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(71) Applicants **Sumitomo Electric Industries Ltd., No. 15, Kitahama 5-chome, Higashi-ku, Osaka-shi, Osaka, Japan**
(72) Inventor **Yukinori Nishiyama**
(74) Agents **Marks & Clerk**

(54) **Caliper for supporting pad assemblies of disc brake for two-wheeled vehicle**

(57) The caliper 11, primarily for a two-wheeled vehicle, has a bridge 19 straddling a disc and through which passes a pad assembly support pin 20. A recess 17 of the caliper forms side portions 25 having respective side surfaces *a* and lower surfaces *b*. Pad assemblies 12, 13 for use with the caliper have respective backing plates 12*b*, 13*b*, each of which has a protruding portion 18 for insertion within the recess 17 and through an oblong slot 21 passes the pin 20. Shoulder portions 23, 24 of the backing plates engage the side surfaces *a* of the caliper side portions 25 and the surfaces *b* engage upper surface portions of the backing plates 12*b*, 13*b*. Braking torque is reacted on said surfaces *a* and *b*.

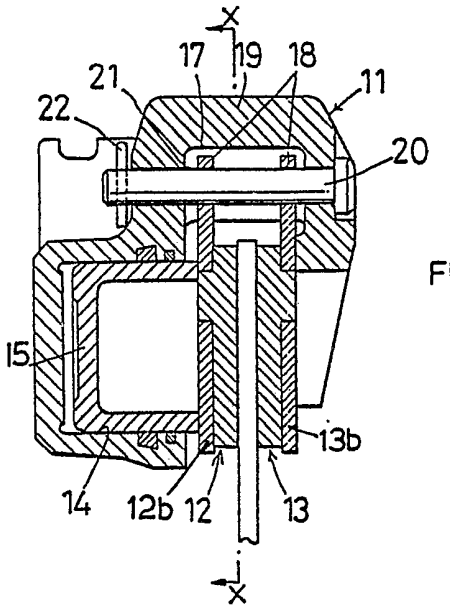

FIG.2.

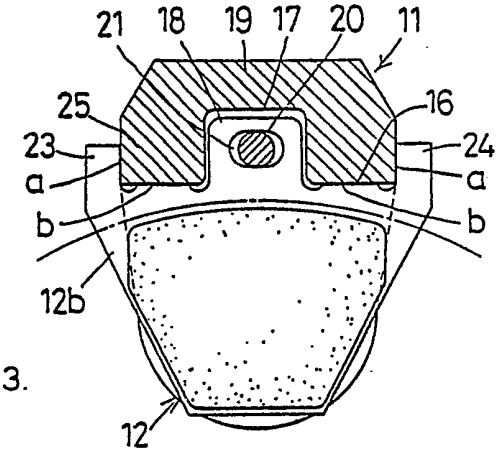

FIG.3.

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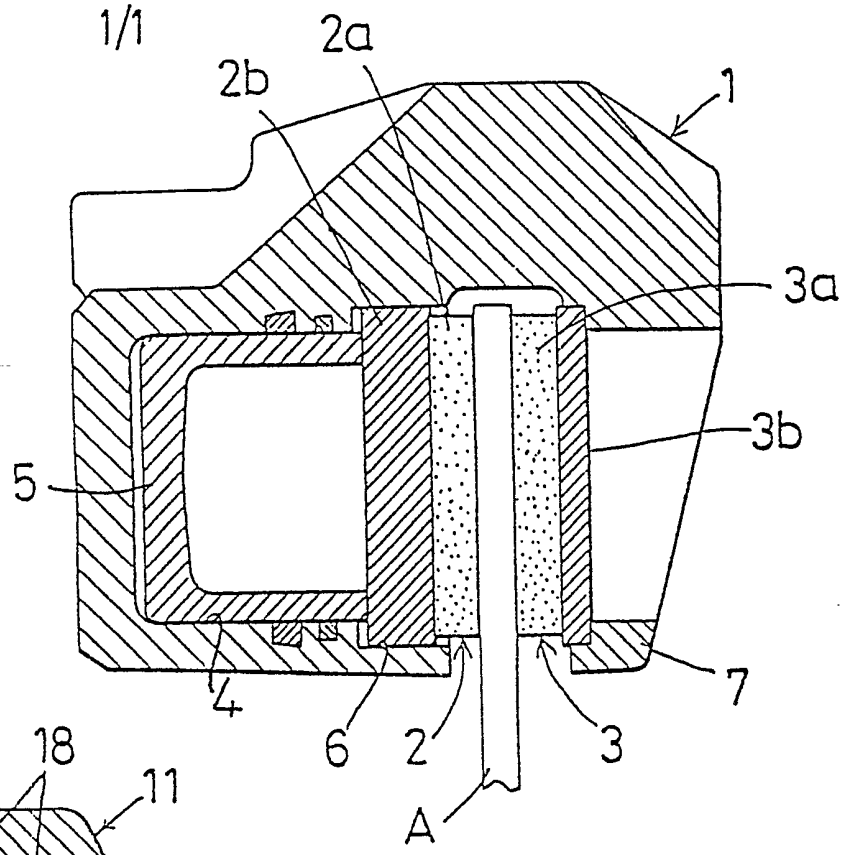
FIG.1.



