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**Datasheet for the decision  
of 25 February 2015**

**Case Number:** T 0377/12 - 3.3.06

**Application Number:** 01919003.2

**Publication Number:** 1272262

**IPC:** B01D65/00, B01D63/02

**Language of the proceedings:** EN

**Title of invention:**

HOLLOW FIBRE RESTRAINING SYSTEM

**Patent Proprietor:**

Evoqua Water Technologies LLC

**Opponent:**

Koch Membrane Systems GmbH

**Headword:**

**Relevant legal provisions:**

EPC Art. 52(1), 56, 100(c), 123(2)

**Keyword:**

Added subject-matter (Main Request) - no  
Inventive step (Main Request) - yes

**Decisions cited:**

**Catchword:**



**Beschwerdekammern  
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Case Number: T 0377/12 - 3.3.06

**D E C I S I O N  
of Technical Board of Appeal 3.3.06  
of 25 February 2015**

**Appellant:** Koch Membrane Systems GmbH  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
15 December 2011 concerning maintenance of the  
European Patent No. 1272262 in amended form.**

**Composition of the Board:**

**Chairman** B. Czech  
**Members:** P. Ammendola  
J. Geschwind

## Summary of Facts and Submissions

I. The appeal by the Opponent is from the interlocutory decision of the Opposition Division concerning maintenance of European Patent No. 1 272 262 in amended form.

II. Claims 1 and 5 of the patent in the version held allowable by the Opposition Division (comprising a set of claims 1 to 13 according to the then pending Auxiliary Request 1 filed with letter of 4 October 2011) read as follows (amendments to claim 1 as granted made apparent by the Board):

"1. A filtration system, said filtration system including a bundle of hollow fibres and a restraining system for the hollow fibres, said restraining system including a plurality of longitudinally extending elements (6) spaced from one another and supported by a number of discrete spacer elements (7), each spacer element (7) extending generally transverse of said longitudinal elements (6) such that in combination with said longitudinal elements (6) they define a cage-like structure (5), wherein the longitudinal elements ~~comprise~~ **are** rods (6) and the spacer elements ~~comprise~~ **are** rings (7) and wherein each ring (7) has a number of engagement formations (9, 10) for releasably engaging any associated rod (6)."

"5. A filtration system according to any one of claim 1 to 4 wherein each ring (7) has a number of radially extending cut-outs (10) spaced around its periphery, each cut-out (10) being sized and

*shaped to form an interference or snap-fit with an associated rod (6)."*

Dependent claims 2 to 4 and 6 to 13 according to said set of claims are directed to more specific embodiments of a filtration system according to said claim 1.

III. The Opponent had sought revocation of the patent *inter alia* on the grounds of added-subject matter and lack of inventive step. It maintained these objections also with regard to the claims held allowable by the Opposition Division.

The documents cited in support of the inventive step objection include:

D4: JP 61-263605 A & D4a: PAJP English abstract thereof

and

D10: US 5,179,799 A.

The added matter objections under Articles 100c/123(2) EPC had been raised against claims 1 and 5 as granted and maintained against claims 1 and 5 according to said Auxiliary Request 1 (see II *supra*), in particular in view of,

a) in claim 1, the omission of "*radially extending*" from the features "*radially extending engagement formations*" as disclosed in the application as filed,

and,

- b) in claim 5, the combination of "*radially extending cut-outs*" with "*engagement formations*" (implied by the dependence of claim 5 on claim 1) undisclosed in the application as filed.
- IV. The Opposition Division decided that the patent as amended met the requirements of the EPC. In particular, the Opposition Division found that the added matter objections a) and b) referred to above were not convincing, and that the claimed subject-matter was not obvious in the light of D4, taken as closest prior art, and D10.
- V. In its statement setting out the grounds of appeal, the Appellant (Opponent) maintained the added matter and inventive step objections referred to under point III above against the claims held allowable by the Opposition Division.
- VI. The Respondent rebutted these objections in its reply. However, with its further letter of 23 January 2015 it not only provided further comments but also enclosed three further sets of amended claims respectively labelled Auxiliary Requests 1 to 3.
- VII. Oral proceedings held before the Board on 25 February 2015. The issues addressed were allowability of the claims under Article 123(2) EPC and inventive step in the light of D4 and D10.
- VIII. The Appellant requested that the decision under appeal be set aside and the patent be revoked.

