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(51) INT CL:

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(56) Documents Cited:

US 6868695 B1 **US 20110226005 A1**
US 20020117293 A1
JP H06241615
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(58) Field of Search:

INT CL **F25B, F28D, F28F**
Other: **eKOMPASS (KIPO internal)**

(54) Title of the Invention: **Refrigerant management in HVAC systems**
Abstract Title: **Refrigerant management in HVAC systems**

(57) Generally, management of refrigerant in an evaporator of an HVAC chiller is described. Methods, systems, and apparatuses to manage refrigerant in an evaporator can include one or combination of the following approaches: (1) by use of a refrigerant displacement array to physically prevent refrigerant from residing where the array is positioned; (2) by control of the interstitial velocity of refrigerant flow within the volume of the shell of an evaporator; (3) by a phase biased distribution of the refrigerant mixture, so that a gaseous portion is uniformly distributed into the evaporator shell, while liquid refrigerant and oil is distributed into the evaporator shell at a designated area; and (4) by preventing or reducing the occurrence of foaming inside the evaporator through anti-foaming surfaces, such as by the use of refrigerant phobic and lubricant phobic material(s). Refrigerant management can in turn improve the thermal performance and overall efficiency of the evaporator.

