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Datasheet for the decision of 16 January 2012

Case Number: T 1295/09 - 3.2.03

Application Number: 02712583.0

Publication Number: 1362214

IPC: F28D 9/00, F28F 27/00, G01K 13/02, G01K 5/00

Language of the proceedings: EN

Title of invention:
A plate heat exchanger

Patentee:
Alfa Laval Corporate AB

Opponent:
GEA WTT GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1295/09 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 16 January 2012

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 15 April 2009 rejecting the opposition filed against European patent No. 1362214 pursuant to Article 101(2) EPC.

Composition of the Board:

Chairman: G. Ashley
Members: C. Donnelly
I. Beckedorf

Summary of Facts and Submissions

I. The appeal lies from the decision of the opposition division, posted on 15 April 2009, rejecting the opposition against European Patent no. EP-B-1362214.

II. The opponent (hereinafter - the "appellant") filed a notice of appeal against this decision on 12 June 2009 and paid the fee the same day.

III. In the grounds of appeal filed on 11 August 2009 the appellant referred to the following state of the art, which had been considered by the opposition division, in support of its request for the impugned decision to be set aside and the patent revoked:

E1: EP-608195 B1;
E2: WO-97/00415 A1;
E3: DK-9600205 U3;
E4: DE-69308090 T2.

IV. The patentee (hereinafter - the "respondent") replied to the appeal by letter of 15 December 2009 and requested that the appeal be dismissed, alternatively, that the patent be maintained in amended form on the basis of the first auxiliary request filed with its reply to the appeal.

V. Both parties originally made auxiliary requests for oral proceedings to be held.

VI. In a communication dated 15 July 2011, pursuant to Article 15(1) RPBA annexed to the summons to oral proceedings, the Board informed the parties of its

provisional opinion that it broadly agreed with the reasoning of the opposition division.

VII. By letter of 19 December 2011 the appellant indicated that it did not plan to attend the oral proceedings scheduled for 20 January 2012 and requested that a decision be taken on the basis of the file as it stood.

VIII. By letter of 9 January 2012 the respondent stated that, in view of the appellant's request, it too did not intend to attend the oral proceedings.

IX. Claim 1 as granted reads:

"A plate heat exchanger, which includes a sensor device and a plate package of heat transfer plates (11), which are provided to form, between the plates (1), first passages (3) for a first fluid and second passages (4) for a second fluid, wherein the sensor device includes a space (21), which is closed to the first passages (3) and the second passages (4), wherein the closed space (21) is arranged to contain a medium, which is provided to be influenced by the temperature of at least one of said fluids, and to be connectable to means (14) for sensing a pressure change of said medium in the closed space (21),
characterised in that
the closed space (21) at least partly is defined by at least one of said plates (1)."

X. The arguments of the parties can be summarised as follows:

Appellant

Claim 1 is not inventive in view of a combination of either one of E1,E2 or E3 with E4.

E1,E2 and E3 all describe a plate heat exchanger according to the preamble of claim 1. The arrangement of the sensor either in a separate enclosed space outside of the heat exchanger or in one of the heat exchanger flow channels is disadvantageous in that:

- the sensor only has limited contact with the medium flowing through the exchanger which leads to a long response time of the control valve connected to it;
-the fabrication of a sensor housing which is formed and arranged separately is expensive;
- the positioning of a separate sensor housing in one of the flow-channels increases flow resistance.

However, once the disadvantages of the prior art have been recognised as listed above then it would be obvious for the skilled person to look for a solution whereby:

- the enclosed space for the sensor is neither arranged to be separate from the exchanger nor in one of its flow channels;

- an improved contact between the sensor and the medium is ensured in order to obtain a rapid measurement of the temperature changes of the medium.

Under these conditions, the only possibility is to arrange the enclosed space for the sensor as near as

possible to the flowing medium and to integrate it within the region of the heat exchanger plates.

Further, there is no doubt that the skilled person faced with the problem of overcoming the above mentioned problems would take into consideration E4 since it deals with the same technical field of heat exchangers.

In the plate heat-exchanger according to E4, it is necessary to control the temperature of the heat transfer fluid which previously had been accomplished by a resistance heater placed in a pipe located outside of the exchanger. In order to overcome the disadvantages of this arrangement, E4 suggests in its introductory part that the electrical resistance should be positioned between the plates of the exchanger. This is already a sufficient hint to the skilled person that the same approach would solve the similar problems associated with the exchangers of E1 to E3.

E4 explicitly suggests that the heating medium should be placed in an enclosed space that is at least partly defined by one of the exchanger plates. In an identical manner to the contested patent, such an arrangement reduces the response time between the heating medium and the fluid, avoids the fabrication costs associated with a separate enclosure and minimises flow resistance.

Thus, E4 teaches the skilled person the solution suggested the contested patent.

Respondent

The reasoning of the opposition division in the impugned decision is correct.
None of the documents E1,E2 and E3 discloses or suggests the feature of the characterising portion of claim 1 as granted.

E4 deals with the fitting of an electrical resistance element to a plate heat exchanger and does not describe a closed space for a sensor. For this reason E4 would not in any case be consulted by the skilled person.

