# CENTRAL DISC FOR A BRAKE DISC FOR CYCLE OR MOTORCYCLE

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The present invention relates to a central disc for a brake disc for cycle or motorcycle.

In the state of the art, a brake disc comprising an outer ring and a central disc of inner support is known. The outer ring forms two flat surfaces parallel to each other which define contact areas with friction means suitable for braking. The outer ring comprises an outer edge and an inner edge from which a multiplicity of protuberances or ribs radially protrude which are adapted to be mounted with the central disc of inner support which is in turn adapted to key centrally on a hub of a rotating means of a cycle or a motorcycle. The central disc comprises a multiplicity of radial grooves arranged radially and adapted to mount the respective multiplicity of protuberances or ribs of the outer ring supporting the outer ring.

Disadvantageously, friction powder resulting from the braking action accumulates in the lower portion of the radial grooves of the central disc.

The object of the present invention is to realize a brake disc that remains clean and that maintains an axial float over time.

In accordance with the invention, this object is achieved with a central disc of inner support of a brake disc for cycle or motorcycle according to claim 1.

Other features are provided in the dependent claims.

The features and advantages of the present invention will be more apparent from the following description, which is to be understood as exemplifying

and not limiting, with reference to the appended schematic drawings, in which:

Figure 1 is a front view of a central disc of a brake disc for cycle or for motorcycle according to the present invention;

Figure 2 is a sectional view of the central disc according to line II-II of Figure 1;

Figure 3 is an enlarged view of detail A of Figure 1;

Figure 4 is a rear view of detail A of Figure 1;

Figure 5 is a sectional view of detail B of Figure 2 according to line V-V of Figure 4;

Figure 6 is a sectional view according to the line VI-VI of Figure 5.

With reference to the aforementioned figures, a central disc 10 of a brake disc for cycle or motorcycle is shown.

The brake disc also comprises an outer ring which comprises a contact zone with friction means for braking.

The central disc 10 is an inner support for said outer ring of the brake disc.

The central disc 10 structurally supports an axial load resulting from normal use, wherein axle means the axis of rotation of a wheel of the cycle or of the motorcycle.

Radial direction means a direction along the radii of said cycle or motorcycle wheel.

The central disc 10 comprises a multiplicity of first radial grooves 20 adapted to mount a respective multiplicity of protuberances or ribs extending radially from an inner edge of the outer ring of the brake disc towards the central disc 10.

The central disc 10 is configured to key on a wheel hub of the cycle or of the motorcycle.

The central disc 10 comprises a load-bearing body 11 where the multiplicity of first radial grooves 20 are obtained.

The first radial grooves 20 have a shape complementary to that of the protuberances or ribs on the inner edge of the outer ring of the brake disc.

The load-bearing body 11 of the central disc 10 comprises through holes 12 that are adapted to be coupled with sealing elements that once mounted with the load-bearing body 11 retain the protuberances or ribs inside the first radial grooves 20 of the central disc 10 by fixedly mounting the outer ring with the central disc 10.

The load-bearing body 11 of the central disc 10 comprises a front face 13 and a back face 14.

The first radial grooves 20 are obtained by carving the back face 14 of the load-bearing body 11 of the central disc 10.

The load-bearing body 11 of the central disc 10 also comprises a multiplicity of second radial grooves 30 which are carved in the front face 13 of the load-bearing body 11.

The second radial grooves 30 are arranged only in correspondence with each first radial groove 20.

Each first radial groove 20 is in communication of friction powder flow resulting from the braking action with a corresponding second radial groove 30 by means of a through slot 40 which is arranged between the first groove 20 and the corresponding second radial groove 30.

As shown in particular in Figure 5, the through

slot 40 is carved in the load-bearing body 11 between the first radial groove 20 and the second radial groove 30.

Each radial slot 40 of the multiplicity of radial slots 40 puts in communication of friction powder flow resulting from the braking action the first 20 and the second corresponding radial slot 30 so that the powder can fall downwards by gravity passing through the through slot 40 and out of the second radial slot 30.

More preferably as shown in particular in Figure 3 the second radial groove 30 comprises an enlarged front portion 35 which increases a width of the second radial groove 30 so as to allow an easier passage of the braking powder. Width of the second groove 30 means a dimension along a direction of rotation of the central disc (10) both in a clockwise and in a counterclockwise direction.

The enlarged front portion 35 increases the width of the second radial groove 30 in the axial direction by increasing the width towards the front portion, starting from an initial width from the bottom of the second radial groove 30 until reaching a greater final width of the second radial groove 30 in correspondence with the outer surface of the front face 13, so as to allow an even easier passage of the braking powder.

Moreover, even more preferably, the enlarged front portion 35 enlarges the width of the second groove 30 only in correspondence with the through slot 40 along the direction of rotation of the central disc 10 in both clockwise and anticlockwise direction so as to allow an even easier passage of the braking powder.

Even more preferably, as shown in the figures, the load-bearing body 11 of the central disc 10 comprises an

inner portion 15 and an outer portion 18.

The inner portion 15 of the load-bearing body 11 of the central disc 10 is adapted to key on the wheel hub of the cycle or of the motorcycle.

The outer portion 18 of the load-bearing body 11 of the central disc 10 comprises a multiplicity of outer bodies 19 wherein the first 20 and the second radial grooves 30 are carved.

The first radial grooves 20 are carved in the back face 14 of the outer body 19, while the second radial grooves 30 are carved in the front face 13 of the outer body 19.

Each outer body 19 comprises a pair of through holes 12.

The load-bearing body 11 comprises a multiplicity of radial rods 16 extending radially from the inner disc 15.

The radial rods 16 support the multiplicity of outer bodies 19.

