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**Datasheet for the decision
of 12 October 2007**

Case Number: T 0098/06 - 3.2.01

Application Number: 97105275.8

Publication Number: 0803431

IPC: B62M 11/16

Language of the proceedings: EN

Title of invention:
Hub transmission for bicycle

Patentee:
SHIMANO INC.

Opponent:
SRAM Deutschland GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 54, 84, 123(2)
RPBA Art. 10b(1)

Keyword:
"Novelty - yes (auxiliary request)"
"Clarity - yes"
"Added subject-matter (no)"
"Amendment of a party's case (yes)"

Decisions cited:
T 0301/87

Catchword:
-



Case Number: T 0098/06 - 3.2.01

DECISION
of the Technical Board of Appeal 3.2.01
of 12 October 2007

Appellant: SRAM Deutschland GmbH
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
8 December 2005 concerning maintenance of
European patent No. 0803431 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 8 December 2005 according to which, account being taken of amendments made by the patent proprietor during the opposition proceedings, the patent and the invention to which it relates were found to meet the requirements of the EPC.

- II. The following state of the art document played a significant role during the appeal procedure:

E6: US-A-4 973 297.

- III. In reply to the grounds of appeal the respondent requested that the appeal be dismissed (main request) or in the alternative that the patent be maintained on the basis of first or second auxiliary requests.

- IV. The board summoned the parties to oral proceedings and in an annex to the summons according to Article 11(1) RPBA raised questions as regards amendments contained in the claims as approved by the opposition division. The respondent reacted to the content of the annex by amending its requests (first amended requests). The appellant reacted to the amended requests by *inter alia* encouraging the board to exercise its discretion in accordance with Article 10b RPBA by disregarding the first amended requests.

- V. During oral proceedings held on 12 October 2007 the appellant requested that the decision under appeal be set aside and the patent revoked. The respondent requested that the decision under appeal be set aside

and the patent maintained on the basis of the set of claims according to the main request or in the alternative on the basis of the set of claims and the description according to the auxiliary request, both requests submitted at the oral proceedings (final, second amended requests).

VI. Claim 1 according to the respondent's final main request reads as follows, wherein amendments in comparison with the claim as granted are indicated as [deletion] and *addition*:

"A bicycle transmission comprising:

- a hub axle (10);
- a drive member (25) rotatably mounted around the hub axle (10);
- a hub body (70) rotatably mounted around the hub axle (10);
- a planetary gear mechanism (99, 40, 41, 50) coupled between the drive member (25) and the hub body (70) for communicating rotational force from the drive member (25) to the hub body (70) through multiple rotational force transmission paths, the planetary gear mechanism (99, 40, 41, 50) including:
 - a planet gear (41) supported by a planet gear rack (40) for rotation around the hub axle (10); and
 - a ring gear (50) engaging the planet gear (41), wherein the ring gear (50) includes a transmission pawl (55) that can be displaced between a first position for transmitting rotational motion between the ring gear (50) and the hub body (70) and a second position for inhibiting the transmission of rotational motion between the ring gear (50) and the hub body (70);

a clutch (30) mounted around the hub axle (10), wherein the clutch (30) is able to move in the peripheral direction and is movable in the direction of a longitudinal axis (X) of the hub axle (10) for selecting a rotational force transmission path through the planetary gear mechanism (99, 40, 41, 50) and for selectively operating the transmission pawl (55); a clutch operator for operating the clutch (30); characterized in that

the clutch (30) includes a first clutch member (31) and a second clutch member (32) capable of movement relative to each other in the direction of the axis (X) of the hub axle (10), and which are both rotatably mounted around the hub axle;

the first clutch member (31) and the second clutch member (32) [being able to] move [relative to] away from each other to be relatively displaced in the direction of the longitudinal axis (X) of the hub axle (10) when the drive member rotates in a first rotational direction for causing the transmission pawl (55) to be in the first position for transmitting rotational motion between the ring gear (50) and the hub body (70); [and]

the first rotational direction corresponds to a forward direction of a bicycle in which the bicycle transmission is installed, and

wherein the first clutch member (31) and the second clutch member (32) move [relative] toward each other along the longitudinal axis (X) of the hub axle (10) for causing the transmission pawl (55) to be in the second position for inhibiting transmission of rotational motion between the ring gear (50) and the hub body (70) when a driving force in the second

rotational direction *opposite said first rotational direction* is applied to the drive member (25)."

