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**Datasheet for the decision
of 8 February 2017**

Case Number: T 2081/14 - 3.3.06

Application Number: 03772309.5

Publication Number: 1567289

IPC: B08B3/04, A47L15/00, C11D3/00,
C11D7/00

Language of the proceedings: EN

Title of invention:
ACIDIC CLEANING METHOD FOR MACHINE DISHWASHING

Patent Proprietor:
ECOLAB INC.

Opponent:
The Procter & Gamble Company

Headword:
ACIDIC CLEANING METHOD FOR MACHINE DISHWASHING/ECOLAB

Relevant legal provisions:
EPC Art. 52(1), 56

Keyword:
Inventive step - (yes) - non-obvious solution

Decisions cited:

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

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Case Number: T 2081/14 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 8 February 2017

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
7 October 2014 concerning maintenance of the
European Patent No. 1567289 in amended form.**

Composition of the Board:

Chairman B. Czech
Members: G. Santavicca
J. Hoppe

Summary of Facts and Submissions

- I. The appeal by the Opponent lies from the interlocutory decision of the Opposition Division posted on 7 October 2014 and concerning maintenance of European patent No. 1 567 289 in amended form.
- II. The patent in suit had been opposed in its entirety on the grounds of lack of novelty, lack of inventive step and insufficiency of the disclosure. The items of evidence relied upon include
D4: WO 02/100993 A1 and
D6: WO 02/31095 A1.
- III. By a (first) decision of the Opposition Division posted on 4 June 2010, the patent was revoked for lack of novelty over D4 of the subject-matter claimed according to the then pending requests. The claimed invention was however found to be sufficiently disclosed. This decision was appealed by the Proprietor of the patent (first appeal).
- IV. In decision T 2160/10 of 5 June 2013, the Board entrusted with the case found *inter alia*
- that the First Auxiliary Request filed with letter of 11 April 2013 was admissible;
- that the amended claims according to this were formally allowable (Articles 123 and 84 EPC); and
- that the claimed process was novel over D4.
The case was remitted to the Opposition Division for further prosecution.
- V. Claim 1 according to this First Auxiliary Request reads as follows:

"1. A process for continuous or discontinuous machine

dishwashing, in which the tableware is treated at least in one process step with an acidic cleaning solution and, in another process step, with an alkaline cleaning solution, comprising the steps of

- a) applying an acidic aqueous cleaning solution before the final rinse cycle or the final rinse zone to the at least partly soiled tableware and*
- b) removing the acidic aqueous cleaning solution and the soil in one or more following steps,*

the alkaline treatment taking place before and after the acidic treatment and the alkaline and at least one acidic aqueous cleaning solution at least partially neutralizing one another and the pH of the wastewater produced by the process being below 12."

Dependent claims 2 to 14 of this request define more specific embodiments of this process.

- VI. In its (second) decision (subject of these appeal proceedings), the Opposition Division found that as regards the amended patent with the claims according to said First Auxiliary Request, the requirement of inventive step was also met.
- VII. In its statement setting out the grounds of appeal the Appellant (Opponent) maintained that the subject-matter of Claim 1 of the amended patent held allowable by the Opposition Division lacked an inventive step over D6.
- VIII. In its response of 11 June 2015 to the statement setting out the grounds of appeal, the Respondent (Proprietor) defended the patent in the amended version held allowable by the Opposition Division (Main Request). With the response, it nevertheless also filed amended sets of claims as First and Second Auxiliary Requests. It maintained that the claimed process was

not obvious in the light of D6.

IX. In a further letter, the Appellant *inter alia* rebutted the arguments submitted by the Respondent and maintained its inventive step objection.

X. Oral proceedings were held on 8 February 2017. The debate focused on the question whether the subject-matter of claim of the Main Request (wording under V, *supra*) involved an inventive step in the light of D6.

XI. Requests

The Appellant requested that the decision under appeal be set aside and that the patent be revoked.

The Respondent requested that the appeal be dismissed (main request) or, auxiliarily, that the patent be maintained on the basis of the claims according to one of the First and Second Auxiliary Requests submitted with the letter dated 11 June 2015.

