

(21) Application No 8919960.8

(22) Date of filing 04.09.1989

(30) Priority data
(31) 3831379 (32) 15.09.1988 (33) DE

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(51) INT CL⁴
B60T 13/10

(52) UK CL (Edition J)
F2F FBJ

(56) Documents cited
None

(58) Field of search
UK CL (Edition J) F2F FBJ
INT CL⁴ B60T

(54) Arrangement for fastening a brake booster

(57) In order to enable a brake booster to be fastened to a splash wall of an automotive vehicle without free play, a guiding portion (10) of the booster housing (1) is provided with an annular groove (11) receiving a clamping ring (3) held on the splash wall (2). In an alternative arrangement, the annular groove (11) is provided in a separate ring (4) secured, e.g. by welding, to the guiding portion.

Fig. 1

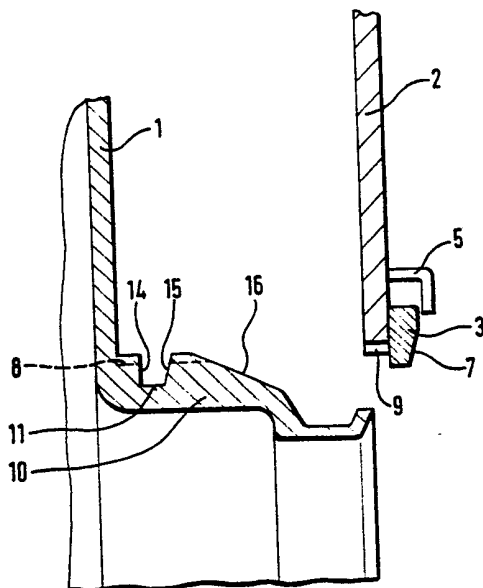


Fig. 2

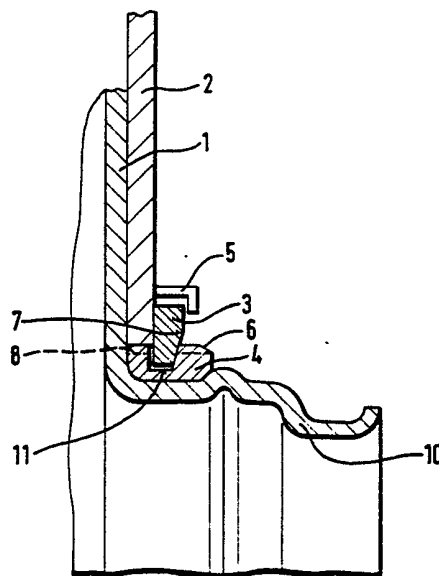


Fig. 1

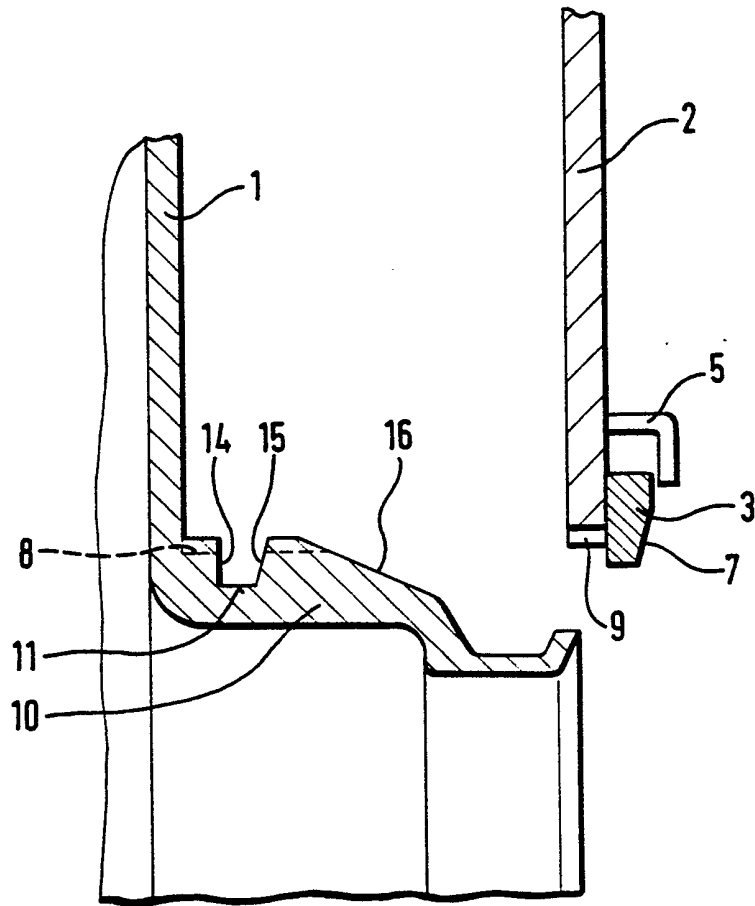


Fig. 2

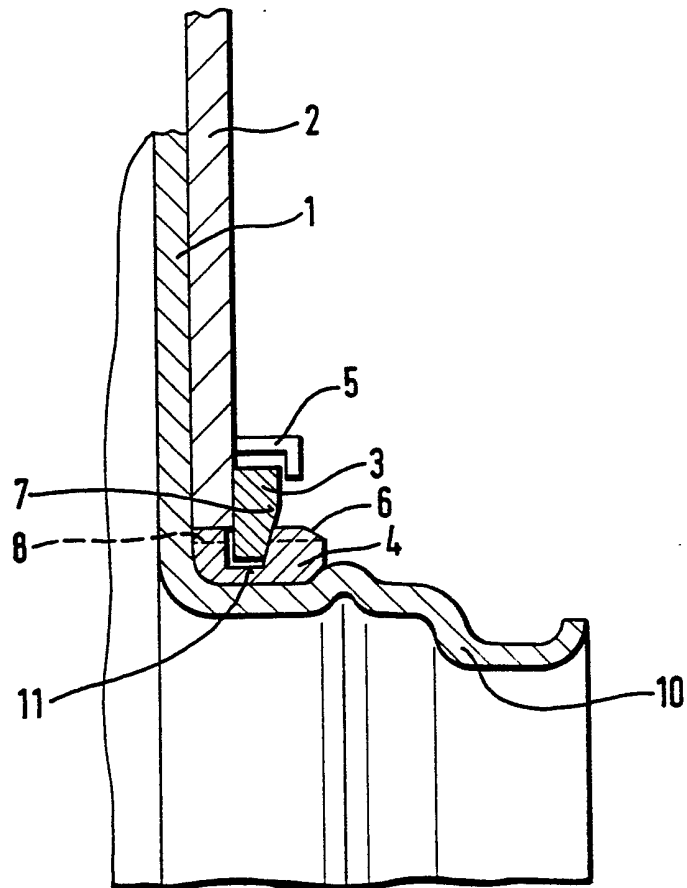
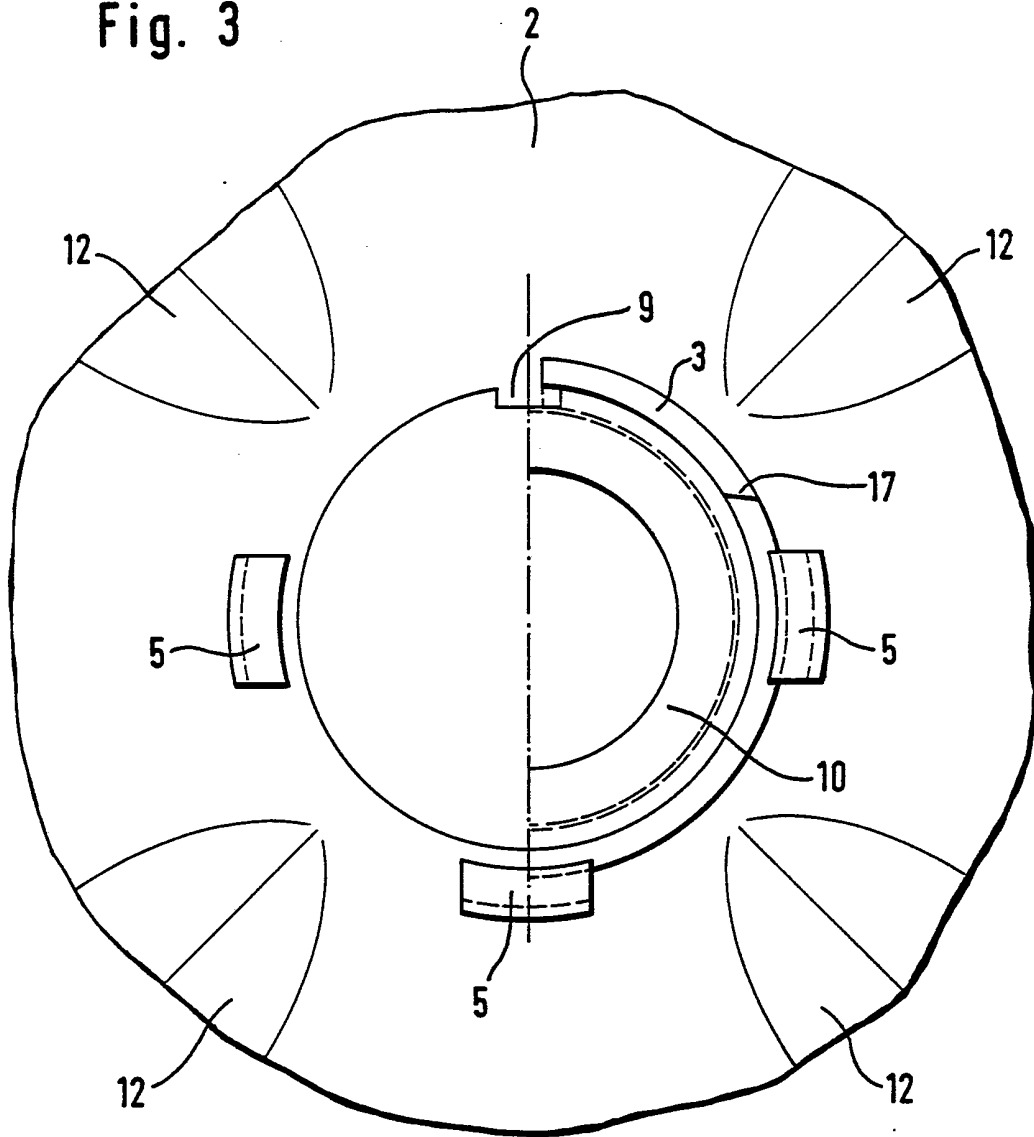


