Appeal decision

Appeal No. 2017-6367

Tokyo, Japan
Appellant BRIDGESTONE CORPORATION

Patent Attorney NAKAJIMA, Jun

Patent Attorney KATO, Kazuyoshi

Patent Attorney FUKUDA, Koji

The case of appeal against the examiner's decision of refusal for Japanese Patent application No. 2014-239280, titled "TIRE" [published on May 30, 2016, Japanese Unexamined Patent Application Publication No. 2016-97944] 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 filed on November 26, 2014, to which a reason for rejection was notified on March 18, 2016; in response a written opinion and a written amendment dated on May 30 were submitted, and then a reason for rejection (final) was notified on June 13, and in response a written opinion and a written amendment dated October 20 were submitted. A decision of refusal was issued on January 24, 2017 with a decision to dismiss the amendment made on October 20, 2016, and a notice of appeal was filed on May 1, 2017 with a written amendment of the specification and the scope of the claims.

No. 2 As for Decision to dismiss the amendment made on May 1, 2017

[Conclusion of Decision to Dismiss Amendment]

The written amendment made on May 1, 2017 should be dismissed.

[Reason]

1 The written amendment made on May 1, 2017

The written amendment made on May 1, 2017 (hereinafter referred to as "the Amendment") modifies the recitation of Claim 1 of the scope of the claims as shown in the following (1) (i.e. amended by a written amendment submitted on May 30, 2016) before the Amendment with the recitation of Claim 1 of the scope of the claims as shown in the following (2).

Note that the underlines are provided to show the parts of amendment.

(1) Claim 1 of scope of claims before the Amendment

"[Claim 1]

A tire comprising a circular tire frame member formed from a resin material for frame and

a covered cord member, said covered cord member comprising: a reinforcing cord disposed in said tire frame member extending in a circumferential direction of the tire; a resin layer for covering made from a resin material for covering that coats said reinforcing cord and adheres to said tire frame member; a resin layer for adhesion that is made from a resin material for adhesion with an elastic modulus higher than that of said resin material for covering and is disposed between said reinforcing cord and said resin layer for covering to adhere said reinforcing cord and said resin layer for covering, and has a layer thickness thinner than that of said resin layer for covering,

said tire frame member comprises a bead portion, a side portion connected to the outside of a radial direction of tire of said bead portion, and a crown portion connected to the inside of a width direction of tire of said side portion,

said covered cord member has a cross-section profile of a substantially square profile in a direction orthogonal to a direction to which said reinforcing cord extends, and is helically wound on an outer circumference of said crown portion, and adjacent portions are adhered to each other in a width direction of tire."

(2) Claim 1 of the scope of claims after the Amendment

"[Claim 1]

A tire comprising a circular tire frame member formed from a resin material for frame and

a covered cord member, said covered cord member comprising: a reinforcing cord disposed in said tire frame member extending in a circumferential direction of the tire; a resin layer for covering made from a resin material for covering that coats said reinforcing cord and adheres to said tire frame member; and a resin layer for adhesion that is made from a resin material for adhesion with an elastic modulus higher than that of said resin material for covering and is disposed between said reinforcing cord and said resin layer for covering to adhere said reinforcing cord and said resin layer for covering,

wherein said tire frame member comprises a bead portion, a side portion connected to the outside of a radial direction of tire of said bead portion, and a crown portion connected to the inside of a width direction of tire of said side portion,

and said covered cord member has a cross-section profile of a substantially square profile in a direction orthogonal to a direction to which said reinforcing cord extends, and is helically wound on an outer circumference of said crown portion, and its adjacent portions in a width direction of tire are adhered to each other by thermal adhesion, wherein

said resin layer for adhesion has a layer thickness thinner than that of said resin layer for covering."

2. Legitimacy of the Amendment

2-1 Purpose of Amendment

Regarding Claim 1 of the scope of the claims, the Amendment clarifies a feature of the invention according to Claim 1 by changing word order in Japanese regarding the tire with the "layer thickness thinner than said resin layer for covering."

Further, the Amendment specifies a matter specifying the invention according to Claim 1 of the scope of the claims before the Amendment of "adjacent portions are adhered to each other" as "adjacent portions are adhered to each other by thermal adhesion", which specifies a manner of adhesion as thermal adhesion and also shares an industrial field of an invention and a problem to be solved by the invention between the invention recited in Claim 1 of the scope of the claims before the Amendment and the invention recited in Claim 1 of the scope of the claims after the Amendment.

Therefore, the Amendment aims to explain indefinite description as provided by Article 17-2(5)(iv) and confine the scope of the claims as provided by Article 17-2(5)(ii) of the Patent Act with respect to Claim 1 of the scope of claims.

2-2 Consideration on the independently patentable requirement

A further consideration is given as to whether an invention according to Claim 1 of the claims after the Amendment (hereinafter referred to as "the Amended Invention") was independently patentable as of the filing date.

(1) Described matters in the Cited Document, etc.

A Described matters in Cited Document 1 and Cited Invention

(A) Described matters in Cited Document 1

International Publication No. WO2014-175453 (internationally published on October 30, 2014, hereinafter referred to as "Cited Document 1"), which was distributed or accessible to public via a telecommunication line before the filing date of the present application in Japan or foreign countries and cited in the decision to reasons for refusal, generally discloses the following description of "tire" (hereinafter referred to as "Described matter 1a", etc. in order, and collectively referred to as "described matter of Cited Document 1"): Note that the underlines are provided by the collegial body. The same can apply to other documents.

1a "Technical Field

[0001] The present invention relates to a tire for fitting onto a rim."

1b "Background Art

[0002] Pneumatic tires configured from rubber, organic fiber materials, steel members, and the like have been conventionally employed in vehicles, such as cars.

[0003] Recently, the use of resin materials, in particular thermoplastic polymer materials such as thermoplastic resins and thermoplastic elastomers, as tire materials is being investigated from the perspectives of weight reduction, ease of molding, and ease of recycling. For example, Patent Document 1 discloses pneumatic tires formed using a thermoplastic polymer material.

[0004] A tire in which a polymer material with thermoplastic properties is used is more easily manufactured and lower in cost than a conventional rubber-made tire. However, in a case in which a tire is formed exclusively with a uniform thermoplastic resin without incorporating a reinforcing member, such as a carcass ply, as in Japanese Patent Application Laid-Open (JP-A) No. 2003-104008, it is difficult to achieve a tire that withstands stress and internal pressure, and exhibits rigidity similarly to conventional rubber-made tires. There has been demand for tires using a thermoplastic polymer

material to achieve a performance that is compared favorably to that of conventional rubber-made tires.
[0005] As an approach for enhancing the durability of a tire, for example, there has been proposed a method in which a reinforcing layer, in which a reinforcing cord is wound in a continuous helical shape along a tire circumferential direction, is provided on an outer surface in a tire radial direction of a tread bottom portion of a tire main body (tire frame), whereby a cut resistance performance and a puncture resistance performance of the tire main body are improved (for example, see JP-A No. H03-143701). As techniques related to steel cords (wires) used in reinforcing layers (belt layers), there have been proposed a steel cord for a tire employable in a carcass layer, a bead reinforcing layer, and a belt layer of a radial tire (for example, see Japanese Patent No. 4423772), and a steel cord for reinforcing a tire in which a steel cord body is covered by a thermoplastic elastomer composition in which an elastomer is dispersed in a thermoplastic resin (for example, see JP-A No. 2010-53495)."

1c "Problem to be solved by the invention
[0006] Generally, in terms of tire performance, there is demand for sufficient fixing of a reinforcing cord to a tire frame in a case in which a reinforcing cord is used. However, in a case in which a metal member, such as a steel cord, is used as a reinforcing cord, it is difficult to achieve satisfactory adhesion between the reinforcing cord and the tire frame under ordinary molding conditions. As a result of investigation, the present inventors have found that the durability of a tire itself can be improved by improving the adhesion durability between a tire frame and a reinforcing member, such as a steel cord.
[0007] In contrast to this, the steel cord for a tire described in Japanese Patent No. 4423772 has a thermoplastic elastomer composition filled into a steel structure that has a twist construction of a core formed of a wire, and a sheath. However, such a technique is intended for installation to rubber-made radial tires, and Japanese Patent No. 4423772 fails to disclose a relationship between a tire in which a resin material is used and a reinforcing member. The steel cord for reinforcing a tire described in Japanese Unexamined Patent Application Publication No. 2010-53495 is also intended for installation to rubber-made radial tires, and the publication fails to disclose improving the adhesion durability between a reinforcing member and a tire frame for tires in which a resin material is used as a tire frame.
[0008] The present invention has been made in view
of the above circumstances, and an object of the invention is to provide a tire that has a tire frame formed from a resin material and is excellent in durability."

