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Datasheet for the decision of 14 September 2020

Case Number: T 0323/18 - 3.2.01

Application Number: 05076711.0

Publication Number: 1595781

IPC: B62L3/02

Language of the proceedings: EN

Title of invention:
Master cylinder lever for a hydraulic disc brake having on the fly dead-band adjustment

Patent Proprietor:
SRAM, LLC.

Opponent:
Shimano Inc.

Headword:

Relevant legal provisions:
EPC Art. 100(b), 111(1)
RPBA Art. 11

Keyword:
Grounds for opposition - insufficiency of disclosure of the invention defined in claim 1 (no)
Appeal decision - remittal to the department of first instance (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Chambres de recours

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Case Number: T 0323/18 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 14 September 2020

Appellant: (Patent Proprietor)	SRAM, LLC. 1333 North Kingsbury, 4th Floor Chicago, IL 60642 (US)
Representative:	Thum, Bernhard Wuesthoff & Wuesthoff Patentanwälte PartG mbB Schweigerstraße 2 81541 München (DE)
Respondent: (Opponent)	Shimano Inc. 3-77 Oimatsu-cho Sakai-ku Sakai City, Osaka 590-8577 (JP)
Representative:	Grosse, Felix Christopher Grosse - Schumacher - Knauer - von Hirschhausen Patent- und Rechtsanwälte Nymphenburger Straße 14 80335 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 1 December 2017 revoking European patent No. 1595781 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairwoman	O. Loizou
Members:	S. Mangin
	A. Wagner

Summary of Facts and Submissions

I. The appeal was filed by the appellant (patent proprietor) against the decision of the opposition division to revoke the patent in suit (hereinafter "the patent").

II. In opposition proceedings, the opponent raised the grounds for opposition under Articles 100(a) EPC, 100(b) EPC and 100(c) EPC.

III. The opposition division decided that:
(1) The patent did not disclose the invention defined in claim 1 in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.
(2) The addition of "corresponding with the engagement position of the piston train" in claim 1 during examination does not extend beyond the content of the application as originally filed.

IV. Oral proceedings were held before the Board on the 14 September 2020.

V. The appellant (patent proprietor) requested that the decision under appeal be set aside and the case be remitted to the department of first instance (main request), in the alternative that the patent be maintained as granted (auxiliary request I) or maintained in amended form on the basis of one of the auxiliary requests II to V, auxiliary requests II to V filed with the statement of grounds of appeal.

The respondent (opponent) requested that the appeal be dismissed.

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

1.1 A bicycle hydraulic disc brake master cylinder (222) comprising:
1.2 a housing;
1.3 a bar clamp (204) at one end of the housing for fastening the housing to a bicycle handle bar (280),
1.4 the bar clamp receiving the handle bar (280) along a clamp axis (282);
1.5 a piston train (228) within the housing
1.6 operatively associated with a fluid cylinder (222)
1.7 for movement within the cylinder from a non-actuated position via an engagement position to a fully-actuated position by action of drive force on the piston train;
1.8 a handle (206) pivotably attached to the housing about a pivot axis (284)
1.9 and operatively associated with the piston train to impart the drive force on the piston train,
1.10 the handle having a finger receptacle (286) configured to receive at least one finger of a user defining an effective finger force point (288) for the at least one finger received in the finger receptacle during master cylinder actuation; and
1.11 a pivotable connection between the housing and the handle about the pivot axis,
1.12 the pivotable connection being located so that when the handle is pivoted about the pivot axis the effective finger force point describes an arc (292) between the engagement point and an end point (288') corresponding with the fully-actuated position of the piston train,
characterized in that

1.13 the cylinder further comprises: an ideal finger path,
1.14 the ideal finger path (290) beginning at a start point with the effective finger force point at an engagement point (288) corresponding with the engagement position of the piston train where the handle begins to drive the piston train against operative fluid resistance,
1.15 the engagement point being 50 mm or less from the clamp axis, and along a line at a select angle relative to the clamp axis;
1.16 and that an actuation chord between the engagement point and the end point of the effective finger force point arc extends at an angle relative to the clamp axis greater than or equal to the select angle less 6°.

