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**Datasheet for the decision
of 29 January 2014**

Case Number: T 0559/11 - 3.2.01

Application Number: 02002949.2

Publication Number: 1231077

IPC: B60B5/02, B60B21/06, B29C70/44

Language of the proceedings: EN

Title of invention:
Method for producing a bicycle wheel rim, apparatus for
implementing the method and bicycle wheel rim obtained thereby

Patent Proprietor:
CAMPAGNOLO S.R.L.

Opponents:
CarbonSports GmbH
DT Swiss AG

Headword:

Relevant legal provisions:
EPC 1973 Art. 56
EPC Art. 123(2)

Keyword:
Main request: inventive step (no)
Auxiliary request: added subject-matter (no) -inventive step
(yes)

Decisions cited:

Catchword:



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

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Case Number: T 0559/11 - 3.2.01

**D E C I S I O N
of Technical Board of Appeal 3.2.01
of 29 January 2014**

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Decision under appeal:

**Interlocutory decision of the Opposition
Division of the European Patent Office posted on
7 January 2011 concerning maintenance of the
European Patent No. 1231077 in amended form.**

Composition of the Board:

Chairman: G. Pricolo
Members: Y. Lemblé
D. T. Keeling

Summary of Facts and Submissions

I. All the parties to the first instance proceedings, the Patent Proprietor and the Opponents I and II, appealed against the decision of the Opposition Division dated 7 January 2011 to maintain the European patent No 1 231 077 in amended form.

II. In its decision the Opposition Division held that independent method claims 1 and 30 according to the third auxiliary request filed during the oral proceedings of 26 November 2010 (identical to claims 1 and 30 as granted) fulfilled the requirement of novelty and inventive step. It rejected independent product claim 35 according to the second auxiliary request as lacking novelty. The following prior art documents were considered, inter alia, by the Opposition Division:

D3: US-A-5 540 485,

D4: EP-A-0 390 300,

D6: DE-A-44 25 592,

D10: Leaflet "RTV-2 Silikonkautschuk Elastosil RT 607",

D12: WO-A-98/57812.

III. In the oral proceedings, held on 29 January 2014, the Appellants/Opponents I and II requested that the decision of the Opposition Division be set aside and that the patent be revoked.

The Appellant/Patent Proprietor requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the Main Request filed with the grounds of appeal on 16 May 2011 or, in the alternative, on the basis of the Auxiliary Request filed during the oral proceedings on 29 January 2014.

IV. The Main Request of the Appellant/Patent Proprietor includes method claim 30 which is identical to claim 30 of the patent as granted and reads as follows:

"Method for producing a bicycle wheel rim of the type presenting a peripheral inner wall (3), an outer peripheral wall (2), two lateral walls (4, 5) joining said peripheral walls (2, 3) and two circumferential wings (6) for anchoring a tyre which radially extend outwards from the two sides of the outer peripheral wall (2), **characterised in that** said rim is made as a single part of structural fibre material, by means of a moulding process of several layers of structural fibre fabric incorporated in a plastic material matrix, and **in that** said tyre anchoring circumferential wings (6) made in said moulding process are longer than required and **in that** after the moulding process said circumferential wings (6) are subjected to a machining operation to reduce them to the required length and/or shape."

Independent claims 1 and 30 of the Auxiliary Request read as follows

1. "Method for producing a bicycle wheel rim of the type presenting an inner peripheral wall (3), an outer peripheral wall (2), two lateral walls (4,5) joining said peripheral walls (2, 3), and two circumferential wings (6), for anchoring a tyre, which extend outwards from the two sides of the outer peripheral wall (2), **characterised in that** it comprises the following steps: applying on the inner part (8) of a mould (8,9) a predetermined number of layers (12, 12a, 12b, A, B) of structural fibre fabric incorporated in a plastic material matrix which are to form the inner wall (3),

the outer wall (2), the two lateral walls (4, 5) and the wings (6);
arranging an inflatable bag (13) on the layers (12);
folding a first predetermined number (12a, B) of the layers (12) on the inflatable bag (13),;
applying at least one core (14) over the folded first predetermined number (12a) of layers (12);
folding a second predetermined number (12b, A) of the layers (12) over the core (14);
applying the outer part (9) of the mould (8,9) so as to enclose the layers (12, 12a, 12b, A, B);
inflating the inflatable bag (13) so as to press the layers (12, A) against the mould (8,9);
increasing the temperature of the mould (8,9) to a value sufficient to cause reticulation of the plastic material matrix;
removing the bicycle wheel rim from the mould (8,9) and removing the core (14), so as to obtain a bicycle wheel rim formed of a single piece of structural fibre material."