The Respondent requested that the appeal be dismissed (Main Request) or, alternatively, that the patent be maintained on the basis of the claims according to one

of the Auxiliary Requests 1 to 3 filed with letter of 23 January 2015.

IX. The arguments of the **Appellant** regarding its Main Request of relevance here can be summarised as follows.

*Added matter - Claim 1*

Regarding the omission of "*radially extending*" it held the following:

i) Already the presence of this wording *per se* in the application as filed, i.e. in a technical document, implied that it had been used to express a technically relevant meaning.

ii) For the skilled reader of the application as a whole said wording indeed provided an indication of the direction along which the engagement between the rings and the rods had to occur, i.e. a radially directed engagement of these parts, as shown in all the embodiments depicted in the figures of the application as filed. Hence, said wording contributed to the technical meaning of the subsequent expression "*engagement formations*".

iii) On the contrary, the "*engagement formations*" according to claim 1 at issue, deprived of the additional qualification of being "*radially extending*", could as well be conceived as providing engagement by a "*circumferential*" or "*axial*" relative movement of rods and rings. Examples of such conceivable "*circumferential*" or "*axial*" engagement of rods and rings were invoked at the oral proceedings.

*Added matter - Claim 5*

As to the added subject-matter deriving from the dependency of claim 5 on claim 1 at issue, the Appellant stressed that the broadest possible meaning of the expression "*engagement formations*" was not compatible with the whole disclosure of the patent application as filed.

In particular, the wording of claims 4 and 6 of the application as filed, wherein claim 6 was not dependent on claim 4, confirmed that the wordings (radially extending) "*engagement formations*" and "*radially extending cut-outs*" identified two alternative constructions of the restraining system.

Accordingly, also claim 11 of the application as filed referred to "*A restraining system according to anyone of the preceding claims*" thereby confirming that more than one alternative constructions had been defined in the preceding claims. Finally, on page 2 of the application as filed, the (radially extending) "*engagement formations*" were disclosed in the context of "*one preferred form*" (see lines 8 to 9), of which an example was represented by the "*socket*" defined in the next sentence (on lines 9 to 11), whereas the "*radially extending cut-outs*" were only subsequently disclosed in the context of "*another preferred form*" (see subsequent lines 12 to 14).

Considering that the same restrictive interpretation of "*engagement formations*" would also apply to the maintained version of claim 1, the Appellant concluded that claim 5 at issue, by making reference to claim 1, defined the simultaneous presence in the same filtration system of both "*engagement formations*" and "*radially extending cut-outs*" in combination, i.e. a combination of alternative features undisclosed in the application as filed.

*Inventive step*

The Appellant considered that the hollow yarn membrane device disclosed in document D4, comprising an outer cage-like structure to support and prevent the entanglement of the hollow yarn membranes, represented the closest prior art. In the light of D4 the technical problem solved by the presently claimed invention consisted in providing a filtration system that was easy to repair in case of partial damage.

A skilled person would conventionally address a technical problem such as this one by "modularizing" a structure into separable elements, as this measure clearly allowed to selectively remove only the damaged elements. Document D10 merely represented an example of such a conventional approach, i.e. it was one illustration of common general knowledge.

Moreover, the figures in document D4 suggested by themselves the option of "modularizing" the outer support structure into rings and rods, since these were the geometrical elements that a skilled person would immediately recognize therein as the simplest elements into which the support could be divided.

The **Respondent** rebutted the above objections, arguing essentially as follows.

*Allegedly added matter - Claim 1*

As to the omission of "*radially extending*", it stressed that redundant qualifications were occasionally also present in patents. This was also the case of "*radially extending*" in the application in suit, since this wording only identified the location of the "*engagement formations*" in respect of the center of the ring. The Respondent stressed that any conceivable engagement formation of the ring, including specifically shaped



hole or protrusions in/on the ring as invoked by the Appellant at the oral proceedings, had at least some portion extending in the radial direction in respect of the center. Accordingly, it was apparent that the wording "*radially extending*" was redundant. Hence, no limitation had been removed by omitting "*radially extending*" from the originally disclosed expression "*radially extending engagement formations*". Thus, no extension of subject-matter resulted from this omission.

