

(19) **DANMARK**

(10) **DK/EP 1982087 T4**



Patent- og
Varemærkestyrelsen

(12) **Oversættelse af ændret
europæisk patentskrift**

-
- (51) Int.Cl.: **F 16 D 65/092 (2006.01)** **F 16 D 55/00 (2006.01)**
- (45) Oversættelsen bekendtgjort den: **2018-07-23**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om opretholdelse af patentet i ændret form: **2018-04-18**
- (86) Europæisk ansøgning nr.: **07703015.3**
- (86) Europæisk indleveringsdag: **2007-01-25**
- (87) Den europæiske ansøgnings publiceringsdag: **2008-10-22**
- (86) International ansøgning nr.: **EP2007000618**
- (87) Internationalt publikationsnr.: **WO2007085441**
- (30) Prioritet: **2006-01-26 DE 102006003748**
- (84) Designerede stater: **AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR**
- (73) Patenthaver: **KNORR-BREMSE Systeme für Nutzfahrzeuge GmbH, Moosacher Strasse 80, 80809 München, Tyskland**
- (72) Opfinder: **PRITZ, Wolfgang, Forstergasse 1, 94501 Aldersbach, Tyskland**
CAMILO-MARTINEZ, José, Bussardstr. 22, 82008 Unterhaching, Tyskland
- (74) Fuldmægtig i Danmark: **Zacco Denmark A/S, Arne Jacobsens Allé 15, 2300 København S, Danmark**
- (54) Benævnelse: **SKIVEBREMSE OG BREMSEBELÆGNING TIL EN SKIVEBREMSE, ISÆR TIL ET ERHVERVSKØRETØJ**
- (56) Fremdragne publikationer:
EP-A1- 1 473 481
DE-A1- 2 734 585
DE-A1-102004 052 541
DE-T2- 60 317 116
DE-U1-202004 006 651
KR-A- 20010 039 713
US-A- 3 684 061
US-A- 3 976 169
US-A- 5 472 068
EP-A- 0 429 110
WO-A-2006/040062
DE-A1- 2 236 749
DE-A1- 3 217 759
DE-A1- 3 708 699
DE-C1- 19 855 614
GB-A- 880 870

Fortsættes ...

The invention relates to a disc brake, in particular for a commercial vehicle, according to the preamble of claim 1.

5 A disc brake of the generic type is disclosed in DE 199 07 958 A1, for example. What is shown and described in this literature is that, in order to protect the inner compartment of the brake calliper, which accommodates actuating spindles of an application device, a mounting and functional opening of the brake calliper is closed off by means of a closure plate, this closure plate being fastened to the brake calliper by means of screws.

10

In principle, it is possible when mounting the brake pads for assembly errors to occur, both through the use of an incorrect brake pad which is not intended and approved for the respective disc brake, and through mixing up the right and left brake pads when fitting them, in which case the brake pads can be mounted in a position in which they are rotated through 180° without this being noticed, with the result that the backing plate is directed toward the brake disc. Since the brake disc is no longer operationally reliable, this assembly error can result in serious and dangerous operating problems with the vehicle.

20 Apart from the aforementioned assembly errors, the known disc brakes also enable the brake pads to be replaced by external makes which are not approved for the particular vehicle or the particular disc brake.

25 This can also result in limiting the operational reliability of the disc brake, a situation which is fundamentally unacceptable, especially since disc brakes are among the components of a vehicle which are of particular importance from a safety point of view.

30 Although attempts have been made to code brake pads, the known codings can be removed by a simple mechanical operation, for example using a hammer and chisel, which means that uncoded brake linings of unauthorised manufacturers can be used without problems.

US 6,357,559 B1 discloses a disc brake wherein the backing plate of a brake pad is provided with a projection which engages with a recess of the brake calliper in the region of the pad shaft, resulting in a coding which prevents installation errors.

- 5 The invention is therefore based on the problem of developing a disc brake of the generic type such that an improvement in the operational reliability is achieved in combination with a low structural and manufacturing outlay.

This problem is solved by a disc brake with the features of claim 1.

10

This structural design means that only the brake pad designated for this intended use can be mounted, it being ensured at the same time that the brake pad can only be used in such a way that its friction lining side is directed facing the brake disc.

- 15 Moreover, no external product can be used since the high spots and cutouts of the closure cover on the one hand and of the backing plate on the other hand, which correspond to one another in the manner of a coding facility are compatible with one another only in a defined configuration.