30. "Rim of a bicycle wheel, comprising an inner peripheral wall (3), an outer peripheral wall (2), two lateral walls (4,5) joining said peripheral walls (2, 3) and two circumferential wings (6), for anchoring a tyre, which extend outwards from the two sides of the outer peripheral wall (2), said rim being made of a single part of structural fibre based material, characterised in that the two circumferential wings (6) are formed by a predetermined number of layers (A, C, 12, 12b) of structural fibre based material, and in that it has a layered structure of fibre based fabric material, including at least first layers (A, 12, 12b) extending so as to contribute to define only the inner wall, the lateral walls and the two wings of the rim and second layers (B, 12, 12a) arranged so as to

contribute to define only the inner wall (3), the lateral walls (4,5) and the outer wall (2) of the rim, wherein said first layers comprise circumferential edges folded one towards the other to form said wings and said second layers comprise circumferential edges folded back at the outer wall (2) to form a closed circumferential cavity."

- V. The arguments of the Appellants/Opponents in support of their request of revocation of the patent, insofar as they are relevant to this decision, can be summarised as follows:

The Main Request

Method claim 30 of the main request was not new over document D4 or document D6 or at least did not involve an inventive step in view of the prior art documents D4, D6 and/or D3. On a reading of the passage starting at line 56, column 10 of D4, the skilled person would not completely enclose the small tubes 35 with the fiber reinforcing plastic material for the formation of the anchoring wings. The claimed machining or reshaping step which followed the moulding of the anchoring wing, as mentioned in D4, was an operation which was well known in the art. For example, document D6 mentioned in column 2, lines 38 to 54 that it was usual to submit to a machining operation anchoring wings which resulted from a previous manufacturing step. There was nothing special in making the anchoring wings by a moulding process, since document D3 showed anchoring wings which were obtained at the end of a moulding process of fiber reinforced plastic material (see column 10, lines 4-9).

The Auxiliary Request

The method according to claim 1 of the Auxiliary Request did not involve an inventive step. Compared to the method of document D4 for producing a bicycle wheel rim, which included the use of an inflatable bag and of at least one core (small bags 35), the method of claim 1 mainly differed in the way the different layers of fiber reinforced plastic material were disposed on the inflatable bag and the core. There were, however, various possibilities to lay that material on the respective elements. Figures 3 of D4 showed how strips of reinforced plastic material 251-254 might be laid out to cover the core 14. It was obvious to use such layers to form the anchoring wings. In the same way, figures 10 and 11 of document D3 showed how the composite cloth 54 was folded around the inflatable bag 20 to form the inner, outer and lateral walls of a bicycle rim. When combining the teachings of these documents, a person skilled in the art would obviously arrive at the claimed method.

Concerning the amendments made in claim 30 of the auxiliary request, both Appellants/Opponents objected to the last feature of claim 30 beginning with "wherein..." as extending beyond the content of the application as originally filed. Appellant/Opponent I was of the opinion that figures 1 and 2 as originally filed showed that the edges of the second layers would rather abut in the middle of the outer wall to form a closed circumferential cavity. Thus, the claimed formulation "at the outer wall" amounted to an intermediate generalisation. For Appellant/Opponent II the original figures did not show that the circumferential edges of the second layers were folded back "at the outer wall": they were rather folded at the upper end of the lateral wall. Moreover, the wording "folded back" was taken in isolation from the

more limited original wording: "folded back, over the bag" (see column 5, line 4 of the patent specification). There was therefore no clear basis for the added features in the originally filed documents (Article 123(2) EPC).

