Appeal decision

Appeal No. 2014-8720

Tokyo, Japan
Appellant BRIDGESTONE CORPORATION

Tokyo, Japan
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The case of appeal against the examiner's decision of refusal for Japanese Patent application No. 2011-511476, entitled "TIRE" [International Publication filed on November 4, 2010 as WO2010/126144] has resulted in the following appeal decision.

Conclusion

The appeal of the case was groundless.

Reason

No. 1 History of the procedures

The present application is an application with an international filing date of April 30, 2010 (claiming priority with dates of April 30, 2009, JP), for which a notice of reasons for refusal was issued on August 2, 2013, a written opinion and a written amendment were submitted on October 9, 2013, and the examiner's decision of refusal was issued on March 5, 2014. In response, a notice of appeal against the decision of refusal was filed on May 12, 2014, together with a written amendment for the purpose of clarification of an ambiguous description.

No. 2 The Invention

The inventions according to Claims 1 to 22 of the present application should be specified in the matters recited in Claims 1 to 22 of the claims that have been amended by the written amendment on May 12, 2014. The invention according to Claim 1 (hereinafter referred to as "the Invention") is set forth as below:

"A pneumatic tire, comprising turbulent-flow-creating projections extending from an inner circumference side to an outer circumference side, the turbulent-flow-creating projections being provided for a tire surface of a tire side portion at intervals in a circumferential direction of the tire, wherein: the turbulent-flow-creating projections

each have an edge portion when viewed in a section in a radial direction, and front wall surfaces thereof on which an airflow impinges each form a front wall angle in a range of 70° to 110° with respect to the tire surface; and
a rubber composition obtained by compounding 100 parts by mass of rubber components containing 10 mass% or more of a modified conjugated diene-based polymer, which is obtained by introducing a primary amino group or a precursor capable of producing a primary amino group through hydrolysis to a terminal of a conjugated diene-based polymer through a modification reaction between the terminal and an alkoxysilane compound having the primary amino group or the precursor capable of producing a primary amino group through hydrolysis, and adding a condensation-accelerating agent to the modification reaction system in the middle of and/or after completion of the modification reaction, with 10 to 100 parts by mass of carbon black having a nitrogen adsorption specific surface area of 20 to 90 m^2/g is used in a side-reinforcing rubber for constituting the tire side portion."

No. 3 Reasons for refusal stated in the examiner's decision

The reason for refusal stated in the examiner's decision is the reason 1 for refusal in the notice of reasons for refusal on August 2, 2013. The following is the outline thereof: the inventions according to Claims 1 to 16 and 18 to 24 were easily conceivable by a person skilled in the art on the basis of the inventions described in Cited Documents 1 and 2, which had been distributed before the filing, and thus a patent cannot be granted to the invention under the provision of Article 29(2) of the Patent Act.

Further, Cited Document 1 is Japanese Unexamined Patent Application Publication No. 2009-29404 (hereinafter referred to as "Publication 1") and Cited Document 2 is International Publication No. 2008/114668 (hereinafter referred to as "Publication 2").

No. 4 Judgment by the body

As reasons for refusal stated in the examiner's decision, the body determines that a person skilled in the art could have easily conceived of the Invention on the basis of the invention described in Publications 1 and 2, and thus a patent cannot be granted to the invention under the provision of Article 29(2) of the Patent Act. The reason is set forth as below.

1 Described matters in Publication

A Publication 1

(1a) "[Scope of claims]

[Claim 1]

A pneumatic tire provided with a bead core, a carcass layer, a tread rubber layer, an inner liner, a side-reinforcing layer and a bead filler, the pneumatic tire using a rubber composition comprising 100 parts by mass of a rubber component (A) and 55 parts by mass or more of a carbon black (B), and having vulcanized rubber properties of a 100% elongation elastic modulus (M100) of 10 MPa or more and a Σ value of a loss tangent tan δ at 28°C to 150°C of 6.0 or less.

