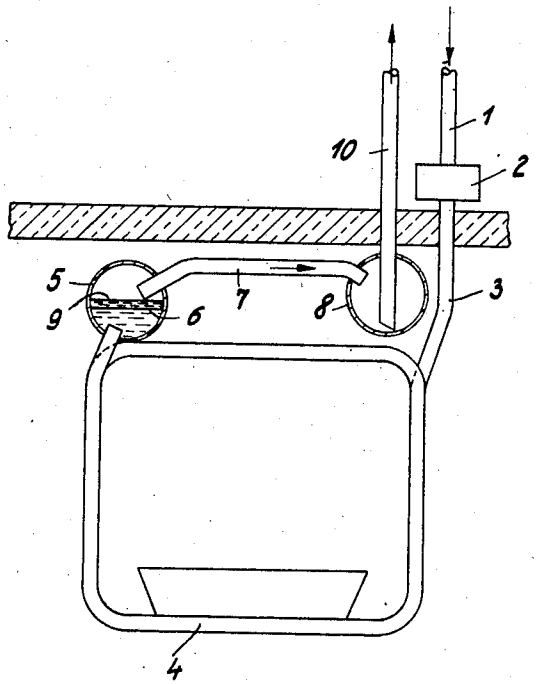
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EVAPORATOR FOR REFRIGERATING APPARATUS OF THE COMPRESSION TYPE

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Inventor
Rudolf Hintze
by Knight Bros
Attorneys

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EVAPORATOR FOR REFRIGERATING APPARATUS OF THE COMPRESSION TYPE

Rudolf Hintze, Berlin-Charlottenburg, Germany, assignor to Patentverwertungs-Gesellschaft mit beschrankter Haftung "Hermes," Berlin, Germany, a corporation of Germany

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3 Claims. (Cl. 62—126)

This invention relates to an evaporator for refrigerating apparatus of the compression type.

The evaporators of refrigerating apparatus of the compression type are frequently so designed that a pipe coil is connected to a header serving as collecting tank for the liquid refrigerant. During the operation, the collecting tank is, for instance, half filled with the liquid refrigerant, and the lubricant entrained into the evaporator from the compressor collects on the surface of the liquid refrigerant. The header or collecting tank of this known type of evaporator is connected with a conduit leading directly to the suction side of the compressor. The compressor withdraws the oil floating on the refrigerant, together with the vaporous refrigerant filling the space in the header above the liquid level. It cannot be avoided in such constructions that a certain percentage of liquid refrigerant intimately mixed with the lubricant is withdrawn through the suction conduit and evaporates between the evaporator system and the compressor. This reduces the efficiency of the refrigerator as the refrigerant withdrawn from the evaporator system in liquid form does not produce useful refrigeration.

The object of the invention is to improve the evaporator of refrigerating apparatus of the compression type and to remove the above-mentioned disadvantages.

According to the invention an evaporator unit for refrigerating apparatus of the compression type is composed of three evaporator sections which are arranged in series connection relative to the flow of fluid refrigerant and which are mounted within the refrigerator chamber so as to be all exposed to the air to be cooled. The first of these sections consists of the evaporator proper, usually a coil or pipe system connected with the condenser of the apparatus. The second section consists of a collecting tank serving as an oil separator, and the third and last evaporator section to which is connected the suction conduit leading to the compressor forms an auxiliary evaporator for evaporating the residual liquid refrigerant.

In an evaporator unit according to the invention the liquid refrigerant withdrawn from the collecting tank, together with the vaporous refrigerant and the lubricant, produces refrigeration in the auxiliary evaporator which is arranged inside the cooling chamber and it need no longer be feared that liquid refrigerant will reach the compressor.

In the accompanying drawing is shown an embodiment of the invention in diagrammatic form. A supply conduit 1 for liquefied refrigerant leads from a condenser not shown to a control member 2, for instance a float-controlled valve, whence the refrigerant passes through a conduit 3 into an evaporator coil 4 having numerous turns of the shape as shown in the drawing. This coil forms the first and main section of the evaporator unit and ends in the lower part of a collecting tank 5 which is filled with liquid refrigerant up to the level 6. The tank forms the second section of the evaporator unit. It has cylindrical shape and a cross section considerably larger than that of coil 4. To the space above the liquid contained in the tank 5 is connected a conduit 7 leading to the upper part of a second tank 8 also of cylindrical shape which forms the third section of the unit. On the surface 6 of the liquid refrigerant in tank 5 collects the oil 9 entrained from the compressor into the evaporator. A suction conduit 10 leading directly to the suction side of the compressor extends to the bottom of the tank 8. The cross section of tank 8 is considerably larger than that of the conduits 7 and 10 opening into this tank.

