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Datasheet for the decision of 21 January 2015

Case Number: T 2424/11 - 3.3.03

Application Number: 04103512.2

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Title of invention:
A rubber composition containing nanoscaled zinc oxide particles

Patent Proprietor:
The Goodyear Tire & Rubber Company

Opponent:
Continental AG

Relevant legal provisions:
EPC R. 99(1)(c)
EPC Art. 83, 54, 56

Keyword:
Admissibility of appeal - (yes)
Sufficiency of disclosure - (yes)
Novelty - (yes)
Inventive step - (no)

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Case Number: T 2424/11 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 21 January 2015

Appellant: (Opponent)	Continental AG Vahrenwalder Str. 9 D-30165 Hannover (DE)
Representative:	Finger, Karsten Continental Aktiengesellschaft Patente und Lizenzen Postfach 169 30001 Hannover (DE)
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:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 9 September 2011 concerning maintenance of the European Patent No. 1505115 in amended form.**

Composition of the Board:

Chairman	B. ter Laan
Members:	D. Marquis
	C. Brandt

Summary of Facts and Submissions

I. The appeal by the opponent lies from the decision of the opposition division posted on 6 September 2011 maintaining European patent N° 1 505 114 (based on application number 04 103 512.2) in amended form.

II. An opposition against the patent was filed in which the revocation of the patent was requested on the grounds according to Article 100(a) EPC (lack of novelty and lack of inventive step) and Article 100(b) EPC.

III. By a decision posted on 6 September 2011, the opposition division maintained the patent in amended form on the basis of the auxiliary request filed during the oral proceedings which contained 9 claims of which independent claims 1, 5, 6, 7, 8 read as follows:

"1. A tire having a tread comprising a rubber composition, the rubber composition comprising:
(a) 100 parts by weight of at least one rubber containing olefinic unsaturation,
(b) 1 to 250 phr of a filler, and
(c) 0.1 to 1.5 phr of zinc oxide particles having a mean diameter of less than 20 nanometers."

"5. A tire having a tread comprising a sulfur-vulcanized rubber composition which has been prepared by heating a rubber composition to a temperature ranging from 100°C to 200°C in the presence of a sulfur-vulcanizing agent, the rubber composition comprising:
(a) 100 parts by weight of at least one rubber containing olefinic unsaturation,
(b) 1 to 250 phr of a filler, and
(c) 0.1 to 1.5 phr of zinc oxide particles having a

mean diameter of less than 20 nanometer."

"6. A method of processing a rubber composition, the method comprising the steps of:
(i) mixing 1 to 250 phr of a filler with 0.1 to 1.5 phr of zinc oxide particles having a mean diameter of less than 20 nanometer, and
(ii) mixing said mixture with 100 parts by weight of at least one rubber containing olefinic unsaturation."

"7. A method of processing a rubber composition, the method comprising the steps of:
(i) mixing a processing additive with 0.1 to 1.5 phr of zinc oxide particles having a mean diameter of less than 20 nanometer, and
(ii) mixing said mixture with a second mixture comprising of 1 to 250 phr of a filler and 100 parts by weight of at least one rubber containing olefinic unsaturation."

"8. A method of processing a tire tread rubber composition, the method comprising the steps of:
(i) preparing a masterbatch comprising 0.1 to 1.5 phr of zinc oxide particles having a mean diameter of less than 20 nanometer and at least one polymer,
(ii) mixing said masterbatch with a mixture comprising 100 parts by weight of at least one rubber containing olefinic unsaturation and 1 to 250 phr of a filler."

Claims 2 to 4 were directed to preferred embodiments of claim 1. Claim 9 was directed to preferred embodiments of claims 6, 7 and 8.

IV. The decision was based *inter alia* on the following documents:

D1: "a Study of the Application of Nano zinc Oxide in Tire Rubber", Yu Yong, Shanxi Fenghai Nano Science and Technology Co. Ltd., Taiyuan (2002), 22(12), 729-732.
D4: CN-1386788
D7: US-A-6 225 397
D8: DE-A-1 299 419

In the decision it was held that the claims as granted were sufficiently disclosed and were novel in view of D1 and D4 because those documents did not disclose a tire tread. The opposition division also found that although claims 1, 5, 6 and 7 as granted were inventive, claim 8 did not comply with the requirements of Article 56 EPC because the distinguishing feature of claim 8 over the closest prior art D4, the particle size of zinc oxide of less than 20 nanometer, was obvious from D4. The auxiliary request met the requirements of Articles 84, 123(2) and Rule 80 EPC. Due to the amendment made in claim 8 (addition of "tire tread") the subject-matter of the auxiliary request was inventive over D4 because the teaching of D4 did not lead the person skilled in the art to the preparation of tire treads.

