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**Datasheet for the decision
of 14 January 2016**

Case Number: T 1454/14 - 3.2.08

Application Number: 08252387.9

Publication Number: 2022999

IPC: F16D55/228, F16D55/00

Language of the proceedings: EN

Title of invention:

A disc brake caliper body and a disc brake caliper comprising such a body

Patent Proprietor:

AP Racing Limited

Opponent:

Alcon Components
Apollo

Headword:

Relevant legal provisions:

EPC Art. 54, 56

Keyword:

Novelty - main request (no)
Inventive step - auxiliary request (yes)

Decisions cited:

Catchword:



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Case Number: T 1454/14 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 14 January 2016

Appellant: AP Racing Limited
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
23 April 2014 concerning maintenance of the
European Patent No. 2022999 in amended form.**

Composition of the Board:

Chairwoman P. Acton
Members: M. Foulger
P. Schmitz

Summary of Facts and Submissions

- I. With the decision dated 23 April 2014 the opposition division found that the patent according to the then valid auxiliary request 'E' met the requirements of the EPC.
- II. Appellant I (patent proprietor) and appellant II (opponent) filed appeals against this decision. The notices of appeal and the statements setting out the grounds of appeal were filed within the given time limits and in due form.
- III. Oral proceedings took place before the Board of Appeal on 14 January 2016.
- IV. Appellant I requested that the decision under appeal be set aside and the patent be maintained as granted, or, in the alternative, as first auxiliary request that the patent be maintained on the basis of the auxiliary request upheld by the opposition division (this was the request named auxiliary request 'E' in the opposition proceedings and fourth auxiliary request in the statement setting out the grounds of appeal and which became the first auxiliary request during the oral proceedings).
- V. Appellant II requested that the decision under appeal be set aside and the patent revoked.
- VI. Claim 1 of the patent as granted reads as follows:
"A caliper body (30, 130) (feature A),
the body comprising a mounting side limb (31; 131)
(feature B)
and a non-mounting side limb (32, 132) (feature C),
each limb having two or more hydraulic brake cylinders

(37, 38, 39; 137, 138, 139) suitable for receiving corresponding hydraulic brake pistons (171) (feature D) and being profiled to define a housing portion (42; 142) about each cylinder (feature E), the body having two peripheral stiffening bands (45, 55; 145, 155) (feature F), each stiffening band extending about an outer lateral surface of a respective one of the limbs and inter-connecting outer lateral end regions (43; 143) of the cylinder housing portions (42, 142) in its respective limb (feature G), characterised in that at least one of the peripheral stiffening bands (45, 55; 145, 155) has at least one opening (47, 48, 49, 50, 51, 52) extending therethrough in a radial direction (feature H)."

(Feature references added by the Board.)

Claim 1 of the first auxiliary request is further restricted over the main request by the features according to which:

"for at least part of its length, at least one peripheral stiffening band (45, 55; 145) comprises a laterally outer region (45c, 55c; 145b) connected with a cylinder housing portion by means of a web (45b, 55b; 145b), the web having reduced thickness when compared with the laterally outer region of the band."

VII. The following documents are referred to in this decision:

D5: STR Brake System

D8: Photographs of Wilwood STR caliper

D9: Drawing Nos. 4114B1M rev. D and 4115B1M rev. E

D41: Marked-up version of D8

VIII. Appellant I argued essentially the following:

a) Main request - novelty of claim 1

The Wilwood STR prior use caliper may well disclose a caliper with features A-E. However this caliper did not disclose a peripheral stiffening band as defined in the claim (features F and G). Consequently, feature H was also not disclosed. In particular, although the outer lateral surface of the cylinder housing portion could be seen as being the thinner part of the end of the cylinder in section A-A, shown on sheet 2 of drawing 4114B1M Rev. D of D9, the material outboard of this surface (i.e. to the right in the drawing) did not contribute materially to the stiffness of the caliper but was merely there to act as a heat sink and to improve the heat dissipation properties of the caliper. This view was supported by D5 wherein the temperature performance of the caliper was emphasized. Therefore this part of the caliper could not be regarded as a stiffening band.

The subject-matter of claim 1 as granted was therefore new.

b) First auxiliary request - novelty

The Wilwood STR caliper did not disclose a web connecting the peripheral stiffening band with the limb. A web was a plate-like structure having a uniform cross-section and because there was nothing that resembled this in the Wilwood STR caliper, the subject-matter of claim 1 of the auxiliary request was new.

c) First auxiliary request - inventive step

According to D5 the Wilwood STR caliper was already optimised using FEA techniques so that the person skilled in the art would not have seen the need to add further stiffening elements. The prior art did not contain any hint that would lead the person skilled in the art to the claimed solution.

