BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [ ] To Chairmen
(D) [X] No distribution

D E C I S I O N
of 12 August 2003

Case Number: T 1135/00 - 3.2.7

Application Number: 96610001.8

Publication Number: 0722000

IPC: C23F 13/02

Language of the proceedings: EN

Title of invention:
Apparatus for corrosion portection of a water system

Patentee:
DANSK ELEKTROLYSE A/S

Opponent:
Guldager Elektrolyse A/S

Headword:
-

Relevant legal provisions:
EPC Art. 56
EPC R. 57(a)

Keyword:
"Admissibility of main and auxiliary requests I to VII (no: amendments to the claims of the granted patent not occasioned by grounds of appeal"
"Inventive step (auxiliary request VIII, yes)"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1135/00 - 3.2.7

D E C I S I O N
of the Technical Board of Appeal 3.2.7
of 12 August 2003

Appellant: (Opponent)
Guldager Elektrolyse A/S
Hejrevang 1-3
DK-3450 Alleroed (DK)

Representative:
Roerboel, Leif
Budde, Schou & Ostenfeld A/S
Vester Soegade 10
DK-1601 Copenhagen V (DK)

Respondent: (Proprietor of the patent)
DANSK ELEKTROLYSE A/S
48 Holsbjergvej
DK-2620 Albertslund (DK)

Representative:
Simonsen, Christian Rosendal
c/o Internationalt Patent-Bureau
Hoeje Taastrup Boulevard 23
DK-2630 Taastrup (DK)

Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 17 October 2000 concerning maintenance of European patent No. 0722000 in amended form.

Composition of the Board:

Chairman: A. Burkhart
Members: H. E. Hahn
C. Holtz

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the decision of the Opposition Division to maintain the European patent EP-B-0 722 000 in amended form on the basis of the third auxiliary request.

II. Opposition was filed against the patent as a whole and was based on Article 100(a) EPC (lack of novelty and lack of inventive step).

The Opposition Division held that the apparatus of claim 1 of the patent as granted lacked novelty, that the first auxiliary request was not allowable under Article 84 EPC and that the subject-matter of apparatus part claim 11 of the second auxiliary request lacked novelty. The subject-matter of the independent use claim 1, the independent apparatus claims 4 and 5, and the process claim 7 of the third auxiliary request was considered to be novel and inventive.

III. The most relevant documents of the available prior art are considered to be:

D1: US-A-5 344 537

D5: Copies from "Laerebog Katodisk Beskyttelse" (1975), pages 5, 12, 14, 62-63 and partial English translations of pages 14 and 62

IV. The oral proceedings before the Board of Appeal took place on 12 August 2003.

(i) The appellant requested that the decision under appeal be set aside and the patent be revoked.

(ii) The respondent (proprietor) requested that the decision under appeal be set aside and that the patent be maintained with the amended claims as maintained by the Opposition Division and an amended description as filed with letter of 1 July 2003 (main request), or with the claims of either auxiliary requests 1 to 7, also filed with letter of 1 July 2003, or with claims 1 to 6 of auxiliary request 8 and an amended description filed in the oral proceedings on 12 August 2003.

(iii) The independent claims 1, 4, 5, 7 and 9 of the main request (corresponding to the third auxiliary request of the appealed decision) read as follows:

"1. A use of an apparatus for corrosion protection of a water system, said apparatus comprising a container (1, 14, 17), fully or partly flowed through by water, connected as cathode and/or comprising at least one cathode (9, 10), the apparatus being provided with at least one anode (3), wherein cathode and anode are connected to a DC source, and at least one electrode (4), comprising alkaline sensitive metal selected among aluminium, zinc, tin, lead, or mixtures thereof and electrically isolated from the cathode and the anode connected to the DC source, is provided such that at least a part of

the electrical current, running in the water from the anode to the cathode, is forced through the electrode comprising alkaline sensitive metal."

"4. An apparatus for corrosion protection of a water system comprising a container, fully or partly flowed through by water, said container comprising at least one cathode (10), the apparatus being provided with at least one anode (3), wherein cathode and anode are connected to a DC source, the at least one anode is placed in the same container as the at least one cathode, and the container is divided into two chambers, wherein the first chamber (12) comprises at least one cathode (10) and at least one electrode (4) electrically isolated from the cathode, and the second chamber (13) comprises at least one anode (3) and at least one electrode (4) electrically isolated from the anode and comprising alkaline sensitive metal, selected among aluminium, zinc, tin, lead, or mixtures thereof, the electrodes, isolated from cathode and anode in the two chambers, being electrically connected and provided such that at least a part of the electrical current, running in the water from the anode to the cathode, is forced through the electrode comprising alkaline sensitive metal."

