Datasheet for the decision of 26 July 2018

Case Number: T 2206/13 - 3.2.06
Application Number: 06004024.3
Publication Number: 1826114
IPC: B62M9/12
Language of the proceedings: EN

Title of invention:
Assembly of a bicycle frame and a low profile derailleur

Patent Proprietor:
SHIMANO INC.

Opponent:
SRAM Deutschland GmbH

Headword:

Relevant legal provisions:
EPC Art. 100(c)
RPBA Art. 12(4), 13(1)
Keyword:
Late-filed argument - admitted (yes)
Amendments - added subject-matter (yes)
Late-filed requests - requests clearly allowable (no)

Decisions cited:
T 1682/15, T 2363/10, T 1374/07

Catchword:
DECISION of Technical Board of Appeal 3.2.06 of 26 July 2018

Appellant: SRAM Deutschland GmbH
Romstr. 1
97424 Schweinfurt (DE)

(Opponent)

Representative: Prechtel, Jörg
Weickmann & Weickmann
Patent- und Rechtsanwälte PartmbB
Postfach 860 820
81635 München (DE)

Respondent: SHIMANO INC.
3-77, Oimatsu-cho
Sakai-ku,
Sakai City
Osaka 590-8577 (JP)

(Patent Proprietor)

Representative: Hofmann, Harald
Sonnenberg Fortmann
Patent- und Rechtsanwälte
Herzogspitalstrasse 10a
80331 München (DE)

Decision under appeal: Decision of the Opposition Division of the European Patent Office posted on 25 September 2013 rejecting the opposition filed against European patent No. 1826114 pursuant to Article 101(2) EPC.
Composition of the Board:

Chairman: M. Harrison
Members: P. Cipriano
          W. Ungler
Summary of Facts and Submissions

I. An appeal was filed by the appellant (opponent) against the decision of the opposition division rejecting the opposition to European patent no. 1 826 114. The appellant requested that the decision be set aside and the patent be revoked in its entirety.

II. In reply, the respondent (proprietor) requested that the appeal be dismissed and the patent be maintained as granted. It also filed an auxiliary request 1 (corresponding to the auxiliary request filed with letter dated 12 August 2011 during opposition proceedings) together with auxiliary requests 2 to 4 and 5a-5e to 11a-11e.

III. The Board issued a summons to oral proceedings including a communication containing its provisional opinion, in which it indicated that the subject-matter of claim 1 of all the respondent's requests appeared to extend beyond the content of the application as originally filed.

IV. With letter dated 27 February 2018, the respondent filed auxiliary request 12.

V. Oral proceedings were held before the Board on 26 July 2018, during which auxiliary requests 4 to 12 were withdrawn and new requests 12 and 13 were filed.

The appellant requested that the decision under appeal be set aside and the European patent be revoked.

The respondent requested that the appeal be dismissed (main request), auxiliarily that the case be remitted to the opposition division for further consideration of
the auxiliary requests, auxiliarily that the patent be maintained in amended form on the basis of auxiliary request 1 filed with letter dated 12 August 2011, or on the basis of one of auxiliary requests 2 and 3 filed with letter dated 9 August 2013, or on the basis of one of auxiliary requests 12 and 13 filed during the oral proceedings of 26 July 2018.

VI. Claim 1 of the main request (patent as granted) reads as follows:

"1. Assembly comprising a bicycle frame with a rear frame end (34) having a junction between a forward portion (38) and a rearward portion (42) forming an axle receiving slot (46) dimensioned to receive a rear wheel axle therein, and a bicycle – rear derailleur comprising:

a base member (70) mounted to said rear frame end (34);

a movable member (74) that supports a chain guide (78) including a first pulley that rotates around a first pulley axis, wherein the first pulley has a pulley plane (P), the chain guide (78) being pivotably coupled to the movable member (74); and

a first linking member coupled between the base member (70) and the movable member (74) so that the chain guide (78) moves laterally relative to the base member (70) between a first lateral position and a second lateral position;

a second linking member (166) coupled between the base member (70) and the movable member (74) so that the chain guide (78) moves laterally relative to the base member (70) between a first lateral position and a second lateral position;
the first linking member (162) is pivotably coupled to the base member (70) about a first pivot axis (P1) and to the movable member (74) about a second pivot axis (P2), the first and second pivot axes (P1, P2) being slanted with respect to the pulley plane (P),

wherein

the base member (70) includes an outer casing coupler (102) dimensioned to couple to an outer casing of a Bowden cable, wherein the outer casing coupler is located rearward of a rotational axis of a rear wheel of the bicycle

the pulley plane (P) intersects the first linking member when the chain guide (78) is located at a first position between the first lateral position and the second lateral position, such that a space circumscribed by the base member (70), the movable member (74) and the linking members coincides at least in part with a space between a plane being parallel to said pulley plane (P) at an innermost edge of the movable member (74), and said pulley plane (P), in at least one position of the pulley."

