



(12) **CORRECTED EUROPEAN PATENT SPECIFICATION**

Note: Bibliography reflects the latest situation

- (15) Correction information:  
**Corrected version no 1 (W1 B1)**  
**Corrections, see page(s) 4,5**
- (48) Corrigendum issued on:  
**22.03.2006 Bulletin 2006/12**
- (45) Date of publication and mention  
of the grant of the patent:  
**14.12.2005 Bulletin 2005/50**
- (21) Application number: **00915597.9**
- (22) Date of filing: **06.04.2000**
- (51) Int Cl.:  
**B60C 27/16<sup>(1968.09)</sup>**
- (86) International application number:  
**PCT/NO2000/000113**
- (87) International publication number:  
**WO 2000/059745 (12.10.2000 Gazette 2000/41)**

(54) **A GLIDING PREVENTER FOR VEHICLE WHEELS**

GLEITSCHUTZVORRICHTUNG FÜR FAHRZEUGGRÄDER

DISPOSITIF DE PREVENTION DE PATINAGE POUR ROUES DE VEHICULES

- (84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU**  
**MC NL PT SE**  
Designated Extension States:  
**AL LT LV MK RO SI**
- (30) Priority: **06.04.1999 NO 991631**
- (43) Date of publication of application:  
**02.01.2002 Bulletin 2002/01**
- (60) Divisional application:  
**05023588.6 / 1 621 370**
- (73) Proprietor: **Autosock AS**  
**3491 Klokkarstua (NO)**
- (72) Inventor: **LOETVEIT, Bard**  
**N-3490 Klokkarstua (NO)**
- (74) Representative: **Haimelin, Jukka Ilmari et al**  
**Oy Jalo Ant-Wuorinen Ab**  
**Iso Roobertinkatu 4-6 A**  
**00120 Helsinki (FI)**
- (56) References cited:  
**WO-A1-93/12944** **US-A- 2 682 907**
- **PATENT ABSTRACTS OF JAPAN & JP 59 160 607 A (MOTOYOSHI TSUJITA) 11 September 1984**
  - **PATENT ABSTRACTS OF JAPAN & JP 01 249 503 A (SHOJI MATSUURA) 04 October 1989**

## Description

**[0001]** The present invention relates to a device to be fitted on a vehicle wheel of a predetermined size in order to increase the friction between the wheel and the road surface during winter conditions, comprising a belt made substantially from textile material and intended to encircle the tread of the wheel and be held in place by means of flexible inner and outer side portions which, at least on the inner side of the wheel, is tightened by means of an elastic member.

**[0002]** Such a device according to the preamble of claim 1 is known from US 2,682,907, Figures 1 - 3. This known device is symmetrical about its middle plane and is made from a single piece of coarse canvas, which is folded over so that along either of the two outer edges a continuous pocket is formed which receives an elastic member in the form of a helical spring.

**[0003]** The middle portion of the device, which is supposed to constitute the belt to come into contact with the road surface, is by means of glue provided with a coating of aluminium oxide impregnated with abrasive particles in order to substantially increase the friction against the road surface.

**[0004]** The device according to US 2,682,907 is formed to cling quite closely to the vehicle wheel and cannot be put in place on the wheel when the wheel is mounted on a vehicle unless the wheel is raised from the ground. Since the device is symmetrical with flexible side portions having springs included on both sides, the device, e.g. when driving through a curve on a dry road surface, conceivably could creep off the wheel towards the inside thereof and impede the steering mechanism of the vehicle, possibly also damage brake lines. Once the device has moved to the inner side of the wheel, it cannot be removed without destroying the device or removing the wheel from the vehicle.

**[0005]** A purpose of the present invention is to provide a device mentioned in the introductory paragraph, which may be fitted to the wheel of the vehicle even when the wheel is resting on the road surface with the full weight of the vehicle, preferably also when the wheel is stuck in more or less deep snow.

**[0006]** This is obtained according to the invention by making the belt encircle the tread with a clearance resulting from the internal circumference of the belt being at least 4% larger than the largest circumference of the tread of the wheel. Very surprisingly, it has been found that such an oversize makes it possible to fit the inner side portion over the tread of the wheel to the inner side of the wheel along such a long part of the circumference of the wheel not being in contact with the road surface that, when the wheel thereafter is rotated, e.g. by attempting to drive the car forwards or backwards, the remaining part of the inner side portion will assume its place on the inner side of the wheel and pull the belt in place along the tread of the wheel.

**[0007]** It has also surprisingly been found that with this

oversize, which can be permitted to amount up to 8% or more, somewhat depending on the space conditions in the wheel well of the vehicle, the device will stay in place on the wheel even when driving on a clear and winding road at speeds at least as high as common snow chains would permit.

**[0008]** A second purpose of the invention is to provide a device of the type mentioned in the introductory paragraph which will not be able to shift on the wheel so that dangerous driving situations occur.

**[0009]** This is obtained according to the invention by the outer side portion of the device being shaped so that it will not be able to jump over the wheel to the inner side thereof. Here, the outer side portion may e.g. cover the entire outer side of the wheel, or it may be provided with one or more openings, the largest circumference of such an opening being less than 2.2 times the largest diameter of the wheel. Where the outer side portion is so narrow that its opening becomes larger than this, the opening can be limited by means of radially extending straps. These straps may also be suitable as gripping means when the device is to be removed from the wheel after use.

**[0010]** A further purpose of the present invention is to provide a method for fitting a device according to the invention to a vehicle wheel while the wheel is mounted on the vehicle and possibly also is stuck in snow.

**[0011]** This is obtained according to the invention in that the inner side portion is fitted over the tread of the wheel to the inside of the wheel along at least two thirds of the circumference of the wheel, preferably along as much as possible of that part of the circumference which does not rest against the road surface, whereupon the wheel is rotated by means of the vehicle, whereby the remaining part of the inner side portion moves to assume its place on the inside of the wheel and pulls the belt in place along the tread of the wheel.