"5. An apparatus for corrosion protection of a water system comprising two containers, wherein the first container (14, 17), fully or partly flowed through by water, is connected as cathode, and/or comprises at least one cathode, and comprises at least one electrode (4, 16, 19)

electrically isolated from the cathode, and the second container (15) comprises at least one anode and at least one electrode electrically isolated from the anode and comprising alkaline sensitive metal selected among aluminium, zinc, tin, lead, or mixtures thereof, wherein cathode and anode are connected to a DC source, the electrodes, isolated from cathode and anode in the two containers, being electrically connected and provided such that at least a part of the electrical current, running in the water from the anode to the cathode, is forced through the electrode comprising alkaline sensitive metal."

"7. A process for operating an apparatus according to claim 4 to 6, wherein it is operated with alternating polarity, such that the electrodes operating as anode and cathode, respectively, in one time period changes polarity to cathode and anode, respectively, in another time period."

"9. A process for operating an apparatus according to claim 8, wherein the polarity of the at least one anode in the second container may alternate, such that the electrode in this container operating as anode in one time period changes polarity to cathode in another time period."

Each of the first to seventh auxiliary requests contains as claim 1 a "use claim" which is modified in some aspects with respect to the use claim 1 of the main request. The eighth auxiliary

request is restricted to the subject-matter of the independent apparatus claims 4 and 5 and of process claims 7 and 9 of the main request and their respective dependent claims.

(iv) The Board indicated that the main request and the first to seventh auxiliary requests were considered not to be allowable under Rule 57a EPC for comprising an additional independent claim of a new category, namely a use claim, which had no counterpart in the patent as granted.

(v) The appellant argued essentially as follows:

The "general technical problem" underlying the patent in suit as assumed by the opposition division (i.e. the problem arising from the use of aluminium anodes in corrosion protection; cf. patent, column 1, lines 23 to 48) is not the correct objective technical problem to be used in the problem solution approach. Instead the technical effect of differing features with respect to a particular prior art document in question should be used to define the correct objective technical problem. D1 represents the starting point of analyses from which the invention of the patent in suit essentially differs in that it comprises an isolated electrode comprising aluminium or other alkaline sensitive metals. Claim 1 of D1 defines a method of corrosion protection in which the cathode comprises aluminium, i.e. a method which only produces AlO^{2-}. The problem with precipitation of Al^{3+} and the advantage of producing AlO^{2-} were

recognised before the priority date of the patent in suit and explicitly mentioned in document D1 (cf. column 1, lines 9 to 24 and column 2, lines 27 to 32). Thus the differing feature of the subject-matter of the invention leads to a shift from producing only AlO^{2-} to producing AlO^{2-} and Al^{3+} in a ratio of 3 to 1. The effect of this shift is an increased precipitation and siltation with respect to the device of document D1. Therefore, the previously solved problem is reintroduced by the invention. The technical problem is regarded as being the provision of an alternative apparatus for corrosion protection of a water system. The addition of an isolated electrode has no technical function and is actually disadvantageous since it increases the problems with precipitation and requires extra steps in the construction of the device. Hence such a modification does not involve an inventive step, if the skilled person could clearly predict this disadvantage which was not compensated by any unexpected technical advantage (cf. T 158/97). Furthermore, such a modification is rendered obvious by the general text book D5 (cf. Figure 3 of page 14).

Also the additional features of claims 1 and 2 of the eighth auxiliary request, namely the provision of two chambers in one container or two containers, cannot contribute to an inventive step, since it is customary practice in electrolysis devices to subdivide the containers housing the electrodes.

(vi) The respondent argued essentially as follows:

Concerning the allowability of an additional use claim 1 according to the main and first to seventh auxiliary requests it is pointed out that claim 1 of the main request (i.e. the third auxiliary request of the appealed decision) had been examined during the opposition proceedings and was found to meet all the requirements of the EPC.

The subject-matter of claims 1 and 2 of the eighth auxiliary request is not rendered obvious by combining the teaching of document D1 with the disclosure of document D5. Figure 3 of document D5 shows in a simplified diagram a "foreign metallic part" suspended in an electrolysis cell between the anode and the cathode but no information about the composition thereof is given. The opposition division has accepted the formulation of the objective problem as given in the patent in suit (cf. column 2, lines 5 to 9). The appellant's formulation of the objective problem is not correct because document D1 actually describes also the production of Al^{3+}, albeit by use of a soluble anode. Essential advantages are obtained by the invention, including in particular a significantly improved versatility in use compared to the prior art electrolysis system of document D1 (cf. patent, column 3, line 55 to column 6, line 45) which opens up to various kinds of electrode arrangements.

