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D E C I S I O N
of 10 July 2001

Case Number: T 0111/98 - 3.3.5

Application Number: 91902807.6

Publication Number: 0575314

IPC: C02F 3/00

Language of the proceedings: EN

Title of invention:
METHOD AND REACTOR FOR PURIFICATION OF WATER

Patentee:
KALDNES MILJOTEKNOLOGI A/S

Opponent:
E.V.U. - Entwicklung von Unwelttechnik GmbH
Raisio Engineering

Headword:
Water purification/KALDNES

Relevant legal provisions:
EPC Art. 54, 56, 84, 114(2), 111(1) 112(1), 123(3)

Keyword:
"Novelty - yes"
"Inventive step - yes"
"Remital - no"
"Referral - no"
"Late-filed document - admitted"
"Clarity of amendment - no (main request)"
"Extention of protection - no"

Decisions cited:
T 0557/94, T 0097/90, T 0273/84, T 0852/90, T 0113/96, T 0966/95, T 1060/96

Headnote:
Amendment of the claims in response to the citation of a new document during appeal proceedings is not as such a sufficient reason to remit the case to the department of first instance.

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Case Number: T 0111/98 - 3.3.5

D E C I S I O N
of the Technical Board of Appeal 3.3.5
of 10 July 2001

Appellant: (Proprietor of the patent)
KALDNES MILJOTEKNOLOGI A/S
P.O. Box 2011 Postterminalen
NO-3103 Tönsberg (NO)

Representative:
Towler, Philip Dean
Frank B. Dehn & Co.
European Patent Attorneys
179 Queen Victoria Street
London EC4V 4EL (GB)

Respondent: (Opponent 01)
E.V.U. - Entwicklung von Umwelttechnik GmbH
Schneebergstrasse 33
D-01277 Dresden (DE)

Representative:
Hofmann, Klaus, Dipl.-Ing.
Patentanwälte Pätzelt-Seltmann-Hofmann
World Trade Center
Ammonstrasse 72
D-01067 Dresden (DE)

Respondent: (Opponent 02)
Raisio Engineering
P1 101
FI-212 01 Raisio (FI)

Representative:
Wallin, Bo-Göran
AWAPATENT AB
Box 5117
S-200 71 Malmö (SE)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 7 November 1997 revoking European patent No. 0 575 314 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: G. J. Wassenaar
Members: B. P. Czech
S. U. Hoffmann

Summary of Facts and Submissions

I. The appeal is from the decision of the Opposition Division to revoke European patent No. 0 573 314, which was granted in response to European patent application No. 91 902 807.6.

II. The opposition grounds were lack of novelty and lack of inventive step. Of the documents cited in the opposition procedure the following were also relied upon during the appeal proceedings:

D1: Forschungsbericht 02-WA-8538, D. Dengler et al., January 1988, Bundesministerium für Forschung und Technologie,

D2: DE-A-1 459 485

D3: DE-A-1 943 848

D4: EP-A-0 058 974

D5: FR-A-2 185 437

D7: Wat. Sci. Tech., Vol. 16 (1984), pages 119-130

D8: "Biological fluidised bed treatment of water and wastewater", Ellies Horwood Ltd, 1981, Chapter 5, pages 75-107.

The Opposition Division held that claim 7 then on file, relating to a reactor for the purification of water, comprising biofilm carriers, lacked an inventive step in view of D1 in combination with D7.

III. With the statement of the grounds of appeal, the appellant filed two new sets of claims. In reply, the respondents maintained that the subject-matter of claims 1 and 7 of the main and auxiliary request lacked an inventive step over D1 in combination with D8. Later in the proceedings, respondent O1, introduced the following new document:

D9: DE-A-3 017 439.

It was argued that D9 destroyed the novelty of claims 1 and 7 of the appellant's main request.

In his reply the appellant stated that he accepted that D9 was relevant to the novelty of the claims and considered it necessary to amend the claims. He filed six sets of amended claims, labelled A to F. He indicated that he did not intend to challenge the admission of D9 into the proceedings but, referring to various board of appeal decisions, he requested that the case be remitted to the Opposition Division if the Board considered D9 to be sufficiently relevant to be admitted into the proceedings.