V. On 4 November 2011, the opponent (appellant) lodged an appeal against the decision of the opposition division. The notice of appeal was worded as follows: "Hiermit legt die Continental AG Beschwerde gegen die von der Einspruchsabteilung getroffene Entscheidung ein. Eine entsprechende Beschwerdebegründung wird fristgerecht nachgereicht.".

The statement setting out the grounds of the appeal was filed on 6 January 2012. It included four further documents. The opponent requested the revocation of the

patent on the grounds of lack of sufficiency of disclosure, lack of novelty and lack of inventive step.

VI. By letter dated 15 Mai 2012, the patent proprietor (respondent) filed a reply to the statement of grounds of the appeal. The admissibility of the appeal was contested. As main request the dismissal of the appeal was requested. Also a first and a second auxiliary request were filed. The first auxiliary request contained 9 claims, of which independent claim 1 was identical to claim 1 of the main request. The second auxiliary request contained 8 claims, of which independent claim 1 read as follows:

"1. A tire having a tread comprising a rubber composition, the rubber composition comprising:
(a) 100 parts by weight of at least one rubber containing olefinic unsaturation,
(b) 1 to 250 phr of a filler, and
(c) 0.1 to 1.5 phr of zinc oxide particles having a mean diameter of less than 12 nanometers."

VII. In preparation of oral proceedings a communication was issued, setting out the preliminary opinion of the Board regarding the admissibility of the appeal as well as Articles 83, 54 and 56 EPC.

VIII. By letter of 9 December 2014, the respondent submitted arguments concerning the basis for the modifications made in the auxiliary requests.

IX. Oral proceedings were held on 21 January 2015. During the oral proceedings, the respondent filed a third and a fourth auxiliary request. After discussion, the third auxiliary request was withdrawn. The fourth auxiliary

request contained 2 claims, of which independent claim 1 read as follows:

"1. A method of processing a tire tread rubber composition, the method comprising the steps of:
(i) preparing a masterbatch comprising 0.1 to 1.5 phr of zinc oxide particles having a mean diameter of less than 20 nanometer and at least one polymer,
(ii) mixing said masterbatch with a mixture comprising 100 parts by weight of at least one rubber containing olefinic unsaturation and 1 to 250 phr of a filler."

X. The appellant's arguments may be summarised as follows:

Admissibility of the appeal

Even if the notice of appeal did not contain the word "request" *expressis verbis*, it was clear that the revocation of the patent was sought. The appeal was therefore admissible.

Main, first and second auxiliary requests

Novelty

D1 (implicitly) disclosed all the features now being claimed. The compositions of D4 had ranges overlapping with those being claimed and they were suitable for treads. Therefore, the claimed subject-matter was not novel.

Inventive step

D8 was the the closest prior art. Starting from that document, the technical problem was to reduce the amount of zinc oxide without impairing the

vulcanization properties of the rubber compositions used in tire treads. The terms "zinc containing silica" and "zinc oxide containing silica" used in the examples of D8 were equivalent. D8 taught that the amount of zinc oxide had to be reduced as it had a negative impact on vulcanization. In order to solve that problem the person skilled in the art would arrive at the claimed subject matter in view of D1, which disclosed that the amount of zinc oxide could be reduced by 50% when zinc oxide with a particle size smaller than 20 nm was used in the rubber compositions. D4 also provided the solution to the problem as it suggested to use 1 to 3 phr of zinc oxide with a particle size of 10 to 80 nm. Both ranges overlapped the claimed ranges of amount and particle size of the zinc oxide. Claim 1 was therefore an arbitrary selection within the ranges already known from D4.

Fourth auxiliary request

Inventive step

D4 was the closest prior art since it referred to masterbatches. Example 2 disclosed a masterbatch containing zinc oxide with a particle size of 10 to 40 nanometers. The problem to be solved was to reduce the amount of zinc oxide present in the rubber composition without impairing its vulcanisation properties. The abstract of D4 alone provided a motivation to use zinc oxide nanoparticles in an amount of 1 to 3 phr. D1 also taught to reduce the amount of zinc oxide to improve vulcanization. Also D7 hinted at the use of nanoparticle materials in rubber compositions. The fourth auxiliary request therefore lacked an inventive step over D4 alone, D4 and D1 or D4 and D7.

