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File No.: T 0804/92 - 3.5.2
Application No.: 85 900 817.9
Publication No.: 0 169 878
Classification: HO2J 7/00
Title of invention: Energy saving refrigeration apparatus having a control means

D E C I S I O N
of 8 September 1993

Patentee: Thermo Produkter B.S. AB
Opponent: WAECO - Wähning & Co. GmbH

Headword:

EPC: Art. 56
Art. 117(1) (g)
Art. 123(2)

Keyword: "Inventive step (yes), after amendment" - "Sworn statements in writing, contents should not be suggested by the EPO" - "Added subject-matter (no)"

Headnote

While it is permissible, and even desirable, in proceedings before the EPO for the EPO to draw attention to any discrepancies between the arguments presented and the documents which are supposed to support those arguments, this should always be done in an as neutral and objective way as possible. It is definitely not proper to request the filing of statements under oath having a content suggested by the Opposition Division or any other instance. This involves the risk of leading witnesses and could seriously undermine the probative value of such statements. Such practice should therefore be avoided (point 5 of the reasons for the decision).



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Boards of Appeal

Chambres de recours

Case Number: T 0804/92 - 3.5.2

DECISION
of the Technical Board of Appeal 3.5.2
of 8 September 1993

Appellant: Thermo Produkter B.S. AB
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Representative: Avellan-Hultman, Olle
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Respondent: WAECO - Wähning & Co. GmbH
(Opponent) Sinniger Strasse 36
D-48282 Emsdetten (DE)

Representative: Dipl.-Phys. Dr. H. Schumacher,
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office dated 30 June 1992 revoking
European patent No. 0 169 878 pursuant to
Article 102(1) EPC.

Composition of the Board:

Chairman: R.E. Persson
Members: W.J.L. Wheeler
A.G. Hagenbucher

Summary of Facts and Submissions

I. The Appellant contests the decision of the Opposition Division revoking European patent No. 0 169 878 on the ground that the subject-matter of Claim 1 then on file did not involve an inventive step.

II. In the proceedings before the Opposition Division the following documents relating to the prior art were considered:

D1: WAECO leaflet: "Kühlaggregate mit Speicherplatte COOLMATIC DCU/S" (not dated) with price list valid from 21 January 1984 and "Kühlaggregate im mobilen Einsatz COOLMATIC DCU" (not dated)

D1.1: Statutory declaration by Theodor Wähning, dated 16 May 1988

D1.2: Statutory declaration by Theodor Wähning, dated 15 January 1991, filed 15 January 1992

D2: Kissmann leaflet: "Die Strom-Schoner von Indel Kissmann", October 1983

D2.1: Statutory declaration by Hermann Kisslinger, dated 17 May 1988

D2.2: Statutory declaration by Hermann Kisslinger, dated 15 January 1992

D3: DE-C-610 450 *im KB*

D4: DE-A-2 726 954. *im RB*

III. In the course of the appeal proceedings the Respondent filed the following additional documents relating to the prior art:

D1.3: Statutory declaration by Theodor Wähning, dated 3 September 1993

D1.4: Statutory declaration by Christian Echelmeyer with test results, dated 3 September 1993.

The Appellant also filed additional documents relating to the prior art, of which only the following remain relevant to the present decision:

Enc 1: Statement by Ronny Lindquist, dated 17 June 1993

Enc 2: Affidavit by Professor Björn Karlsson, dated 30 August 1993, with diagrams showing test results.

For avoidance of doubt, it is recorded that the document marked Enc 3, filed by the Appellant on 5 September 1993, was withdrawn by the Appellant in the oral proceedings. Neither Enc 3 itself nor the documents D1.2.2, D2a and D2b referred to therein have been taken into account by the Board in the present decision.

