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Aktenzeichen / Case Number / N° du recours : T 151/87 . 3.3.1

Anmeldenummer / Filing No / N° de la demande : 84 901 632.4

Veröffentlichungs-Nr. / Publication No / N° de la publication : WO 84/03880

Bezeichnung der Erfindung: Apparatus for destroying microorganisms
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : C 02 F 1/32

## ENTSCHEIDUNG / DECISION

vom / of / du 20 January 1989

Anmelder / Applicant / Demandeur : L.P. Larsson AB

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence : Destroying microorganisms/Larsson

EPÜ / EPC / CBE Article 56

Schlagwort / Keyword / Mot clé : "Inventive step (confirmed)"

**Leitsatz / Headnote / Sommaire**

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Case Number : T 151/87 - 3.3.1

# D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 20 January 1989

Appellant : L.P. Larsson AB
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Representative : Kierkegaard, Lars-Olav
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Decision under appeal : Decision of Examining Division 026 of the European Patent Office dated 9 February 1987 refusing European patent application No. 84 901 632.4 pursuant to Article 97(1) EPC

Composition of the Board :

Chairman : K.J. A. Jahn
Members : R.W. Andrews
C.V. Payradeau

## Summary of Facts and Submissions

I. European patent application No. 84 901 632.4, claiming priority of 30 March 1983 from a prior application filed in Sweden, was filed under the Patent Cooperation Treaty on 29 March 1984 under application No. PCT/SE 84/00116 (Publication No. WO 84/03880). The decision of the Examining Division 026 of the European Patent Office dated 9 February 1987 to refuse the application was based on the claim filed on 4 March 1986.

II. The stated ground for the refusal was that the subject-matter of this claim, which was also considered to be unacceptable under Rule 29 1(a) and (b) EPC, did not involve an inventive step in the light of the disclosure in FR-A-1 278 161 (2) and FR-A-1 359 259 (3). The Examining Division considered that the essential difference between the disclosure of document (2) and the present apparatus was that, instead of the longitudinal baffles inducing a flow lengthwise up and down the UV lamp, in document (2) the baffles direct the flow around the UV lamp and that this was not a patentable distinction. The Examining Division contended that the skilled person faced with the technical problem of sterilising fluids using UV light is aware that, to ensure efficient sterilisation, the fluid must be agitated and brought as close to the UV lamp for as long as possible. Therefore, in the light of the disclosure of documents (2) and (3) the skilled person faced with this problem would arrive at the present apparatus without the exercise of inventive skill.

III. A notice of appeal together with the grounds therefor were filed on 23 March 1987 and the prescribed fee duly

paid. A claim, redrafted in a manner to overcome the objection under Rule 29 1(a) and (b) EPC, was also filed.

In these grounds the Appellant argued that the presently claimed apparatus was designed to provide the maximal flow path and favourable flow characteristics of the bacteria containing medium by means of stationary baffles and a unique arrangement of openings connecting the minor chambers defined by said walls. The Appellant contended that document (2), which discloses an apparatus design to facilitate turbulance of the liquid during its passage through it, would not have provided any guidance to the inventor of the present apparatus.

With respect to document (3) the Appellant submitted that the constructional features of the apparatus described therein are so different from conventional devices using several baffles to create a horizontal meandering flow path that its teaching would not provide any incentive to the skilled person seeking to improve such conventional devices.

IV. With a reply dated 10 October 1988 to a communication of the Board of Appeal the Appellant filed an amended claim and amended pages 1 and 1a of the description.

The Appellant requests that the decision under appeal be set aside and a patent be granted on the basis of the amended claim filed on 13 October 1988. The present claim reads as follows:

"Apparatus for destroying microorganisms in a bacteria-containing medium by treating said medium with ultra-violet radiation, in which apparatus said medium is passed from an inlet (11) in an irradiation chamber (1), past an elongated UV-lamp (5), to an outlet (12), wherein

the irradiation chamber (1) is divided into a plurality of mutually co-acting minor chambers (A-E) by partition walls (6-10) spaced around the UV-lamp and extended in the lengthwise direction over the whole length of the irradiation chamber (1), said partition walls being sealingly connected to the walls (1', 2, 3) of the irradiation chamber,
openings (14, 15) are provided in the partition walls (6-10) between co-acting minor chambers (A-E) in the radially innermost part of the respective wall near the UV-lamp (5), which openings (14, 15) alternatively are located in the upper and lower end sections of said walls thereby successively connecting said minor chambers (A-E) to each other, said inlet (11) and outlet (12) of the irradiation chamber are located in adjacent minor chambers (A, E), the minor chamber (A) containing the inlet (11) and the minor chamber (E) containing the outlet (12) being unconnected due to the absence of such an opening (14, 15) in the partition wall (10) which separates those two minor chambers (A, E)."

