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Datasheet for the decision of 23 October 2020

Case Number: T 0538/18 - 3.2.01

Application Number: 11718969.6

Publication Number: 2569177

IPC: B60H1/32, F17C7/04

Language of the proceedings: EN

Title of invention:
REFRIGERATION VEHICLE AND METHOD FOR COOLING ITS REFRIGERATION SPACE USING A LOW-TEMPERATURE-LIQUEFIED COMBUSTIBLE GAS

Applicant:
L'Air Liquide Société Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude
Air Liquide Deutschland GmbH

Headword:

Relevant legal provisions:
EPC Art. 123(2), 56

Keyword:
Amendments - allowable (yes)
Inventive step - (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 0538/18 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 23 October 2020

Appellant: (Applicant 1)	L'Air Liquide Société Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude 75, Quai d'Orsay 75007 Paris (FR)
Appellant: (Applicant 2)	Air Liquide Deutschland GmbH Hans-Günther-Sohl-Strasse 5 40235 Düsseldorf (DE)
Representative:	Mellul-Bendelac, Sylvie Lisette L'Air Liquide Direction des Services De la Propriété Intellectuelle 75, Quai d'Orsay 75321 Paris Cedex 07 (FR)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 21 September 2017 refusing European patent application No. 11718969.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Pricolo
Members:	S. Mangin
	O. Loizou

Summary of Facts and Submissions

I. The appeal was filed by the appellant (applicant) against the decision of the examining division to refuse the patent application in suit (hereinafter "the application").

II. The examining division decided that the subject-matter of the independent claims 1 and 12 according to the applicant's sole request did not involve an inventive step in view of D1 in combination with D3 (Articles 52(1) and 56 EPC).

III. With the statement of grounds of appeal, the appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request underlying the decision under appeal or, in the alternative, on the basis of the auxiliary request filed therewith.

IV. Following a first telephone call with the rapporteur, raising issues related to Article 123(2) EPC, the appellant submitted a new main request on 4 August 2020, whereby new claim 1 was a combination of original claims 1, 5 and 9 and the method claims were deleted and whereby pages 1 and 2 of the description were adapted to the new claims.

V. Following a second telephone call with the rapporteur, raising further issues related to the optional arrangement of the nitrogen heat exchanger in a refrigerant unit together with the supplemental heat exchanger and the adaptation of the description, the appellant submitted a new main request on 8 October 2020 whereby the term "preferably" in claim 1

was deleted, resulting in the arrangement of the nitrogen heat exchanger in a refrigeration unit together with the supplemental heat exchanger being mandatory and whereby pages 1, 2 and 6 of the description were further adapted to the new set of claims.

VI. Claim 1 of the main request reads as follows:

Refrigeration vehicle (1) comprising at least one refrigeration space (5), which can be cooled via at least one supplemental heat exchanger (22), the supplemental heat exchanger (22) being located in the refrigeration space (5) and being connected to other components establishing a heat exchange loop (20) and being able to exchange heat with an evaporator (10) for low-temperature liquefied combustible gas (LNG), wherein
- the heat exchange loop (20) comprises a first heat exchanger (21), which is arranged in the refrigeration vehicle (1) in such a way, that the first heat exchanger (21) is able to exchange heat with the evaporator (10) and that the first heat exchanger (21) is connected to the supplemental heat exchanger (22) in the refrigeration space (5); and
- the refrigeration vehicle (1) comprises a first nitrogen tank (40) for liquid nitrogen (LIN), nitrogen lines (42), a nitrogen pump (43), a nitrogen outlet (45) and a nitrogen heat exchanger (44), arranged in a refrigeration unit (6) together with the supplemental heat exchanger (22).

VII. In the present decision, reference is made to the following documents:

D1: US 3 640 337 A (MCJONES ROBERT W) (1972-02-08)

D3: GB 2 275 098 A (AIR PROD & CHEM) (1994-08-17)

Reasons for the Decision

1. Main request - added subject-matter - Article 123(2) EPC

Claim 1 of the main request is a combination of original independent claim 1 with dependent claims 5 and 9. Therefore its subject-matter does not extend beyond the content of the application as originally filed.

2. Main request - Inventive step - Articles 52(1) and 56 EPC

The subject-matter of claim 1 involves an inventive step.

2.1 D3 is considered to be the closest prior art as it is directed to a refrigeration system comprising a refrigeration space which is adapted to be connected to a tractor unit (D3, figure 2, p.4, l.10-14).

