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D E C I S I O N
of 13 November 1997

Case Number: T 0735/95 - 3.2.4

Application Number: 91113479.9

Publication Number: 0483466

IPC: A47L 15/46

Language of the proceedings: EN

Title of invention:
Washing process for an automatic dishwasher

Patentee:
ELECTROLUX ZANUSSI ELETTRODOMESTICI S.p.A.

Opponent:
BOSCH-SIEMENS HAUSGERÄTE GMBH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - yes"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0735/95 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 13 November 1997

Appellant: (Opponent)
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Representative:
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Respondent: (Proprietor of the patent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 23 June 1995 rejecting the opposition filed against European patent No. 0 483 466 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: C. A. J. Andries
Members: M. G. Hatherly
J. P. B. Seitz

Summary of Facts and Submissions

I. The decision of the opposition division to reject the opposition against European patent No. 0 483 466 (granted on application No. 91 113 479.9) was dispatched on 23 June 1995.

On 31 August 1995 the appellants (opponents) both filed an appeal against this decision and paid the appeal fee. The statement of grounds of appeal was received on 2 November 1995.

II. Claim 1 as granted reads as follows:

"Washing process for an automatic dishwasher having a wash tub in which are provided at least a lower spray arm and at least an upper spray arm able to be supplied by a circulating pump with water which is contained in said tub and can be heated by heating means to perform, during said washing process, at least an operative cycle in which said spray arms are alternately supplied to spray the crockery, **characterized in that** said operative cycle substantially consists of a first phase (t1-t2) in which only said lower spray arm (10) is supplied, and a second phase (t3-t4) in which only said upper spray arm is supplied, said heating means (15) being only energized when the lower spray arm is supplied."

III. The following documents were referred to during the appeal proceedings:

D1: EP-A-0 237 994
D2: EP-B-0 237 994
D3: DE-A-3 830 717
D4: FR-A-2 589 057
D5: DE-A-3 537 970
D6: DE-C-858 763

D7: DE-A-2 412 257
D8: DE-A-2 434 535
D9: DE-A-2 415 530
D10: DE-A-1 428 364
D11: DE-A-3 716 952

IV. Oral proceedings took place on 13 November 1997 in the presence of the parties.

In the appeal proceedings the appellants argued that the subject-matter of claim 1 as granted lacked inventive step over the cited documents. The various problems cited in the patent's description could not support inventive step because they were well known problems which had already been solved.

The respondents (proprietors) essentially countered the appellants' arguments.

V. The appellants request that the decision under appeal be set aside and the patent revoked.

The respondents request the dismissal of the appeal.

Reasons for the Decision

1. The appeal is admissible.

2. *Interpretation of claim 1*

2.1 The wording in the characterising portion of claim 1 that "said operative cycle substantially consists of a first phase (t1-t2) ... and a second phase (t3-t4)" means that, while there is something additional to the first phase and a second phase (e.g. the switch over or commutation period t2-t3 between the two phases), there cannot be more than one first phase and more than one

second phase in the operative cycle. Thus there is only one commutation in the operative cycle. This meaning is accepted both by the proprietors (see e.g. their letter of 21 March 1995, page 5, lines 12 to 17) and by the appellants (see e.g. the statement of grounds of appeal, page 2, lines 24 to 27).

2.2 The wording in the pre-characterising portion of claim 1 that "said spray arms are **alternately** supplied" means that firstly one of the arms is supplied and then the other but not both at the same time.

If taken in isolation the cited wording would cover a cyclic supply, i.e. supply to lower arm, then supply to upper arm, then supply to lower arm, then supply to upper arm, and so on. However, as explained in the above section 2.1, the characterising portion of the claim makes it clear that there is a single commutation from supplying the lower arm to supplying the upper arm.

3. *Document D1*

3.1 The prior art pump 8 shown in Figure 1 of document D1 supplies washing liquid to either the lower spray arm 11 (when the valve 15 is the state shown in Figure 3) or the upper arm 12 (when the valve 15 is in the state shown in Figure 5) but not both at the same time. Thus the arms are supplied alternately as stated in the pre-characterising portion of the granted claim 1.

3.2 Indeed document D1 discloses all the features of the pre-characterising portion of the granted claim 1 except that it makes no mention of heating the water by heating means.

3.3 In view of the way the closure element 18 is made to shift from outlet 16 to outlet 17, the statement in the third paragraph of page 6 of document D1 that the pump is actuated with intervening stoppage intervals of a shorter or longer duration must mean that there is more than one commutation and that the supply is cyclic in the meaning of the above section 2.2. Therefore, unlike the operative cycle in claim 1 as granted, the prior art operative cycle consists of a plurality of phases in which only the lower spray arm is supplied and a plurality of phases in which only the upper spray arm is supplied.

3.4 The board agrees with the appellants that claim 1 is divided using the disclosure of document D1, that the pre-characterising portion of claim 1 includes the word "alternately" and that the word "alternately" encompasses a single change. The board however cannot accept the appellants' conclusion that document D1 includes the disclosure of a single commutation and that therefore the first part of the characterising portion of claim 1 is known.