IV. The respondents raised objections to the new sets of claims on the grounds of Articles 123(3), 52, 54 and 56 EPC. They further requested refusal of the appellant's request for remittal of the case to the Opposition Division.

V. During oral proceedings, which took place on 10 July 2001, the appellant requested that if the Board of Appeal were to consider D9 but not intend to remit the case to the department of first instance the following two questions (a) and (b) should be referred to the

Enlarged Board of Appeal under Article 112(1)(a)EPC:

(a) If a document is relied on for the first time during appeal proceedings and is admitted because it is sufficiently relevant to require amendment of the claims, must the case be remitted to the department of first instance?

(b) If the answer to question (a) is "no", what factors should the Board of Appeal take into account in exercising its discretion under Article 111(1) EPC whether to remit the case?

The request for referral was refused and the substantive issues of the case were discussed, taking D9 into consideration. During this discussion the appellant submitted amended sets of claims A, A1, B, B1, C, C1, D, D1, E, E1, F, F1. The Board raised a clarity objection against an amendment present in sets A to F, but not present in sets A1 to F1.

VI. Independent claims 1 and 5 of set A read as follows:

Claim 1:

"A biofilm method for water purification in which waste water is allowed to flow through a reactor containing carriers on which biofilm will grow, which promotes a desired conversion of impurities,

characterized by using carriers which are particulate elements which have been prepared from a soft plastic, optionally recycled plastic, and are in the form of pieces of a tube with internal separation walls, the carriers having:

a) a surface which is at least 1.5 times as large as the outer surface of a smooth element of the same dimensions, and

b) a density in the range 0.90 to 1.20, normally 0.92 to 0.98, particularly 0.92 to 0.96 kg/dm³, and
c) some of the surface protected against biofilm wear during use, and
d) walls which allow easy passage of water, and
e) linear dimensions in the range 0.2-3 cm, particularly 0.5-1.5 cm,
wherein the carriers with biofilm are kept suspended and moving in the water in a reactor with inlet and outlet and optionally mixing means; and wherein sludge which leaves the reactor is not returned to the reactor."

Claim 5:

"Reactor (1) for aerobic, anoxic or anaerobic water purification, comprising inlet (4) and outlet (5,6) means,
characterized in that it contains a large number of carriers (2) for biofilm, said carriers being particulate elements which have been prepared from a soft plastic, optionally recycled plastic, and are in the form of pieces of a tube with internal separation walls, said carriers having:
a) a surface which is at least 1.5 times as large as the outer surface of a smooth element of the same dimensions, and
b) a density in the range 0.90 to 1.20, normally 0.92 to 0.98, particularly 0.92 to 0.96 kg/dm³, and
c) some of the surface protected against biofilm wear during use, and
d) walls which allow easy passage of water, and
e) linear dimensions in the range 0.2-3 cm, particularly 0.5-1.5 cm,
the volume of the carriers in an empty reactor

representing 30-70 % of the reactor volume, and means for suspending and moving said carriers within the reactor."

The claims of set A1 differ from the claims of set A only in that in the first line of claim 1 the word "biofilm" has been deleted. Claim 5 of set A1 is thus identical to claim 5 of set A.

VII. The appellant's submissions can be summarized as follows:

Remittal

D9, cited for the first time during the appeal proceedings, was so relevant to the claims then on file that the appellant felt obliged to amend the claims. If the Board of Appeal were to agree that this document was sufficiently relevant to be admitted into the proceedings the case had to be remitted to the department of first instance. According to the case law of the EPO it was consistently held that, if a document is relevant enough to be taken into consideration, the case should as a rule be remitted under Article 111(1) EPC to the department of first instance, so that the document can be examined at two levels of jurisdiction and the patent proprietor is not deprived of the possibility of subsequent review. Reference was inter alia made to decision T 273/84 (OJ EPO 1986, 346).

Amendments

The introduction of the expression "biofilm method" in claim 1 of set A was based on the patent in suit, in particular on column 1, line 19 and column 2, line 5.

The expression had a generally accepted meaning and limited the scope of the claim, as was accepted by the Opposition Division.

