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PATENT SPECIFICATION

DRAWINGS ATTACHED

Inventor: ALFRED YARDLEY

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COMPLETE SPECIFICATION

Improvements in Seals

We, GIRLING LIMITED, a British Company, of Kings Road, Tyseley, Birmingham 11, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to seals of the kind intended for use where there is relative movement between the seal and a surface and comprising a flange which in use extends over the surface and is biased into contact with the surface, the seal being intended to prevent the flow of fluid past the free edge of the flange and hence between the flange and the surface.

Seals of this kind are frequently used on the pistons of master cylinders and wheel cylinders in hydraulic braking systems for vehicles, the seals being of annular shape or of cup shape, and the peripheral flange terminating at its free edge in an annular planar face normal to the cylinder axis. In the free state of the seal, the flange is flared outwards at a small angle, but in use the flange is resiliently deformed so that its outer surface becomes cylindrical engaging the corresponding inner surface of the cylinder right up to the free edge of the flange.

According to the present invention there is provided a seal of the kind specified in which the flange of the seal is of such a form that when in position in a cylinder it presents a cylindrical portion in engagement with the surface and an inwardly inclined annular portion, there being a sharply defined edge at the junction of the two portions.

The flange is conveniently of wedge shape in radial cross-section, the inner face of the section being formed by a frusto-conical inner surface of the flange and the outer face being formed by a reversely coned annular surface extending outwardly to meet in a sharply defined edge a peripheral portion of the flange.

Two embodiments of the invention will now be more particularly described with reference to the accompanying drawings in which:—

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Figure 1 is a diametral section of a seal in accordance with the invention and in its free, unstressed state,

Figure 2 is a similar section of the seal of Figure 1 in use, and

Figure 3 is a similar section of an alternative form of seal in accordance with the invention and in its position of use.

The seal shown in Figures 1 and 2 is made from oil-resisting rubber and comprises an annular body 10 having an integral peripheral flange 11 which flares outwards in the free state. When resiliently deformed as shown in Figure 2 to conform to the interior surface of a cylinder 12 the free edge of the flange extends beyond that part of the flange in contact with the cylinder surface and presents a surface 13 inclined away from the cylinder surface. The seal is mounted in a groove in a piston 14 working in the cylinder 12. The seal shown in Figure 3 is of cup shape having a body 15 and integral flange 16. The flange is flared outwards in the free state but is resiliently deformed to conform with the interior surface of the cylinder 17 in use. The free edge of the flange presents a surface 18 inclined away from the interior surface of the cylinder. The seal backs against the piston 19 working in the cylinder 17 and is held in place by a compression spring 20 acting on a disc 21 within the seal.

In either of these forms of seal, and in any other form of seal in which the free edge of the flange presents a frusto-conical surface inclined away from the surface engaged by the flange, the included angle between the frusto-conical surface and the cylindrical outer surface of the flange, in a diametral plane, is preferably of the order of 120°.

In an alternative form of seal, not illustrated the free edge of the flange may be formed so as to be of part circular section.

Tests have shown that a seal in accordance with our invention has a considerably longer life and is less liable to failure than the seals at present in use when operating under the

high pressures used in hydraulic braking and like systems.

WHAT WE CLAIM IS:—

1. A seal of the kind specified in which the flange is of such a form that when in position in a cylinder it presents a cylindrical peripheral portion in engagement with the surface and an inwardly inclined annular portion, there being a sharply defined edge at the junction of the two portions.

2. A seal of the kind specified in which the free edge of the flange is of wedge shape in radial cross-section, the inner face of the section being formed by a frusto-conical inner surface of the flange and the outer face being formed by a reversely coned annular surface extending outwardly to meet in a sharply de-

fined edge a peripheral portion of the flange which, when the seal is in position in a cylinder is cylindrical.

3. A seal of the kind specified and substantially as hereinbefore described with reference to and as shown in Figures 1 and 2, or Figure 3.

4. A piston and cylinder device in or for an hydraulic braking system for a vehicle having a seal in accordance with any of the preceding Claims acting between the piston and cylinder.

BARKER, BRETTELL & DUNCAN,
Agents for the Applicants,
Chartered Patent Agents,
16, Greenfield Crescent, Edgbaston,
Birmingham, 15.

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22 SEP 1963

D. Barker

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- BARKER, BRETTELL & DUNCAN,**
Agents for the Applicants,
Chartered Patent Agents,
16, Greenfield Crescent, Edgbaston,
Birmingham, 15.

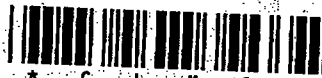
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DeWitt

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