Claim 1 according to the respondent's final auxiliary request differs from that according to the final main request by the addition of the following wording at the end of the claim:

"and wherein the first clutch member (31) includes a first contact surface (31d) for contacting the transmission pawl (55) and causing the transmission pawl (55) to be in the second position, and wherein the second clutch member (32) includes a second contact surface (32d) for contacting the transmission pawl (55) and causing the transmission pawl (55) to be in the second position."

Claim 1 according to the auxiliary request is followed by claims 2 to 14 which specify features additional to those of claim 1.

VII. The appellant's submissions in as far as they are relevant to the present decision may be summarised as follows:

The respondent has amended its requests after filing its reply to the grounds of appeal. The amendments to claim 1 according to both the main and the auxiliary requests result in a lack clarity and introduce subject-matter which was not originally disclosed. Movement of the clutch members "toward" and "away from" each other occurs in the described embodiment only when the transmission is in its highest gear ratio but this has not been specified in the claim. Moreover, these

movements were originally disclosed in claims 5 and 6 respectively, both of which were dependent from claim 3. Those original claims included other features which have not been taken into the present claim, resulting in an intermediate generalisation of the original disclosure. The corresponding disclosure in the description as originally filed comprises yet more features. The claim does not specify the feature in the embodiment that only the first clutch member moves in response to the change in rotational direction of the driving force. In view of these problems and the fact that added features have been taken from the description these requests should be declared inadmissible in accordance with Article 10b RPBA.

The subject-matter of claim 1 according to the main request is not new with respect to the disclosure of E6. The drivers 4 and 9 may be considered as the two clutch members which undergo relative movement upon application of rotational force in the driving and reverse directions. Movement of both drivers 4, 9 serves to select the transmission path whilst movement of driver 9 causes engagement and disengagement of the transmission pawl. Present claim 1 does not require that a clutch member directly contacts the transmission pawl. Moreover, the claim does not require that the movement of the first clutch member results from application of driving force, it can result from merely removing braking force.

There are no objections to the auxiliary request in respect of either the further amendments or novelty and inventive step.

VIII. The respondent replied essentially:

Claim 1 as originally filed and as granted already specified axial movement between the two clutch members upon application of rotational movement in a first direction. The changes in claim 1 according to the main request merely associate direction of movement with direction of rotation. This additional detail does not render it necessary to specify also the means by which the movement is achieved.

Claim 1 according to the main request is to be understood as requiring that both clutch members are involved in both operation of the transmission pawl and selection of the gear ratio, as in the described embodiment. E6 does not disclose all features of the claim because the driver 4 does not directly control movement of the transmission pawl and the driver 9 is involved in selection of the gear ratio but not in engagement of the transmission pawl. Axial movement of driver 4 upon the application of reverse rotation for braking is described but there is no disclosure of what causes the driver 4 to return to its initial position. Furthermore, claim 1 according to the main request is to be interpreted as requiring that the clutch members normally are moved towards each other and move away when forward drive is applied.

Reasons for the Decision

Admissibility of the respondent's requests

1. The appellant encouraged the board to exercise its discretion in accordance with Article 10b RPBA and to refuse to admit the respondent's first amended requests. Article 10b RPBA gives the board discretion in this respect by virtue of paragraph (1) which states that "Any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted 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."
- 1.1 Although the respondent's final requests were filed during the oral proceedings the further amendments which these contained were purely editorial. The appellant's arguments as regards admissibility of requests were made in respect of the first amended requests.
- 1.2 The claims according to the respondent's main and auxiliary first amended requests differ from those filed as respective main and second auxiliary requests in response to the grounds of appeal essentially in as far as amendments were made in response to the matters raised for the first time by the board in the annex to the summons to oral proceedings. The amendments which in the appellant's view provide justification for disregarding the first amended requests, on the other hand, were already present in the requests filed in response to the grounds of appeal. Under these

circumstances the appellant's case finds no basis in Article 10b(1) RPBA.

1.3 One aspect to be considered in accordance with Article 10b(1) RPBA is the state of the proceedings. The amendments made by the respondent were in reaction to matters which were not raised by the appellant but by the board when summoning the parties to oral proceedings and were filed in the respondent's first reply to the summons. The board raised those matters as the result of examination in accordance with Article 114(1) EPC in conjunction with Article 111(1) EPC and it would render such examination pointless if the respondent were unable to file amendments in order to overcome objections raised by the board.