Reasons for the Decision

1. *Rule 57a EPC*

1.1 According to Rule 57a EPC and to the established jurisprudence of the Boards of Appeal amendments to the text of a granted patent during opposition or subsequent appeal proceedings should only be considered appropriate and necessary if they can fairly be said to be occasioned by grounds for opposition laid down in Article 100 EPC (compare **Case Law** of the Boards of Appeal of the EPO, 4th edition 2001, pages 483-484, paragraph 10.1.1 "Admissibility of amendments, general remarks").

1.2 Considering this premise the Board comes in the present case to the following conclusions:

(a) The patent as granted comprised an independent apparatus claim 1, independent process claims 7, 8 and 10, and an independent apparatus part claim 11. The patent as granted did not comprise any use claim.

(b) The main request, however, comprises an independent use claim 1 with two dependent use claims 2 to 3, two independent apparatus claims 4 and 5, and independent process claims 7 and 9.

(c) Since apparatus claim 1 as granted covered two specific embodiments in the form of the dependent claims 4 and 5 as granted, the proprietor could, in order to deal with the lack of patentability, restrict himself to these two embodiments and,

consequently, file two independent apparatus claims, each protecting one of the two embodiments (compare **Case Law** of the Boards of Appeal of the EPO, 4th edition 2001, and pages 487-488, paragraph 10.1.4 "Filing additional dependent and independent claims").

(d) The proprietor is, however, not entitled to additionally file another independent use claim which had no counterpart in the patent as granted. Such an additional independent claim of a new category is clearly not occasioned by the grounds of opposition within the meaning of Rule 57a EPC. Such a change of category would only be considered to be appropriate in the specific case where the subject-matter of the independent apparatus claims could not be maintained for lack of patentability. This condition is, however, not fulfilled in the present case.

The observations and objections made in points (a) to (d) above apply *mutatis mutandis* to the auxiliary requests 1 to 7 as filed on 4 July 2003 with letter dated 1 July 2003 which all contain an independent use claim in addition to the apparatus claims.

Therefore, the claims 1 of the main request and the first to seventh auxiliary requests do not meet the requirements of Rule 57a EPC, and consequently, the main to seventh auxiliary requests are not allowable.

1.3 The eighth auxiliary request is restricted to only the independent apparatus claims 1 and 2 and the independent process claims 4 and 6, i.e. restricted to claims of categories, which have a counterpart in the patent as granted. On the basis of the consideration in paragraph 1.2 (c) above, the two independent apparatus claims 1 and 2 are not objectionable since they are the result of an amendment occasioned by a ground of opposition.

Consequently, the eighth auxiliary request meets the requirement of Rule 57a EPC.

Eighth auxiliary request

2. *Article 123(2) and (3) EPC*

The independent apparatus claims 1 and 2 are based on the originally filed claims 1 to 2 and 4 to 5. Independent process claims 4 and 6 are based on the originally filed claims 7 and 10.

The dependent claims 3 and 5 of the eighth auxiliary request are based on the originally filed claims 6 and 9.

Furthermore, the scope of independent claims 1, 2, 4 and 6 of the eighth auxiliary request is restricted compared to the claims as granted.

Consequently, the claims 1 to 6 of the eight auxiliary request are considered to meet the requirements of Articles 123(2) and (3) EPC.

3. Novelty

The subject-matter of the apparatus claims 1 and 2 and of the process claims 4 and 6 of the eighth auxiliary request is novel, since the submitted documents do not disclose an apparatus having either in one container divided into two chambers, or in two containers the cathode and/or anode arrangements in combination with the isolated electrodes made of alkaline sensitive metal as defined in claims 1 and 2.

Also, the appellant acknowledged novelty of the subject-matter of the independent claims 1 and 2, 4 and 6 of the eighth auxiliary request.

4. *Inventive step*

4.1 Closest prior art

The closest prior art is represented by document D1, which corresponds in substance to the Danish patent specification identified in the patent in suit at column 1, lines 49 to 53. It discloses an apparatus for the corrosion protection of a water system comprising at least two electrodes in a container which are connected with a DC current source. The cathode of said electrodes consists of an alkaline sensitive metal, namely aluminium, which electrochemically forms aluminate ions which act as a corrosion inhibitor.

4.2 Problem to be solved

The Board concurs with the statement in the patent that the problem to be solved is to provide an apparatus for

corrosion protection of a water system with less formation of silt, said corrosion protection being more effective than for a conventional cathodic protection system or an electrolysis system (cf. patent, column 2, lines 5 to 9).

4.3 Solution to the problem

The problem is solved by the apparatuses as defined in claims 1 or 2, in particular by the combination of the features:

(a) it comprises an additional electrode, which comprises alkaline sensitive metal selected among aluminium, zinc, tin, lead or mixtures thereof, between the cathode and anode which electrode is not electrically connected with either of the same; and

(b) the cathode and anode are either placed in two chambers obtained by a partition wall provided in a single container, or are each placed in two separate containers.