**[0012]** Further advantageous features of the invention will appear from the following description of the exemplifying embodiments schematically shown on the dependent drawings, wherein:

Figures 1A,B,C are a perspective view of a vehicle wheel provided with a first device according to the invention seen from the outside, a perspective view of the wheel in Figure 1A seen from the inner side, and a partial radial cross-section through the wheel in Figure 1A, respectively;

Figures 2A,B,C are views similar to Figures 1A,B,C of a second embodiment of the invention, except that the wheel is removed from Figures 2A and 2B;

Figures 3A, B, C are views similar to Figures 2A,B, C of a third embodiment according to the invention; and

Figures 4A, B to 7A,B are views similar to Figures

2A and 2B of a fourth to seventh embodiment, respectively, of the device according to the invention.

**[0013]** In the various embodiments shown in the above mentioned figures, the same reference numerals have been used on like or corresponding parts.

**[0014]** Figures 1A-C shows a vehicle wheel 1 provided with a first embodiment of the device according to the invention. This device 2 comprises a belt 3 which is to encircle the tread 4 of the wheel with a certain clearance therebetween over at least a part of the portion of the belt 3 which is not located between the wheel and the road surface. This clearance results from the inner circumference of the belt being 4 - 10%, preferably 5 - 6% larger than the largest circumference of the wheel 1. The belt 3 may consist of a textile material, preferably made of a polymer. A woven textile of polyamide has turned out to be particularly suitable, combining high strength with very good adhesion to a snow covered surface. One such material is commercially available under the trade name Cordura 1000.

**[0015]** On the side of the belt 3 facing the tread of the wheel 4 its textile material may advantageously be coated with a suitable plastic, e.g. polyurethane rubber, in order to strengthen and stabilise the material and reduce the friction against the tread of the wheel.

**[0016]** Even though a woven textile has been found suitable as belt material, it will be understood that also other materials can turn out to be suitable, e.g. more or less stabilised felt materials. It will also be understood that the outer side of the belt may be provided with a friction increasing coating. The device according to the invention can be made reversible, the belt on one side having a surface which is suitable for driving on snow, while the other side has a surface for better gripping ability on ice.

**[0017]** Furthermore, the device 2 is provided with an inner side portion 5 which in the embodiment shown consists of a lighter and more flexible textile material than the belt 3 and which is sewn or in another suitable way is attached to the belt 3 along one of its longitudinal edges. The inner side portion may on its inside advantageously be provided with a low friction coating, preferably silicone polymer, butadiene rubber, neoprene rubber, PVC or similar polymer. Such a low friction coating makes it easier to fit the device 2 in place on the wheel 1 during the mounting.

**[0018]** The free edge of the inner side portion 5 is provided with a longitudinal pocket 6, in which an elastic element 7. is placed, here in the form of a multi-thread rubber band covered by a sheathing spun of relatively smooth thread material. The purpose of the sheathing is, firstly, to reduce the stretchability of the rubber band and, secondly, to reduce the friction between the rubber band and the inside of the pocket 6. The low friction on this point is important for the unhindered adaptation of the rubber band in the pocket 6 when the rubber band is stretched during the fitting of the device onto the tire and

for reducing the potentially destructive friction forces when the pocket with the rubber band is driven over by the wheel 1 during the last phase of the fitting of the device 2. (It will be understood that the spring shown in US 2,682,907 and its pocket easily will be damaged if it were to be driven over in such a way.)

**[0019]** From Figure 1A it appears that on its outer side the device 2 is provided with a fully covering side portion 8. It is also made of a partly coated textile material, e.g. of the type Cordura, but in a lighter quality than the belt 3.

**[0020]** The outer side portion is provided with two diametrically extending orthogonal straps 9, which in addition to being attached to the outer side portion and possibly also the belt 3 at their ends, also are attached to each other and to the middle of the outer side portion 8. The straps 9 serve the purpose of facilitating removal of the device 2 after use and will, in addition, have a reinforcing effect. It will be understood that the straps 9 may be arranged in different numbers, e.g. three radial straps may be used. The straps may also advantageously be made of a polymer so that the entire device 2 will consist of materials that neither rust nor rot if it is stored in a wet condition.

**[0021]** In figures 2A-C there is shown a second exemplifying embodiment of a device according to the invention. The belt 3 and the inner side portion 5 are here made of one and the same piece of textile material. The elastic member 7 is constituted by a band which is woven, spun or knitted from a rubber elastic thread material and a substantially inelastic thread material, so that the latter thread material limits the extendability of the elastic member 7. The band can have a width of about 5 cm and be of a type which is used for suspenders or belts. The band is doubled and is in tensioned condition sewn to the free edge of the inner side portion 5. This avoids a pocket with a concealed rubber band that cannot be inspected for damage or wear.

**[0022]** In this case the outer side portion 8 has a relatively large central opening. However, the free edge 10 of the side portion 8 has a circumference that is less than 2.2 times the largest diameter of the wheel 1 for which the device is to be used. Considering that the tread 4 of the wheel is about 20% of the diameter of the wheel, an opening limited in this way will not be able to jump over the wheel to bring the device in its entirety on the inner side of the wheel. The free edge 10 can be reinforced in a suitable manner.

**[0023]** In the third exemplifying embodiment illustrated in Figures 3A-C the belt 3 is made of two layers of textile material, e.g. the Cordura 1000 mentioned above, coated with polyurethane rubber on one side. Here the layers are placed so that the sides coated with polyurethane rubber face each other in the middle portion of the belt. The outer layer will thereby have the possibility of sliding somewhat against the inner layer, the effect being to reduce the strains on the belt when driving on an uneven surface, e.g. over sharp stones.

**[0024]** Here, the inner and outer side portions 5, 8 are

sewn to the belt 3 and consist of a textile material of a lighter quality than the belt. The elastic member 7 is a band as described above in connection with the second exemplifying embodiment.

[0025] Figures 4A,B show an exemplifying embodiment similar to that of Figures 3A-C, except that the outer side portion 8 is provided with two crossed straps 9, as is also shown in connection with Figure 1A.

[0026] In the fifth exemplifying embodiment shown in Figures 5A,B the outer side portion 8 is essentially fully covering, but is provided with four openings 11 which are large enough to serve as grips when the device 2 is to be stabilised during mounting or pulled off after use.

