Aug. 1, 1944. R. C. RIKE 2,354,831

CYLINDER BOOT

Filed Aug. 31, 1942

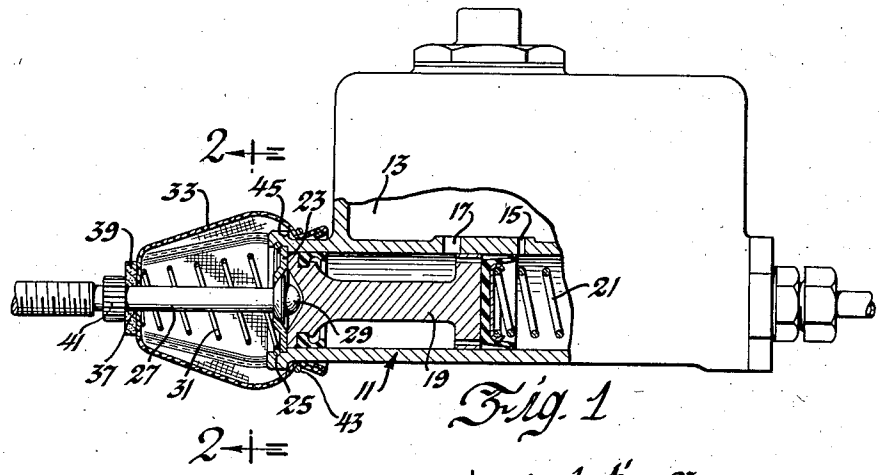


Fig. 1

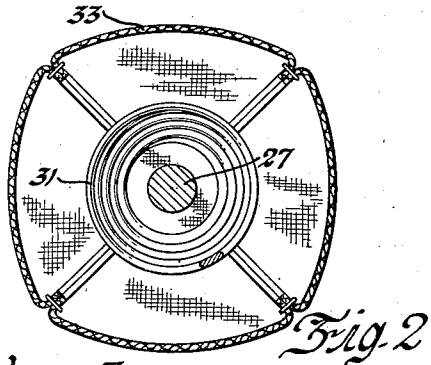


Fig. 2

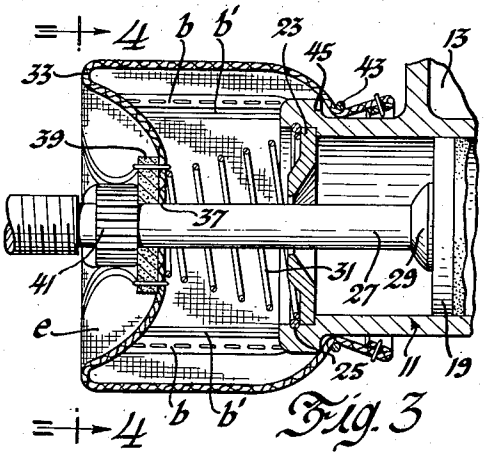


Fig. 3

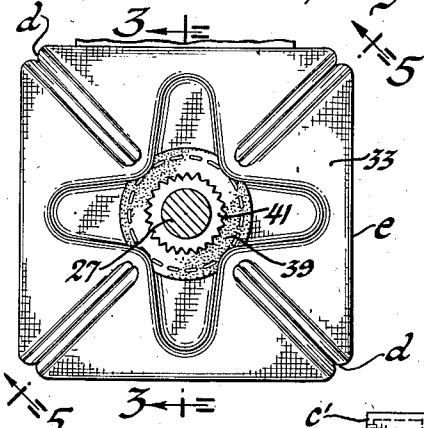


Fig. 4

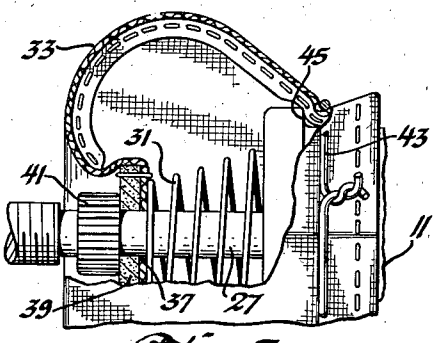


Fig. 5

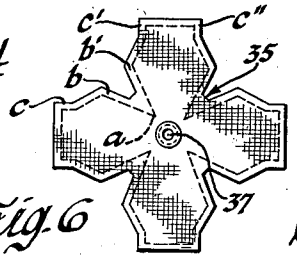


Fig. 6

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CYLINDER BOOT

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Application August 31, 1942, Serial No. 456,798