The pre-characterising portion of claim 1 is merely stating the features which document D1 and claim 1 have in common, including the fact that the spray arms are alternately supplied (the generic definition). The characterising portion of claim 1 then includes a specific definition of the previously given generic definition to bring out the differences of the invention over the prior art. The Guidelines for Examination in the EPO, part C, chapter IV, 7.4 explain the general principle that a generic disclosure does not take away the novelty of the specific disclosure.

It is clear from claim 1 that there can only be a single commutation (see the above section 2.1) and it is equally clear that document D1 discloses only a plurality of commutations and not a single commutation (see the above section 3.3).

3.5 Since document D1 does not disclose the heating of the water by heating means, it is clear that it cannot disclose that the latter is only energized when the lower spray arm is supplied.

4. *Novelty*

After examining document D1 and the other available prior art documents, the board is satisfied that none of them discloses the washing process specified in claim 1 as granted. Moreover, the appellants did not dispute novelty in the appeal proceedings.

Therefore the subject-matter of claim 1 is considered novel within the meaning of Article 54 EPC.

5. *Closest prior art, problem and solution*

5.1 The parties and the board agree that the closest prior art document or starting point for the invention is document D1.

5.2 Cyclic operation

In the washing process known from document D1, supplying the upper and lower spray arms alternately with water enables a smaller pump to be used than if the arms were supplied at the same time. However the flow is repeatedly switched from one arm to the other by stopping the pump (see document D1, page 6, lines 17 to 24) which shortens the pump life.

5.3 Overheating

5.3.1 Although not explicitly stated in document D1, it is usual for a machine of this type to use a heating element to heat the water which is to be sprayed onto the crockery. It is well known that the heating element will overheat and be damaged if energised at full power for any length of time when not in contact with sufficient water.

5.3.2 The washing process (implicitly) known from document D1 suffers from a more specific cause of heating element overheating. The heating element can be assumed to be energised both when the pump is pumping water to the lower arm and when it is pumping water to the upper arm. In the former case the water falls quickly back to the sump so sufficient water is always present at the heating element. Water supplied to the upper arm however takes longer to return to the sump so the level at the heating element may fall to such an extent that overheating occurs when insufficient water is present.

5.3.3 Obviously the person skilled in the art will take the general problem of overheating of the heating element into account when designing a dishwashing machine and deciding how it is to operate. However, some possible solutions would bring their own problems with them.

One solution to the general heating element overheating problem (and indeed to the specific overheating problem arising from the way in which the machine of document D1 is operated) is to provide enough water so that a problem can never arise, since sufficient water will be present in the sump even in unfavourable circumstances. Providing more water however means that more time and energy is needed to heat it to the required temperature. It may also force the sump and therefore the machine to be larger than otherwise necessary.

Another way of overcoming the general and specific overheating problem would be to take action of some kind or another if a sensor detected a potential danger situation. However the sensor and its associated components may increase the cost and size of the machine.

5.4 Thus the prior art known from document D1 gives rise to a number of problems which cannot be viewed in isolation one from the other because improvement in one area may cause a deterioration in another. The problems all need to be solved at the same time.

These problems are set out in column 2, lines 14 to 27 of the description of the granted patent, namely

(a) to provide a washing process which can be readily carried out with good results in an automatic dishwasher of a substantially known type;

(b) to provide a washing process which enables the dishwasher to be compact and highly reliable; and

(c) to provide a washing process overcoming problems of overheating of the water heating element without special constructional features.

5.5 From the features of claim 1 (in particularly those of the characterising portion) it can be seen that the water is heated solely during the first phase of the operative cycle and apparently remains hot during the second phase while the heating means is not energised, to give good washing results. The single commutation from first phase to second phase, instead of repeated commutations between shorter phases, improves the machine reliability and lengthens its life. Not energising the heating means when the upper spray arm

is in use overcomes the specific heating element overheating problem. These advantages are achieved without adding sensors and associated components to the known machine, thus it can remain compact and reliable.

6. *Inventive step*

6.1 Since document D1 makes no mention of heating it cannot provide the skilled person with any help in solving a problem connected with the overheating of the heating means. The related document D2 was published after the priority date of the present patent and therefore cannot be taken into account.

According to document D3 either the middle sprayer 9 is operated or both the upper sprayer 8 and the lower sprayer 10. This document could not lead the skilled person to the invention because the upper sprayer and lower sprayer are never operated separately, because heating is not mentioned and because there is no first phase in which only the lower arm is supplied.

The related documents D4 and D5 recognise (e.g. see document D5, column 2, lines 36 to 61) that water can be sprayed faster than it can fall to the bottom of the machine. The liquid level at the pump inlet therefore falls and in order to stop it sucking air, the pump is switched off repeatedly during the washing cycle by a liquid level switch. This document does not mention heating means let alone an overheating problem and so would not be consulted by the skilled person in the present case. Moreover the solution to the problem set out in documents D4 and D5 is not the solution provided by the present invention.