Although the reactor claims no longer referred to the method claims, they contained all the limitations of the previous reactor claims, in particular concerning the carriers and inlet and outlet means for a flow through reactor system previously implied by the reference to the method claim as granted.

Novelty and inventive step

None of the cited documents disclosed the use of biofilm carriers as defined in claim 1 of sets A and A1 in a water purification reactor wherein the carriers were kept in suspension. The advantages over carriers as disclosed in D8 were improved flow along the protected surfaces and reduced clogging so that the effective reaction surface was increased. With respect to the carriers according to D1 the biofilm surface was increased and the stability of the carriers was improved leading to less process disruptions. Compared with the carriers disclosed in D9 the water flow along the protected surfaces of the carriers was improved and the production costs of the carriers could be substantially reduced since the carriers according to D9 could not be produced by extrusion as in the present case. The biofilm carriers disclosed in D5 were much larger since they were used in a trickling bed. Such large carriers were not suitable for a suspension reactor. Moreover, D5 was published long before D1, D8 and D9. Skilled persons developing the processes according to D1, D8 and D9 would not have considered the use of carriers according to D5. The present

carriers made it possible to perform the process without sludge recycle and had a great commercial success.

VIII. The respondents' arguments can be summarized as follows:

Remittal

The appellant was aware of D9 since March 1999 but waited before showing any reaction until March 2001. D9 was a technically simple document the relevance of which could be easily determined and it's citation would not change the factual situation if D8 was admitted. Remittal would further delay and increase the costs of the proceedings and would not lead to a different result. According to the case law it depended on the specific circumstances of the case whether a citation cited for the first time in appeal proceedings required remittal. This case was very close to the case of T 1060/96 in which it was held that the citation of the new document did not justify remittal.

Amendments

The amended reactor claims extended beyond the granted scope because the reactor as now claimed was no longer required to be a flow-through reactor.

Novelty and inventive step

Although D9 did not explicitly disclose carriers in the form of a tube, this feature followed implicitly from the disclosure that the carrier is a hollow body. With respect to inventive step both D8 and D9 could be taken

as starting point. The only difference -if any- would be the shape of the biofilm carriers. According to the patent in suit it had been tried to improve the effectiveness of the process by increasing the surface area of the biofilm carriers. No particular limitation with respect to the form of the carrier was required. This problem was also discussed in many of the prior art citations and solved according to both D1 and D5 by a carrier in the form of a tube with internal separation walls which allowed easy passage of water. Although according to D5 the carriers were used in a stationary trickling bed, the requirements of high surface area and easy flow were the same as in a suspension reactor. It was thus obvious to use in a process according to D8 or D9 carriers as disclosed in D1 or D5. With respect to the reactor claims, which did not comprise the requirement of no sludge recycling, D1 could be taken as the closest prior art. It was obvious to combine the teaching of D1 with the teaching of D7, disclosing a carrier filling in the reactor to 40%, and the teaching of D5, disclosing the exact form as required by the present independent claims according to set A or A1.

IX. The appellant (patentee) requested that the decision under appeal be set aside and

(1) the case be remitted to the Opposition Division for further prosecution because of a late filed document on the basis of one of the sets of amended claims A to F, filed with the letter dated 2 March 2001,

(2) referral to the Enlarged Board of Appeal of questions (a) and (b) filed during the oral

proceedings, or

(3) maintenance of the patent in amended form on the basis of the claims according to the requests filed during oral proceedings taken in the order annexes A, A1, B, B1, C, C1, E, E1, F, F1.

The respondents requested that the appeal be dismissed.

Reasons for the Decision

1. *Late filed documents and remittal*

1.1 According to Article 114(2) EPC, the EPO may disregard facts or evidence which are not submitted in due time. From this article it follows that the Board has a discretion and thus also the power to consider late filed evidence.

D8, filed during the opposition proceedings before the department of first instance but after the nine month opposition period, was not admitted by the Opposition Division with the argument that it was not more relevant than the other documents then on file. The parties have discussed D8 in detail during the written and oral appeal proceedings. During the oral proceedings the Board also indicated that its content did not appear to be without relevance with regard to the invention as now claimed. The Board, therefore, has considered D8 in these proceedings.