For both Appellants/Opponents the bicycle rim of claim 30 did not involve an inventive step over the rim of document D12. Figure 7 of this document disclosed a rim with a layered structure of fibre based fabric material including at least first layers (outer braid 42 with removed portion) which comprised edges folded one towards the other to form anchoring wings 49 and second layers (inner braid 41) forming a closed circumferential cavity. To form the circumferential cavity by folding back edges of the second layers was a mere non-inventive alternative to the multiple nested tubular braids of document D12 (page 5, line 23 to page 6, line 11).

- VI. The arguments of the Appellant/Patent Proprietor, as far as they are relevant for the present decision, may be summarised as follows:

The Main Request

Method claim 30 of the Main Request was new and involved an inventive step. The wording of claim 30 clearly required that the tyre anchoring wings had one unsupported end (flange) which resulted from the moulding process. Neither document D4, nor document D6 disclosed tyre anchoring wings which were obtained at the end of the moulding process. What documents D4 or D12 or D6 taught, was to provide for a closed cross-sectional cavity or a box-like shape, which was cut open after the moulding process. Hence, none of these

documents disclosed anchoring wings which were made longer than required as a result of the moulding process. There was no mention anywhere in D4 that the wings were originally longer than required. The machining operation disclosed in D4 or D6 was a finishing treatment of the surface of tubes. Such a treatment was not comparable to the claimed machining operation which required that the length of the wings be reduced.

The Auxiliary Request

As recognised by the Opposition Division, claim 1 was new and inventive over the combination D4/D3 cited by the Appellants Opponents.

The amendments made in product claim 30 (to compare with granted product claim 35) fulfilled the requirements of the EPC. In order to overcome the objections of unallowable extension of the protection conferred by the granted claim 35 (Article 123(3) EPC), the expression "made as" was replaced by the original wording of granted claim 35 ("made of a single part of structural fibre based material"). The other amendments made in the last paragraph of the claim (beginning with "wherein") had a clear basis in paragraphs [0003], [0023], [0024] and figures 1-2 of the patent specification. Claim 30 of the auxiliary request reflected in terms of structural features of the rim the method of claim 1 that had been recognised as new and inventive by the Opposition Division. Neither document D12 nor any of the other prior art documents taught or suggested such a rim.

Reasons for the Decision

1. Admissibility of the appeal

At the beginning of the oral proceedings, Appellant/Opponent I challenged the admissibility of the appeal of the Patent Proprietor on the grounds that its main request was unclear, because it requested the maintenance of the patent on the basis of dependent claims which had no definitive numbering and should be "properly renumbered".

For the Board, the use of the following formulations "claim 42 as filed on 26 October 2010 (properly renumbered) and claim 43 as granted (properly renumbered) and claim 44 as filed with letter of 16 May 2011 (properly renumbered)", in a set of claims on the basis of which the maintenance of the patent is requested, does not render the request unclear. The fact that some of the previous dependent claims should be properly renumbered because one granted dependent claim was incorporated into an amended independent claim according to the main request does not *per se* put into question the admissibility of the appeal.

Since, on the other hand, the Patent Proprietor indicated in detail in the statement setting out the grounds of appeal why it considered that the decision of the Opposition Division should be set aside and the patent maintained on the basis of the set of claims according to the main request (Rule 99(2) EPC), whereby all the other formal requirements for the admissibility of the appeal of the Patent Proprietor are met, the Board judges that the appeal of the Patent Proprietor is admissible.

2. Main Request; independent method claim 30

For the Board, the wording of claim 30 of the main request "said tyre anchoring circumferential wings made in said moulding process are longer than required", when interpreted in the context of the patent specification, means that the tyre anchoring capacity of the wings (flange) is the direct result of the moulding process. The claimed method is new over the disclosure of D4 or D6, since none of these documents clearly and unambiguously discloses a machining operation made on wings having anchoring flanks which directly result from a moulding process.