IV. Oral proceedings were held on 8 September 1993, at which the Appellant filed amended Claims 1 to 7. Claim 1 is now worded as follows:

"A refrigeration apparatus comprising

a cold creating means (1, 2) arranged to be operated at different temperature ranges by

one or more rechargeable accumulator batteries (8) arranged to be under electrical charging (9) and non-charging respectively, and having connected thereto

a cold emitting means (3) in the form of a eutectic plate (3) containing a fluid which begins to stiffen at a predetermined temperature below zero and which is mounted in

a fridge or in a cooling box (4),

and in which the cold creating means (1, 2) and the cold emitting means (3) are connected to a control means (5) comprising

a voltage sensing means (11) for observing if the battery voltage is above or below a predetermined voltage level,

means for selecting different temperature operating ranges of the cold emitting means,

a temperature sensing means (12) for observing the upper and lower temperature levels of the selected temperature operating range of the cold emitting means,

and means (13, 14, 38 - 41) for providing connection and disconnection of the cold creating means (1, 2) with the selected temperature operating range of the cold emitting means (3), characterized

in that the voltage sensing means (11) is arranged to observe if the voltage is above or below a predetermined charging voltage level for the accumulator battery or batteries,

in that the apparatus comprises an automatically operating temperature range selection means (13, 14) for actuating the cold creating means (1, 2) such as to automatically switch between two different temperature ranges for the cold emitting means (3), namely a low temperature operating range (e.g. -8 to -15°C) for the cold emitting means (3) during periods when the battery (8) or batteries is/are under charging and the voltage is above said predetermined charging voltage level, and a higher temperature operating range (e.g. -2 to -6°C) for the cold emitting means (3) during periods when the battery or batteries are not under charging and the voltage is below said level,

in that the voltage sensing means (11) comprises two comparators (17, 18) which are connected to the temperature sensing means (12), and one comparator (17 or 18) of which is arranged to take an active state at a voltage above the battery charging voltage level, thereby providing an operation of the cold creating means (1, 2) at said low temperature range, whereas the other one (18 or 17) is arranged to take an active state at a voltage below said battery charging voltage level, thereby providing an operation of the cold creating means (1, 2) at said high temperature range,

in that said two temperature operating ranges are selected such that the freezing/melting temperature (e.g. -8°C to -6°C) of the cold emitting means (3) is located between said two temperature ranges,

in that the temperature sensing means (12) of said control means (5) is arranged to observe the upper and lower temperature levels of both of said two different temperature operating ranges of the cold emitting means (3),

and in that said means (13, 14) for providing connection and disconnection respectively of the cold creating means (1, 2) is arranged to provide connection and disconnection within both the said high temperature range and said low temperature range for the cold emitting means (3)."

Claims 2 to 7 are dependent on Claim 1. An amended page of the description containing columns 1 and 2 was also filed in the oral proceedings.

V. The Appellant argued in effect that the claims were based on the COOLMATIC DCU/S (D1) as the closest prior art. The voltage sensing means in D1 was arranged to prevent total discharge of the battery, it did not sense if the voltage was above or below battery charging level. Also in D1 the eutectic plate was always refrozen when the compressor was started after thawing, even when the battery was not being charged. The present invention automatically switched to an operating temperature range above the freezing/melting point of the eutectic plate when the voltage sensing means sensed that the battery was not being charged, to avoid freezing the eutectic plate from the battery. Neither D1 nor D2 mentioned operating in a temperature range entirely above the freezing/melting point of the eutectic plate. There was no disclosure in D2 that the apparatus might be run at all at low voltages. The Appellant challenged the statements D1.1 and D1.2, arguing that the tests performed by Professor Karlsson (see Enc 1 and Enc 2) showed that the Coolmatic DCU/S could not be operated in a temperature range lying fully above the freezing/melting point (-3°C) of the eutectic plate. The tests made by the Respondent (see D1.4) were not relevant as they were carried out on a later model, the FA-30 Coolmatic, which was not on the market when the patent in suit was applied for, and in which the

freezing/melting point of the eutectic plate was -8°C , i.e. lower than that in the Coolmatic DCU/S. The Appellant also challenged the statements D2.1 and D2.2, pointing out that it would have been necessary to make considerable changes to the Indel apparatus before it could be operated in the manner described in D2.1 and D2.2. There was no evidence of what changes were actually made. Considering the importance of the changes, it was surprising that there were no written details available.