IX. Appellant II argued essentially the following:

a) Main request - novelty of claim 1

The Wilwood STR caliper disclosed all features of claim 1. In particular, a band, marked "Wilwood", was clearly visible on the side of the caliper in the photograph of D8. This band was peripheral because it was outboard of the outer lateral surface of the limb defined by the thinner end wall of the cylinder housing as could be seen in section A-A of drawing no. 4114B1M Rev. D of D9. This band also had a stiffening function because it added material to the caliper - clearly a caliper with this material was stiffer than a caliper without this extra material. Thus features F and G were known from the Wilwood STR caliper. Radial holes through the band were visible on the plan view of the caliper in D9 and also in the photograph of D8. Thus all features of claim 1 were known from the Wilwood STR caliper and the subject-matter of claim 1 was not new.

b) First auxiliary request - novelty

Claim 1 of the auxiliary request was restricted over claim 1 of the main request by the features whereby "for at least part of its length, at least one peripheral

stiffening band comprises a laterally outer region connected with a cylinder housing portion by means of a web, the web having reduced thickness when compared with the laterally outer region of the band." However the direction of thickness of the web was not defined. It could therefore be either in the radial, circumferential or even lateral directions. In the circumferential direction the web could be regarded as being the material between the holes in the band as illustrated in D41 by region 2. This material had a reduced thickness compared with the band itself in the circumferential direction. Thus in the terms of the claim it could be seen as being a web.

Moreover, in the lateral direction the material between the holes and the limb could also be seen as being the web.

Therefore the subject-matter of claim 1 was not new.

c) First auxiliary request - inventive step.

The person skilled in the art knew that the stiffness of the caliper was important and would therefore try to improve the stiffness as part of his routine work. The person skilled in the art also knew, as part of the common general knowledge, that an I beam structure provided stiffness with low weight. For the person skilled in the art it would have been obvious to add such an I beam structure to the Wilwood STR caliper in order to improve the stiffness and thereby arrive at the subject-matter of claim 1 without an inventive step being involved.

Reasons for the Decision

1. Main request - novelty

It was not disputed that features A-E were disclosed by the STR-Wilwood prior use caliper. It was moreover not disputed that the outer lateral surface of the cylinder housing portion could be seen as being the thinner part of the end of the cylinder in section A-A shown on sheet 2 of drawing 4114B1M Rev. D of D9. The band marked Wilwood in photo D8 is therefore a peripheral band in the sense of claim 1 because it extends about an outer lateral surface of the limbs and inter-connects outer lateral end regions of the cylinder housing portions.

The point of dispute was whether the thickened area with radial holes visible on the caliper of the Wilwood STR prior use also had the function of stiffening as required by features F and G of the claim.

Since the band provides extra material offset from the neutral bending axis of the caliper, the Wilwood STR caliper is stiffer than a theoretical caliper where this material is not present. The band therefore provides a stiffening function irrespective of whether it additionally provides further advantages such as improved heat dissipation. Consequently the band is a peripheral stiffening band in accordance with features F and G. As may be seen in the plan view in drawing 4114B1M Rev. D of D9 and also in the photographs of D8, the band is also provided with radial holes. Therefore the Wilwood STR caliper also fulfills feature H of claim 1.

All features of claim 1 are therefore known from the

Wilwood STR prior use caliper.

2. First auxiliary request - novelty

Central to the question of novelty is whether there is a web in the Wilwood STR caliper.

The person skilled in the art would recognise a web as being a thin plate-like piece of material. The argument that the thickness of the web may be seen in the circumferential direction or even the lateral direction is unconvincing because such an approach would contradict the skilled person's understanding of the term "web". This is because the material connecting the cylinder housing portion with the peripheral stiffening band is neither thin nor plate-like.

The subject-matter of claim 1 of the first auxiliary request is therefore new.

3. First auxiliary request - inventive step

It was not contested that the Wilwood STR caliper represented the most relevant prior art.

The subject-matter of claim 1 therefore differs from this caliper in that:

for at least part of its length, at least one peripheral stiffening band comprises a laterally outer region connected with a cylinder housing portion by means of a web, the web having reduced thickness when compared with the laterally outer region of the band.

Although the Wilwood STR caliper had already been optimised using FEA techniques, see D5, the person

skilled in the art would constantly strive to improve important properties of the product in question - in this case the stiffness. Thus, the problem to be solved is to improve the performance of the prior art caliper, in particular its stiffness.

The person skilled in the art of mechanical engineering would certainly be aware that adding material in the form of an I section would increase the stiffness of the caliper. Whilst this measure is common and usual in the field of structural engineering, this field is remote from that of brake calipers. Merely removing material from region 2 shown in D41 would also not necessarily result in a plate like structure that could be termed a web. Moreover there is no hint in the prior art that would suggest to the person skilled in the art that precisely this material (whose removal would lead to the claimed structure) should be removed.

Thus, the subject-matter of claim 1 involves an inventive step in the sense of Article 56 EPC.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar:

The Chairwoman:



C. Moser

P. Acton

Decision electronically authenticated