VII. Claim 10 of the main request (claim as granted) reads as follows:

10.1 A method of making a master cylinder for a bicycle hydraulic disc brake comprising:
10.2 providing a housing having a clamp at one end configured to receive a handle bar along a clamp axis;
10.3 providing a piston train within the housing;
10.4 providing a handle having a finger receptacle configured to receive a finger defining an effective finger force point;
10.5 defining a desired select actuation path for the effective finger force point of the handle; and
10.6 pivotably attaching the handle to the housing in operative association with the piston train to drive the piston train,
10.7 the pivotable attachment being located relative to the clamp axis so that as the handle is pivoted between an engagement point position where the handle begins to drive the piston train against operative fluid

resistance and a fully actuated position by a force applied along the select actuation path any decrease in mechanical advantage does not exceed 3%.

All arguments put forward by the parties in writing and during the oral proceedings are before the Board and have been taken into consideration.

Reasons for the Decision

Main request - Claim 1 - Sufficiency of Disclosure - Article 100(b) EPC

1. The European patent discloses the invention according to claim 1 in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

1.1 The patent discloses in paragraphs [0044] - [0058] as well as in figures 10-16 one way of carrying out the invention.
In particular, figures 10 and 12 disclose all the structural features of claim 1: the bar clamp 204 with a clamp axis, the housing 208 comprising the piston train 228 operatively associated to the fluid cylinder 222 and the handle 206 having an effective finger force point and being pivotably attached to the pivot axis 284 and operatively associated with the piston train 228.

Figure 15 further depicts an arc 292 defined by the movement of the effective finger force point when the handle is actuated between the engagement point 288 and a fully actuated position. On figure 15, the actuation chord between the engagement point 288 and the end point 288' of the effective finger force point arc

extends at an angle relative to the clamp axis greater or equal to the select angle (96°) of the ideal finger path less 6°, thus greater than or equal to 90° relative to the clamp axis 282. It is to be noted that should the engagement point 288 and the end point 288' be somewhat shifted on the arc 292, the angle of the chord with the bar clamp axis would still be greater than or equal to 90°.

Furthermore figure 16 illustrates the geometry of an embodiment of the present invention, where the pivot axis is located 39 mm from the clamp axis, the effective finger force point is 30 mm from the end of the lever, the engagement point is at 50 mm from the clamp axis 282 and the end point is at 10 mm from the engagement point. With this geometry the actuation chord defined between the engagement point (288) and the end point (intersection between the arc 304 and the line 302) extends at an angle equal or greater than 90° from the clamp axis. Should the engagement point and the end point be somewhat shifted along the arc, the chord would still be at an angle greater than 90° with the clamp axis.

1.2 While it is acknowledged that the engagement point and the end point may vary according to the settings of the hydraulic disc brake on the bicycle and the user, the location of the engagement point and the end point will not vary substantially as the invention deals with hydraulic disc brakes for a bicycle. In particular these types of brakes require less hand effort to be applied in order to brake, such that the end point will hardly depend on the user.

1.3 The invention illustrated in figures 15 and 16 is to be put in perspective with the bicycle hydraulic disc

brake depicted in figures 17A, 17B, 18 and 19, which fall outside the scope of claim 1 if the angle of the ideal finger path relative to the select angle is 96°. In these embodiments, wherever the engagement point and the end point are defined along the arc, the angle of the actuation chord relative to the clamp axis is below 90°. This is mainly due to fact that the pivot axis is located further away from the clamp axis than the engagement point.

1.4 Therefore the engagement point and the end point somewhat depend on the settings of the hydraulic disc brake on the bicycle and the user. This however renders the limits of protection conferred by claim 1 unclear, but does not amount to a lack of sufficiency of the invention defined in claim 1. For most of the hydraulic disc brake master cylinder mounted on a bicycle, the skilled person will be in a position to determine whether he is working within the ambit of claim 1 (Reference is made to figures 16-19). The variation of the position of the engagement point and the end point on the arc defined by the effective finger force point for such type of brakes when mounted in a reasonable manner will not vary in such a way that the angle of the chord with the bar axis will differ substantially.

