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TYRE WITH A SYSTEM FOR ADHERENCE TO THE RUNNING SURFACE

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DESCRIPTION

TYRE WITH A SYSTEM FOR ADHERENCE TO THE RUNNING SURFACE

Object of the invention

The present invention relates to a new type of wheel tyre, hereinafter referred to simply as a “tyre”, particularly a tyre comprising means that make it possible to improve the grip or adherence of the wheel to the running surface.

The field of application of the invention falls within the sector relating to wheels for different types of vehicles and, more specifically, within the sector of the manufacture and marketing of tyres.

Background of the invention

A tyre is a covering, generally made of rubber, which is mounted on the rim of a wheel and comes into contact with the running surface of a road, generally made of asphalt.

It is known that one of the main functions of tyres is to adhere to the running surface, providing traction and control to the vehicle. In this regard, the tyre is a crucial element for road safety, since it determines the vehicle’s ability to brake, accelerate and turn.

The main factors determining a tyre’s good condition and good adherence lie in the design of the tread, consisting of surface grooves designed to evacuate water and improve traction under different conditions, which must be prevented from wearing down; the composition or mixture of the tyre’s rubber, which directly affects adherence, especially in wet conditions or at extreme temperatures; and appropriate pressure and temperature. The condition of the road (dry, wet, icy) and its material and/or roughness (earth, asphalt) are also decisive. To date, as a general rule, efforts to improve the tyre’s grip and adherence to the running surface have taken these variables into account.

Considering the different types of tyres in more detail, there are those commonly referred to as summer tyres, intended for asphalted and dry surfaces, which generally have treads with fewer patterns; and winter tyres, intended for wet, snowy or icy surfaces and more irregular surfaces, which have treads with very pronounced reliefs and patterns and may even have fixed studs. These types of tyres have the drawback of being expensive and limited to specific environmental conditions. For example, a vehicle that is going to travel on an icy mountain road in winter cannot use summer tyres, just as it is not advisable for a vehicle travelling on a motorway in summer to use winter tyres.

It is also widely known that, in snowy or icy conditions, what are commonly referred to as chains are used, which wrap around the surface of the tyre and provide additional grip in adverse winter conditions. This is the most common and cheapest solution, and a wide range of different types of chains also exists. However, there is the problem and inconvenience of having to carry chains in the vehicle and having to fit them, generally in dangerous or adverse situations, and in many cases skill is required to install them.

Taking into account what is known in the state of the art, the present invention solves the problem of providing a single type of tyre that can be used in any atmospheric condition and/or type of running surface. To this end, the tyre that is the subject of the present invention is distinguished by comprising a pneumatically activated system that makes it possible to improve the grip or adherence of the wheel to the running surface, which a user may activate automatically according to the conditions of the running surface.

In this regard, no tyre is known that is either similar to or as advantageous as the one described and claimed below.

Explanation of the invention

The tyre that is the subject of the present invention is intended to overcome the problems and limitations indicated above.

In greater detail, the present tyre is of the type structurally comprising at least one insulating or sealing layer arranged on the inner and lower part of the tyre and in contact with the rim; a carcass arranged over the sealing layer; a sidewall over the carcass on the lateral walls of the tyre, which may have a bead at the bottom of the lateral wall, which may be reinforced; a stiffening belt arranged over the carcass and at the front of the tyre between the lateral walls, which may have an upper protector; and a tread over the belt, which may have surface grooves or patterns and which comes into contact with the running surface; and which is distinguished by additionally comprising a system for adherence or grip to the running surface comprising:

an air chamber arranged inside the tread;

a valve for filling the air chamber, wherein the valve is connected to the air chamber by a conduit, preferably arranged in one of the tyre sidewalls;

a plurality of housings extending from the air chamber and having an upper opening in the tread, wherein these housings are preferably arranged in rows and each housing accommodates a stud;

and wherein the stud moves axially along the housing according to the air pressure in the chamber, so that it projects from the tread when pressure is introduced into the air chamber, or remains accommodated inside the tread if pressure is released from the chamber.