Claim 1 of auxiliary request 1 differs from claim 1 of the main request in that the paragraph introducing the second linking member reads:

"a second linking member (166) coupled between the base member (70) and the movable member (74) so that the chain guide (78) moves laterally relative to the base member (70) between a first lateral position and a second lateral position, wherein the second linking member (166) is pivotally coupled to the base member (70) about a third pivot axis (P3) and to the movable member (74) about a fourth pivot axis (P4);"
Claim 1 of auxiliary request 2 differs from claim 1 of the main request in that the paragraph introducing the second linking member reads:
"a second linking member (166) coupled between the base member (70) and the movable member (74) so that the chain guide (78) moves laterally relative to the base member (70) between a first lateral position and a second lateral position, wherein the second linking member is disposed laterally outward from the first linking member;"

Claim 1 of auxiliary request 3 differs from claim 1 of the main request in that the paragraph introducing the second linking member and the paragraph thereafter regarding the coupling of the first linking member read:
"a second linking member coupled between the base member (70) and the movable member (74) so that the chain guide (78) moves laterally relative to the base member (70) between a first lateral position and a second lateral position, wherein the second linking member is pivotally coupled to the base member (70) about a third pivot axis and to the movable member (74) about a fourth pivot axis;
wherein the second linking member is disposed laterally outward from the first linking member and
the first linking member is pivotally coupled to the base member (70) about a first pivot axis and to the movable member (74) about a second pivot axis, the first and second pivot axes being slanted with respect to the pulley plane (P),"

Claim 1 of auxiliary requests 12 and 13 is annexed at the end of the decision.
VII. The arguments of the appellant relevant to the decision may be summarised as follows:

Main request

(a) Late-filed arguments

The arguments under items 2-5 presented in the grounds of appeal did not represent a new line of argument and Article 12(4) RPBA did not apply. In addition, they had already been presented in the oral proceedings before the opposition division and thus ignoring these arguments at the appeal stage would be a violation of the right to be heard.

The arguments of item I.8 in the grounds of appeal had been presented during oral proceedings before the opposition division as could be inferred from Annex 1 of the minutes.

(b) Article 100(c) EPC

The combinations of paragraphs and claims suggested by the respondent did not directly and unambiguously disclose the subject-matter of claim 1.

Paragraph [0022] of the published application formed a single disclosure and could not be combined with claims or features extracted from other embodiments and disclosures of the description, such as paragraph [0025], the embodiment of Figure 12 or the embodiment of Figures 1 to 11.

Paragraph [0025] was a list of features and did not form a reservoir from which features could be selected
and combined with claims or other embodiments of the description. The features of the first and second linking members picked from paragraph [0025] did not form a single disclosure with the embodiment of paragraph [0022] and the linking members defined in it. This interpretation of extension of subject-matter was not new and was in alignment with the case law of the Boards of Appeal - see for example T 1347/07.

The outer casing coupler as defined in paragraph [0045] had more features than the outer casing coupler of claim 1. Thus this paragraph did not serve as a pointer or provide support for the specific combination of features of the assembly comprising the outer casing coupler of claim 1. The expression "more particularly" in the description in paragraph [0045] did not render the features following it optional, but simply specified what those features were.

Further, the claimed features relating to the mounting of the derailleur to the rear frame end had been extracted from the two different embodiments of Figures 1-11 and 12, respectively, arriving at a mounting that comprised only what the respondent considered to be common features of both embodiments; this was however not originally disclosed. In addition, even if this were permissible, not even all the common features had been added to the claim - for example, the location angles were missing.

Remittal of the case to the opposition division

The objections regarding extension of subject-matter had not been overcome, thus there was no reason to remit the case. There was no absolute right to have each request decided upon by two instances.
Auxiliary requests 1 to 3

The amendments carried out in claim 1 of the auxiliary requests 1 to 3 did not overcome the objections regarding extension of subject-matter against the main request.

