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**Datasheet for the decision  
of 16 November 2009**

**Case Number:** T 0101/07 - 3.4.02

**Application Number:** 98903774.2

**Publication Number:** 1023623

**IPC:** G02B 21/00

**Language of the proceedings:** EN

**Title of invention:**

Producing high throughput tapered straight and cantilevered glass structures for nanodelivery and nanosensing

**Patentee:**

Nanoptics, Inc.

**Opponent:**

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**Headword:**

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**Relevant legal provisions:**

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**Relevant legal provisions (EPC 1973):**

EPC Art. 56, 111

**Keyword:**

"Claim 1 - support, clarity, inventive step (after amendment - yes) "

"Remittal for adaption of remainder of application"

**Decisions cited:**

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**Catchword:**

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Case Number: T 0101/07 - 3.4.02

**D E C I S I O N**  
of the Technical Board of Appeal 3.4.02  
of 16 November 2009

**Appellant:** Nanoptics, Inc.  
Neveh Shaanan 14/18  
Jerusalem 91904 (IL)

**Representative:** Fuhlendorf, Jörn  
Driess Patentanwälte  
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**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 24 July 2006  
refusing European application No. 98903774.2  
pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** A. G. Klein  
**Members:** M. Rayner  
M. J. Vogel

## Summary of Facts and Submissions

I. The applicant has appealed against the decision of the examining division refusing European patent application number 98903774.2 (=WO-A-98 37440). The patent application concerns use of a micropipette for delivering nanoquantities of liquid or gas chemicals. In the decision under appeal, the examining division made reference to the following documents:

D1	EP-A-0 545 538
D2	WO-A-95/05000.

The division refused the application for lack of novelty of the subject matter of claim 1 then before it, which claim was directed to a device.

II. During the examination proceedings, the examining division objected that the application lacked unity, identifying one invention as involving a tapered glass structure for delivery of nano-quantities of liquid. Moreover, with reference to section 4 of the communication of 25.07.2005, the examination division objected that optimising a tapered glass structure for delivery of nanoquantities of liquid appeared to lack novelty over the disclosure of document D2. During the examination proceedings, document D1 had also been considered, the applicant arguing that normal force sensing is not disclosed in document D1 (see letter dated 31.01.2006).

III. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 8 submitted with its letter dated

12.11.2009. The appellant also requested postponement of any amendments to the description until after evaluation of the claims. Moreover, oral proceedings were requested as an auxiliary measure.

In a letter dated 22.10.2009, the appellant argued that the use of a micropipette for the delivery of nanoquantities of chemicals was novel with respect to document D2. The distinguishing features concerned have the effect that surfaces can be treated with an exceptionally high precision. Therefore, starting from document D2, the objective technical problem to be solved by the invention was to provide a way of treating surfaces with the highest precision possible. Neither the problem nor the solution is provided by the teaching of document D2.

IV. The sole independent claim of the application is worded as follows:

"1. Use of a micropipette comprised of a tapered glass structure produced from a glass capillary by pulling technologies, the micropipette being bent near a tip to produce a cantilevered structure suitable for normal force sensing in a variety of attractive, repulsive, contact and non-contact modes, the micropipette having an aperture smaller than the wavelength of light, using the force sensing capability of the micropipette and delivering nanoquantities of liquid or gas chemicals for writing on a surface in a controlled fashion so that chemistry can be performed with nanometric control in order to prevent the spreading of the chemicals on the surface."

## Reasons for the Decision

1. The appeal is admissible.
2. *Support in the documents as filed*
  - 2.1 Amended claim 1 is supported by claims 1, 2, 4 and 6 of the originally filed application. A feature "contact mode" is originally disclosed on page 11, line 32 and "gas chemical" is originally disclosed on page 11, line 4, supporting amendment of the wording "prevent the spreading of liquid chemicals" to "prevent the spreading of liquid or gas chemicals". Moreover, writing on a surface is disclosed in line 10 on page 12. Further, a feature "generating a geometry for high transmission efficiency of electromagnetic radiation" is not present in amended claim 1 since page 11, lines 20 to 26 make clear that the requirement on the parameter of the tip geometry for light funnel tips, which require a high transmission efficiency of electromagnetic radiation, is "exactly opposite" for cantilevered pipettes for chemistry (see page 11, line 3) according to amended claim 1.
  - 2.2 The board is therefore satisfied as to support for the subject matter of claim 1 in the documents as originally filed.
3. *Clarity of claim 1*

The board is satisfied as to the clarity of this claim in view of the positive recital of "using..." and "delivering..." therein.

4. *Prior art*

4.1 Document D2 discloses a cantilevered micropipette having a tip with a hole as small as 7.5 nm (see, e.g. page 7, line 15) and a structure suitable for normal force sensing as can be seen, for example, from claims 1 and 2 and the figures. In addition, the board observes that lithography is mentioned in claim 3.

4.2 Document D1 discloses a shear force probe in the form of an optical fibre drawn down to 100 Å in diameter and a taper angle as small as 10°. Moreover a fibre having a hook shape is readily produced, in which a terminal portion of the probe is curved. An imaging system with application for example to patterning a substrate is disclosed. A pattern which has been formed is examined and dimensions measured. If predetermined specifications are not met, process parameters are changed to bring subsequent substrates into conformity.

5. *Patentability*

5.1 The board concurs with the examining division that document D2 can be considered the closest prior art document, in view of sensing normal force (i.e. normal to the surface being sensed) rather than shear force (i.e. parallel to the surface being sensed) as in the case of document D1 as pointed out by the applicant during the examination proceedings. However, document D2 contains no disclosure at all of use of delivering nanoquantities of liquid or gas chemicals for writing on a surface in a controlled fashion so that chemistry can be performed with nanometric control in order to

prevent the spreading of the chemicals on the surface. The reference to lithography is no more than that and thus does not affect the view of the board on this point.

5.2 The board concurs with the appellant that starting from document D2, the objective technical problem to be solved by the invention was to provide a way of treating surfaces with the highest precision possible. Document D1 cannot provide a solution to this problem because there is no nanodelivery of chemicals to a substrate, any change effected being to process parameters for subsequent substrates.

5.3 While there are a large number of documents in the file relating to near field imaging and micropipettes, the board found none to be more relevant than documents D2 or D1.

5.4 Accordingly, since neither the novel features claimed in claim 1 nor the problem addressed thereby can be found in the available prior art, the board found no convincing reason to argue against patentability and thus concluded that the subject matter of claim 1 can be considered to involve an inventive step within the meaning of Article 56 EPC.

## 6. *Remittal*

6.1 The application has not been adapted to the invention now claimed in "use" claim 1.

6.2 In these circumstances and in view of the complexity involved consequent to remarks of the examining

division about unity, the board considered it appropriate to remit the case to the examining division to offer the applicant the opportunity for amendment requested and permit examination of any such amendments for the first time by the examining division.

- 6.3 In view of the positive position of the board in relation to claim 1, oral proceedings before the board were not necessary.

## **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 grant a patent based on

Claim 1 as filed with the letter dated 12.11.2009,

the remainder of the application (description, dependent claims, drawings) to be adapted thereto as necessary for compliance with the requirements of the EPC.

The Registrar

The Chairman

M. Kiehl

A. G. Klein