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D E C I S I O N
of 13 December 2005

Case Number: T 0951/03 - 3.3.05

Application Number: 98923956.1

Publication Number: 0986517

IPC: C02F 1/50

Language of the proceedings: EN

Title of invention:
Method of disinfecting water and food stuff preservation with iodine species

Applicant:
Iosolutions Incorporated

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty (no, main request)"
"Inventive step (no, auxiliary request)"

Decisions cited:
-

Catchword:
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Case Number: T 0951/03 - 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 13 December 2005

Appellant: Iosolution Incorporated
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 27 March 2003 refusing European application No. 98923956.1 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: M. Eberhard
Members: H. Engl
J. Willems

Summary of Facts and Submissions

I. This appeal lies from the decision of the examining division posted on 27 March 2003 refusing European patent application No. 98923956.1.

II. The decision was based on two sets of claims in accordance with a main and an auxiliary request, both filed with letter of 20 January 2003. An amended version of claim 1 of the main request was additionally indicated in said letter (page 1, second paragraph). This claim 1 is referred to hereinafter as first auxiliary request and claims 1 to 9 of the auxiliary request as second auxiliary request.

The independent claim of the main request reads as follows:

"1. A method for producing bacteria-free water containing iodine species under continuous dynamic water flow, comprising the steps of

(a) selecting a predetermined temperature;

(b) heating a first water flow to said predetermined temperature;

(c) providing solid iodine;

(d) passing said first water flow at a first flow rate through said solid iodine to dissolve said solid iodine into said first water flow to produce a saturated aqueous solution containing iodine species at said predetermined temperature, and

(e) blending said saturated solution with a second water flow to produce a diluted iodine species bacterium-free aqueous solution

characterized in that said dissolution of said solid iodine into said first water flow is carried out in an iodine generator (36; 38) comprising
a housing (41a; 41b) retaining said solid iodine and passing said first water flow through said housing, and
heating means (30b; 30c) for heating said first water flow to said predetermined temperature."

Claim 1 of the first auxiliary request (AR1) is based on claim 1 of the main request but with the characterising part reading as indicated in the letter of 20 January 2003, namely:

" … characterized in that said dissolution of said solid iodine into said first water flow is carried out in an iodine generator comprising a housing retaining said solid iodine and passing said first water flow through said housing, and heating means **provided in the housing** for heating said first water flow to said predetermined temperature."

(Bold print added by the Board and representing the amendments with respect to claim 1 of the main request).

Claim 1 of the second auxiliary request reads as follows:

"1. A method for producing bacteria-free water containing iodine species under continuous dynamic water flow, comprising the steps of
(a) selecting a predetermined temperature;

(b) heating a first water flow to said predetermined temperature;

(c) providing solid iodine;

(d) passing said first water flow at a first flow rate through said solid iodine to dissolve said solid iodine into said first water flow to produce a saturated aqueous solution containing iodine species at said predetermined temperature, and

(e) blending said saturated solution with a second water flow to produce a diluted iodine species bacterium-free aqueous solution

characterized in that said dissolution of said solid iodine into said first water flow is carried out in an iodine generator (36;38) comprising

a housing (41a; 41b) retaining said solid iodine and passing said first water flow through said housing, and

heating means (30b; 30c) provided in the housing for heating said first water flow to said predetermined temperature as it passes through said iodine generator."

III. The examining division rejected claim 1 of the main request on the ground of lack of novelty having regard to document D1: US A 4 555 347. According to the contested decision, said document already disclosed a method for producing bacteria - free water containing iodine species under continuous dynamic water flow comprising the process steps (c), (d) and (e) of claim 1. The first water stream was heated to a higher temperature by mixing with a hot water stream. The term "predetermined" was undetermined and could not establish novelty of the claimed method over D1. The characterising portion of claim 1 was disclosed in

Figure 6 of D1. Therefore, claim 1 of the main request lacked novelty. The claims of both auxiliary requests lacked an inventive step, because the feature of providing the heating means in the housing retaining the iodine cannot solve the problem of the application as defined by the applicant, namely that the exact concentration of iodine leaving the iodine reservoir of D1 could not be known. The same objection applied to the feature defining the heating of the water taking place as it passes through the iodine generator.

IV. Against this decision, an appeal was filed on 20 May 2003 and grounds of appeal were submitted with letter of 4 August 2003 together with two sets of claims. These sets of claims are identical to those of the main request and the second auxiliary request as filed during examination procedure with letter of 20 January 2003.