Admittance of requests 12 and 13

Claim 1 of auxiliary requests 12 and 13 was not prima facie allowable. There had been ample opportunity to file them previously in response to the communication of the Board containing its detailed negative provisional opinion regarding extension of subject-matter. In addition, auxiliary requests 12 and 13 did not prima facie overcome the objections raised against the previous requests, since several features, which were only directly and unambiguously disclosed in the content of the application as filed in combination with some of the claimed features, were still missing (e.g. the position setting abutment of the rearward portion as defined in paragraph [0064] or the outer casing receiving bore from the outer casing coupler as defined paragraph [0045]).

Claims 1 and 2 of auxiliary requests 12 and 13 were also unclear, since it was not possible to give a meaning to the measurement of the angles defined in the claims without the additional information of Figures 1 and 12, which information was absent in the claim.

VIII. The arguments of the respondent relevant to the decision may be summarised as follows:

Main request
(a) Late-filed arguments

In line with decision T 1682/15, the line of argument in paragraphs I.2-I.5 in the grounds of appeal had been presented for the first time with the grounds of appeal and, under Article 12(4) RPBA, should not be admitted into the proceedings. This part of the grounds of appeal did not argue why the decision was wrong but simply constituted a new line of argument which changed the case presented previously.

Also, the arguments relating to the rear frame end and mounting features in item I.8 of the grounds of appeal were put forward for the first time in the appeal proceedings and were thus late filed.

(b) Article 100(c) EPC

The basis for the subject-matter of claim 1 was originally filed claim 1 or alternatively paragraph [0022] combined with paragraph [0025], originally filed claims 2 and 12, paragraphs [0042] and [0063].

Paragraph [0022] disclosed most of the features of current claim 1 and was an embodiment of the invention according to original claim 1 as filed. Thus the skilled person understood that the above-mentioned paragraphs of the description and claims 2 and 12 as originally filed were also combinable with its subject-matter.

Paragraph [0025] explicitly authorized the combination of the other features in the claim with any of the listed features. The Case Law regarding the intermediate generalisation of a list with bullet
points came from decision T 2363/10 and was new, since until recently the combination of claimed features with any feature in a list was acceptable. Further, the bullet points of paragraph [0025] constituted only straightforward mechanical features that the skilled person with even only limited skill would recognize as applicable to the whole invention.

The skilled person reading paragraph [0045] understood that the features relating to the outer casing coupler, after the words "more particularly", were optional.

The skilled person would also recognize that only the common features of both embodiments relating to the mounting of the base member of the derailleur (Figures 1-11 with paragraphs [0042] and [0043] on one hand and Figure 12 with paragraphs [0063] and [0064] on the other) represented the core idea of the invention which was to put the derailleur at the rear end of the frame, whichever frame that might be.

Remittal of the case to the opposition division

The case should be remitted to the opposition division so that the respondent had an opportunity to address the arguments relating to the mounting of the base member and rear frame end presented belatedly by the appellant.

Auxiliary Requests 1 to 3

The subject-matter of claim 1 of auxiliary requests 1 to 3 fulfilled the requirement of Article 123(2) EPC. Support for the amendments could be found in paragraphs [0014],[0015] and [0048] to [0050] for auxiliary
requests 1 and 3 and in paragraph [0025], column 5 lines 19-25 for auxiliary request 2.

Admittance of requests 12 and 13

Auxiliary requests 12 and 13 were prima facie allowable, since the amendments carried out meant that claims 1 and 2 of each of the requests fulfilled the requirement of Article 123(2) EPC.

Reasons for the Decision

Main request

1. Late-filed arguments

1.1 The respondent argued that items I.2-I.5 and I.8 of the grounds of appeal constituted new lines of argument presented for the first time with the grounds of appeal, thus changing the appellant's case, and that therefore these lines of argument should not be admitted into the proceedings under Article 12(4) RPBA.

1.2 However, the Board does not accept this. The appellant objected that there was no basis for claim 1 in the content of the application as originally filed from the onset of the opposition proceedings. This objection relied inter alia on the fact that there was no basis in the originally filed application for the derailleur with the linking member as defined in claim 1, since the combination of paragraphs and claims given by the respondent as a basis did not together form a single
disclosure. Thus, the items brought forward under paragraphs I.2-I.5 with the grounds of appeal are just a further set of arguments to support the case that had already been made and to highlight relevant aspects of matters which had been decided to its detriment in this case, i.e. to explain why a derailleur comprising a linking mechanism with the features defined in claim 1 is not part of the original disclosure and why paragraphs [0022] and [0025] do not form a basis for the claimed combination of features.

