

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 742 414 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
20.11.1996 Bulletin 1996/47

(51) Int Cl.⁶: **F25B 45/00, F25B 43/04**

(43) Date of publication A2:
13.11.1996 Bulletin 1996/46

(21) Application number: **96630028.7**

(22) Date of filing: **25.04.1996**

(84) Designated Contracting States:
DE FR IT

(30) Priority: **08.05.1995 US 436731**

(71) Applicant: **EMERSON ELECTRIC CO.**
St. Louis Missouri 63136 (US)

(72) Inventors:

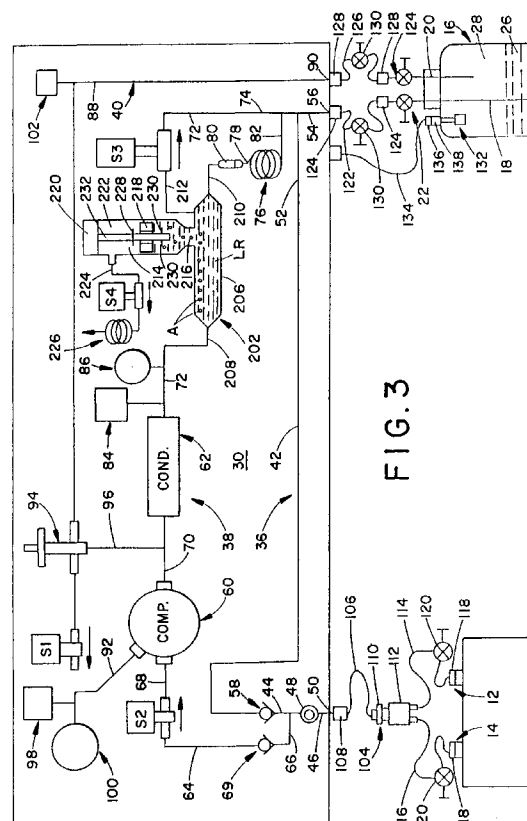
- **Hanna, William T.**
Gahanna, Ohio 43230 (US)

- **Murray, Joseph G.**
Worthington, Ohio 43235 (US)
- **Osborne, Rodney L.**
Hebron, Ohio 43025 (US)
- **Faught, John H.**
Grove City, Ohio 43123 (US)

(74) Representative: **Waxweiler, Jean et al**
Dennemeyer & Associates Sàrl
P.O. Box 1502
1015 Luxembourg (LU)

(54) Method and apparatus for recovering refrigerant

(57) Apparatus for recovering refrigerant from a refrigeration system having a high pressure liquid side and a low pressure vapor side comprises a storage receptacle (16) for receiving recovered refrigerant, a liquid flow circuit (36) for recovering liquid from the high pressure side of the system, a vapor flow circuit (38) for recovering vapor from the low pressure side of the system, and a vapor feedback flow circuit (40) from the receptacle (16) to the inlet side of a vapor reducing section (76) of the vapor flow circuit. The apparatus is operable in a liquid recovery mode and in a vapor recovery mode, and an arrangement (202) for automatically purging non-compressible gases from liquid refrigerant is provided in the vapor flow circuit on the downstream side of the vapor reducing section thereof. During a liquid recovery operation, vapor is fed back from the storage receptacle (16) to the inlet side of the vapor reducing section (76) and non-condensable gas in the liquid refrigerant flowing therefrom is separated from the liquid prior to return of the liquid refrigerant to the storage receptacle (16). During a vapor recovery operation, the apparatus is operable to shift back to the liquid recovery mode in response to a high pressure in the storage receptacle (16), whereby vapor in the receptacle (16) is fed back and reduced to a liquid from which non-condensable gas is removed prior to return of the liquid to the receptacle (16). Gas removed from the liquid refrigerant is accumulated and periodically exhausted to atmosphere.

**FIG. 3****EP 0 742 414 A3**



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 63 0028

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	FR-A-2 645 948 (MATHIEU) * page 4, line 29 - page 8, line 34; figure *	1,20,46, 66	F25B45/00 F25B43/04
A	US-A-4 981 020 (SCUDERI) * column 1, line 60 - column 4, line 54; figure 1 *	1,20,46, 66	
A	US-A-5 269 148 (LUDWIG) * column 2, line 13 - column 5, line 12; figures 1,2 *	1,20,46, 66	
A	US-A-5 078 756 (MAJOR) * column 4, line 39 - column 9, line 10; figures 1-4 *	1,3-6, 12-16, 18, 20-22, 25-27, 30,36, 37,41, 46,48, 49,66, 67,71, 72,75	TECHNICAL FIELDS SEARCHED (Int.Cl.6) F25B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30 September 1996	Examiner Boets, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.92 (P04C01)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 63 0028

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US-A-5 398 518 (VEER) * column 2, line 58 - column 4, line 51; figures 3-5 * ---	1,3, 12-14, 20,22, 30,31, 36,37, 40,41, 46,48, 66,68,78	
A	US-A-5 247 804 (PAIGE) * column 3, line 43 - column 18, line 8; figures 1-5 * ---	1,20,46, 66	
A	US-A-5 327 741 (MASON) ---		
A	US-A-5 337 578 (PTACEK) ---		
A	US-A-4 316 364 (SPAUSCHUS) ---		
A	US-A-5 285 647 (MANZ) -----		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
Place of search THE HAGUE		Date of completion of the search 30 September 1996	Examiner Boets, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)