[Claim 2]

The pneumatic tire of Claim 1, wherein the carbon black (B) is selected from the group consisting of FEF grade, FF grade, HAF grade, ISAF grade, and SAF grade in the rubber composition.

[Claim 3]

The pneumatic tire of Claim 2, wherein the carbon black (B) is FEF grade.

[Claim 4]

The pneumatic tire of any one of Claims 1 to 3, wherein the rubber component (A) comprises an amine-modified conjugated diene-based polymer in the rubber composition.

...

[Claim 6]

The pneumatic tire of Claims 4 or 5, wherein the amine-modified conjugated diene-based polymer is a primary amine-modified conjugated diene-based polymer.

[Claim 7]

The pneumatic tire of Claim 6, wherein the primary amine-modified conjugated diene-based polymer is obtained by reacting a protected primary amine compound with an active terminal of a conjugated diene-based polymer.

...

[Claim 10]

The pneumatic tire of any one of Claims 7 to 9, wherein the protected primary amine compound is N,N-bis (trimethylsilyl) aminopropyltriethoxysilane.

[Claim 11]

The pneumatic tire of any one of Claims 1 to 10, wherein said rubber composition is used for a side-reinforcing layer." (the scope of the claims, Claims 1 to 4, 6, 7, 10, 11)

(1b) "[0001]

The present invention relates to a pneumatic tire with improved run-flat durability without compromising rolling resistance and ride in normal driving mode, using a rubber composition having vulcanized rubber properties of a 100% elongation elastic modulus of a certain value or more and a Σ value of a loss tangent tan δ at 28°C to 150°C of a certain value or less particularly for side-reinforcing layer and/or bead filler."

(1c) "[0002]

Conventionally, in a pneumatic tire, in a particular run flat tire, there is disposed a side-reinforcing layer made of rubber composition only or a composite of rubber composition and fibers for the improvement of rigidity of side wall parts. (see, e.g., Patent Document 1)

A pneumatic tire becomes deformed in a side wall or bead filler part of the tire and generates heat up to 200°C or more in some cases when running in a condition of a pressure inside the tire (hereinafter referred to as an inner pressure) being decreased due to blowout, a so-called run-flat running condition. In such a condition, even a pneumatic tire provided with a side-reinforcing layer may exceed the breakage limit of the side-reinforcing layer or the bead filler, and finally result in a tire breakage.

As means for delaying a time until the occurrence of such breakage, there is a method of suppressing deformation of a side-reinforcing layer or bead filler of a tire by compounding a high level of sulfur in a rubber composition to make a high-modulus rubber composition; however, this causes a problem of increasing rolling resistance of the tire in normal running mode and compromising low fuel consumption properties."

(1d) "[0006]

In such circumstances, the present invention can provide a pneumatic tire with improved run-flat durability without compromising rolling resistance and ride in normal driving mode."

(1e) "[0008]

The present invention can provide a pneumatic tire with improved run-flat durability without compromising rolling resistance and ride in normal driving mode, the pneumatic tire using a rubber composition having vulcanized rubber properties of a 100% elongation elastic modulus of 10 MPa or more and a Σ value of a loss tangent tan δ at 28°C to 150°C of 6.0 or less, particularly for a side-reinforcing layer and/or bead filler."

(1f) "[0010]

[Rubber composition]

The aforesaid pneumatic tire may use a rubber composition comprising 100

parts by mass of a rubber component (A) and 55 parts by mass or more of a carbon black (B), and having vulcanized rubber properties of a 100% elongation elastic modulus (M100) of 10 MPa or more and a Σ value of a loss tangent tan δ at 28°C to 150°C of 6.0 or less for the side-reinforcing layer 8 and/or bead filler 7.

(Rubber component (A))

The rubber component (A) of the rubber composition of the present invention may preferably be an amine-modified conjugated diene-based polymer where a conjugated diene-based polymer is modified with amine. Such amine-modified conjugated diene-based polymer may be contained in a proportion of 30 mass% or more, preferably 50 mass% or more. If the rubber component comprises 30 mass% or more of the above modified conjugated diene-based polymer, the obtained rubber composition becomes low-heat-generating, thereby providing a pneumatic tire with improved run-flat running durability."