- 20 This configuration, i.e. the shape and arrangement of the correspondence parts, is determined at the factory, which means that, as replacement part, use can only be made of the brake pad which has the high spots and cutouts predetermined by the manufacturer of the disc brake.

- 25 In addition, the coding allows the prior determination of the brake pads for a specific point of installation. It is thus possible to exactly allocate brake pads with different coefficients of friction of the friction linings, as are required for an inner pad and an outer pad, in order, for example, to take account of the different cracking behaviour of a brake disc. Any interchange between the two brake pads can thus be ruled out if the
30 coding of the two brake pads or of the associated closure cover is different. According to an advantageous variant of the invention, provision is made for at least some of the screws which are used to fasten the closure cover to the brake calliper to serve as high spots, within the meaning of the invention, the screws, in particular the screw heads,

being correspondingly modified and engaging with recesses adapted thereto in the backing plate.

5 In a manner known per se, the screws are mounted in the peripheral region of the closure cover. Depending on the variation of their position within the periphery, a coding facility can be achieved whereby brake pads intended exclusively for a predetermined type can be used which then have corresponding recesses, the screw heads of the screws projecting into the recesses.

10 A variation of the code can also be obtained by designing the screw heads differently, for example in terms of shape, diameter and length. Here, these differences, to which the recesses of the backing plate are adapted, can result in a large number of coding facilities which, inter alia, can be used to rule out any interchange between the right and left brake pads.

15 A further advantage of the invention is that disc brakes in operation can be retrofitted, in which case the associated screws of the closure cover are then also replaced during a replacement of the brake pads. It is expedient in this case only to provide the coding facility by changing the shape, the length and/or the diameter.

20 A particular importance also attaches to the fact that the new disc brake can be produced with low manufacturing outlay. Since such disc brakes, and also in particular the replacement brake pads, are produced in large quantities, the invention offers the advantage of a significantly improved operational reliability with low
25 outlay.

Further advantageous variants are specified in the dependent claims.

30 An embodiment of the invention is described below with reference to the appended drawings, in which:

Figure 1 is a side view of a part-section of a disc brake according to the invention,

Figure 2 is a top view of a part-section of the disc brake, and

Figures 3-5 are perspective view of details of the disc brake.

5 Figures 1 and 2 depict a disc brake, in particular for a commercial vehicle, with a brake calliper 1 which straddles a brake disc 3 with which a brake pad 2 comprising a backing plate 4 and a friction lining 5 can be brought into operative contact on both sides, the friction lining 5 being pressed against the brake disc 3 during braking.

10 For this purpose, actuating spindles 12 are arranged in a mounting compartment 13, these spindles being connected on the one hand to an application device (not shown) and on the other hand bearing against the backing plate 4.

In the direction of the brake disc 3, the mounting compartment 13 is closed off by
15 means of a closure cover 6, specifically by means of screws 7 which are screwed peripherally into threaded holes in the brake calliper 1, the screws 7 being inserted through holes 11 (Figure 3) in the closure cover 6.

At least some of the screws 7, in the present embodiment two screws 7, are designed
20 in such a way that they comprise a screw shank 8, which is screwed onto the brake calliper 1, and a cylindrical screw head 9 which is produced as a separate part and connected to the respectively associated screw shank 8.

This screw head 9 forms a high spot which projects into a recess 10 in the backing
25 plate 4, the screw head 9 and the recess 10 corresponding to one another in the manner of a coding facility. In other words, the screw heads 9 and the recesses 10 are tailored to one another in their arrangement and dimensioning such that, when the closure cover 6 has been firmly screwed into place, only a correspondingly modified
30 brake pad 2 can be used whose backing plate 4 accommodates the screw heads 9 in the desired manner.

As shown very clearly particularly in Figure 5, the recesses 10, formed as blind holes, are open toward the bottom starting from the narrow side of the backing plate 4.

Both the shape of the screw heads 9 and the dimensioning thereof can be freely selected such that a large variety of different codings can be achieved.

5 In order to facilitate simple assembly, in particular simple insertion of the brake pad 2 from above into the brake calliper 1, the screws 7 forming the high spots are expediently provided in the lower region (as viewed in the direction of insertion) of the closure cover.

