

Internal distribution code:

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

D E C I S I O N
of 4 May 2001

Case Number: T 0265/97 - 3.4.1

Application Number: 89911931.7

Publication Number: 0436658

IPC: A61N 1/30

Language of the proceedings: EN

Title of invention:

Control membrane for electrotransport drug delivery

Applicant:

ALZA CORPORATION

Opponent:

-

Headword:

Iontophoretic agent delivery device and electrode/ALZA CORPORATION

Relevant legal provisions:

EPC Art. 84, 123(2), 111(1)

Keyword:

"Clarity of functional features (yes - after amendment)"
"Remittal to the first instance for further prosecution"

Decisions cited:

T 0204/90, T 0181/96

Catchword:

-



**Europäisches
Patentamt**

**European
Patent Office**

**Office européen
des brevets**

Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number: T 0265/97 - 3.4.1

D E C I S I O N
of the Technical Board of Appeal 3.4.1
of 4 May 2001

Appellant: ALZA CORPORATION
950 Page Mill Road
P.O. Box 10950
Palo Alto
California 94303-0802 (US)

Representative: Evans, David Charles
fJ CLEVELAND
40-43, Chancery Lane
London WC2A 1JQ (GB)

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 16 October 1996
refusing European patent application
No. 89 911 931.7 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: G. Davies
Members: H. K. Wolfrum
M. G. L. Rognoni

Summary of Facts and Submissions

- I. European patent application 89 911 931.7 (publication No. 0 436 658) was refused by a decision of the examining division posted 16 October 1996, on the ground that independent claims 1 and 2 then on file did not meet the requirements of Article 84 EPC.

The examining division considered the independent claims as specifying the matter for which protection was sought merely by results to be achieved or rather by unusual properties or parameters of a membrane. The fact that the claims were not restricted to specific tests, by which the claimed properties could be verified, rendered their scope unclear. But even if the test conditions had been specified, the claimed properties were so unusual that it was impossible to determine whether or not prior art membranes would have achieved the same results so that also in this respect the scope of the claims was unclear. In accordance with the Guidelines C-III, 4.7a, in the present case, the characterisation of the product solely by its parameters could not be allowed because these parameters were not usual in the context of a membrane. Moreover, the specified properties were only desiderata and only amounted to restating the underlying technical problem.

- II. The appellant lodged an appeal against the decision on 22 November 1996, paying the prescribed fee the same day. A statement of grounds of appeal was filed on 14 February 1997.
- III. Oral proceedings were held on 4 May 2001 at the request of the appellant.

IV. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 6 and amended pages 1 to 28 of the description with Figures 1/2 and 2/2 filed in the oral proceedings.

V. Independent claims 1 and 2 read as follows :

"1. An iontophoretic agent delivery device (10, 36) for placement on a body surface comprising: a donor electrode (12, 40) including a reservoir (16, 38) containing the agent to be delivered, a counter electrode (14, 46) and a source of electrical power electrically (24, 42) connected to the donor and counter electrodes, the donor and counter electrodes adapted to be placed in spaced apart relationship on the body surface; adhesive means (28, 50) for adhering the device to the body surface in order to maintain the agent reservoir in agent transmitting relation with the body surface; and a membrane (30, 32) interposed between the agent reservoir and the body surface, characterised in that: (a) the membrane is formed by dissolving in a solvent about 60 to 95 parts by weight of cellulose acetate and 5 to 40 parts by weight of a water soluble material having a molecular weight at least as great as the agent molecular weight, casting the membrane, evaporating the solvent and leaching out substantially all of the water soluble material, whereby the membrane permits electrically-assisted flux (J_{EK}) of the agent therethrough and substantially prevents passive flux (J_p) of the agent therethrough, the membrane exhibiting at a temperature of 32°C a $(J_{EK}+J_p)/J_p$ ratio of at least