V. The appellant's arguments were essentially as follows:

Valve 92 (Figure 6 of D1) described in D1 as a "temperature control valve" has been interpreted, wrongly and with hindsight, as a "heating means" within the meaning of the instant application. However, in the appellant's submission, said valve 92 is a simple manual control valve by which the temperature of a mixture of water can be set for specific conditions. Consequently, D1 would not disclose controlling of the temperature of the first water flow, but merely allow to adjust valve 92 to another setting for obtaining another concentration of iodine in water.

Moreover, the appellant argued that said valve would not "heat" what is the "first flow of water" in accordance with the application. In his view, said "first flow of water" in D1 starts only after valve (92). Consequently, even if valve (92) were considered to be a heating means, said means would not heat the "first flow of water" as called for in claim 1 of the main request.

Because of the lack of a heating means dedicated to the heating of the first water flow, D1 would not be anticipatory of any of the claims on file. The claimed subject matter would also involve inventive activity, since D1 did not suggest the flexible control of the water temperature necessary for keeping the iodine concentration within limits.

Concerning the auxiliary requests, the appellant contested that the heating means could obviously be included in the generator housing. This solves the problem of providing a saturated aqueous solution of iodine species at the predetermined temperature, as selected and desired by the operator (grounds of appeal, page 5, first paragraph). Placing the heating means in the generator ensures a more accurate way of heating and reduced the chance of heat loss from the first flow of water before it can reach the generator. Such would not be taught in D1.

The appellant furthermore stressed that, in his view, the features of claim 3 of the main request relating to temperature measuring and control means, had considerable additional inventive merit, because it would have needed substantial modifying of the known

method and apparatus to include a sensor and control circuit.

VI. In a communication annexed to the summons to oral proceedings, the Board informed the appellant that claim 1 of the main request was considered to lack novelty having regard to D1. Reasons were also given as to why the subject matter of the independent claims of the auxiliary requests, as well as a possible combination of claims 1 and 3 of the second auxiliary request were considered to lack an inventive step.

VII. With letter of 25 October 2005, the appellant informed the Board of his intention not to attend the oral proceedings; he requested that the appeal procedure be continued in writing. He filed a further auxiliary request No. 3 consisting of 8 claims, and pages 6a, 6b of an adapted description. Claim 1 thereof includes the features of claim 3 of the main request.

Claim 1 of said third auxiliary request reads as follows:

"1. A method for producing bacteria-free water containing iodine species under continuous dynamic water flow, comprising the steps of

(a) selecting a predetermined temperature;

(b) heating a first water flow to said predetermined temperature;

(c) providing solid iodine;

(d) passing said first water flow at a first flow rate through said solid iodine to dissolve said solid iodine into said first water flow to produce a

saturated aqueous solution containing iodine species at said predetermined temperature, and

(e) blending said saturated solution with a second water flow to produce a diluted iodine species bacterium-free aqueous solution,

the dissolution of said solid iodine into said first water flow is carried out in an iodine generator (36;38) comprising

a housing (41a; 41b) retaining said solid iodine and passing said first water flow through said housing; and

heating means (30b; 30c) for heating said first water flow to said predetermined temperature as it passes through said iodine generator,

characterized in that said method further includes the steps of

measuring the temperature of said first water flow by temperature measuring sensing means to determine the temperature of said first water flow; and

raising the temperature of said first water flow by said heating means in consequence of said temperature measurement to heat said first water flow to said predetermined temperature."

The appellant also submitted additional arguments in support of the third auxiliary request which may be summarized as follows:

D1 would disclose neither measuring the temperature of the first water flow by sensing means nor raising the temperature of the first water flow in response to said temperature measurement. Claim 1 of the third auxiliary request was therefore novel. The method of D1 suffered from the problem that there was no feedback or

monitoring system to determine the temperature of the water flow through the iodine container and then to adjust the temperature accordingly. Therefore, an accurate concentration of iodine leaving the container could not be calculated in D1. The appellant argued that said problem was solved by claim 1 of the third auxiliary request which provided a substantially more accurate and finely tuned method for achieving a desired iodine concentration in a water supply. The appellant maintained that the use of temperature control for the dissolving water could have been considered an obvious measure only with hindsight in the absence of evidence available to suggest that it was an obvious step in the technical field in question. Similarly, the components used to achieve the temperature sensing and control means and provided for in the method and technical field as defined in the third auxiliary request were unobvious, except with hindsight. In the appellant's view, D1 taken as a whole would not teach to measure the temperature of a water flow using temperature sensing means. Claim 6 of D1 should be read in the context of said document referring to said valve as a "temperature control valve", which amounted to no more than a valve that controls the mixing of hot and cold water.