*Allegedly added matter - Claim 5*

As to the allegedly added subject-matter deriving from the dependency of claim 5 at issue on claim 1 at issue, it was apparent to the skilled reader that the wording "*engagement formations*" was used in the original application according to its normal meaning and thus as encompassing engagements of all possible shapes (e.g. protrusions or holes) including the preferred engagement formation explicitly mentioned on page 2, lines 9 to 14, i.e. the "*part-circular opposed flanges spaced to provide a socket having an interference or snap-fit with the associated rod*" or the "*cut-out ... sized and shaped to form an interference or snap-fit with an associated rod*" also represented in the original figures. Hence, the Appellant's interpretation of the wording "*engagement formations*" appeared to be based on an arbitrary assumption as to the reasons, unknown to the representative of the Respondent, for which the drafter of the claims of the application as filed did not make claim 6, defining the preferred "*cut-out*" embodiments, dependent on the preceding claim 4, defining in general the "*engagement formations*". However, such an arbitrary assumption could not justify attributing to the wording "*engagement formations*" in claim 1 at issue an unusually narrow meaning. Hence,

this wording had to be interpreted as encompassing the "cut-outs" option as well. Accordingly, claim 5 at issue, through its dependency on claim 1, did not require the simultaneous presence of two different kinds of engagements, but just the presence of the "cut-outs" as preferred form of the "engagement formations".

*Inventive step*

The Respondent rebutted as an unproven allegation the Appellant's statement that it would be conventional to "modularize" the outer support structure of a hollow fibre membrane filter, such as that of document D4, in order to render it easy to repair. It stressed that document D10 not only belonged to a totally different technical field but did also not address any potential advantage of the disclosed support structure in case of partial damage.

**Reasons for the Decision**

*Main Request (claims allowed by the Opposition Division)*

1. Allowability of the amendments
  - 1.1 The Appellant argued that claims 1 and 5 at issue (see II *supra*) contravened Articles 100(c)/123(2) EPC, because of the omission of "radially extending" in claim 1 and of the "engagement formation"/"cut-out" combination defined by claim 5 depending on claim 1 (see III *supra*).
  - 1.2 Omission of "radially extending" in claim 1

1.2.1 The Appellant arguments in this respect (see IX *supra*) are not convincing for the following reasons.

i) For the Board, the mere fact that the wording "*radially extending*" is used in the application as filed within the expression "*radially extending engagement formations*" does not *per se* imply that it must attribute to such expression a technical meaning differing from that expressed by the remaining part of that expression (i.e. "*engagement formation*") taken by itself. Redundant or even tautological wordings may also occur in a patent document.

ii) In the absence of a more detailed definition, the original wording "*each ring has a number of radially extending engagement formations for releasable engaging an associated rod*" (on page 2, lines 8 to 9, and in claim 4 of the application as filed) should be given its broadest technically sensible meaning compatible with the whole disclosure of the document. In the present case of a three-dimensional object in which a "*cage-like structure*" is defined by "*longitudinal elements*" that are rods and "*spacer elements*" that are rings and are "*extending generally transverse of*" said longitudinal elements, it is apparent that the direction along which the rods are oriented is essentially perpendicular to the essentially planar ("*transverse*") orientation of the rings. In this context, the skilled person will understand that the term "*radially*" refers to the directions of the radii connecting the relevant portions of the ring with its center. Thus, any possibly conceivable way to generate the "*cage-like structure*" by means of "*engagement formations*" of the rings necessarily comprise at least some portion(s) thereof extending along such a radial direction.

In other words, the requirement that it is each ring that "**has**" (emphasis added by the Board) the "*engagement formations*" connecting the former to the rods, so as to generate the described "*cage-like structure*", implies that at least part of any holes, cut-outs, protrusions, sockets, etc. constituting the "*engagements formations*" of the **ring** must, at least to some extent, be "*radially extending*". Thus, this latter wording is redundant.

iii) In its examples of conceivable "circumferential" or "axial" engagement of rods and rings invoked at the oral proceedings, the Appellant apparently equated the omitted wording "*radially extending*" to an implicit restriction to "*engagement formations*" requiring (for carrying out the actual engagement) a radially directed relative movement of the rod and ring, i.e. as if "*radially extending*" also implied "radially engaging".

However, for the Board, neither the literal meaning of the original wording "*each ring has a number of radially extending engagement formations for releasable engaging an associated rod*" nor the remainder of the original disclosure justifies a restrictive construction of "*engagement formations*", i.e. a limitation to only those involving an engagement by a radial relative movement of ring and rod. In particular, the fact that in the embodiments exemplified in the Figures of the patent in suit the rings are also radially engaging the rods via "*sockets*" or "*cut-outs*" is at most indicative of a certain preference but does not, for the Board, express an intention to exclude the possibility of engagements occurring along directions other than "radial".