4 and a voltage drop across the membrane of less than 1 volt both at a current density of $100\mu\text{A}/\text{cm}^2$, and a J_p of less than $100\mu\text{g}/\text{hr}\text{-cm}^2$, or

b) the membrane comprises a mixture of a hydrophilic resin and a hydrophobic polymer, the proportion of the hydrophilic resin to the hydrophobic polymer being such that the membrane permits electrically-assisted flux (J_{EK}) of the agent therethrough and substantially prevents passive flux (J_p) of the agent therethrough, the membrane exhibiting at a temperature of 32°C a $(J_{EK}+J_p)/J_p$ ratio of at least 4 and a voltage drop across the membrane of less than 1 volt both at a current density of $100\mu\text{A}/\text{cm}^2$, and a J_p of less than $100\mu\text{g}/\text{hr}\text{-cm}^2$.

2. An iontophoretic agent delivery electrode (54) for placement on a body surface and for delivering an agent through the body surface, comprising:

a reservoir (58) containing the agent to be delivered; conductive means (62) for electrically connecting the reservoir to a source of electrical power adhesive means (60) for maintaining the reservoir in agent transmitting relationship to said body surface; and

a membrane (30) interposed between the agent reservoir and the body surface, characterised in that :

(a) the membrane is formed by dissolving in a solvent about 60 to 95 parts by weight of cellulose acetate and 5 to 40 parts by weight of a water soluble material having a molecular weight at least as great as the agent molecular weight, casting the membrane, evaporating the solvent and leaching out substantially all of the water

soluble material, whereby the membrane permits electrically-assisted flux (J_{EK}) of the agent therethrough and substantially prevents passive flux (J_p) of the agent therethrough, the membrane exhibiting at a temperature of 32°C a $(J_{EK}+J_p)/J_p$ ratio of at least 4 and a voltage drop across the membrane of less than 1 volt both at a current density of 100 μ A/cm², and a J_p of less than 100 μ g/hr-cm², or

b) the membrane comprises a mixture of a hydrophilic resin and a hydrophobic polymer, the proportion of the hydrophilic resin to the hydrophobic polymer being such that the membrane permits electrically-assisted flux (J_{EK}) of the agent therethrough and substantially prevents passive flux (J_p) of the agent therethrough, the membrane exhibiting at a temperature of 32°C a $(J_{EK}+J_p)/J_p$ ratio of at least 4 and a voltage drop across the membrane of less than 1 volt both at a current density of 100 μ A/cm², and a J_p of less than 100 μ g/hr-cm²."

VI. The appellant's submission in support of its request may be summarized as follows:

The invention was based on the recognition that two conflicting demands encountered in iontophoretic agent delivery devices and electrodes thereof, i.e. that for a membrane significantly suppressing the passive flux of an agent therethrough and that for a membrane having a low electrical resistivity and allowing a sufficiently high electrically-assisted flux of the agent to pass, could be reconciled. Since the applicant was the first one to contemplate meeting both

requirements by a single device and electrode structure, a broad scope of protection was justified. In particular, as regarded the functional definitions, it was not possible to define the invention in any other way than by present claims 1 and 2 without unduly restricting the scope of protection. Notwithstanding the functional definitions, the claim wording was unambiguous and sufficient information was given so as to enable a skilled person to successfully devise a device or electrode. The independent claims did not just relate to a membrane and its properties but to the interaction between an agent to be delivered, the electrical power source and electrodes and the membrane itself. Claims 1 and 2 contained all essential features, whereas details of the tests to be performed for verifying the claimed functional relationships and specific examples of material combinations could be found in the description.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.
2. *Amendments*

Independent claim 1 is based on a combination of original claims 40, 41 and 44, and independent claim 2 is based on a combination of original claims 52, 53 and 56. Clarifying amendments relating to the conditions under which the desired parameter values are to be observed are based on information disclosed on page 9, penultimate paragraph to page 10, first paragraph; and

page 20, last paragraph of the published application description. Finally, the definition of the adhesive means in claim 1 was amended so as to encompass the embodiments of Figures 1 and 3.