Although the Board shares the view of the Appellant/Patent Proprietor that document D4 does not disclose the direct formation of the flanks of the wings by moulding, it comes nevertheless to the conclusion that the method of claim 30 does not involve an inventive step. Several passages in the relevant part of the description of D4 (column 10, line 56 to column 11, line 3) suggest that the small bags (*Folienschläuche* 35) used to form the wings during the moulding process should not necessarily be covered with the fiber reinforced plastic material such as to completely surround them: there is the mention that the bags themselves - and not the plastic material - are cut open ("*Folienschläuche [werden] aufgeschnitten*") and that the small bags are used to create the flanks of the crotchet type rim ("*Flanke [werden] durch zwei Folienschläuche erzeugt*"). In the Board's view, the skilled person, in applying the teaching of D4, will dispose the fiber reinforced plastic material where it is needed, that is, where the flanks are to be formed. For example, he may use a combination of a tubular fabric layer as shown in figure 2c with strips as shown

in figure 3 of D4 to form the wings. The idea of making the flanks of such anchoring wings by a direct moulding operation cannot in itself justify an inventive step, since document D3 shows how such flanks can be directly obtained by moulding with the adequate use of one or more core elements (see D3: column 10, lines 4-9 and figure 11 with core element 55 of silicone rubber).

For the Board, the supplementary step of machining the moulded anchoring wings to reduce them to the required length and/or shape cannot add anything inventive to the method. Document D4 clearly mentions that the raw crotchet type rim may be machined after the rim is removed from the mould (column 5, lines 36-44 and column 11, lines 1-3). In the same way, document D6 confirms that machining raw anchoring wings is a usual practice in the art (column 2, lines 49-51).

Contrary to the opinion of the Appellant/Patent Proprietor, the Board cannot recognise in the expression "said wings made in the moulding process are longer than required" any clear distinctive feature, since the adjective "longer" only has a relative meaning. In the same manner, the wording "machining operation to reduce them to the required form and/or shape" also has a very broad meaning, a mere change of shape by a machining operation as taught by D4, being able to fulfil that requirement.

It follows from the foregoing that the main request of the Appellant/Patent Proprietor cannot be allowed, since at least independent claim 30 of this request fails to fulfil the requirements of the EPC.

3. Auxiliary Request

3.1 Inventive step; method claim 1

3.1.1 This claim has been delimited with respect to the prior art shown in document D4 or in document D3.

3.1.2 As mentioned in paragraph [0007] of the patent specification, the object of the invention is "to provide a ring with circumferential wings made out of a single part of carbon fibre based material that can be easily manufactured".

3.1.3 This object is achieved by the features of the claim which teaches how, with a predetermined number of layers of structural fibre fabric, it is possible to produce, by a moulding process and adequate folding operations over an inflatable bag and at least one core element as claimed, a complete rim with its anchoring wings.

3.1.4 None of the documents D4 or D3 cited by the Appellants/ Opponents discloses or suggests the possibility of obtaining a bicycle wheel rim formed as a single piece of structural fibre material by the method of claim 1.

Document D4 shows different possibilities for disposing layers of fiber reinforced plastic material on a core 14 or an inflatable bag to form the rim. For example, the material may completely surround the core 14 as a tubular fabric hose (figures 2a-2c), or be disposed longitudinally as elongated strips 251-254 around the core (see figure 3), or be helically wound around the core 14 (figure 4). None of these proposals leads in an obvious way to the claimed operating steps in the claimed sequence. There is also not the slightest hint in D4 which suggests starting from a predetermined

number of layers of structural fibre fabric and folding them according to the steps of claim 1.

Moreover, document D4 does not disclose the step of inflating the inflatable bag so as to press the layers against the mould after the latter has enclosed the layers and the core element, which provides for a good and homogeneous filling of the fibre plastic material in all parts of the mould (see patent specification, column 4, line 56 to column 5, line 1). In D4, the bag is inflated before the mould is closed (see column 10, lines 36 to 45).

Document D3 starts from a layer of composite cloth 54 to be applied on the inner part of a mould 45,46 (see in particular Figures 10 and 11). The composite cloth 54 is then laid over an inflatable bladder 20 arranged on the cloth to form the inner wall, the outer wall and the lateral walls of the rim's circumferential cavity. The rim is completed with a toroidal outer piece 14 having anchoring wings. That piece 14 may be of a composite fabric material (column 10, lines 4 to 9). A core 55 made of preferably silicone rubber, for moulding the anchoring wings, is installed in the mould to permit the withdrawal of the finished product from the mould. There is no suggestion in D3 to separate the cloth 54 in first layers which have to be folded back over the bladder 20 to form the outer wall of the rim and second layers which have to be folded over the core 55 to form the anchoring wings. Clearly, in D3, the rim is manufactured from two parts: the inner part 15 enclosing the bag 20 and forming a circumferential cavity and a separate outer piece 14 which bears the anchoring wings.

