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**D E C I S I O N**  
of 26 January 2005

**Case Number:** T 0422/99 - 3.3.9

**Application Number:** 93200192.8

**Publication Number:** 0553926

**IPC:** A61L 2/06

**Language of the proceedings:** EN

**Title of invention:**  
Method of terminal steam sterilization

**Patentee:**  
NYCOMED IMAGING AS

**Opponent:**  
Schering Aktiengesellschaft  
Berlin und Bergkamen

**Headword:**  
-

**Relevant legal provisions:**  
EPC Art. 83

**Keyword:**  
"Sufficiency of disclosure (no) - undue burden"

**Decisions cited:**  
T 0629/90, T 0226/85

**Catchword:**  
-



Case Number: T 0422/99 - 3.3.9

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.9  
of 26 January 2005

**Appellant:** NYCOMED IMAGING AS  
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**Respondent:** Schering Aktiengesellschaft  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 11 February 1999  
revoking European patent No. 0553926 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** P. Kitzmantel  
**Members:** J. Jardon Alvarez  
M.-B. Tardo-Dino

## Summary of Facts and Submissions

I. Mention of the grant of European patent No. 0 553 926 in respect of European patent application No 93200192.8 in the name of NYCOMED IMAGING AS, which had been filed on 26 January 1993, was announced on 20 November 1996 (Bulletin 1996/47) on the basis of 8 claims, Claim 1 reading as follows:

"1. A method for terminal sterilization of a pre-filled plastic or glass syringe or cartridge containing a liquid therein, said syringe or cartridge comprising:

(a) a syringe barrel terminating in a nozzle at its distal end or

(b) a cartridge barrel terminating in a neck portion at its distal end and adapted to receive a pierceable diaphragm;

an open or proximal end; and

a slideable plunger or piston situated in the barrel having a means to engage a plunger rod, said method comprising the steps of:

inserting the plunger into the barrel and positioning it toward the distal end thereof to leave a volume of at least about 2% empty space between the plunger and the proximal end of the barrel;

filling the syringe or barrel through its nozzle or neck portion respectively with the liquid allowing for a head space not exceeding about 10% by volume;

hermetically sealing the nozzle by a cap, or the neck portion by a pierceable diaphragm, respectively; either

autoclaving the pre-filled plastic or glass syringe or cartridge to sterilize it and its content at an autoclave pressure less than the pressure of the syringe or cartridge content; and

cooling the autoclave chamber with a water cascade or nozzle spray or air draft at a rate that will not allow a sudden collapse of the steam atmosphere in the autoclave chamber."

II. Notice of Opposition requesting revocation of the patent in its entirety on the grounds of Article 100(a) and (b) EPC was filed by SCHERING AG on 20 August 1997.

The opposition was based on the following documents:

D1a: E. Venten and J. Hoppert; Pharm. Ind. 40, Nr 6 (1978), pages 665 - 671,

D1b: H. Kuntscher and H. Eder; Pharm. Ind. 38, Nr. 11a (1976), pages 1058 - 1064,

D1c: M. Junga; Pharm. Ind. 35, Nr. 11a (1973), pages 824 - 829,

D2a: EP - B1 - 0 227 401,

D2b: US - 3 406 686, and

D3: FR - 2 258 866

In support of the arguments relating to Article 100(b) EPC the Opponent also filed with its submission dated 18 November 1998 a test report intended to show that

the claimed method of terminal sterilization could not be worked within the full scope of Claim 1.

III. By its decision announced orally on 19 January 1999 and issued in writing on 11 February 1999 the Opposition Division revoked the patent in suit because it did not disclose the invention in a manner sufficiently complete for it to be carried out by a person skilled in the art (Article 100(b) EPC).

According to that decision (see Reasons 4) the expression "carried out" in Article 83 or 100(b) EPC meant "that the invention must be carried out with obtainment of the intended result", which in the present case meant maintenance of seal integrity during the sterilization (plunger not blown out).

The decision *inter alia* held:

- (a) that the patent did not contain a detailed description of at least one way of carrying out the invention,
- (b) that the terminal sterilization tests performed by the Opponent according to Claim 1 of the challenged patent failed for all the tested syringes because the plungers were blown out, and
- (c) that the conditions leading to the desired successful terminal sterilization were missing from Claim 1 and were neither explicitly disclosed in the specification nor implicitly obvious for

the skilled person at least for a multitude of situations covered by the patent.