All the parties agreed that D9 was very relevant for the amended claims filed with the grounds of appeal. In response to the late filing of D9, the appellant had

considered it necessary to further amend the claims. D9 was also discussed in detail both in writing and during the oral proceedings. Since all the parties agreed that D9 was relevant for the claimed invention, the Board also considered D9.

1.2 By the introduction of D9 into the proceedings the factual framework of the case has been changed after the delivery of the contested decision. It remains to be decided whether this change in the factual framework requires or justifies a remittal of the case to the first instance.

Under Article 111(1) EPC a Board of Appeal has a discretion during appeal proceedings before it, either to "exercise any power within the competence of the department which was responsible for the decision appealed" (here: the Opposition Division) or to "remit the case to that department for further prosecution". The provision of a discretionary power would make no sense if the boards were ipso facto obliged to remit the case whenever new matter was raised in appeal proceedings, irrespective of the nature of such matter. Thus, in accordance with jurisprudence of the Boards of Appeal (cf. T 557/94, of 12 December 1996, reasons 1.3 and T 966/95, of 24 March 1999, reasons 2.2), Article 111 EPC also confers the power upon a Board of Appeal to act *inter alia* as the first and only instance in deciding upon a case taking into account a document, which was only filed in appeal proceedings, without the possibility of further appellate review. Remittal of a case results in a substantial delay of the procedure which keeps the public in uncertainty about the fate of the patent for several more years. It also involves additional costs for all the parties and the EPO. In

the Board's view remittal, due to the admission of a new document, should therefore rather be an exception eg if, without remittal, a party would not have had sufficient opportunity to defend itself against an attack based on the new document, or if the factual framework has changed to such an extent that the case is no longer comparable with the one decided by the first instance (see eg T 97/90, OJ EPO 1993, 719, headnotes and reasons 2). In the present case the appellant was aware of D9 two years before the oral proceedings took place so that there was sufficient time for a proper defence. As it will appear from the discussion of the relevance of D9 below, the introduction of this document does not amount to a substantial change in the factual framework, but merely reinforces a line of argument that was already on file. Also the amendments made by the appellant in response to the citation of D9 cannot be considered as a substantial change of the factual framework. In the further amended independent claims features from subclaims of the patent in suit have been introduced. This is the normal behaviour of a patentee in appeal proceedings if one of its independent claims has been rejected in opposition proceedings and cannot, as such, be a reason for remittal. Whether the patentee limits his claims because of the arguments given in the contested decision alone or because he considered them necessary in view of a new citation is a subjective issue solely within the hands of the patentee. The appellant's declaration that in this case the amendments were necessary in view of the new citation cannot deprive the Board of its discretion not to remit the case. At the beginning of the oral proceedings the Board felt that D9 was not likely to play a decisive role for the issue of inventive step of the claims then

on file. Therefore, the Board considered it appropriate to exercise its discretion not to remit the case to the Opposition Division.

1.3 Because remittal is a matter of discretion of the Boards it is not surprising that a lot of case law exists concerning this issue. A decision frequently cited with respect to this issue is T 273/84. In this decision it was held that in the case that documents are taken into consideration which were introduced for the first time in the appeal proceedings it might be appropriate to refer the matter back to the Opposition Division so as to make it possible for the new documents to be examined at two levels of jurisdiction (headnote). In the case decided in T 273/84 the examination as to patentability needed to be resumed on a new basis and the technical problem to be solved determined in the light of the new citation which was primarily the task of the department of the first instance (point 6 of the reasons). Thus according to T 273/84 remittal is not unconditional if a new document is taken into consideration but depends on the relevance of the document. The Board's decision not to remit the case is thus not contradictory to T 273/84 and is in agreement with other decisions in which remittal was refused despite admission of a new document during appeal proceedings; see eg T 852/90 of 2 June 1992, point 4 of the reasons, T 113/96 of 19 December 1997, point 11 of the reasons, T 966/95 of 24 March 1999, point 2 of the reasons and T 1060/96 of 26 January 1999, point 2 of the reasons. The Board is not aware of any case law according to which it is mandatory to remit a case because the patentee considered it necessary to amend the claims in response to the citation of a new document in appeal

proceedings, independently of the special circumstances of the case.

