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Datasheet for the decision of 21 September 2022

Case Number: T 0427/21 - 3.2.03

Application Number: 15814910.4

Publication Number: 3164651

IPC: F25D11/00, F25B31/00, F25B39/00, F25B43/00

Language of the proceedings: EN

Title of invention:
LOW CHARGE PACKAGED REFRIGERATION SYSTEM

Applicant:
Evapco, Inc.

Headword:

Relevant legal provisions:
EPC Art. 84, 123(2)

Keyword:
Claims - essential features - clarity - main request (no)
Amendments - allowable (no) - added subject-matter (yes) - deletion of features

Decisions cited:

Catchword:

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Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 0427/21 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 21 September 2022

Appellant: (Applicant)	Evapco, Inc. 5151 Allendale Lane Taneytown, MD 21787 (US)
Representative:	Barker Brettell LLP 100 Hagley Road Edgbaston Birmingham, West Midlands B16 8QQ (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 27 October 2020 refusing European patent application No. 15814910.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	B. Miller
Members:	R. Baltanás y Jorge
	D. Prietzel-Funk

Summary of Facts and Submissions

I. European patent application No. 15 814 910.4 relates to a low charge packaged refrigeration system.

II. The appeal lies from the decision of the examining division to refuse the above-mentioned European patent application.

The examining division held that claim 1 according to the main request did not comply with the requirements of Article 84 EPC, that the same objection applied to claim 1 of each of auxiliary requests 1 to 4 and that claim 1 of auxiliary request 5 did not comply with Article 123(2) EPC.

III. The applicant (the "appellant") filed an appeal against the above-mentioned decision of the examining division.

In a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA 2020), the Board indicated its preliminary opinion of the case.

Oral proceedings were held on 21 September 2022.

IV. Final requests

The appellant requested that the decision under appeal be set aside and that a patent be granted based on the main request or auxiliary request 5, both underlying the impugned decision.

Previously filed auxiliary requests 1 to 4 were withdrawn during the oral proceedings before the Board.

V. Claim 1 according to the main request reads (numbering added by the Board):

M1 *A refrigeration system comprising:*

M2 *an evaporator (2a,2b) comprising a refrigerant evaporator coil (4a, 4b),*

M3 *liquid-vapor separation structure (12) connected to an outlet of said evaporator coil via refrigerant line configured to separate low pressure refrigerant vapor from low pressure refrigerant liquid;*

M4 *a refrigerant compressor (10) connected to an outlet of said liquid-vapor separation structure via refrigerant line and configured to compress refrigerant vapor from said liquid-vapor separation structure;*

M5 *a refrigerant condenser (8) connected to an outlet of said refrigerant compressor via refrigerant line and configured to condense refrigerant vapor produced in said compressor to refrigerant liquid,*

M6 *a high pressure-side expansion device connected to an outlet of said refrigerant condenser via refrigerant line and configured to reduce pressure of refrigerant liquid received from said refrigerant condenser;*

M7 *a collection vessel connected to an outlet of said high pressure-side expansion device via refrigerant line for receiving refrigerant liquid from said high pressure-side expansion device;*

M8 *a low pressure-side expansion device connected to an outlet of said collection vessel via refrigerant line and configured to reduce*

pressure of refrigerant liquid received from said collection vessel;

M9 *refrigerant line connecting an outlet of said low pressure-side expansion device to an inlet of said liquid-vapor separation structure and configured to deliver refrigerant liquid to said separation structure;*

M10 *said liquid-vapor separation structure having a liquid outlet that is connected via refrigerant line to an inlet of said evaporator;*

M11 *said refrigeration system further comprising a pre-packaged modular machine room in which is situated said liquid-vapor separation structure, said compressor, said high pressure side expansion device, said collection vessel, and said low pressure side expansion device;*

M12 *wherein said refrigeration system comprises less than 2.72Kg (six pounds) of refrigerant per 3.52 kW of refrigeration capacity (per ton of refrigeration capacity).*

Dependent claims 2 to 9 concern preferred embodiments of the refrigeration system of claim 1.

VI. Originally filed claim 27 reads as follows (numbering added by the Board):

M27a *A method for reducing the amount of refrigerant per ton of refrigeration capacity in a refrigeration system having*

M27b *an evaporator,*

M27c *liquid/vapor separator,*

M27d *a compressor,*

M27e *a condenser,*

M27f *and a collection vessel,*

M27g *said method comprising installing a pre-fabricated modular machine room including said compressor, said liquid vapor separator and said collection vessel,*

M27h *and connecting said evaporator to said pre-fabricated modular machine room using refrigerant line.*

VII. Claim 1 according to auxiliary request 5 comprises all features of claim 1 of the main request, except feature M1.12, which has been deleted.

VIII. The appellant's arguments can be summarised as follows.

(a) Main request - Clarity, Article 84 EPC

Feature M12 (less than 2.72 kg of refrigerant per 3.52 kW of refrigeration capacity) is not a mere result to be achieved since it is a physical characteristic of a system defined by all the features of claim 1. The ensemble of the features of the claim have to be considered, and M12 is just one more restriction - which can be directly verified by tests in a clear and reliable manner - among these features. Feature M12 is enabled by means of all the other features of claim 1, and particularly by means of feature M11 (pre-packaged modular machine room). The pre-packaged arrangement of feature M11 avoids the assembling of the claimed elements in-situ at the location where the refrigeration system is to be used. The elements of the pre-packaged modular machine room can be arranged beforehand under controlled conditions such that the machine room can be installed as a unit on arrival at the installation location. The pre-packaging enables the skilled person to achieve a more efficient refrigeration system.