XII. The arguments of the Appellant of relevance for the present decision can be summarised as follows:

D6 (page 1, first paragraph) represented the closest prior art. The closest process embodiment disclosed in D6 was the one illustrated in Example 2, comprising a mildly alkaline cleaning step at pH 10 followed by an acidic cleaning step. Example 2 of D6 had to be read in conjunction with the indications on page 17 (lines 6-15) referring to an additional, advantageous "bypass", comprising introducing acidic rinse water into the pre-wash zone. Hence, D6 disclosed a process comprising an acidic pre-wash step, followed by a mild alkaline cleaning step and another acidic cleaning in

the rinse. Since the cleaning was mildly alkaline at pH 10, the wastewater coming out from the process always had a pH below 12. The argument voiced by the Respondent that tableware could only be cleaned with alkaline compositions, and that all cleaning steps in D6 (page 17) were, therefore, alkaline, was not correct. The rinse step of D6 was a cleaning step too. D6 thus clearly taught that a sequence of cleaning steps with alternating pHs (here: acidic-alkaline-acidic) was preferred and resulted in improved cleaning. D6 also taught (Example 2) that the soil removal effect increased with a decrease in pH of the acidic cleaning agent. Thus, the process of Claim 1 at issue (with the sequence alkaline/acidic/alkaline) differed from the closest process embodiment disclosed in D6 only in that the particular pH sequence of the cleaning steps was reversed. However, the patent in suit contained no evidence of a technical effect attributable to this difference.

No other difference was apparent. The alleged, different, use of an acidic "washing" solution was not even in Claim 1, which simply required the spraying on the tableware of an acidic composition. In fact, the examples of the patent in suit, in particular Example 2, showed that the three baths (all) had alkaline pH.

The technical problem solved by the claimed process thus merely consisted in the provision of a further machine dishwashing process.

In the absence of proof for the contrary, the pH sequence of claim 1 was "arbitrary". The burden of proof to show that it was not lay with the Patent Proprietor but had not been discharged. Moreover D6 already taught using a reduced alkaline (mild alkaline

cleaning) and also taught a sequence of cleaning step with a change in the pH values. Since D6 taught that applying a sequence of pH-changes was good for cleaning soiled dishes, the question was not "why the skilled person would have modified the sequence disclosed in D6 to arrive at the one claimed", but rather "why would he not modify the sequence of D6 in order to provide a further process". Hence, the skilled person would obviously come up to a process with a sequence as claimed.

XIII. The relevant counter-arguments of the Respondent can be summarised as follows:

D6 indeed represented the closest prior art. However, it did not relate to soil removal from dishes, but rather with providing dishes with a soil release effect. Accordingly, in the embodiment described in Example 2 of D6, dishes were subjected to an alkaline washing step, followed by an acidic rinse step providing a soil release effect, and the effectiveness of the treatment was tested (in terms of adhered starch residues) with various rinsing agents (from neutral to strongly acidic).

The description passage on page 17 of D6 did not refer to a process comprising an acidic/alkaline/acidic cleaning sequence. It was apparent from D6 (page 1, lines 11-16 and 18-22), that the treatment in the pre-wash zone was alkaline, as the cleaning ingredient used was an alkaline agent. According to D6, apart from the final rinse step, every other cleaning step was alkaline. This was also confirmed by the indication, on page 17 of D6, that by the introduction of the (implicitly acidic) rinse water "into the pre-wash zone", "a pH gradient is created over the wash tanks",

and that "more neutral pH conditions resulting from the introduction of acid post-wash rinse composition into the pre-wash zone". Hence, even taking into account page 17 of D6, this document did not disclose or suggest an acidic/alkaline/acidic cleaning sequence, the pre-wash being at most neutral. Therefore, the totally different sequence of cleaning steps according to Claim 1 at issue could not be qualified as arbitrary. D6 did not incite the skilled person to apply an acidic cleaning step in the wash zone or step. The claimed process was, therefore, not obvious to the skilled person.

Reasons for the Decision

Main Request - Inventive step

1. The invention

The present invention concerns a continuous or discontinuous process of machine dishwashing for cleaning tableware or other surfaces soiled with food remains (patent, paragraph [0001]).

2. The closest prior art

2.1 It is common ground between the parties that D6 discloses the closest prior art. Considering the similarities between the patent in suit and D6 in terms of technical problems addressed and dishwashing methods described, the Board has no reasons to take a different stance.