- VI. The Respondent argued that D1 mentioned that the eutectic plate could have a freezing/melting point between 0 and -12°C . As supplied in accordance with D1, the eutectic plate of the Coolmatic DCU/S had a freezing/melting point of -3°C . However, the eutectic plate had a filler screw, making it possible to exchange the fluid in the eutectic plate for one with a freezing/melting point of, say, -8°C . When that was done, it was possible to select, by means of the thermostat, a high operating temperature range above the freezing/melting point of the eutectic plate and a low operating temperature range below it. This was shown by the test described in D1.4. The thermostat and defrosting button were the same in the Coolmatic DCU/S and FA-30 models. The Appellant's apparatus merely automated what had been possible manually with the DCU/S. If the Board did not accept Mr. Wähning's statements, it was requested that he be heard as a witness at a later date. If the Board wished, Mr. Kisslinger (who lived in Munich) could attend the present hearing as a witness.

The Respondent further raised doubts as to whether the second and fourth paragraphed sections of the characterising part of Claim 1 complied with Article 123(2) EPC.

VII. The Chairman of the Board explained at the oral proceedings that the Board did not consider it essential to summon Mr. Wähning and/or Mr. Kisslinger.

VIII. The Appellant requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of:

Claims 1 to 7 as filed at the oral proceedings;

Description: Columns 1 and 2 as filed at the oral proceedings, otherwise as printed in EP-B1-0 169 878;

Drawings: as printed in EP-B1-0 169 878.

IX. The Respondent requested dismissal of the appeal.

Reasons for the Decision

1. The appeal is admissible.
2. The claims of the patent in suit have been amended in the appeal proceedings. The Respondent expressed doubts as to whether the second and fourth paragraphed sections of the characterising part of Claim 1 comply with Article 123(2) EPC. The Board notes that all the features specified there were disclosed in the application as originally filed, see WO 85/03603, page 2, line 23 to page 3, line 9, page 4, line 21 to page 5, line 11 and page 7, line 14 to page 8, line 11. It is true that the expression "freezing/melting temperature" does not appear there, but nevertheless it is clear that the temperature at which the fluid in the eutectic plate starts freezing (when the compressor is running) or melts (when the compressor is not running), i.e. its freezing/melting temperature, lies between the

lower limit of the higher temperature range and the upper limit of the lower temperature range. The fact that according to the description the fluid may become fully frozen at a substantially lower temperature is not inconsistent with this. In the opinion of the Board, the amended claims do not contravene Article 123 EPC.

3. The Board will now consider the question of whether the apparatus according to Claim 1 (see paragraph IV above) involves an inventive step.

3.1 According to Mr. Wähning's statement D1.1, document D1 (which carries no date) was distributed in the last week of January 1984 at the boat show in Düsseldorf and he had already before then demonstrated and sold the Coolmatic DCU/S described in D1. This was before the priority date (1 February 1984) of the patent in suit. The Board accepts that D1 and the Coolmatic DCU/S as described in D1 belong to the prior art.

3.2 Document D1 discloses a refrigeration apparatus according to the preamble of Claim 1 now on file. The voltage sensing means mentioned in D1 is for switching off the compressor when the battery voltage reaches a minimum voltage. D1 does not disclose means for detecting whether the battery is being charged or not. D1 does not disclose a temperature operating range above the freezing/melting point of the fluid in the eutectic plate, or control means for automatically selecting and switching between two temperature operating ranges. Although D1 makes it clear that it is preferable to cool the eutectic plate down when the battery is being charged, it gives no hint of the idea of saving the battery by operating in a range above the freezing/melting point of the fluid in the eutectic plate when the battery is not being charged. Thus the

apparatus according to Claim 1 differs from the prior art disclosed in D1 by the characterising features specified in the claim.

3.3 As pointed out by the Respondent, D1 does mention that the freezing/melting point of the medium in the eutectic plate can lie between 0°C and -12°C (see the first paragraph on the second page of D1). However the Board notes that this paragraph is part of a general discussion of refrigeration systems with and without eutectic plates, it does not form part of the description of the Coolmatic DCU/S. According to the description of the Coolmatic DCU/S on the third and fourth pages of D1, and the summary of the technical data in the left hand column of the first page, the Coolmatic DCU/S was fitted with a eutectic plate containing a medium whose freezing point was -3°C.