1d "Means for solving problem
[0009] A concrete means for achieving the above object is as described below.

A tire comprising: a circular tire frame formed from a resin material; and a reinforcing metal cord member that is wound on an outer circumference of the tire frame, at least a portion of the reinforcing metal cord member being covered, via an adhesion layer including a hot melt adhesive, with a covering composition that comprises at least one thermoplastic material selected from the group consisting of a thermoplastic resin and a thermoplastic elastomer.

[0009] In the present specification, the concept of "resin" includes thermoplastic resins and thermoset resins, but does not include vulcanized rubbers, such as conventional natural rubbers and synthetic rubbers.

In the below description of resins, components of "the same type" means those main chains being formed of a common frame, examples of which include ester-based ones and styrene-based ones.

[0011] In the present specification, a numerical range expressed using "from A to B" means a range including A and B as a lower limit value and an upper limit value, respectively.

In addition, the term "process" means not only an individual process but also a process in which an expected object in the process is attained even when the process cannot be clearly distinguished from one or more other processes.

1e "Advantageous Effects of Invention

[0012] According to the invention, a tire that has a tire frame formed from a resin material and is excellent in durability can be provided."

1f "[0099] Hereinafter, the tire according to embodiments of the invention will be described with reference to the accompanying drawings. Note that each drawing described below (FIG. 1A, FIG. 1B, FIG. 2, FIG. 3, and FIG. 4) is schematic, and sizes and shapes of components are illustrated figuratively as appropriate in order to facilitate understanding.

[First Embodiment for carrying out the Invention]

First, a tire 10 according to a first embodiment of the invention will be explained with reference to FIG. 1A and FIG. 1B. FIG. 1A is a perspective view illustrating a cross-section of a portion of the tire according to the first embodiment of the invention. FIG. 1B is a cross-sectional view of a bead portion that has been fitted onto a rim. As illustrated in FIG. 1A, the tire 10 according to the first embodiment has a cross-section profile substantially similar to cross-section profiles of ordinary conventional rubber-made pneumatic tires.

[0100] The tire 10 according to the first embodiment of the invention includes a tire case 17 including a pair of bead portions 12, each of which is in contact with a bead seat 21 and a rim flange 22 of a rim 20, side portions 14 that respectively extend in the tire radial direction outward from the bead portions 12, and a crown portion (outer circumferential portion) 16 that connects a tire radial direction outer end of one of the side portions 14 with a tire radial direction outer end of the other side portion 14. The tire case 17 is formed using a resin material including a polyamide-based thermoplastic elastomer.

[0101] In the tire 10 according to the first embodiment of the invention, the tire case 17 is formed by configuring identical annular tire case half parts 17A (tire frame pieces) in which one of the bead portions 12, one of the side portions 14, and the half-width crown portion 16 are integrally injection molded to be aligned to face each other and to be bonded to each other at a tire equatorial plane portion.

[0102] In each bead portion 12 of the tire 10 according to the first embodiment of the invention, an annular bead core 18 made of a steel cord is embedded in a manner similar to ordinary conventional pneumatic tires. At a portion of each bead portion 12 in contact with the rim 20, and at least at a portion of each bead portion 12 in contact with

the rim flange 22 of the rim 20, an annular seal layer 24 made of a rubber that is a material having a sealing property superior to that of the resin material forming the tire case 17 is formed.
[0103] On the crown portion 16 of the tire 10 according to the first embodiment of the invention, a resin-covered cord 26, which is a reinforcing cord, is wound in a helical shape in a circumferential direction of the tire case 17 such that at least a portion thereof is embedded in the crown portion 16 in a cross-sectional view taken along an axial direction of the tire case 17. At a tire radial direction outer circumferential side of the resin-covered cord 26, a tread 30 made of a rubber that is a material having abrasion resistance superior to that of the resin material forming the tire case 17 is disposed. The resin-covered cord 26 will be described in detail below."

1g "[0108] Next, the resin-covered cord 26 will be described with reference to FIG. 2. FIG. 2 is a cross-sectional view taken along a tire rotation axis of the tire according to the first embodiment of the invention and illustrating a state in which the resin-covered cord is embedded in the crown portion of the tire case.

As illustrated in FIG. 2, in the tire 10 according to the first embodiment of the invention, the resin-covered cord 26 is wound in a helical shape such that at least a portion thereof is embedded in the crown portion 16 in a cross-sectional view taken along the axial direction of the tire case 17. The portion of the resin-covered cord 26 embedded in the crown portion 16 is in close contact with the resin material forming the crown portion 16 (the tire case 17). The letter L in FIG. 2 refers to a depth of embedding the resin-covered cord 26 with respect to the crown portion 16 (the tire case 17) along a tire rotation axis direction. In a tire 10 according to the first embodiment of the present invention, the embedding depth L of the resin-covered cord 26 with respect to the crown portion 16 is 1/2 of a diameter D of the resin-covered cord 26.
[0109] In the tire 10 according to the first embodiment of the invention, the resin-covered cord 26 has a structure in which, an outer circumference of the steel cord 27 having a steel cord (a reinforcing metal cord member) 27 of twisted steel fibers acting as a core is covered with a covering composition, via an adhesion layer 25 including a hot melt adhesive including an acid-modified olefin-based resin, that includes a polyamide-based thermoplastic elastomer. At the tire radial direction outer circumferential side of the resin-covered cord 26, the rubber-made tread 30 is disposed. A tread pattern of plural grooves is formed in a road surface contact surface of the tread 30, similarly to conventional rubber-made pneumatic tires.
[0110] In the tire 10 according to the first embodiment of the invention, the resin-covered cord 26 is configured such that the entirety of the outer circumference of the steel cord 27, which is formed of twisted steel fibers, is covered by, via the adhesion layer 25 including a hot melt adhesive including an acid-modified olefin-based resin, the covering composition that includes a polyamide-based thermoplastic elastomer. The resin-covered cord 26 is embedded in the tire case 17 formed of the resin material including a polyamide-based thermoplastic elastomer of the same type while being in close contact therewith. Accordingly, the contact area between the covering composition 28, which covers the steel cord 27, and the tire case 17 increases, and the adhesion durability between the resin-covered cord 26 and the tire case 17 is improved so that the durability of the tire becomes excellent.

[0111] While the embedding depth L of the resin-covered cord 26 with respect to the crown portion 16 is 1/2 of a diameter D of the resin-covered cord 26 in the tire 10 according to the first embodiment of the invention, it is preferably 1/5 or more, and particularly preferably above 1/2 of the diameter D of the resin-covered cord 26. Further, it is most preferable that the entirety of the resin-covered cord 26 is embedded in the crown portion 16. In a case in which the embedding depth L of the resin-covered cord 26 is above 1/2 of the diameter D of the resin-covered cord 26, the resin-covered cord 26 becomes hard to project from an embedded portion in view of the size of the resin-covered cord 26. Embedding the entirety of the resin-covered cord 26 in the crown portion 16 makes a surface (outer circumferential surface) flat, and can suppress incorporation of air in a peripheral portion of the resin-covered cord 26 even in a case in which any member is placed on the crown portion 16 in which the resin-covered cord 26 is embedded.
[0112] A layer thickness of the covering composition 28 that covers the steel cord 27 is not particularly limited, and an average layer thickness may be preferably from 0.2 mm to 4.0 mm, more preferably from 0.5 mm to 3.0 mm, and particularly preferably from 0.5 mm to 2.5 mm."