Reasons for the decision

1. The appeal is admissible.

2. The subject of the appeal is the decision of the opposition division to reject the opposition against European Patent EP-B-1362214. The "additional decision" to reject the opposition of the opponent as inadmissible, which is mentioned on both the cover page (EPO form 2330) and the final page (EPO form 2339) bearing the signatures of the members of the division, is considered to be an obvious clerical and/or computer error since in the first paragraph of section 1 of the "Reasons for the decisions" (sic) it is stated "The opposition is admissible". Moreover, the respondent has never raised this objection, and the appellant has not addressed this issue in its statement of grounds of appeal.

3. *Novelty*

The novelty of the subject-matter of claim 1 as granted is not contested.

4. *Inventive step.*

4.1 E1 forms the nearest prior art since, as stated by the opposition division, it concerns an apparatus where the sensor device comprising a temperature responsive medium is arranged in a space within the plate package. As such it comes closest to the idea behind the contested patent of seeking to provide a solution to the problem of minimising the reaction time of the system to fluid temperature changes.

4.2 In detail E1 discloses a plate heat exchanger, which includes a sensor device (12,13) and a plate package of heat transfer plates (A,B), which are provided to form, between the plates, first passages (16) for a first fluid ("district heating water" see page 3, line 15) and second passages (17) for a second fluid ("water for consumption" - see page 3, line 16), wherein the sensor device includes a space (13), which is closed to the first passages (16) and the second passages (17), wherein the closed space (13) is arranged to contain a medium, which is provided to be influenced by the temperature of at least one of said fluids and to be connectable to means (14,15) for sensing a pressure change of said medium in the closed space (13).

4.3 The subject-matter of claim 1 as granted differs from this known device in that said closed space is at least partially defined by at least one of said plates.

4.4 The objective problem to be solved is one of minimising the reaction time of the system to fluid temperature changes in the most economic manner whilst maintaining exchanger efficiency.

4.5 By arranging the temperature sensitive medium in a closed space which is at least partially defined by at least one of the heat exchange plates, it can be appreciated that the response time is improved, since the medium is in direct contact with the heat exchange plate. Further, manufacturing costs may be reduced since there is no requirement to produce a separate medium container and fix this to the exchanger although there would be a requirement to seal the medium holder to the exchanger plate to prevent leakage of the medium into the circulating fluids.

4.6 The appellant has argued that once the disadvantages of the prior art system are known then the solution proposed in the contested patent would be obvious the skilled person. However, the reasoning adopted by the appellant is largely based on hindsight, particularly in that the formulation of the disadvantages already anticipate to some extent the solution.

4.7 The appellant has also submitted that E4 suggests such a solution. However, when considering E4 in detail, it can be seen to concern a system for controlling the temperature of a thermal transfer fluid (FC) circulating through industrial equipment such as an injection moulding machine. The basic arrangement of the system is shown in figure 7 and comprises a plate heat-exchanger (1) through which a thermal transfer

fluid (FC) and a cooling fluid (FR) flow. An electrical resistance heater (3) is used to raise the temperature of the thermal transfer fluid if necessary, in order to maintain the correct operating temperature of the industrial process. E4 principally deals with various arrangements (see figures 1,2,4,5 and 6) for fitting this resistance heater (3) into the heat-exchanger (1).

4.8 As regards the provision of a temperature sensor, E4 merely states that one is fitted to the heat exchanger and connected conventionally with the control system in order to provide a continuous check on the temperature of the thermal transfer fluid and limit its maximum temperature (see page 10, final paragraph to page 11, first paragraph). However, no further details are given as regards either the type of sensor used or its installation.

4.9 In conclusion, E4 is mainly concerned with the provision of a resistance heating device and does not disclose in any detail a sensor device or any closed space enclosing a medium to be influenced by fluids flowing through the heat exchanger. Thus, even if the skilled person took E4 into consideration he would come to the conclusion that it offers no help in solving the above objective problem.

4.10 Further, none of the available prior art documents describes or suggests a sensor device employing a medium producing detectable pressure changes in response to temperature influence, and which is placed in direct contact with a heat exchanger plate so as to form an integrated unit.

4.11 E2 discloses a temperature responsive actuation member 21 made of memory metal placed in the connection pipes 5. Depending upon the liquid temperature, the member 21 moves the valve element 17 to either direct liquid to the by-pass passage 15a (see figure 3) or to press the valve member 17 against the end plate 3 such that liquid enters the inlet channel 10 (see figure 4). A similar mechanism is arranged at the outlet pipe 6a for actuating the valve member 18.

4.12 E3 is in Danish and no translation into one of the official languages of the Office has been provided. However, it can be seen that it discloses a closed space 20 housing a temperature sensor 24 fitted to a strengthening plate 2 positioned on the outside of the plate heat exchanger. The space 20 is in fluid communication via opening 9 with one of the passages, so that one of the fluids is guided around the sensor 24 (see figure 3).

4.13 In view of this, the subject-matter of claim 1 as granted is both new and involves an inventive step.

5. Since the main request of the respondent is allowable, there is no need to consider its auxiliary requests or to hold oral proceedings.

Order

For these reasons it is decided that:

The appeal is dismissed.

Registrar Chairman

D. Hampe G. Ashley