2.2 The Appellant considered that the process according to Example 2 of D6, read together with the more general

indications on page 17 concerning the so-called "bypass process", was the embodiment of D6 coming closest to a process according to Claim 1 at issue, i.e. the most appropriate starting point for the assessment of inventive step. D6 allegedly only differed from the process of Claim 1 at issue in that it comprised an acidic/alkaline/acidic cleaning sequence instead of an alkaline/acidic/alkaline cleaning sequence.

2.3 Although the Board can accept that a combined reading of Example 2 with the information on page 17 discloses a process comprising a cleaning sequence including a first pre-wash step, followed by an alkaline cleaning step and then an acidic rinse step, the Board holds that a pH sequence **acidic**/alkaline/acidic is not directly and unambiguously disclosed in D6, as apparent from the following analysis of the contents of D6:

2.3.1 D6 (see claim 8) is directed to "a method of warewashing in a mechanical warewashing machine, comprising the steps of (emphasis added by the Board):
(1) formulating at least 2 separate components of a chemical cleaning system for aqueous dissolution or dilution to respective use concentrations, a first component comprising a cleaning agent and an alkaline agent for obtaining a neutral or mildly alkaline use concentration, and a second component comprising an acid agent for obtaining an acidic use concentration having a pH of at most 6.0;
(2) **introducing the first component into a wash zone or step to clean dirty dishware;**
(3) **introducing the second component into a post-wash rinse zone or step to obtain a soil release effect,**

wherein said method is carried out in a multi-tank or in a single-tank institutional mechanical warewashing machine."

- 2.3.2 Example 2 of D6 (pages 19-21) describes the cleaning of soiled dishes in 10 soiling/cleaning cycles, with an aqueous, mildly alkaline cleaning solution (pH 10), followed by rinsing the dishes with solutions comprising one of three different rinse aids, comprising wetting and anti-foaming nonionics, and different levels of citric acid (page 20, lines 19-24), the rinse solutions having, correspondingly pH values of 7, 4 and 3, respectively.

For the Board, Example 2 *per se* thus merely illustrates an alkaline/acidic sequence of washing/rinsing in accordance with Claim 8 of D6.

- 2.3.3 On page 17 of D6, the drafter of this document first recalls (lines 1 to 6) the zones usually present in a (continuous) conveyor-type system ("pre-wash", "wash", "post-wash", "rinse", "drying") and that "wash water is introduced into the post-wash zone and is passed cascade-fashion back toward the pre-wash zone while the dishware is transported in a counter current direction". Then, in lines 6 to 15, it is indicated that "[i]n an alternative (so called "bypass") process, this rinse water is introduced into the pre-wash zone. It may be attractive to combine this 'bypass' process with the method of the present invention, because in this way a pH-gradient is created over the wash tanks, which is likely to lead to more optimal conditions for soil removal. For instance, enzymes - when present in the first component - can become more active at the more neutral pH-conditions resulting from the introduction of acid post-wash rinse composition into

the pre-wash zone."

- 2.3.4 According to the Appellant, the indication "more neutral pH-conditions" in D6 meant acidic conditions, or in any case was the result of applying an acidic composition. Hence, the combined teaching of Example 2 and the preferred "by-pass" process mentioned on page 17 of D6 amounted to the disclosure of a process with an acidic/alkaline/acidic pH sequence.

It is to be noted, however, that the introduction of the acid post-wash rinse composition into the pre-wash zone as described, likely to lead to more optimal conditions for soil removal using enzymes, is merely stated to lead to "more neutral" pH-conditions.

- 2.3.5 In this connection the Respondent also argued that in the context of a pre-wash zone of a continuously operated dishwasher (as referred to in lines 1 to 6 of the same paragraph), where an alkaline cleaning agent is usually sprayed onto the tableware, "more neutral" could only mean "less alkaline", but certainly not "acidic".

The Board notes, in this respect, that D6 is indeed silent as regards the question whether the acidic rinse water is led into a tank comprising the pre-wash composition or is directly sprayed onto the dishes.

