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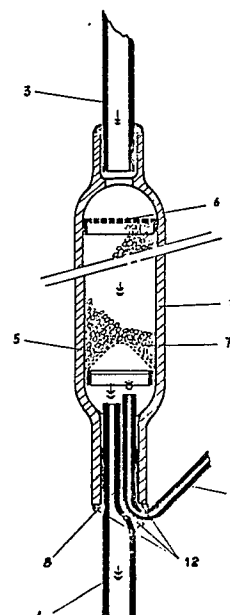
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㉗ **Dehydrating and filtering unit for a refrigerant circuit.**

㉗ A dehydrating and filtering unit for a compression refrigerant circuit, comprising a body (1) having a first end connected to the condenser (3) and a second end connected to the vacuum service conduit (4) and to the capillary (2). The capillary (2) is intimately associated with the body (1) by means of a single solder joint (12). The end portion of the capillary (2) may be located in a seat formed on the service conduit (4). Alternatively, the service conduit (10) is integrally formed with the body (1) and formed with an opening (11) for insertion of the end portion of the capillary (2).

Application particularly in domestic refrigerators.



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25 Dehydrating and Filtering Unit for a Refrigerant Circuit

The present invention relates to a dehydration filter for use in domestic refrigerators employing an evacuation system in the high pressure part.

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More particularly, the invention concerns a dehydration filter to be inserted in the refrigerant circuit between the condenser and the capillary tube of the evaporator and connected to the service conduit employed for creating a vacuum within the refrigerant circuit prior to introducing thereinto the refrigerant fluid.

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1 The dehumidifying filters of the above defined kind and
the associated inlet and/or outlet conduits are usually
made of copper, it being generally known that consider-
able difficulties are encountered in connecting the
5 filter with the respective conduits by brazing. These
brazed or soldered connections are relatively fragile
and expensive due to the employ of noble metal brazing
alloys, and have to be made unter suitable conditions
in order to avoid refrigerant losses due to imperfect,
10 porous and/or irregular seams.

The main object of the present invention is therefore
the provision of a filter which is connected to the
respective refrigerant circuit by a reduced number of
15 soldered connections and presents maximum safety,
structural simplicity, ruggedness and reliable sealing
function.

According to the invention, this object is attained by
20 a filtering and dehydrating unit adapted to be inserted
in a refrigerant circuit between the condenser and the
capillary tube of the evaporator thereof, and connected
to a service vacuum conduit, said filter unit being
characterized by the fact that the capillary is intim-
25 ately associated with the service vacuum conduit, and
that the connection of the capillary and the service
conduit to the body of the filter unit is established
by a single solder joint.

30 In a first embodiment of the invention, the connection
between the end of the capillary tube and the service
conduit is established by partially compressing the
latter to form a seat for the end of the capillary, so
as to facilitate the insertion of the two conduits
35 together into the respective port of the filter unit
and to reduce the section to be filled with the
solder material.

1 In a second embodiment of the invention, the end of the capillary is partially inserted into an opening formed in the service conduit, the latter being formed as an extension of the filter body.

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The characteristics and advantages of the invention will be better understood upon reading of the following description of exemplary and non-limitative embodiments with reference to the accompanying drawings, wherein:

10 fig. 1 shows a diagrammatic longitudinal sectional view of a dehydration filter according to prior art, fig. 2 and 3 show diagrammatic longitudinal sectional views of two embodiments of a filter unit according to the invention.

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As shown in fig. 1, the cylindrical body 1 of a known filter has one of its ends formed with a port for connection to a capillary 2, while its other end portion is laterally compressed to form two tubular ports
20 for receiving therein a condensed conduit 3 and a vacuum service conduit 4, respectively.

25

In this system the gaseous refrigerant, after having been compressed and subsequently cooled in condenser conduit 3, flows through the filter in the liquid state, the main function of said filter being to retain any humidity so as to avoid the formation of ice in capillary 2 with consequent blocking of the flow within the refrigerant circuit.

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In order to meet these requirements, the filter body 1 contains an absorbent material 7 such as silica gel or the like acting as a chemical filter, and mechanical filters 5, 6 disposed adjacent the inlet and the
35 outlet of body 1, respectively, for retaining any solid contaminants and for preventing absorbent material 7

1 from being carried out of filter body 1 by the refrigerant fluid.

After passing through the filter, the refrigerant enters
5 capillary 2 which functions to control the amount of the fluid flowing towards the evaporator, wherein it develops its refrigerating effect due to evaporation and expansion in the gaseous phase.

10 During evacuation of the refrigerant circuit preparatory to introducing the refrigerant thereinto, the air aspirated through service conduit 4 may enter thereinto directly from condenser conduit 3 without passing through filter body 1, thus avoiding any
15 contamination or moistening of absorbent material 7.

Fig. 2 shows a first embodiment of the filter unit according to the invention adapted to achieve the advantages described above.