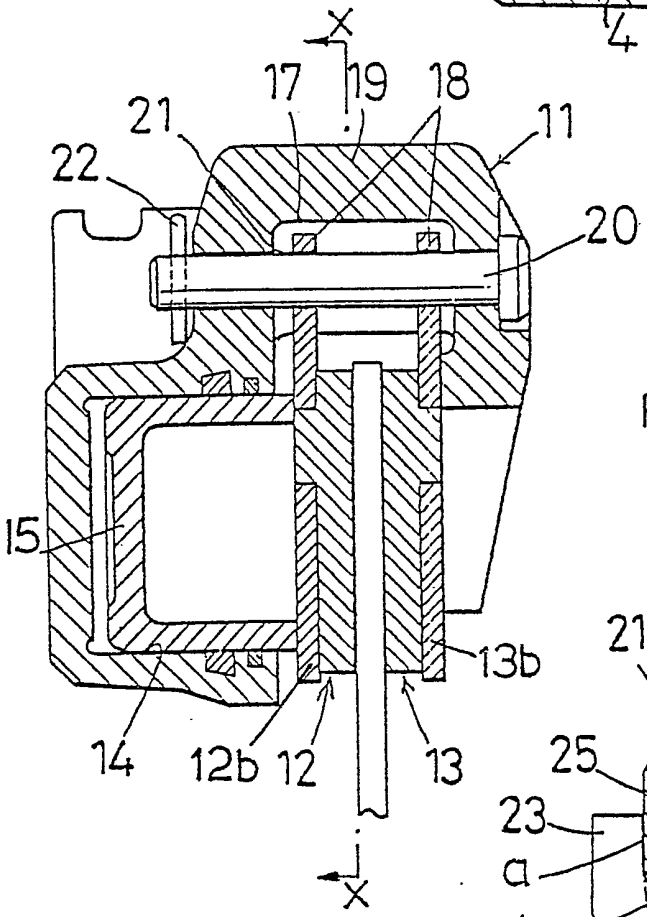


FIG.2.