1h "[0114] Hereinafter, a method of manufacturing the tire according to the first embodiment of the invention will be described.
[Tire Case Forming Process]

First, tire case half parts supported by thin metal support rings are aligned to face each other. Then, a jointing mold is placed in such a manner as to be in contact with outer circumferential surfaces of abutting portions of the tire case half part. The jointing mold is configured to press the periphery of bonding sections (abutting portions) of the tire case half parts at a predetermined pressure (unillustrated). Then, the periphery of the bonding sections of the tire case half parts is pressed at a melting temperature (or softening temperature) or higher of a thermoplastic resin material (polyamide-based thermoplastic elastomer in the present embodiment) that forms the tire case. The bonding sections of the tire case half parts are heated and pressed by the jointing mold so that the bonding sections are melted, the tire case half parts are welded together, and these members are integrally formed into the tire case 17.
[0115] [Resin-covered cord Forming Process]

Next, a resin-covered cord forming process will be described. A steel cord 27 is unwound from a reel, and a surface thereof is cleaned. Subsequently, an outer circumference of the steel cord is covered by a hot melt adhesive (in the present embodiment, a hot melt adhesive including an acid-modified olefin-based resin) extruded from an extruder. Then, the outer circumference of the steel cord on which an adhesive layer has been formed is covered by a covering composition (in the present embodiment, a polyamide-based thermoplastic elastomer) extruded from an extruder, and thus, the resin-covered cord 26 is formed in which the outer circumference of the steel cord 27 is covered with the covering composition 28 through the adhesion layer including the hot melt adhesive. Then, the formed resin-covered cord 26 is wound on a reel 58.
[0116] [Resin-covered cord Winding Process]

Next, a resin-covered cord winding process will be described with reference to FIG. 3. FIG. 3 is an explanatory diagram for describing an operation that provides the

resin-covered cord in the crown portion of the tire case using a resin-covered cord heating device and rollers. In FIG. 3, a resin-covered cord feeding apparatus 56 includes the reel 58 on which the resin-covered cord 26 is wound, the resin-covered cord heating device 59 disposed at a cord conveying direction downstream side of the reel 58, a first roller 60 disposed at a resin-covered cord 26 conveying direction downstream side, a first cylinder device 62 that moves the first roller 60 in a direction towards, or away from, a tire outer circumferential surface, a second roller 64 disposed at the resin-covered cord 26 conveying direction downstream side of the first roller 60, and a second cylinder device 66 that moves the second roller 64 in a direction towards, or away from, the tire outer circumferential surface. The second roller 64 may be employed as a cooling roller made of metal. A surface of the first roller 60 or the second roller 64 is coated with a fluorine resin (TEFLON (registered trademark) in the present embodiment) to suppress adhesion of the melted or softened resin material. Thereby, the heated resin-covered cord is firmly integrated with a resin of the case.

[0117] The resin-covered cord heating device 59 includes a heater 70 and a fan 72 for generating hot air. The resin-covered cord heating device 59 also includes a heating box 74 to whose interior hot air is supplied and through an interior space of which the resin-covered cord 26 passes, and a discharge outlet 76 that discharges the heated resin-covered cord 26.

[0118] In the present process, first, the temperature of the heater 70 in the resin-covered cord heating device 59 is raised, and surrounding air heated by the heater 70 is delivered to a heating box 74 by the air generated by rotation of the fan 72. Then, the resin-covered cord 26 unwound from the reel 58 is fed into the heating box 74, whose interior space has been heated by the hot air, and heated (for example, the temperature of the resin-covered cord 26 is heated to from approximately 100°C to approximately 250°C). The heated resin-covered cord 26 passes through the discharge outlet 76, and is wound under a constant tension in a helical shape on the outer circumferential surface of the crown portion 16 of the tire case 17 rotating in the direction indicated by arrow R in FIG. 3. When a covering resin of the heated resin-covered cord 26 contacts the outer circumferential surface of the crown portion 16, the resin material of a contact portion melts or softens, and is melt-bonded to a tire case resin and integrated with the outer circumferential surface of the crown portion 16. In this case, the resin-covered cord is melted and bonded also to the resin-covered cord adjacent thereto so that winding is performed while no gap is present. Thereby, there can be suppressed incorporation of air in a portion in which the resin-covered cord 26 is embedded.

[0119] The embedding depth L of the resin-covered cord 26 can be adjusted by means of a heating temperature of the resin-covered cord 26, a tension acting on the resin-covered cord 26, a pressure of the first roller 60, and the like. In the present embodiment, the embedding depth L of the resin-covered cord 26 is set to be 1/5 or greater of the diameter D of the resin-covered cord 26.

[0120] Then, a vulcanized, belt-shaped tread 30 is wound by a single turn on an outer circumferential surface of the tire case 17, and the tread 30 is bonded to the outer circumferential surface of the tire case 17 by means of a bonding agent or the like. Note that the tread 30 may be, for example, a pre-cured tread employed in conventionally-known recycled tires. The present process is similar to a process for bonding a pre-cured tread to an outer circumferential surface of a base tire of a recycled tire.

Then, bonding the seal layers 24 made of a vulcanized rubber to the bead portions 12 of the tire case 17 by means of a bonding agent or the like thereby completes the tire 10.

[0121] (Effects)

In the tire 10 of the first embodiment of the invention, the resin-covered cord 26 is wound on the outer circumferential surface of the tire case 17 formed of a polyamide-based thermoplastic elastomer, in which the resin-covered cord 26 has the steel cord 27 as a core and is covered, via the adhesion layer 25 including a hot melt adhesive including an acid-modified olefin-based resin, by the covering composition 28 that includes a polyamide-based thermoplastic elastomer.

Since the thermoplastic resin included in the covering composition 28 is a polyamide-based thermoplastic elastomer of the same type as the resin material forming the tire case 17, an adhesion property between the covering composition 28 and the tire case 17 is high. The hot melt adhesive which includes an acid-modified olefin-based resin and which is included in the adhesion layer 25 has a high adhesion property with respect to the steel cord 27 and the covering composition 28 including a polyamide-based thermoplastic elastomer. When the resin-covered cord 26 is covered with the covering composition 28 including a polyamide-based thermoplastic elastomer of the same type as the resin material forming the tire case 17 in this manner, a difference in hardness between the resin-covered cord 26 and the tire case becomes smaller in comparison with a case in which a resin material of a different type is employed. Accordingly, the resin-covered cord 26 can be sufficiently adhered and fixed to the tire case 17.

In the tire 10 of the first embodiment of the invention, the steel cord 27 is not directly covered with the covering composition 28 including a polyamide-based thermoplastic elastomer, but the adhesion layer 25, which includes a hot melt adhesive which includes an acid-modified olefin-based resin and which exhibits a high adhesion property relative to both the steel cord 27 and the covering composition 28, is interposed therebetween. Accordingly, the steel cord 27 exhibits excellent pull-out resistance with respect to the covering composition 28. As a result, remaining of air bubbles can be effectively suppressed during tire manufacture, and movement of the reinforcing metal cord member during running can be effectively suppressed."

1i "Examples

[0142] Hereinafter, the invention will be specifically described, but this description never restricts the invention.

[0143] [Example 1]

In accordance with the resin-covered cord forming process described above, a multifilament having an average diameter ϕ of 1.15 mm (a twisted cord formed of twisted mono-filaments having ϕ of 0.35 mm (made of steel, strength: 280 N, elongation degree: 3%)) was adhered with a hot melt adhesive A-1 described in Table 1 that had been heated and melted at a temperature of 240°C so as to have an average layer thickness of 100 μm, and then covered by a resin N-1 extruded by an extruder, and cooled, whereby a metal reinforcing cord was obtained in which an outer circumference of the multifilament was covered by a covering composition N-1 with an adhesion layer including the hot melt adhesive A-1 therebetween.

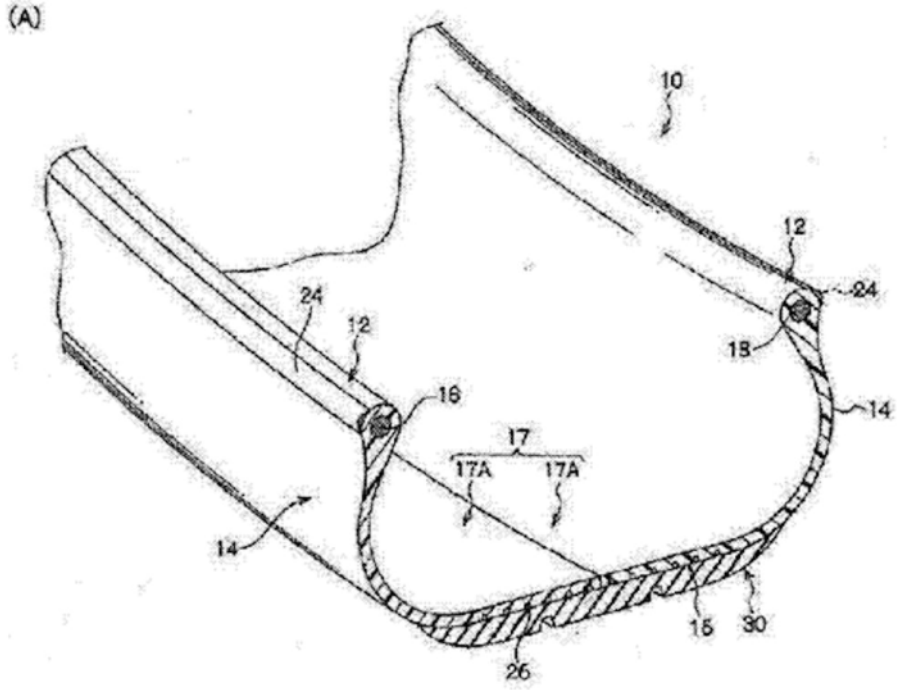
A tire was formed using the obtained metal reinforcing cord according to a method similar to the first embodiment described above. N-1 indicated in Table 1 was employed as a material for forming the tire frame.