3.4 According to Mr. Wähning's statements D1.1 and D1.3, the thermostat of the Coolmatic DCU/S could be set manually to seven different temperature levels and he had advised his customers to choose the coldest setting when the battery was being charged and the warmest setting when the battery was not being charged, so that the entire eutectic plate did not have to be cooled down from the battery. In other words, the compressor was to be switched off before the entire fluid had become frozen. This does not necessarily imply that the compressor was to be switched off before any of the fluid had become frozen, or that the lower limit of the highest temperature range was above the temperature at which the fluid began to freeze.

3.5 According to Mr. Wähning's statement D1.2, the Coolmatic DCU/S was superseded by the FA-30 Coolmatic and both were fitted with the same mechanical thermostat and defrosting knob. Point 3 of D1.2 describes a method of

operating the DCU/S in which the higher temperature operating range is shown to be fully above the melting/freezing zone of the medium in the eutectic plate. This method of operating the DCU/S is not described in D1 itself. Nor does it appear to be possible with a fluid whose freezing point is -3°C , as may be deduced from the test results filed by the parties. Thus, according to the Respondent's test results, D1.4, the warmest setting of the thermostat (Stufe 1) produced a temperature range for the eutectic plate of about 4°C to 5°C . Although this is above the freezing point of the fluid used in the FA-30 (-8°C) it is below the freezing point of the fluid used in the DCU/S (-3°C). According to the results of Appellant's tests, which were performed on a Coolmatic DCU/S 65-2406 as described in D1 using three different thermostats of types approved for use with the DCU/S, see Enc 1 and Enc 2, the warmest setting (Stufe 1) of all three thermostats produced a temperature range for the eutectic plate below the freezing point of the fluid used in the DCU/S, which was measured to be $-3^{\circ}\text{C} \pm 0.3^{\circ}\text{C}$. The fluid remained frozen.

- 3.6 The Board concludes from the results of these tests that it would not have been possible to operate the Coolmatic DCU/S in a range above the freezing point of the fluid in the eutectic plate, without first replacing the fluid supplied, which had a freezing point of -3°C , with a fluid whose freezing point was lower, e.g. -8°C . There is no mention in D1 itself or in any of Mr. Wähning's statements (D1.1, D1.2, D1.3) of changing the fluid in the eutectic plate. Given these circumstances, it cannot be said that the present invention merely provides automation of an already known method of operation of the Coolmatic DCU/S. Although it appears it was possible to operate the FA-30 Coolmatic in a range above the

freezing point of the fluid in the eutectic plate (-8°C), there is no evidence that the FA-30 belongs to the prior art.

3.7 Document D2 is dated October 1983 and therefore belongs to the prior art. It discloses a refrigeration apparatus with cold creating means operated by one or more accumulator batteries arranged to be under electrical charging and non-charging respectively, cold emitting means connected to the cold creating means, the cold emitting means being in the form of a eutectic plate mounted in a fridge or in a cooling box, and electronic control means connected to the cold creating means and the cold emitting means. D2 discloses that the eutectic plate is cooled down when abundant electrical current is available, but there is no mention of the idea of saving the battery by operating in a range above the freezing/melting point of the fluid in the eutectic plate when the battery is not being charged. D2 does not disclose any means for detecting whether the battery is being charged or not. Nor does it mention a temperature operating range above the freezing/melting point of the fluid in the eutectic plate, or means for automatically switching between two temperature operating ranges. In fact D2 does not disclose any of the features specified in the characterising part of Claim 1 now on file.

3.8 According to Mr. Kisslinger's affidavits (D2.1 and D2.2) the type LT 40 IPE was sold in the years 1980 to 1983. In addition to the features disclosed in D2, the LT 40 IPE had voltage sensing means for observing if the battery voltage was above a predetermined voltage (12.2 V), which it would be when the battery was being charged, in which case the eutectic plate was cooled down and the compressor was cycled on and off to maintain the temperature in the range of -5°C to -8°C, the eutectic plate thawing partly or fully (depending on

various factors) during the off time of the compressor before it was switched on again. The LT 40 IPE had an adjustable potentiometer for setting the operating temperature range. Furthermore, particular examples of the LT 40 IPE could be operated like a normal refrigerator at a higher temperature operating range when the battery voltage was below the predetermined level.