Fig. 3



ARRANGEMENT FOR FASTENING A BRAKE BOOSTER

This invention relates to an arrangement for fastening a brake booster to a splash wall of an automotive vehicle, the housing of the brake booster having a central guiding portion which passes through an opening provided in the splash wall.

More specifically, the invention relates to such fastening arrangements which can be made without the need for any tools.

Such a fastening arrangement is disclosed in German Published Patent Application (DE-OS) No. 3629181 in which the brake booster housing has at least two shaped nuts which pass through corresponding apertures formed in the splash wall of an automotive vehicle. Rotary motion, or a linear displacement of the housing, will force the brake booster into a secured position at which it will be detachably connected to the splash wall. In this arrangement, elastic means - preferably in the form of a spring plate fastened to the nuts - is provided between the brake booster and the splash wall. The spring plate elastically prestresses the brake booster relative to the splash wall or a fastening bracket connected thereto. In order that the brake booster becomes detachably locked in its secured position the spring plate has a projecting finger at the end of which a lip or nose is formed which engages a notch provided in the splash wall.

This known fastening arrangement, however, requires a

relatively complicated booster mounting operation which, particularly in respect of the required rotary, or displacing, motion and with regard to the means needed therefor, can only be carried out with difficulty in the
5 very restricted engine space. A further disadvantage resides in the fact that either the individual components of such a fastening arrangement have to be manufactured with high precision or a strong spring is required in order to eliminate the free plate at the junction between the booster
10 housing and splash wall. The work to be performed in connection with forming the notches on the splash wall can also be considered disadvantageous.

It is thus an object of the present invention to provide an arrangement for fastening a brake booster of the
15 type referred to above which allows the brake booster to be fastened to the splash wall of an automotive vehicle without free play, the assembling operation being simplified and the cost thereof being reduced.

According to this invention this object is realised in
20 that the guiding portion of the booster housing is provided with an annular groove receiving a clamping ring held on the splash wall. The annular groove may be formed in a clamping sleeve inseparably connected with the guiding portion, e.g., by way of welding, caulking or pressing-on.

25 A further advantageous embodiment of the subject matter of this invention provides that the guiding portion of the booster housing is provided with a conical section or that the clamping sleeve has a chamfer on the side thereof away from the booster housing wall.

30 These measures facilitate the introduction of the guiding portion of the housing into the clamping ring.

In a further advantageous embodiment of the invention the clamping ring has at least one bevel where it engages the annular groove and at least one of the side flanks of
35 the annular groove is bevelled, the co-operation of the bevelled side flank with the bevel provided on the clamping ring taking place in the self-locking region. By virtue of

this measure, an efficient tolerance compensation will be provided between the two co-operating parts.

Finally, so as to effect a centering of the brake booster in the splash wall without any additional measures this invention provides that the diameter of the clamping sleeve in the area where it passes through the splash wall corresponds to the diameter of the opening provided in the splash wall.

By way of example this invention will be explained in more detail in the context of the following description of two embodiments illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a first embodiment of the fastening arrangement of this invention before assembly;

Figure 2 is a second embodiment of the fastening arrangement of this invention in assembled condition; and,

Figure 3 shows the splash wall of a vehicle with and without a brake booster fastened to it.

Referring to Figures 1 and 3, a brake booster has a booster housing 1 with a central cylindrical guiding portion 10 introducible into an opening of a splash wall 2 of an automotive vehicle. The guiding portion 10 provided with a conical section 16 has an annular groove 11 near the booster housing wall. The annular groove 11 is bounded by two side flanks 14,15 and receives a clamping ring 3. The clamping ring 3 is held on the splash wall 2 by means of several holding brackets 5 and is provided with a slot 17 (Figure 3). The annular groove 11 of this embodiment preferably features a design according to which at least one of the side flanks 14,15 is not perpendicular, but rather runs at a certain angle to the longitudinal axis of the guiding portion 10. The side flank 15 which in the present embodiment is not perpendicular co-operates with a bevel 7 formed on the clamping ring 3. On the one hand, this arrangement serves to compensate for the tolerances which exist in the components. On the other hand, due to the angle lying in the self-locking area, it enables taking up

the operating forces in the axial direction. Further, the guiding portion 10 is provided with an axial groove 8 which, upon assembly, receives a projection 9 formed on the splash wall 2 and in this way secures the mounted brake booster in its mounted position against twisting.

In the second embodiment of the invention shown in Figure 2, the above-mentioned annular groove 11 is formed in a clamping sleeve 4.

This sleeve 4 is inseparably secured to the guiding portion 10, e.g., by way of welding, or is held by part of the guiding portion 10 being rolled up. The diameter of the clamping sleeve 4 preferably corresponds to that of the opening provided in the splash wall 2, the clamping sleeve 4 having a chamfer 6 on the end thereof away from the booster housing wall. The chamfer serves to expand the clamping ring 3 upon assembly.

