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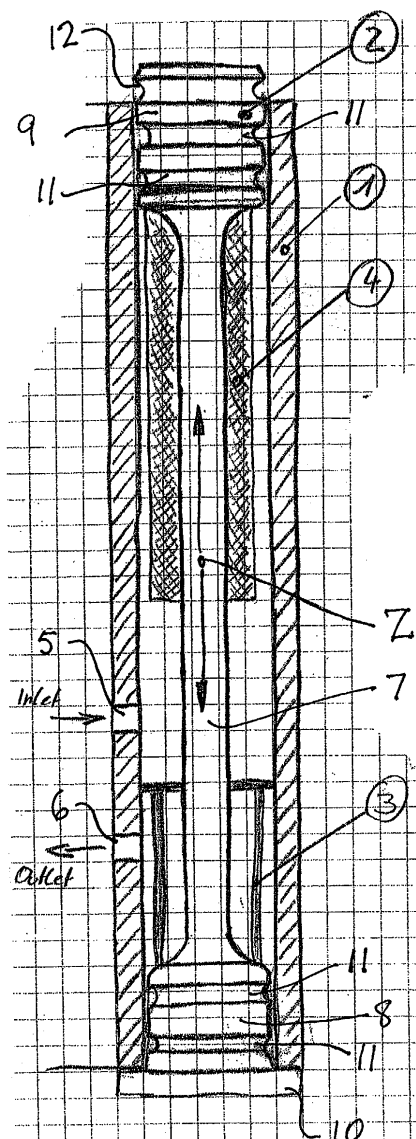
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(54) **Receiver for air conditioning**

(57) A receiver-drier has a tubular body (1) through which extends a plug (2) which is sealingly engaged with the inner surface of the body (1) at its ends, and which is mechanically engaged with the ends of the body (1) to carry axial loads produced by fluid pressure within the body (1). A filter (3) and drier (4) are carried by the plug (2).



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## Description

**[0001]** This invention relates to a receiver-drier for use in air conditioning systems. The invention is particularly, but not exclusively, applicable to automotive air conditioning systems.

**[0002]** It is conventional for the condenser in an automotive air conditioning system to have associated with it a receiver to act as a refrigerant reservoir and pressure accumulator. It is also usual for the receiver to contain a water-absorbing desiccant element for removing water from the refrigerant, and a filter for removing particulate contamination, the combined unit being known as a receiver-drier.

**[0003]** Hitherto receiver-driers have typically been fabricated from aluminium alloy by brazing. In view of the considerable pressures involved, it has been necessary to use relatively thick aluminium, for example 3mm. These products have had high costs in terms of materials, fabrication and assembly time, and energy consumption in brazing.

**[0004]** In some cases, the receiver-drier is non-serviceable, that is, there is no provision for cleaning or exchanging the desiccant element or the filter; the unit is sealed closed and in the event of a malfunction must be discarded and replaced. It is also known to provide a serviceable receiver-drier in which the desiccant element and filter can be removed and replaced via a plug. However, in this latter case the plug and the wall of the receiver with which it engages have been substantial structures with complex mechanical engagement.

**[0005]** An object of the present invention is to provide improved receivers and receiver-driers having lower material and manufacturing costs and improved ease of serviceability.

**[0006]** The present invention provides a receiver for use in air conditioning systems, comprising a tubular body, and a fluid inlet and a fluid outlet communicating with the interior of the tubular body; and is characterised by a plug extending from one end of the tubular body to the other end, the plug being sealingly engaged with the inner surface of the tubular body at either end, and the plug being mechanically engaged with the tubular body at either end to carry axial loading produced by fluid pressure within the tubular body.

**[0007]** This enables the wall thickness of the body to be reduced, and brazing to be eliminated.

**[0008]** The plug preferably comprises a base and a head each having an outer diameter close to the inner diameter of the tubular body, and a stem of reduced diameter extending between the base and the head. Preferably the base and the head are sealingly engaged with the inner surface of the body by means of O-rings located in grooves in the base and head.

**[0009]** The base may include a flange which engages against the adjacent end surface of the body and the head may have a portion extending externally of the body and having a groove for receipt of a circlip to en-

gage the adjacent end surface of the body. This arrangement simplifies assembly

**[0010]** The tubular body may be an extrusion of aluminium or of a plastic material.

**[0011]** The invention also provides a receiver-drier comprising a receiver as defined above, a desiccant element contained within the body, and preferably also a filter positioned within the body between the fluid inlet and the fluid outlet. Because of the construction of the receiver-drier, these elements are readily serviceable.

**[0012]** An embodiment of the invention will now be described, by way of example only, with reference to the drawing, in which Figure 1 is a cross-section of one form of receiver-drier according to the invention.

**[0013]** The receiver-drier comprises a tubular body 1 which may conveniently be an aluminium extrusion of 1.5mm wall thickness, formed with an inlet 5 and outlet 6. A plug 2, which may suitably be of aluminium, passes through the body 1 and comprises a stem 7, a base 8 and a head 9. The base 8 includes a flange 10 which engages against the end of the body 1.