The load-bearing body 11 comprises a multiplicity of separation rods 17 which are arranged between one outer body 19 and another one.

The inner portion 15 comprises a back face arranged in a first geometric plane $\Sigma$.

The front face 13 of the outer body 19 lies on a second geometric plane $\Lambda$ parallel to said first geometric plane $\Sigma$.

The radial rods 16 extend from the inner portion 15 and tilt towards the front by an angle $\theta$ comprised between 0 and 40 degrees so that the first geometric plane $\Sigma$ and the second geometric plane $\Lambda$ are not coplanar.

The tilt of the angle $\theta$ makes it advantageous to discharge by gravity the accumulation of friction powder resulting from the braking action so that it does not soil the brake disc, but falls towards the outside of the cycle or of the motorcycle.

As shown in the figures, the through slot 40 is carved in the outer body 19 between the first radial groove 20 and the second radial groove 30.

More generally, it is possible to envisage that the front face 13 of the load-bearing body 11 where the second radial groove 30 is carved lies on the second geometric plane $\Lambda$ which is parallel to the first geometric plane $\Sigma$ on which the back face of the inner portion 15 of the central disc 10 lies, wherein the second geometric plane $\Lambda$ is separated by an axial space from the first geometric plane $\Sigma$ so that the second geometric plane $\Lambda$ is outermost towards the front portion along the axial direction with respect to the first geometric plane $\Sigma$. In this way the accumulation of friction powder resulting from the braking action is discharged by gravity towards the outside of the cycle or of the motorcycle so that it does not soil the brake disc or any other component of the cycle or of the motorcycle.

Alternatively, a pressure blower can be used to remove residual braking powder.

Alternatively, it can be envisaged that the central disc 10 may not have the rods 16, but that the shape of the central disc 10 is made so that the back face of the central portion 15 lies on the first geometric plane $\Sigma$ and the outer portion 18 of the load-bearing body 11 where the radial grooves 20, 30 are carved comprises a

front face 13 lying on the second geometric plane Λ shifted axially towards the front portion.

Advantageously, the central disc 10 according to the present invention makes it possible to realize a brake disc that remains clean and that maintains an axial float over time.

The invention thus conceived is susceptible to many modifications and variants, all falling within the same inventive concept. In practice, the materials used, as well as their dimensions, can be of any type according to the technical requirements.

CLAIMS

1. Central disc (10) of a brake disc for cycle or motorcycle,

wherein said central disc (10) is configured to key on a wheel hub of the cycle or of the motorcycle,

wherein said central disc (10) supports an outer ring of the brake disc, wherein said outer ring comprises a contact zone with friction means for braking,

wherein said central disc (10) comprises a load-bearing body (11) comprising a multiplicity of first radial grooves (20) adapted to mount a multiplicity of protuberances or ribs extending radially from an inner edge of said outer ring of the brake disc towards said central disc (10),

characterized in that said load-bearing body (11) comprises a multiplicity of second radial grooves (30), wherein each second radial groove (30) is arranged in correspondence with each first radial groove (20) of said multiplicity of first radial grooves (20),

wherein each second radial groove (30) is in communication of friction powder flow resulting from the braking action with each first radial groove (20) of said multiplicity of first radial grooves (20) through a through slot (40) carved inside the load-bearing body (11) between said first (20) and said second radial groove (30).

2. Central disc (1) according to the claim 1, characterized in that said load-bearing body (11) of the central disc (10) comprises a front face (13) and a back face (14),

wherein the first radial grooves (20) are obtained by carving the back face (14) of the load-bearing body

(11) of the central disc (10),

wherein the second radial grooves (30) are obtained by carving the front face (13) of the load-bearing body (11) of the central disc (10).

3. Central disc (10) according to anyone of the claims 1 or 2, characterized in that the second radial groove (30) comprises an enlarged front portion (35) which increases a width of the second radial groove (30),

wherein the width of the second groove (30) means a dimension along a direction of rotation of the central disc (10) both in a clockwise and in a counterclockwise direction.

4. Central disc (10) according to the claim 3, characterized in that the enlarged front portion (35) increases the width of the second radial groove (30) in the axial direction by increasing the width towards the front portion.

5. Central disc (10) according to anyone of the claims 3 or 4, characterized in that the enlarged front portion (35) increases the width of the second groove (30) only in correspondence with the through slot (40) along the direction of rotation of the central disc (10) both in a clockwise and in a counterclockwise direction.

6. Central disc (10) according to anyone of the claims 1-5, characterized in that the load-bearing body (11) of the central disc 10 comprises an outer portion (18) comprising a multiplicity of outer bodies (19) wherein the first (20) and the second radial groves are carved (30).

7. Central disc (10) according to anyone of the claims 2-6, characterized in

that the load-bearing body (11) of the central disc

10 comprises an inner portion (15) which comprises a back face lying on a first geometric plane (Σ),

that the front face (13) of the load-bearing body (11) wherein the second radial groove (30) is carved lying on a second geometric plane (Λ) which is parallel to the first geometric plane (Σ),

wherein the second geometric plane (Λ) is separated by an axial space from the first geometric plane (Σ) so that the second geometric plane (Λ) is outermost towards the front portion along the axial direction with respect to the first geometric plane (Σ).

8. Central disc (10) according to the claim 7, characterized in that the load-bearing body (11) comprises a multiplicity of radial rods (16) which protrude radially from the inner disc (15) and tilt towards the front by an angle (θ) comprised between 0 and 40 degree with respect to the first geometric plane (Σ), so that the first geometric plane (Σ) and the second geometric plane (Λ) are not coplanar.

9. Central disc (10) according to anyone of the claims 6-8, characterized in that the load-bearing body (11) comprises a multiplicity of separation rods (17) which are arranged between one outer body (19) and another one.