[0144] [Examples 2 to 11, and 15]

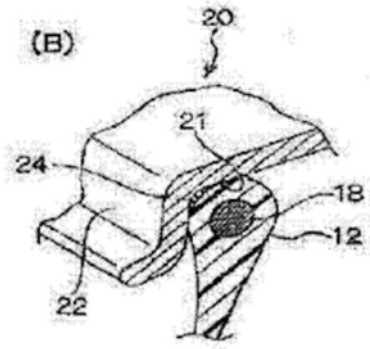
Metal reinforcing cords and tires were manufactured respectively in the same manner as in Example 1, except that the hot melt adhesive A-1 in Example 1 was replaced by a hot melt adhesive indicated in Table 1."

1j "[0163]
[Table 1]
... (Omitted)...
[0164]
* The components in Table are set forth below.
- A-1: "ADMER QE-060" manufactured by Mitsui Chemicals, Inc. (maleic acid-modified olefin-based resin (polypropylene resin), melting temperature: 143°C)
... (Omitted)...
- N-1: "UBESTA XPA9055X1" manufactured by Ube Industries, Ltd. (polyamide-based thermoplastic elastomer)"

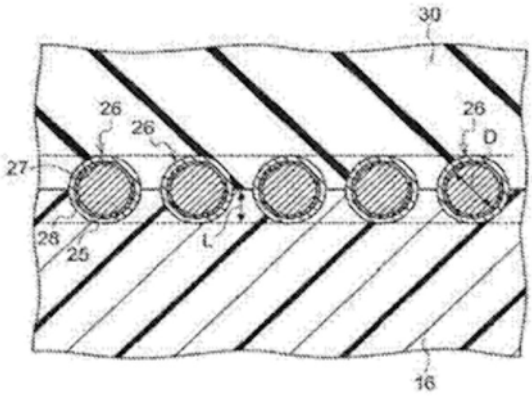
1k "
[FIG. 1A]



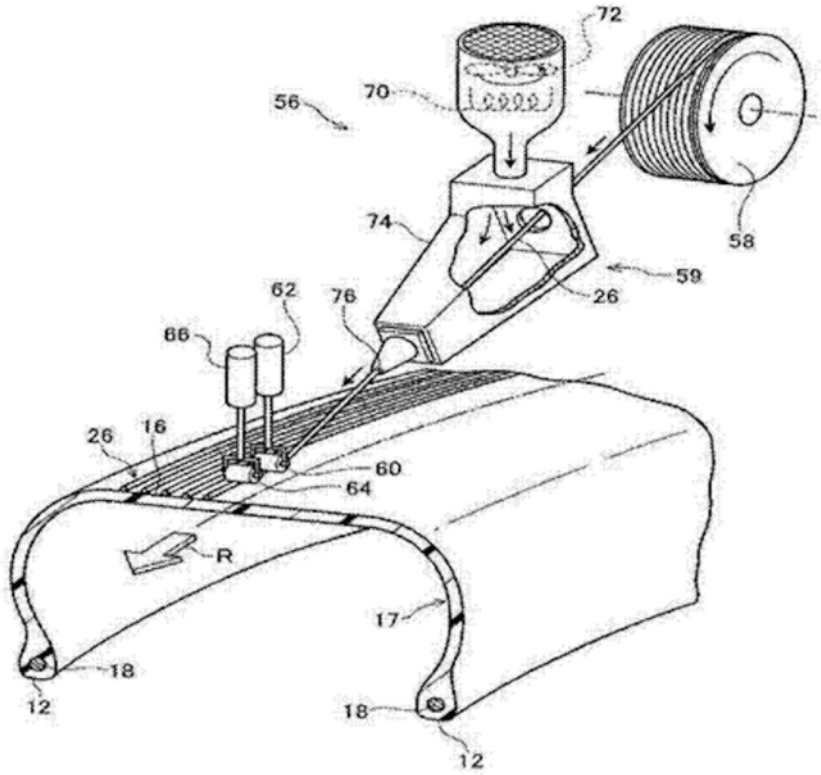
[FIG. 1B]



[FIG. 2]



[FIG. 3]



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(B) Cited Invention

a Summarizing the described matters in Cited Document 1 with respect to Example 1, Cited Document 1 discloses the following invention (hereinafter referred to as "Example Invention"):

"A tire formed by a similar method to the first embodiment using a resin N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd. as a material for forming a tire frame, wherein a multifilament having an average diameter ϕ of 1.15 mm (a twisted cord formed of twisted mono-filaments having ϕ of 0.35 mm (made of steel, strength: 280 N, elongation degree: 3%)) was adhered with a hot melt adhesive A-1 of 'ADMER QE-060' manufactured by Mitsui Chemicals, Inc. that had been heated and melted at a temperature of 240°C so as to have an average layer thickness of 100 μm, and then covered by a resin N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd. extruded by an extruder, and cooled, whereby a metal reinforcing cord was obtained in which an outer circumference of the multifilament was covered by a covering composition N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd. with an adhesion layer including the hot melt adhesive A-1 of 'ADMER QE-060' manufactured by Mitsui Chemicals, Inc. therebetween."

b "Tire" of the Example Invention is "formed by a method similar to the first embodiment". Thus "tire frame" of the Example Invention is "circular" (see the described matters 1d, 1f, and 1k.).

Therefore, "using a resin N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd. as a material for forming a tire frame" of the Example Invention may be restated as "a circular tire frame made from a resin N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd."

c The "tire" of the Example Invention is "made by a method similar to the first embodiment", and thus "a tire frame" of the Example Invention is "a tire case 17 consisting of: a pair of bead portions 12 each of which is in contact with a bead seat 21 and a rim flange 22 of a rim 20; side portions 14 that respectively extend in the tire radial direction outward from the bead portions 12; and a crown portion 16 (outer circumferential portion) that connects a tire radial direction outer end of one of the side portions 14 with a tire radial direction outer end of the other side portion 14" (see the described matters 1f and 1k.).

Therefore, it can be said that a "tire frame" of the Example Invention "comprises a pair of bead portions 12 each of which is in contact with a bead seat 21 and a rim flange 22 of a rim 20, side portions 14 that respectively extend in the tire radial direction outward from the bead portions 12, and a crown portion 16 (outer circumferential portion) that connects a tire radial direction outer end of one of the side portions 14 with a tire radial direction outer end of the other side portion 14",

d "Tire" of the Example Invention is "formed by a method similar to the first embodiment". Thus "a metal reinforcing cord" of the Example Invention is "wound in a helical shape such that at least a portion thereof is embedded in the crown portion 16 in a cross-sectional view taken along the axial direction of the tire case 17" (see the described matter 1g.).

"A metal reinforcing cord" of the Example Invention "is wound under a constant tension in a helical shape on the outer circumferential surface of the crown portion 16 of the tire case 17 rotating in the arrow R direction in FIG. 3. When a covering resin of the heated resin-covered cord 26 contacts the outer circumferential surface of the crown portion 16, the resin material of a contact portion melts or softens, and is melt-bonded to a tire case resin and integrated with the outer circumferential surface of the crown portion 16." (see the described matter 1h.).

Furthermore, according to the above c, "tire case 17" is "tire frame".