[0027] Figures 6A,B shows an exemplifying embodiment where the belt 3 and the inner side portion 5 is constituted by one and the same textile material, while the outer side portion 8 is fully covering.

[0028] The exemplifying embodiment in Figures 7A,B has its starting point in the example of Figures 6A,B, but the outer side portion 8 is provided with ventilation holes 12 along the outer edge and also two crossed straps 9. During driving the outer side portion 8 may have a tendency to act as a centrifugal pump so that the device 2 is inflated. This effect may be advantageous when driving in loose snow because the air blown out along the free edge of the inner side portion 5 prevents the snow from penetrating into the device 2. If, on the other hand it is desirable that the device cling closer to the wheel, e.g. in case of narrow space conditions in the wheel well, the ventilation holes 12 may be advantageous.

[0029] Further development of the invention has suggested that the outer side portion of the device preferably may be made from a netting material, thus obviating any additional ventilation holes. For example, the netting may be made of PVC coated 1100 dtex polyester multifilament material. The netting openings may have an opening side length of 2-7 mm, preferably about 4 mm. Furthermore, there is reason to believe that polyester may be a suitable material also for the belt 3 of the device according to the invention. One envisions a belt of a multilayer construction, the outer surface comprising polyester multifilament yarn oriented crosswise to the circumferential direction of the belt. The yarn may have a fineness of about 1100 dtex, and the layer construction pattern could be 4-shed broken twill.

[0030] Furthermore, it is envisioned that the multilayer construction has an inner layer with a colour or colour pattern which is different from that of the outer layer or layers. Such a differently coloured inner layer, which may be made of polyester or polyamide, will appear when the outer layers are worn through and thereby serve as a wear indicator helping to prevent the situation where the device would separate in the circumferential direction into two parts.

[0031] Finally, it is envisioned that the outer and inner layers of the belt are interconnected by a common yarn system in said circumferential direction. Also in this case a yarn of polyester multifilament of about 1100 dtex is

expected to be suitable.

[0032] It will be understood that according to the invention, a device has been provided which is simple and inexpensive to produce. It is environmentally desirable since it does not cause noise and vibrations or wear on the road surface during use and also since it is made of recyclable materials. The device provides good gripping ability on dry and wet snow and ice, even better than a good studded tire. It is very simple to fit onto and remove from the wheel, and it is comfortable to handle even in cold weather. Even though the device primarily is intended for use in difficult driving situations of a temporary nature, it has proven itself to be very durable. Thus, a prototype mounted on the driven wheels of a vehicle was driven a distance of 30 km at speeds varying between 60 and 70 km per hour, mostly on dry asphalt, which gives the highest wear. Both devices kept stably in place and were intact after the driving. Nevertheless, should the entire or parts of the device for one reason or another fall off during driving, due to its limited weight and soft character it will not do much damage to the vehicle or the surroundings. It will also be understood that the device according to the invention is not limited to the exemplifying embodiments described above, but that it may be modified and varied by the skilled person within the scope of the appended claims.

## Claims

1. A device to be fitted on a vehicle wheel (1) of a predetermined size in order to increase the friction between the wheel and the road surface during winter conditions comprising a belt (3) made substantially from textile material and intended to encircle the tread (4) of the wheel (2) and be held in place by means of flexible inner and outer side portions (5,8) which, at least on the inner side of the wheel, is tightened by means of an elastic member (7), **characterized in that** the belt (3) is to encircle the tread (4) with a clearance resulting from the internal circumference of the belt (3) being **[deletion(s)]** at least 4% larger than the largest circumference of the tread (4) of the wheel (1).
2. A device according to claim 1, **characterized in that** the internal circumference of the belt (3) is 4-10%, preferably 5-6% larger than the largest circumference of the tread (4) of the wheel.
3. A device according to one of the preceding claims, **characterized in that** the outer side portion (8) is designed so as to prevent it from jumping over the wheel (1) to the inside thereof.
4. A device according to one of the preceding claims, **characterized in that** the outer side portion (8) is designed to cover substantially the outer side of the

wheel (1) and that it preferably is made of a netting material preferably comprising a PVC coated 1100 dtex polyester multifilament material and having a netting opening of 2-7 mm, preferably about 4 mm.

5. A device according to claim 3, **characterized in that** the outer side portion (8) has at least one opening the largest circumference (10) of such an opening being less than 2.2 times the largest diameter of the wheel (1).
6. A device according to one of the preceding claims, **characterized in that** the outer side portion (8) is provided with radially extending straps (9).
7. A device according to one of the preceding claims, **characterized in that** the elastic member (7) comprises a rubber-elastic material which is covered by spinning about it, or is spun, woven or knitted together with, a substantially inelastic thread material, said thread material limiting the extensibility of the elastic member (7).
8. A device according to one of the preceding claims, **characterized in that** the belt (3) consists mostly of a polymer textile material.
9. A device according to one of the preceding claims, **characterized in that** textile material is exposed on the outer side of the belt.
10. A device according to one of the preceding claims, **characterized in that** the belt (3) comprises two layers of textile material which on one side is coated with a suitable plastic, e.g. polyurethane rubber, the two layers being arranged so that the plastic coatings contact one another.
11. A device according to any one of claim 1-9, **characterized in that** the belt (3) is of a multilayer construction, the outer surface comprising polyester multi-filament yarn oriented crosswise to the circumferential direction of the belt (3), and preferably having a fineness of about 1100 dtex, the layer construction pattern preferably being 4-shed broken twill.
12. A device according to claim 11, **characterized in that** the multilayer construction has an inner layer of a colour different from that of an outer layer and preferably being made of a polyester or polyamide multifilament material.
13. A device according to claim 11 or 12, **characterized in that** the outer and inner layers are interconnected by a common yarn system in said circumferential direction, preferably comprising a polyester multifilament of about 1100 dtex.

14. A device according to one of the preceding claims, **characterized in that** the inside of the inner side portion (5) is coated by a low friction coating, preferably a silicone polymer, butadiene rubber; neoprene rubber, PVC or similar polymer.

15. A method for fitting a device (2) according to one of the preceding claims on a vehicle wheel (1), resting against a road surface, in order to increase the friction between the wheel and the road surface during winter conditions, said device comprising a belt (3) made substantially from textile material and intended to encircle the tread (4) of the wheel (1) and be held in place by means of flexible inner and outer side portions (5,8) which, at least on the inside of the wheel is tensioned by means of an elastic member (7), **characterized in that** the inner side portion (5) is fitted over the tread (4) of the wheel (1) to the inside of the wheel along at least two thirds of the circumference of the wheel, preferably along as much as possible of that part of the circumference which does not rest against the road surface; whereupon the wheel (1) is rotated by means of the vehicle, whereby the remaining part of the inner side portion (5) moves to assume its place on the inside of the wheel (1) and pulls the belt (3) in place along the tread (4) of the wheel.

#### 30 Patentansprüche

1. Vorrichtung zum Anbringen an einem Fahrzeugrad ( 1 ) vorgegebener Größe, um unter den Winterverhältnissen die Reibung zwischen dem Rad und der Straßenoberfläche zu erhöhen, die ein wesentlich aus textilem Material hergestelltes Band (3) umfasst, das dafür vorgesehen ist, die Lauffläche (4) des Rades (1) zu umgeben und mittels flexibler innerer und äußerer seitlicher Abschnitte (5, 8) festgehalten zu werden, die, mindestens an der inneren Seite des Rades, mittels eines elastischen Gliedes (7) festgespannt ist, **dadurch gekennzeichnet, dass** das Band (3) vorgesehen ist, die Lauffläche (4) in einem durch den inneren Umfang des Bandes (3) ergebenden Abstand zu umgeben, der um mindestens 4 % größer als der größte Umfang der Lauffläche (4) des Rades (1) ist.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der innere Umfang des Bandes (3) um 4 -10%, bevorzugt um 5 - 6 % größer als der größte Umfang der Lauffläche (4) des Rades ist.
3. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** der äußere seitliche Abschnitt (8) derart ausgebildet ist, dass er in der Lage ist, zu verhindern, dass die Vorrichtung über das Rad (1) auf die innere Seite des

Rades überspringt.

4. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** der äußere seitliche Abschnitt (8) derart ausgebildet ist, dass er im wesentlichen die äußere Seite des Rades (1) abdeckt und vorzugsweise aus einem netzartigen Material hergestellt ist, das vorzugsweise ein mit PVC beschichtetes, 1100 dtex Polyester-Multifilamentmaterial enthält und Netzmaschen von 2-7 mm, vorzugsweise von ca. 4 mm aufweist. 5
5. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet, dass** der äußere seitliche Abschnitt (8) mindestens eine Öffnung aufweist, wobei der größte Umfang (10) einer solchen Öffnung weniger als das 2,2-fache des größten Durchmessers des Rades (1) beträgt. 10
6. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** der äußere seitliche Abschnitt (8) mit radial verlaufenden Riemen (9) versehen ist. 15
7. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** das elastische Glied (7) ein gummielastisches Material enthält, das mit einem um dieses gesponnenen, im wesentlichen unelastischen Fadenmaterial umhüllt, oder mit diesem zusammengesponnen, -gewebten oder -gewirkt ist, wobei das Fadenmaterial die Dehnbarkeit des elastischen Gliedes (7) beschränkt. 20
8. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** das Band (3) zum größten Teil aus einem polymeren textilen Material besteht. 25
9. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** textiles Material auf der äußeren Seite des Bandes freigelegt ist. 30
10. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** das Band (3) aus zwei Lagen textilen Materials besteht, das einseitig mit einem geeigneten Kunststoff, z.B. Polyurethan-Kautschuk beschichtet ist, wobei die beiden Lagen derart angeordnet sind, dass die Kunststoffbeschichtungen miteinander in Kontakt sind. 35
11. Vorrichtung nach einem der Ansprüche 1-9, **dadurch gekennzeichnet, dass** das Band (3) einen mehrlagigen Aufbau aufweist, wobei die Aussenfläche quer zur Umfangsrichtung des Bandes (3) orientierte Polyester-Multifilamentfäden enthält, und vorzugsweise eine Feinheit von etwa 1100 dtex auf- 40

weist, wobei das Lagenaufbaumuster vorzugsweise ein 4-fächiger gebrochener Twill ist.

12. Vorrichtung nach Anspruch 11, **dadurch gekennzeichnet, dass** der mehrlagige Aufbau eine innere Lage aufweist, die eine andere Farbe als eine äußere Lage hat und vorzugsweise aus einem Polyester- oder Polyamid-Multifilamentmaterial hergestellt ist. 45
13. Vorrichtung nach Anspruch 11 or 12, **dadurch gekennzeichnet, dass** die äußere und die innere Lage in der genannten Umfangsrichtung durch ein gemeinsames Fadensystem miteinander verbunden sind, das vorzugsweise ein Polyester-Multifilament von ca. 1100 dtex enthält. 50
14. Vorrichtung nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Innenseite des innenseitigen Abschnitts (5) mit einer Beschichtung niedriger Reibung, vorzugsweise einem Silikonpolymer, einem Butadien-Kautschuk, einem Neopren-Kautschuk, PVC oder einem ähnlichen Polymer beschichtet ist. 55
15. Verfahren zum Anbringen einer Vorrichtung (2) nach einem der vorangehenden Ansprüche an einem an einer Straßenoberfläche anliegenden Fahrzeugrad (1), um unter den Winterverhältnissen die Reibung zwischen dem Rad und der Straßenoberfläche zu erhöhen, wobei die Vorrichtung ein wesentlich aus textilem Material hergestelltes Band (3) umfasst, das dafür vorgesehen ist, die Lauffläche (4) des Rades (1) zu umgeben und mittels flexibler innerer und äußerer seitlicher Abschnitte (5, 8) festgehalten zu werden, die, mindestens an der inneren Seite des Rades, mittels eines elastischen Gliedes (7) festgespannt ist, **dadurch gekennzeichnet, dass** der innenseitige Abschnitt (5) über die Lauffläche (4) des Rades (1) längs mindestens des zweidrittels des Umfangs des Rades, vorzugsweise längst einer möglichst langen Strecke des Teils des Umfangs, der nicht direkt an der Straßenoberfläche anliegt, an der inneren Seite des Rades angebracht wird, wonach das Rad (1) mit Hilfe des Fahrzeugs gedreht wird, wobei der restliche Teil des innenseitlichen Abschnitts (5) sich bewegt, um seine Stellung auf der Innenseite des Rades (1) einzunehmen, und das Band (3) entlang der Lauffläche (4) des Rades in seine Position zieht. 60

#### Revendications

1. Dispositif à installer sur une roue de véhicule (1) d'une dimension prédéterminée afin d'augmenter le frottement entre la roue et la surface de route pendant des conditions hivernales, comportant une ceinture (3) faite essentiellement d'un matériau tex- 65

- tile et prévue pour entourer la bande de roulement (4) de la roue (1) et être maintenue en place au moyen de parties latérales intérieure et extérieure souples (5, 8), dont au moins celle du côté intérieur de la roue est tendue au moyen d'un organe élastique (7), **caractérisé en ce que** la ceinture (3) est destinée à entourer la bande de roulement(4) avec un espace résultant du fait que la circonférence interne de la ceinture (3) est au moins 4 % plus grande que la circonférence la plus grande de la bande de roulement (4) de la roue (1) .
2. Dispositif selon la revendication 1, **caractérisé en ce que** la circonférence interne de la ceinture (3) est de 4 à 10 %, de préférence 5 à 6 % plus grande que la circonférence la plus grande de la bande de roulement (4) de la roue.
  3. Dispositif selon l'une des revendications précédentes, **caractérisé en ce que** la partie latérale extérieure (8) est conçue de manière à l'empêcher de sauter par dessus la roue (1) vers l'intérieur de celle-ci.
  4. Dispositif selon l'une des revendications précédentes, **caractérisé en ce que** la partie latérale extérieure (8) est conçue pour recouvrir sensiblement le côté extérieur de la roue (1) et **en ce qu'**elle est de préférence faite d'un matériau en treillis constitué de préférence d'un PVC revêtu d'un matériau multifilamentaire de polyester de 1100 dtex et ayant une ouverture de treillis de 2 à 7 mm, de préférence d'environ 4 mm.
  5. Dispositif selon la revendication 3, **caractérisé en ce que** la partie latérale extérieure (8) a au moins une ouverture, la circonférence la plus grande (10) d'une telle ouverture étant inférieure à 2,2 fois le diamètre le plus grand de la roue (1).
  6. Dispositif selon l'une des revendications précédentes, **caractérisé en ce que** la partie latérale extérieure (8) est munie de sangles s'étendant radialement (9).
  7. Dispositif selon l'une des revendications précédentes, **caractérisé en ce que** l'organe élastique (7) comprend un matériau élastique en caoutchouc qui est revêtu par filage autour de celui-ci, ou est filé, tissé ou tricoté, ensemble avec un matériau en fil sensiblement non-élastique, ledit matériau en fil limitant la capacité d'extension de l'élément élastique (7).
  8. Dispositif selon l'une des revendications précédentes, **caractérisé en ce que** la ceinture (3) est constituée principalement d'un matériau textile polymère.
  9. Dispositif selon l'une des revendications précédentes, **caractérisé en ce que** du matériau textile est exposé sur le côté extérieur de la ceinture.
  10. Dispositif selon l'une des revendications précédentes, **caractérisé en ce que** la ceinture (3) comporte deux couches de matériau textile qui, sur un premier côté, est revêtu d'une matière plastique adaptée, par exemple de caoutchouc de polyuréthane, les deux couches étant disposées de sorte que les revêtements de matière plastique soient en contact l'un avec l'autre.
  11. Dispositif selon l'une des revendications 1 à 9, **caractérisé en ce que** la ceinture (3) a une construction multicouche, la surface extérieure comportant un fil multifilamentaire de polyester orienté transversalement par rapport à la direction circonférentielle de la ceinture (3), et ayant de préférence une finesse d'environ 1100 dtex, le motif de construction de couche étant de préférence un croisé anglais à 4 fous.
  12. Dispositif selon la revendication 11, **caractérisé en ce que** la construction multicouche a une couche intérieure ayant une couleur différente de celle d'une couche extérieure et est de préférence faite d'un matériau multifilamentaire de polyester ou de polyamide.
  13. Dispositif selon la revendication 11 ou 12, **caractérisé en ce que** les couches extérieure et intérieure sont reliées mutuellement par un système de fil commun dans ladite direction circonférentielle, comportant de préférence un multifilament de polyester d'environ 1100dtex.
  14. Dispositif selon l'une des revendications précédentes, **caractérisé en ce que** l'intérieur de la partie latérale intérieure (5) est revêtu d'un revêtement à faible frottement, de préférence un polymère de silicone, un caoutchouc de butadiène, un caoutchouc de néoprène, un PVC ou un polymère similaire.
  15. Procédé d'installation d'un dispositif (2) selon l'une des revendications précédentes sur une roue de véhicule (1), en appui contre une surface de route, afin d'augmenter le frottement entre la roue et la surface de route pendant des conditions hivernales, ledit dispositif comportant une ceinture (3) faite essentiellement d'un matériau textile et prévue pour entourer la bande de roulement (4) de la roue (1) et être maintenue en place au moyen de parties latérales intérieure et extérieure souples (5, 8), dont au moins celle du côté situé sur l'intérieur de la roue est tendue au moyen d'un organe élastique (7), **caractérisé en ce que** la partie latérale intérieure (5) est installée autour de la bande de roulement (4) de la roue (1) vers l'intérieur de la roue le long d'au moins deux

tiers de la circonférence de la roue, de préférence sur le plus possible de la partie de la circonférence qui n'est pas en appui contre la surface de la route, après quoi la roue (1) est entraînée en rotation par l'intermédiaire du véhicule, de sorte que la partie restante de la partie latérale intérieure (5) se déplace pour prendre sa place sur l'intérieur de la roue (1) et tire la ceinture (3) en place le long de la bande de roulement (4) de la roue.

5

10

15

20

25

30

35

40

45

50

55

Fig.1A.

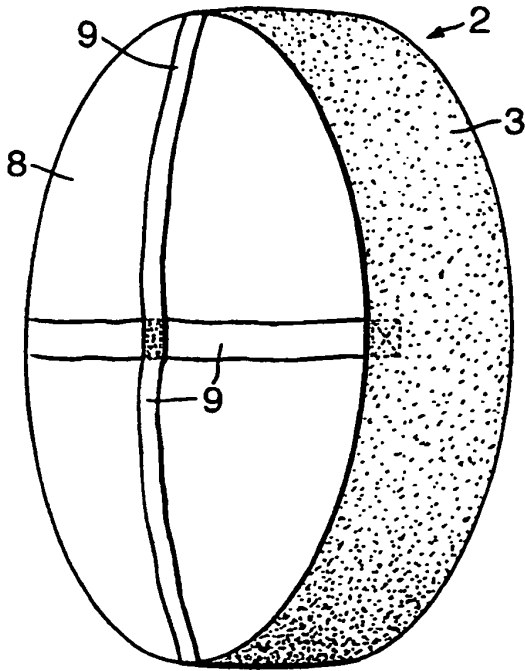


Fig.1B.

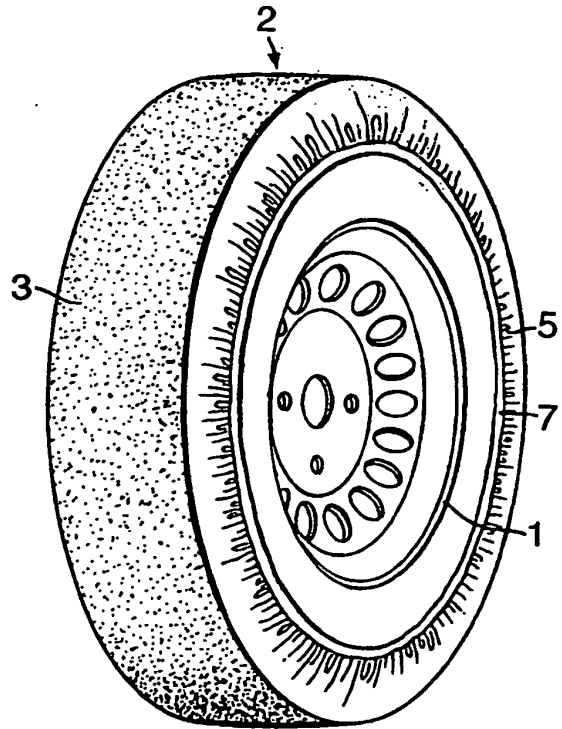


Fig.1C.

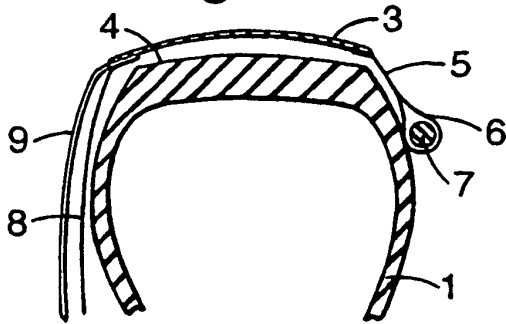


Fig.2A.

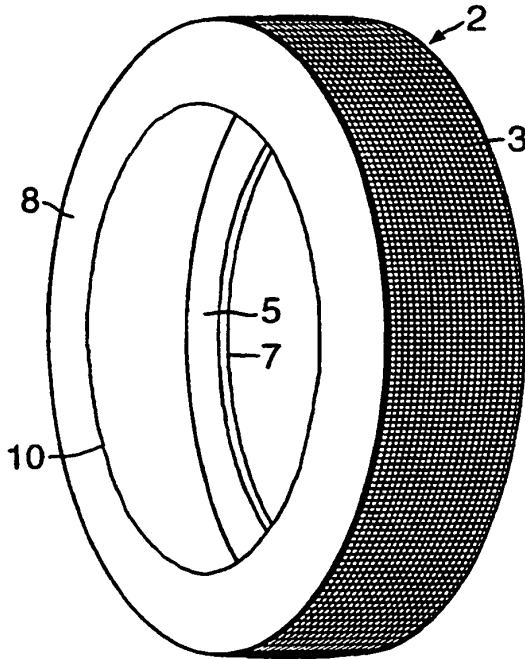


Fig.2B.

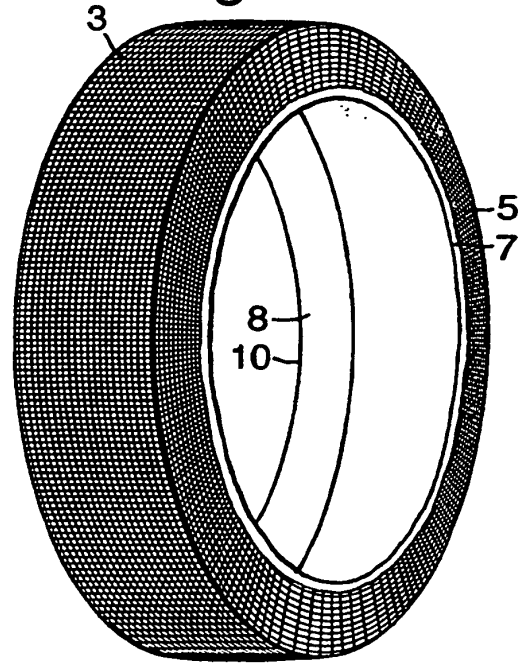


Fig.2C.

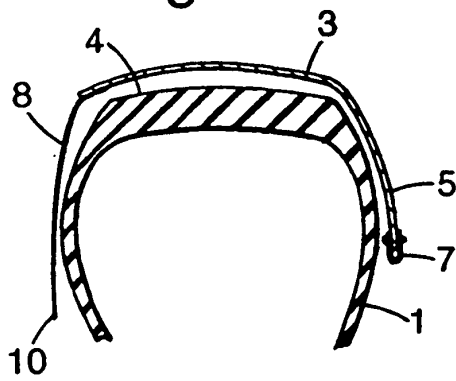


Fig.3A.