(1g) "[0026]

<Condensation-accelerating agent>

In the present invention, a condensation-accelerating agent is preferably used for promoting condensation reaction in which an alkoxysilane compound having a protected primary amino group used for the aforesaid modifier is involved.

...

A condensation-accelerating agent used herein may be added prior to the aforesaid modification reaction, but is preferably added to the modification reaction system in the middle of or after the completion of the modification reaction. The addition prior to the modification reaction may sometimes result in a direct reaction with an active terminal and thus sometimes fail to introduce a hydrocarbyloxy group having a primary amino group protected by the active terminal.

The timing of the addition of condensation-accelerating agent is normally 5 minutes to 5 hours after the start of modification reaction, preferably 15 minutes to 1 hour after the start of the modification reaction.

...

[0031]

The condensation reaction of the present invention proceeds in the presence of the aforementioned condensation-accelerating agent and steam or water.

...

[0032]

In addition, the condensation reaction time is normally 5 minutes to 10 hours, preferably 15 minutes to 5 hours.

...

The primary amino group of the modified conjugated diene-based polymer of the present invention derived from a modifier may produce the aforesaid deprotection treatment. Preferable examples of the deprotection treatment other than desolvation treatment using steam such as the aforementioned steam stripping are fully discussed in the following.

Specifically, a protecting group on a primary amine is converted into a free primary amine through hydrolysis. This is subjected to desolvation treatment to obtain a modified conjugated diene-based polymer having primary amino group. In addition, a deprotection treatment of protected primary amino group derived from modifier can be implemented as necessary in any stage from the stage including the condensation treatment to the stage of desolvation treatment to obtain a dried polymer."

(1h) "[0036]

(Carbon black (B))

The rubber composition of the present invention is required to use 100 parts by mass of the aforesaid rubber component (A) and 55 parts by mass or more of carbon black (B). The preferable amount of carbon black is 55 to 70 parts by mass, more preferably 60 to 70 parts by mass. ..."

(1i) "[0047]

(Examples 1 to 4 and Comparative Examples 1 to 4)

There were prepared 8 kinds of rubber composition each having a composition as shown in the formulations A to H of Table 1, and respective vulcanization rubber properties were calculated; i.e., M100 and Σtanδ (28 to 150C).

Subsequently, these 8 kinds of rubber compositions were disposed in the side-reinforcing layer 8 and bead filler 7 of Figure 1, and radial tires for vehicles with tire sizes 215/45ZR17 were respectively manufactured in accordance with a conventional method. For these tires, run-flat durability and ride were evaluated. The results are shown in Table 1. Additionally, a maximum thickness of side-reinforcing layer was calculated as reinforced rubber gage and is shown in Table 1.

[0048]

【表１】

第１表

		実施例				比較例			
		1	2	3	4	1	2	3	4
配合組成（質量部）	配合	A	B	C	D	E	F	G	H
	天然ゴム[1]	30	30	50	30	30	30	80	30
	未変性ポリブタジエン[2]	−	−	−	−	70	−	−	−
	一級アミン変性ポリブタジエン[3]	70	70	50	−	−	70	20	70
	DMBTESPA変性ポリブタジエン[9]	−	−	−	70	−	−	−	−
	カーボンブラック[4]	60	65	65	60	60	50	65	75
	プロセスオイル[5]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	亜鉛華	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	ステアリン酸	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	老化防止剤6C[6]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	加硫促進剤DZ[7]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	加硫促進剤TOT[8]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	硫黄	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
補強ゴムゲージ (mm)		5.7	5.7	5.7	5.7	6.3	6.3	6.3	6.3
評価	100%伸張時弾性率(M100) (MPa)	11.2	11.9	12.0	11.3	10.7	8.8	12.5	15.9
	Σtanδ (28～150℃)	5.06	5.61	5.82	5.80	7.32	5.43	6.35	6.92
	ランフラット耐久性	165	175	170	149	100	95	135	145
	乗り心地性	7.5	7.0	7.0	7.5	7.0	7.5	6.5	5.5

