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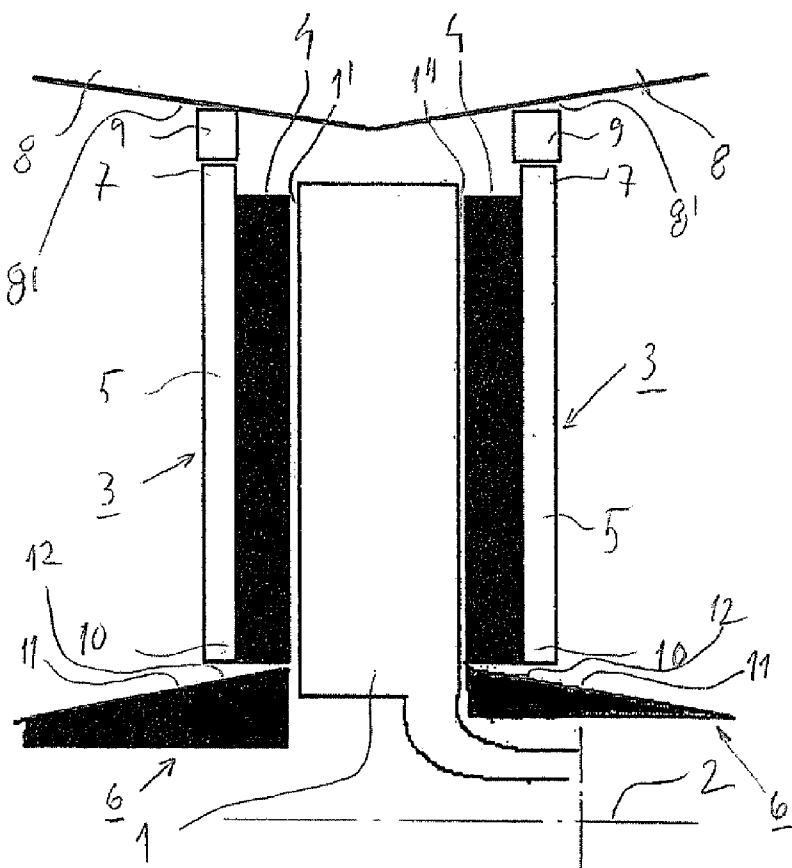
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[Continued on next page]

(54) Title: METHOD AND DEVICE FOR DISC BRAKES AND VEHICLE



(57) Abstract: A method for reliable non-application of the brake blocks (3) of a vehicle disc brake, comprising the step of putting the brake cylinder of the disc brake's brake yoke into an unapplied state. The method is particularly distinguished by the steps of - arranging each brake block (3) in combination with a ramp (12) which slopes from the brake disc (1) and towards the centreline (2) of the brake disc at the brake block's portion (10) which points towards said centreline and - allowing each brake block to move away from the brake disc along said ramp by utilisation of vibrations which occur in the disc brake during motion of the vehicle. The invention also relates to a device for reliable non-application, and to a vehicle.



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METHOD AND DEVICE FOR DISC BRAKES AND VEHICLE

BACKGROUND

5 Technical field

The present invention relates to a method according to the introductory part of the attached claim 1.

- 10 The invention relates further to a device according to the introductory part of the attached claim 3.

The invention also relates to a vehicle according to claim 8.

15 State of the art

- A disc brake for a vehicle wheel comprises a brake yoke arranged relative to the shaft of the wheel and adapted to acting upon two brake blocks which are disposed on opposite sides of a brake disc arranged relative to the wheel shaft and which each
20 comprise a friction surface in the form of a brake lining.

- The brake blocks are adapted to being kept applied by a lining holder which is caused to act against one spring per brake block, which springs are adapted to pushing the brake blocks in a substantially radial direction of the brake disc, substantially towards
25 the centre of the latter in order to keep the brake blocks in position.

- A problem of disc brakes is that the brake blocks with their brake linings abut against the brake disc even when the brake is not applied by the brake cylinder of the brake yoke, causing a retardatory dragging moment and hence both unnecessary wear and
30 redundant fuel consumption.

Known devices for solving the problem described above have proved to be complicated and expensive to manufacture.

OBJECT OF THE INVENTION

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The object of the present invention is to provide a solution to the problem described above and thereby eliminate said retardatory dragging moment.

SUMMARY OF THE INVENTION

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The object as above is achieved by a method, a device and a vehicle, e.g. a truck, with features according to claims 1, 3 and 8 respectively.

Further advantages are afforded by features according to the dependent claims.

15

BRIEF DESCRIPTION OF THE DRAWING

The present invention will be better understood in the light of the following detailed description read in combination with the attached drawing, in which

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- Fig. 1 depicts schematically an axial section through the disc brake's brake disc with brake linings fitted.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

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In Fig. 1, ref. 1 denotes a brake disc of a disc brake and ref. 2 the centreline of the brake disc.

The respective sides of the brake disc are provided with mutually opposite brake blocks 3 adapted to being applied, by an undepicted brake cylinder of a brake yoke, against the brake disc in order to abut brakingly against the brake disc.