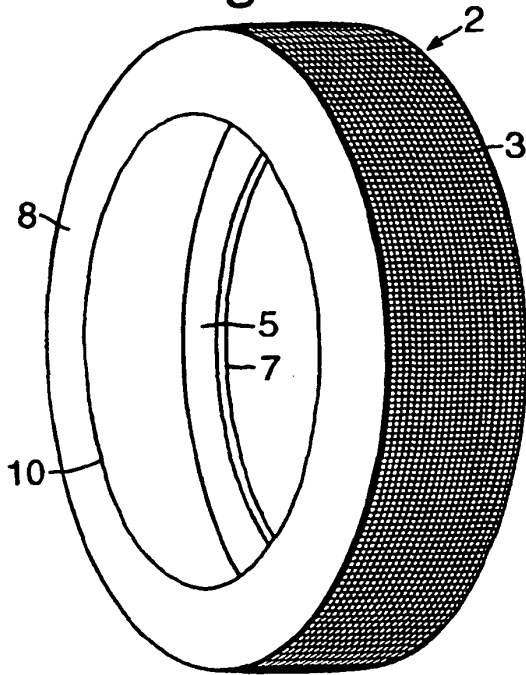


Fig.3B.

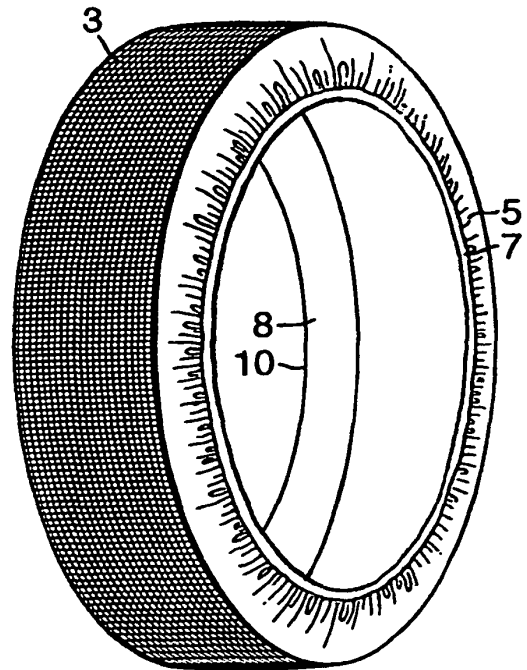


Fig.3C.

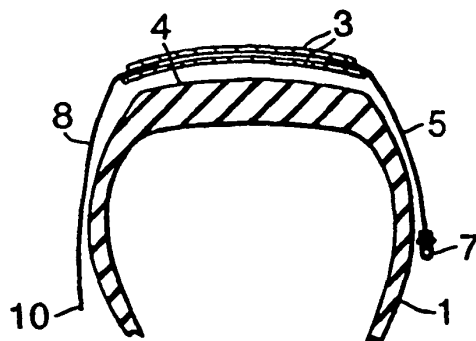


Fig.4A.

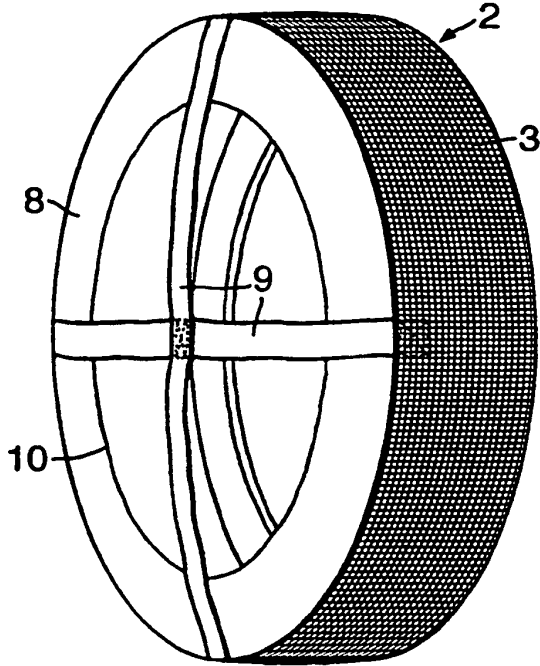


Fig.4B.

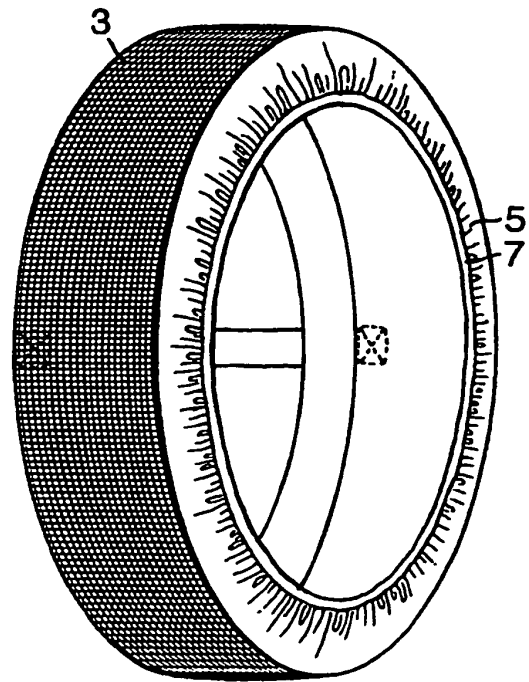


Fig.5A.