[Table 1]

第１表　Table 1

実施例　Example

比較例　Comparative Example

配合組成（質量部）　Composition (parts by mass)

配合　Compounding

天然ゴム　Natural rubber

未変性ポリブタジエン　Unmodified polybutadiene

一級アミン変性ポリブタジエン　Primary amine-modified polybutadiene

ＤＭＢＴＥＳＰＡ変性ポリブタジエン　DMBTESPA　modified polybutadiene

カーボンブラック　Carbon black

プロセスオイル　Processed oil

亜鉛華　Zinc white

ステアリン酸　Stearic acid

老化防止剤６Ｃ　Age register inhibitor 6C

加硫促進剤ＤＺ　Vulcanization accelerating agent DZ

加硫促進剤 TOT　Vulcanization accelerating agent TOT
硫黄　Sulfur
補強ゴムゲージ　Reinforced rubber gage
評価　Evaluation
１００％伸張時弾性率（Ｍ１００）（ＭＰａ）　100% elongation elastic modulus (M100) (MPa)
ランフラット耐久性　Run-flat durability
乗り心地性　Riding comfort

[note]
1)　Natural rubber: TSR20
2)　Unmodified polybutadiene: BR01 manufactured by JSR Corporation
3)　Primary amine-modified polybutadiene: The one obtained in Manufacturing example 1
4)　Carbon black: FEF (N550), "Asahi #60", manufactured by ASAHI CARBON CO., LTD.
..."

B　Publication 2
(2a)　"[0001] The present invention relates to a pneumatic tire, particularly, a pneumatic tire capable of decreasing temperature in a tire side portion prone to occurrence of degradation."
(2b)　"[0002] In general, increase of a tire temperature in a pneumatic tire is considered unfavorable in terms of durability, since the increase accelerates time-dependent changes such as a change in material property, and leads to breakage of a tread portion and the like when the tire travels at high speed.　Decreasing a tire temperature has been a challenge for enhancing durability particularly in the cases of an off-the-road radial tire (ORR) and a truck/bus radial tire (TBR) which are used under heavy loads, and in the case of a run-flat tire when travelling in a punctured state (when travelling with an inflation pressure thereof at 0 kPa).
[0003] For example, in a run-flat tire having a sidewall reinforcing layer whose cross-sectional shape in a tread-width direction is crescent, when the tire travels in a punctured state, deformation in a tire radius direction concentrates on the sidewall reinforcing layer, and causes the sidewall reinforcing layer to reach a very high temperature, whereby durability is severely affected."
(2c)　"[0008] Therefore, the present invention was made in consideration of the above

described situation, and aims to provide a pneumatic tire capable of enhancing durability by decreasing a tire temperature, specifically a temperature inside a tire side portion, through efficient heat release."

(2d) "[0009] The present invention has the following aspects. First of all, a first aspect of the present invention is summarized as a pneumatic tire in which turbulent-flow-generating projections each provided so as to extend from the inner circumferential side to the outer circumferential side are provided on a tire surface at intervals in a tire circumferential direction, the pneumatic tire being characterized in that: each of the turbulent-flow-generating projections includes an edge portion when being viewed in a cross-sectional shape taken along a direction perpendicular to an extending direction thereof; and a front wall angle formed between a front wall face of each turbulent-flow-generating projection and the tire surface is set in the range of 70° to 110°, the front wall face being hit by an airflow."

(2e) "[0010] According to the feature above, when the pneumatic tire rotates, airflows which flow along substantially in the tire circumferential direction in a manner relative thereto are generated on the tire surface. These airflows carry out active heat exchange with the tire surface by flowing on the tire surface after being turned into turbulent flows by the turbulent-flow-generating projections.

[0011] In detailed description of flows of the turbulent flows which flow on the tire surface, airflows are turned into upward-and-downward turbulent flows which go upward in positions where the turbulent-flow-generating projections exist, and go downward in positions where the turbulent-flow-generating projections do not exist. Particularly, in a condition that the turbulent-flow-generating projections respectively include the edge portions, separation of the airflows from the tire surface is facilitated when the airflows go over the turbulent-flow-generating projections with the rotation of the pneumatic tire. Consequently, the airflows once separated from the tire surface are turned into turbulent flows and can accelerate heat exchange with the tire surface, the turbulent flows rapidly falling onto and hitting the tire surface due to negative pressures generated in rearward sides (downstream) of the respective turbulent-flow-generating projections in a direction of the tire rotation.

[0012] Additionally, in a condition that the front wall angle θ1 of each of the turbulent-flow generating-projections is set in the range of 70° to 110°, an angle of air separated in the edge portion can be made large to some extent, and the upward-and-downward turbulent flows turn into strong downward flows in the downstream of the respective turbulent-flow-generating projections and hit the tire surface, whereby active heat exchange with the tire surface is carried out. Thus, a tire temperature can be reliably

decreased by the turbulent-flow-generating projections provided on the tire surface, and durability can be enhanced."

(2f) "[0058] This turbulent-flow-generating projection 10 includes an edge portion 10f when being viewed in a cross-section in the tread-width direction (refer to FIGS. 1 and 3). That is, the edge portion 10f is formed between the inner side face 10c and the upper face 10e of the turbulent-flow-generating projection 10.

[0059] Additionally, the turbulent-flow-generating projection 10 includes another edge portion 10g when being viewed in a cross-section thereof (hereinafter, a projection-width cross section) taken along the direction A perpendicular to the extending direction. That is, the edge portion 10g is formed between the front wall face 10a and the upper face 10e of the turbulent-flow-generating projection 10."

2 Invention described in Publication 1

According to the point (1a) of Publication 1, Publication 1 discloses:

A A pneumatic tire provided with a bead core, a carcass layer, a tread rubber layer, an inner liner, a side-reinforcing layer, and a bead filler, using a rubber composition comprising 100 parts by mass of a rubber component (A) and 55 parts by mass or more of a carbon black (B), and having vulcanized rubber properties of a 100% elongation elastic modulus (M100) of 10 MPa or more and a Σ value of a loss tangent tan δ at 28°C to 150°C of 6.0 or less (Claim 1),

B said rubber composition is used for said side-reinforcing layer (Claim 11),

C the rubber component (A) comprises an amine-modified conjugated diene-based polymer (Claim 4), the amine-modified conjugated diene-based polymer is a primary amine-modified conjugated diene-based polymer (Claim 6), the primary amine-modified conjugated diene-based polymer is obtained by reacting a protected primary amine compound with an active terminal of a conjugated diene-based polymer (Claim 7), the protected primary amine compound is N,N-bis (trimethylsilyl) aminopropyltriethoxysilane (Claim 10), and

D the carbon black (B) is FEF grade (Claims 2 and 3).

As seen above, Publication 1 discloses the invention of "A pneumatic tire provided with a bead core, a carcass layer, a tread rubber layer, an inner liner, a side-reinforcing layer, and a bead filler, using a rubber composition comprising 100 parts by mass of a rubber component (A) and 55 parts by mass or more of a carbon black (B), and having vulcanized rubber properties of a 100% elongation elastic modulus (M100) of 10 MPa or more and a Σ value of a loss tangent tan δ at 28°C to 150°C of 6.0 or less,

wherein said rubber composition is used for said side-reinforcing layer,

wherein the rubber component (A) comprises an amine-modified conjugated diene-based polymer, wherein the amine-modified conjugated diene-based polymer is a primary amine-modified conjugated diene-based polymer, wherein the primary amine-modified conjugated diene-based polymer is obtained by reacting a protected primary amine compound with an active terminal of a conjugated diene-based polymer, and wherein the protected primary amine compound is N,N-bis (trimethylsilyl) aminopropyltriethoxysilane, and

wherein the carbon black (B) is FEF grade."