For the Board, it is not apparent how a combination of the teaching of document D4 and D3 could lead in an obvious way to the claimed method.

3.2 Claim 30 of the Auxiliary Request; allowability of the amendments

This claim refers to a rim of a bicycle wheel. As compared to claim 35 as granted, claim 30 has been amended to include the features of claim 41 as granted which includes lists of the parts of the rim (inner wall, outer wall, lateral walls, wings) to which the first and second layers respectively "contribute to define". In response to the objection presented during oral proceedings before the Opposition Division, that the lists did not provide a clear limitation for the claimed subject-matter, the word "only" was inserted before each list. In the Board's judgement, this insertion has a clear basis in the application documents as originally filed (see especially method claim 1 and figures 1-2 as originally filed) and represents a limitation of the scope of the claim.

Both Appellants/Opponents objected to the last feature of claim 30 beginning with "wherein..." as extending beyond the content of the application as originally filed.

Although the Board agrees with the Appellants/Opponents that there is no explicit support for the exact formulation used in this feature, it cannot accept the contention of the Appellants/Opponents that the application documents as filed did not disclose this feature. On a fair reading of the passages cited by the Appellant/Patent Proprietor (which correspond to paragraphs [0003],[0020], [0021] and figures 1-2 of the application as published) there is a clear basis for

this feature in the original filed documents. Accordingly, these passages support the concept of the second layers being "folded back" to form a closed circumferential cavity (cavity formed by the bag) and of the first layers comprising circumferential "edges folded one towards the other" to form the anchoring wings. Whether the edges of the second layers abut in the middle of the outer wall (as shown in Fig. 1) or at some distance therefrom is clearly irrelevant for the skilled reader, who would recognise that what counts is that the edges abut "at the outer wall" and not the exact location of their abutment at the outer wall. Hence, no unallowable intermediate generalisation occurs by non specifying that the edges of the second layers abut in the middle of the outer wall. Nor does an unallowable generalisation occur by including the term: "at the outer wall". Bearing in mind that the bag has not played any role in the definition of the rim, this term has the same meaning as "over the bag", since the outer wall is the part of the rim which is over the bag and at which level the folding operation takes place.

Consequently, the Board comes to the conclusion that there is a direct and unambiguous basis in the application as originally filed for the specific combination of features of claim 30 according to the auxiliary request. Thus, this claim meets the requirements of Article 123(2) and (3) EPC.

3.3 Novelty and inventive step

Claim 30 of the auxiliary request reflects, in terms of structural features of the rim, the method of claim 1.

For the Appellants/Opponents, this rim was rendered obvious by document D12. The Board does not agree. The rim shown in figure 7 of document D12 is a two box design, wherein each box is a hollow structure manufactured from a tubular braid 40,41. Both braids are nested in an outer braid 42 which forms the outer layer of the rim 12 (D12: page 5, line 23 to page 6, line 6). To obtain a rim with anchoring wings ("clincher style rim" mentioned on page 6, line 6) a portion of the radially outer box 52 is removed by a machine cut 51. This implies also cutting the braids 40 and 42 (D12: page 6, lines 6 to 11).

Owing to the structure of the rim of D12, the Board cannot see how the the radially inner box - which corresponds to the "closed circumferential cavity" of the claim and is manufactured from the tubular braid 41- could exhibit layers comprising circumferential edges folded back to form that cavity. The folded back edges are incompatible with a manufacturing process from tubular braids. For the Board, it is certainly not obvious for a skilled person to arrive at the claimed rim, starting from the rim of figure 7 of D12.

The Board concludes that the subject-matter of independent claim 30 is new and involves an inventive step.

4. Dependent claims 2 to 29 and 31 to 37 relate to further developments of the inventive concept disclosed in the respective independent claim 1 or 30 to which they refer. They contain all of the features of the independent claim. The above conclusions regarding novelty and inventive step apply equally to these claims, which likewise meet the requirements of the EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Opposition Division with the order to maintain the patent in amended form on the basis of the Auxiliary Request filed at the oral proceedings on 29 January 2014, with a description to be adapted.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated