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Datasheet for the decision of 12 October 2017

Case Number: T 0486/15 - 3.2.01

Application Number: 07123543.6

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Language of the proceedings: EN

Title of invention:
Pneumatic tire

Patent Proprietor:
The Goodyear Tire & Rubber Company

Opponent:
MICHELIN Recherche et Technique S.A.

Headword:

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (yes)

Decisions cited:
T 0857/91, T 0272/92, T 1664/06

Catchword:

Europäisches Patentamt
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Case Number: T 0486/15 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 12 October 2017

Appellant: (Opponent)	MICHELIN Recherche et Technique S.A. Route Louis Braille 10 1763 Granges-Paccot (CH)
Representative:	Diernaz, Christian M. F. P. Michelin, 23, place des Carmes Dechaux, DGD/PI-F35-Ladoux 63040 Clermont-Ferrand Cedex 09 (FR)
Respondent: (Patent Proprietor)	The Goodyear Tire & Rubber Company 1144 East Market Street Akron, OH 44316-0001 (US)
Representative:	Kutsch, Bernd Goodyear S.A. Patent Department Avenue Gordon Smith 7750 Colmar-Berg (LU)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 23 December 2014 rejecting the opposition filed against European patent No. 1935671 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	G. Pricolo
Members:	W. Marx
	S. Fernández de Córdoba

Summary of Facts and Submissions

I. The appeal is directed against the decision of the opposition division to reject the opposition, filed on grounds of lack of novelty and inventive step (Article 100(a) EPC), against European patent No. 1 935 671.

II. The appellant relied on the following evidence filed during the opposition procedure:

- A1: EP 1 015 261 B1;
- A2: EP 1 616 719 B1;
- A3: EP 0 503 406 A1;
- A4: US 5 275 218 A;
- A5: EP 1 935 670 B1, prior art under Art. 54(3) EPC if the priority date of the patent is not valid;
- A6: US 2 960 138;
- A7: JP 62-268707;
- A8: EP 1 800 843 B1.

The appellant filed the following further evidence with its statement of grounds of appeal:

- A12: EP 0 598 300 B1;
- A13: second communication of examining division during examination dated 8 June 2010;
- A14: JP 2001-130227;
- A15: English translation of A15.

III. At oral proceedings held on 12 October 2017 the appellant (opponent) requested that the decision under appeal be set aside and that the European patent be revoked. The respondent (patent proprietor) requested that the appeal be dismissed.

IV. Claim 1 as granted reads as follows (broken into a feature analysis adopted by the parties, with indices (a), (b), (c) added to the characterising features):

A pneumatic tire, the tire having an equatorial plane (EP) and a tread (12), the tread (12) comprising grooves (16) therein and having a radially outer surface and an unworn non-skid tread depth (D) as measured from the radially outer surface of the unworn tread (12) and a radially innermost surface of the grooves (16), **characterised in that,**

(a) when the tread is unworn, the tread has a net-to-gross ratio in the range of 62-68%,

(b) after the tread (12) is worn to a worn non-skid tread depth, as measured from the radially outer surface of the worn tread (12) and a radially innermost surface of the grooves (16), said worn non-skid tread depth being in a range of from 20% to 80% of the unworn non-skid tread depth, the tread (12) has a net-to-gross ratio in a range of from 50% to 55%,

(c) and the tread (12) has two or three additional unobstructed circumferential grooves (32, 34, 36, 68, 70) on each side of the equatorial plane (EP) when the tread (12) is worn to said worn non-skid depth compared to the unworn tread.

V. The appellant's submissions in as far as they are relevant to this decision may be summarised as follows:

The European patent application was not entitled to the priority claimed, so document A5 was prior art relevant for novelty. Figures 1 to 9 and the related description of the contested patent and A5 were identical except for paragraphs [0015] and [0027] of the patent missing in A5. Since these figures illustrated the invention claimed, A5 destroyed the novelty of claim 1 although the claimed ranges of 62-68% and 50-55% were not explicitly disclosed.

Pneumatic tires according to the preamble of claim 1 were known in the prior art, which also showed a net-to-gross ratio of the new tire in the range of 50-80% (A3) or 56-72%, preferably 60-70% (A7). The subject-matter of claim 1 was not limited to a specific type of pneumatic tire (passenger car or truck). The claimed ranges were arbitrarily chosen without any specific effect. Moreover, the minimum possible variation between the worn and unworn net-to-gross ratio was only 7%, so that in view of the inclination of the groove walls only a small surface was generated by creating new circumferential grooves. Although specific means were defined by feature (c), claim 1 did not define any specific parameter in respect of the relative position of the obstructed grooves on both sides of the equatorial plane. Thus, even asymmetric configurations fell under the wording of claim 1, which probably did not solve the problem formulated by the opposition division, in particular to avoid uneven tire wear. The distribution of obstructed grooves on both sides of the equatorial plane was an essential element that was missing in claim 1 and had an influence on the wear characteristics of the tire.

A1 showed at least two tread patterns appearing successively at different levels of tire wear (see Figures 8 and 9) and groove voids forming new grooves in the worn tire. According to A1, one additional circumferential groove was formed on both sides of the equatorial plane and further grooves laterally towards the outside of the tread. The example tires of A1 provided the advantage of maintaining nearly constant the liquid drainage volume (paragraph [0042]) and thus a good wet performance of the tire during the entire time of use. As a consequence, the net-to-gross ratio

was reduced gradually with every new tread pattern which appeared. The groove voids allowed for a reduced volume of unobstructed grooves in the unworn tire and thus an improved rigidity. A1 solved a problem similar to the one solved by the contested patent, namely to optimise the tire's adhesion and behaviour performance without being negatively affected by its wear.
A1 disclosed a specific example having a net-to-gross ratio of the unworn tread of 73%, which could be applied to treads having ratios between 62 and 68% (the latter value being close to 73%). This range of 62-68% was commonly known and would not be excluded by the skilled person, see A7 (range of 60-70% not new over 62-68%) or A3 (50-80%).
When applying the teaching of A1 (in particular Figures 8 and 9) to a tread having a net-to-gross ratio range of 62-68%, the skilled person would inevitably reproduce feature (b), because the ratio was reduced two or three times with tire wear, so that a net-to-gross ratio in the range of 50-55% (for a worn non-skid tread depth between 20% and 80%) could reasonably be expected. A1 disclosed in paragraphs [0043] and [0044] a specific tire having a tread thickness of 8.5 mm and a width of 125 mm, and after wear of about 2.5 mm of the tread, the cavities radially beneath the running surface of the new tire opened to ensure that the ratio of the groove volume was kept virtually constant. Based on this data, it was derivable that the groove ratio of the worn tire had to be 38%, which corresponded to a net-to-gross ratio of 62% of the worn tire, i.e. a reduction by 11% compared to the net-to-gross ratio of the unworn tread of 73% disclosed in A1. Applying a reduction of 11% (the contested patent also mentioned a reduction by at least 10% in paragraph [0027]) to the net-to-gross ratio range of 62-68% according to

feature (a) would lead to the range specified in feature (b) for the worn tread.
A1 also showed a molding apparatus (Figure 10) and the means for achieving the reduction in the net-to-gross ratio of the worn tread (see Figure 11: three molding fingers in order to realise lateral groove voids at the tread edges). The skilled person would also contemplate realising additional (e.g. four) circumferential groove voids by a modification of the means of Figure 11, which was technically feasible. Moreover, A1 indicated (see paragraph [0079]) that by using at least one molding finger one, two or three additional circumferential grooves were generated in the worn tread. Thus, feature (c) was implicitly disclosed. As a consequence, the subject-matter of claim 1 as granted did not involve an inventive step in view of document A1, as found already (see A13) by the examining division for the subject-matter of a version of claim 1 not yet containing feature (c).

It was not necessary to combine four documents, as mentioned in the contested decision, but applying the teaching of A1 to tires as described in any one of the documents A3, A7, A8 or A4 led in an obvious manner to the subject-matter of claim 1. A7 suggested a range of 60-70% (A3: 50-80%) for the net-to-gross ratio of the unworn tread, which was very close to the claimed range. A1 also taught to keep constant the volume of the groove ratio in comparison to the new tire (paragraph [0044]), so a reduction in tread depth by 20% required the net-to-gross ratio to be reduced from an initial value of 70% to 50% for the worn tread. A4 showed (Figure 2) two buried grooves on each side of the equatorial plane so that the net-to-gross ratio of the worn tire tread was reduced. In the variant shown

in Figures 2 and 3 of A8, the net-to-gross ratio was reduced at 30% wear level.

Starting from A7 as the closest prior art document and trying to compensate for the reduced groove volume in the worn tire, the subject-matter of granted claim 1 was not inventive in view of the teaching of A1.

Document A2, which cited A1 as prior art and achieved the same advantages as those in the contested patent (compromise between tire stiffness and wet performance characteristics), taught to provide a tire with at least two tread patterns changing with wear. Moreover, groove voids and "at least one circumferential or lateral groove" were shown (paragraph [0008]), i.e. two or three grooves were possible. The two embodiments known from A2 (Figures 1, 2; Figures 4A, 4B) showed that groove voids could be provided either centrally or to both sides of the equatorial plane, and it was up to the skilled person to determine the number of groove voids. Like A2, the unworn tread known from A7 had four circumferential grooves, and A7 disclosed an unworn net-to-gross ratio of 60 to 70%. Since Figures 3 and 4 of the contested patent were close to Figures 4A and 4B of A2 (Figures 4 and 4B were even identical), it could reasonably be assumed that the net-to-gross ratio of the example of Figure 4A was also within the claimed range (62-68%). Compared to this unworn state of the tread, adding two circumferential grooves to the partially worn tread of Figure 4B led to a reduced net-to-gross ratio, which could reasonably be considered as lying in the claimed range 50-55% (assuming that the net-to-gross ratio of Figure 4 of the contested patent was within this range), as also found by the examining division (see A13). Therefore, feature (c) remained as the only distinguishing feature. In view of the problem

to reduce the net-to-gross ratio of a partially worn tread in order to maintain the drainage capacity without affecting tire stiffness, the skilled person knew groove voids from A2 and at the same time the teaching of document A4 or A6, showing two grooves uniformly distributed on both sides of the equatorial plane in order to homogenise the tire's contact pressure. Contrary to the finding of the opposition division with regard to A4, the contested patent was not limited to a certain type of tire and applied also to truck tires, which had a net-to-gross ratio of at least 55%, as disclosed in document A12. Moreover, A4 described (column 4, lines 27-31, and column 8, lines 22-26) a reduced ratio of surface grooves of the unworn tread, so that the net-to-gross ratio of the unworn tread was larger than the net-to-gross ratio in a partially worn state, in which additional grooves appeared in the running surface. It was not incompatible with the teaching of A4 to choose a value between e.g. 62 and 68% for the unworn tread and to achieve a lower value in a partially worn state. The additional grooves appearing in A4 in the worn state did not only compensate for the reduced width of the initial grooves (see Figure 5 of A4 showing V-shaped groove voids increasing in width with increasing depth of the groove), but could also lead to a reduced net-to-gross ratio of the worn tread. Nothing prevented the skilled person from choosing the ranges as claimed.

Documents A12 and A14/A15 were filed in reaction to the contested decision, showing that truck tires might have a low net-to-gross ratio of 55% and that two additional circumferential grooves on both sides of the equatorial plane were known.

VI. The respondent countered essentially as follows:

Late-filed documents A12, A14 and A15 should not be admitted into the appeal proceedings, since they related to technical background of the invention not relevant for the outcome of the proceedings. They had not been used in arguing inventive step and did not show more than the documents in the proceedings.

Claim 1 of the contested patent was new over A5. The ranges of net-to-gross ratios for the unworn and the worn tire tread as specified in claim 1 were not directly and unambiguously derivable from A5. Schematic drawings could not be used to derive dimensions (see T 857/91, T 272/92) or ratios of values (T 1664/06). In these circumstances it was irrelevant whether the priority of the contested patent was validly claimed.

In view of the problem to be solved by the contested patent, document A7 could not qualify as the closest prior art. It only showed the net-to-gross ratio of the unworn tread, which did not change in use. No additional grooves were formed as the tread was worn.

The subject-matter of claim 1 was distinguished by features (a), (b) and (c) from documents A1 and A2. The objective technical problem could be seen as providing a tire with optimised worn tire performance, in particular providing an improved compromise as regards wet driving performance, stiffness and uneven wear. It involved an inventive step to modify the tire of A1 or A2 with regard to all three features (a), (b) and (c).

A1 only showed a net-to-gross ratio of the unworn tire of 73%, i.e. outside and not close to the range specified in feature (a). A1 was silent with regard to

features (b) and (c). The appellant's calculations in respect of feature (b) were not available, but even supposing that a reduction in the net-to-gross ratio from 73% to 62% was derivable, the range of 50-55% for the worn tread was not achieved. Paragraph [0079] of A1 only addressed the forming of circumferential groove voids as disclosed for the central rows of tread blocks (one row on each side of the equatorial plane). There was no teaching in A1 to provide further additional circumferential grooves in the edge portion of the tire tread. Documents A7 and A3 showed ranges of the net-to-gross ratio of a new tire (60-70% and 50-80%) which were still larger than the claimed range according to feature (a). There was no motivation for combining A1 with A7. Even assuming that feature (a) was not inventive, features (b) and (c) were still missing.

Document A2 even did not contain any information on the net-to-gross ratio of the tire tread of Figure 4A, so it was purely speculative to assume a range of 62-68%. Although Figure 4B of A2 was similar to Figure 4 of the contested patent, a net-to-gross ratio of the worn tire in the range of 50-55% was not derivable from this schematic drawing. A2 taught at best to provide one additional circumferential groove on each side of the equatorial plane, and feature (c) was not derivable from paragraph [0008] in A2. The respondent already failed to argue why the skilled person would combine A2 with document A4 or A6. Moreover, such combination still did not suggest the net-to-gross ratios of the unworn and worn tire as claimed. A7 showed a range of 60-70% for the unworn tread, but why should the skilled person choose this range instead of e.g. a net-to-gross ratio of 73% as disclosed in A1. Late-filed document A12 also failed to support a range of 62-68%. Even

assuming that such a range was obvious, features (b) and (c) would still be missing.

Reasons for the Decision

1. Novelty

1.1 Even assuming that the European patent is not entitled to the priority claimed, so that document A5 were to be considered as prior art under Article 54(3) EPC, the disclosure of A5 is not prejudicial to the novelty of the subject-matter of claim 1.

1.2 Admittedly, A5 seems to show drawings identical to Figures 1 to 9 of the contested patent. However, the description of A5 is totally silent on ranges of the net-to-gross ratios of the unworn and the worn tire tread. No numerical values are given in A5 for these net-to-gross ratios, as agreed by the appellant.

1.3 According to the established case law of the Boards of Appeal (see Case Law of the Boards of Appeal of the European Patent Office, 8th edition 2016, I.C.4.6), schematic drawings cannot be used for deriving dimensions or ratios between two dimensions (see e.g. T 1664/06). This applies the more to ratios as claimed. According to the definition given in the patent specification, the net-to-gross ratio is the ratio of the total surface area of the normally loaded and normally inflated tire tread contacting a hard flat surface, divided by the total area of the tread including the grooves. Determination of this ratio would require to derive a large number of dimensions from schematic drawings to calculate an area of contact

of the tire tread on the surface on which the tire is placed under well-defined conditions.

1.4 In view of the foregoing, the board concludes that the claimed ranges of net-to-gross ratios of the unworn and worn tread are not directly and unambiguously disclosed by the drawings of A5. The subject-matter of claim 1 as granted is therefore new over the disclosure of A5.

2. Inventive step (Article 56 EPC)

2.1 The subject-matter of granted claim 1 involves an inventive step when starting from either document A1 or A2 as the closest prior art (Article 56 EPC). It was not contested that both documents show the features according to the preamble of claim 1.

2.2 Document A1 discloses a surface groove ratio of 27%, which corresponds to a net-to-gross ratio of 73% of the unworn tread within the meaning of the contested patent. When reaching a certain degree of wear (see Figure 2 compared to Figure 1 and the sectional view in Figures 3A, 3B), only one circumferential groove opens on each side of the equatorial plane together with additional grooves directed laterally towards the outside of the tread. A1 is totally silent with regard to the net-to-gross ratio of the worn tread. Therefore, the board finds that A1 neither shows a range of 62-68% for the net-to-gross ratio of the unworn tread, nor a range of 50-55% for the net-to-gross ratio of the worn tread as required by features (a) and (b). Moreover, A1 does not disclose feature (c) according to which two or three additional circumferential grooves open on each side of the equatorial plane when the tread is worn.

2.3 The objective technical problem to be solved by the characterising features (a) to (c) of claim 1 can be seen as providing a tire with optimised worn tire performance, in particular maintaining the tire's wet performance characteristics, as recited in the patent specification (paragraph [0007]).

2.4 The appellant's allegation that the claimed ranges (see features (a) and (b)) were arbitrarily chosen without any specific effect was not further substantiated and could not convince the board that claim 1 as granted lacked an inventive step. On the one hand, claim 1 was distinguished from the known prior art not only by features (a) and (b), but also by feature (c) which specifies structural means in order to arrive at the range specified in feature (b). On the other hand, the appellant itself presented calculations allegedly derivable from A1 which showed that groove voids were chosen such that the groove volume of the worn tire tread was equal to the groove volume of the unworn tire tread in order to maintain constant the liquid drainage volume of the tire. This effect was achieved in A1 by allegedly providing a reduction in the net-to-gross ratio by 11% between the unworn and the worn tire tread, which perfectly agrees with the reduction according to features (a) and (b). However, A1 discloses a net-to-gross ratio of the unworn tread which was higher than the range claimed in feature (a), and A1 provided structural means different from those specified in feature (c) to arrive at the claimed range according to feature (b). Moreover, the mere fact that the claimed ranges according to features (a) and (b) only differ by 7% cannot speak against inventiveness of the subject-matter of claim 1.

2.5 The appellant also alleges that claim 1 does not define any specific parameter in respect of the relative position of the obstructed grooves on both sides of the equatorial plane. Allegedly, in order to solve the problem posed, the distribution of obstructed grooves on both sides of the equatorial plane was an essential element that was missing in claim 1 as granted. This allegation relates to the clarity - in particular the broadness - of the subject-matter of granted claims, which does not form part of the grounds for opposition and therefore cannot be objected to in opposition proceedings.

2.6 Feature (a) specifies the unworn tread and thus a starting point for the optimisation which the invention tries to achieve. A1 only discloses a specific example having a net-to-gross ratio of the unworn tread of 73% so that feature (a) is not known from A1. New tires having a net-to-gross ratio range of 60-70%, which is very close to the range of 62-68% specified in feature (a), might be known from A7, so that feature (a) on its own would not contribute to the inventiveness of the claimed subject-matter. However, it still has to be assessed whether the combination of features (b) and (c) is obvious in view of the known prior art. Since feature (c) specifies the structural characteristics of the tire for achieving a reduction in the net-to-gross ratio of the worn tread lying in the range of 50-55%, as specified by feature (b), features (b) and (c) are interrelated. Moreover, the board finds that also feature (a) is connected to features (b) and (c), because the tire as claimed is expected to provide a compromise in behaviour between the unworn and the worn state of the tire.