When mounting the brake booster on the splash wall 2 of the automotive vehicle, the booster housing 1 will at first be positioned so that its guiding portion 10 will face the clamping ring 3 arranged between the holding brackets 5. Upon a subsequent movement in the direction of the booster axis the guiding portion 10 will be introduced into the opening provided in the splash wall 2 so that, upon a further displacement of the booster housing 10 towards the splash wall, the clamping ring 3 will be expanded due to the action of the conical section 16 (Figure 1) on the ring or of the action of chamfer 6 of the clamping sleeve 4 (Figure 2) on the ring 3, this enabling the guiding portion 10 to pass fully through the opening in the splash wall. In the final phase of this assembling procedure, the annular groove 11 in the guiding portion 10 or in the clamping sleeve 4 will appear radially directly opposite the expanded clamping ring 3 which, due to its own stressed condition will contract radially so that it engages the annular groove 11, with the bevel 7 formed on the clamping ring 3 automatically locking together with the inclined side flank 15 of the groove 11. By this arrangement all the tolerances in the

components will be compensated for. The splash wall 2 is provided with reinforcing depressions 12 around the opening (Figure 3) so as to take up the forces generated during assembly without the splash wall being deformed.

CLAIMS:

1. An arrangement for fastening a brake booster to a splash wall of an automotive vehicle by means of a disconnectable junction producible without any tools, the booster housing of the brake booster having a central guiding portion which passes through an opening provided in the splash wall, characterised in that the guiding portion (10) is provided with an annular groove (11) receiving a clamping ring (3) held on the splash wall (2).
- 10 2. An arrangement as claimed in claim 1, characterised in that the annular groove (11) is formed in a clamping sleeve (4) inseparably connected with the guiding portion (10).
- 15 3. An arrangement as claimed in claim 1, characterised in that the guiding portion (10) has a conical section (16).
4. An arrangement as claimed in claim 1 or in claim 2, characterised in that the clamping ring (3) has a slot (17) and is held by means of several holding brackets (5) provided on the splash wall (2) along the circumference of
20 the opening.
5. An arrangement as claimed in any one of claims 1 to 4, characterised in that the clamping ring (3) is provided with at least one bevel (7) where the ring engages the annular groove (11).
- 25 6. An arrangement as claimed in claim 5, characterised in that at least one (15) of the side flanks (14,15) of the annular groove (11) is bevelled and in that co-operation with the bevel (7) provided on the clamping ring (3) takes place in the self-locking area.
- 30 7. An arrangement as claimed in claim 2, characterised in that the clamping sleeve (4) has a chamfer (6) on the side thereof away from the booster housing wall.
8. An arrangement as claimed in claim 1 or in claim 2, characterised in that the guiding portion (10), or the clamping sleeve (4), has an axial groove (8) receiving a
35 bracket (9) formed on the splash wall (2).
9. An arrangement as claimed in claim 2, characterised

in that the diameter of the clamping sleeve (4) in the area where it passes through the splash wall (2) corresponds to the diameter of the opening provided in the splash wall (2).

10 5 10. An arrangement as claimed in claim 2, characterised in that the clamping sleeve (4) is fastened on the guiding portion (10) by means of welding.

11. An arrangement as claimed in claim 2, characterised in that the clamping sleeve (4) is fastened on the guiding portion (10) by means of caulking.

10 12. An arrangement as claimed in claim 2, characterised in that the clamping sleeve (4) is fastened on the guiding portion (11) by means of pressing.

15 13. An arrangement as claimed in any one of the preceding claims, characterised in that a seal is provided between the booster housing (1) and the splash wall (2).

14. An arrangement as claimed in any one of the preceding claims, characterised in that the splash wall is provided with reinforcing depressions (12).

20 15. An arrangement for fastening a brake booster to a splash wall of an automotive vehicle substantially as hereinbefore described with reference to Figures 1 and 3 of the accompanying drawings.

25 16. An arrangement for fastening a brake booster to a splash wall of an automotive vehicle substantially as hereinbefore described with reference to Figures 2 and 3 of the accompanying drawings.