1.3 Decision T 1682/15 (see Reasons, 9.1.1) cited by the respondent does not alter the Board's finding, since it concerns a new effect brought forward by the appellant (for the first time on the second day of oral proceedings) in a discussion of inventive step that would have resulted in the need to evaluate and assess a comprehensive set of data in the context of the problem-solution approach. In the particular case, the Board considered this to be a complex task that went beyond what could reasonably be undertaken during oral proceedings. It thus exercised its discretion under Article 13(1) RPBA not to admit this new line of argument into the proceedings. In the present case, the appellant filed the arguments already with its grounds of appeal and thus they do not anyway constitute an amendment to the party's case under Article 13(1) RPBA. Indeed, the arguments put forward are anyway simply a normal development of the case already made rather than constituting a new line of argument.

In as far as Article 12(4) RPBA is concerned, this makes no reference to new arguments, its only relevance to arguments being its back reference to Article 12(2) requiring that all arguments be expressly stated. This
has no relevance to the present case, as the arguments are expressly stated and this has not been disputed.

1.4 Regarding the arguments relating to the rear frame end and the mounting of the base member in item 1.8, these arguments were already presented and admitted during the proceedings before the opposition division, contrary to the statement by the respondent. This much is at least evident from Annex 1 filed in the oral proceedings before the opposition division (which includes drawings of an embodiment allegedly also covered by the claims, and making a specific reference to Article 123(2) EPC), from the corresponding first two paragraphs of page 2 of the minutes of the oral proceedings before the opposition division as well as from page 7, paragraph 2.2.2 of the decision under appeal.

2. Article 100(c) EPC

2.1 The respondent argued that the basis for the disclosure of claim 1 relied basically on either claim 1 as originally filed or the embodiment of paragraph [0022], combined with two bullet points of paragraph [0025], the features of paragraphs [0042] and [0063] which it regarded as relevant for the invention as well as originally filed claims 2 and 12.

2.2 The Board finds that the combination of passages and claims suggested by the respondent does not form a basis upon which the subject-matter of claim 1 can be directly and unambiguously derived, such that this subject-matter extends beyond the content of the application as originally filed.
In regard to the respondent's argument that either of claim 1 as originally filed or the embodiment of paragraph [0022] could each be taken as forming part of the basis for claim 1 of the main request, it must be noted that claim 1 as originally filed contains less features than paragraph [0022]. Were claim 1 as originally filed to be considered as forming part of the basis of claim 1, at least the features relating to the chain guide (as defined in granted claim 1), would then be unaccounted for, since none of the other paragraphs or claims mentioned by the respondent is directed implicitly or explicitly to a chain guide. Thus only paragraph [0022] could possibly be part of the basis of claim 1 of the main request.

However, the combination of the embodiment of paragraph [0022] with the subject-matter of originally filed claims 2 and 12 is not originally disclosed. Paragraph [0022] discloses one embodiment of a rear derailleur, while all the parts of the description relating to a slanted pivot axis are encompassed in paragraphs [0013] and [0016] which are preferential options of another derailleur according to paragraph [0003] and corresponding to claim 1 as originally filed. Thus a combination of the embodiment of paragraph [0022] and the features of claims 2 and 12 is not directly and unambiguously derivable from the content of the application as originally filed.

2.3 The respondent further argued that the skilled person would recognize that only the common features of both embodiments relating to the mounting of the base member of the derailleur (Figures 1-11 with paragraphs [0042] and [0043] on one hand, and Figure 12 with paragraphs [0063] and [0064] on the other), which was to put the
derailleur at the rear end of the frame, represented the core idea of the invention.

The Board does not accept this. The patent discloses two ways of mounting the base member of the derailleur to the frame in order to achieve a low lateral profile: one in paragraphs [0042] and [0043] where the rear frame end has a configuration “that differs from common frame ends” and one in paragraphs [0063] and [0064] that requires an extension member 330 to achieve the same positioning. The features added to claim 1, whilst being common to both embodiments, define a very general rear frame end that has not been originally disclosed and does not even comprise all the features common to both embodiments. For example, the angular placement of openings 60 and 350 (relative to the axle receiving opening/slot and to the rotational axis) common to both embodiments is missing. Thus, a rear frame end as defined in claim 1 is not originally disclosed in the content of the application as filed.