XI. The respondent's arguments may be summarised as follows:

Admissibility of the appeal

The notice of appeal of the opponent did not contain a clear request and therefore did not define the framework of the appeal proceedings, contrary to the requirements of Rule 99(1)(c) EPC. Also, the statement of grounds of the appeal did not clearly set out the object against which the appeal was filed. For those reasons, the appeal was not admissible.

Main, first and second auxiliary requests

Novelty

Neither D4 nor D1 clearly and unambiguously disclosed all the claimed features so that the claimed subject-matter was novel.

Inventive step

The closest prior art was D8 because it disclosed a rubber composition for a tire tread. D8 did not disclose zinc oxide with a particle size below 20 nanometer. Example III of D8 explicitly disclosed a composition for a tire tread. That composition however contained 2 phr of a zinc containing silica and did not contain zinc oxide. The other examples of D8 comprised zinc oxide in an amount outside the claimed range. The problem to be solved was to reduce the health risks caused by the release of zinc oxide through tire abrasion, without impairing the vulcanization of the rubber compositions. Although D8 taught to reduce the amount of zinc oxide in the rubber compositions, it did

not lead the person skilled in the art towards zinc oxide with a particle size below 20 nm. D1 did not disclose tire treads so that it did not render the claimed subject matter obvious. D4 did not suggest that both the amount of zinc oxide and its particle size had to be in the claimed range. On the contrary, it taught away from combining low amounts of zinc oxide with a small particle size. Also, the examples of D4 hinted at a higher amount of zinc oxide when its particle size was small. Claim 1 was therefore inventive.

The respondent did not provide separate arguments for the first and second auxiliary requests.

Fourth auxiliary request

Inventive step

D4 was the closest prior art. The problem was to provide an alternative preparation distinguished by good dispersion and processability, as indicated in paragraph [0036] of the patent in suit. In order to arrive at the subject matter of present claim 1, the zinc oxide had to be modified in two aspects, namely its particle size and its amount. D4 did not disclose tire treads, nor did D4 disclose the use of less than 1.5 phr of zinc oxide or suggest its use in rubber compositions for tire treads. Claim 1 was therefore inventive over D4. D1 did not contain any teaching in the direction of the claimed subject-matter and D7 did not refer to silica, so it was even further away. Therefore, also a combination of D4 with D1 or D7 did not render the claimed subject-matter obvious.

XII. The appellant requested that the decision under appeal be set aside and that European patent No. 1 505 115 be revoked.

The respondent requested that the appeal be dismissed, or, alternatively, that the patent be maintained in amended form on the basis of any of the First or the Second Auxiliary Request, filed with letter dated 9 December 2014, or on the basis of the Fourth Auxiliary Request, filed during the oral proceedings on 21 January 2015.

XIII. The Board announced its decision at the end of the oral proceedings.

Reasons for the Decision

1. Admissibility of the appeal

The notice of appeal filed by the opponent does not explicitly contain a request defining the subject of the appeal. However, having regard to the opponent's request before the opposition division that the patent be revoked in its entirety, to the tenor of the impugned decision according to which the patent was maintained in amended form, and to the fact that the appeal was filed against that decision ("...gegen die von der Einspruchsabteilung getroffene Entscheidung..."), it is implicit that with the notice of appeal the appellant requested that the decision under appeal be set aside and that the patent be revoked in its entirety. For this reason the notice of

appeal meets the requirements of Rule 99(1)(c) EPC and is admissible.

Main request

2. Sufficiency of disclosure

2.1 In its statement of grounds of the appeal the appellant had maintained its objection of lack of sufficiency of disclosure. In its communication the Board had indicated that it considered the requirements of Article 83 EPC to be fulfilled. The appellant did not give any further arguments regarding that issue during the oral proceedings so that the Board sees no reason to change its preliminary opinion. In view of the negative outcome regarding inventive step, it is not necessary to elaborate any further on the issue of sufficiency.

3. Novelty

3.1 D1 describes the application of nano zinc oxide in the formula of tire rubber (Abstract). D1 does not disclose the total amount of rubber present in the compositions so that it does not appear to be possible to determine whether the compositions contain 0.1 to 1.5 phr of zinc oxide particles (in paragraph [0014] of the patent in suit defined as "parts by weight of a respective material per 100 parts by weight of rubber, or elastomer."). D1 also does not disclose the mean particle diameter of the zinc oxide particles introduced in the rubber compositions so that it cannot be determined whether they have a mean diameter as set out in the present claims. Therefore, D1 does not disclose a tire having a tread comprising a rubber composition according to the present claims.