VIII. The appellant requested in writing that the decision under appeal be set aside and that a patent be granted on the basis of the main request (claims 1 to 9) filed with letter of 4 August 2003; or, alternatively, a first auxiliary request as requested with letter of 20 January 2003, wherein claim 1 of the main request is amended to read:

" … characterized in that said dissolution of said solid iodine into said first water flow is carried out in an iodine generator comprising
a housing retaining said solid iodine and passing said first water flow through said housing, and heating means provided in the housing for heating said first water flow to said predetermined temperature.";

or, more alternatively, on the basis of a second auxiliary request, filed as Appendix B with letter of 4 August 2003 or a third auxiliary request as filed with letter of 25 October 2005.

Moreover, he requested the continuation of the appeal procedure in writing and a reimbursement of the appeal fee.

IX. Oral proceedings took place on 13 December 2005 in the absence of the appellant. After deliberation, the decision was announced to dismiss the appeal and to refuse the additional requests.

Reasons for the Decision

1. *Novelty*

1.1 Claim 1 of the main request is not novel having regard to D1. Said document discloses a method for producing a saturated solution of iodine in a water stream comprising controlling the temperature of the water entering the iodine dissolving container (see claims 1 and 6; Figures 1 to 3; column 4, lines 22 to 24;

column 5, lines 31 to 44). As already observed in the contested decision, point 1.1. (ii), the dispenser of Figure 6 is described as functioning in the same manner as the dispenser of Figures 2 and 3, i.e. it produces a saturated solution of iodine. More specifically, there is disclosed in Figure 6 and in the description, column 6, lines 64 to column 7, line 10, an apparatus for carrying out the method including a temperature control valve (92) for mixing hot and cold water streams (94, 98) to give a water flow mixture (90) entering the iodine dispenser (24). The cold water flow through line (98), which represents a "first water flow", is thus heated to a predetermined temperature by addition of the hot water stream flowing through line (94) connected to the temperature control valve (92). This constitutes "heating means for heating a first flow of water (cold water through line (98)) to a predetermined temperature" within the meaning of claim 1 of the main request. Operating the apparatus described in D1, by setting mixing valve 92 to a desired mixing ratio and thereby selecting a predetermined temperature, and passing the heated flow of water through the iodine dispenser 24, followed by blending the saturated solution of iodine in water with a second water stream results in a process as claimed in claim 1 of the main request.

The appellant's arguments in the grounds of appeal, in particular on page 2, last paragraph, cannot convince the Board. In the appellant's interpretation of D1, the "first flow" of water starts after valve (92). Consequently, even if valve (92) were to be considered to be heating means, they would not heat the first flow of water in accordance with the claimed method.

However, there is no basis in D1 for this interpretation. The Board finds it logical to define the first water flow as starting from the branching point of line 98 with the main cold water inflow pipe 100 because this is the point where a separate stream of water appears. Comparison of Figure 6 of D1 with Figure 1 of the application in suit reveals that this stream corresponds to the first water stream 16 in accordance with the application, branching from main line 14 and flowing to the iodine generator assembly 15. As can be seen in Figure 6 of D1, this "first water flow" in D1 includes mixing valve 92 and thus comprises "heating means".

The main request is therefore rejected (Article 54 EPC, lack of novelty of claim 1).

1.2 Apparently, as the heating means shown in D1 are not located within the housing of the iodine dispenser, the claims of the auxiliary requests are novel over D1.

2. *Inventive step (Auxiliary requests 1 to 3)*

2.1 The Board considers D1 to represent the closest prior art. In view of the Appellant's comments in the Grounds of Appeal and in view of the statements in the description (paragraph bridging pages 7 and 8; page 17, second paragraph; paragraph bridging pages 20 and 21), the technical problem underlying the claimed method can be seen in producing an aqueous iodine solution of constant, predetermined concentration irrespective of variations in the temperature of the water supply or of temperature fluctuations within the installation

environment itself, as selected and desired by the operator.

2.2 *Auxiliary requests 1 and 2*

In accordance with claim 1 of the auxiliary requests 1 and 2 it is proposed to solve this problem by heating means for the first water flow which are located in the housing of the iodine generator itself, thereby heating the water stream to a predetermined temperature as it passes through the iodine generator(s) (auxiliary request 2). The Board has doubts whether this problem has been actually solved by the claimed processes, since the independent claims do not define any temperature sensing or control means. It is doubtful that the mere provision of "heating means (30b; 30c) for heating a first flow of water to a predetermined temperature" would be able to compensate for temperature variations and thus to result in the desired constant iodine concentration.