6.2 Documents D6 to D9 set out what the skilled person certainly already knows, namely that if a water heater which is not covered with water is energised at full power for any length of time, then it burns out (see e.g. document D6, page 1, left-hand column, lines 11 to 13).

The Figure of document D6 shows a weir 1 next to the inlet of the pump f which ensures that the heater e stays submerged or that the bottom above the heating means d remains covered with water even if the pump f runs dry.

Document D7 says that the known ways of preventing heaters being operated dry (using a liquid level sensor, a pressure switch in the pump outlet and a temperature sensor on the heater) are unsatisfactory, see page 2, lines 3 to 15. The Figure shows an extra pump inlet 11 above the level of the heaters 12 so that the pump 7 sucks air if the level drops, then the pressure sensor 17 operates.

To prevent the heater 4 of the dishwasher of document D8 from being operated dry if water is held up by the filter lid 2, the heater 4 is located in a depression 5 in the form of a separate, additional trough (Figures 1 and 2) and/or water is sprayed from a nozzle 15 (Figures 3 and 4). This nozzle is not a nozzle also for spraying the crockery but a dedicated nozzle.

Document D9 recognises that the temperature sensor for the liquid must be kept wet to prevent it sensing the air temperature instead (see the last four lines of page 1 and lines 1 to 11 of page 2). Figure 2 shows a thermistor 30 for sensing the water temperature and a water level line 125 below which contacts 61, 62 open and the heating element is no longer heated.

6.3 Document D10 was cited only against claims 4 and 5. It is not relevant for claim 1.

During the first phase of the presently claimed washing process, dirt on the crockery in the upper part of the dishwasher is softened by moisture resulting from hot water sprayed through the lower spray arm. This is merely one result of carrying out the claimed process so that, while document D11 concerns an additional dishwashing cycle in which dirt on cooking pots is softened using steam, this document would not lead the skilled person to the claimed washing process as a whole.

6.4 Thus the Article 54(2) EPC prior art documents D1 and D3 to D5 contain no hint of an overheating problem, documents D6 to D9 solve overheating problems in ways which differ from the washing process presently claimed, and documents D10 and D11 are irrelevant for the present claim 1. Accordingly the board cannot see how said documents, taken alone or in any combination, could lead the skilled person to the washing process claimed in the granted claim 1.

6.5 The appellants argue that the various problems cited in the patent's description are well known problems which have already been solved. So the recognition of these problems cannot support inventive step and these problems cannot be the real problems underlying the invention. They maintain that the real problem is to provide protection against overheating of the heating elements. This also is a well known problem so its recognition cannot support inventive step.

The board agrees that the general problems - taken separately - were well known and solutions to them had been found. However, of course, inventive step can lie in a new solution to an old and already solved problem, e.g. that of overheating of the heating elements.

6.6 The appellants argue in the paragraph bridging pages 5 and 6 and the following paragraph of the statement of grounds of appeal that the real problem of providing protection against overheating of the heating elements is solved in document D6 by a weir. The skilled person thus knows from this document that to protect heating elements from overheating and burning out sufficient water must be present. The appellants continue that when the skilled person sees during a normal washing process that during operation of the upper arm the heating element tends to overheat, apparently because too little water is present to protect it (for which definitely no inventive activity is necessary), he uses the long known solution of document D6 to energize the heater only when sufficient water is there, i.e. only when the lower arm is being used.

The board is unconvinced by this argumentation. If the skilled person realised that there was insufficient water around the heater, then plainly he would realise that he cannot operate the heater. However he would have various solutions at his disposal for making sure the quantity of water around the heater was sufficient, and since document D6 is in front of him, its solution of a weir would be the first to spring to his mind.

The board does not consider that the skilled person would realise that overheating only occurs when the upper arm is used. It is not so much a case of "when the skilled person sees (as he will do) during a normal washing process that during operation of the upper arm the heating element tends to overheat" but "if the

skilled person were to see (and it is by no means sure that he will) ..." The amount of crockery in the baskets also affects whether the water returns fast enough to prevent overheating. The board cannot see that it would be obvious for him to de-energise the heating means every time the upper spray arm is used.

The appellants have put similar arguments based also on documents D7 to D9 and the board's position thereto is the same as for document D6.

6.7 The present invention provides a new and rather simple solution to known problems, the patent does not protect the problems, it protects the new solution. While the documents D6, D7 and D9 solve the overheating problem by sensing a parameter (temperature, level or pressure) and then taking action, and while the machine of document D8 needs additional technical features (e.g. a trough and/or a nozzle) to keep the heating means wet, the present invention prevents the overheating occurring in the first place and does this in a simple way (e.g. merely changing the sequence of the machine programmer) without adding an extra sensor and/or additional components.

6.8 Thus the board finds that the subject-matter of the present claim 1 involves an inventive step (Article 56 EPC).

7. The subject-matter of claim 1 as granted is thus patentable as required by Article 52 EPC. The patent may therefore be maintained with this granted independent claim and the granted claims 2 to 5 which are dependent on claim 1, so that the appeal has to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

N. Maslin

The Chairman:

C. Andries