Therefore, "a metal reinforcing cord" of the Example Invention, "a multifilament having an average diameter ϕ of 1.15 mm (a twisted cord formed of twisted mono-filaments having ϕ of 0.35 mm (made of steel, strength: 280 N, elongation degree: 3%)) was adhered with a hot melt adhesive A-1 of 'ADMER QE-060' manufactured by Mitsui Chemicals, Inc. that had been heated and melted at a temperature of 240°C so as to have an average layer thickness of 100 μm, and then covered by a resin N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd. extruded by an extruder, and cooled, whereby a metal reinforcing cord was obtained in which an outer circumference of the multifilament was covered by a covering composition N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd. with an adhesion layer including the hot melt adhesive A-1 of 'ADMER QE-060' manufactured by Mitsui Chemicals, Inc. therebetween." "disposed in a tire frame and wound under a constant tension in a helical shape on the outer circumferential surface of the crown portion 16 of the tire frame rotating in the arrow R direction in FIG. 3", "When a covering resin of the heated resin-covered cord 26 contacts the outer circumferential surface of the crown portion 16, the resin material of a contact portion melts or softens, and is melt-bonded to a resin forming a tire frame".

e "Tire" of the Example Invention is "formed by a method similar to the first embodiment". Thus "a metal reinforcing cord" of the Example Invention is "wound under a constant tension in a helical shape on the outer circumferential surface of the crown portion 16 of the tire case 17 rotating in the arrow R direction in FIG. 3. When a covering resin of the heated resin-covered cord 26 contacts the outer circumferential surface of the crown portion 16, the resin material of a contact portion melts or softens, and is melt-bonded to a tire case resin and integrated with the outer circumferential surface of the crown portion 16. In this case, the resin-covered cord is melted and bonded also to the resin-covered cord adjacent thereto so that winding is performed while no gap is present." (see the described matter 1h.).

Further, according to the above c, "tire case 17" is "tire frame".

Therefore, "a metal reinforcing cord" of the Example Invention "is wound under a constant tension in a helical shape on the outer circumferential surface of the crown portion 16 of the tire frame", and "a resin-covered cord is melted and bonded also to a resin-covered cord adjacent thereto".

f Therefore, the example invention may be restated as the following invention (hereinafter referred to as "Cited Invention").

"A tire comprising a circular tire frame made from a resin N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd. and

a reinforcing metal cord, said reinforcing metal cord comprising: a multifilament disposed in said tire frame having an average diameter ϕ of 1.15 mm (a twisted cord formed of twisted mono-filaments having ϕ of 0.35 mm (made of steel, strength: 280 N, elongation degree: 3%)) wound in a helical shape on the outer circumferential surface of the crown portion of said tire frame; and a covering layer made from a covering composition N-1 that covers said multifilament; an adhesive layer made from a hot melt adhesive A-1 of 'ADMER QE-060' manufactured by Mitsui Chemicals, Inc. disposed between said multifilament and said covering layer, wherein said heated covering layer contacts with the outer circumferential surface of said crown portion, so that a resin material in a contact portion is melted or softened to melt and adhere with said resin N-1 that forms said tire frame,

wherein said tire frame includes a pair of bead portions each of which is in contact with a bead seat and a rim flange of a rim, side portions that respectively extend in the tire radial direction outward from the bead portions, and said crown portion that connects a tire radial direction outer end of one of the side portions with a tire radial direction outer end of the other side portion,

said metal reinforcing cord is helically wound on an outer circumference of said crown portion, and said covering layer is melted and bonded also to an adjacent covering layer."

B Described matters in Cited Document 2

Japanese Unexamined Patent Application Publication No. 2012-46019, which was distributed or accessible to public via a telecommunication line before the filing date of the present application in Japan or foreign countries (published on March 8, 2012, hereinafter referred to as "Cited Document 2"; further, it is a document cited as Cited Document 5 in a decision to decline the amendment on January 24, 2017), generally discloses the following description of "tire" (hereinafter referred to as "described matter of Cited Document 2"):

- "[0205]
<Manufacture of sample piece>
... (Omitted)...

2) 'ADMER QE-060' manufactured by Mitsui Chemicals, Inc.
(glass transition temperature of 4°C, elastic modulus of 875 MPa)"

C Described matters in Cited Document 3

Japanese Unexamined Patent Application Publication No. 2012-166723, which was distributed or accessible to public via a telecommunication line before the filing date of the present application in Japan or foreign countries, (published on September 6, 2012, hereinafter referred to as "Cited Document 3"; further, it is a document cited as Cited Document 4 in a decision to decline the amendment on January 24, 2017) generally discloses the following description of "tire" (hereinafter referred to as "described matter in Cited Document 3"):

- "[0177]

Descriptions of abbreviations in the tables are shown below.
* Polyamide elastomer
... (Omitted)...

- 'UBESTA XPA9055X1' manufactured by Ube Industries. Ltd. (Elastic modulus: 303 MPa)"

D Described matters of Well-Known-Techniques Document 1

Japanese Unexamined Patent Application Publication No. 2014-189084, which was distributed or accessible to public via a telecommunication line before the filing date of the present application in Japan or foreign countries, (published on October 6, 2014, hereinafter referred to as "Well-Known-Techniques Document 1"; further, it is the Cited Document 6 in the notice of reasons for refusal on June 21, 2016, and also the Cited Document 3 in the decision to decline the amendment on January 24, 2017) generally discloses the following description of "tire" (hereinafter referred to as "described matter in Well-Known-Techniques Document 1"):

- "[0030]

Subsequently, a reinforcing layer 14 is configured by directly and helically winding a cord 30 covered with a cord covering layer 34 made from a resin material on the outer circumference of a crown portion 22. This reinforcing layer 14 corresponds to a belt layer disposed outside of a carcass ply in a radial direction of tire in a conventional, rubber-made pneumatic tire.

[0031]

A resin material used for cord covering layer 34 may be the same kind or different kind of resin material constituting a tire frame member 12. The use of the same kind of resin material as the one constituting a tire frame member 12 allows for better adhesion of said tire frame member 12.

[0032]

From FIG. 1 to FIG. 3, a tread member 16 is disposed in the outside of a radial direction of tire of reinforcing layer 14. In an inner circumference of this tread member 16 formed continuously in a circumferential direction of tire is a concave portion 20 to which a reinforcing layer 14 is installed. This concave portion 20 is formed on an inner circumference of a tread member 16 so as to fit with a profile of a reinforcing layer 14 having a convex shape when viewed from a crown portion 22 of a tire frame member 12 to the outside of radial direction of tire. In the present embodiment, a reinforcing layer 14 is projected with a cross-section profile of rectangular profile. Thus the concave portion 20 is also formed with a cross-section profile of a rectangular profile.

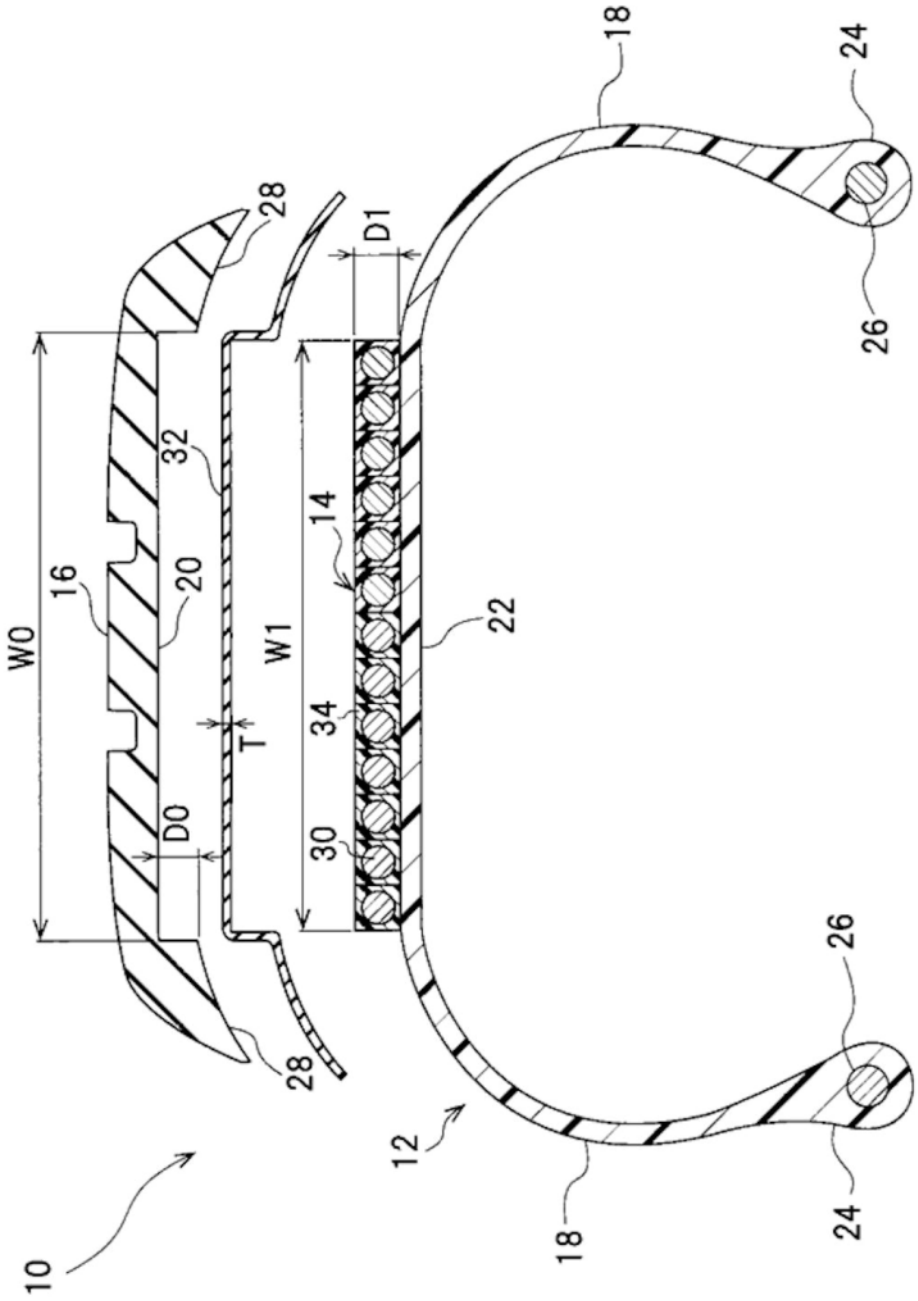
... (Omitted)...