1.4 According to Article 112(1)(a) EPC the Board has the power to reject a request of a party to refer a question to the Enlarged Board of Appeal. As explained above, the Board's decision not to remit the case is supported by earlier decisions of other Boards of Appeal and is not contradictory to other decisions wherein, under different circumstances, the case was remitted after the admission of a new document in the appeal proceedings. There was, therefore, no need for referral of the said questions a) and b) to the Enlarged Board of Appeal to ensure uniform application of the law as requested by the appellant. The Board further considers that referral of these questions is also not appropriate because they do not concern the interpretation of an article or rule of the EPC. Article 111(1) EPC gives the Boards the discretion to exercise any power within the competence of the Opposition Division or to remit the case to it. The way this discretion should be exercised depends on the special circumstances of the case and is a matter of fact and not of interpretation of the law. The Board holds that giving rules for exercising discretion in any possible situation which might arise is not comprised by the tasks of the Enlarged Board of Appeal set out in Article 112 EPC.

2. *Amendments*

2.1 Claim 1 of set A is a combination of claims 1 to 4 as granted with the additional limitation that the sludge which leaves the reactor is not returned to the reactor and the explicit indication that the method is a

"biofilm method". The performance of the method without sludge recycling has uncontestedly been disclosed in the description of the patent in suit (column 8, lines 5 to 8) and the original application (page 10). The expression "biofilm method" does not appear in the patent in suit. It is true that the patent in suit comprises the expression "biofilm systems". This expression simply designates processes in which the microorganisms grow on fixed surfaces in the reactor (column 2, lines 5 to 6). The appellant and the Opposition Division gave the expression "biofilm method" a more limiting meaning (point 5.1, last paragraph, point 5.2, third paragraph, and point 7 of the reasons of the contested decision). It remains, however, unclear which further limitations, beyond the explicit technical features of claim 1, are implied by the expression "biofilm method". The requirement that sludge is not returned already implies that a substantial amount of the microorganisms is fixed on biofilm carriers. The appellant's submission that this expression further implies that a certain minimum amount of biofilm carriers is present may be accepted, but without making this minimum amount explicit it provides no clear further limitation. Therefore, the Board holds that the added expression "biofilm method" in claim 1 is not clearly defined in the patent in suit and introduces an unclarity in the scope of the process claims. The claims according to set A must thus be rejected for non-compliance with the requirements of Article 84 EPC.

2.2 In claim 1 of set A1 the expression "biofilm method" has been deleted and replaced by the original expression "method". The objection made under point 2.1 thus no longer applies. The respondents raised

objections under Article 123(3) EPC against the reactor claim 5 because it was no longer dependent upon claim 1 and therefore lacked the feature that water was allowed to flow through the reactor. The Board holds, however, that the reference to the process according to any of the claims 1 to 6 in the reactor claim 7 as granted only defined the carriers used in the process according to claims 1 to 6 and did not imply the presence of means other than an inlet and an outlet for allowing water to flow through the reactor. The other amendments are uncontestedly based on the application as originally filed and do not extend the protection conferred. Claims 1 to 10 of set A1 thus fulfil the requirements of Article 123(2) and (3) EPC.

3. *Novelty (claims of set A1)*

The independent claims 1 and 5 are limited by the use or the presence of biofilm carriers of a specific shape, dimension and density. The respondents objected to the novelty of the subject-matter of these claims on the ground that D9 disclosed the use of hollow bodies, which would imply the use of bodies in the form of pieces of a tube. The only specific disclosure of a hollow body in D9 is, however, a body in the form of hollow hemispheres with internal dividing walls ("Kalotten"); see page 10, lines 15 to 18 and the picture on page 19. This alone shows that a hollow body according to D9 is not necessarily in the form of a tube, which renders the specific feature "in the form of a piece of a tube" novel over the generic disclosure "hollow body". Further according to D9, the hollow body has an open side and a closed side so that different conditions are created with respect to the contact of the microorganisms in the biofilm with the oxygen in

the water depending on the position of the carriers to the water flow (page 9, lines 22 to 28). The water flow through the segmented hollow part is thus restricted, contrary to the requirement of the present claims that the walls should allow easy passage of water. This condition required by present claims 1 and 5 cannot be fulfilled by a hollow body according to D9. Thus D9 neither explicitly nor implicitly discloses carriers as used according to claim 1 or present according to claim 5. None of the other citations disclose the present carriers in a suspension reactor. This is not disputed so that no further reasons are necessary in this respect. The subject-matter of claims 1 and 5 and their more restricted sub-claims is thus new.