2.4 Contrary to the respondent's argument, paragraph [0025] does not explicitly or implicitly specify the combination of the other features defined in the claim with any of the features listed in paragraph [0025]. Paragraph [0025] simply discloses a list of bullet points (of which there are forty two) with an introductory sentence that reads “in further preferred embodiments one or more of the following features could be implemented”. Which ones of these features might be implemented with which particular other features or for what purpose is not disclosed.

The features of claim 1 relating to the linking member and the outer casing coupler are based on at least two bullet points from this list. The Board finds that the
The introductory sentence does not allow the skilled person to clearly and unambiguously derive which possible combinations of one or more of the bullet points with any particular embodiment of the patent application as filed is intended. The number of possible combinations is such that no specific combination of features comprising features from paragraph [0025] is unambiguously derivable by a skilled person from the application. The introductory sentence is wholly unspecific and does not provide any pointer to any particular combination of bullet points or to the combination of these with any embodiment mentioned previously in the application, such as the one in paragraph [0022], or to any of the original combinations of claims. The claimed selection of features is thus found to be one which can only be arrived at by making multiple selections of features from one list and combining these with still further features, for which selections there is no unambiguous disclosure.

2.5 The argument that case law regarding the intermediate generalisation of a list with bullet points came from decision T 2363/10 and was new, since until recently the combination of claimed features with any feature in a list was authorised, is not accepted. Decision T 2363/10 is not the first decision to take up this subject and other decisions have already dealt with this (see e.g. T 1374/07).

2.6 The respondent argued also that, whilst the features of the claim concerning the linking members and the outer casing coupler had been taken from paragraph [0025], paragraph [0045] served as pointer to such a combination.
Paragraph [0045] relates only to the outer casing coupler and discloses an outer casing coupler more specific than the one claimed, such as with regard to the location of the outer casing coupler in relation to the mounting surface of the base member or the outer casing receiving bore. The Board also finds that the expression "more particularly" does not render the features following this expression optional, and, on the contrary, is used to give special emphasis to the points following it.

Even if paragraph [0045] were to be considered as a valid pointer (which it is not) for the addition of the features of the outer casing coupler to the features of the embodiment in paragraph [0022], this paragraph cannot serve as a pointer for the other two selections from the list (relating to the features of the second linking member and the ones relating to the first and second pivot axis of the first linking member) which would be needed in order to arrive at the claimed combination of features.

2.7 For the reasons stated above, the ground of opposition under Article 100(c) EPC is prejudicial to maintenance of the patent. Thus the main request is not allowable.

3. Remittal of the case to the opposition division

3.1 The respondent requested that the case be remitted to the opposition division, should the main request not be found allowable.

3.2 Under Article 111(1) EPC, second sentence, the Board of Appeal may either decide on the appeal or remit the case to the department which was responsible for the decision appealed. The appropriateness of a remittal is
decided by the Board on the merits of the particular case. There is no absolute right to have every issue decided upon by two instances. Further, the criteria which inter alia can be taken into account when deciding on possible remittal include the parties' requests, the general interest that proceedings are brought to a close within an appropriate period of time and whether or not there has been comprehensive assessment of the case during the proceedings.

3.3 Auxiliary requests 1 to 3 were filed with the reply to the grounds of appeal. Not least for reasons of procedural economy, such requests should only be remitted, if any of the requests overcame the objections found to be prejudicial against the main request. For this to occur, the Board must at least examine the first of them to consider whether the requirement of Article 123(2) EPC is fulfilled.

3.4 The argument from the respondent that the arguments relating to the derailleur mounting to the frame had been brought at a late stage into the proceedings by the appellant and that the respondent deserved further time is not accepted by the Board. As explained in item 1.4 above, it is clear from at least Annex 1 of the minutes of the oral proceedings before the opposition division and from paragraph 2.2.2 of the decision, that the question regarding the mounting at the rear frame end was already brought forward during the oral proceedings on 19 November 2013.

3.5 For these reasons, the Board decided, in the exercise of its discretion conferred by Article 111(1) EPC, not to remit the case to the opposition division for further prosecution of the opposition at the present
stage of the proceedings reached during oral proceedings before the Board.

4. Auxiliary requests 1 to 3

4.1 Claim 1 of auxiliary request 1 has been amended to define the two pivot axes from the second linking member.

Claim 1 of auxiliary request 2 has been amended with respect to claim 1 of the main request to define that the second linking member is disposed laterally outward from the first linking member.

Claim 1 of auxiliary request 3 has been amended with respect to claim 1 of the main request to define the two pivot axes from the second linking member and the second linking member is disposed laterally outward from the first linking member, i.e. the features added to previous auxiliary requests 1 and 2 combined.