20

The filter unit shown comprises a tubular body 1 having two outwardly projecting hemispherical end portions for connection to an end portion of a condenser conduit 3 and the end portions of a service
25 conduit 4 and a capillary 2, respectively.

The latter connection is preferably formed by locating the end portion of capillary 2 in a seat 8 formed in vacuum service conduit 4 by partially compressing its
30 end portion. In this manner it is possible to connect both conduits together to the filter body with minimum consumption of solder material by a single solder joint 12, so as to achieve maximum safety and reliability of the connection.

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Diagrammatically shown in fig. 3 is a second embodiment of the invention further simplified with respect to the

1 one shown in fig. 2 and comprising a cylindrical filter
body 1 having two end portions for connection to con-
denser conduit 3 and the combination of service conduit
als capillary, respectively.

5

In this embodiment the service tube 10 is formed as an
integral extension of cylindrical body 1, the end
portion of capillary 2 being inserted in to a port 11
formed in service conduit 10 and affixed thereto by

10 a single solder joint 13.

In both embodiments of the invention, the refrigerant
circuit functions in the well-known classical manner,
i.e. the liquid refrigerant provenient from the con-
15 denser flows through the absorbent material 7 contained
within filter body 1, and enters capillary 2 on its
way towards the evaporator. The above described con-
struction results in a difference, however, with regard
to the flow path of the air aspirated from the circuit
20 during evacuation thereof. In both embodiments of the
invention, the aspirated air passes through the
absorbent filter material, in contrast to what happens
in the case of prior art constructions. This feature
could be disadvantageous, if the air originally con-
25 tained in the circuit contains a certain degree of
humidity sufficient to partially saturate the filter
material.

Extensive and repeated tests have shown, however, that
30 this inconvenient phenomenon occurs very rarely indeed,
and scarcely to such a degree as to impair the effi-
ciency of the filter. Any inconveniency of this kind
are fully compensated by the technical and economical
advantages obtained by having only a single solder
35 connection of reduced dimensions for the outlet con-
duits of the filter, i.e. the capillary and the vacuum
service conduit.

1 The filter unit according to the invention may obviously
be modified in various manners. Thus the diameters and
wall thicknesses of the filter body and the various con-
duits as well as the materials employed may be selected
5 in accordance with the characteristics of the refriger-
ant circuit.

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25 Claims:

1. A filtering and dehydrating unit adapted to be
inserted in the refrigerant circuit of a domestic
refrigerator between the condenser and the capillary
30 of the evaporator thereof, and connected to a service
vacuum conduit, characterized in that said capillary (2)
is intimately associated with the service vacuum con-
duit (4), and in that the connection of the capillary
and the service vacuum conduit to the body (1) of the
35 filter is established by a single solder joint (12, 13).

1 2. A unit according to claim 1, characterized in
that the end portion of said capillary (2) is located
in a seat (8) formed on said service conduit (4) so
as to facilitate the assembly and insertion thereof
5 into a single port of the filter.

3. A unit according to claim 1, characterized in
that said service conduit (10) is integrally formed
with said body (1) as an extension thereof, an end
10 portion of said capillary (2) being inserted into an
opening (11) formed in said extension.

4. A unit for a refrigerant circuit, substantially
as described with reference to the accompanying drawings
15 and for the purpose indicated.

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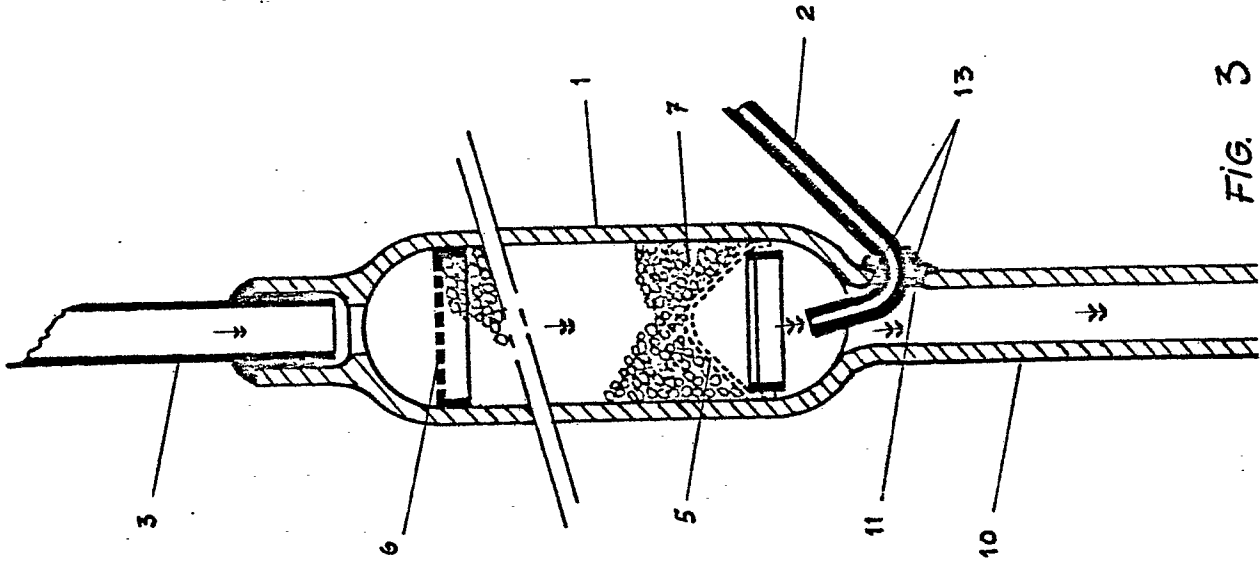