D3 discloses:
a refrigeration vehicle comprising at least one refrigeration space, (figure 2, container 102)
- wherein the refrigeration vehicle comprises a first nitrogen tank (D3, figure 2, vessel 103) for liquid nitrogen (LIN), nitrogen lines (figure 2, pipe 104), a nitrogen pump, a nitrogen outlet (figure 2, vent 115) and a nitrogen heat exchanger (figure 2, heat exchanger 111).

The subject-matter of claim 1 differs from D3 in that:

- a first heat exchanger is arranged in the refrigeration vehicle in such a way
-that the first heat exchanger is able to exchange heat with the evaporator for low-temperature liquefied combustible (LNG) and
-that the first heat exchanger is connected to the supplemental heat exchanger in the refrigeration space (5) and other components establishing a heat exchange loop (20).

The objective technical problem to be solved is regarded as to improve the cooling of the refrigeration space.

Starting from D3, the skilled person would not take D1 into consideration, as D1 deals with air conditioning and heating in a passenger vehicle. Indeed, the requirements in terms of temperatures for refrigeration vehicles are very different from those for passenger vehicles. While typically refrigeration vehicles require a refrigeration system capable of obtaining temperatures around or below zero degrees Celsius, passenger vehicles require maintaining a comfortable temperature for the passenger typically between 15 and 30 degrees Celsius by either heating or cooling the air in the passenger's compartment.

But even if the skilled person were to consider D1, extensive modifications would need to be made to the air conditioning system of D1 in order to implement the teaching thereof in the refrigeration vehicle according to D3 to arrive at the subject-matter of claim 1 because the vehicle of D3 consists of two parts, the container and the tractor unit.

D3 discloses a refrigeration system in a container adapted to be connected to a tractor unit. Combining the teaching of D3 with D1 results in a tractor unit comprising the air conditioning and heating system of D1 for the cabin of the driver and a container comprising the refrigeration system of D3.

D3 discloses a refrigeration system for a container independent of the tractor unit and does not suggest using an additional heat exchanger in the container and D1 does not suggest placing the heat exchanger 12 remotely for cooling the container of a trailer. Therefore, the skilled person would not place the heat exchanger 12 of D1 in the container of D3 without hindsight.

Furthermore, placing the heat exchanger 12 of D1 in the container 102 of D3 in a unit together with the nitrogen heat exchanger 111, remote from the rest of the components of the heat exchanger loop, in particular the evaporator and remote from the vehicle engine, which are placed in the tractor unit requires adapting the coupling of the heat exchanger 12 to the heat exchange loop. In particular, it will be necessary to use flexible lines for enabling the coolant to circulate to the heat exchanger 12 in the trailer and detachable couplings for enabling the disconnection of the heat exchange loop in two parts when the container is separated from the tractor unit (see page 9, lines 3-13 of the patent). Neither D1 nor D3 suggest such a coupling, which is not obvious especially in view of the possible losses of coolant that may occur.

Finally the dimensioning of the components of the heat exchange loop of D1 in particular the heat exchanger 12 will have to be adjusted in view of the amount of

cooling required in the refrigeration vehicle compared to a passenger vehicle.

3. The examining division considered that in D1 the vehicle comprising a passenger compartment could be considered as a refrigeration vehicle.

3.1 The Board is of the opinion that D1 cannot be considered as a refrigeration vehicle and cannot be considered to be the closest prior art since it relates to a passenger vehicle. As mentioned above the requirements for passenger vehicle are very different from those for refrigeration vehicles. Although in the passenger compartment of the passenger vehicle "refrigeration" takes place when the vehicle is cooled (see D1, col. 1, lines 62-72), still the passenger vehicle cannot be regarded as a refrigeration vehicle, which is understood by a skilled person as a vehicle in which objects can be maintained at low temperatures (e.g. for holding perishable foodstuffs as in D3, see page 1, lines 3,4) and which is not intended for "refrigerating" passengers (in the sense of maintaining passengers at low temperatures).

3.2 Furthermore, even if the skilled person would start from D1, combining D1 and D3 would require extensive and non-obvious modifications in order to adapt the refrigerant loop of one vehicle to that of the other, as explained above.

4. The examining division, in the contested decision, did not refer to the other prior art documents cited in the search report and the Board does not see why they would be relevant to the claimed subject-matter. Accordingly, claim 1 of the main request together with dependent

claims 2 to 8 and the adapted description form a suitable basis for the grant of a patent.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division with the order to grant a patent with the following claims and description pages.

Claims:
1-8 filed with letter of 8 October 2020

Description pages
1-2 and 6 filed with letter of 8 October 2020
3-5 and 7-12 as originally filed

Figure 1/1 as originally filed

The Registrar: The Chairman:

D. Magliano G. Pricolo

Decision electronically authenticated