4.2 The amendments made to all requests concern only the second linking member and do not address the other problems raised above for the main request, e.g. the rear frame end and mount features explained above in paragraph 2.3. The respondent did not bring forward any additional arguments on this issue and the basis given for the amendments to these requests in the original written submissions does not address these issues either – given that paragraphs [0014], [0015], [0048] to [0050] and column 5, lines 19-25 only disclose features from various linking mechanisms of different contexts in the disclosure. Thus, at least for the same reasons as stated above in paragraph 2.3, an assembly according to claim 1 of the auxiliary requests 1 to 3
extends beyond the content of the application as originally filed.

4.3 Thus the Board concludes that auxiliary requests 1 to 3 contain subject-matter which contravenes Article 123(2) EPC. Auxiliary requests 1 to 3 are therefore not allowable.

5. Admittance of new auxiliary requests 12 and 13

5.1 Auxiliary requests 12 and 13 were filed during the oral proceedings before the Board, hence at the latest possible stage of the proceedings. According to Article 13(1) of the Rules of Procedure of the Boards of Appeal (RPBA), it lies within the discretion of the Board to admit any amendment to a party's case after it has filed its grounds of appeal or reply. In order to be admitted at such a late stage of proceedings, such requests should normally be clearly allowable at least in the sense that they overcome the objections raised (and do not give rise to new objections). The objections already raised and found to be prejudicial to maintenance of the patent concerned inter alia the issues regarding the rear frame end and the mounting of the derailleur discussed in paragraph 2.3 above in regard to the main request.

5.2 Claim 1 of auxiliary request 12 has been amended to define inter alia further features relating to the rear frame end and the mounting of the base member to the rear frame, these features coming from paragraphs [0063] and [0064] of the published application and relating to the embodiment of Figure 12.

Claim 1 of auxiliary request 13 was, in this respect, amended in the same way.
5.3 However, paragraph [0064] of the published application further defines that the rearward portion (of the rear frame end) extends further from the derailleur mounting opening to form a position setting abutment. Only a rear frame end with this position setting abutment can be directly and unambiguously derived from the content of the application, since it cannot be inferred from this or any other part of the application content, implicitly or explicitly, that this feature is somehow optional or not part of the combination of features forming the embodiment of Figure 12. Although given the explicit opportunity to present counter-arguments in this regard during the oral proceedings, the respondent did not bring forward any such counter-arguments on this issue. Thus, the Board finds that the subject-matter of claim 1 of auxiliary requests 12 and 13 *prima facie* does not meet the requirement of Article 123(2) EPC.

5.4 Accordingly, the objections raised for the main request and auxiliary requests 1 to 3 were at least *prima facie* not overcome. Thus, the Board exercised its discretion under Article 13(1) RPBA not to admit the requests 12 and 13 into the proceedings. Since the requests were already not admitted for this reasons, the further objections made by the appellant concerning whether the clarity requirement of Article 84 EPC was met do not need to be considered in this decision.
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:

M. H. A. Patin  

M. Harrison

Decision electronically authenticated
Annexed claim 1 of auxiliary requests 12 and 13

New Auxiliary Request 12 – 26/07/2018

1. Assembly comprising
a bicycle frame with a chain stay (26), a seat stay (30) and a frame end (300) joining
the chain stay and the seat stay together, said rear frame end (34) comprising a
forward portion (304) and a rearward portion (308) end having a junction between a
said forward portion (304) and a said rearward portion (42308) forming an axle
receiving slot (46312) dimensioned to receive a rear wheel axle therein, the rear
wheel axle (22) defining a rotational axis (22), wherein the forward portion (304)
extends from said chain stay and seat stay to a horizontal position aligned with the
rotational axis (X), and the rearward portion (308) extends from a horizontal position
aligned with rotational axis X rearwardly and substantially vertically downwardly,
wherein the axle receiving slot (312) is oriented substantially vertically with a slight
incline and defines an open end (316) and a closed end (320), the open end being
disposed below the closed end, and the rearward portion (308) forming an annular
mounting boss (3249) with an opening dimensioned to receive a mounting bolt (328)
therein; and,