- 2.3.6 Hence, for the Board, in D6, the expression "more neutral pH conditions" is ambiguous as to the effective pH of the treatment carried out in the pre-wash zone, and the entire paragraph in question does not constitute a direct and unambiguous disclosure of a step of "*applying an acidic cleaning solution ... to the at least partly soiled tableware*", followed by a

step of treating the tableware with an alkaline cleaning solution, and then a final rinse, as required by Claim 1 at issue.

Consequently, the quoted passages of page 17 of D6, even when read in combination with claim 8 or example 2, do not directly and unambiguously disclose a cleaning sequence comprising the application of alkaline/acidic/alkaline cleaning compositions before the final rinse of the table ware.

3. The technical problem

3.1 The Appellant argued that in the light of the disclosure of D6, the technical problem could only be seen in providing an alternative or further dishwashing process.

3.2 In the absence of a direct comparison, in terms of cleaning results achieved, between a process according to D6 (not acknowledged as prior art in the application as filed) and the process according to Claim 1 at issue, the Board adopts, in the following, this formulation of the technical problem also retained in the decision under appeal.

4. The solution

The patent in the amended version held allowable by the Opposition Division proposes to solve the technical problem posed by the "*process for continuous or discontinuous machine dishwashing*" according to Claim 1, which is characterized in that it comprises, *inter alia*, "*applying an acidic aqueous cleaning solution before the final rinse cycle or the final rinse zone*" and

"the alkaline treatment taking place before and after the acidic treatment".

5. The success of the solution

It is not in dispute that the least ambitious technical problem of providing a further machine dishwashing process is effectively solved by the process of Claim 1 at issue.

6. Obviousness

6.1 Hence, it remains to be decided whether the claimed solution was obvious to the skilled person having regard to the state of the art, i.e. whether in the light of D6 the skilled person seeking to solve the technical problem posed was induced to modify the process of D6 such as to arrive at a process falling within the ambit of Claim 1.

6.2 According to the Appellant, D6 disclosed a dishwashing process comprising an acidic/alkaline/acidic cleaning sequence and thus taught to change the pH in the course of the process. Absent some evidence for an improvement the modifications that had to be made to the process of D6 were "arbitrary".

The Board does not accept these views for the following reasons.

6.2.1 The Appellant's line of argument, according to which the person skilled in the art would obviously consider switching from the acidic/alkaline/acidic of D6 to the reversed alkaline/acidic/alkaline sequence according to Claim 1 at issue cannot possibly succeed, since the

former is not disclosed in D6, as explained under point 2.3 *et seq.*

- 6.3 However, even assuming *arguendo* that D6 disclosed a process with an acidic treatment in the pre-wash zone, i.e. an acidic/alkaline/acidic sequence, the Appellant did not convince the Board that the skilled person would obviously consider reversing the sequence of steps to an alkaline/acidic/alkaline sequence. A change in pH is of course *de facto* occurring when the process of D6 is carried out, but there is no general teaching in D6 that a repeated change of the pH in the course of machine dishwashing would generally be beneficial.
- 6.4 For the sake of completeness, the Board also holds that, irrespective of whether the process of Example 2, the "by-pass"-process of page 17 or a combination of the two is taken as the starting point in D6, there is nothing in this document suggesting to intercalate an acidic step between two alkaline steps, all these steps preceding a final rinse step, or to apply a further alkaline step after treating the dishes with the acidic "second component in the post-wash rinse zone or step" according to D6 (claim 8).
- 6.5 In the Board's judgement, it was thus not obvious to the skilled person considering the contents of D6, to modify any process described therein in a manner leading to a process falling within the ambit of Claim 1 at issue.
- 6.6 The Appellant also referred to common general knowledge but did not indicate, let alone corroborate by suitable evidence, which specific element of common general knowledge would induce the skilled person to come up with a process as claimed.

6.7 Considering that the modification of the known processes of D6 required to arrive at a process according to Claim 1 at issue, which solves a technical problem (see 5, *supra*), is not obvious in the light of the prior art cited and common general knowledge, it is not apparent why it should be considered as arbitrary, as alleged by the Appellant.

6.8 Therefore, the Board concludes, that the subject-matter of Claim 1 at issue and, consequently, the subject-matters of dependent claims 2 to 14 involve an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



D. Magliano

B. Czech

Decision electronically authenticated