Fig. 3

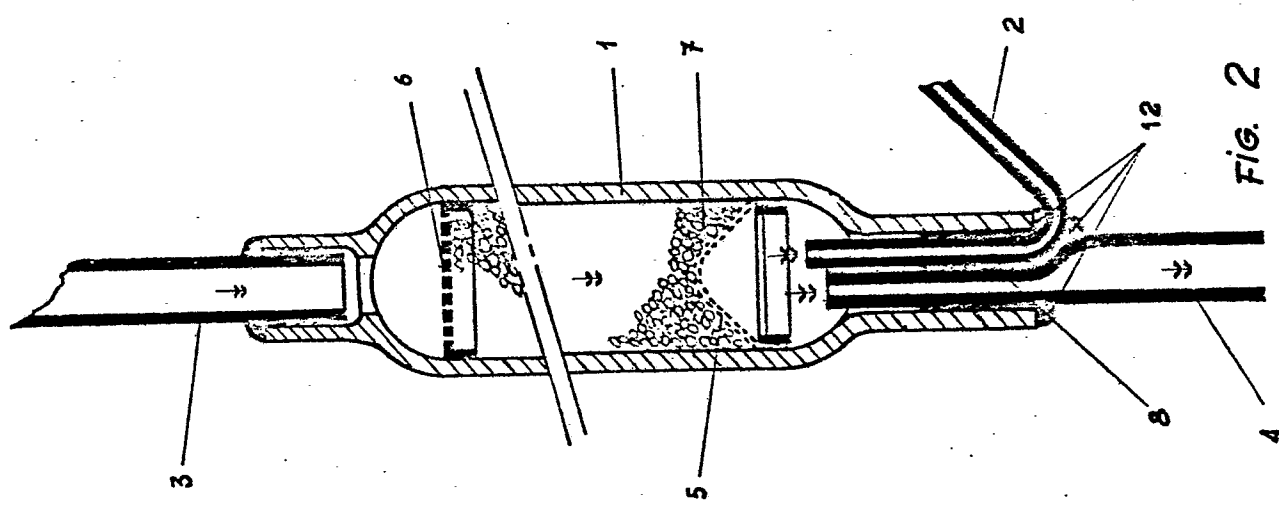


Fig. 2

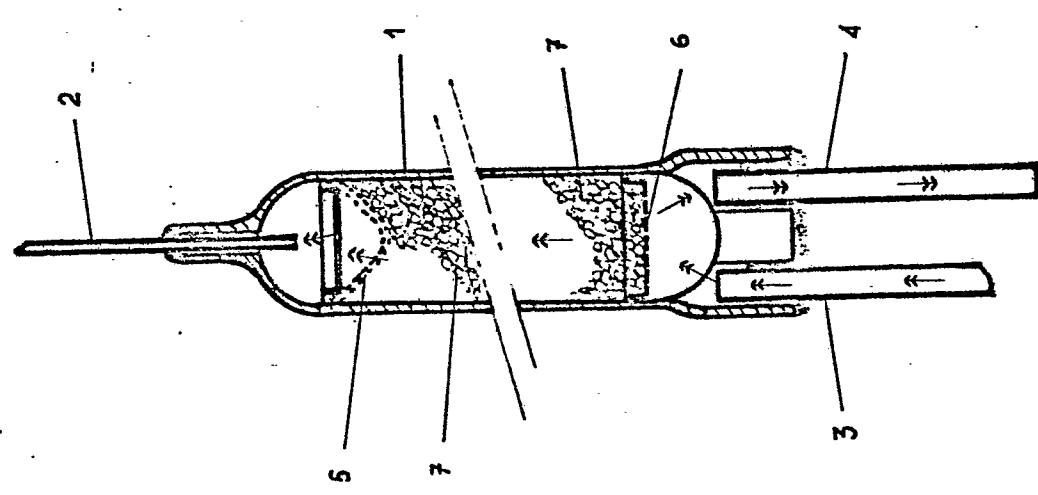


Fig. 1