the torsion and coil springs together exhibit a combination of high force provided by the former and reliability provided

by the latter. However, this amounts to no more than an aggregation of the known springs and their known characteristics. The board therefore considers that the subject-matter of one member of the group in claim 1 according to this request lacks an inventive step; it follows that the claim as a whole is not allowable.

Further requests by the respondent

6. The respondent filed its main and first and second auxiliary requests in writing one month before the date set for the oral proceedings. Claim 1 of the second auxiliary request had been amended to include the wording "said second spring is selected from the group consisting of: a torsion spring (60,60a,60b,60c), a second coil spring (75) disposed concentrically within said coil spring, and an elastomeric coating (52) formed on said coil spring (50)". After the matter of inventive step of this claim had been considered during the oral proceedings and before the board deliberated on the matter the respondent asked for the opportunity to further amend its requests. In the event the board found in its deliberation on the second auxiliary request that any one or any two of the alternative features in claim 1 according to that request would result in an inventive step the respondent wished to file a new claim restricted accordingly.

6.1 In as far as such a new claim would differ from one already considered by both the board and the appellant by the mere deletion of one or more alternative features it may seem reasonable that the respondent should be permitted to proceed with its request even at such a late stage. Moreover, although the method of

formulating the requests is not the usual, since the single request in effect corresponds to six further auxiliary requests in which the preferred order is implicit the Board has no objection to the way in which the request is formulated. However, the three features in question relate to alternative embodiments described in the patent. Exclusion of one of those features would require not only amendment of the dependent claims but also extensive amendment of the description and drawings.

- 6.2 Article 10b(1) RPBA states that "Any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of *inter alia* the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy". It is immediately clear from the respondent's second auxiliary request that a finding by the board that any one of the additional alternative features fails to establish an inventive step would result in failure of the request. The respondent should have been aware of this at the time of formulating the request and acted accordingly by filing further auxiliary requests in a timely fashion. The proceedings were clearly at an advanced stage when the respondent did finally indicate its further requests. Moreover, the matter of amendment to dependent claims, description and drawings to delete features no longer covered by an independent claim would in the present case both involve extensive re-drafting and require careful, time-consuming checking. The respondent had ample opportunity to prepare its further requests and their admittance late in the oral

proceedings would not have been conducive to procedural economy. The board therefore exercises its discretion not to consider them.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

A. Vottner

S. Crane