- 3.9 D2.1 and D2.2 do not mention means for automatically switching between two temperature operating ranges such that when the battery was being charged the refrigerator was operated in a range below the freezing point of the fluid in the eutectic plate and when the battery was not being charged the refrigerator was operated in a range above the freezing point of the fluid in the eutectic plate.
- 3.10 D3 (DE-C-610 450) and D4 (DE-A-2 726 954) disclose mains operated refrigerators with eutectic plates, which are automatically switched between two temperature operating ranges, so as to operate above the freezing point of the fluid in the eutectic plate during the day (high tariff) and below the freezing point of the fluid during the night (cheap tariff). Neither of these documents contains the slightest suggestion that the apparatus described therein could be adapted for use with battery driven refrigerators so as to operate above the freezing point of the fluid in the eutectic plate when the battery was not being charged and below the freezing point of the fluid when the battery was being charged.
- 3.11 Summarising, there is no disclosure in any of the prior art documents D1, D2, D3, D4 of the features recited in the characterising part of Claim 1 as submitted in the oral proceedings. Furthermore, in the Board's opinion, it is not possible to conclude from Mr. Wähning's

statements D1.1, D1.2 and D1.3, taken at their face value, or from Mr. Kisslinger's statements D2.1 and D2.2, taken at their face value, that clear enough information had been made available to the public for it to have been obvious to modify the Coolmatic DCU/S or the LT 40 IPE in such a way as to fall within the terms of the present Claim 1.

3.12 The Board therefore agrees with the Appellant that the apparatus according to Claim 1 involves an inventive step within the meaning of Article 56 EPC. Claims 2 to 7 are properly dependent on Claim 1, so their subject-matter also involves an inventive step and ground (a) in Article 100 EPC does not prejudice maintenance of the patent in suit on the basis of Claims 1 to 7 filed at the oral proceedings.

4. The Board is of the opinion that the patent may be maintained with the claims in the amended form in accordance with the Appellant's request. The opening of the description has been adapted to the present form of the claims. In the opinion of the Board the description discloses the invention in a manner sufficiently clear for it to be carried out by a person skilled in the art.

5. Finally, the Board, without questioning that the Opposition Division and everybody else concerned acted in good faith in this particular case, considers it appropriate to make the following general remarks about the proceedings before the Opposition Division.

5.1 The Board has noticed that the statements D1.2 and D2.2 were filed in response to the communication from the Opposition Division dated 14 November 1991, in which was stated *inter alia* that:

"The Opponent should ... present a statement under oath by Mr. Kisslinger that:

--- contrary to the standard version of LT 40 IPE a modified version has been sold and made available to the public

--- said modified version could also be operated below a battery voltage of 12,2 Volts like a normal refrigerator

--- that it was common practice that the users of the modified versions received no written manual and were satisfied with only an oral explanation.

The Opponent should also provide a statement under oath by Mr. Wähning that:

--- all manuals of the old Coolmatic DCU/S have been destroyed

--- said old and new FA-30 Coolmatic use the same mechanical thermostat

--- said old Coolmatic DCU/S operated according to the temperature diagram on page 4 of the letter filed 09.02.90."

5.2 While it is of course permissible, and even desirable, in proceedings before the EPO for the EPO to draw attention to any discrepancies between the arguments presented and the documents which are supposed to support those arguments, this should always be done in an as neutral and objective way as possible. It is definitely not proper to request the filing of statements under oath having a content suggested by the Opposition Division or any other instance, as

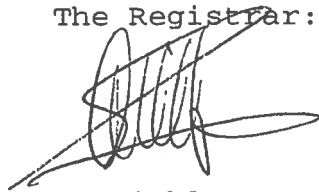
illustrated in paragraph 5.1 above. This involves the risk of leading witnesses and could seriously undermine the probative value of such statements. Such practice should therefore be avoided.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent in amended form as requested by the Appellant (see paragraph VIII above).

The Registrar:



M. Kiehl

The Chairman:



E. Persson

Wjms
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