[0039]

(Effects)

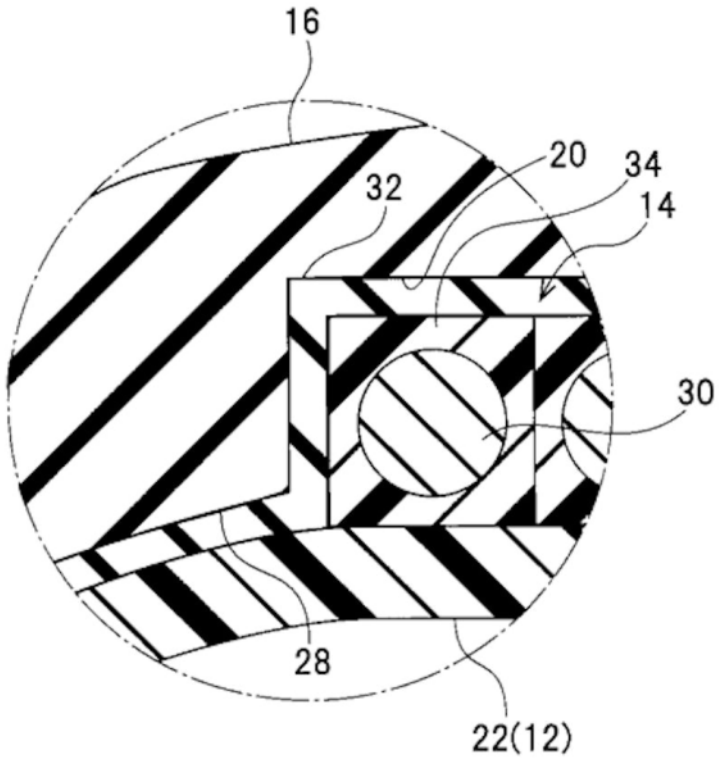
The present embodiment is configured as above, and an explanation is given to its effects in the following. In the present embodiment, while providing a tension to a cord 30 covered with a cord covering layer 34, the cord 30 is directly wound and disposed around the outer circumference of a crown portion 22 of a tire frame 12 to form a reinforcing layer 14. Cushion rubber, etc. is not disposed between the reinforcing layer 14 and tire frame member 12. Further, the cord covering layer 34 is composed of a resin material, and hard to deform as compared to a cushion rubber during cure adhesion of a tread member 16."

- "[FIG. 1]



"

- "[FIG. 4]



"

E Described matters of Well-Known-Techniques Document 2

Japanese Unexamined Patent Application Publication No. 2014-205462, which was distributed or accessible to public via a telecommunication line before the filing date of the present application in Japan or foreign countries (published on October 30, 2014, hereinafter referred to as "Well-Known-Techniques Document 2"), generally discloses the following description of "tire and production method of tire" (hereinafter referred to as "described matter of Well-Known-Techniques Document 2"):

- "[0059]

As illustrated in Fig. 2, the depth L1 of embedding the cord end portions 22A of the reinforcing cord member 22 is set to be within the range of 5% to 100% of a vertical width L0 of the cord end portions 22A.

The vertical width L0 and the depth L1 of embedding are lengths measured along the above-mentioned perpendicular line PL passing through the center of the cord end portion 22A (the center of the reinforcing cord 24 in the present exemplary embodiment).

[0060]

The reinforcing cord member 22 has a depth of embedding in the crown portion 16 that becomes deeper on progression from the cord intermediate portion 22B toward the cord end portions 22A. The length over which the depth of embedding gradually becomes deeper is preferably shorter than substantially one turn's worth of winding of the reinforcing cord member 22 onto the tire case 17.

[0061]

The reinforcing cord member 22 is configured including the reinforcing cord 24, and a resin covering layer 26 that covers the reinforcing cord 24.

The reinforcing cord 24 is configured either by a mono-filament (single strand), such as a metal fiber or an organic fiber, or by twisted multi-filaments (twisted strands) of fibers thereof.

The resin covering layer 26 is configured by a covering resin material, and has a cross-section profile that is a substantially square profile. The cross-section profile of the resin covering layer 26 is not limited to being a substantially square profile. For example, a circular cross-section profile or a trapezoidal cross-section profile may be employed.

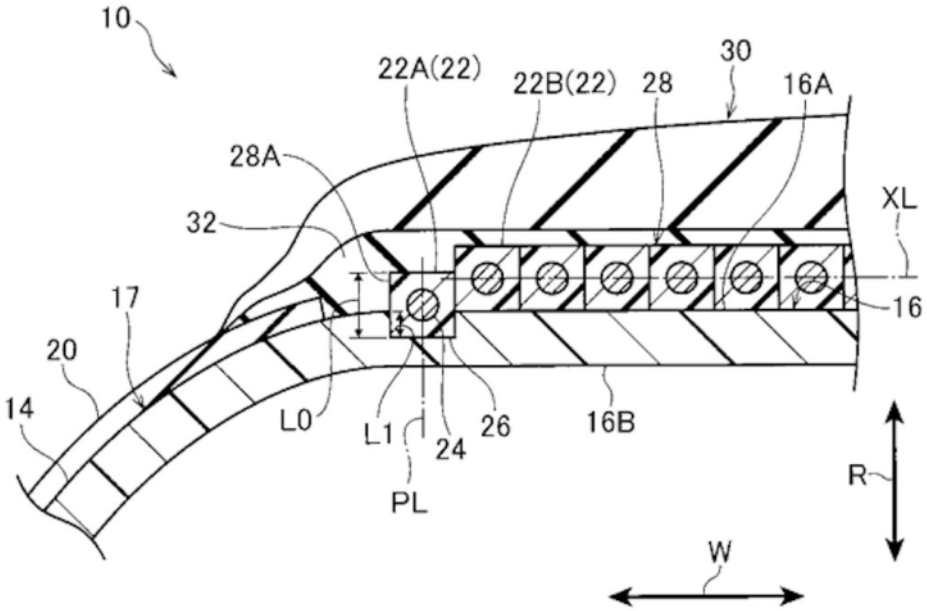
[0062]

In the present exemplary embodiment, a thermoplastic resin is employed as the covering resin material forming the resin covering layer 26.

[0063]

The crown portion 16 and the reinforcing cord member 22, specifically the resin covering layer 26, are welded together. Portions of the reinforcing cord member 22 that are adjacent to each other in the tire axial direction are bonded together (welded together in the present exemplary embodiment). The bonding together of adjacent portions of the reinforcing cord member 22 in the tire axial direction may apply to some or all of the portions; however, the wider the bonding surface area, the greater the reinforcing effect on the tire case 17 by the reinforcing cord member 22 (the reinforcing layer 28). The reinforcing layer 28 is formed at the outer circumference of the crown portion 16 by the reinforcing cord member 22."