a bicycle rear derailleur comprising:
a base member (70) mounted to said rear frame end (3004), through an extension
member (330), the derailleur (10) being mounted to said extension member (330)
having a first end portion (334) and a second end portion (338), wherein said first end
portion (334) includes a mounting opening (342) dimensioned for receiving an
extension member mounting bolt (346) therein, and wherein said second end portion
(338) includes a derailleur attachment structure in the form of a derailleur mounting
opening (350) dimensioned for receiving a derailleur mounting bolt (62) therethrough,
wherein the extension member (330) is dimensioned such that, when extension
member (330) is attached to the frame end (300), the mounting opening (350), and
hence the boss member (86) of the base member is located from approximately 180° to
approximately 240° relative to axle receiving opening 312, from approximately 180°
to approximately 240° relative to rotational axis X;
a movable member (74) that supports a chain guide (78) including supporting a first
pulley that rotates around a first pulley axis, wherein the first pulley has a pulley plane
(P), the chain guide (78) being pivotably coupled to the movable member (74),
wherein the chain guide (78) comprises an upper chain guide link (194), said first
pulley being an upper guide pulley (198) rotatably mounted to said upper chain guide
link (194) through a guide pulley pivot shaft (200), a lower chain guide link (202) and
a second pulley (206) being a lower tension pulley (206) rotatably mounted to the
lower chain guide link (202) through a tension pulley pivot shaft (208),
wherein the upper chain guide link is pivotably connected to an upper chain guide link
mounting frame (158) through an upper chain guide link pivot shaft (210),
wherein the pulley plane (P) bisects the guide pulley (198), each tooth on the guide
pulley (198) being symmetrical and centered on the guide pulley when viewed
perpendicular to the guide pulley pivot shaft (200) so that said pulley plane (P) is
located in the center of the guide pulley (198), and all of the pulley teeth lie in said
pulley plane (P), wherein said pulley plane (P) also bisects the tension pulley (206);
a linking mechanism (82) pivotably coupled to the base member (70) and pivotably
coupled to the movable member (74), wherein the linking mechanism (82) includes a
pair of linking members (162, 165), comprising a first linking member and a second
linking member; and with
a said first linking member coupled between the base member (70) and the movable
member (74) so that the chain guide (78) moves laterally relative to the base member (70) between a first lateral position and a second lateral position;
a said second linking member coupled between the base member (70) and the movable
member (74) so that the chain guide (78) moves laterally relative to the base member (70) between a first lateral position and a second lateral position,
wherein the first linking member is a laterally inner lower linking member and the
second linking member is a laterally outer upper linking member disposed laterally
outward from the first linking member,
the first linking member (162) is being pivotably coupled to the base member (70)
about a first pivot axis (P1) and to the movable member (74) about a second pivot axis
(P2), and the second linking member (166) being pivotably coupled to the base.
member (70) about a third pivot axis (P3) and to the movable member (74) about a fourth pivot axis (P4),

the first, second, third and fourth pivot axes (P1, P2, P3, P4) being slanted with respect to the pulley plane (P),

wherein

the base member (70) includes an outer casing coupler (102) dimensioned to couple to an outer casing of a Bowden cable, wherein the outer casing coupler is located rearward of a said rotational axis of a rear wheel of the bicycle, said outer casing coupler being disposed on an upper portion of said transition portion and being located rearward from the frame end and at least partially laterally inward from said mounting surface (90) of the base member,

wherein

the pulley plane (P) intersects the first linking member when the chain guide (78) is located at a first position between the first lateral position and the second lateral position, such that a space circumscribed by the base member (70), the movable member (74) and the linking members coincides at least in part with a space between a plane being parallel to said pulley plane (P) at a laterally innermost edge of the movable member (74), and said pulley plane (P), in at least one position of the guide pulley.
1. Assembly comprising

a bicycle frame with a chain stay (26), a seat stay (30) and a frame end (300) joining the chain stay and the seat stay together, said rear frame end (34) comprising a forward portion (304) and a rearward portion (308) and having a junction between a said forward portion (304) and a said rearward portion (42308) forming an axle receiving slot (46312) dimensioned to receive a rear wheel axle therein, the rear wheel axle (22) defining a rotational axis (22), wherein the forward portion (304) extends from said chain stay and seat stay to a horizontal position aligned with the rotational axis (X), and the rearward portion (308) extends from a horizontal position aligned with rotational axis X rearwardly and substantially vertically downwardly, wherein the axle receiving slot (312) is oriented substantially vertically with a slight incline and defines an open end (316) and a closed end (320), the open end being disposed below the closed end, and the rearward portion (308) forming an annular mounting boss (3249 with an opening dimensioned to receive a mounting bolt (328) therein; and;

a bicycle rear derailleur comprising:

