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**Datasheet for the decision
of 17 July 2020**

Case Number: T 2461/16 - 3.2.03

Application Number: 09785156.2

Publication Number: 2342509

IPC: F25B15/10, F25B27/00

Language of the proceedings: EN

Title of invention:
MODULAR COOLING APPARATUS

Applicant:
Solar Polar Limited

Headword:

Relevant legal provisions:

EPC Art. 56, 84, 123(2)
RPBA 2020 Art. 13(2)

Keyword:

Inventive step - (yes)
Claims - clarity - main request (yes)
Amendments - added subject-matter (no)

Decisions cited:

Catchword:



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Case Number: T 2461/16 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 17 July 2020

Appellant: Solar Polar Limited
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 14 June 2016
refusing European patent application No.
09785156.2 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman G. Ashley
Members: C. Donnelly
N. Obrovski

Summary of Facts and Submissions

- I. The appeal lies from the decision of the examining division refusing European application no. 09785156.2.

In its decision the examining division held that claim 1 of the then main request of 11 September 2013 comprised added subject-matter (Art. 123(2) EPC). It also decided that the subject-matter of claim 1 according to auxiliary requests 1, 2 and 3 of 23 March 2016 did not involve an inventive step (Art. 56 EPC) in view of DE 100 28 543 (D1).

- II. The applicant (hereinafter: the "appellant") lodged an appeal against this decision in due form and time. In the statement of the grounds of appeal filed on 13 October 2016, the appellant initially requested that a patent be granted on the basis of the main request, alternatively on the basis of the first or second auxiliary requests all filed with the grounds of appeal.

- III. With the summons to oral proceedings, the Board sent a communication pursuant to Articles 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA 2020) informing the appellant of its preliminary, non-binding opinion of the case. In particular, the Board indicated that the subject-matter of claim 1 according to the main and first auxiliary requests lacked an inventive step (Article 56 EPC) in view of D1 and of the second auxiliary request lacked clarity (Article 84 EPC).

A telephone consultation between the rapporteur and the appellant was held on 6 July 2020.

By letter of 9 July 2020 the appellant filed a new main request and new first and second auxiliary requests. It also maintained the previous main and auxiliary requests 1 to 3 renumbered as auxiliary requests 3 to 6.

- IV. As requested by the appellant, remote oral proceedings were held via by video-conference on 17 July 2020.

At the conclusion of the debate, the appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request filed with the letter of 9 July 2020, alternatively on the basis of one of the sets of claims filed as auxiliary requests 1 and 2 with the letter of 9 July 2020, or on the basis of one of the sets of claims filed as auxiliary requests 3 to 6 (renumbered) with the grounds of appeal.

- V. The following documents were cited during the examination proceedings:

D1: DE 100 28 543 A1;

D2: GB 2 083 901 A;

D3: DE 103 25 933 A1;

D4: DE 102 48 557 A1.

- VI. *Claim 1 according to the main request reads:*

"Cooling apparatus comprising, a solar heat collection means (2); two or more absorption refrigeration modules (1), each module being arranged to receive heat from the heat collection means and to re-circulate refrigerant through an evaporator (16); and means for putting air to be cooled into thermal contact with each of the evaporators, wherein each module has:

- a. a generator (11) containing a solution of refrigerant in a liquid, the generator being arranged to receive heat from the heat collector and to cause evaporation of the refrigerant
- b. a bubble pump (12) for pumping the liquid from the generator to an absorber (17),
- c. a condenser (14) arranged to receive gaseous refrigerant from the generator and to condense the same,
- d. an evaporator (16),
- e. means for passing liquid refrigerant from the condenser to the evaporator,
- f. absorbing means (17) for receiving gaseous refrigerant from the evaporator, absorbing it into the liquid from the bubble pump and returning the liquid to the generator, and
- g. a casing (4) enclosing components (a) to (f) and including means for attaching the modules rigidly together,

in which the casing of each module, together with partition walls within the casing, provides an evaporator housing (24) defining a path for the air to be cooled, and includes ports (21) by which the evaporator housings (24) within the casings of adjoining modules (1) are connected together."

