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Bezeichnung der Erfindung: Method of diamond identification
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : G01N 21/65, G01N 21/87

ENTSCHEIDUNG / DECISION

vom / of / du 20 September 1990

Anmelder / Applicant / Demandeur : The British Petroleum Company P.L.C.

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 84 EPC

Schlagwort / Keyword / Mot clé : "Clarity of claims (no)"

Leitsatz / Headnote / Sommaire

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Case Number : T 787/89 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 20 September 1990

Appellant : The British Petroleum Company P.L.C.
Britannic House
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Representative : Dodding, Robert, Anthony
BP International Limited
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Decision under appeal : Decision of Examining Division 061 of the European Patent Office dated 28 July 1989 refusing European patent application No. 86 903 527.9 pursuant to Article 97(1) EPC

Composition of the Board :

Chairman : E. Turrini
Members : W. Hofmann
M. Lewenton

Summary of Facts and Submissions

I. European patent application No. 86 903 527.9 (international publication number WO 86/07457) was refused by decision of the Examining Division.

II. The reason given for the refusal was that the subject-matter of both independent Claims 1 and 6 lacked an inventive step in view of the disclosure of documents GB-A-2 140 555 (D1) and US-A-4 397 556 (D2). The Examining Division held in particular that the subject-matter of Claim 1 differed from the disclosure of document D1 only by the fact that (i) the Raman radiation from the sample is passed through a filtering means passing only said characteristic radiation, and (ii) the filtered radiation is detected by the eye of an observer, that feature (i) was obvious in view of document D2 which deals with the same problem as the present application and proposes to use a filter instead of a monochromator, and that the difference (ii) was also obvious to the skilled person since human observation is traditional in the field of diamond sorting.

III. The Appellant lodged an appeal against the decision.

IV. In the Statement of Grounds of Appeal the Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of a new set of claims according to a principal request or one of two auxiliary requests.
The Appellant requested oral proceedings in the event that the Board of Appeal was unable to grant the principal request on the basis of the written record.
The independent claims of the principal request read as follows:

"1. A method for differentiating between diamonds and artificial diamonds or zircon comprising the steps of (a) placing a sample (3) to be differentiated in a beam of monochromatic laser radiation (2) and (b) detecting the scattered Raman radiation of frequency chracteristic of diamond, characterised in that the laser radiation (2) has a wavelength in the green region of the visible spectrum, the scattered Raman radiation from the sample (3) is passed through a filterin means (4) which passes only scattered Raman radiation of frequency characteristic of a diamond and the filtered radiation is detected by the eye (5) of an abserver thereby to enable identification of said sample (3) as a diamond or otherwise."

"4. A device for differentiating between diamonds and artificial diamonds or zircon comprising a source (1) of laser radiation (2) adapted to provide a monochromatic beam (2) and means for supporting a sample (3) to be differentiated in the path of the monochromatic beam (2), characterised in that the laser radiation (2) has a wavelength in the green region of the visible spectrum and the device has a filtering means (4) for passing only scattered Raman radiation of frequency characteristic of a diamond so that the filtered Raman radiation may be detected by the eye (5) of an observer thereby to enable identification of said sample (3) as a diamond of otherwise."

Claims 2 to 3 and 5 to 6 are appended respectively to Claims 1 and 4.

The independent Claims 1 and 3 according to the first auxiliary request differ from Claims 1 and 4 according to the principal request only by the fact that the text "the laser radiation (2) has a wavelength in the green region

of the visible spectrum" is replaced by "the laser radiation (2) is provided by a helium/neon laser (1) adapted to provide radiation having a wavelength at or near 543.5 nanometres" and "the source (1) of laser radiation (2) is a helium/neon laser adapted to provide radiation having a wavelength at or near 543.5 nanometres" respectively.

In addition to the features of Claims 1 and 3 according to the first auxiliary request the independent Claims 1 and 2 according to the second auxiliary request refer to the filtering means (4) as "comprising a portion of glass having a filtering coating".

V. In support of the allowability of his requests the Appellant stressed that document D1 did not constitute the closest relevant art and was not relevant to a consideration of inventive step since it related to different technical problems to the present invention. Thus, in D1 the ore was passed through the laser beam whereas in the present invention the gems were placed in the laser beam. The present invention had an inventive step over document D1 since too many features/changes had to be added to provide the present invention for such a combination of features to be obvious. With regard to document D2, it had been surprisingly found in the present invention that by using laser radiation in the green region of the visible spectrum the Raman shift for diamond was towards the red and might be readily detected by the eye of an observer, whereas D2 related to electronic discrimination and did not relate to diamonds.