(hereinafter referred to as "Cited Invention".).

3 Comparison

The Invention and the Cited Invention are compared.

A The "pneumatic tire" of the Cited invention corresponds to "pneumatic tire" and "tire" of the Invention.

B The "rubber composition" of the Cited invention is used for "side-reinforcing layer" of pneumatic tire. Therefore, it corresponds to "side-reinforcing rubber for constituting the tire side portion" and "rubber composition" of the Invention.

C The "active terminal of a conjugated diene-based polymer" of the Cited invention corresponds to the "terminal of a conjugated diene-based polymer" of the Invention.

D The specification discloses that "An alkoxysilane compound having a precursor capable of producing a primary amino group through hydrolysis is used as a modifying agent for efficiently introducing a primary amino group to the active terminal. Examples of the compound may include ... N,N-bis (trimethylsilyl) aminopropyltriethoxysilane" (paragraph [0033]). Therefore, the "protected primary amine compound" consisting of "N,N-bis (trimethylsilyl) aminopropyltriethoxysilane" of the Cited Invention corresponds to "an alkoxysilane compound having a precursor capable of producing a primary amino group through hydrolysis" of the Invention.

E The "reaction of a protected primary amine compound with an active terminal of a conjugated diene-based polymer" of the Cited Invention corresponds to "introducing a primary amino group or a precursor capable of producing a primary amino group through hydrolysis to a terminal of a conjugated diene-based polymer through a modification reaction between the terminal and an alkoxysilane compound having the primary amino group or the precursor capable of producing a primary amino group through hydrolysis" of the Invention in their technical sense.

F The "amine-modified conjugated diene-based polymer" consisting of "primary

amine-modified conjugated diene-based polymer" of the Cited Invention and the "modified conjugated diene-based polymer" of the Invention are produced via the modification reaction of at least the above E. Therefore, both have "modified conjugated diene-based polymer" in common to that extent.

G "Carbon black (B)" of the Cited Invention corresponds to "carbon black" of the present invention.

H "Rubber composition" of the Cited Invention is configured to "include 100 parts by mass of rubber component (A) and 55 parts by mass or more of carbon black (B)," and the above rubber component (A) "comprises amine-modified conjugated diene-based polymer." Therefore, such rubber composition and the "rubber composition in which 100 parts by mass of rubber component containing 10 mass% or more of a modified conjugated diene-based polymer is mixed with 10 to 100 parts by mass of carbon black having a nitrogen adsorption specific surface area of 20 to 90 m^2/g" of the present invention have a common point in that "they are rubber composition where a rubber component containing a modified conjugated diene-based polymer is mixed with a carbon black."

Therefore, the Invention and the Cited Invention have a common point in that "A pneumatic tire using a rubber composition for a side-reinforcing rubber constituting the tire side portion, the rubber composition being obtained by compounding with carbon black with respect to a rubber component containing a modified conjugated diene-based polymer, which is obtained by introducing a primary amino group or a precursor capable of producing a primary amino group through hydrolysis to a terminal of a conjugated diene-based polymer through a modification reaction between the terminal and an alkoxysilane compound having the primary amino group or the precursor capable of producing a primary amino group through hydrolysis."
but they are different from each other in the following features:

(The different feature 1)

Regarding pneumatic tire, the present invention "disposes turbulent-flow-creating projections extending from an inner circumference side to an outer circumference side on a tire surface of a tire side portion at intervals in a circumferential direction of the tire," and "the turbulent-flow-creating projections each have an edge portion when viewed in a section in a radial direction, and front wall surfaces thereof on which an airflow impinges each form a front wall angle in a range of 70° to 110° with respect to the tire surface," whereas the Cited Invention lacks such

turbulent flow-creating projections.