4. *Inventive step (claims of set A1)*

4.1 The reactor claim 5 is broader than the process claim 1 in the sense that the reactor claim 5 does not exclude the presence of means for recirculation of sludge. The Board considers it therefore appropriate to examine first the inventive step of reactor claim 5.

4.2 In the contested decision D1 was taken as the closest prior art. After the amendments made during the appeal proceedings the Board considers that, at least with respect to the reactor claim 5, D1 still represents the closest prior art. This was, in fact, confirmed by the submissions made by the respondent O2 during oral proceedings. D1 discloses a reactor for aerobic water purification comprising inlet and outlet means and containing a large number of suspended biofilm carriers. The carriers may be made from soft plastic. Three kinds of soft plastic carriers are disclosed, all of cylindric shape with large openings in the cylinder

wall, similar to hair curlers. The smallest carriers have a size of 25 x 25 mm (pages 12 and 13 and Figure 3). The Board cannot accept the respondents' position that the cylinders disclosed in D1 could be considered as pieces of a tube. A tube is generally intended to contain or transport fluids and comprises thus no lateral openings, whereas the cylinder wall of the carriers used according to D1 comprises large openings. According to D1, some experiments with soft carriers of the hair curler type with linear dimensions larger than required by present claim 5 in an amount of 1% and 3% of the reactor volume were performed. D1 itself indicates that the reactor/carrier combination has the disadvantage that the carriers have a tendency to form agglomerates and are easily deformed and pushed through the grating intended to prevent the carriers from leaving the reactor (pages 21, 27, 36, 37 and 43). It was found that the use of more than 1 vol.% of carriers was problematic (page 40, third paragraph and page 41, first paragraph). Nevertheless it was concluded that in order to improve the results the amount of carriers should be increased to at least 10 Vol.% and the form of the reactor should be adapted to the carriers (page 45, point 3).

4.3 The problem underlying the invention can be seen in the provision of a reactor system having improved water purification efficiency. The patent in suit proposes solving this problem by a reactor comprising carriers in the form of pieces of a tube with internal separation walls which allow easy passage of water, in an amount of 30-70 Vol.% of the reactor. Although direct comparison of reactor efficiency is not possible, it is credible that by increasing the total volume of the carriers and by using carriers having an

increased protected surface by the presence of internal separation walls within the pieces of a tube, the available biofilm surface, and thus the purification efficiency, is increased. The Board is thus satisfied that the reactor as claimed actually solves the above mentioned problem.

4.4 Despite the poor results indicated in D1, it contains no suggestion to try other kinds of carriers. On the contrary it discloses that after long laboratory experiments it was decided to use the carriers in the form of hair curlers and that the problems might be overcome by adaptation of the reactor.

4.5 Other prior art citations disclosing carriers in a suspension reactor are D4, D7, D8 and D9.

D4 discloses plastic carriers having a weight slightly larger than the wastewater. Several shapes are described and illustrated but none thereof resembles the form of a tube (pages 5 and 6 and Figures 4 to 8). No indication concerning the amount of carriers is given.

D7 discloses the use of sponge-like porous plastic bodies having a size of 10 to 15 mm in an amount of 10 to 40% of the reactor volume (pages 120 and 130).

D8 discloses the use of microporous carriers in the form of stainless steel wire spheres, polypropylene toroids, reticulated polyester foams and matted reticulated polypropylene sheets (page 79).

As already indicated above with respect to novelty, D9 discloses hollow bodies comprising separating walls but they are not in the form of pieces of a tube and the separating walls do not allow easy passage of water but restrict the flow along the hollow surface.

Thus, none of the citations relating to suspension reactors discloses or suggests the use of carriers in the form of pieces of a tube, let alone a tube with internal separation walls which allow easy passage of water.