Reasons for the Decision

1. *Admissibility of the main request and auxiliary requests 1 and 2 filed with letter of 9 July 2020*
 - 1.1 In its communication pursuant to Article 15(1) RPBA 2020 (see in particular section 5), the Board raised a clarity objection in connection with the expression "cooling air" used in the second auxiliary request filed with the grounds of appeal. In order to overcome this objection, the appellant filed a new main request and two auxiliary requests.
 - 1.2 The raising of the clarity objection by the Board for the first time in its provisional opinion is considered to be an exceptional circumstance under Article 13 (2) RPBA 2020 which justifies the late filing of the new requests intended to overcome this objection. Therefore, the new requests are taken into consideration.
2. *Clarity, Article 84 EPC*
 - 2.1 In its decision the examining division had understood "cooling air" to be that exiting through port 23 after cooling the condenser 14 (as disclosed at page 7, line 34 of the application as filed), whereas the appellant saw the "cooling air" as that to be cooled by the evaporator 16 as disclosed for example at page 1, line 33. In its provisional opinion, the Board's considered that both interpretations were possible and that the claim therefore lacked clarity within the meaning of Article 84 EPC.

2.2 The Board agrees with the appellant that the term "air to be cooled", now used in claim 1 of the main request, makes it clear that the air under consideration is that to be cooled by the evaporator before entering the space to be cooled.

3. *Added subject-matter, Article 123(2) EPC*

3.1 The examining division decided that there was no basis in the application as originally filed for amending the feature "a bubble pump" to "a single bubble pump" since it was of the view that the passage at page 2, lines 9 to 27 of the description could also be seen to suggest the use of multiple bubble pumps. Since the present main request now specifies "a bubble pump" as originally used, this objection no longer applies.

3.2 Claim 1 of the main request is essentially based on claims 1 to 3 and 8 as originally filed. The Board accepts the appellant's submission that a basis for the replacement of the term "fluid to be cooled" by "air to be cooled" can be found at page 4, lines 1 to 3.

3.3 The Board also agrees with the appellant that a basis for the feature:

"in which the casing of each module, together with partition walls within the casing, provides an evaporator housing (24) defining a path for the air to be cooled".

can be found in figure 1 and the passage at page 1, lines 32 to 34 of the application as filed which reads:

"Each module preferably incorporates its own individual evaporator. A housing for this, defining a path for air

to be cooled, can conveniently be formed by partition walls within a main outer casing of the module."

3.4 The Board further agrees with the appellant's submission that the feature:

"and includes ports (21) by which the evaporator housings (24) within the casings of adjoining modules (1) are connected together."

is based on dependent claims 10 and 11 as filed, the figures and the passage from page 1, line 35 to page 2, line 2 states:

"In one particularly effective design, the outer casing of each module is formed with lines of weakness defining knock-out areas allowing interconnection between evaporator housings of adjoining modules."

It is evident to the skilled person that the evaporator housings form an interior space within the casing since this is where they are formed. Since claim 10 as filed specifies "ports by which interior spaces within the casings are connected together" it follows that the evaporator housings can also be interconnected by ports. It is not considered necessary to define that the ports are formed by pressing out areas delimited by lines of weakness in the casing since this is a preferred embodiment, as indicated by the reference to "one particularly effective design" in the above cited passage and the definition in claim 11 as filed which refers back to claim 10.

3.5 Therefore, the subject-matter of claim 1 according to the main request meets the requirements of Article 123(2) EPC.

4. *Inventive step, Article 56 EPC*

4.1 D2 discloses a solar powered refrigeration apparatus in which an absorption refrigeration system is operated directly by solar energy. However, there is no hint at modularisation or any suitability for connecting such apparatus in parallel. The disclosure is principally directed at a standard fridge arrangement in which a cold box is to be maintained at a low temperature. D3 relates to an absorption system comprising several modules. However, the system is not solar powered and the passage of the fluid to be cooled is not explicitly disclosed. D4 concerns a solar powered absorption apparatus which can be connected to a consumer's heating or cooling system. However, there is no suggestion of modularisation or any detailed disclosure of how the cooling circuit works.