VI. In a communication pursuant to Article 11(2) of the Rules of Procedure of the Boards of Appeal, accompanying the summons to oral proceedings, the Rapporteur, on behalf of the Board, informed the Appellant that both independent

claims, according to each one of the three requests, lacked clarity (Article 84 EPC).
The Appellant was furthermore informed that, even if the claims were rendered clear, the subject-matter of the independent claims according to the main request would lack an inventive step in the sense of Article 56 EPC. In this context reference was made to D1, D2 and "ABC der Optik" von Karl Mütze, Verlag Werner Dausien, Hanau 1966 (D4).
Moreover, with regard to the feature that a helium/neon laser was adapted to provide radiation having a wavelength at or near 543.5 nm, which feature is contained in the dependent Claims 3 and 5 of the main request and in the independent claims according to both auxiliary requests, it was stated that the disclosure of the present patent application could only be considered sufficiently complete for it to be carried out by a person skilled in the art (Article 83 EPC) if the necessary modifying steps for obtaining the 543.5 nm line from a helium/neon laser had been known to a skilled person. The Appellant was therefore invited to submit a prepublished document indicating this knowledge of the skilled person.

VII. Oral proceedings were scheduled to take place on 15 October 1990, but in a letter from the Appellant received on 25 August 1990 it was stated that a representative of the Appellant would not attend and that the Appellant wished to withdraw the request for further oral proceedings. The letter contained no proposal to amend nor any new argument, stating simply that it was maintained that the present invention was novel and inventive over the prior art and had solved the problem of distinguishing between real and artificial diamonds.

Reasons for the Decision

1. The appeal is admissible.

2. According to the reasoned opinion given in the Board's communication, all the independent claims, those of the principal request as well as those of both auxiliary requests, lack clarity in the sense of Article 84 EPC since the expression "artificial diamonds or zircon" would indicate that zircon is not an artificial diamond which does not appear to be correct.
Moreover, as far as the independent claims of the principal request and the first auxiliary request are concerned, "filtering means" is a vague term including all devices, e.g. spectrometers passing on only the signals of a certain line, performing similar functions as filters.

The Appellant did not contest this opinion, nor did he propose any amendments or seize the opportunity of submitting arguments at oral proceedings. Thus, the Board can see no reason for changing its opinion.

The Board therefore finds that, for the reasons set out in the communication referred to in par. VI above, Claims 1 and 4 according to the principal request, Claims 1 and 3 according to the first auxiliary request, and Claims 1 and 2 according to the second auxiliary request are lacking in clarity (Article 84 EPC).
For this reason alone all the requests have to be refused.

3. Furthermore, even if the claims had been rendered clear as indicated in the communication of the Board, Claims 1 and 4 according to the principal request would still not be allowable since their subject-matter would lack an inventive step for the reasons given in the above-mentioned communication of the Board.

It may be summarised that the subject-matter of Claim 1 of the principal request, once clarified as before mentioned, differs from the method disclosed in document D1 only by the fact that the spectrometer is replaced by a filter and the diode detector by the eye of an observer. Despite the argument of the Appellant brought forward in the Grounds of Appeal, the Board is not convinced that the technical problems presented and overcome in document D1 are quite different from those of the present invention. Although document D1 finally seeks to separate automatically the diamonds from ore transported on a conveyor belt, it deals clearly enough with the problem of identification of diamond and its solution by means of the Raman effect. Since the Raman spectrum of diamond is quite specific , it is not important from which other material the diamond is to be differentiated. Nevertheless, zircon is mentioned in document D1. The Board cannot see any essential difference between the sample "being placed in" or "passing through" the beam of laser light. Document D1 also explicitly uses the term "placed in" (cf. page 1, line 122) in agreement with the wording of present Claim 1, and the term "passing through" used in Claims 1 and 9 of document D1 cannot be considered as a contradiction to "placing in". Thus, the remaining objective problem for the present invention is to render the method cheap and reliable.

To the same end, i.e. for obtaining a cheap and reliable method of separating a characteristic Raman line of one material from the exciting line and the Raman lines of other materials, document D2 proposes to use a filter device. Detection of radiation by means of the eye is usual in spectroscopy (cf. document D4) and evidently less costly than the use of electronic means.
It is thus obvious to replace the more complicated apparatus according to document D1 by the simpler means according to documents D2 and D4.

Similar considerations apply to Claim 4, once clarified as before mentioned.

4. Finally Claims 3 and 5 of the main request and the independent claims according to the first and second auxiliary requests contain the feature that a helium/neon laser is adapted to provide radiation having a wavelength at or near 543.5 nm. In the communication of the Board, the Appellant was informed that the disclosure of the present patent application in this respect could only be considered to be sufficiently complete for it to be carried out by a person skilled in the art if the Appellant could show that the necessary modifying steps were known to a skilled person.

Since the Appellant did not react to this objection, the Board maintains its opinion that the European patent application according to the main request and to the first and second auxiliary requests violates Article 83 EPC.

5. It follows therefore that the appeal has to be dismissed.

Order

For these reasons, it is decides that:

The appeal is dismissed.

The Registrar: The Chairman:

P. Martorana E. Turrini

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