4.6 The only citations disclosing carriers for biofilm support which can be considered as pieces of a tube are D2, D3 and D5. These documents disclose plastic biofilm carrier bodies in a filtration bed (trickling filter). According to D2 the carriers may have any form having a high surface area which allow passage of air and liquid. As suitable forms there are mentioned, amongst many other forms, tubes (paragraph bridging pages 3 and 4). The size is not indicated and there is no disclosure of internal separation walls. According to D3 the carriers may have any suitable shape. One of the shapes mentioned are pieces of a tube which surface may be roughened (claim 1 and paragraph bridging pages 1 and 2). The only citation disclosing carriers in the form of a tube or cylinder with internal separating walls which allow easy passage of water is D5 (claims 1 and 2 and Figures 1 to 5). It does not comprise any suggestion to use them for any other purpose than as filler in a trickling filter. Although the size of the bodies is not indicated, the parties agreed that their size would be too large to be used in suspended form. Moreover carriers in a trickling bed must be mechanically stable, whereas present claim 5 requires

that the carriers are made from a soft plastic. Thus, without modification, the bodies disclosed in D5 are not suitable for a reactor as defined by claim 5. The Board accepts the respondents' submission that some of the properties required for bodies in a trickling bed, such as a high surface area, are also mandatory for suspended carriers. Other important properties for suspended carriers, however, such as abrasion resistance and mobility, do not play a role in a trickling bed. D5 does not contain any incentive that the biofilm carrying bodies disclosed therein would be suitable for use in a suspension reactor in an amount of 30 to 70 % by volume. Moreover, because of the said differences of the biofilm carrying bodies, the average skilled person trying to solve the above-mentioned problem in suspension reactors, would not expect to find a solution in documents relating to trickling filters and would not be interested in such documents. This is confirmed by the fact that D5 was published in 1974 and that, although skilled persons have intensively looked for suitable carriers for suspension reactors at least since 1981, the publication year of the handbook D8, there is no sign that these skilled persons have contemplated the use of suspended bodies of a configuration as disclosed in D5 before 1990, the priority year of the patent in suit. For these reasons, the Board holds that it was not obvious to a skilled person to combine the teaching of D5 with the teaching of D1 and to adapt biofilm carriers known from D5 to the conditions prevailing in a suspension reactor with a high carrier load, irrespective of the presence or absence of sludge return means. The solution of the above-mentioned problem by the provision of a reactor comprising biofilm carriers according to claim 5, therefore, involves an inventive step within the

meaning of Article 56 EPC.

4.7 The same conclusion would be reached if D9 or D8 had been taken as the closest prior art and the problem underlying the invention was merely regarded as providing an alternative suspension reactor for water purification. For the same reasons as mentioned above it was not obvious to combine their teaching with that of D5 or D1. In fact, D1 teaches away from using relative large amounts of soft cylindrical carriers by suggesting the adaptation of the reactor rather than modifying the carriers.

4.8 In the method according to claim 1 the reactor with the same carriers as defined in claim 5 are used. In claim 1 the amount of carriers is not specified by its volume percentage, but is implicitly defined by the requirement that sludge is not returned, which implies the presence of a substantial amount of carriers. In the analysis of inventive step given above the precise amount of the carriers does not play a role. The operation of the inventive reactor according to claim 5, therefore, also involves an inventive step, independently of the way the amount of carriers is defined. Thus the method according to claim 1, comprising the operation of a reactor containing a substantial amount of the specific carriers without sludge return, also involves an inventive step.

4.9 Claims 2 to 4 and 6 to 10 are dependent upon claims 1 and 5 respectively and are of a more limited scope than the claims on which they depend. Their subject-matter involves an inventive step for the same reasons as given for the independent claims 1 and 5.

Order

For these reasons it is decided that:

1. The request for remittal to the Opposition Division for further prosecution because of a late-filed document is refused.

2. The request for referral to the Enlarged Board of Appeal is refused.

3. The decision under appeal is set aside.

4. The case is remitted to the first instance with the order to maintain the patent with claims 1 to 10 according to annex A1 as submitted during the oral proceedings and a description to be adapted.

The Registrar: The Chairman:

G. Rauh G. J. Wassenaar