1.4 On the basis of the foregoing the board decided to exercise its discretion in accordance with Article 10b(1) RPBA to admit the respondent's requests.

Main request

Amendments

2. The essential amendments in claim 1 in comparison with its form as granted are:

- (a) the definition of the movement of the clutch members when the drive member rotates in the first rotational direction as "relative to" each other has been replaced by "away from" each other;

- (b) the subject-matter of claim 2 as granted has been added and amended to specify that the second direction of rotation is opposite to the first.
- 2.1 Amendment (a) was disclosed in claim 5 and the paragraph bridging columns 8, 9 of the original application as published. In both cases the movement of the clutch parts was disclosed together with the features which cause the movement, specifically an inclined surface. However, the original disclosure in its broadest form (claim 1) already included the feature of relative movement without specifying any feature which caused it. It is clear to the skilled person that an inclined surface could be used to cause movement in either direction so that no functional link exists between the direction of movement and the means which cause it. The addition to claim 1 of the directions of movement without also adding the means of achieving them therefore does not provide the skilled person with any information beyond that which he already obtained from the application as originally filed.
- 2.2 As regards amendment (b), claim 2 as granted was dependent on claim 1 so the presentation of their combined subject-matter in one claim does not change the overall content of the patent. The feature that the second direction of rotation is opposite to the first, even if not already implicit, was explicitly disclosed in column 9, lines 2, 3 of the original application as published.
- 2.3 The appellant objects that claim 1 does not specify both that the movements of the clutch members towards

and away from each other occur only when in top gear and that the movements are executed only by the first clutch part. However, whether any objection may be present here need not be considered because claim 1 as granted already defined merely relative movement between the clutch members and without specifying that this occurred only in top gear. It follows that the objection does not arise from amendment made after grant and therefore is not to be considered (T 301/87 OJ 1990, 335).

2.4 Claims 2 to 14 correspond to claims 3 to 15 as granted and the description has been amended only for consistency with amended claim 1 and to acknowledge the disclosure of E10.

2.5 The board concludes from the foregoing that the amendments do not result in any lack of clarity (Article 84 EPC) or addition of subject-matter (Article 123(2) EPC).

Novelty with respect to E6

3. The present patent relates to a hub transmission for a bicycle comprising a planetary gear mechanism for transmitting rotational movement between the drive member and the hub body. When top gear has been selected the drive is transmitted to the hub body by means of transmission pawls which are spring-loaded to engage internal teeth on the hub body. When the transmission is driven in the forward direction the pawls engage the teeth and drive the hub. The patent in its broadest sense sets out to avoid the generation of noise when the transmission is rotated in the reverse

direction and the teeth repeatedly recline and release the pawls. It achieves this by using the reverse direction of rotation of the driver to recline the pawls.

- 3.1 The respondent submits that present claim 1 is to be interpreted as requiring that both clutch members perform both of the functions of operating the transmission pawl and selecting the transmission ratio. The board disagrees. The wording of claim 1 specifies that the "clutch is ... movable in the direction of a longitudinal axis of the hub axle for selecting a rotational force transmission path through the planetary gear mechanism and for selectively operating the transmission pawl". The subsequent specification of two clutch members merely relates their relative movement with the operation or inhibition of the transmission pawl. In the described embodiment a spring holds the first member in contact with the second member and causes them both to undergo the same axial movement when transmission ratios are selected. Nevertheless, the first member merely follows the axial movement of the second and plays no role in the selection of the ratios. The correct interpretation of the claim, which is also consistent with the disclosure when taken as a whole, therefore is that the clutch as a whole is operable to select the transmission ratios and that relative movement of the two clutch members operates the transmission pawl.

- 3.2 The respondent also submits that present claim 1 requires that the two clutch members act directly on the transmission pawl. However, the wording of the claim merely states that the relative axial

displacement of the clutch members is "for selectively operating the transmission pawl". Whilst in the embodiment there is direct contact between the clutch members and the pawls there is no basis for interpreting the broader wording of the claim in such a restrictive way.

4. E6 relates to a six-speed hub transmission for a bicycle comprising two planetary gear mechanisms coupled in series and a back-pedal brake. In accordance with the first embodiment spring-loaded transmission pawls 24 operate in combination with internal teeth 1b on the hub body to transmit the drive when the two highest gear ratios have been selected. When in this condition backward drive is applied in order to operate the brake the pawls 24 are reclined by a control edge 1c.