a base member (70) mounted to said rear frame end (3004), through an extension member (330), the derailleur (10) being mounted to said extension member (330) having a first end portion (334) and a second end portion (338), wherein said first end portion (334) includes a mounting opening (342) dimensioned for receiving an extension member mounting bolt (346) therein, and wherein said second end portion (338) includes a derailleur attachment structure in the form of a derailleur mounting opening (350) dimensioned for receiving a derailleur mounting bolt (62) therethrough, wherein the extension member (330) is dimensioned such that, when extension member (330) is attached to the frame end (300), the mounting opening (350), and hence the boss member (86) of the base member is located from approximately 180° to
approximately 240° relative to axle receiving opening 312, from approximately 180° to approximately 240° relative to rotational axis X;
a movable member (74) that supports a chain guide (78) including supporting a first pulley that rotates around a first pulley axis, wherein the first pulley has a pulley plane (P), the chain guide (78) being pivotably coupled to the movable member (74), wherein the chain guide (78) comprises an upper chain guide link (194), said first pulley being an upper guide pulley (198) rotatably mounted to said upper chain guide link (194) through a guide pulley pivot shaft (200), a lower chain guide link (202) and a second pulley (206) being a lower tension pulley (206) rotatably mounted to the lower chain guide link (202) through a tension pulley pivot shaft (208), wherein the upper chain guide link is pivotably connected to an upper chain guide link mounting frame (158) through an upper chain guide link pivot shaft (210), wherein the upper chain guide link (194) comprises a chain pushing member (214) and a chain regulating unit (218), wherein the chain pushing member (214) is disposed between the upper chain guide link mounting frame and the guide pulley (198), with an arcuate portion (222) disposed in close proximity to the teeth on the guide pulley, wherein the chain pushing member (214) is provided to push a chain (18) when switching the chain from a smaller diameter sprocket to a larger diameter sprocket and to prevent chain from derailing from guide pulley (198), and wherein the chain pushing member (214) rotates around a chain pushing member rotational axis defined by upper chain guide link pivot shaft 210, which is offset from a first pulley axis defined by guide pulley pivot shaft (200), whereby both guide pulley (198) and chain pushing member (214) rotate around the chain pushing member rotational axis defined by said upper chain guide link pivot shaft (210), wherein the pulley plane (P) bisects the guide pulley (198), each tooth on the guide pulley (198) being symmetrical and centered on the guide pulley when viewed perpendicular to the guide pulley pivot shaft (200) so that said pulley plane (P) is located in the center of the guide pulley (198), and all of the pulley teeth lie in said pulley plane (P), wherein said pulley plane (P) also bisects the tension pulley (206); a linking mechanism (82) pivotably coupled to the base member (70) and pivotably coupled to the movable member (74), wherein the linking mechanism (82) includes a pair of linking members (162, 166), comprising a first linking member and a second linking member; and-with
a said first linking member coupled between the base member (70) and the movable member (74) so that the chain guide (78) moves laterally relative to the base member (70) between a first lateral position and a second lateral position;

a said second linking member coupled between the base member (70) and the movable member (74) so that the chain guide (78) moves laterally relative to the base member (70) between a first lateral position and a second lateral position,

wherein the first linking member is a laterally inner lower linking member and the second linking member is a laterally outer upper linking member disposed laterally outward from the first linking member,

the first linking member (162) is being pivotally coupled to the base member (70) about a first pivot axis (P1) and to the movable member (74) about a second pivot axis (P2), and the second linking member (166) being pivotally coupled to the base member (70) about a third pivot axis (P3) and to the movable member (74) about a fourth pivot axis (P4),

the first and second, third and fourth pivot axes (P1, P2, P3, P4) being slanted with respect to the pulley plane (P),

wherein

the base member (70) includes an outer casing coupler (102) dimensioned to couple to an outer casing of a Bowden cable, wherein the outer casing coupler is located rearward of a said rotational axis of a rear wheel of the bicycle, said outer casing coupler being disposed on an upper portion of said transition portion and being located rearward from the frame end and at least partially laterally inward from said mounting surface (90) of the base member,

wherein

the pulley plane (P) intersects the first linking member when the chain guide (78) is located at a first position between the first lateral position and the second lateral position, such that a space circumscribed by the base member (70), the movable member (74) and the linking members coincides at least in part with a space between a plane being parallel to said pulley plane (P) at a laterally innermost edge of the movable member (74), and said pulley plane (P), in at least one position of the guide pulley.