- "[FIG. 2]



"

F Described matters of Well-Known-Techniques Document 3

Japanese Unexamined Patent Application Publication No. 2014-210487, which was distributed or accessible to public via a telecommunication line before the filing date of the present application in Japan or foreign countries (published on November 13, 2014, hereinafter referred to as "Well-Known-Techniques Document 3"), generally discloses the following description of "tire and production method of tire" (hereinafter referred to as "described matter of Well-Known-Techniques Document 3".):

- "[0044]
As illustrated in Fig. 1 and Fig. 2, the reinforcing cord member 22 is disposed at the outer circumference of the tire case 17; specifically, at the outer circumference of the crown portion 16. The reinforcing cord member 22 is configured including the reinforcing cord 24, and a resin covering layer 26 that covers the reinforcing cord 24.
[0045]
The reinforcing cord 24 is configured either by a mono-filament (single strand), such as a metal fiber or an organic fiber, or by twisted multi-filaments (twisted strands) of fibers thereof.
[0046]
The resin covering layer 26 is formed by a resin material used for covering (covering resin material), and has a cross-section profile that is a substantially square profile. The cross-section profile of the resin covering layer 26 is not limited to being a substantially square profile. For example, a circular cross-section profile or a trapezoidal cross-section profile may be employed.
[0047]
In the present exemplary embodiment, a thermoplastic resin is employed as the covering resin material forming the resin covering layer 26.
[0048]
The reinforcing cord member 22 is wound along the tire circumferential direction so as to form a spiral shape, and is bonded to the outer circumference of the tire case 17 (specifically, the outer circumference of the crown portion 16).
[0049]
Portions of the reinforcing cord member 22 that are adjacent to each other in the tire axial direction are bonded together. The bonding together of adjacent portions adjacent to each other in the tire axial direction of the reinforcing cord member 22 may apply to some or all of the portions; however, the wider the bonding surface area, the greater the rigidity of the reinforcing layer 28 configured by the reinforcing cord member 22.
[0050]
In the reinforcing cord member 22 of the present exemplary embodiment, the resin covering layer 26 is welded to the outer circumference of the tire case 17 (specifically to the outer circumference of the crown portion 16), and portions of the resin covering layer 26 that are adjacent to each other in the tire axial direction are welded together."

(2) Comparison
The Amended Invention and the Cited Invention are compared.

A "A resin N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd." of the Cited Invention corresponds to "a resin material for frame" of the Amended Invention, and "tire frame" corresponds to "tire frame member". Thus "a circular tire frame made from a resin N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd." of the Cited Invention corresponds to "a circular tire frame member formed from a resin material for frame" of the Amended Invention.

B According to the described matters in Cited Document 2, an elastic modulus of "a hot melt adhesive A-1 of 'ADMER QE-060' manufactured by Mitsui Chemicals, Inc." is 875 MPa, and according to the described matter of Cited Document 3, an elastic modulus of "a covering composition N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd." is 303 MPa. Therefore, it can be said that "a hot melt adhesive A-1 of 'ADMER QE-060' manufactured by Mitsui Chemicals, Inc." of the Cited Invention has a higher elastic modulus compared to "a covering composition N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd."

"A multifilament having an average diameter ϕ of 1.15 mm (a twisted cord formed of twisted mono-filaments having ϕ of 0.35 mm (made of steel, strength: 280 N, elongation degree: 3%)) wound in a helical shape on the outer circumferential surface of the crown portion of said tire frame" of the Cited Invention corresponds to "a reinforcing cord extending in a circumferential direction of the tire" of the Amended Invention.

"An adhesive layer made from a hot melt adhesive A-1 of 'ADMER QE-060' manufactured by Mitsui Chemicals, Inc. disposed between said multifilament and said covering layer" of the Cited Invention corresponds to "a resin layer for adhesion disposed between said reinforcing cord and said resin layer for covering to adhere said reinforcing cord and said resin layer for covering" of the Amended Invention.

"Said heated covering layer" "that contacts with the outer circumferential surface of said crown portion, so that a resin material in a contact portion is melted or softened to melt and adhere with a resin N-1 that forms said tire frame" of the Cited Invention corresponds to "a resin layer for covering made from a resin material for covering that covers said reinforcing cord and adheres to said tire frame member" of the Amended Invention.

Therefore, "a reinforcing metal cord, said reinforcing metal cord comprising: a multifilament disposed in said tire frame having an average diameter ϕ of 1.15 mm (a twisted cord formed of twisted mono-filaments having ϕ of 0.35 mm (made of steel, strength: 280 N, elongation degree: 3%)) wound in a helical shape on the outer circumferential surface of the crown portion of said tire frame; and a covering layer made from a covering composition N-1 that covers said multifilament; an adhesive layer made from a hot melt adhesive A-1 of 'ADMER QE-060' manufactured by Mitsui Chemicals, Inc. disposed between said multifilament and said covering layer, wherein said heated covering layer contacts with the outer circumferential surface of said crown portion, so that a resin material in a contact portion is melted or softened to melt and adhere with said resin N-1 that forms said tire frame" of the Cited Invention corresponds to "a covered cord member comprising: a reinforcing cord disposed in said tire frame member extending in a circumferential direction of the tire; a resin layer for covering made from a resin material for covering that coats said reinforcing cord and adheres to said tire frame member; a resin layer for adhesion that is made from a resin

material for adhesion with an elastic modulus higher than said resin material for covering and is disposed between said reinforcing cord and said resin layer for covering to adhere said reinforcing cord and said resin layer for covering" of the Amended Invention.

C "Wherein said tire frame includes a pair of bead portions each of which is in contact with a bead seat and a rim flange of a rim, side portions that respectively extend in the tire radial direction outward from the bead portions, and said crown portion that connects a tire radial direction outer end of one of the side portions with a tire radial direction outer end of the other side portion" of the Cited Invention corresponds to "said tire frame member comprises a bead portion, a side portion connected to the outside of a radial direction of tire of said bead portion and a crown portion connected to the inside of a width direction of tire of said side portion" of the Amended Invention.

D "Said metal reinforcing cord is helically wound on an outer circumference of said crown portion, and said covering layer is melted and bonded also to an adjacent covering layer" of the Cited Invention corresponds to "said covered cord member" "is helically wound on an outer circumference of said crown portion, and its adjacent portions in a width direction of tire are adhered to each other by thermal adhesion" of the Amended Invention.

E Therefore, the Amended Invention and Cited Invention have common points in that they are

"A tire comprising: a circular tire frame member formed from a resin material for frame;

a covered cord member comprising: a reinforcing cord disposed in said tire frame member extending in a circumferential direction of the tire; a resin layer for covering made from a resin material for covering that coats said reinforcing cord and adheres to said tire frame member; and a resin layer for adhesion that is made from a resin material for adhesion with an elastic modulus higher than said resin material for covering and is disposed between said reinforcing cord and said resin layer for covering to adhere said reinforcing cord and said resin layer for covering,

said tire frame member comprises a bead portion, a side portion connected to the outside of a radial direction of tire of said bead portion, and a crown portion connected to the inside of a width direction of tire of said side portion,

said covered cord member is helically wound on an outer circumference of said crown portion, and its adjacent portions in a width direction of tire are adhered to each other by thermal adhesion."

but they are at least different from each other in the following features:

<Different Feature 1>

Regarding a covered cord member (a metal reinforcing cord), in the Amended Invention it is specified as "has a cross-section profile of a substantially square profile in a direction orthogonal to a direction to which said reinforcing cord extends", whereas in the Cited Invention it is not specified in such a manner.

<Different Feature 2>

The Amended Invention specifies that "said resin layer for adhesion has a layer thickness thinner than said resin layer for covering", whereas the Cited Invention fails to specify it in such a manner.

(3) Judgment on the different features

Accordingly, the above Different Features 1 to 2 are considered in the following.

A Regarding Different Feature 1

According to the described matter of Well-Known-Techniques Documents 1 to 3, it was well-known before the filing to make a covering cord member (reinforcing metal cord) wound around a crown portion of tire a substantially square profile, and that it does not matter whatever profile of covering cord member (reinforcing metal cord) wound around a crown portion of tire, square profile, circular profile or trapezoidal profile (it can be seen from a drawing of Well-Known-Techniques Document 1 that a covering cord member (reinforcing metal cord) wound around a crown portion of tire has a substantially square profile; see in particular [0061] for Well-Known-Techniques Document 2, and [0046] for Well-Known-Techniques Document 3; hereinafter collectively referred to as "well-known techniques").

Further, in the Cited Invention, a person skilled in the art could have easily conceived of matters specifying the invention of the Amended Invention according to Different Feature 1 by selecting substantially square profile from substantially square profile, circular profile, and trapezoidal profile that were known as well-known techniques as a shape of a covered cord member (reinforcing metal cord).