1.5 It is to be noted that the wording of claim 1 only limits the engagement point to be at 50 mm or less from the clamp. Claim 1 does not define the angle of the ideal finger path with the clamp axis such that the angle of actuation chord with the clamp axis is not limited. Therefore the only requirement of the invention according to claim 1 is that the engagement point being 50 mm or less from the clamp axis, the skilled person can always carry out the invention and the skilled person will be able to verify that the

engagement point is 50 mm or less once he has mounted it on a bicycle. Even without mounting the hydraulic disc brake master cylinder on the bicycle the skilled person can at least estimate said distance starting from the rest position of the handle of a bicycle hydraulic disc brake.

2. The opponent is of the opinion that the invention defined in claim 1 is not sufficiently disclosed for the following reasons:

2.1 The subject-matter of claim 1 of the patent is defined by features which rather relate to a method for adjusting a bicycle braking system than to a bicycle hydraulic disc brake master cylinder as such.

2.2 The "engagement point" corresponding to the moment when the pads begin compressing the disc and the "end point" corresponding to the fully actuated position of the lever do not define features of the claimed master cylinder, neither structurally nor functionally. The product of claim 1 alone does not have an engagement point and an end point of the piston train. It is only when mounted that an engagement position and an end point can be defined, which will vary depending on the way the master cylinder is assembled and adjusted with the other components on the bicycle braking system and the user's strength and anatomy.

2.3 The "effective finger force point" represents a feature which does not define the claimed master cylinder as such as it is dependent on the finger or the fingers of the user. The opponent referred to paragraph [0017] "The finger receptacle is preferably configured to receive an index of a user during master cylinder actuation and the effective finger force point is at an

axial center of the index finger received in the receptacle" and to paragraph [0054], "the finger receptacle 286 is configured to receive two fingers of a user and effective finger force point 288 is defined by approximately the center of a typical user's two finger". While noting that paragraph [0054] also discloses that "For the purpose of this application and the charts and calculations herein, the location from the end of the lever when based on an estimate of an average user's finger size", the opponent notes that in the perpendicular direction, a specific value for the position of the effective finger force point relative to the lever is missing in the patent.

2.4 Therefore the opponent is of the opinion that the two parameters defined in feature 1.15 ("the engagement point being 50 mm or less from the clamp axis") and in feature 1.16 ("an actuation chord between the engagement point and the end point of the effective finger force point arc extends at an angle relative to the clamp axis greater than or equal to the select angle less 6°"), limited by numerical ranges depend on the adjustment of components that are not part of claim 1 as well as on the user's hand anatomy and strength such that the skilled person is not in a position to rework the invention according to claim 1 and is not able to ensure that a given bicycle hydraulic brake master cylinder falls under the scope of claim 1.

2.5 The opponent acknowledges that the skilled person is capable of manufacturing a master cylinder mounting the master cylinder on a bicycle together with all the other components of a braking system, adjust the master cylinder or other components in a way that when a specific user actuates the brake lever the requirements of claim 1 are fulfilled, meaning that the location of

the engagement point and the angle of the actuation chord are within the claimed ranges. However the opponent is of the opinion that the invention as claimed, the master cylinder as such, cannot be carried out as it does not specify the location of the engagement point and the end point.

3. The Board cannot follow the arguments of the opponent. The Board is of the opinion that the skilled person can carry out the invention as explained above and is able to determine for most of the cases whether a specific bicycle hydraulic brake falls under the scope of protection of claim 1 as the invention depends primarily on the distance of the pivot axis to the bar clamp axis and on the lever geometry (see figures 16-19). The cylinder and piston train arrangement and the distance between the disc brake and the brake pads may vary from model to model but not in a way such as to have big variations of the position of the engagement point and the end point on the arc defined by the lever and therefore to be unable to determine whether the hydraulic disc brake master cylinder falls within the scope of claim 1 or not.

3.1 The Board agrees with the opponent that the bicycle disc brake master cylinder according to claim 1 should be mounted on a bicycle, to be able to determine the position of the lever when the brake pads begin to compress the disc and when the brake pads are fully actuated. In other words, as long as the master cylinder according to claim 1 is not mounted on a bicycle the engagement point and the end point cannot be determined. This is also obvious to the skilled person, who would mount the hydraulic disc brake on a bicycle to determine the engagement point and the end point.