3.2 D4 describes rubber containing nano zinc oxide, including rubber based body, vulcanizing agent, accelerating agent, antioxidant and zinc oxide as vulcanizing activator, wherein the the zinc oxide particle diameter is 10 to 80 nm and its content is 1 to 3 parts per 100 parts rubber in weight (claim 1). In particular, D4 (page 7) discloses compositions comprising 100 parts of rubber, 20 to 60 parts of calcium carbonate as a filler and 1 to 3 parts of zinc oxide of a particle diameter of 10 to 80 nm. A double selection is therefore necessary in order to arrive at the claimed subject matter. D4 also discloses a two-step preparation of a masterbatch (passage bridging pages 7 and 8) in which the ratio of rubber to zinc oxide is between 90/10 and 95/5, so that the amount of zinc oxide in the masterbatch is at least 5 phr, which is above the claimed range of 0.1 to 1.5 phr of present claim 8. Although the ratios are given, it is not clear from that passage in D4 how much rubber is actually used in the preparation of the masterbatch (step 2) and the total composition (step 3) and if the total amount of rubber corresponds to that indicated on page 7. Also, the mean particle size of the nano zinc oxide used in the masterbatch preparation is not disclosed.

3.3 In view of the above, the claimed subject-matter is novel.

4. Inventive step

4.1 The closest prior art

4.1.1 The patent in suit seeks to reduce the content of zinc oxide in rubber compositions used in the production of

tires, without impairing their curing/vulcanization (paragraph [0007]).

4.1.2 D8, which is cited in paragraph [0006] of the patent in suit, aims at reducing the amount of zinc oxide in rubber compositions used in tires, in particular in tire treads, because of the negative properties of zinc oxide on the vulcanization process (column 1, lines 12 to 16 and 30 to 34; column 2, lines 17 to 24). Since D8 addresses the same problem as the patent in suit, it can be considered to be the closest prior art, as was the view of both parties as well as the opposition division.

4.2 The problem

4.2.1 D8 describes a process for producing vulcanised rubber compositions using zinc oxide containing silica by mixing a previously prepared addition product of zinc oxide with silica in an amount of at least 5 wt.% with the other usual components and then vulcanising the mixture in the absence of free zinc oxide (claim 1; column 1, lines 35 to 42). The examples disclose a rubber composition comprising 40 parts (example III) or 20 parts (example V) of a silica containing 5 % zinc, or 40 parts (in example IV) of a silica containing 15 % zinc oxide. Although a different wording was used to describe the compound used in those examples - silica containing zinc and silica containing zinc oxide - from the context, in particular claim 1, column 2, lines 10 to 12, and the explanation of the examples in column 2, lines 26 to 44, it is clear that both wordings refer to zinc in its form as zinc oxide. The amounts of zinc oxide in the rubber compositions of representative examples III, IV and V can be calculated from the table on page 2 and are respectively 2 phr (example III), 6

phr (example IV) and 1 phr (example V). D8 therefore teaches that vulcanized rubber compositions can be obtained when zinc oxide in an amount of as low as 1 phr is used. In column 4, lines 29 to 33, it is further stated that the rubber composition of example III (containing 2 phr zinc oxide) is advantageously used for the production of car tire treads. The tire treads claimed in the patent in suit are characterized by an amount of zinc oxide of 0.1 to 1.5 phr, it can therefore be acknowledged that, starting from the composition according to example III of D8, which is specifically disclosed for use in tire treads and is therefore the closest to the patent in suit, an object of the patent in suit is the reduction of the amount of zinc oxide.

4.2.2 D8 describes the desirability of reducing the amount of zinc oxide because of its negative effect on the vulcanization process (see point 4.1.2 above). In the patent in suit (paragraphs [0032], [0034] and [0036]) it is stated that the vulcanization process was not affected by the presence of 0.1 to 1.5 phr of zinc oxide particles having a mean diameter of less than 20 nanometers. As the patent in suit does not contain any comparative examples with the compositions or tire treads of D8, it cannot be concluded that the claimed tire treads are improved over those of D8 in that respect. Since the vulcanization of compositions of D8 was already good, the fact that the vulcanization properties of the present rubber composition were not impaired cannot be seen as part of the problem solved by the present subject-matter.