30

Each brake block 3 has a brake lining 4 adapted to exerting, by friction against a side 1', 1'' of the brake disc, a braking moment on the brake disc and to being supported by a usually metallic backup plate 5, most commonly made of steel.

- 5 The brake blocks rest in an only schematically depicted lining holder 6 on each side of the brake disc, each brake block being adapted to being kept in position, by spring loading, in the lining holder by a brake block retainer 8 arranged relative to the portion 7 of the brake block which points away from the centreline of the brake disc and adapted to pressing on the respective brake block's spring 9 situated between the brake
10 block and the brake block retainer.

Each brake block is also adapted to being supported, by a bottom portion 11 of the lining holder, relative to its portion 10 which points towards the centreline of the brake disc.

- 15 According to the invention, each brake block is arranged in combination with a ramp 12 of the bottom portion of the lining holder which slopes from the brake disc and towards the centreline of the brake disc, as schematically depicted in Fig. 1, at the portion 10 of the brake block which points towards said centreline.

- 20 The brake cylinder of the brake yoke is adapted to assuming an unapplied first state and an applied second state, in which second state the brake blocks of the disc brake assume a position applied against the brake disc, substantially as depicted in Fig. 1, whereby according to the invention, when the brake cylinder is in said unapplied state,
25 each brake block is adapted to being allowed to move away from the brake disc along said ramp under the influence and by utilisation of vibrations occurring in the disc brake during motion of the respective undepicted vehicle, which vibrations are transmitted to the brake yoke inter alia from the respective wheel via the undepicted wheel shaft. Assurance is thus afforded that the respective brake block will assume an
30 unapplied position and not exert any retardatory dragging moment on the brake disc.

According to preferred embodiments, the brake block retainer of the disc brake is, in a substantially corresponding manner, provided with a configuration 8' sloping from the brake disc and away from the centreline of the brake disc on each side of the brake disc, as schematically depicted in Fig. 1, and when the brake cylinder is in said
5 unapplied state, each brake block is adapted to its portion 7 which points away from said centreline being allowed to move away from the brake disc relative to said brake block retainer under the influence and with utilisation of vibrations occurring in the disc brake during motion of the vehicle, which vibrations, as previously mentioned, are transmitted to the brake yoke inter alia from the respective wheel via the wheel shaft.
10 The brake block's assumption of an unapplied position across its whole surface 10 which faces towards the brake disc is thus facilitated.

The method and the function of the device according to the invention are probably substantially and sufficiently indicated by the above description.

15 With the object of ensuring that no brake blocks abut against the brake disc when the brake cylinder assumes its unapplied position and no braking is therefore intended, each brake block is arranged in combination with a ramp which slopes from the brake disc and towards the centreline of the brake disc, whereby the perpendicular force on
20 each brake block at the ramp acquires a component directed away from the brake disc so that the brake block endeavours, as a result of vibrations occurring in the brake yoke, to move away from the brake disc.

A preferred corresponding configuration of the disc brake's brake block retainer, close
25 to the respective brake block's portion pointing away from said centreline, results in a component corresponding to the perpendicular force on the brake block via the latter's spring so that this portion of the brake block also endeavours to move away from the brake disc.

30 Assurance is thus afforded that each brake block will move away from the brake disc, thereby preventing retardatory dragging moment, when no braking is intended.

The invention is described above in relation to preferred embodiments and embodiment examples.

Further embodiments and minor additions and modifications are of course conceivable
5 without departing from the fundamental concept of the invention.

According to preferred embodiments, said sloping ramp is arranged for low friction, which primarily means little contact surface relative to the brake block's portion which points towards said centreline. It is preferred in this respect that the ramp comprise at
10 least two ramp portions distributed along the width direction of the brake block or, if so desired, the circumferential direction of the brake disc, each ramp portion being of small extent in said width direction.

It is further preferred that the respective spring be movable together with the brake
15 block which it is adapted to springingly holding down.

The invention is therefore not to be regarded as limited to the embodiments indicated above but may be varied within its scope indicated by the attached claims.

CLAIMS

1. A method for reliable non-application of the brake blocks of a vehicle disc brake, comprising the step of putting the brake cylinder of the disc brake's brake yoke into an
5 unapplied state, **characterised** by the steps of

- arranging each brake block (3) in combination with a ramp (12) which slopes from the brake disc (1) and towards the centreline (2) of the brake disc at the brake block's portion (10) which points towards said centreline,

10

- allowing each brake block to move away from the brake disc along said ramp by utilisation of vibrations which occur in the disc brake during motion of the vehicle,

- providing the disc brake's brake block retainer (8), which presses the respective
15 brake block's spring (9) substantially towards the centreline of the brake disc at the respective brake block's portion 7 which points away from said centreline, with a configuration (8') which slopes from the brake disc and away from said centreline, and

- allowing each brake block's said portion 7 pointing away from the centreline to move
20 away from the brake disc relative to said brake block retainer by utilisation of vibrations which occur in the disc brake during motion of the vehicle.