The evaporator unit operates as follows. The main portion of the liquid refrigerant passing through valve 2 is evaporated in coil 4. The lubricant admixed to the liquid collects on the level 6 of the liquid refrigerant in tank 5 and is supplied through conduit 7 together with the vaporous refrigerant passing from the evaporator 4 to the auxiliary evaporator 8. The amounts of liquid refrigerant which might be withdrawn from tank 5 and which are intimately mixed with the lubricant, evaporate in the tank 8 so that only the lubricant collected at the bottom of tank 8 and the vaporous and, as a rule, superheated refrigerant are withdrawn through the suction conduit 10.

In evaporator units according to the invention the tank 5 is preferably brought into good heat exchange with the evaporator coil 4, whereas it is advisable to arrange the tank 8 in such a manner that there is no direct metallic contact between the walls of this tank and the evaporator coil 4.

What is claimed is:

1. An evaporator unit for refrigerating apparatus of the compression type, comprising three evaporator sections, the first of said sections having inlet means for supplying liquefied refrigerant and any liquid lubricant that might be entrained thereby, the second of said sections consisting of a collecting tank arranged to re-

ceive liquid refrigerant-lubricant mixture passed through said first section, and the third of said sections forming a vessel for evaporating residual liquid refrigerant, in combination with a connecting conduit arranged between said second and said third evaporator sections so as to permit the developing of a free liquid level in said second section in order to separate lubricant and liquid refrigerant in said second section, and a suction conduit connected with said third section and having its opening near the bottom of said third section for withdrawing vaporized refrigerant therefrom, said third section having a cross section considerably greater than that of said suction conduit, whereby liquid lubricant passing from said second section into said third section is caused to collect at the bottom of said third section and to be entrained by the vaporized refrigerant passing from said third section to the compressor of the refrigerating apparatus.

2. An evaporator unit for refrigerating apparatus of the compression type, comprising three evaporator sections, the first of said sections forming the main evaporator portion and consisting of a coil system of relatively small cross section having inlet means for supplying liquefied refrigerant and any liquid lubricant that might be entrained thereby, the second of said sections consisting of a cylindrical container of larger cross section arranged above the main portion of said coil system and forming a collecting tank arranged to receive liquid refrigerant-lubricant mixture passed through said first section, and the third of said sections also consisting of a cylindrical container and forming a vessel for evaporating residual liquid refrigerant, in combination with a connecting conduit arranged between said second and said third evaporator sections, said conduit having a smaller cross section than said second and said third evaporator sections and opening into the upper portions of said second and third evaporator sections so as to permit the developing of a free liquid level in said second section in order to separate lubricant and liquid refrigerant in said second section and collecting of liquid lubricant at the bottom of said third evaporator section, and a suction conduit connected with said third section and having its opening near the bottom of said third section for withdrawing vaporized refrigerant therefrom, said suction conduit having a smaller cross section than said second and said third evaporator sections, whereby liquid lubricant collected at the bottom of said third section is entrained by the vaporized refrigerant passing from said third section to the compressor of the refrigerating apparatus.

3. An evaporator unit for refrigerating apparatus of the compression type, comprising three evaporator sections, the first of said sections consisting of a coil system and having inlet means for supplying liquefied refrigerant and any liquid lubricant that might be entrained thereby, the second of said sections consisting of a collecting tank arranged to receive liquid refrigerant-lubricant mixture passed through said first section, said second section being in good heat-exchanging relation with said coil system, and the third of said sections forming a vessel for evaporating residual liquid refrigerant and being arranged in poor heat-exchanging relation with said coil system, in combination with a connecting conduit arranged between said second and said third evaporator sections so as to permit the developing of a free liquid level in said second section in order to separate lubricant and liquid refrigerant in said second section, and a suction conduit connected with said third section and having its opening near the bottom of said third section for withdrawing vaporized refrigerant therefrom, said third section having a cross section considerably greater than that of said suction conduit, whereby liquid lubricant passing from said second section into said third section is caused to collect at the bottom of said third section and to be entrained by the vaporized refrigerant passing from said third section to the compressor of the refrigerating apparatus.

RUDOLF HINTZE.