(b) Auxiliary request 5 - Extension of subject-matter, Article 123(2) EPC

Originally filed claims 1 and 27 both define the refrigeration system to comprise a "pre-packaged modular machine room" (M11, M27g), although a slightly different wording has been used. Therefore, the skilled person understands that this feature is key for solving the underlying technical problem, as confirmed by paragraph [0027] of the description.

Consequently, the omission of feature M12 from claim 1 of auxiliary request 5 is within the limits of what a skilled person would derive directly and unambiguously, using their common general knowledge, from the whole of the application documents. The skilled person would realise that the invention is defined in claim 27 in broader terms than in claim 1. The skilled person would therefore conclude that the invention can be considered without features which are in claim 1 but not in claim 27 since this invention would still solve the objective problem. Thus, a refrigeration system without feature M12 does not extend beyond the teaching of the application as filed.

Reasons for the Decision

1. Main request - Clarity, Article 84 EPC

The Board agrees with the appellant that feature M12 (less than 2.72 kg of refrigerant per 3.52 kW of refrigeration capacity) is a parameter which can be verified by the skilled person since both the amount of refrigerant and the refrigeration capacity of a

particular refrigeration system can be determined without any technical difficulty.

However, the parametric definition of feature M12 actually defines the efficiency of the refrigeration system since it associates a given mass of refrigerant (<2.72 kg) to a particular amount of power of refrigeration capacity (3.52 kW). This definition corresponds to the underlying problem of the application, which is how to reduce the amount of refrigerants such as ammonia while maintaining the refrigeration capacity (see paragraphs [0002], [0016] and [0019] of the application).

Under these circumstances, the Board concludes that feature M12 is a result to be achieved.

The degree of efficiency defined by limiting the amount of refrigerant according to feature M12 cannot be explained by the remaining features of claim 1.

Most of the remaining features of claim 1 (M1 to M10) simply define usual elements of a refrigeration system which do not explain by themselves alone the defined efficiency.

Feature M11 defines a pre-packaged modular machine room in which the liquid-vapor separation structure, the compressor, the high pressure side expansion device, the collection vessel and the low pressure side expansion device are situated. This could at most imply a closer arrangement of these elements of the refrigeration system, but cannot explain by itself how to achieve the efficiency defined in M12 since other parameters which directly affect this efficiency - such as the dimensions of the system, including distances

between the rest of the claimed elements and the machine room - are not defined in the claim. The use of a pre-packaged modular machine room may have a lot of advantages as set out by the appellant. However, it has not been rendered credible that the mere pre-packaging itself leads to a highly efficient system which allows using a low amount of refrigerant as defined in claim 1.

It follows that the efficiency defined in feature M12 can only be expected to be obtainable by means of further essential features which are, however, missing from claim 1.

In view of the above, the Board agrees with the contested decision and does not consider the main request allowable on the grounds of lack of clarity (Article 84 EPC).

2. Auxiliary request 5 - Extension of subject-matter, Article 123(2) EPC

Originally filed claim 27 relates to a "A method for reducing the amount of refrigerant per ton of refrigeration capacity in a refrigeration system". Claim 27 thus aims at increasing efficiency expressed as a reduction of the mass of refrigerant, analogously to feature M12 (see point 1 above). The reader of the originally filed application therefore does not infer from claim 27 that feature M12 can be omitted from claim 1. On the contrary, the general aim of claim 27 confirms that feature M12 is necessary for the definition of the invention of claim 1 since it focuses on the same issue.

Furthermore, feature M27g ("pre-fabricated modular machine room including said compressor, said liquid vapor separator and said collection vessel") does not correspond to feature M11 ("pre-packaged modular machine room in which is situated said liquid-vapor separation structure, said compressor, said high pressure side expansion device, said collection vessel and said low pressure side expansion device"), the latter including high and low pressure side expansion devices in the modular machine room.

Moreover, originally filed claim 1 comprises several other supplementary features compared to claim 27: a refrigerant evaporator coil (feature M1.2), a high pressure side expansion device (feature M1.6), a low pressure side expansion device (feature M1.8), and also the connections and functions of the different components of the system (features M1.3 to M1.10). All these supplementary features of originally filed claim 1 (together with the efficiency defined in M12) teach the reader that the invention of claim 1 concerns a particular **device** defined by the ensemble of its features which is independent from the much simpler invention defined in **method** claim 27. Neither claim 27 nor the remaining application provides any teaching that any of the features of originally filed claim 1 can be omitted. This is particularly so in the case of feature M12 since this feature directly concerns the problem that the patent application tries to solve.

Paragraph [0027] of the originally filed description does not provide such a teaching either. Firstly, the "concept" of a refrigeration system where some "packaging" is carried out is presented without specifying which elements of the refrigeration system would be subject to the "packaging". This means that

paragraph [0027] does not disclose feature M11 and therefore does not provide a teaching that feature M11 makes feature M12 redundant. Secondly, the "packaged" refrigeration system mentioned in paragraph [0027] is also disclosed as being linked to a particular efficiency ("*less than 10lbs of refrigerant per ton of refrigeration capacity*"). The disclosure of paragraph [0027] therefore does not support the argument that the efficiency defined in originally filed claim 1 can be omitted since the feature "packaged" was equally disclosed as being linked to the same kind of efficiency in the concerned paragraph.

In view of the above, the Board agrees with the examining division that the amendment in claim 1 extends beyond the teaching of the application as originally filed and thus contravenes Article 123(2) EPC.

3. Since none the claim requests is allowable, the appeal is not successful.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

C. Spira B. Miller

Decision electronically authenticated