2. A device for reliable non-application of the brake blocks of a vehicle disc brake, comprising a brake yoke with a brake cylinder adapted to assuming an unapplied first
25 state and an applied second state, in which second state the disc brake's brake blocks arranged on mutually opposite sides of the disc brake's brake disc assume an applied position for braking, **characterised** in that each brake block (3) is arranged in combination with a ramp (12) sloping from the brake disc (1) and towards the centreline (2) of the brake disc at the brake block's portion (10) which points towards
30 said centreline, and that each brake block is adapted, when the brake cylinder is in said unapplied state, to being allowed to move away from the brake disc along said ramp by utilisation of vibrations which occur in the disc brake during motion of the vehicle, and

that the disc brake's brake block retainer (8), which is adapted to pushing the respective brake block's spring (9) substantially towards the centreline of the brake disc at the portion 7 which points away from said centreline, is provided with a configuration (8') which slopes from the brake disc and away from said centreline, and
5 that each brake block, when the brake cylinder is in said unapplied state, is adapted to its portion 7 which points away from said centreline being allowed to move away from the brake disc relative to said brake block retainer by utilisation of vibrations which occur in the disc brake during motion of the vehicle.

10 3. A device according to claim 2, **characterised** in that said ramp is provided with a relatively small surface in the respective brake lining's width direction in order to achieve low friction force during movement away from the brake disc.

15 4. A device according to claim 3, **characterised** in that said ramp comprises at least two ramp portions distributed along the brake block's width direction, each ramp portion being of small extent in said width direction.

20 5. A device according to claim 2, 3 or 4, **characterised** in that the respective spring (9) is movable together with the brake block which it is adapted to springingly holding down.

6. A vehicle, e.g. a truck, **characterised** in that it is provided with at least one disc brake comprising a device according to any one of claims 2-5.

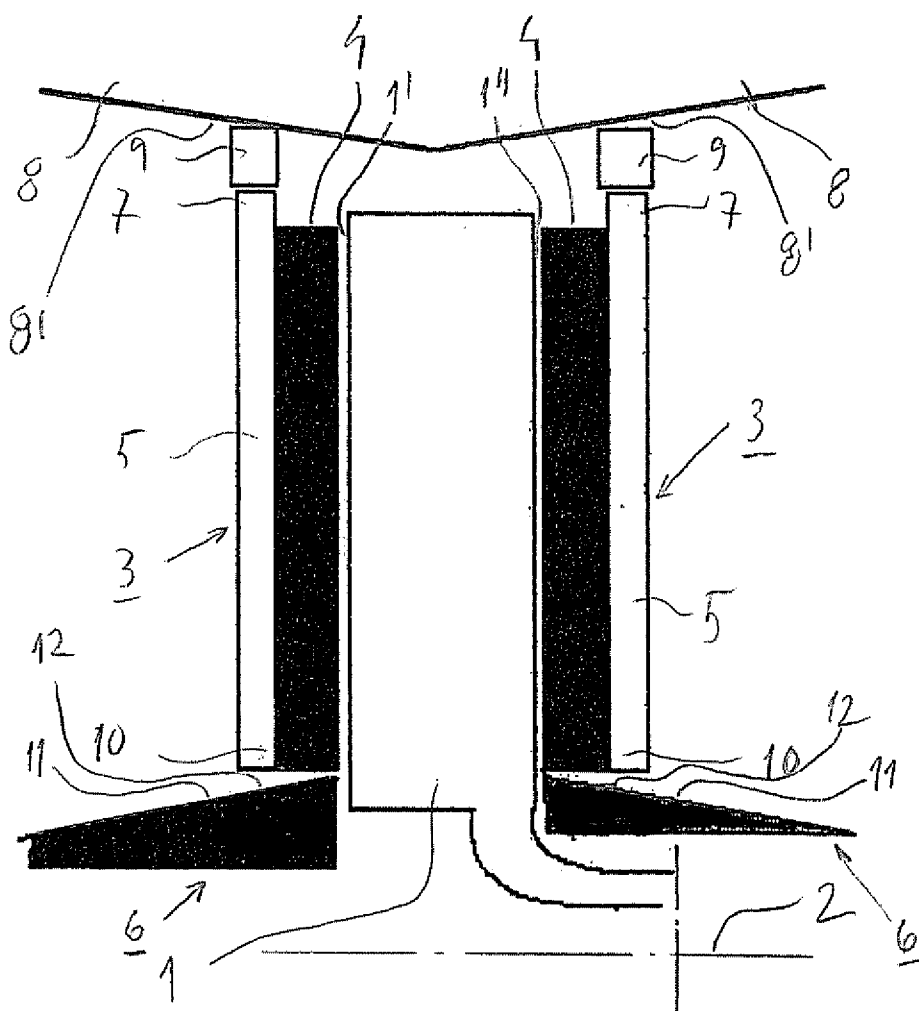


Fig. 1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE2007/050988

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: F16D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 4418703 A1 (BAYERISCHE MOTOREN WERKE AG), 30 November 1995 (30.11.1995), whole document -- -----	1-6

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

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Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT

Information on patent family members

26/01/2008

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DE 4418703 A1 30/11/1995 NONE