Additionally, in order to improve the rigidity and stability of the tread, it may internally comprise a plurality of wire lines.

This invention is therefore intended to enable the tyre to serve in any type of environmental situation. For example, if the vehicle is travelling on a dry road, the studs remain accommodated inside the tread. However, if the road is snowy and/or may have patches of ice, a user introduces pressure into the chamber through the valve; this pushes the studs so that they project from the tread, and the tyre is automatically provided with a grip and adherence system in this dangerous situation, without needing either to change the tyre or to fit chains.

To ensure the airtightness of the air chamber and the housings accommodating the studs, rims or lips may be provided at the contact areas between them, ensuring that the pressure in the air chamber is

maintained both when the studs are deployed and project from the tread and when they are retracted and accommodated inside the tread; and a projecting flange may be provided at the upper opening of the housing to ensure that it is closed when the stud is in its retracted position inside the housing.

In possible embodiments of the invention, the stud may have a projecting front end of rounded or pointed shape, although it may have other configurations, such as a shovel shape.

In a possible embodiment of the invention, the housing may be arranged in the groove or pattern area of the tread, that is, the studs may emerge from the relief pattern.

Among the different options for introducing pressure into the air chamber, the valve may be connected, for example, to a manual air pump; to a semi-automatic system comprising a pump arranged next to the vehicle engine with a manually positioned tube and suction from the engine for automatic inflation; or to an automatic control system in which the valve is integrated with the engine pump and is activated from the vehicle dashboard. In any case, the mode of activation of the grip system is not the subject of the present invention and depends on the tyre manufacturer’s judgement.

It should be borne in mind that, throughout the description and the claims, the term “comprises” and its variants are not intended to exclude other technical features or additional elements.

Brief description of the figures of the invention

To supplement the description being given and in order to assist a better understanding of the features of the invention, a set of drawings is attached as an integral part of said description, in which the following is shown by way of illustration and without limitation:

Figure 1 shows a section of an exemplary embodiment of the tyre that is the subject of the present invention.

Figures 2 and 3 schematically show the main elements of the invention and how the tyre adherence system operates: on the one hand, when the studs do not project from the tread (Fig. 2), and on the other, when air is introduced into the air chamber and the pressure rises, the studs move and project from the tread (Fig. 3).

Explanation of an embodiment of the invention

As can be seen in detail in the figures, in one embodiment of the invention, the tyre comprises:

a sealing layer (1) arranged in the inner part of the tyre and in contact with the rim;

a carcass (2) arranged over the sealing layer;

a sidewall (3) over the carcass on the lateral walls of the tyre;

a bead (13) at the bottom of the lateral wall, with a reinforcement (14);

a stiffening belt (4) arranged over the carcass and at the front of the tyre between the lateral walls, additionally having a protector (15); and

a tread (5) over the belt, comprising surface grooves (6) and coming into contact with the running surface;

and which is distinguished by comprising a system for adherence or grip to the running surface comprising:

an air chamber (7) arranged inside the tread;

a valve (8) for filling the air chamber, wherein the valve is connected to the air chamber by a conduit (9), arranged in one of the tyre sidewalls;

a plurality of housings (10) extending from the air chamber and having an upper opening in the tread, wherein these housings are arranged in rows and each housing accommodates a stud (11);

wherein the stud (11) moves axially along the housing according to the pressure in the air chamber (7), so that, as can be seen schematically in Fig. 3, it projects from the tread when pressure (P) is introduced into the air chamber through the valve; or, as can be seen schematically in Fig. 2, it remains accommodated inside the tread if pressure is released from the chamber;

and wherein the tread comprises a plurality of wire lines (12) to improve the rigidity and stability of the tyre.