1 Claim. (Cl. 286—29)

It has been common practice in hydraulic brake systems for vehicles to use a cone-shaped rubber boot to prevent the entrance of foreign matter to the region where the push rod enters the master cylinder. Rubber serves especially well because it rolls and folds as the push rod slides in and out. This invention is the result of an effort to provide a boot to be made from inexpensive material other than rubber and which shall roll and fold as does the rubber. It will be understood that although the invention was occasioned by the need to find a substitute for rubber in making the boot for the master cylinder the inventive idea can as well be embodied in other relations where it is desired to provide a protecting cover for such relatively movable parts. The solution of the problem consists in making a boot from flexible material, for example a piece of cloth or canvas having a specially chosen shape and folding and sewing the cloth to form seams to produce an article not only shaped like the rubber boot but adapted to roll along its seams and to fold between the seams much as the rubber boot folds and rolls.

An embodiment of the invention is shown in the accompanying drawing in which:

Fig. 1 is a view in elevation partly broken away and in section of the improved boot.

Fig. 2 is a sectional view, the section being indicated by line 2—2 of Fig. 1.

Fig. 3 is a vertical section, the boot being partially collapsed indicated by line 3—3 of Fig. 4.

Fig. 4 is a section on line 4—4 of Fig. 3.

Fig. 5 is a section on line 5—5 of Fig. 4.

Fig. 6 is a detail on a reduced scale of the blank from which the boot is made.

For a more complete description reference is made to the several figures and the numerals thereon.

Numeral 11 is applied to a conventional master cylinder of a brake system. As is usual the cylinder is associated with a reservoir 13, there being communicating passages 15 and 17 as usual, the purpose of which is well known and which is no part of this invention. The piston is marked 19. It is biased to the position shown by a spring 21 in which position it is stopped by a retainer 23 and snap ring 25. A push rod 27 has a rounded head 29 engaging a similarly shaped surface on the piston. The push rod moves through the retainer 23 as shown under the influence of any preferred form of brake applying means (not shown). After being advanced by the applying means the rod is restored by a retractor spring on said applying means.

A conically shaped rubber boot is commonly employed between the rod and the cylinder. A boot indicated by numeral 33 is shown in Fig. 1. It is made from a blank 35 of some selected fabric, canvas for example, shaped as shown by Fig. 6. The dotted lines in Fig. 6 indicate where the blank is sewed to form the boot. Adjacent edges of adjacent arms are sewed together from points near the center leaving the center flat. The lines *a b c* are sewed to lines *a b' c'*. The outer margins of the arms are protected by hemming, as along the lines *c' c''*. It will be observed that the blank has an opening 37 in the flat central part; that the adjacent lines for stitching *a b* and *a b'* diverge; that the lines *b c* and *b' c'* approach alignment; and that upon completion of the hemming the line *c c''* etc. is substantially circular. An apertured disc of rubber, felt or the like marked 39 is secured to the apex of the conical boot with the apertures of the disc and boot in registration. The boot may be assembled by being slipped over the rod 27, the felt disc being stretched over the knob 41 of the rod. The large open end is received over the end of the cylinder and held by a wire 43 which is wrapped about the boot just within the shoulder 45 of the cylinder. The ends of the wire may be drawn together and twisted as shown by Fig. 5. The spring 31 within the boot holds its apex, together with the washer 39, against the rod knob 41. As shown, the blank has four arms although of course the number may be changed. Fig. 1 shows the form which the boot takes in the position of brake release in which the rod is withdrawn and the spring 31 is biasing the apex of the cone to its outward limit. When the rod is pushed inwardly the boot appears as shown by Figs. 3, 4 and 5. The apex is pushed inwardly as shown by Fig. 3. Rolling occurs along the lines of the seams (*d* in Fig. 4) while along lines joining the seams the material folds as at *e*, Fig. 4. Figs. 3 and 4 and 5 show better than words can describe the form assumed by the boot as the plunger rod is advanced and they show, too, how closely the form of the fabric boot corresponds to that of the now commonly used protecting boot of rubber.

I claim:

A flexible boot of inelastic material and of substantially conical form, the apex being apertured to embrace a piston rod and the marginal

edge of its base being substantially circular and adapted to surround and to be secured to a cylinder end, said cone having a plurality of arms extending from its apex, the edges of said arms being made up of rectilinear parts angularly related to each other and terminal rectilinear parts, the said last named terminal parts on each arm being parallel with a line extending from said apex midway between the edges of the arm, the adjacent edges of said arms being secured together to form seams whereby, in response to relative reciprocal movement of said cylinder and piston rod, said conical boot may roll along the seams and fold along lines joining the seams.

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