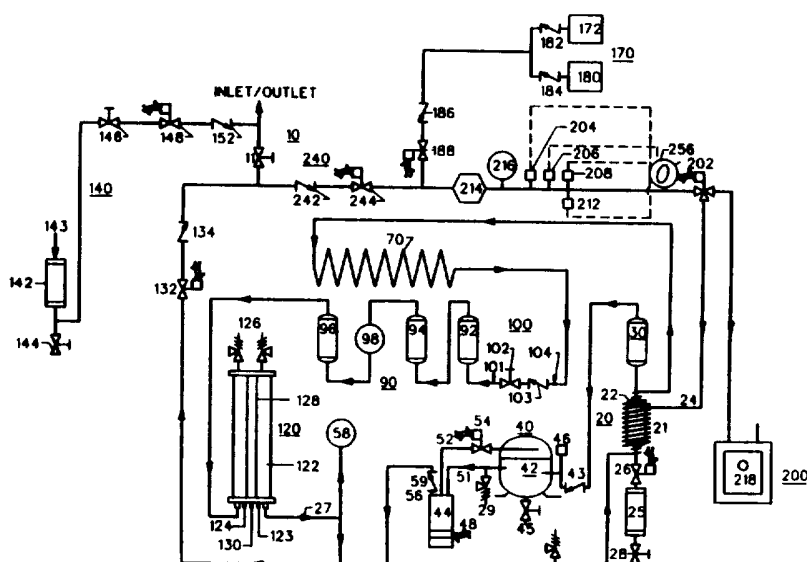




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(54) Title: REFRIGERATION RECOVERY AND PURIFICATION



(57) Abstract

Refrigerant recovery and purification system optionally capable of drawing a nearly full vacuum on the system to be evacuated and having multi-port valve means for setting to different configurations for different refrigerant processing cycles; e.g., evacuation, deep vacuum, recovery, purification cycle, refrigerant charging, and oil charging, etc. Virgin refrigerant can be inputted from commercial cylinders or from refrigerant cans via a can manifold. Major components comprise: inlet/outlet means (10), suction accumulator means (20), low-side purifying means (filter dryer) (30), compressor means (40), secondary coil means (70), purifying means (highside) (90), pump-down manifold means (100), storage means (120), oil injection means (140), virgin refrigerant supply means (170) and (180), vacuum pump means (200), and circulation control means (240).

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AMENDED CLAIMS

[received by the International Bureau on 1 December 1992 (01.12.92);
original claims 3 and 10 deleted; original claim 1 amended;
original claims 2-9 and 11 unchanged but renumbered as claims 2-9 (4 pages)]

1. In an improved apparatus for the recovery, purification and recharging of refrigerant from a refrigeration system, said apparatus comprising:

- (a) a inlet/outlet conduit means adapted for two-way flow to or from connected upstream of;
- (b) a suction accumulation means upstream of;
- (c) a compressor means upstream of;
- (d) an external coil means upstream of;
- (e) a highside-purifying means upstream of;
- (f) a storage means adapted for recharging said system with a measured charge of refrigerant;
- (g) a vacuum pump means having 3-way solenoid valve alternately connecting said inlet/outlet means to said vacuum pump means to communicate with said refrigerant system or to said suction accumulator means;
- (h) first sensing means to start said vacuum pump means in response to a first internal pressure within said inlet/outlet means substantially equal to atmospheric pressure; and
- (j) a second pressure sensing means to stop said vacuum pump means at a substantially lower pressure in said inlet/outlet means.

2. An apparatus according to Claim 7 additionally comprising:

a secondary coil means connected to receive and

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condense at least a portion of refrigerant from said external coil means.

3. An apparatus according to Claim 7 additionally comprising:

a circulation control for causing refrigerant to circulate from said storage means back through said suction accumulator and said secondary coil and said purifying (highside) to return to said storage.

4. An apparatus according to Claim 7 wherein the suction accumulation means comprises a canister in heat exchange relationship to the external coil, the external coil being connected in fluid communication to a secondary coil on its outlet and to the compressor on its inlet.

5. An apparatus according to Claim 7 additionally comprising all drain means for draining oil from a point near the bottom of said suction accumulator means.

6. An apparatus according to Claim 7 additionally comprising oil charging means for measuring a quantity of oil out through said inlet/outlet means to recharge said refrigeration system with a measured charge of oil.

7. In an improved apparatus for the recovery, purification and recharging of refrigerant from a refrigeration system, said apparatus comprising:

- (a) a inlet/outlet conduit means adapted for two-way flow to or from connected upstream of;
- (b) a suction accumulation means upstream of;
- (c) a compressor means upstream of;
- (d) an external coil means upstream of;

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2 (e) a highside-purifying means upstream of;
3 (f) a storage means adapted for recharging said system
4 with a measured charge of refrigerant;
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7 (g) vacuum pump means having 3-way solenoid valve
8 alternately connecting said inlet/outlet means to said
9 vacuum pump means to communicate with said
10 refrigerant system or to said suction accumulator
11 means;
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14 (h) first sensing means to start said vacuum pump means
15 in response to a first internal pressure within said
16 inlet/outlet means substantially equal to atmospheric
17 pressure;
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20 (i) a second pressure sensing means to stop said
21 vacuum pump means at a substantially lower pressure
22 in said inlet/outlet means; and
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24 (j) a multi-position switch controlling a plurality of
25 solenoid valves adapted to configure the apparatus to
26 various cycles comprising refrigerant recovery,
27 refrigeration system, refrigerant circulating through the
28 high-side purifying means, evacuation by said vacuum
29 pump and recharging of said refrigeration system.
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34 8. An apparatus according to Claim 7 wherein at least one of
35 said solenoid valves is a 3-way valve directing flow from said inlet/outlet
36 means to said suction accumulator (storage) means or alternatively to a
37 vacuum pump means for evacuating said refrigeration system.
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39 9. An apparatus according to Claim 7 additionally comprising a
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2 manifold for discharging the contents of two or more hermetically sealed
3 cans of refrigerant into said storage means.

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