4.2.3 Starting from the closest prior art D8, the technical problem that can be derived from the data provided in the patent in suit can therefore only be seen as to

provide a tire having a tread comprising a rubber composition with a reduced amount of zinc oxide.

4.3 The solution

4.3.1 The solution to the technical problem defined above resides in the rubber composition of present claim 1, in particular to the use of 0.1 to 1.5 phr of zinc oxide particles having a mean diameter of less than 20 nanometers (feature c), which it can be accepted effectively solves the problem defined above.

4.4 Obviousness

4.4.1 It remains to be decided whether the solution as defined in claim 1 was obvious in view of the prior art.

4.4.2 D8 teaches that the presence of zinc oxide in rubber compositions was known to impair their vulcanization (column 1, lines 12 to 16). Vulcanization processes were developed to reduce the amount of zinc oxide to as low as 1.5 weight% and lower. Those processes however resulted in a deterioration of the mechanical properties of the vulcanized rubber (column 1, lines 21 to 29). D8 aimed at using sufficient amounts of zinc oxide as an essential part of the vulcanization system but to avoid the negative impact of zinc oxide on the vulcanization process (column 1, lines 10 to 34). To that effect, D8 proposes the use of an addition product of zinc oxide and silica (column 2, lines 3 to 25). The examples of D8 disclose that rubber compositions containing 2 phr of zinc oxide can advantageously be used in tire treads (column 4, lines 29 to 33) and a further composition with an amount of zinc oxide of as low as 1 phr (example V) was also produced. D8

therefore provides an incentive to reduce the amount of zinc oxide in tire tread rubber compositions.

4.4.3 D1 is a study of the application of nano zinc oxide in tire rubber compositions. The object of D1 was to reduce the amount of zinc oxide in tire rubber compositions (page 7, first paragraph). D1 teaches that the amount of zinc oxide in rubber compositions can be reduced down to a range of 1.5 to 2 phr when it is in the form of particles of a diameter of 20 nm or smaller (page 6, paragraph 2, last two lines) and that such a reduction of the amount in zinc oxide does not lead to a deterioration of the mechanical properties of the vulcanized rubber (page 7). The person skilled in the art therefore finds in D1 an alternative solution to that used in D8 in order to reduce the amount of zinc oxide in rubber compositions, namely the use of zinc oxide particles with a particle size of 20 nm or smaller. Starting from D8 and aiming at a reduction of the amount of zinc oxide, the skilled person would therefore use zinc oxide with a particle diameter of less than 20 nm in an amount of as low as 1.5 phr to provide a tire having a tread comprising a rubber composition with a reduced amount of zinc oxide. As a consequence, the subject-matter of claim 1 of the patent in suit does not involve an inventive step.

4.5 Therefore, the main request does not fulfil the requirements of Article 56 EPC.

First auxiliary request

5. Inventive step

5.1 Claim 1 of the first auxiliary request is identical to claim 1 of the main request so that the reasoning and

the conclusion reached on the inventive step of the main request apply to the first auxiliary request.

Second auxiliary request

6. Modifications

6.1 Claim 1 of the second auxiliary request differs from claim 1 of the main request in that the mean diameter of the zinc oxide particles is less than 12 nm instead of less than 20 nm, as present in claim 2 as originally filed and as granted. That modification does not contravene the requirements of Article 123(2) and (3) EPC.

7. Inventive step

7.1 The modification of the upper limit of the range of the mean diameter of the zinc oxide particles to less than 12 nm in claim 1 is disclosed in paragraph [0012] of the patent in suit but is nowhere demonstrated to be associated with any particular technical effect alone or in combination with a specific amount of zinc oxide, which was undisputed by the respondent. The problem defined above for the main request therefore also applies to the subject matter of claim 1 of the second auxiliary request.

7.2 The use of zinc oxide particles with a mean diameter of less than 12 nm in vulcanizable rubber compositions for tires was however already known from D1 (10 to 20 nm on page 1, second paragraph) so that it was readily usable in the tire tread compositions of D8. The choice of a mean diameter of zinc oxide particles below 12 nm is therefore obvious in view of D8 in combination with D1.

7.3 Therefore, the second auxiliary request does not fulfil the requirements of Article 56 EPC.

Fourth auxiliary request

8. Inventive step

8.1 The closest prior art

8.1.1 Claim 1 of the fourth auxiliary request describes a method of processing a tire tread rubber composition. It only contains steps relating to the preparation of a rubber composition - involving the preparation of a zinc oxide containing masterbatch. Claim 1 is therefore interpreted as pertaining to a method for the preparation of a rubber composition that is suitable for the production of tire treads, in line with the fact that claim 1 does not specify any steps for the preparation of a tire tread.