CLAIMS

1. Tyre with a system for adherence to the running surface, comprising a sealing layer (1) arranged in the inner part of the tyre; a carcass (2) arranged over the sealing layer; a sidewall (3) over the carcass on the lateral walls of the tyre; a stiffening belt (4) arranged over the carcass and at the front of the tyre between the lateral walls; and a tread (5) over the belt, comprising surface grooves (6) and coming into contact with the running surface; and characterised in that it comprises a system for adherence to the running surface comprising: an air chamber (7) arranged inside the tread; a valve (8) for filling the air chamber, wherein the valve is connected to the air chamber by a conduit (9); a plurality of housings (10) extending from the air chamber and having an upper opening in the tread, wherein each housing accommodates a stud (11); and wherein the stud (11) moves axially along the housing, projecting from or remaining inside the tread by action of the pressure in the air chamber (7).

2. A tyre according to claim 1, wherein the valve (8) is arranged in a sidewall (3).

3. A tyre according to claim 1, wherein the housings (10) are arranged in rows.

4. A tyre according to claim 1, wherein the studs (11) have a projecting front end of rounded or pointed shape.

5. A tyre according to claim 1, wherein the tread (5) comprises a plurality of wire lines (12).

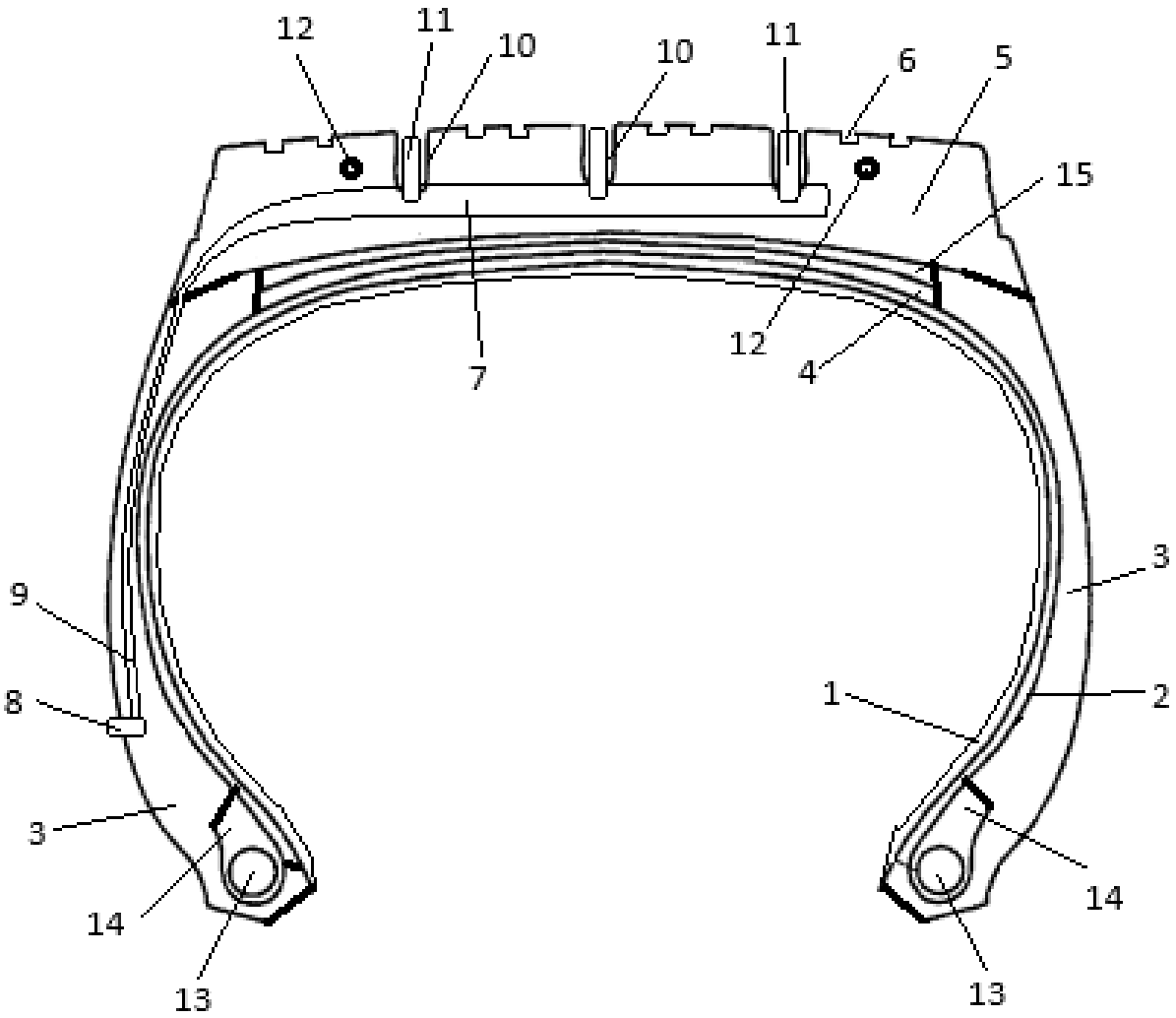


FIG.1

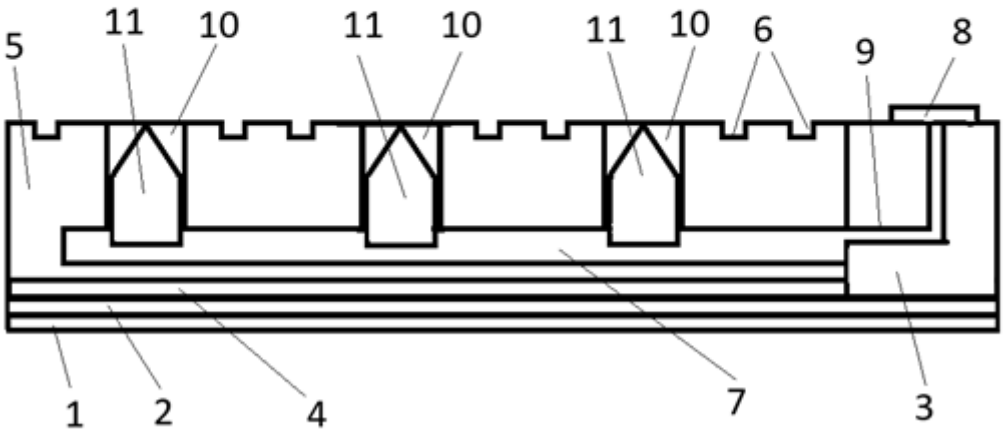


FIG.2

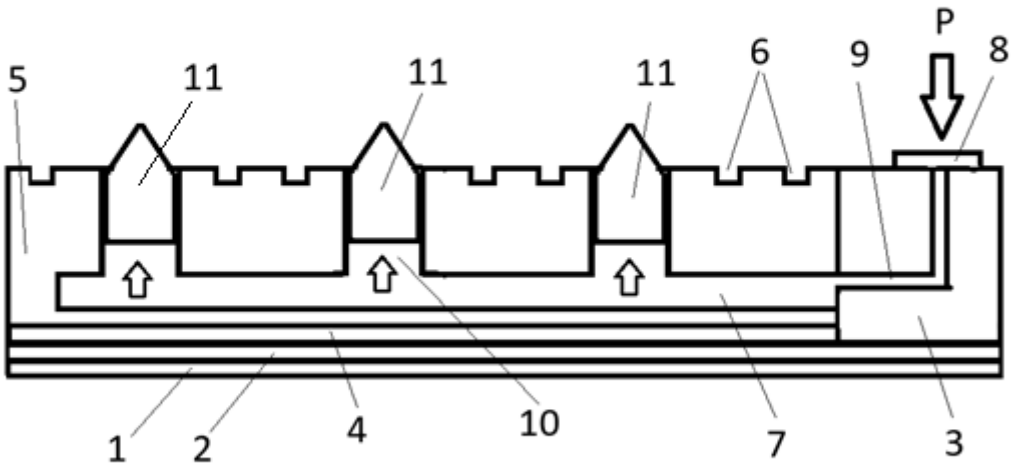


FIG.3