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(54) Detachable aerial assembly

(57) An aerial assembly for mounting on a vehicle body (4), for example, comprises an aerial having a member (1a) which is removably receiveable in a socket (2) of a base nut (5). Resilient leaves (5a) urge the member (1a) into electrical connection with an aerial feed cable (3) located in the base nut (5) at the base of the socket (2).

The aerial may be tiltable about the longitudinal axis of the socket and be clamped in a desired orientation by means of a nut (6).

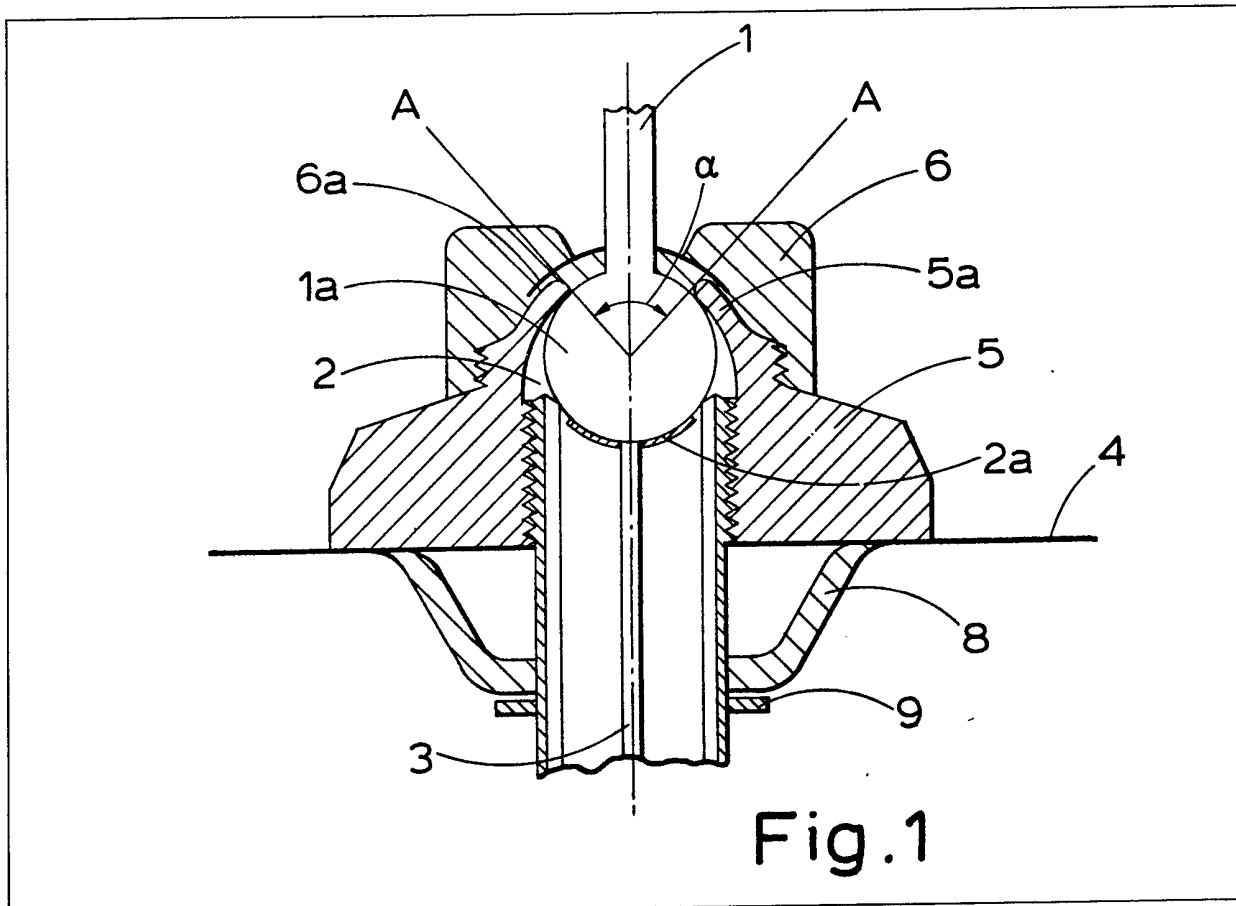


Fig. 1

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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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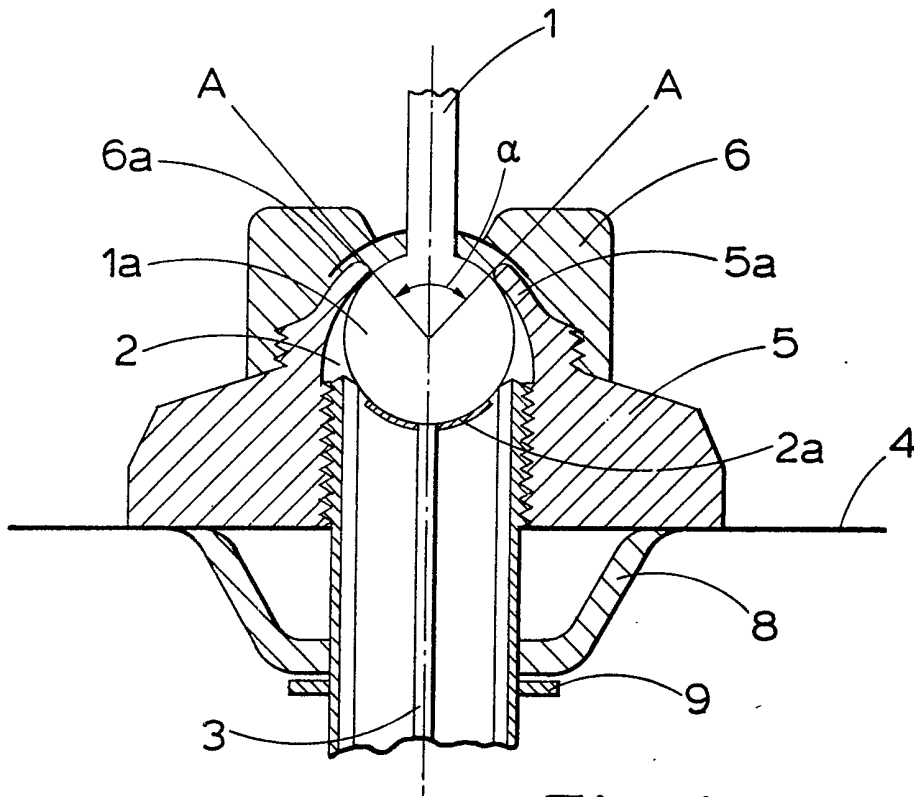


Fig. 1

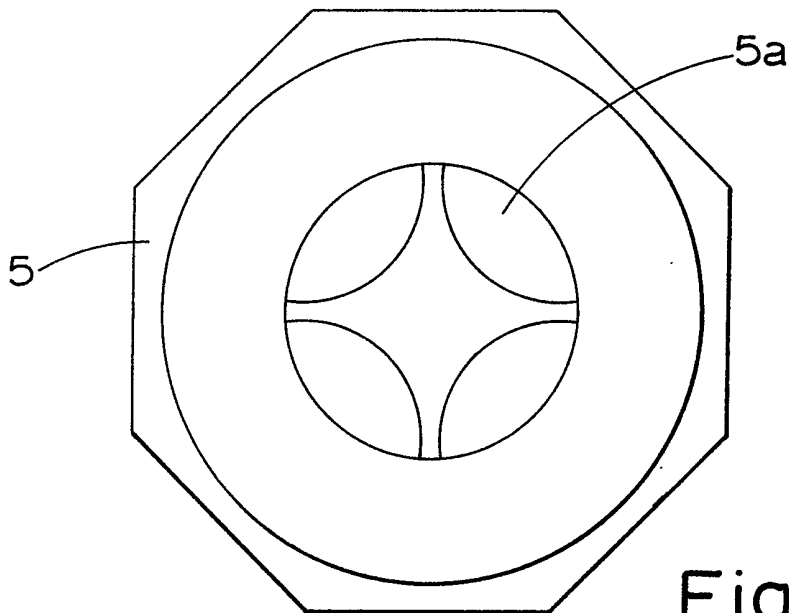


Fig. 2



## SPECIFICATION

**Detachable aerial assembly**

5 The present invention relates to an aerial assembly providing means for detachably installing an aerial in a desired location.