(The different feature 2)

Regarding modification reaction of modified conjugated diene-based polymer, the present invention includes "further adding a condensation-accelerating agent to the modification reaction system in the middle of and/or after completion of the modification reaction," whereas the Cited Invention fails to specify in such a manner.

(The different feature 3)

Regarding rubber composition, the present invention uses "rubber composition in which a 100 parts by mass of rubber component containing 10 mass% or more of a modified conjugated diene-based polymer is mixed with 10 to 100 parts by mass of carbon black having a nitrogen adsorption specific surface area of 20 to 90 m^2/g," whereas the Cited Invention is configured to include "100 parts by mass of rubber component (A) and 55 parts by mass or more of carbon black (B)," and the above rubber component (A) "comprises amine-modified conjugated diene-based polymer," and wherein "said carbon black (B) is FEF grade."

4 Examination

(1) Regarding the different feature 1

A In view of the problem of the conventional pneumatic tire; i.e., at least a problem that a side wall parts or bead filler of the tire becomes deformed and generates heat in a run-flat running condition and the problem of side-reinforcing layer and bead filler exceeding a breakage limit and resulting in the tire breakage in some cases (the point (1c)), the Cited Invention tried to solve a problem to provide a pneumatic tire with improved run-flat durability without compromising rolling resistance and ride in normal driving mode (point (1d)).

B On the other hand, Publication 2 discloses, particularly, a pneumatic tire capable of decreasing temperature in a tire side portion prone to occurrence of degradation (point (2a)). At least in a run-flat tire having a sidewall reinforcing layer, when the tire travels in a punctured state, deformation in a tire radius direction concentrates on the sidewall reinforcing layer, and causes the sidewall reinforcing layer to reach a high temperature, whereby durability is severely affected (point (2b)). In view of this, the present invention has an objective to provide a pneumatic tire capable of enhancing durability by decreasing a tire temperature, specifically a temperature inside a tire side portion, through efficient heat release (point (2c)). It can be said that the technical

matters described in the Cited Invention and Publication 2 have many common points not only in the technical field and the problems to be solved.

C Further, in order to solve the problem, Publication 2 discloses provision of turbulent-flow-generating projections each provided so as to extend from the inner circumferential side to the outer circumferential side on a tire surface of pneumatic tire at intervals in a tire circumferential direction, so that each of the turbulent-flow-generating projections includes an edge portion when being viewed in a cross-sectional shape taken along a direction perpendicular to an extending direction thereof; and a front wall angle formed between a front wall face of each turbulent-flow-generating projection and the tire surface is set in the range of 70° to 110°, the front wall face being hit by an airflow (point (2d)), and further the turbulent-flow-generating projection comprises: the edge portion 10f defined between the inner side face 10c and the upper face 10e; and the edge portion 10g defined between the front wall face 10a and the upper face 10e (point (2f)), and obviously has an edge portion when viewed in a section in a radial direction.

Consequently, it is not particularly difficult for a person skilled in the art who recognizes a problem of further improving run-flat durability to try to apply the technical matter of the above turbulent-flow-generating projections described in Publication 2 to the Cited Invention for the purpose of further improving run-flat durability. There is a sufficient motivation to try to apply that.

D Therefore, a person skilled in the art could have easily conceived of the constitution of the Invention according to above Different feature 1 by applying the technical matters described in Publication 2 to Cited invention.

(2) Regarding the different feature 2

Publication 1 discloses that "In the present invention, a condensation-accelerating agent is preferably used for promoting condensation reaction in which an alkoxysilane compound having a protected primary amino group used for the aforesaid modifier is involved. ... Condensation-accelerating agent used herein may be added prior to the aforesaid modification reaction, but preferably is added to the modification reaction system in the middle of or after the completion of the modification reaction. ..." (point (1g)). In the Cited Invention, it is presumed that a condensation-accelerating agent is added to a modification reaction system in the middle of and/or after the completion of modification reaction.

Therefore, a person skilled in the art could have easily conceived of the constitution of the Invention according to the above Different feature 2.