4.1 The parties are in agreement that some of the features of claim 1 are known from E6. Moreover, the board is satisfied that those features which the respondent accepts as being known from E6 are in fact disclosed. It is therefore necessary to consider in detail only those features whose disclosure in E6 are disputed by the respondent, namely those relating to the clutch.

4.1.1 In the first embodiment according to E6 rotation is applied to a drive member 5 in the form of a first ring gear 5a having internal teeth which are engaged both by the planet wheels of a first planetary gear mechanism and by the external teeth of a disc. A first driver 9 is movable longitudinally of the axle by means of an operator 10 to engage either with the first planet wheel carrier or with internal teeth on the disc. In

this way rotation is transmitted from the first ring gear 5a to the first driver 9 either without speed reduction via the disc or with speed reduction through the first planetary gear mechanism. The rotation is then transmitted via coupling sleeves 2, 3 to a second driver 4 which is movable by means of an operator 13 into three longitudinally spaced control positions in order to select paths of torque transmission through the second planetary gear mechanism. A second ring gear 16, which forms part of the second planetary gear mechanism, is urged by a spring 22 into contact with the second driver 4 in each of the three control positions and carries the pawls 24 which in one of the control positions engage with the internal teeth 1b on the hub body. The control edge 1c on the hub body reclines the pawls 24 when the second ring gear 16 is in the other two control positions. Since the first and second drivers 9, 4 are functionally in series they form two members of a "clutch for selecting a rotational force transmission path through the planetary gear mechanism", as specified in present claim 1. Moreover, the movement of the second driver 4, by virtue of the following action of the second ring gear 16, causes selective operation of the pawls 24.

- 4.1.2 In order to release the back-pedal brake after it has been applied it is necessary for the gear mechanism to be able to rotate in the forward direction relative to the hub body. That would be prevented by engagement of the pawls 24 with the internal teeth 1b of the hub body when the transmission is in its two highest ratios. In order to avoid this problem (so-called "brake lock") there is provision for the pawls 24 to be reclined and so removed from engagement when reverse rotation is

applied. This is achieved in E6 by means of an inclined surface 4b on the second driver which co-operates with a fixed inclined surface 17b to move the second driver 4 in a direction towards the first driver in response to the reverse rotation, thereby compressing a spring 21. The second ring gear 16 follows the second driver and so moves the pawl into contact with the control edge 1c, thereby reclining the pawls 24. E6 therefore discloses the feature of the movement of the two clutch members towards each other when reverse rotation is applied.

4.1.3 When forward rotation is applied again the relative rotation of the inclined surfaces 4b, 17b frees the second driver 4 for movement away from the first driver 9 again. It is implicit that this occurs under the influence of the spring 21.

4.1.4 In the described embodiment of the present patent when top gear has been engaged the clutch members are adjacent to each other when the transmission is in the rest condition, they move away from each other when forward drive rotation is applied and move toward each other again when forward drive ceases or reverse drive is applied. Present claim 1 correspondingly specifies the movement of the clutch members away from each other in response to the forward drive before their movement towards each other. By comparison, in E6 the two drivers 4, 9 are in the rest condition at their greatest spacing, move towards each other when reverse rotation is applied and away again when forward rotation is applied. Nevertheless, the wording of the claim has no implication as regards a "normal" position of the clutch members or a sequence of their movement

and the respective features defined in present claim 1 are known from E6.

- 4.2 It follows from the foregoing that all features relating to the clutch are disclosed in the first embodiment of E6. As acknowledged by both parties all other features of claim 1 are also known from E6 so that the subject-matter of present claim 1 is not new (Article 54(2) EPC).

Auxiliary request

5. The appellant stated during oral proceedings that no objections arose out of the amendment in comparison with the main request and that it acknowledged both novelty and inventive step of the subject-matter of claim 1.
6. The board's findings in respect of amendments made according to the main request apply equally to this request. In accordance with Article 114(1) EPC in conjunction with Article 111(1) EPC the board has considered the auxiliary request *ex officio*. It is satisfied that no objections arise out of the amendments and that the subject-matter of claim 1 both is new and involves an inventive step with respect to the state of the art which the appellant relied upon in the appeal proceedings. Claims 2 to 14 contain all features of claim 1 and this conclusion therefore applies equally to those claims.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent on the basis of the following documents:
 - claims 1 to 14 and description according to the auxiliary request submitted at the oral proceedings;
 - drawings as granted.

The Registrar:

The Chairman:

A. Vottner

S. Crane