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Datasheet for the decision of 26 July 2007

Case Number: T 0312/05 - 3.4.02

Application Number: 02251286.7

Publication Number: 1281951

IPC: G01N 15/14

Language of the proceedings: EN

Title of invention:
Method and device for identification of particles in fluid

Applicant:
PointSource Technologies, LLC

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Claim 1 (main and auxiliary - requests) - inventive step (no)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0312/05 - 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 26 July 2007

Appellant: PointSource Technologies, LLC
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 26 October 2004 refusing European application No. 02251286.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

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

Summary of Facts and Submissions

I. The present appeal was filed on 22 December 2004, the appeal fee being paid on the same date, the statement of grounds being filed on 1 March 2005 and is against the decision of the examining division dated 26 October 2004 refusing European patent application number 02 251 286.7, relating to identification of particles in fluid. In the examination and/or appeal proceedings, reference has been made to document

D1 GB-A-2 317 228.

II. According to the decision under appeal, the subject matter of independent method claim 1 of the main and auxiliary request presented to the examining division was not novel having regard to document D1. The characterising features of claim 1 according to the main request are

"said step of flowing the fluid includes flowing the fluid through locations along said light beam that are not in said detection zone, so light is scattered by particles (140) passing through locations along said beam that are not in said detection zone; and
said step of detecting scattered light by a plurality of detectors, includes detecting, by each of said detectors, only light that is scattered from said detect zone but not light that is scattered from locations along said light beam that are outside said detect zone."

In its reasons for the decision, the examining division read the preamble of claim 1 onto corresponding

features disclosed by document D1. The division considered document D1 also to disclose a lens system which images light scattered by the particle in the detect zone. The lens system is arranged to focus on the detection zone. Document D1 also states that an optical detector could be substituted in a detector assembly of prior art type and mentions environmental monitoring of stack emissions, which implies illumination of particles which are not detected. Avoiding stray light is desirable in any optical system.

Features involving recitation of a wall of the detect zone as claimed in claim 1 of the auxiliary request do not provide novelty because the definition is not precise enough to exclude the wall of the scattering chamber in Figure 2 of document D1 or that of a stack emission monitoring device.

Therefore, the subject matter of claim 1 according to the main or auxiliary request is not novel having regard to the disclosure of document D1 and therefore fails to satisfy Article 54 EPC.

III. The appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of the independent claims presented as main request with the appeal, or in the alternative, those presented with one of a first to third auxiliary request. The main and first auxiliary request correspond to the two requests filed before the examining division. Oral proceedings were requested on an auxiliary basis.

The appellant explained that document D1 relates to a fibre detection system in which airborne particles are

passed through a detection chamber essentially in single file. The light scattered by the particles is incident on a lens system at the forward end of the detection chamber. The lens system collects incident light between an angle of about 40 to 30° with respect to the primary light beam axis. The lens system images this collected light onto a detector which records the scattered light distribution for each of the single file particles. There are no particles outside the detection zone and there is therefore no scattered light emanating from outside the detection zone. In a theoretical situation where scattered light emanated from just behind the sample air column, the lens must also focus, to some extent at least, the scattered light on to the detector. While there may be a reduction in the lens's ability to accurately focus scattered light from points spaced away from the detection zone, nevertheless such light would still be incident on the detector, even if it not fully focused. Any such light would therefore be detected and would contribute to the detected signal.

In the invention, it is realised that it is important to detect light scattered from only one particle at a time. If two or more particles pass through the detect zone at the same time, then that scatter data cannot be used. Therefore, the detect zone must be small. A detect zone of small length is obtained by using photodetectors that have only a narrow angle of detection. Although the particle-containing fluid flows throughout the space traversed by the light beam so that particles can cross the light beam anywhere along the length of the light beam, the identity of an unknown particle may thus still be determined by

detecting only the light scattered from a selected volume along the light beam. An advantage of being able to flow fluid through the apparatus across the full length of the light beam is that the apparatus may be placed in-situ in the fluid e.g. in the effluent stream of a water treatment plant or the outlet of a reservoir so that the sample of water can be taken straight from the effluent stream of a water treatment plant.

The subject matter of the independent method claim according to the requests therefore both has novelty and involves an inventive step.

IV. All the requests for grant of a patent presented to the board contain one of the following independent claims:-

Main Request - Claim 1

"A method for identifying unknown particles that are present in a fluid (19), which includes interrogating particles by directing a light beam (104) through the fluid while flowing the fluid in a stream past the beam and detecting scattered light by a plurality of detectors (112) as a result of an event, which is when a particle passes through a detection zone (114) that lies along said beam, and recording the outputs of said detectors for an event to produce an eventvector, which includes producing multiple events for particles that are of a known first species, to produce multiple eventvectors for that known first species, producing an event for an unknown particle of an unknown species to produce an eventvector for the unknown particle, and comparing the multiple eventvectors for said known first species to said eventvector for the unknown

species to determine whether the unknown particle is of said known first species, characterized by:
said step of flowing the fluid includes flowing the fluid through locations along said light beam that are not in said detection zone, so light is scattered by particles (140) passing through locations along said beam that are not in said detection zone; and
said step of detecting scattered light by a plurality of detectors, includes detecting, by each of said detectors, only light that is scattered from said detect zone but not light that is scattered from locations along said light beam that are outside said detect zone. "