A1 shows (see Figures 8 and 9) at least two tread patterns appearing successively at different levels of tire wear. However, the appellant's argument that in view of the teaching of A1 feature (b) might reasonably be expected or inevitably reproduced (when starting from a net-to-gross ratio range of 62-68%, as suggested e.g. by A7) does not take into account feature (c), which specifies the structural features provided in the tire's tread in order to realise feature (b) and which does not inevitably result from the teachings of A1 and A7. With same reasoning, even assuming that the appellant's calculation on the basis of the exemplary tire of A1 (leading to a 11% reduction in net-to-gross ratio for the worn tire) were acknowledged, the skilled person is still not prompted to realise feature (c). As explicitly said in A1 (see paragraph [0043]), these calculations for a tire of dimension 175/70R13 showing a net-to-gross ratio of 73% of the unworn tread relate to a tire having a tread pattern as represented in Figures 1 and 2. In this embodiment, the worn tire shows one additional circumferential groove opening on each side of the equatorial plane and further a plurality of grooves which extend laterally towards the outside of tread. Therefore, the board cannot see why the skilled person would be motivated to provide instead at least two additional circumferential groove voids on each side of the equatorial plane when the tread is worn. According to the explicit teaching in A1 (see paragraph [0044]) in this respect to keep constant the volume of the groove ratio in comparison to the new tire, this would require to replace the laterally extending groove voids in this embodiment by at least one circumferential groove void, which would lead to a totally different tread pattern and is found not to be an obvious modification. There might be indications in A1 to arrive at a range of the net-to-gross ratio of

the worn tread which falls into the range according to feature (b), but not in connection with a tread pattern as specified by feature (c).

Feature (c) is neither disclosed nor derivable from the drawings of A1. As argued above, Figure 2 only shows one circumferential groove (171, 181) on each side of the equatorial plane which appears after partial wear, whereas further grooves open laterally towards the outside of the tread (as represented in more detail in the sectional views according to Figures 3A, 3B). Figure 4 only shows a variant of the embodiment described in relation to Figure 3A (see paragraphs [0036] and [0037]), and further variants are disclosed in Figures 5 to 9 which also represent (as explicitly stated in paragraph [0046]) sectional views in a plane perpendicular to the axis of rotation of the tire, i.e. showing groove voids which only extend laterally towards the outside of the tread. The appellant also refers to paragraph [0079] in A1, which relates to modifications of the molding tool as disclosed in Figure 10 and comprises (see Figure 11) three fingers to define a groove void and two sip voids as depicted in Figures 1 to 3, i.e. having an orientation laterally towards the outside of the tread. The board cannot see any indication in these figures that the skilled person would contemplate realising additional circumferential grooves.

Paragraph [0079] in A1 might also suggest to provide more than one additional circumferential groove void. However, there is no teaching in A1 to support the appellant's allegation that at least two additional groove voids on each side of the equatorial plane, as required by feature (c), were implicitly disclosed. Moreover, it is not considered obvious to provide a

total number of at least four circumferential groove voids, two of them on each side of the equatorial plane, when starting from the tire of A1. The patent specification (see paragraph [0004]) as well as A1 (paragraph [0006] ff) emphasise the compromise in the tread pattern between stiffness and wet driving performance. Since all embodiments of tires described in A1 (see Figure 1-9, as stated above) only show one circumferential groove void provided in each of the two central rows of tread blocks on each side of the equatorial plane, which appear in the worn tread together with further laterally extending grooves, the board is not convinced that the skilled person would deviate from these known tread pattern and arrive in an obvious manner at the subject-matter of claim 1. Moreover, providing additional circumferential groove voids without further modifying the tire embodiments known from A1, in particular as regards the laterally extending groove voids already provided in A1, might be detrimental to the tire's stiffness and rigidity and thus affect driving performance and stability.

2.7 Document A7 was cited to show a range of the net-to-gross ratio of the unworn tire tread according to feature (a). Apart from that, A7 does not provide any information in respect of the worn tire tread.

Moreover, the reasoning given so far with regard to A1 in combination with A7 also applies to a combination of A1 with A3, because A3 only shows a net-to-gross ratio of the unworn tire of 50-80% without mentioning any groove voids to appear in the worn tread.

A8 shows (see embodiment of Figures 2 and 3) one additional circumferential groove opening in the equatorial plane and a reduced net-to-gross ratio at

30% wear level. Therefore, the board cannot see that additional information should be derivable from A8 which was not yet suggested by A1 and would motivate the skilled person to arrive at features (b) and (c).

A4 shows (Figure 2) two buried grooves on each side of the equatorial plane so that the net-to-gross ratio of the worn tire tread is reduced, but no explicit values of the net-to-gross ratio of the unworn or worn tire tread as required by features (a) and (b). A4 might suggest the formation of two additional circumferential grooves on both sides of the equatorial plane as required by feature (c), but for a tread pattern which does not show laterally extending groove voids as known from A1. The appellant has not provided convincing arguments why the skilled person would seriously consider applying the teaching of A4 to a tire tread as known from A1 and also realise features (a) and (b).