List of Reference Numbers

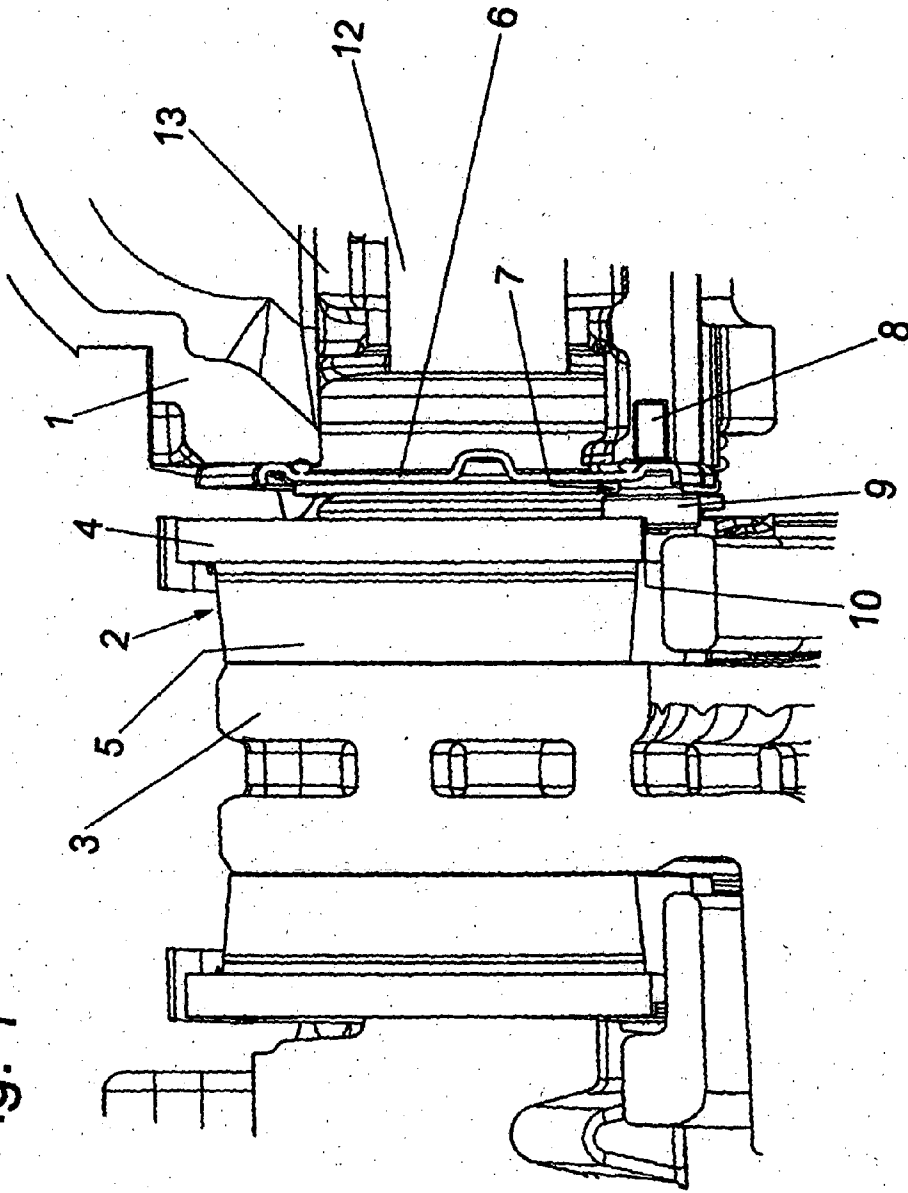
5	1	brake calliper
	2	brake pad
	3	brake disc
	4	backing plate
	5	friction lining
10	6	closure cover
	7	screw
	8	screw shank
	9	screw head
	10	recess
15	11	hole
	12	actuating spindle
	13	mounting arm

Patentkrav

- 5 1. Skivebremse, især til et erhvervskøretøj, med en bremsesaddel (1), der griber over en bremseskive (3), som kan bringes i funktionsforbindelse med bremsebelægninger (2), som respektivt består af en belægningsbærerplade (4) og en derpå fastgjort friktionsbelægning (5), og mindst et lukkedæksel (6), som lukker bremsesadlen (1) og er fastgjort på denne ved hjælp af skruer (7), **kendetegnet ved, at** lukkedækslet (6) og belægningsbærerpladen (4) respektivt har mindst en forhøjning og udsparring (10), som i henhold til en kodning svarer til hinanden, hvor et skruehoved (9) af mindst en af lukkedækslets (6) skruer (7) danner en forhøjning, som rager ind i en tilknyttet udsparring (10) af belægningsbærerpladen (4).
- 10
- 15 2. Skivebremse ifølge krav 1, **kendetegnet ved, at** mindst en skrue (7), som er forsynet med skruehovedet (9), er anbragt ved det nedre randområde af lukkedækslet set i bremsebelægningens (2) indskubsretning.
- 20 3. Skivebremse ifølge krav 1 eller 2, **kendetegnet ved, at** skruehovedet (9) som separat del er forbundet med et tilknyttet skrueskaft (8), som er skruet ind i bremsesadlen (1).
- 25 4. Skivebremse ifølge et af de foregående krav, **kendetegnet ved, at** udsparringen (10) er tilpasset skruehovedet (9) i sin form og dimensionering.
- 30 5. Skivebremse ifølge et af de foregående krav, **kendetegnet ved, at** der er tilvejebragt to forhøjninger i form af skruehovederne (9).
6. Skivebremse ifølge et af de foregående krav, **kendetegnet ved, at** udsparringerne (10) er udformet som blinde udsparringer på belægningsbærerpladens (4) bagside, der vender mod lukkedækslet (6).
- 35 7. Skivebremse ifølge et af de foregående krav, **kendetegnet ved, at** udsparringen (10) er tilvejebragt ved et radiale indvendigt randområde af belægningsbærerpladen (4).

