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**Datasheet for the decision
of 1 April 2008**

Case Number: T 0025/07 - 3.2.01

Application Number: 98303202.0

Publication Number: 0875445

IPC: B62M 9/12

Language of the proceedings: EN

Title of invention:
Bicycle derailleur

Patentee:
SHIMANO INC.

Opponent:
SRAM Deutschland GmbH

Headword:
-

Relevant legal provisions:
-

Relevant legal provisions (EPC 1973):
EPC Art. 56

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
-



Case Number: T 0025/07 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 1 April 2008

Appellant: SRAM Deutschland GmbH
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
28 December 2006 concerning maintenance of
European patent No. 0875445 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 2 November 2006 as corrected on 28 December 2006 in accordance with Rule 89 EPC 1973 according to which it was found that, account being taken of the amendments made by the patent proprietor during the opposition proceedings, the European patent No. 0 875 445 and the invention to which it relates were found to meet the requirements of the EPC 1973.

II. The following state of the art played a role during the appeal proceedings:

E1: DE-A-34 00 432.

III. During oral proceedings held 1 April 2008 the appellant requested that the decision under appeal be set aside and the patent revoked. The respondent requested that the patent be maintained on the basis of claims 1 to 7 filed with a letter of 9 July 2007 together with the description and drawings underlying the contested decision.

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

"A bicycle derailleur (100) comprising:
a base member (114);
a moveable member (118) supporting a chain guide;
a first link (122) having first and second ends;
wherein the first end of the first link (122) is moveably mounted to the base member (114) and wherein the second end of the first link (122) is moveably mounted to the moveable member (118);

a second link (124) having first and second ends;
wherein the first end of the second link (124) is pivotably mounted to the base member (114) through a first pivot pin (136) and the second end of the second link is moveably mounted to the moveable member (118);
and
a spring (144) having a second end (154) mounted to the first link (122),
wherein the first end of the first link (122) is pivotably mounted to the base member (114) through a second pivot pin (128); and the spring (144) exerts a spring force on one side of a longitudinal axis (x) of the first link (122) and directed away from the moveable member (118); and
wherein the derailleur (100) further comprises a control element coupling member (155) coupled to the first link (122) for coupling to a control element (156) which exerts a control element force on an opposite side of the first link (122) and directed away from the moveable member, characterised in that:
a first end (148) of the spring (144) is mounted to the base member (114) offset from the first pivot pin (136) and the second pivot pin (128),
and that the derailleur includes:
a first bearing (162) mounted to the second pivot pin (128) between the first end of the first link (122) and the second pivot pin (128); and
a second bearing (190) mounted between the second end (154) of the spring (144) and a mounting post (158) positioned along the path of the first link (122)."

V. The submissions of the appellant in as far as they are relevant to this decision may be summarised as follows:

The feature in claim 1 of "a bearing" means nothing more than an interface between two components which enables relative movement between them. The specification according to claim 1 that the bearings are "mounted between" components merely requires that they are arranged there.

The closest state of the art is known from E1 in the embodiment of figure 7 which discloses all features of the preamble of claim 1. It further discloses that a first end of the spring is mounted to the base member offset from the first pivot pin and the second pivot pin and that the second end of the spring is mounted, implicitly movably, at a position along the path of the first link. The movable mounting implies the presence of a bearing surface. The patent specification acknowledges that a previously known derailleur had bearings on the pivot pins connecting the links and to which the spring was connected. The patent proprietor states that its invention lies in achieving low friction with a small number of bearings but claim 1 does not specify a limit on the number of bearings present. It would have been obvious for the skilled person wishing to reduce friction to adapt the derailleur according to E1 to include the arrangement of bearings as previously known. Moreover, it falls within the general knowledge of the skilled person to provide a bearing to reduce friction where desired.

VI. The respondent essentially replied:

Claim 1 specifies that there are bearings between the respective pins and components and so requires more than a mere bearing surface. Indeed, it is clearly

stated in the description of the patent specification that no bearing is present when there is direct contact. E1 in the embodiment of figure 7 does not unambiguously disclose the attachment of one end of the spring to the base member. Moreover, the feature of a bearing between a mounting post and an end of a spring is not known in the state of the art. Figure 1 of the patent specification is a conceptual illustration intended to show the arrangement of bearings on the pivot pins in a known derailleur and the spring is drawn so as not to obscure one of those bearings. It does not show a bearing between the end of the spring and the pivot pin and, moreover, the figure is not prior art in itself. The subject-matter of the claim solves the problem of reducing friction without using a large number of bearings by restricting the combination of relative rotation and high loads to fewer locations. By comparison, E1 aims to achieve equal loading at all pivots.