4.2 In view of this, the Board agrees with the examining division that D1 is the most relevant state of the art, since it discloses a cooling apparatus comprising a solar heat collection means and absorption refrigeration modules of the type specified in claim 1.

4.3 D1 discloses:

Cooling apparatus comprising: a solar heat collection means ("Solaranlage" 11); two or more absorption refrigeration modules (10) (see column 1, lines 65 to 68), each module being arranged to receive heat from the heat collection means (11) and to re-circulate refrigerant through an evaporator ("Verdampfer" 24); wherein each module has:

a. a generator ("Austreiber" 12) containing a solution of refrigerant in a liquid, the generator (12) being

arranged to receive heat from the heat collector (11) (see column 4, lines 13 to 17) and to cause evaporation of the refrigerant,

b. the generator being constructed as a single bubble pump ("Gasblasenpumpe") for pumping the liquid from the generator (12) to an absorber ("Absorber" 32) (see column 5, lines 16 to 17 and figure 1),

c. a condenser ("Kondensator" 19) arranged to receive gaseous refrigerant from the generator (12) and to condense the same,

d. an evaporator ("Verdampfer" 24),

e. means (25) for passing liquid refrigerant from the condenser (19) to the evaporator (24) (see figure 1), and

f. absorbing means ("Absorber" 32) for receiving gaseous refrigerant from the evaporator, absorbing it into the liquid from the bubble pump and returning the liquid to the generator.

4.4 The subject-matter of claim 1 differs from this known device in that it comprises:

a casing enclosing components (a) to (f) and including means for attaching the modules rigidly together, and

means for putting air to be cooled into thermal contact with the evaporator, and

in which the casing of each module, together with partition walls within the casing, provides an evaporator housing defining a path for the air to be

cooled, and includes ports by which the evaporator housings within the casings of adjoining modules are connected together.

- 4.5 As submitted by the appellant, these distinguishing features produce a synergistic effect which facilitates the connection of the multiple modules such that the air to be cooled can flow between modules, thus increasing the overall cooling capacity of the system in an additive manner.
- 4.6 Starting from D1, the technical problem to be solved is one of how to provide a cooling apparatus that allows for a variable amount of cooling capacity in an inexpensive and user friendly manner.
- 4.7 Although D1 suggests (see column 1, lines 65 to 68) that it is also possible to design the refrigeration unit as an independent module assembly, so that parallel connections of several refrigeration units can also be realised in a relatively simple manner ("Ferner ist es möglich, das Kälteaggregat als unabhängige Modulbaugruppe auszugestalten, so dass auch Parallelschaltungen mehrerer Kälteaggregate in verhältnismäßig einfacher Weise realisierbar sind."), it does not provide any indications as to how this might actually be put into practice.
- 4.8 In particular, faced with the above problem, the skilled person would find nothing in D1, or any of the other available prior art documents, to suggest modules that could be connected to one another in such a way as to provide a path for the flow of air to be cooled between adjoining modules in the manner claimed, thereby providing the possibility of increased cooling of the air passing through the system.

4.9 Therefore, the subject-matter of claim 1 according to the main request involves an inventive step and meets the requirements of Article 56 EPC.

5. *Auxiliary requests*

Since the appellant's main request has been allowed there is no need to consider the auxiliary requests.

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 in the following version:
 - claims 1 to 9 of the main request filed on 9 July 2020;
 - description pages 1 to 8 filed during the oral proceedings before the Board;
 - figures 1 to 5 as originally filed.

The Registrar:

The Chairman:



C. Spira

G. Ashley

Decision electronically authenticated