1.2.2 The Board concludes therefore that the omission of the expression "*radially extending*" from claim 1 at issue does **not** provide a broader meaning to the feature "*engagement formations*", as compared to the wording "*radially extending engagement formations*" as disclosed originally in claim 4 and the description of the application as filed.

1.3 Combination of "*engagement formations*" and "*cut-outs*"

1.3.1 The Board notes preliminarily that it is undisputed that the expression "*engagement formations*" per se is so generic that it embraces any formation suitable for releasably connecting rings and rods so as to generate the cage-like structure, including, *inter alia*, "*cut-outs*".

1.3.2 According to the Appellant's line of reasoning in this respect (see IX *supra*) it would be justified to depart from the broader understanding of the expression "*engagement formations*" when considering the whole disclosure of the application as filed. In particular, it could be gathered from the whole disclosure that the expression "*engagement formations*" was not meant to include, as one alternative, the "*cut-outs*". Instead, the wordings (radially extending) "*engagement formations*" and "*radially extending cut-outs*" apparently identified two alternative design options for the releasable engagement between the rings and rods forming the cage-like restraining system.

In the Appellant's opinion, the same restrictive interpretation of "*engagement formations*" was also justified when construing the meaning of claims 1 and 5 at issue in the context of the patent as modified during the Opposition proceedings (since paragraphs

[0006] and [0007] of the patent in suit were as granted and, thus, contained the same relevant wording of originally filed page 2 identified at IX *supra*).

1.3.3 The Board is, however, not convinced that the Appellant's construction of the expression "*engagement formations*", i.e. excluding "*cut-outs*", is appropriate, even when considering the whole content of the application as filed.

i) Relevant elements of the disclosure of the application as filed were referred to by the Appellant as follows:

- a) The invention embodiments with "*engagement formations*" were claimed in claim 4 of the application as filed whereas those with "*cut-outs*" were claimed in claim 6 of the application as filed, whereby claim 6 was not dependent on claim 4.
- b) Claim 11 of the application as filed referred to "*A restraining system according to anyone of the preceding claims*", thereby confirming that more than one alternative construction had been defined in the preceding claims.
- c) On page 2 of the application as filed, the (radially extending) "*engagement formations*" were disclosed in the context of "*one preferred form*" (see lines 8 to 9), of which an example was represented by the "*socket*" defined in the next sentence (on lines 9 to 11), whereas the "*radially extending cut-outs*" were only subsequently disclosed in the context of "*another preferred form*" (see lines 12 to 14). Also the Figures in

the application as filed only depicted alternative embodiments either with "sockets" or with "cut-outs".

For the Board, however, none of these elements of the application as filed implies that the expression "engagement formations" excludes its normal broad meaning, which also encompasses "cut-outs".

Quite to the contrary, the wording of the application as filed at page 2, lines 12 to 14, i.e. "***In another preferred form, each ring has a number of radially extending cut-outs spaced around its periphery, each cut-out being sized and shaped to form an interference or snap-fit with the associated rod***" (emphasis added) can also be understood by the skilled person as

- referring to an alternative to the "socket" embodiment defined in the immediately preceding description at page 2, lines 9 to 11, reading "*The formations may be in the form of part circular opposed flanges spaced to provide a socket having an interference or snap-fit with the associated rod*"),

and, thus,

- not necessarily referring to an alternative of the embodiment defined using the words as "*In one preferred form, each ring has a number of radially extending engagement formations for releasably engaging an associated rod*", at page 2 lines 8 to 9 of the application as filed.

Likewise, the wordings of claims 4, 6 and 11 of the application as filed do not exclude either considering

- "sockets" and "cut-outs" as two specific alternatives of the "*engagement formations*" defined in claim 4.
- 1.3.4 The same reasons as given above in respect of the disclosure in original page 2 apply also to the identically worded sentences in paragraphs [0006] and [0007] of the patent in the version at issue.
- 1.3.5 The Board concludes therefore that the Appellant's restrictive construction of the expression "*engagement formations*" in claim 1 at issue is not appropriate considering the contents of the patent as granted and of the application as filed.
- 1.3.6 In the Board's judgement, claim 5 at issue does not, therefore, require the presence of "*engagement formations*" other than "*cut-outs*" in combination with such "*cut-outs*".
- 1.4 Accordingly, the Board concludes that the Appellant's objections under Article 100(c)/123(2) EPC are unconvincing .
- 1.5 The Board is thus satisfied that the patent as amended does not contain subject-matter which extends beyond the content of the application as filed and meets the requirements of Article 123(2) EPC.
2. Inventive step
- 2.1 Closest prior art

The Parties concurred with the view of the Opposition Division that the closest prior art was the hollow fibre membrane device depicted in the figures of document D4.