10 Detachable aerals find particular application with regard to vehicles. Commonly, vehicle aerals are mounted in a telescopic fashion so that they can be brought substantially flush with the vehicle body surface in order to permit, for example, the use of car washes. Further, the telescopic retraction of an aerial requires that it be linear and therefore restricts the design of such aerals.

15 Detachable aerial assemblies of the screw-in type are known. In these assemblies, the aerial is provided with a screw thread which allows an end to be screwed into a suitable receiving socket which is mounted in a desired location and is connected with an aerial feed cable. Thereby, electrical connection is made between the aerial and the feed cable. However, these aerial assemblies do not facilitate removal. Further, such aerals may only be mounted at the angle determined by the axis of the receiving socket.

20 It is an object of the present invention to provide means for installing an aerial, irrespective of its shape, in a detachable manner so that removal is facilitated.

25 Thus according to the present invention there is provided an aerial assembly comprising; an aerial having aerial connection means comprising a male member, and feed cable connection means for establishing electrical connection between an aerial feed cable and said aerial, said feed cable connection means being adapted for mounting in a desired location and comprising a female member having a socket for removably receiving the male member and bias means for urging said male member into electrical connection with the aerial feed cable.

30 The feed cable connection means may be an integral part of the aerial feed cable or may comprise a member having, for example, a screw threaded socket or clamping means so that the cable may be attached.

35 A particular embodiment of the present invention further provides the possibility of clamping and securing the aerial at a desired angle with respect to the surface on which it is located. This angle may be in any of a number of directions.

40 The present invention will now be further described with reference to the accompanying drawings, in which:

45 *Figure 1*, shows a longitudinal section through a pop-in-type embodiment of the present invention; *Figure 2*, shows a plan view of a member shown in *Figure 12*, and

50 *Figure 3* shows a longitudinal section through a modified embodiment of that shown in *Figure 1*.

55 *Figure 1* shows an aerial 1 having a ball shaped member 1a which rests on a partially spherical contact pad 2a which is attached to and in electrical connection with a feed cable 3. The feed cable is mounted to a vehicle body 4, for example, the wing, by means of a base nut 5 whose screw thread mates

60 with a similar thread provided on the outer covering of the feed cable. In addition, an under wing fixing bracket 8 is preferably also provided for securing the cable to the vehicle. This bracket 8 is fixed to the wing and bears against a flange 9 provided on the outer covering of the feed cable, as the base nut 5 is tightened.

65 A socket 2 is formed above the feed cable contact pad 2a by resilient leaves 5a which extend from the upper surface of the base nut 5, towards its longitudinal axis at an angle to the horizontal. As shown in *Figure 4*, four leaves 5a are arranged symmetrically around the bore of the base nut 5 however, two or more leaves may be used. In this embodiment, the entire base nut 5 including the leaves 5a is composed of a moulded plastics material. The ball shaped member 1a is introduced into the socket 2 by pressing the ball member 1c along the axis of the base nut bore against the resilient leaves 5a. This causes the resilient leaves to move outwards to allow the ball to pass through and then to snap back so as to retain the ball in the socket 2.

70 A clamping nut 6 provided with a sealing ring 6a which may or may not be integral therewith, threadedly engages with a threaded surface provided on the base nut 5. On tightening, the clamping nut 6 bears against the ball member 1a and/or the leaves 5a so as to clamp the ball member in position and at the same time pressing it against the contact pad 2a so as to ensure good electrical contact. Alternatively, the clamping nut 6 may bear against a flange which extend, radially from the aerial just above the ball member 1a, in which case, the sealing ring is not necessary. The aerial may be released simply by unscrewing the clamping nut 6 and extracting the ball member 1a from the socket 2 by force against the resiliency of the leaves 5a.