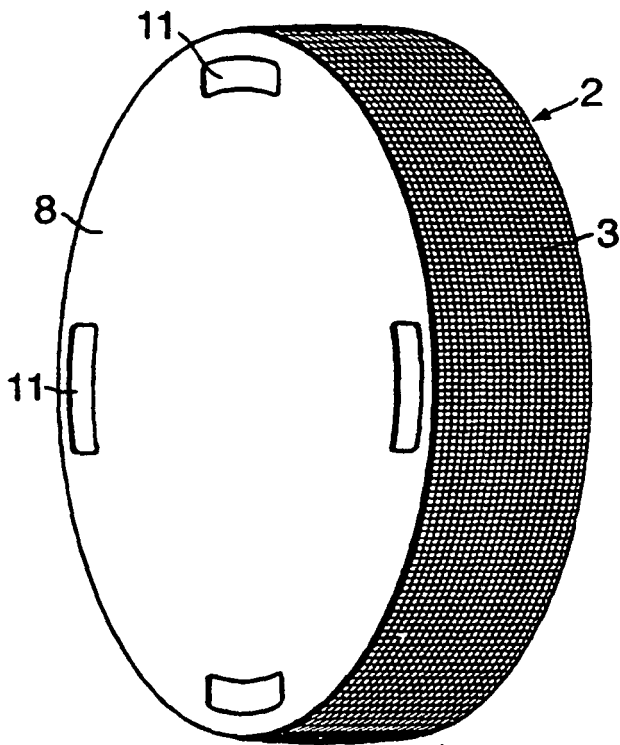


Fig.5B.

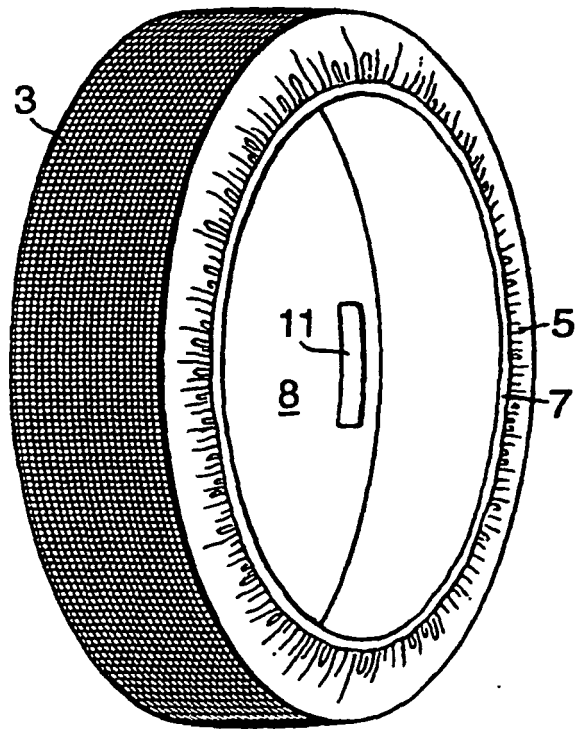


Fig.6A.

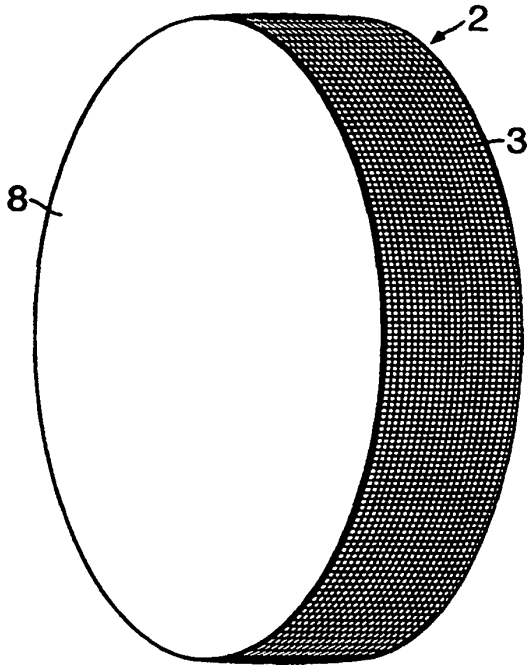


Fig.6B.

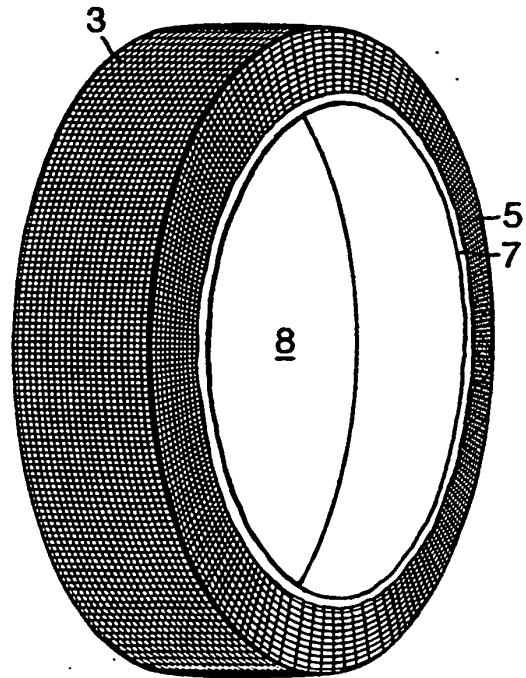


Fig.7A.

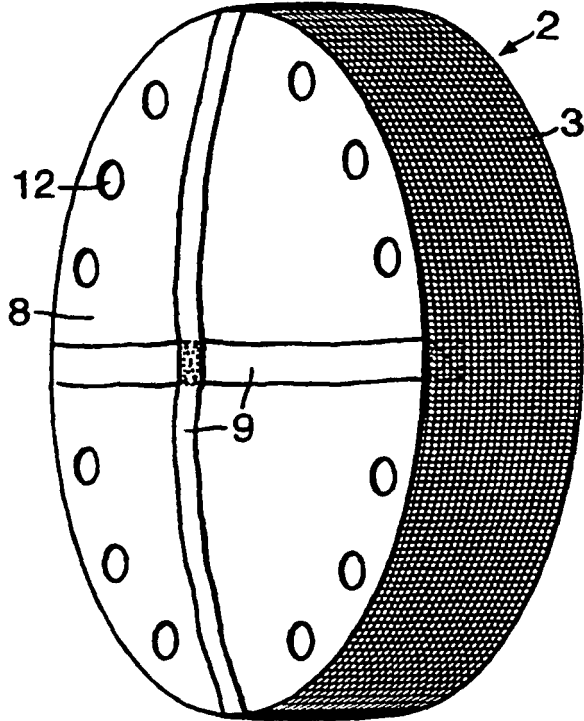


Fig.7B.