The Board concurs with the respondent's arguments concerning the improved versatility due to feature (a), since any existing electrolysis system can be transformed into the claimed one by merely introducing the alkaline sensitive metal bipolar electrodes and thereby obtaining the corrosion protecting effects of the prior art such as described in document D1. The decision T 158/97 cited by the appellant concerning an apparatus comprising a third electrode which was considered to represent a technically non-functional

modification with respect to the state of the art is considered not to be relevant because in the present case the alleged advantages appear to be plausible.

The patent in suit mentions further advantages of the two alternative embodiments according to feature (b) of claims 1 or 2, namely a better and complete control of the electrical current running between the said electrodes isolated from cathode and anode. These two embodiments allow to separate the cathode reactions from the anode reactions (cf. patent, column 3, line 55 to column 4, line 1; and column 4, line 27 to column 5, line 7) whereby the silt production according to the patent in suit will be as low as according to the process of document D1 when using an insoluble anode. If a soluble aluminium anode is used in accordance with the teaching of document D1 (cf. D1, column 2, lines 61 to 64) the silt production according to the patent in suit may be even smaller than that according to the process of D1.

Thus the Board considers it credible that the claimed features (a) and (b) provide a solution to the aforementioned technical problem.

4.4 The solution to the problem is not obvious to the person skilled in the art, for the following reasons:

The Board concurs with the respondent's view that the skilled person has no reason for placing an electrically isolated electrode between a cathode and an anode. Even if the general text book D5 in its description of Figure 3 (cf. partial English translation of page 14) reveals that a metal object

when placed electrically isolated in an electrolyte between the cathode and the anode of an electrolysis system can change the current path of the system (whereby the current can take "a short cut") and creates new anodic or cathodic areas this does not lead the skilled person to the solution claimed in claims 1 and 2. The passage corresponding to said Figure 3 of document D5 is silent with respect to the material to be used, or the purpose of such an electrode. Furthermore, document D5 does not mention any effect of enhancement caused by such an arrangement. The skilled person has no incentive to incorporate such an electrically isolated electrode into the electrolysis apparatus according to document D1 as alleged by the appellant. The Board is therefore of the opinion that, although the skilled person could have done so, he actually would not have done so since he has no reason to amend the apparatus according to document D1. The skilled person cannot expect any improvement, let alone a specific enhancement with respect to the silt formation or the effectiveness of the corrosion protection in view of the said explanation of Figure 3 of the general text book D5.

The appellant could also not make plausible as to why the skilled person would choose such electrodes selected from an alkaline sensitive material. As already mentioned, the cited passage of document D5 is totally silent with respect to the material of the metal object. Therefore, the Board is of the opinion that, although the skilled person could have done so, he actually would not have selected electrodes comprising alkaline sensitive material since he could not expect any improvement or advantage in view of the

disclosure of document D5 and thus has no conclusive reason to do so.

Taking account of the disclosures of documents D1 and D5 the first step necessary in order to allow to derive the subject-matter claimed, i.e. feature (a) of the solution to the aforementioned technical problem chosen, namely to place electrodes between the cathode(s) and anode(s) which are electrically isolated from cathode and anode and which comprise an alkaline sensitive material, is not considered to be obvious.

For the second necessary step, i.e. feature (b) of the solution to the aforementioned technical problem, namely to place the cathode and anode either in two separate chambers in one container having a partition wall, or in two containers, there is not any hint in any of the submitted documents.

The appellant argued that this would represent an obvious modification of the apparatus according to document D1 for the skilled person which is based on his common general knowledge. These arguments cannot be accepted by the Board since the appellant did not give any reasoning as to why the skilled person actually would modify the known apparatus of document D1 at all, let alone in the claimed manner. Therefore, also the second step necessary in order to allow to derive the subject-matter claimed is not considered to be obvious.

4.5 The subject-matter of the independent apparatus claims 1 and 2 thus involves an inventive step within the meaning of Article 56 EPC.

4.6 The same applies to the process of claims 4 or 6 which concern the operation of the apparatuses claimed in claims 1 to 3 and 5, respectively, and to the subject-matter of the dependent claims 3 and 5 which define further preferred embodiments of the apparatus according to claim 2.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent in amended form with the following documents:

Claims: 1 to 6 filed as eighth auxiliary request in the oral proceedings on 12 August 2003

Description: pages: 2 to 6 filed in the oral proceedings on 12 August 2003

Drawings: Figures: 1 to 10 as granted

The Registrar: The Chairman:

D. Spigarelli A. Burkhart