75 The embodiment of the base nut 5 shown in *Figures 1* and *3* allows the aerial to be clamped so that it is orientated at an angle of up to  $\frac{\alpha}{2}$  on either side of the centre line axis of the assembly. Further, on tilting the aerial from the vertical, the portion of the aerial just above the ball shaped member 1c may be moved, into a gap formed between two adjacent leaves 5a. The number of leaves and hence the number of gaps therebetween will determine the number of directions in which the aerial can be tilted beyond  $\frac{\alpha}{2}$ .

80 The provision of the clamping nut 6 is not an essential feature of the invention. In another embodiment of the invention, the resiliency of the leaves 5a of the base nut 5 is sufficient to ensure that the aerial is in good electrical contact with the contact pad 2a and to hold the aerial against lateral displacement. This arrangement further facilitates removal of the aerial.

85 The ball member 1a of this latter embodiment is preferably provided with a sealing ring or skirt on its upper surface against which the resilient leaves 5a bear. This ensures that the ball member is held snugly in the socket 2.

90 In yet another embodiment of the invention which is shown in *Figure 3*, instead of a clamping nut 6, an annular cap member 16 is provided which mates in press-stud fashion with a rim formed in the base nut

5 about the leaves 5a.

#### CLAIMS

- 5 1. An aerial assembly comprising; an aerial  
having aerial connection means comprising a male  
member, and feed cable connection means for  
establishing electrical connection between an aerial  
feed cable and said aerial, said feed cable connection  
10 means being adapted for mounting in a desired  
location and comprising a female member having a  
socket for removably receiving the male member  
and bias means for urging said male member into  
electrical connection with the aerial feed cable.
- 15 2. An assembly as claimed in claim 1 wherein the  
male member is received in the female member for  
orientation of the aerial in any one of a plurality of  
directions.
3. An assembly as claimed in claim 1 or 2  
20 wherein clamping means are provided to clamp the  
resiliently retained male member in position in the  
socket of the female member.
4. An assembly as claimed in claim 3 wherein the  
clamping means comprise an annular member  
25 which engages the external surface of the female  
member and bears against the male member and/or  
bias means to clamp the male member in position.
5. An assembly as claimed in any preceding  
claim, wherein the bias means comprise a plurality  
30 of resilient projections disposed around the mouth  
of said socket; extending towards the longitudinal  
axis of the socket and being inclined thereto, the  
projections resiliently deforming to permit entrance  
of the male member into said socket.
- 35 6. An assembly as claimed in claim 5 wherein  
said resilient projections comprise resilient leaves  
disposed symmetrically about the mouth of said  
socket, a gap being provided between adjacent  
leaves to permit entrance of the portion of the aerial  
40 extending from the male member therein.
7. An assembly as claimed in claim 5 or 6  
wherein said resilient projections and the female  
member are integral and formed from a plastics  
material.
- 45 8. An assembly as claimed in any preceding  
claim wherein the male member is substantially  
spherical.
9. An assembly as claimed in claim 7 further  
comprising a partially spherical contact pad for a  
50 establishing electrical connection between the feed  
cable and the male member, the male member being  
sealed on this pad when received in the socket.
10. An assembly as claimed in any preceding  
claim wherein said female member is integral with  
55 an internally threaded base nut, the longitudinal axis  
of the nut coinciding with that of the socket, the base  
nut screwably receiving an externally threaded end  
of the feed cable to secure the cable at a position at  
the base of the socket to make electrical connection  
60 with the male member when the latter is received in  
the socket.
11. An assembly as claimed in any preceding  
claim, further comprising a fixing bracket for loca-  
tion on the reverse side of a surface to which the  
65 cable connection member is mounted and through

which the feed cable passes for connection with the  
connection member, the fixing bracket being  
adapted to engage said reverse side of the surface  
and a flange projecting from the surface of the feed  
70 cable.

12. An aerial assembly substantially as herein  
described with reference to an as illustrated in  
Figures 1 and 2 or without reference to Figure 3 of  
the accompanying drawings.

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