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D E C I S I O N
of 5 August 2003

Case Number: T 0911/99 - 3.2.7

Application Number: 95112862.8

Publication Number: 0693576

IPC: C23C 18/44

Language of the proceedings: EN

Title of invention:

Deposition of silver layer on nonconducting substrate

Applicant:

Ad Tech Holdings Limited

Opponent:

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Headword:

-

Relevant legal provisions:

EPC Art. 56, 111(1)

Keyword:

"Inventive step - main, first, second auxiliary requests (no)"
"Remittal to first instance - third auxiliary request"

Decisions cited:

-

Catchword:

-



Case Number: T 0911/99 - 3.2.7

D E C I S I O N
of the Technical Board of Appeal 3.2.7
of 5 August 2003

Appellant: Ad Tech Holdings Limited
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 11 February 1999
refusing European application No. 95112862.8
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: A. Burkhardt
Members: P. A. O'Reilly
C. Holtz

Summary of Facts and Submissions

- I. The appellant (applicant) filed an appeal against the decision of the Examining Division to refuse the European application No. 95 112 862.8.
- II. The application was refused by the Examining Division because of added subject-matter (main request) and lack of inventive step (auxiliary request).

The most relevant prior art documents for the present decision are:

D1: US-A-4 407 865

D2: US-A-4 054 139

- III. The appellant requested that the decision under appeal be set aside and a patent be granted on either of the following requests filed on 25 July 2003: main request comprising claims 1 to 10; first auxiliary request comprising claims 1 to 10; second auxiliary request comprising claims 1 to 7; third auxiliary request comprising claims 1 to 9; fourth auxiliary request comprising claims 1 to 6.

- IV. The independent claims of the main request read as follows:

"1. A method of preparing an article that resists microbial growth, the article comprising a nonconducting material having coated on at least a portion of a surface area thereof an adhesive, thin,

coating comprising a layer of silver, the method comprising:

a) depositing the silver layer by treating a portion of the surface of the article activated with stannous ion with an aqueous solution of at least one salt of silver in the presence of a deposition control agent and in the absence of an electric current, the depositing being conducted for a time sufficient only to result in a silver layer, wherein the thickness of the silver layer is from 2 to 2000Å and/or wherein thickness of the coating is such that it is transparent to the naked eye; followed by

b) rinsing the coating in demineralized water and drying the coating."

"4. An article obtainable by a method according to any of claims 1 to 3."

"5. An article that resists microbial growth comprising a nonconducting substrate which is coated over at least a portion of its surface area with an adhesive coating comprising a layer of silver that is from 2 to 2000Å in thickness and is in colloidal form."

"7. An article that resists microbial growth comprising a nonconducting substrate which is coated over at least a portion of its surface area with an adhesive coating comprising a layer of silver that is from 2 to 2000Å in thickness and is transparent to the naked eye."

The first auxiliary request differs from the main request essentially in that at the beginning of each of the independent claims 1, 5 and 7 the expression "that resists microbial growth" has been replaced by "for antimicrobial medical applications".

The second auxiliary request differs from the main request essentially in that in each of the independent claims 1, 5 and 7 the wording "wherein the nonconducting material is latex, polystyrene, polyester, polyvinylchloride, polyurethane, an ABS polymer, polycarbonate, polyamide, polytetrafluoroethylene, polyimide or synthetic rubber" has been added at the end of each claim. Dependent claims of the main request which contained this feature have been deleted and the claims have been consequentially renumbered.

The third auxiliary request differs from the main request essentially in that in the independent method claim 1 the wording "wherein the method further comprises treating the coated portion with a hydrogel layer" has been added at the end of the claim and in the independent product claims 5 and 7 the wording "wherein the article is further coated with a hydrogel layer" has been added at the end of each claim. Dependent claims of the main request which contained this feature have been deleted and the claims have been consequentially renumbered.

The fourth auxiliary request differs from the main request essentially in that in each of the independent claims 1, 5 and 7 the extra wording of both the second and the third auxiliary requests has been added to the

respective independent claim. Dependent claims of the main request which contained these features have been deleted and the claims have been consequentially renumbered.

V. The appellant argued in written and oral submissions essentially as follows:

- (i) Regarding the main request document D2 discloses a coating of silver for a catheter with a thickness of 254000Å. This is a factor of more than 100 times greater than the top of the range claimed in the independent claims. There is no teaching in document D2 to work in a range which is so much thinner than that which was specifically disclosed. The very thin layer specified in the claimed range has been found to have a surprising effect. As a standard test an antimicrobial agent is tested in a Petri dish containing microbes to test its range of efficacy. Normally, the microbes should be killed for up to a certain distance from the article under test. In the case of a catheter having a coating according to the invention this test failed, but nevertheless in clinical trials the catheter achieved good results. It is thought that the thin layer kills just the microbes which come in contact with it, whilst not negatively affecting the body tissue with which it comes in contact. Prior art thicker layers, e.g. as known from document D2, have had some negative effects on the bodily tissues with which they have come in contact. The skilled person had no reason to provide such a thin layer and would not have

expected the surprising effect that has been achieved.

(ii) The features added to the independent claims of the first and second requests are intended to distinguish the field of application of the invention from that of document D1.

(iii) The feature of the hydrogel layer as added to the independent claims of the third auxiliary request has the effect that the layer expands in use. This brings an indwelling catheter into closer contact with the surrounding tissue and reduces the possibility for passage of microbes between the tissue and the catheter. A remittal of this request to the Examining Division would be appropriate.