Each of the base 8 and head 9 is formed with circumferential grooves 11 for receiving O-rings (not shown) which seal against the inner surface of the body 1. The head 9 has an additional groove 12 for receiving a circlip (not shown) to hold the assembly together.

**[0014]** A filter 3 is seated around the stem 7 so as to be interposed in fluid flow between the inlet 5 and the outlet 6. A drier in the form of a desiccant pad 4 is located around the other end of the stem 7.

**[0015]** In use, the plug 2 carries the axial tension in the direction Z produced by the fluid pressure within the receiver. This allows the wall thickness of the receiver to be reduced. Assembly is greatly simplified, as is opening and resealing for servicing the filter and drier.

**[0016]** Because of the use of the plug to carry axial loads, it may be practicable to use plastics rather than aluminium for the body, for example a plastic extrusion. This would give additional cost savings.

## Claims

1. A receiver for use in air conditioning systems, comprising a tubular body (1), and a fluid inlet (5) and a fluid outlet (6) communicating with the interior of the tubular body (1); **characterised by** a plug (2) extending from one end of the tubular body (1) to the other end, the plug (2) being sealingly engaged with the inner surface of the tubular body (1) at either end, and the plug (2) being mechanically engaged with the tubular body (1) at either end to carry axial loading produced by fluid pressure within the tubular body (1).
2. A receiver according to claim 1, in which the plug (2) comprises a base (8) and a head (9) each having an outer diameter close to the inner diameter of the

tubular body (1), and a stem (7) of reduced diameter extending between the base (8) and the head (9) .

3. A receiver according to claim 2, in which the base (8) and the head (9) are sealingly engaged with the inner surface of the body (1) by means of O-rings located in grooves in the base (8) and head (9). 5
4. A receiver according to claim 2 or claim 3, in which the base (8) includes a flange (10) which engages against the adjacent end surface of the body (1), and the head (9) has a portion extending externally of the body (1) and having a groove for receipt of a circlip to engage the adjacent end surface of the body (1). 10 15
5. A receiver according to any preceding claim, in which the tubular body (1) is an extrusion of aluminium or of a plastic material. 20
6. A receiver-drier comprising a receiver according to any preceding claim and a desiccant element (4) contained within the body (1).
7. A receiver-drier according to claim 6 including a filter (3) positioned within the body (1) between the fluid inlet (5) and the fluid outlet (6). 25

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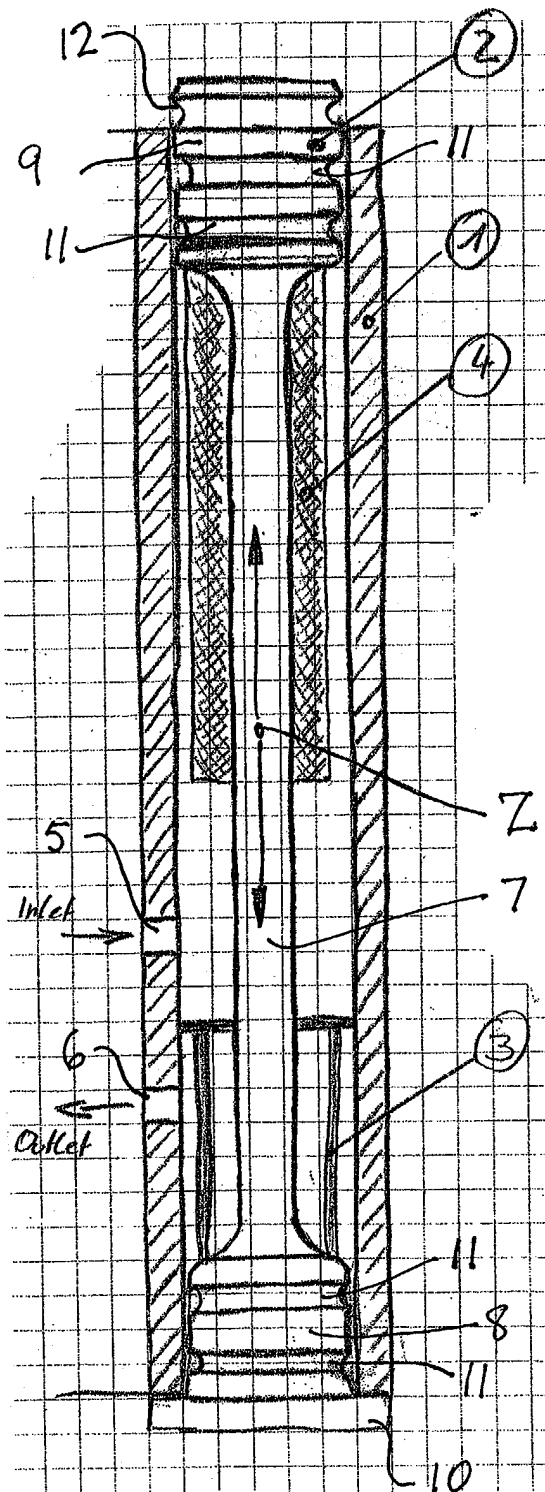
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Application Number  
EP 04 25 1345

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                    |                                                                                                                                                                           |                                                                                                                                                                                                                                                                                       |                                              |
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