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Féktárcsa

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

Brake disc

DESCRIPTION

The present invention relates to a brake disc/hub combination according to Patent Claim 1.

A generic brake disc with associated axle hub is described in EP 1 108 155 B1. Further details and functions of a generic brake disc/hub connection for vehicle disc brakes of this kind result from DE 10046705 C1. The brake disc is usually pushed axially onto the brake disc hub, which is frequently also a wheel hub of the vehicle, and secured. The hub is provided for this purpose with form-fitting contours, for example a tooth-shaped outer contour or mortise and tenon joints, on its outer circumferential surface, with which a corresponding internal contour of the brake disc engages in a form-fitting manner, so that a reciprocal rotation of the brake disc and hub in the rotational direction of the vehicle disc brake is prevented and the brake disc therefore exhibits no degree of freedom in respect of the hub. The braking moment is therefore transferred from the brake disc to the hub. Publication US 2004/0129509 A1 discloses a disc brake for a vehicle. Publication DE 101 61 719 A1 discloses a wheel bearing flange with a planar brake disc.

The problem addressed by the present invention is that of improving overall the heat generation and also service lives of generic brake disc/hub connections for vehicle disc brakes and therefore the reliability and the response of the vehicle disc brake.

This problem is solved by a brake disc/hub combination according to Patent Claim 1. Advantageous developments of the invention are indicated in the dependent claims.

Further advantages, features and details of the invention result from the following description of preferred exemplary embodiments and also with the help of the drawing. In the drawing

Figure 1 shows a perspective view of a first embodiment of a brake disc/hub connection not according to the invention for vehicle disc brakes with wear plates and also a brake disc and an enlarged detail A and

Figure 2 shows a perspective view of an embodiment of a brake disc according to the invention for vehicle disc brakes and an enlarged detail B.

In the figures, identical components and components with the same function are labelled using the same reference numbers.

Figure 1 shows a brake disc/hub connection arrangement for vehicle disc brakes with a particularly internally vented brake disc 20 which can be pushed onto a brake hub 50 axially with a locating opening 32 configured concentrically to the brake disc. The brake disc 20 has two friction rings 27, 28 with ventilation ducts 29 running between the friction rings 27, 28. On an inner circumference 20i, the brake disc 20 has a plurality of radially aligned cam holders 21 which are evenly distributed over the inner circumference 20i running concentrically to the brake disc 20, particularly configured in a rotationally symmetrical manner, as form-fitting contours in which cams 51 of the brake hub 50 can be received. The cam holders 21 are of U-shaped configuration corresponding to the cams 51, wherein lateral supporting surfaces 22, 22' of the cam holders 21 interact during operation of the vehicle disc brake with corresponding supporting surfaces 52, 52' of the cams 51,

in that they are supported against one another in the rotational direction during braking, so that the braking force is transferred from the brake disc 20 to the brake hub 50. In an axial direction of the brake hub 50, the brake disc 20 is supported by bearing surfaces 23 and/or bearing surfaces 23' of the cam holders 21 at corresponding bearing surfaces 53 and/or bearing surfaces 53' of the cams 51.

Wear plates 1 can be inserted between the cams 51 and the corresponding cam holders 21 in each case, particularly exclusively in the region of the supporting surfaces 22, 22', 52, 52' and also of the bearing surfaces 23, 23', 53, 53'. The bearing surfaces 23, 23', 53, 53' preferably have a step-shaped configuration, wherein the steps may exhibit different functions; in particular, another step may be provided for the bearing of the wear plates 1, just as for the bearing of the cams 51, wherein the cams 51 may also exhibit steps, particularly corresponding steps.

The wear plates 1 are each folded as U-profiles, wherein on an intermediate leg 3 (base of the U-profile) wear plates 2, 2' laterally opposite in each case are connected running substantially orthogonally to the intermediate leg 3 (leg of the U-profile).