First auxiliary request - Claim 1

"1. A method for identifying unknown particles that are present in a fluid (19), said fluid being in a fluid passage having fluid passage walls which method includes interrogating particles by directing a light beam (104) through the fluid white flowing the fluid in a stream past the beam in the fluid passage and detecting scattered light by a plurality of detectors (112) as a result of an event, which is when a particle passes through a detection zone (114) that lies along said beam, and recording the outputs of said detectors for an event to produce an eventvector, which includes producing multiple events for particles that are of a known first species, to produce multiple eventvectors for that known first species, producing an event for an unknown particle of an unknown species to produce an eventvector for the unknown particle, and comparing the multiple eventvectors for said known first species to said eventvector for the unknown species to determine

whether the unknown particle is of said known first species, characterized by:
said step of flowing the fluid includes flowing the fluid through locations along said light beam in the fluid passage that are not in said detection zone, so light is scattered by particles (140) passing through locations along said beam that are not in said detection zone; and
said step of detecting scattered light by a plurality of detectors, includes detecting, by each of said detectors, only light that is scattered from said detect zone but not light that is scattered from locations along said light beam that are outside said detect zone and within the fluid passage walls. "

Second auxiliary request - Claim 1

This claim has the same wording as claim 1 of the main request.

Third auxiliary request

This claim has the same wording as claim 1 of the first auxiliary request

V. Consequent to the auxiliary request of the appellant, the board appointed oral proceedings. In a communication attached to the summons, the board observed that the application was originally about identifying particles using the data analysis procedures described. In the course of the proceedings, document D1 was revealed on this subject, resulting in increased significance of the not originally claimed optical data capture. A reference in the passage on

page 10, line 21 to page 11, line 6 of document D1, to trajectory(ies) through the beam means the path through the light beam involves non-overlapping bands for the detectors (4-10°, 10-18°, 18-28°). In other words, within the width of the gas sheath for the sample flow and along the light beam, wherever the particles pass through, the detector rings C, B and A receive an appropriate signal. According to the present application, the detectors have long tubes to prevent light scattered from particles outside the detection zone affecting the sensors. As the examining division commented, reduction of stray light - and the board considers light scattered from particles outside the zone to be no more than this - is an obvious desideratum and therefore not patentable. The board questioned how the features actually claimed really offered any advantage in taking fluid straight from an effluent pipe, going on to postulate some features which might be relevant in this context.

VI. In response to the communication attached to the summons, the appellant declared that it would not be represented at the oral proceedings. The appellant requested that the board decide the case on the basis of the arguments and requests on file.

VII. At the end of the oral proceedings, the board gave its decision.

Reasons for the Decision

1. The appeal is admissible.

2. *Patentability - Main Request*

2.1 The appellant has not argued that the very general features relating to fluid flow, the light beam and the eventvector processing as recited in the preamble of claim 1 are not known from document D1. The board accepts that this is the case, which means it is not necessary to analyse the data analysis procedures in detail.

2.2 As the board indicated in the communication attached to the summons to oral proceedings, according to document D1, non-overlapping bands are provided for the detectors, which detect light scattered in the detection zone. Arguments discussed in the first instance proceedings about scattered light, if any, originating just in front or just after the detection zone are of an artificial nature because the skilled person understands from document D1, just as for that matter the application, that only light scattered in the detection zone counts. In the system of document D1, there may, of course, be stray light of one sort or another scattered from the beam outside the detection zone, but this is not imaged onto the detector chip. Whether or not light scattered outside the detection zone exists at any point in time, the last feature of the claim, which does not mention the particles as such, is thus met by the disclosure of document D1, because the light that is detected is that scattered from the detection zone - other light scattered from the beam, when present, is not imaged.

2.3 An explicit disclosure of the other feature which is alleged to be novel is not present in document D1, i.e.

the feature "flowing the fluid includes flowing the fluid through locations along said light beam that are not in said detection zone, so light is scattered by particles passing through locations along said beam that are not in said detection zone". Nevertheless, flowing particles in the beam but not in the zone cannot be considered as involving an inventive step because the disclosure of document D1, as pointed out be the examining division, is taught as applicable to stack emission systems. The board agrees with the division that this implies illumination of particles which are not detected. While there may be features in the description of the application, such as those mentioned by the board in its communication, pertinent to taking water straight from an effluent flow if the appellant really had wanted to move on from the data processing to such an idea, such features are not present in the claim. In other words, what is actually claimed does not go beyond the idea of using the system of document D1 in a stack emission system as suggested in that document. The features actually claimed do not solve any problem associated with taking water straight from an effluent flow. Consequently, the board concluded that the subject matter of claim 1 cannot be considered to involve an inventive step within the meaning of Article 56 EPC.

3. *Patentability - First Auxiliary Request*

Method claim 1 of this request differs from that of the main request by virtue of references to fluid passage walls within which the fluid flows. No submission has been made in the appeal proceedings countering the analysis of the examining division according to which

the subject matter concerned is not precisely enough claimed to differ from the walls disclosed in document D1. The board also finds no reason to differ with the analysis of the examining division. Accordingly, the references to fluid passage walls do not contribute any inventive step to the subject matter claimed in claim 1.

4. *Patentability - Second Auxiliary Request*

Claim 1 of this request is the same as claim 1 as that of the main request. Consequently the board reaches the same conclusion as to lack of inventive step of the subject matter concerned.

5. *Patentability - Third Auxiliary Request*

Claim 1 of this request is the same as claim 1 as that of the first auxiliary request. Consequently the board reaches the same conclusion as to lack of inventive step of the subject matter concerned.

In view of the foregoing, all of the requests submitted by the appellant contain a claim directed to subject matter which cannot be considered to involve an inventive step within the meaning of Article 56 EPC. Therefore the appeal cannot succeed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar The Chairman

M. Kiehl A. G. Klein