Reasons for the Decision

1. The appeal is admissible.

2. There are no formal objections to the present claim since it is adequately supported by the original disclosure. Thus, the insertion of the term "elongated" to qualify the UV lamp is justified on the basis of page 2 lines 14 to 26 and Figures 1 and 3 of the drawings. The features relating to the partition walls, the openings provided therein and the location of the said openings, insofar as these were not referred to in Claim 1 as filed, are supported by the disclosure on page 3, lines 1 to 8 and 16 to 27 and Figures 1 and 3 of the drawings. The requirement that the

minor chamber containing the inlet and the one containing the outlet are not connected is disclosed on page 3, lines 25 to 27 of the published patent application.

3. The application relates to a steriliser in which a bacteria containing fluid is exposed to ultraviolet radiation. Document (3), which in the opinion of the Board represents the closest prior art, describes a steriliser in which the water to be sterilised is exposed to ultraviolet radiation while moving in an upward and downward direction along the length of the source of radiation. It is also generally known in the art that efficient sterilisation depends upon the fluid to be sterilised being adequately agitated and being exposed to the ultraviolet radiation for as long as possible.

In the light of this prior art the technical problem underlying the application may be seen in improving this known steriliser by providing an apparatus of improved efficiency with respect to the exposure of the fluid to ultraviolet radiation without any complicated constructional requirements.

According to the disputed patent this technical problem is essentially solved by a steriliser in which the irradiation chamber is divided into a number of smaller chambers by partition walls arranged around an elongated UV lamp. These walls extend the whole length of the chamber and are sealed to its end and side walls. In order to connect these smaller chambers with each other openings are alternatively located in the upper and lower end section of the walls, near to the said UV lamp. However, there is no opening in the partition walls which separates the two smaller chambers containing the inlet and outlet respectively.

In view of the fact that in the present steriliser the fluid to be sterilised is adequately agitated and travels, for example five times along the length of the UV lamp, whereas in the prior art apparatus it only moves twice in front of the UV source, the Board is satisfied that the above-defined technical problem is plausibly solved.

After examination of the cited prior art the Board has reached the conclusion that this technical teaching is not disclosed and the claimed subject-matter is, therefore, novel. Since novelty is no longer disputed it is not necessary to consider this matter in detail.

Document (3) discloses a water steriliser comprising an outer tube provided with an inlet for the water to be sterilised at its lower end and which contains sources of ultraviolet radiation enclosed in tubes transparent to ultraviolet radiation. The sterilised water leaves the apparatus via a further tube which is at least partially transparent to ultraviolet radiation and which extends the whole length of the outer tube and emerges from the bottom of said outer tube. The water enters this tube through holes located near the top of the tube. Turbulence in the ascending water may be created by placing an obstacle in its path (c.f. Résumé 1a and b, 2a and g), such as, for example, the sealed ends of the tubes in which the ultraviolet sources are enclosed (cf. left-hand column of page 2, lines 8 to 14). Thus, in this known steriliser the water is not only exposed to ultraviolet radiation as it is forced to rise in the outer tube, but also during its passage through the tube leading to the outlet.

From this document the skilled person would realise that a solution to the problem underlying the application could be found in ensuring that the fluid to be sterilised flows several times back and forth along the source of

ultraviolet radiation. However, the teaching of this document does not provide the skilled person with any indication of the necessary constructional features required to further extend the flow path of the fluid within a given space.

Document (2) describes a steriliser comprising an elongated UV lamp disposed in a tube. Turbulence in the fluid during its upward passage in the annular space between the UV lamp and the tube wall is created by adjusting the angle of the fluid injector to an appropriate value and by means of a helical piece, a chicane device or a combination of these elements (cf. Résumé, No. 1, 2c and d in combination with Figures 1 and 3). According to the second complete paragraph in the left-hand column of page 2 of this document the displacement of the helical piece or the chicane device is limited and dampened by means of washer plates attached to floats. Thus, it would be evident to the skilled person that the sole purpose of the above-mentioned means is to ensure the efficient agitation of the liquid during its exposure to the ultraviolet radiation.

Therefore, the teachings of this document, in particular the use of baffles vertically arranged round a UV lamp in a zig-zag relationship to each other to cause the fluid to flow around the UV lamp, would not provide the skilled person with any guidance which would enable him to modify the steriliser disclosed in document (3) in order to improve its efficiency with respect to the exposure of the fluid to be sterilised to the ultraviolet radiation.

In the Board's judgement the skilled person could not have deduced from the cited prior art that the solution to the technical problem underlying the application lay in dividing the main radiation chamber into smaller chambers

by means of longitudinal partition walls which are sealed to the wall and ends of the main chamber and in connecting all but two of these smaller chambers by means of openings located in certain specified areas of the partition walls. Therefore, the claimed subject-matter involves an inventive step.

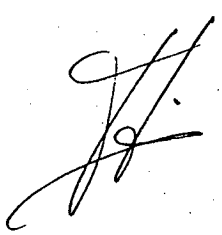
**Order**

**For these reasons, it is decided that:**

1. The decision under appeal is set aside.

2. The case is remitted to the Examining Division with the order to grant a patent on the basis of the claim and pages 1 and 1a filed on 13 October 1988, original page 2 in which the first six lines and the words "vessel 1, the cylinder wall 1' of which is sealed" in line 7 have been deleted, and original pages 3 to 6 and Figures 1 to 3.

The Registrar



The Chairman