Considering that this device comprises a cage-like outer restraining structure (termed "support" in D4a) preventing the entanglement and the whirling up during backwashing of the hollow fibres (see Figures 1 and 2 of D4 as well as the text of D4a), the Board also sees no reason for taking another stance.

## 2.2 Technical problem

The Appellant held that in the light of the disclosure of D4/D4a the technical problem (point 2.2 supra) consisted in providing a filtration system comprising a bundle of hollow fibres with a restraining system that was easy to repair in case of partial damage.

This technical problem is also addressed in paragraph [0002] of the patent in suit.

## 2.3 Solution

As a solution to this technical problem the patent in suit proposes the hollow fibre filtration system according to claim 1 at issue, which is characterised in particular that it comprises a "cage-like" "restraining system" defined by "releasably engaging" "rings" and "rods" as "spacer elements" and "longitudinal elements, respectively.

## 2.4 Success of the solution

For the Board it is immediately apparent that the filtration system according to claim 1 at issue effectively solves the stated technical problem.

This was not disputed by the Appellant.

## 2.5 Obviousness

Thus, it remains to be assessed whether or not the claimed subject-matter is obvious having regard to the state of the art, as alleged by the Appellant.

- 2.5.1 According to the Appellant a skilled person starting from the restraining structure ("support") of document D4/D4a and seeking to solve the posed technical problem would consider obvious to divide such a structure into separable elements so that, in case of a partial damage, it would be possible to replace only the damaged "module(s)". Conceiving the division of a supporting structure in distinct separable elements (also referred to as "modularization" by the Appellant) would be something conventional.

Document D10, although relating to a different technical field, was cited as an example illustrating such approach. D10 was thus held to be evidence for the conventional nature of "modularization", i.e. it illustrated common general knowledge.

Moreover, the figures in document D4, taken as such, showed geometrical shapes of rings and rods within the cage-like structure. Thus, a skilled person would allegedly immediately recognize the possibility of dividing the structure disclosed in D4 into these elements as the simplest and hence most straightforward way to "modularize" the outer cage-like restraining structure described in D4.

- 2.5.2 The Board is not convinced by this argumentation in view of the following considerations.

i) The cage-like structure of the support depicted in Figures 1 and 2 of document D4 is molded as a single part from a combustible material. Hence it can be burned together with the rest of the filtration system (see text of D4a), thereby reducing output of waste.

Repairing said structure is not addressed in D4a at all.

ii) Document D10 discloses a cage-like structure formed from releasably engaging rod- and ring-shaped elements (see title, abstract and figures), but intended to be used as a "demountable tomato plant support".

Hence, this document does not belong to a technical field that the skilled person seeking to solve the technical problem posed would have taken into consideration.

iii) The Respondent disputed the Appellant's allegation that the "modularization" would be conventional or common general knowledge for the person skilled in the art of filtration systems, and that D10 could be considered as evidence for such common general knowledge.

2.5.3 For the Board, D10 is a single patent document relating to a specific device for a specific purpose which is very remote from the technical field of the invention at issue. Hence, it does not *per se* represent evidence of some common general knowledge, let alone in the technical field of filtration systems.

Moreover, D10 neither touches upon the issue of ease of repair nor upon the concept of replacing only some parts in case of partial damage to the structure disclosed.

2.5.4 Hence, the Appellant did not, in the Board's judgement, put forward any evidence (for common general knowledge or prior art hinting towards the claimed solution) convincingly showing that a person skilled in the art of hollow membrane filtering systems would have obviously, without the benefit of hindsight, considered to "modularize" the support structure of D4 into separately replaceable parts, let alone in the form of releasably engaging rings and rods, to thereby solve the posed technical problem.

2.5.5 The Board thus concludes that the subject-matters of claim 1 at issue, and of claims 2 to 13 dependent thereon, involve an inventive step (Article 52(1) and 56 EPC).

**Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:



D. Magliano

B. Czech

Decision electronically authenticated