8. Skivebremse ifølge et af de foregående krav, **kendetegnet ved, at** udsparringen (10) er åben udgående fra den smalle side af belægningsbærerpladen (4).

Fig. 1



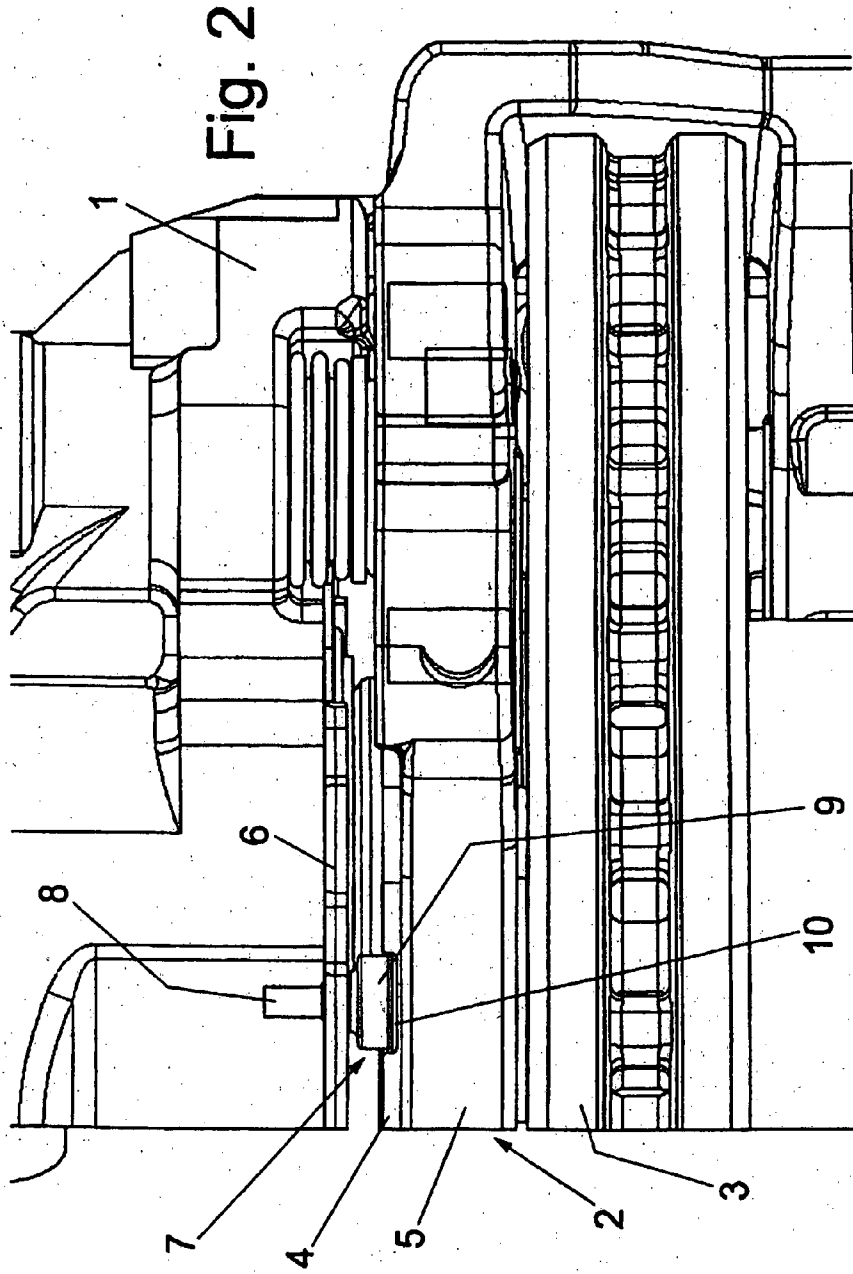
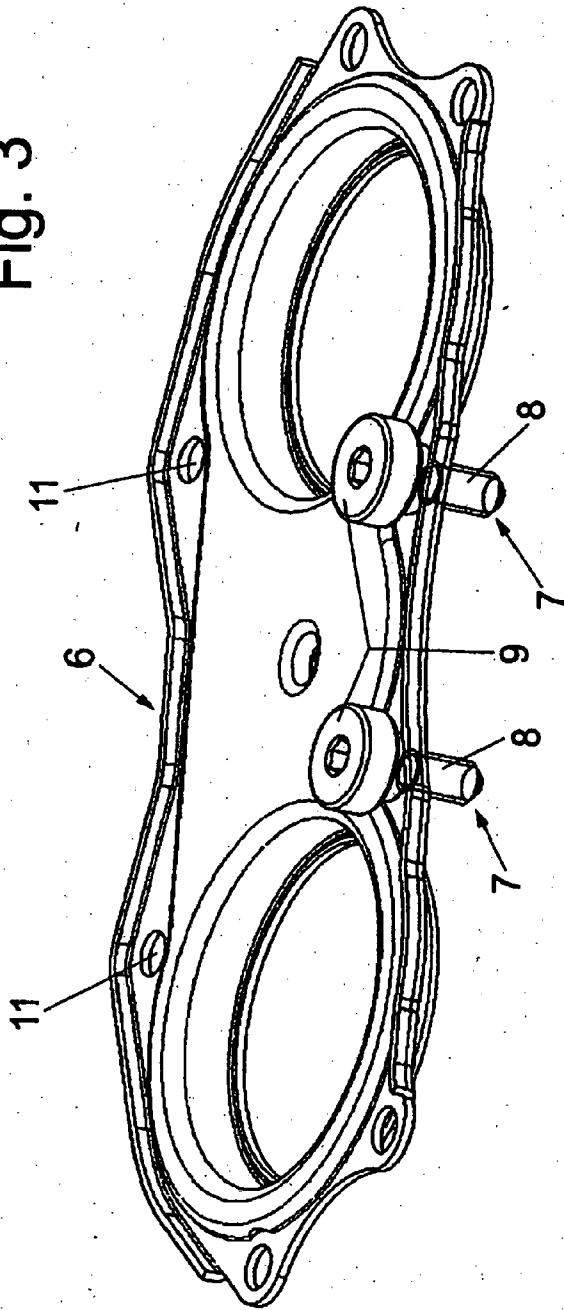