The Opposition Division came to the conclusion that it was an undue burden for the skilled person to find out these conditions in order to achieve the intended result and that, therefore, the patent did not fulfil the requirements of Article 83 EPC.

IV. On 20 April 1999 the Patent Proprietor (Appellant) lodged an appeal against the decision of the Opposition Division and paid the appeal fee on the same day.

In the Statement of Grounds of Appeal filed on 21 June 1999, the Appellant stated that the disclosure of the patent was sufficiently clear and complete. He argued essentially as follows:

- (i) The inventors of the patent had found out that by controlling certain parameters specified in Claim 1 of the patent it was possible to autoclave syringes with the pressure in the autoclave (outside the syringe) being lower than the pressure of the contents of the syringe (inside the syringe), without the plungers being forced completely from the syringes.
- (ii) The tests submitted by the Opponent carried out with cartridges listed as "Medrad Kartuschen Stab. Charge 2" and as "CZ Kartuschen Daikyo Seiko" were immaterial to the sufficiency of the patent and should be ignored by the Board of Appeal.

Concerning the Medrad cartridges he pointed out that the cartridges were only filled with contrast media at the point and time of desired use and therefore were clearly not designed to withstand terminal sterilization.

Concerning the Daikyo Seiko product the Appellant stated that he had contacted West Company, who markets these products in the United States, and had received the information that the respective syringes could be used for post-fill autoclaving but that it was impossible to tell if they would work in the autoclave cycle as claimed and that it would be necessary to evaluate their suitability for this purpose.

Tests carried out by the Appellant with the Medrad cartridges and the Daikyo Seiko syringes showed that all suffered failure through plunger blow out during sterilization or as a result of leakage between the plunger and the syringe barrel, results which were not unexpected because these products were not designed to be suitable for terminal sterilization.

- (iii) The Appellant also filed a new test report with Becton Dickinson syringes, which are designed to undergo terminal sterilization through post-fill autoclaving. These syringes were successfully autoclaved using the method of the invention.
- (iv) The claimed method for terminal sterilization contained only three variables which the skilled person could vary: the amount of empty space, the

amount of head space and the difference between the pressure inside the autoclave and the pressure inside the syringe.

From his common general knowledge the person skilled in the art of autoclave operation would know appropriate temperatures and times for terminal sterilization and, in the event that the plungers were forced out of the syringes or cartridges, he would easily change one or more of the above mentioned variables in order to achieve success. The amount of trial and error involved would not amount to an undue burden (see T 226/85, OJ EPO 1988, 336, Reasons 8).

- V. With his letter dated 16 November 1999 the Opponent withdrew the opposition.
  
- VI. On 29 October 2004 the Board dispatched the summons to attend oral proceedings on 26 January 2005 and in a communication pursuant to Article 11(1) of the Rules of Procedure of the Boards of Appeal dated 7 December 2004, the Board drew the attention of the Appellant to the points to be discussed during the oral proceedings.
  
- VII. With his submission dated 22 December 2004 the Appellant informed the Board that he did not wish to file any further comments and that he would not be attending the oral proceedings. He also asked that a decision be taken on the papers as currently on file.

By EPO form 3031, dated 17 January 2005, the Appellant was informed that the date fixed for oral proceedings was maintained.



VIII. Oral proceedings took place on 26 January 2005 in the absence of the Appellant.

IX. The Appellant requested that the decision under appeal be set aside and the European patent No. 0 553 926 be maintained as granted.

### **Reasons for the Decision**

1. The appeal is admissible.

2. The Opponent has withdrawn the opposition and has therefore ceased to be a party to the appeal proceedings as far as the substantive issues are concerned.

The competence of the Board for reviewing the first instance's decision to revoke of the patent in suit is not affected by the withdrawal of the opposition (cf. T 629/90, OJ EPO 1992, 654).

3. *Sufficiency of disclosure (Article 83 EPC)*

3.1 The patent relates to a method for terminal sterilization of a pre-filled plastic or glass syringe or cartridge containing a liquid therein using an autoclave pressure that is less than the internal pressure of the syringe or cartridge content.

Such a pressure difference tends to urge the plunger outwardly. To avoid the plungers being forced completely from the syringes or cartridges Claim 1 of

the patent requires the control of certain parameters, essentially to maintain a 'head space' not exceeding about 10% of the fill volume in the syringe/cartridge and to leave a volume of at least about 2% 'empty space' between the plunger and the proximal end of the barrel.