However, even assuming in favour of the appellant that the above defined problem has been solved by the features of the claims, the solution does not involve an inventive step, for the following reasons. D1 already teaches to control the temperature of the water being introduced into the iodine generator (see claim 6), i.e. the temperature of the water which passes through said generator. This is achieved by means of a temperature control valve (92) which provides a predetermined flow mixture of hot and cold water which will affect the solubility and the dissolution rate of the solid iodine in the iodine generator, a warmer mixture increasing the amount of

iodine taken up by the water in the dispenser (see column 7, lines 3 to 11). The solubility of iodine in water is, like the solubility of most substances, known to be markedly temperature - dependant; this is also reported in D1 (column 1, lines 38 to 43). Thus the temperature of the water introduced into the generator is controlled by the amount of hot water added. Adding hot water to cold water to raise the temperature of the latter is a kind of heating means. It is also evident that - due to this temperature dependency - the concentration of I_2 in the water can be determined and pre-selected by the operator by selecting the temperature of the water stream entering or passing through the iodine generator.

Therefore, the skilled person confronted with the technical problem stated above, in particular with the problem of producing a water stream having a constant predetermined concentration of iodine, would realise that controlling the temperature of the water within the generator itself instead of before it would avoid possible heat loss of the first flow of water before it reaches the generator and minimize fluctuations in the temperature of the water as it passes through the solid iodine. The appellant did not submit arguments that the claimed position of the heater brings about any benefits other than the above, nor are such effects or advantages immediately apparent from the description. Therefore, placing the heating means inside the generator is an obvious design modification in view of the problem posed.

Consequently, the independent claims of the first and second auxiliary requests do not involve an inventive step and are not allowable (Article 56 EPC).

2.3 *Third auxiliary request*

Claim 1 of this request incorporates the features of claim 3 of the second auxiliary request (temperature measuring means and control means) into claim 1 thereof, with the feature "provided in the housing" being deleted. However, as already pointed out in the Board's communication, such temperature sensing and control means are part of the typical process design for maintaining the temperature of a fluid stream at a predetermined level. In particular, a temperature sensor such as a thermocouple, a temperature controller programmable to a pre-set set point and one or more heating elements co-operating with said controller, as described in the description, page 18, line 20 to page 19, line 17 and in Figure 1, were conventional in the art of process technology before the priority date. It is evident that temperature measuring means in combination with feedback to the heating means would allow still better control of the temperature of the water stream, and, by consequence, of the desired concentration of iodine.

Therefore, in view of the technical problem defined under point 2.1. above, it is obvious to provide temperature sensing and control means as defined in claim 1 of the third auxiliary request. This is all the more so in view of the teaching in D1 (see claim 6) to control the temperature of the water entering the iodine container.

The appellant has argued that the valve (92) disclosed in D1 did not constitute a temperature control valve, but a mixing valve for hot and cold water. No measuring and control of temperature could be derived from this. This argument cannot, however, be accepted because claim 6 of D1 - as was already mentioned in the Annex to the summons for oral proceedings - clearly and unambiguously discloses the concept of controlling the temperature of the water entering the iodine container. The necessity of controlling the water temperature is also in agreement with the passages in D1 at column 7, lines 3 to 11, disclosing the reasons therefor, namely the temperature dependence of the solubility of iodine in water.

The Board cannot follow the appellant's argument that the provision of temperature sensing and control circuit would require considerable modifications of the apparatus known from D1 which would render the claims non - obvious. It is true that implementation of a temperature measuring and control system requires additional circuitry. However, as already indicated above and in the Board's communication, the necessary components, such as a thermocouple, a temperature controller and heating elements co-operating with said controller were conventional in the art of process technology. Therefore, the use of such well-known components in the present technical field is obvious to the skilled person confronted with the problem stated above. The Board further observes that claim 1 mainly indicates the presence of temperature measuring sensing means without defining any control equipment associated therewith. Thus if the appellant made use of

sophisticated control equipments in its method, they are in any case not stated in the claim and thus cannot support the presence of an inventive step. Claim 1 of the third auxiliary request therefore lacks an inventive step and is not allowable, either (Article 56 EPC).

3. The appellant requested in his last letter of 25 October 2005 that the procedure be continued in writing. However, no reasons were given for this request. Clearly, re-entering the written procedure after oral proceedings (held at the appellant's own request) would delay the taking of a decision, which is contrary to the interests of the public. For these reasons, the Board cannot accede to this request.

The Appellant furthermore requested refund of the appeal fee. Rule 67 EPC stipulates that a refund can be ordered only if the appeal is allowed and if such reimbursement is equitable by reason of a substantial procedural violation. Since the appeal is dismissed, a refund cannot be ordered for that reason alone.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

2. The request for continuation of the proceedings in writing is refused.

3. The request for reimbursement of the appeal fee is refused.

The Registrar: The Chairman:

A. Wallrodt M. Eberhard