The intermediate leg 3 has a through-opening 4 passing through the intermediate leg 3 for fixing the wear plates 1 to the brake disc 20 and the brake hub 50. For this purpose, on the brake disc 20 are provided the bearing surfaces 23 of axially penetrating through-openings 31, namely in positions corresponding to the through-openings 4 in each case. Through fixing means which are not shown, particularly screws which are supported on a fixing side 25 of the brake disc 20 and inserted into recesses 26, so that a function of the friction ring 27 is not obstructed, the wear plates 1 are fixed onto the brake disc 20. It is

conceivable for the brake hub 50 also to be fixed simultaneously with the fixing means, particularly by screw-fastening.

The through openings 31 exhibit one, in particular a single, slot 30 pointing radially to the locating opening 32. The slot 30 runs at least predominantly (in this case completely) in an axial direction.

On one side, the slot 30 is of open configuration, in particular completely, to the locating opening. On the opposite side, the slot 30 is of open configuration, in particular completely, to the through-opening 31. In ends, particularly both ends, of the slot 30 lying in the axial direction, these are of open configuration.

The slots 30 have a width B_s of 2 mm. The through-openings 31 have a width B_p of 9.5 mm. The form-fitting contours in the first embodiment have a width B_f of 36.3 mm, wherein in the first embodiment this is the interval between the supporting surfaces 22, 22' lying opposite one another in each case.

The wear legs 2 are each supported by an outer wear surface 2v on the supporting surface 22 and by an inner wear surface 2i on the supporting surface 52. The same applies correspondingly to the wear leg 2' lying opposite, which is supported by its outer wear surface 2v' on the supporting surface 22' and by its inner wear surface 2i' on the supporting surface 52'. During operation of the brake disc/hub connection arrangement or else the vehicle disc brake, the main wear occurs on the inner and outer wear surfaces 2v, 2v', 2i, 2i'. It is particularly provided for this purpose that the wear legs 2, 2' each exhibit a particularly inwardly folded folding section 2f, 2f', so that the wear legs 2, 2' are twice as thick as the intermediate leg 3 (double profile). The folding sections

2f, 2f' therefore also form the inner wear surfaces 2i, 2i'.

The assembly of the brake disc/hub connection arrangement is extremely simple:

- clipping of the wear plates 1 onto the corresponding cams 51, so that the wear plates 1 cover the supporting surfaces 52, 52' and the bearing surfaces 53,
- fitting of the cam holders 21 of the brake disc 20 onto the corresponding wear plates 1 clipped onto the cams 51.

For clipping on, the wear plates 1 are formed to prevent prestressing thereof.

The brake hub corresponding to the brake disc 20' is not depicted in the embodiment according to the invention shown in Figure 2. The brake disc/hub connection shown in Figure 2 is distinguished from the first embodiment shown in Figure 1 in that the form-fit contours are formed at least partially by through-openings 31'. These are arranged concentrically on the inner circumference 20i' of the brake disc 20' and are used for the transmission of force from the corresponding brake hub pin to the brake disc 20'.

Otherwise, what has been said in relation to the first embodiment according to Figure 1 applies similarly, except that the through-openings 31 in the first embodiment are only involved indirectly in the transmission of force between the brake hub 50 and the brake disc 20.