3.2 According to claim 1, feature 1.14, "the engagement point" corresponds with the "engagement position of the piston train where the handle begins to drive the piston train against operative fluid resistance". The Board concurs with the opponent that the engagement point corresponds to the point where the brake pads begin to compress the brake disc rather than the point when the seal associated to the piston train reaches the timing port. Several passages from the patent specification cited by the opponent confer this interpretation:

- paragraph [0015]: "However, observation of user ergonomics indicates that the engagement point of the lever (the point where pads on an associated caliper contact the disc) should be less than 50 mm to accommodate average and smaller sized hand";
- paragraph [0054]: "As used herein, the "engagement point" means a point along the arc of the lever actuation where the pads of a caliper operatively associated with the master cylinder lever begin compressing a disc there between. In other words, a point where the lever handle drives the piston train against operative fluid resistance";
- The x-axis of figure 20 reads "Lever Travel from The point of Pad Engagement (mm)".

While "the operative fluid resistance" is not clearly defined in claim 1, according to the above cited passages, it is to be understood as the resistance of the fluid when the brake pads start compressing the disc rather than the resistance of the fluid when the brake pads start moving towards the disc, which force is certainly much lower. Thus the engagement point will correspond to a moment after the seal associated to the piston has already passed the timing port.

3.3 According to claim 1, feature 1.12, the "end point" corresponds "with the fully actuated position of the piston train". Paragraph [0058] of the patent discloses "The application of the braking force from the engagement point to the conclusion of the lever movement is assumed to be 10 mm and is represented by the full actuation line 302". While it may be admitted that the lever movement from the engagement point to the end point is not always exactly 10 mm this is certainly an indication of the lever movement of most of the hydraulic disc brake systems and if some variation exist the lever movement would still be close to 10 mm.

3.4 As for the "finger force point", paragraphs [0054] and [0056] clearly disclose that for the purpose of calculation the finger force point is deemed to be 30 mm from the end of the lever based on an estimate average user. Furthermore figures 16-19 clearly depict the 30 mm being parallel to the clamp axis, giving sufficient information to determine the effective finger force point and thus the arc described by the effective finger force point.

3.5 To conclude, while the limits of protection conferred by claim 1 might be unclear, as the engagement point and the end point may vary along the arc defined by the lever, it does not amount to a lack of sufficiency of disclosure, as the patent provides sufficient information in particular geometry of the lever to enable the skilled person when taking into account common general knowledge to reproduce the invention.

4. Remittal to the opposition division for further prosecution - Article 111(1) EPC and Article 11 RPBA 2020

The Board decided to remit the case to the opposition for further prosecution.

According to Article 11 RPBA 2020 the Board shall not remit a case to the department whose decision was appealed for further prosecution, unless special reasons present themselves for doing so.
In the present case the Board considers that special reasons present themselves for remitting the case to the opposition division especially as both parties requested the remittal in order to discuss outstanding issues, which have not been discussed and decided upon in a complete manner during opposition proceedings.

The Board notes that while in point 3 on page 1 of the minutes of the oral proceedings in opposition "the extension of the subject-matter of claim 1 of the disputed patent beyond the content of the application as filed (Art. 100(c), 76(1) and 123(2) EPC) was discussed", in the decision under point 5 "Further issues" it is only mentioned that Article 123(2) EPC was discussed because the opponent challenged the addition of the passage "corresponding with the engagement position of the piston train". In its decision the opposition division did not decide on the other objections also raised by the opponent regarding an extension of the subject-matter of the claims.

As both parties acknowledged that following the remittal of the case to the first instance for further prosecution the following issues are outstanding:
- Article 100(b) EPC with regard to claims 4, 5, 6 and 10,
- Article 100(c) in connection with Article 76(1) EPC and Article 123(2) EPC and

- Article 100(a) EPC in connection with Article 54 EPC and Article 56 EPC as well as Article 57 EPC, the Board finds that the requirements of Article 11 RPBA 2020 in combination with Article 25(1) RPBA 2020 are therefore fulfilled.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution.

The Registrar: The Chairwoman:

A. Vottner O. Loizou

Decision electronically authenticated