Further, regarding "reinforcing metal cord" of the Cited Invention, in view of the described matter 1g ([0111]) of "while the embedding depth L of the resin-covered cord 26 with respect to the crown portion 16 is 1/2 of a diameter D of the resin-covered cord 26 in the tire 10 according to the first embodiment of the invention, it is preferably 1/5 or more, and particularly preferably above 1/2 of the diameter D of the resin-covered cord 26." and the described matter 1k (FIG. 2) of "substantially circular profile", it seems to be embedded in a "crown portion". "Substantially square profile" may also be embedded in a "crown portion" (for example, Well-Known-Techniques Document 2 discloses in [0059] and FIG. 2 that a covering cord member (reinforcing metal cord) with a substantially square profile is embedded in a crown portion). Therefore, it does not teach away from making the "reinforcing metal cord" of the Cited Invention in a "substantially square shape".

B Regarding the Different Feature 2

According to the description of "adhered with a hot melt adhesive A-1 described in Table 1 that has been heated and melted at a temperature of 240°C so as to have an average layer thickness of 100 μm" of the described matter 1i ([0143]), an average layer thickness of "an adhesive layer comprising a hot melt adhesive A-1" of the Cited Invention is 100 μm.

On the other hand, according to the described matter 1g ([0112]), stating that "A layer thickness of the covering composition 28 that covers the steel cord 27 is not particularly limited, and an average layer thickness may be preferably from 0.2 mm to 4.0 mm, more preferably from 0.5 mm to 3.0 mm, and particularly preferably from 0.5

mm to 2.5 mm", an average layer thickness of "covering" by "a composition for covering X-1 "UBESTA XPA9055X1" manufactured by Ube Industries, Ltd." in the Cited Invention is preferably 0.2 mm to 4.0 mm, further preferably 0.5 mm to 3.0 mm, and particularly preferably 0.5 mm to 2.5 mm.

Therefore, it is obvious that "an adhesive layer comprising a hot melt adhesive A-1" of the Cited Invention is thinner than "a coated layer" coated by "a composition for covering N-1 of 'UBESTA XPA9055X1' manufactured by Ube Industries, Ltd."

Therefore, it cannot be said that Different Feature 2 is a substantial difference.

Should Different Feature 2 be a substantial difference, a person skilled in the art could have easily conceived of the matters specifying the Amended Invention according to Different Feature 2 in the Cited Invention by taking the described matter 1g into account.

C As for Effects

In view of the descriptions of the specification that "in a tire of Claim 1, since a resin layer for adhesion has a layer thickness thinner than that of a resin layer for covering, the resin layer for adhesion becomes softened compared to, e.g., ones with a layer thickness of a resin layer for adhesion thicker than that of a resin layer for covering, which can improve the following ability of a resin layer for adhesion to a deformation of tire during tire rolling and suppress troubles in a resin layer for adhesion." ([0009]), "In a tire of Claim 1, a covering cord member is helically wound around the outer circumference of a crown portion of a tire frame member, and thus the rigidity of the crown portion in a circumferential direction of tire is improved." ([0011]) and "As a result, the durability of tire improves." ([0081]), the effects caused by the Amended Invention are "can improve the following ability of a resin layer for adhesion to a deformation of tire during tire rolling and suppress troubles in a resin layer for adhesion", "the rigidity of the crown portion in a circumferential direction of the tire is improved" and "the durability of tire improves". In view of the described matters in Cited Document 1, particularly the described matters 1b to 1e, these effects are the effects of the Cited Invention or the effects expectable from the Cited Invention and well-known techniques, and thus cannot be said to be particularly significant.

Demandant alleges in the written appeal that the Amended Invention causes two contradicting effects of: "in-plane shear rigidity in a width direction of tire (in a direction orthogonal to a direction in which a reinforcing cord extends) on a surface along the outer circumference of a crown portion is improved, and a resistant force of tire during wheel running is improved, and the durability is improved. Specifically, covering cord members are adjacent to each other in a width direction of the tire, and the adjacent covering cord members are integrated 'by thermal adhesion', so that the covering cord member functions as a high-rigidity plate member in which a reinforcing cord is embedded." and "while reducing the rigidity gap from a reinforcing cord to a crown portion, out-of-plane rigidity of tire is reduced compared to a case where a resin layer for adhesion is thicker than a resin layer for covering, thereby suppressing the crack of the resin layer for adhesion. Thereby a tire can be deformed flexibly to suppress brittle deformation, thereby improving durability." These effects are not described in the specification, the scope of claims, or drawing initially attached to the application of the present application, and the allegation is not based on the specification, the scope of claims, or drawing initially attached to the application of the

present application, and thus cannot be acceptable. Further, these effects are predictable from the Cited Invention and well-known techniques, and cannot be said to be particularly significant.

(4) Summary

Therefore, the Amended Invention was easily conceivable by a person skilled in the art on the basis of Cited Invention and well-known techniques, and thus the Appellant should not be granted a patent independently for the invention as of the filing under the provision of Article 29(2) of the Patent Act.

2-3 Closing

For the above reason, the Appellant should not be granted a patent independently for the invention as of the filing for the Amended Invention, and thus the Amendment violates the provision of Article 126(7) of the Patent Act, which is applied mutatis mutandis in the provisions of Article 17-2(6) of the Patent Act, and should be dismissed for the provision of Article 53(1) as applied mutatis mutandis by replacing certain terms pursuant to Article 159(1) of the Patent Act.

Therefore, a decision shall be made as per the above [Conclusion of Decision to Dismiss Amendment].

No. 3 Regarding the invention

1 The Invention

For the above reason, the Amendment was dismissed. Thus the inventions according to Claims 1 to 3 of the scope of the claims of the present application should be specified by the matters recited in Claims 1 to 3 of the Claims in view of the claims and specification to which an amendment was made on May 30, 2016. The invention according to Claim 1 of the scope of the claims (hereinafter referred to as "the Invention") is as described in the above No. 2, [Reason], 1(1).

2 Reasons for refusal stated in the examiner's decision

The reasons for refusal stated in the examiner's decision are that the inventions according to Claims 1 to 3 of the present application were easily conceivable by a person skilled in the art who had ordinary knowledge in the field of art to which the invention belongs on the basis of the invention described in the following Cited Documents that had been distributed or available to public via telecommunication line in Japan or foreign countries before the filing. Thus Appellant should not be granted a patent for the inventions under the provision of Article 29(2) of the Patent Act.

<List of Cited Documents, etc.>

1. International Publication No. WO2014/175453
2. Japanese Unexamined Patent Application Publication No. 2013-180652
3. Japanese Unexamined Patent Application Publication No. 2011-42235
4. International Publication No. WO2013/089111
5. Japanese Unexamined Patent Application Publication No. 2006-282102
6. Japanese Unexamined Patent Application Publication No. 2014-189084

Note that the International Publication No. 2014/175453 and Japanese Unexamined Patent Application Publication No. 2014-189084 are Cited Document 1

and Well-Known-Techniques Document 1, respectively, in the above No. 2 [Reason] 2, 2-2.

3 Described matters in cited documents

The described matters of Cited Document 1 and Cited Invention are as per the above No. 2 Reason 2, 2-2(1)A.

Further, the described matters of Cited Documents 2 and 3 and Well-Known-Techniques Documents 1 to 3 are as per the above No. 2 [Reason] 2, 2-2(1)B to F.

4 Comparison / Judgment

As is discussed in the above No. 2 [Reason] 2, 2-1, the Amended Invention clarifies the Invention and specifies its matters specifying the Invention. Further, as in the above No. 2 [Reason] 2, 2-2(2) to (4), the Amended Invention, which limits a scope matters specifying the Invention, was easily conceivable by a person skilled in the art on the basis of the Cited Invention and well-known techniques (regarding the well-known techniques, see the above No. 2 [Reason], 2, 2-2(3)A). Therefore, the Invention was easily conceivable by a person skilled in the art on the basis of the Cited Invention and well-known techniques, similarly to the Amended Invention.

5 Closing

Therefore, the Invention was easily conceivable by a person skilled in the art on the basis of Cited Invention and well-known techniques, and thus the Appellant should not be granted a patent for the invention under the provision of Article 29(2) of the Patent Act.

No. 4 Conclusion

As in the above No. 3, the Invention is not patentable under the provision of Article 29(2) of the Patent Act, and thus the present application should be refused.

Although Demandant also requested that the decision to decline the amendment made on January 24, 2017 should be dismissed, the written appeal failed to specify a reason why the decision is not legitimate, and Demandant filed another amendment (filed on May 1, 2017) regardless of the amendment (filed on October 20, 2016) that had been dismissed. Taking into account those facts, the above Demandant's request cannot be approved.

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

May 21, 2018

Chief administrative judge: SUTO, Yasuhiro
Administrative judge: KATO, Tomoya
Administrative judge: SAKAZAKI, Hiromi