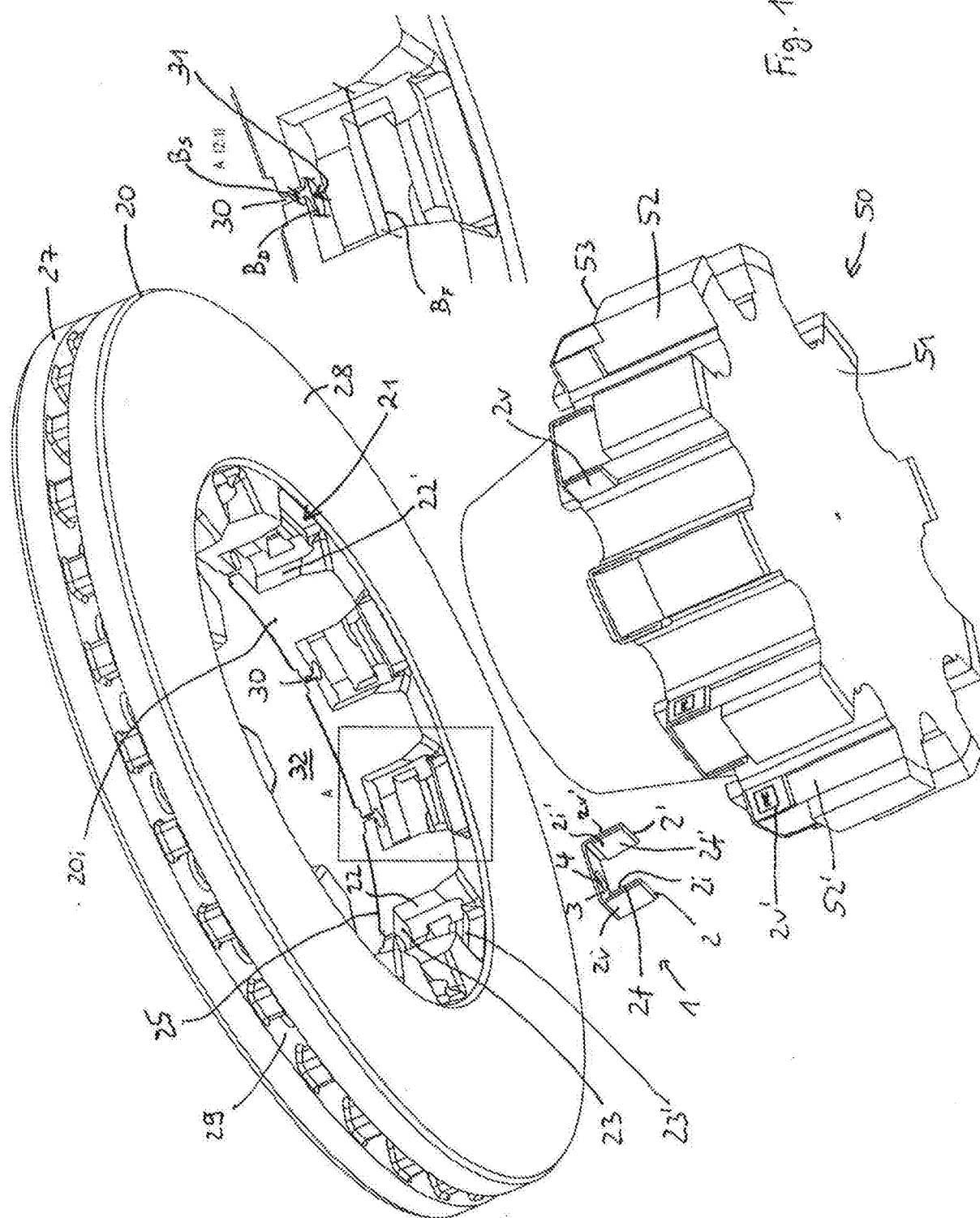
Brake disc

List of reference numbers

1	Wear plates
2, 2'	Wear legs
2i, 2i'	Inner wear surfaces
2v, 2v'	Outer wear surfaces
2f, 2f'	Folding section
3	Intermediate leg
4	Through-opening
20, 20'	Brake disc
20i, 20i'	Inner circumference
21	Cam holders
22, 22'	Supporting surfaces
23, 23'	Bearing surfaces
25	Fixing sides
26	Recesses
27	Friction rings
28	Friction rings
29	Ventilation ducts
30, 30'	Slot
31, 31'	Through-openings
32	Locating opening
50	Brake hub
51	Cams
52, 52'	Supporting surfaces
53, 53'	Bearing surfaces

Szabadalmi igénypontok:

1. Féktárcsa-kerékagy kombináció a féktárcsának a működtetésére a fékezés során, amely rendelkezik:
 - a féktárcsának (20') egy, a féktárcsával (20') koncentrikusan elhelyezett befogadó nyílásával (32) a fék-kerékagynak (50) a befogadására és
 - a féktárcsának (20') egy, a befogadó nyílást (32) határoló belső kerületénél (20i) elhelyezett alakzáró kontúrokkal a fék-kerékagy (50) rotációs erejének a féktárcsára (20') való erő átviteléhez,ahol
az alakzáró kontúrok tartományában a felvevő nyílásra (32) radiálisan irányított, legalább túlnyomó részben axiálisan futó rések (30') vannak elhelyezve,
azzal jellemezve, hogy
a rések (30') axiálisan futó átmenő nyílásokon (31') vannak, ahol az átmenő nyílások (31') közvetlenül a fék-kerékagy (50) és a féktárcsa (20') közötti erő átvitelben vesznek részt.
2. Az 1. igénypont szerinti féktárcsa-kerékagy kombináció, amelynél a rések (30') végigmenően vannak kialakítva.