Reasons for the Decision

1. The patent relates to a derailleur for bicycles, having a tetragonal linkage which is deformable to move a chain across a series of toothed wheels. The linkage is deformed in one direction by tensioning a cable and in the other direction by the biasing force of a tension spring. Conventionally in derailleur mechanisms the biasing spring acts between two opposite pivots in the linkage with the result that all pivots are subjected to loading from the spring. In accordance with the patent the spring acts between the base member of the linkage and one of the links such that the force of the

spring acts primarily on only one pivot. Bearings are provided at that pivot and between the spring and a mounting post by which the spring mounts to the link.

2. E1 relates to a derailleur mechanism for a bicycle and acknowledges earlier prior art in which an operating cable introduces loads to deform the linkage in both directions through a lever pivotable about one of the pivots. E1 sets out to increase design freedom in order to achieve *inter alia* a reduction and equalisation of loads in the linkage. It achieves this by applying the cable loads to a projecting portion of one of the movable linkage members.

- 2.1 According to an embodiment shown diagrammatically in E1 figure 7 the cable applies tensile forces only which are opposed by forces exerted by a coil spring. The board agrees with the parties that this embodiment forms the closest state of the art for consideration of inventive step of present claim 1 and discloses all features of the preamble. In E1 figure 7 the coil spring is mounted at its second end to the first link at a point along the path thereof and at its first end to a position offset from the pivot pins 230, 232 on the base member. This position is on a line which in the respondent's view is not unambiguously disclosed as being the base member. However, consideration of the illustration of the movable member which clearly extends beyond the pivot pin 234 to support the guide pulley leads to the conclusion that the similarly represented base member does extend beyond both pivot pins 230, 232 to be supported in the bicycle frame 212. It follows that E1 figure 7 also discloses the feature of present claim 1 that a first end of the spring is

mounted to the base member offset from the first pivot pin and the second pivot pin.

2.2 The subject-matter of present claim 1 therefore differs from the closest state of the art by the following features:

(a) the spring is connected to the first link by a mounting post;

(b) a first bearing is mounted to the second pivot pin between the first end of the first link and the second pivot pin; and

(c) a second bearing is mounted between the second end of the spring and the mounting post.

2.3 Feature (a) complements the teaching of E1 figure 7 in view of its diagrammatical nature. Whilst features (b) and (c) both serve to provide low friction joints the effects which result from them exhibit no synergy and the features are merely aggregated. Each of these three features therefore is to be considered separately for its contribution to inventive step (see "Case Law of the Boards of Appeal", 5th Edition 2006, I.D.8.2.2).

2.3.1 Feature (a) falls within the general knowledge of the skilled person. When faced with the need to provide a movable connection between the spring and the first link in E1 figure 7 it would be an obvious measure for him to draw on that general knowledge and the choice of feature (a) would not require any inventive activity on his part.

2.3.2 The provision of a bearing between two relatively moving components is a fundamental aspect of mechanical design which therefore also falls within the general knowledge of the skilled person. When putting the mechanism of E1 figure 7 into practical effect the skilled person would apply that knowledge and so provide bearings where desirable in the light of the desired duty and cost. Indeed, the patent specification acknowledges in paragraphs [0002], [0003] with reference to figure 1 that it was already known to provide a derailleur mechanism in which bearings are mounted on the pivot pins connecting the links to the base member. Those bearings and the ones according to present features (b), (c) all perform similar duties in as far as they accommodate rotation which is not continuous but of limited extent occurring only when the derailleur is operated. The skilled person therefore would have been aware of the possibility of providing bearings appropriate to that duty in the same technical field. It follows that no inventive activity was necessary to arrive at the features (b), (c).

2.4 The respondent argues that the problem solved by the subject-matter of present claim 1 is not as set out above but to reduce friction without using a large number of bearings. However, that statement of problem ignores the fact that E1 discloses a derailleur mechanism in which the spring arrangement already would reduce the forces carried by three of the four linkage pivots, albeit without explicit explanation of that effect. The further contribution of the subject-matter of present claim 1 relates essentially only to the avoidance of friction in that arrangement and, as admitted by the respondent, the claim does not exclude

the presence of bearings at the remaining pivot pins which implicitly would further reduce friction.

3. The board concludes from the foregoing that the subject-matter of present claim 1 does not involve an inventive step.

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