Fig. 3



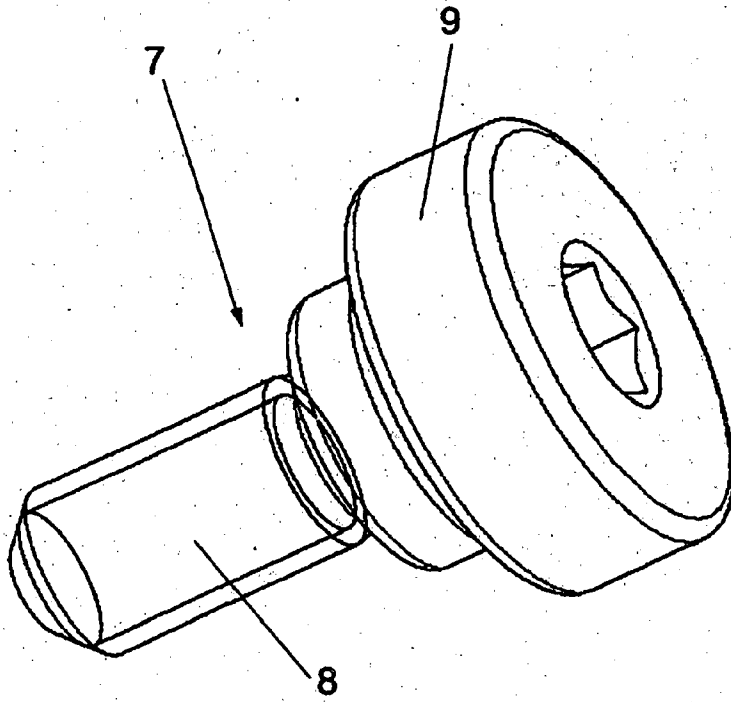


Fig. 4

Fig. 5