2.8 It follows from the foregoing the subject-matter of claim 1 as granted involves an inventive step in view of A1 in combination with A7 or A3 or A8 or A4.

3. Even assuming that the skilled person would start from a tread pattern as known from A7, which already shows a value of the net-to-gross ratio of the unworn tire tread (60-70%) close to the range specified in feature (a), there is no motivation to arrive at the additional features (b) and (c).

The appellant alleges lack of inventive step in view of the teaching of document A1 when trying to compensate for the reduced groove volume in the worn tire. However, as argued already above, the board cannot see that A1 - even taking into account the teaching of paragraph [0079] - suggests to provide at least two

additional circumferential grooves on each side of the equatorial plane when the tread is worn, as required by feature (c). Moreover, the board was not convinced that a reduction in net-to-gross ratio due to the formation of additional grooves in the worn tire - as allegedly known from A1 - would lead to a range as specified in feature (b).

Irrespective of whether this new line of argument was presented for the first time in appeal during the oral proceedings and might change the factual framework of the appeal proceedings, it cannot challenge the inventiveness of claim 1 as granted.

4. Starting from document A2 as the closest prior art, features (a), (b) and (c) of claim 1 as granted are not known from A2. Contrary to the appellant's allegation, feature (c) is not the sole distinguishing feature over A2. The schematic drawings in A2 might be similar to the drawings of the contested patent, but schematic drawings cannot form the basis for deriving directly and unambiguously a net-to-gross ratio of the unworn tread in the range of 62-68% and a net-to-gross ratio of the worn tread in the range of 50-55%, as required by features (a) and (b).

As argued above, feature (a) might be obvious at least in view of A7. The tread pattern of the unworn tread in A2 is similar to the tread pattern of A7 which also shows four circumferential grooves in the unworn tread, so feature (a) cannot establish inventiveness of the subject-matter of granted claim 1. However, the board finds that it is not obvious to arrive at the combination of features (b) and (c) in view of the cited prior art.

A2 discloses (see Figures 1 to 4) a center tread element row which, upon wear of the tread, is divided into smaller rows due to the presence of either one central circumferential groove void in the unworn tread or two circumferential groove voids provided to both sides of the equatorial plane. According to the description (see paragraph [0008]), the tread has "at least one circumferential or lateral groove", and a groove void is created in a wearable filler element which is located in the radially outer portion of the circumferential or lateral groove. However, the board cannot see that this passage forms a sound basis for the skilled person to contemplate providing two additional circumferential grooves on both sides of the equatorial plane when the tread is worn, as required by feature (c).

Documents A4 or A6 show at least two groove voids on both sides of the equatorial plane which become exposed when the rubber outside these cavities is worn through. The board already doubts that the tread patterns as known from A4 or A6 are compatible with the tread pattern shown in A2, which shows a different structure in the edge portion comprising pronounced laterally extending sipes and grooves. Even assuming that the skilled person would consider these documents, he might arrive at feature (c). However, the board finds it purely speculative to assume that the skilled person would contemplate at the same time a range of 62-68% for the unworn tread on the basis of his knowledge or, ignoring the teaching of A1 (which shows a value of 73%), on the basis of the teaching of A7 (which also shows a different tread pattern than A4, A6) in combination with a net-to-gross ratio in the range of 50-55% for the worn tread. Neither A4 nor A6 provides any indication for the skilled person to choose the

ranges claimed. It is not sufficient to argue, as done by the appellant, that nothing prevents the skilled person from choosing such ranges.

5. Since the appellant's arguments with respect to documents A12 to A15 filed with the grounds of appeal have been considered and not contested in the reasons given above, the issue of admittance of these documents into the appeal proceedings can be left open.

6. It follows from the above considerations that the subject-matter of claim 1 as granted involves an inventive step (Article 56 EPC). Similar considerations apply also in respect of dependent claims 2-5.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Vottner G. Pricolo

Decision electronically authenticated