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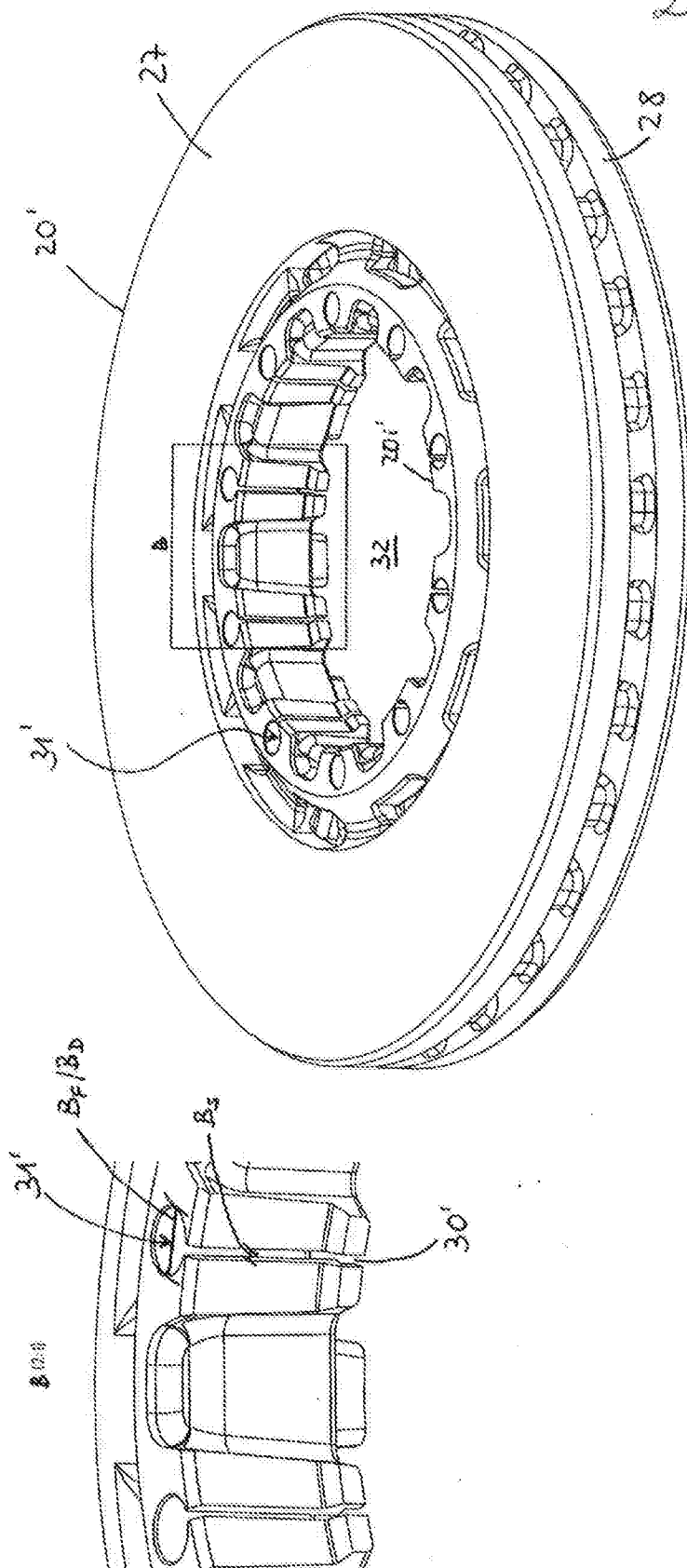


Fig. 2