The Board is thus satisfied that the amendments comply with the requirements of Article 123(2) EPC.

3. *Clarity (Article 84 EPC)*

3.1 The Board is of the opinion that, after amendment, the wording of the claims as such is understandable, in that no doubt is left as to the structure of the claimed device or electrode and as to the properties which have to be met by a membrane in cooperation with a chosen agent.

3.2 The required properties constitute functional definitions relating to a minimum value for the ratio between the total flux of an agent through the membrane under the action of an electrical current and the passive flux, an upper limit for the voltage drop at the membrane, and an upper limit for the passive flux.

In distinction to the claims on which the appealed decision is based, the present claims also indicate the essential operating conditions, such as the current density and temperature, under which the desired properties have to be tested.

Moreover, the claims presently on file do not only specify the desired functions but relate the latter to two alternative groups of materials, a cellulose acetate membrane formed by a specific process from a solution with a water-soluble material the molecular

weight of which has to be at least as great as that of the agent to be delivered, or a mixture of a hydrophilic resin and a hydrophobic polymer.

For each group of materials, at least one specific embodiment is presented in the patent description. Furthermore, the patent description refers to a variety of potentially suitable hydrophilic resins and hydrophobic polymers.

3.3 As regards claims which rely on functional definitions defining a technical result or a desired technical property, case law (cf. for instance T 204/90 and T 181/96, point 2.2) has developed the following three necessary conditions to be met for such a definition to be permissible:

- (i) from an objective viewpoint, such features cannot otherwise be defined more precisely without restricting the scope of the invention;*
- (ii) these features provide instructions which are sufficiently clear for the expert to reduce them into practice without undue burden; and*
- (iii) the state of the art does not stand in the way of using such functional and therefore general and broad terminology.*

3.4 In view of the observations made in points 3.2 above, and the following considerations, the Board finds conditions (i) and (ii) to be met.

For a device or electrode provided with a specific agent to be delivered, the independent claims do not leave any doubt as to the conditions under which the active and passive flux of the agent through the

membrane and the membrane's electrical impedance have to be determined.

Moreover, from the indications concerning the two alternative groups of materials, the skilled person can recognize the basic principles of agent transport to be established. In the case of the membrane of cellulose acetate, the pores or voids left by the leached water soluble material allow the agent to pass through the membrane. Having chosen the agent to be delivered, the main task left to the skilled person is to select a water-soluble material of suitable molecular weight so that the pores, on the one hand, are wide enough to let an agent pass under the action of an iontophoretic current, but, on the other hand, are sufficiently narrow so as to substantially suppress a passive flow of the agent. In the case of the mixture of hydrophilic and hydrophobic materials, a suitable proportion of the hydrophilic component has to be determined so that, whilst passive flux is blocked, a iontophoretic passage of the agent through the hydrophobic polymer structure is achieved.

The Board is thus satisfied that the independent claims on file provide sufficient information for the skilled person to reduce the functional features to practice without undue burden by simple and straightforward experiments. Moreover, in the absence of any evidence putting in question the fundamental suitability of the membrane materials mentioned in the patent description, a requirement to limit the independent claims to those combinations of materials, for which, according to the specific embodiments, experimental data has been disclosed, would appear to be unduly restrictive.

- 3.5 It remains to be checked whether aforementioned condition (iii), which is not strictly speaking a requirement under Article 84 EPC, would also be met.
- 3.6 The Board notes that the relevance of prior art devices or electrodes was not the subject of the appeal proceedings as substantial deficiencies in clarity had prevented a proper assessment of novelty and inventive step of the claimed subject-matter in the procedure before the first instance. These deficiencies could even have stood in the way of performing a complete search with regard to the relevant aspects now claimed. Under these circumstances, the Board, in exercising its discretion under Article 111(1) EPC, considers it appropriate to remit the case to the Examining Division for further examination.

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 for further prosecution on the basis of the request filed in the oral proceedings (cf. point IV above).

The Registrar:

The Chairman:

R. Schumacher

G. Davies