8.1.2 D4 discloses the preparation of rubber compositions involving a zinc oxide containing masterbatch (page 8). Both parties considered D4 as the closest prior art document for the assessment of the inventive step of the fourth auxiliary request and the Board sees no reason to take a different view.

8.2 The technical problem

8.2.1 The process of D4 consists, in a first step, of the preparation of a composition of zinc oxide treated with a solution of silane coupling agent in which the zinc oxide has a particle size between 10 and 80 nm (page 7 and claim 1). A masterbatch is then obtained by admixture of rubber with the treated nano zinc oxide obtained in the first step (page 8, step 2). That

masterbatch is incorporated in a composition of 100 parts of rubber, 20 to 60 parts of calcium carbonate as filler, sulfur and additional agents in a third step. The resulting composition contains between 1 and 3 parts of the nano zinc oxide (page 7, second paragraph , page 6, last paragraph and claim 1). The nano zinc oxide containing rubber compositions are then vulcanized (examples). D4 also discloses that the use of zinc oxide with a particle size below 100 nm provides satisfying vulcanization (passage bridging pages 5 and 6). From the information contained in the patent in suit, it appears that the rubber compositions only have to be vulcanized in order to be suitable for tire treads as no special requirement concerning the rubber compositions or their properties are set out for that specific application. Hence, the rubber compositions resulting from the process of D4, which are vulcanizable, can be considered as being suitable for the production of a tire tread.

8.2.2 Paragraph [0036] of the patent in suit which refers to the masterbatch process of claim 1 states that a considerable reduction of zinc oxide in the rubber composition was possible without negative impact on the vulcanization of the rubber compositions. However, the amount of zinc oxide of 1 to 3 phr disclosed in D4 (page 7) overlaps the claimed amount of of 0.5 to 1.5 phr. Therefore, the claimed method entails no reduction of zinc oxide.

8.2.3 Since the patent in suit does not provide any comparison of the process of claim 1 with that of D4, it cannot be concluded that the vulcanization processes in the patent in suit have better results than those of D4.

8.2.4 In view of the above, starting from D4, the technical problem to be solved by claim 1 of the fourth auxiliary request can only be seen as to provide a further method for processing a tire tread rubber composition.

8.3 The solution

8.3.1 The solution to the problem defined above resides in the method of claim 1 and in particular in the use of zinc oxide particles having a mean diameter of less than 20 nanometers (feature i). Based on the description paragraphs [0035] and [0036], the contents of which were not contested by the appellant, the Board is satisfied that the technical problem is solved.

8.4 Obviousness

8.4.1 It remains to be decided whether the solution to the technical problem was obvious in view of the prior art.

8.4.2 The rubber compositions of D4 are considered to be suitable for the production of tire treads (see point 8.2.1 above). D4 discloses that zinc oxide was conventionally used in rubber compositions in an amount of ca 5 phr, which led to a deterioration of the mechanical properties of the vulcanised rubber composition. D4 teaches that vulcanized rubber compositions with satisfying mechanical properties can be obtained when 1 to 3 phr of zinc oxide with a particle diameter of 10 to 80 nm is used as a vulcanization activator (page 6, last paragraph). The examples of D4 illustrate that teaching with several different ranges of particle size and amounts of zinc oxide. These examples however differ significantly from one another, in particular in the types and amounts of rubber and filler used in the compositions. As a result

no conclusion can be drawn from those examples as to the combination of ranges of particle size and amounts of zinc oxide. Even if the examples of D4 seem to disclose higher amounts of zinc oxide in combination with the smallest ranges of particle size, this cannot be seen as a representative general teaching of D4. Contrary to the respondent's allegations, it can therefore not be concluded that the examples of D4 teach away from the use of low amounts of small particle size zinc oxide. Also, the patent in suit contains no information that the use of 0.1 to 1.5 phr zinc oxide particles of less than 20 nm led to any advantage over the ranges disclosed in D4. Therefore, when looking for a further method to that of D4, the skilled person would, on the basis of the information of D4 alone, contemplate to use the claimed combination. Claim 1 of the fourth auxiliary request is therefore obvious.

8.4.3 In view of the above, it has to be concluded that the fourth auxiliary request does not fulfil the requirements of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. European patent No. 1 505 115 is revoked.

The Registrar: The Chairman:

B. ter Heijden B. ter Laan

Decision electronically authenticated