Reasons for the Decision

Main request

1. The main request contains four independent claims. Claim 7 is the claim of broadest scope so that only this claim needs to be considered.

2. *Inventive step*

2.1 Closest prior art

The closest prior art is represented by document D2 which discloses: an article that resists microbial growth comprising a nonconducting substrate which is

coated over at least a portion of its surface area with an adhesive coating comprising a layer of silver.

2.2 Problem to be solved

The objective problem to be solved by the distinguishing feature is to minimise the quantity of silver to be applied, cf. application as filed, page 2, last paragraph.

2.3 Solution to the problem

The solution to the problem is that the coating is from 2 to 2000Å in thickness and is transparent to the naked eye.

2.4 The solution to the problem is obvious for the following reasons:

Document D2 relates to coating silver on to a catheter. The document explains that silver is an oligodynamic metal, which means that it is effective in small quantities. In column 2, lines 9 to 16 of the document it is explained that an object is to provide an improved catheter which is capable of maintaining minute amounts of oligodynamic silver. In column 4, lines 7 to 12 it is explained that a "thin" layer of about 0.001 inches (254000Å) of silver containing material may be formed. In column 4, lines 16 to 18 it is explained that "Ultra-thin coatings of silver, e.g. of the type deposited by electroless plating, would be operable. " In dependent claim 3 of the document the coating containing silver is stated to have a thickness of "less than about 0.001 inch". From the above

considerations the Board concludes that document D2 teaches providing a layer of silver which is as thin as possible. The document teaches that the layer may have a thickness much less than 254000Å since this is described as "thin" whereas electroless deposition may achieve "ultra-thin" layers. Electroless deposition is also the technique disclosed in the application in suit to deposit the silver. In wishing to achieve a layer as thin as possible, i.e. an ultra-thin layer, the skilled person would also consider a layer having a thickness from 2 to 2000Å.

The appellant has explained that the range claimed in the independent claims produces a surprising effect. However, the appellant has produced no evidence whatsoever to show that this effect is actually achieved and furthermore is achieved solely due to the claimed thickness range. Moreover, the appellant has not shown that the effect could be achieved throughout the claimed range. The Board notes that the lower end of the range, i.e. 2Å, is nothing more than the minimum thickness to achieve a layer having a thickness of an atom or two. A thinner layer cannot therefore exist. The appellant has also indicated in his submissions that the thickness of 2000Å approximately correlates with a thickness below which the layer is transparent to the naked eye. The upper limit was thus chosen on a criterion which has nothing to do with the efficacy of the material of the layer. The Board considers therefore that there is no proof of any surprising effect which occurs throughout the claimed range. Rather to the contrary the limits of the claimed range are specified for other reasons.

The appellant has also alleged that there is a prejudice against such a thin layer. However, no evidence of such a prejudice has been filed and the teaching of document D2 is rather to the contrary, namely that ultra-thin layers should also be effective.

2.5 Therefore, the subject-matter of claim 7 of the main request does not involve an inventive step in the sense of Article 56 EPC.

2.6 Since the main request contains at least one claim which cannot be allowed the request as a whole must be rejected.

3. *First auxiliary request*

3.1 Claim 7, which is the claim of broadest scope of this request, limits the field of application to antimicrobial medical applications. Since this field is the field in which document D2 lies, the limitation does not distinguish the subject-matter of claim 7 from the disclosure of document D2.

3.2 Therefore, the subject-matter of claim 7 of the first auxiliary request does not involve an inventive step in the sense of Article 56 EPC.

3.3 Since the first auxiliary request contains at least one claim which cannot be allowed the request as a whole must be rejected.

4. *Second auxiliary request*

4.1 The extra feature introduced into claim 5, which is the claim of broadest scope of this request, is to indicate the material of the article. The claimed materials are standard materials for catheters. Since document D2 is directed to a catheter also this extra feature does not distinguish the subject-matter of claim 5 in an inventive manner from the disclosure of document D2.

4.2 Therefore, the subject-matter of claim 5 of the second auxiliary request does not involve an inventive step in the sense of Article 56 EPC.

4.3 Since the second auxiliary request contains at least one claim which cannot be allowed the request as a whole must be rejected.

5. *Third auxiliary request*

5.1 The extra feature (additional coating with a hydrogel layer) of the independent claims of this request appeared only in dependent claims in the claims rejected by the Examining Division. The feature did not appear in the claims of the parent application, and the search report for the application in suit contained only one document which was designated as an A document. It is therefore probable that the feature has not been searched. The Board concludes therefore that the effect of this feature on the patentability of the subject-matter of the independent claims has not been examined by the first instance. The Board also notes that the disclosure of this feature appears to be based on two specific examples 15 and 16 (which each refer back to

example 11) in the description, whereas the feature is now claimed broadly. It does not appear that the Examining Division has examined this feature for compliance with Article 123(2) EPC.

- 5.2 In accordance with Article 111(1) EPC, the Board therefore considers it appropriate to remit the case to the first instance for further examination so as to give the appellant the possibility to argue his case before two instances.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The main request and the first and second auxiliary requests are refused.
3. The case is remitted to the first instance for further prosecution.

The Registrar:

The Chairman:

D. Spigarelli

A. Burkhardt