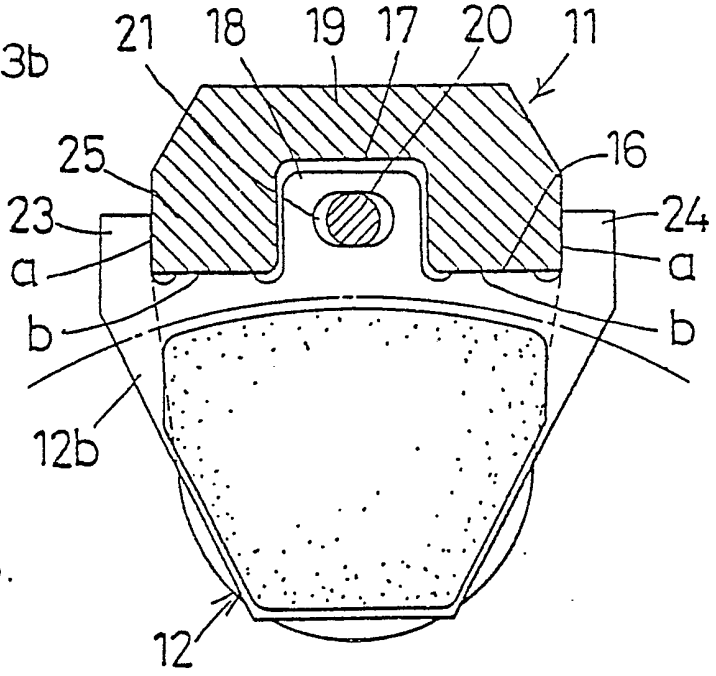


FIG.3.

SPECIFICATION

Structure for supporting pad assemblies of disc brake for two-wheeled vehicle

The present invention relates to a disc brake for use with a two-wheeled vehicle and more particularly to a structure for supporting a pad assembly of a floating type disc brake.

A conventional floating type disc brake for a two-wheeled vehicle as shown in Figure 1 of the accompanying drawings comprises a disc A, a caliper 1 including a caliper cylinder 4 and a caliper arm 7, two pad assemblies 2 and 3 disposed on either side of the disc A, the former being disposed on the cylinder side of the caliper 4 and the latter being disposed on the wheel (not shown) side thereof, and a piston 5 incorporated in the caliper cylinder 4. The pad assembly 2 on the cylinder side of the caliper is received and supported in a receiving portion 6 formed at the open end of the caliper cylinder 4. The pad assembly 3 on the wheel side of the caliper is supported by the caliper arm 7.

The conventional disc brake described above is advantageous in that it is not necessary to provide a stationary member adapted to be coupled to the fork of the vehicle to support the pad assemblies. However, it has the drawback that it is necessary to provide the receiving portion 6 at the open end of the caliper cylinder 4 in order to receive and support the pad assembly 2 on the cylinder side of the caliper. In addition, it is also necessary operatively to support the pad assembly 2 within the receiving portion 6 when the pads 2*a* and 3*a* wear and it is therefore necessary to increase the thickness of the pad assembly 2 on the cylinder side by as much as the amount of effective wear of the pad assembly 3 on the wheel side. As a result, the respective thicknesses of the pad assemblies 2 and 3 differ, and the length of the caliper cylinder becomes longer.

An object of the present invention is to provide a floating type disc brake caliper for a two-wheeled vehicle in which the support of the pad assemblies is achieved in an improved manner, whereby the length of caliper cylinder and the thickness of pad assemblies are reduced to a required minimum, and which enables pad assemblies to be used which have the same thickness.

According to the invention, a disc brake caliper for use primarily on a two-wheeled vehicle comprises a caliper bridge arranged, in use, to straddle a disc rotatable with a wheel of the vehicle, and adapted to receive a pair of pad assemblies each including a backing plate and a layer of friction material, each backing plate having a protruding portion extending from an inner peripheral portion thereof and a pair of shoulder portions extending from respective end peripheral portions, all of said portions extending radially outwardly in relation to the disc when in use, a support pin extending through the caliper bridge and arranged to pass through the protruding portions of the pad backing plates to support the latter with clearance transverse to the pin direction, and side portions formed on the caliper bridge and adapted to be interposed, in use, between the protruding portion and shoulder portions of each pad assembly, whereby the side portions of the caliper bridge are brought into abutment with the inner surfaces of said shoulder portions and the upper surfaces of the backing plates in order to react braking torque arising on the pads during braking of the disc.

The present invention will now be described by way of example, with reference to the accompanying drawings in which:—

Figure 1 is a sectional view of a conventional disc brake;

Figure 2 is a sectional view of one form of the disc brake of the present invention, and

Figure 3 is a cross-sectional view taken along line X—X of Figure 2.