3.2 Article 83 EPC requires that the European patent application discloses the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. In accordance with the case law of the Boards of Appeal the requirements of Article 83 EPC are only met:

(i) if at least one way is clearly indicated in the patent specification enabling the skilled person to carry out the invention, and

(ii) if the disclosure allows the invention to be performed in the whole area claimed

(iii) without undue burden, applying common general knowledge.

3.3 Although the description does not include any working example, it provides (page 3, line 55 to page 4, line 26) information about the parameters to be observed for putting the claimed method into practice. The Board is thus satisfied that the disclosure of the patent is sufficient to carry out, under specific circumstances, the claimed terminal sterilization with maintenance of seal integrity.

3.4 However the Board considers that the disclosure of the patent does not allow the skilled person to reduce the invention to practice without undue burden **in the whole area claimed.**

3.4.1 The reason being that the patent is silent about the type of syringes/cartridges which are to be used, it imposes no restriction on the types of syringes/cartridges to be used and contains no warning that certain syringes/cartridges would not work.

3.4.2 The Opponent filed during the opposition proceedings the results of tests carried out with commercially available syringes/cartridges (CZ Kartuschen Daikyo Seiko and Medrad Kartuschen Stab) using an empty space between the plunger and the proximal end of the barrel of at least 2% and a head space of about 8% under the conditions specified in Claim 1. In these tests no terminal sterilization could be achieved because the plungers were ejected.

The Appellant did not dispute these results. In fact the Appellant carried out his own tests, using the method as claimed, and found out that the Medrad cartridges all suffered failure through plunger blow-out during sterilization and the Daikyo Seiko syringes failed as a result of leakage of product between the plunger and the syringe barrel.

3.4.3 Thus, the question to be answered is whether or not the skilled person was taught by the specification of the patent in suit, or would have known by applying common general knowledge, that the abovementioned syringes/

cartridges were unsuitable for use in the claimed method of terminal sterilization.

As already mentioned above (see 3.4.1), the present specification does not contain any information about the type of plastic syringes/cartridges to be used. It is then to be examined whether the skilled person would have excluded said syringes/cartridges by applying common general knowledge without undue burden.

Concerning the Medrad cartridges, the Appellant indicated in his Statement of Grounds (paragraph 26) that it was clear from their mode of use that they were not intended to undergo terminal sterilization and that the designers of the cartridge had no reason to concern themselves with matching the thermal expansion coefficients of the materials forming the plunger and the barrel.

In view of this situation and since the afore-mentioned properties are among those which contribute to the friction between barrel and plunger working against blowing out of the latter, the Board is satisfied, on the balance of probabilities, that the skilled person would have ruled out the use of the Medrad cartridges in the sterilisation process according to present Claim 1.

However, with respect to the Daikyo Seiko products, the Appellant indicated (paragraph 22 of the Statement of Grounds) that the West Company, which markets the syringes, informed him that "it was impossible to tell (if they would be suitable), and that it would be necessary to evaluate the syringes in the autoclave

cycle in question". On the basis of this information the skilled person had no reason to assume that these syringes would be unsuitable for pre-fill autoclaving. As it turned out, however, they failed.

The Appellant himself acknowledged (see Statement of Grounds, paragraph 32.) that "the success or failure of the method when applied to the Daikyo Seiko syringes could not be predicted before the method was carried out".

- 3.4.4 Whilst assessing sufficiency of disclosure, the skilled person is considered to be somebody with common general knowledge in the field who will interpret the teaching of the patent with a view to excluding any syringe "a priori" unsuitable, or not designed for the purpose of terminal sterilization, he cannot be expected to go beyond his common general knowledge and to make extensive investigations to find out the criteria, which are not disclosed in the patent specification, which allow for distinguishing between suitable and unsuitable syringes.

Since the patent specification does not contain any information suitable to guide the skilled practitioner in the direction of success, once he has encountered failure with the Daikyo Seiko syringes, he is left with the burden experimentally to screen all possible candidates on the market.

This is considered to amount to an undue burden for the skilled person, because the suitability of a syringe/cartridge depends not only on its own specification but also on the various parameters (*inter*

*alia*: autoclaving pressure, vapour pressure of content, cooling conditions, empty space at distal end, head space) pertaining to its concrete use.

Even though a reasonable amount of trial and error is permissible when it comes to assessing sufficiency of disclosure there must still be available adequate instructions in the specification, or on the basis of common general knowledge, leading the skilled person necessarily and directly towards success, through the evaluation of initial failures, which is not the case at present.

## **Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

G. Röhn

P. Kitzmantel