(3) Regarding the different feature 3

A Publication 1 discloses a rubber component consisting of 30 parts by mass of natural rubber and 70 parts by mass of primary amine-modified polybutadiene in Examples 1 and 2 of the Cited Invention, and in Example 3 also describes a rubber component consisting of 50 parts by mass of natural rubber and 50 parts by mass of primary amine-modified polybutadiene (point (1i)). All Examples obviously include 10 mass% or more of primary amine-modified polybutadiene (70 mass% for Examples 1 and 2; 50 mass% for Example 3 by simple calculation). Therefore, it does not go beyond the expectation that the Cited Invention uses 10 mass% or more of modified conjugated diene-based polymer as a rubber component.

B Further, it is common technical knowledge that the "carbon black (B)" of the Cited Invention is "FEF grade," and has a nitrogen adsorption specific surface area of 20 to 90 m^2/g (See, if necessary, International Publication No. 2006/9002: paragraph [0026]; and "Basics and practices of automobile Tire Technology", edited by Bridgestone Corporation, Tokyo Denki University Press, published on April 10, 2008, pages 267 to 270, Table 5-1-8). Therefore, it does not go beyond the expectation to adopt carbon black with a nitrogen adsorption specific surface area of 20 to 90 m^2/g as a "carbon black (B)" of the Cited Invention.

C Furthermore, the rubber composition of the Cited Invention is configured to "include 100 parts by mass of rubber component (A) and 55 parts by mass or more of carbon black (B)," whereas Publication 1 discloses a preferable amount of carbon black of "55 to 70 parts by mass" (point (1h)), and a range satisfying the range of "10 to 100 parts by mass."

D As seen above, according to the above items A to C, it was presumed and implemented in the Cited Invention to use a rubber component comprising 10 mass% or more of a modified conjugated diene-based polymer, and adopt a carbon black (B) having a nitrogen adsorption specific surface area of 20 to 90 m^2/g, and further compound 10 to 100 parts by mass of carbon black on a basis of 100 parts by mass of rubber component. Therefore, the constitution of the Invention according to the above Different feature 3 was easily conceivable by a person skilled in the art.

(4) Regarding effect of the invention

In the item of "(Regarding the combination of Cited Document 1 and Cited Document 2) of the written appeal on May 12, 2014, the Appellant argues that Publication 1 is an invention directed to a rubber composition used for a pneumatic tire,

and Publication 2 is an invention directed to a shape of a pneumatic tire surface, and thus the two technical concepts are irrelevant to each other, and a person skilled in the art could not expect particularly significant effects from the combination of the two inventions.

As discussed in the above item (1), however, the technical matters described in Cited Invention and Publication 2 have many common points not only in technical field but also in the problems to be solved. Therefore, there is a sufficient motivation to combine them, and there is no reason to construe that there is any situation teaching away from the combination.

Further, a person skilled in the art who reads Publication 1 and Publication 2 could understand respectively the effect to improve run-flat durability in pneumatic tire by the rubber composition (point (1e)(1f)), and the effect to improve run-flat durability by disposing turbulent flow-creating projections on the surface (point (2b)(2e)), and thus the effect to further improve run-flat durability by the combination does not go beyond the expectation, and the above Appellant's allegation cannot be accepted.

Therefore, it cannot be remarkable that the effect of the Invention goes beyond the expectation of a person skilled in the art who reads Publication 1 and Publication 2.

5 Summary

Therefore, a person skilled in the art could have easily conceived of the Invention on the basis of the inventions described in Publications 1 to 2, and thus a patent cannot be granted to the invention under the provision of Article 29(2) of the Patent Act.

No. 5 Closing

For the above reasons, the Invention is not patentable, and thus the present application should be rejected without making a determination of the other remaining claims.

Therefore, the appeal decision shall be made as described in the conclusion.

April 21, 2015

Chief administrative judge: TOMIOKA, Kazuhito
Administrative judge: UJIHARA, Yasuhiro
Administrative judge: DEGUCHI, Masaya