Figures 2 and 3 show an example of the disc brake of the present invention which is a floating type disc brake for a two-wheeled vehicle. The disc brake comprises, in similar manner to a conventional disc brake, a disc A, a caliper 11, pad assemblies 12 and 13 disposed on opposite sides of the disc A, the former being disposed on the cylinder side of the caliper and the latter being disposed on the wheel (not shown) side, and a piston 15 incorporated in the caliper cylinder 14. The caliper 11 includes a caliper bridge 19 straddling the periphery of the pad assemblies 12 and 13 and a caliper groove 16. A recess 17 is formed in the groove 16 of the caliper 11 extending parallel to the axis of the disc A thereby forming side portions 25, as particularly shown in Figure 3. The pad assemblies 12 and 13 include backing plates 12*b* and 13*b*, respectively, each of which has a protruding portion 18 extending from the central periphery of the backing plate radially outwardly of the disc A. The protruding portion 18 of each backing plate is adapted to be inserted into the recess 17 of the caliper 11. The protruding portion 18 has an oblong slot 21 having a longitudinal axis perpendicular to the axis of the disc A, into which a pad pin 20 is loosely inserted. At the tip end of the pad pin 20, a split pin 22 is inserted so as to prevent the unwanted removal of the pad pin 20. Thus, the pad assemblies 12 and 13 are supported by inserting the pad pin 20 through the bridge portion 19 and the oblong slots 21 of the pad assemblies.

Each of the backing plates 12*b* and 13*b* of the pad assemblies 12 and 13 has a pair of shoulder portions 23 and 24 which extend from both end portions of the periphery of the backing plate radially outwardly of the disc A, as shown in Figure 3. The side portions 25 of the caliper bridge 19 are interposed between the protruding portion 18 and the shoulder portions 23 and 24 and in abutment with the inner surfaces of said shoulder portions, and also in abutment with the upper surfaces of the backing plates 12*b* and 13*b*.

Accordingly, the brake torque applied to the

pad assemblies 12 and 13 is reacted by the abutting surface *a* of both side portions 25 of the caliper bridge 19 from the inner surfaces of the shoulders 23 and 24 of the backing plates 12*b* and 13*b* and also by the abutting surface *b* of the side portions 25 of the caliper bridge 19 from the upper surfaces of the backing plates 12*b* and 13*b*.

The caliper of the present invention constructed as described above has the following appreciable merits:

(1) Since the pad assemblies are supported by a single pin running through the caliper bridge, it is not necessary to provide a receiving portion for receiving the pad assemblies within the caliper cylinder. Therefore, the length of the caliper cylinder can be reduced to a required minimum.

(2) Both pad assemblies can have the same thickness and furthermore, the thickness can be reduced to the required minimum.

(3) The brake torque resulting from braking operation is not reacted by a pad pin, but by the abutting surfaces of both side portions of the caliper bridge against which abut the inner surfaces of the shoulder portions of the backing plates, and by the surfaces of both side portions of the caliper bridge against which abut the upper surface of the backing plate. Therefore, even if the brake torque is great, the pad pin will not crack.

CLAIMS

1. A disc brake caliper for use primarily on a two-wheeled vehicle and comprising a caliper bridge arranged, in use, to straddle a disc rotatable with a wheel of the vehicle, and adapted to receive a pair of pad assemblies each including a backing plate and a layer of friction material, each backing plate having a protruding portion extending from an inner peripheral portion thereof and a pair of should portions extending from respective and peripheral portions, all of said portions extending radially outwardly in relation to the disc when in use, a support pin extending through the caliper bridge and arranged to pass through the protruding portions of the pad backing plates to support the latter with clearance transverse to the pin direction and side portions formed on the caliper bridge and adapted to be interposed, in use, between the protruding portion and shoulder portions of each pad assembly, whereby the side portions of the caliper bridge are brought into abutment with the inner surfaces of the backing plates in order to react braking troque arising on the pads during the braking of the disc.

2. A disc brake caliper according to Claim 1 wherein the support pin is removable to permit removal of the pads from the caliper.

3. A disc brake caliper, substantially as hereinbefore described with reference to Figures 2 and 3 of the accompanying drawings.

4. A disc brake incorporating a caliper according to any one of Claims 1 to 3.

5. A disc brake substantially as hereinbefore described with reference to the accompanying drawings.

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