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**Datasheet for the decision
of 29 July 2008**

Case Number: T 0585/06 - 3.4.02

Application Number: 97118720.8

Publication Number: 0838665

IPC: G01D 5/347

Language of the proceedings: EN

Title of invention:

Optical displacement detecting apparatus

Patentee:

Mitutoyo Corporation

Opponent:

DR. JOHANNES HEIDENHAIN GmbH

Headword:

-

Relevant legal provisions:

EPC R. 67

Relevant legal provisions (EPC 1973):

EPC Art. 56

Keyword:

"Inventive step - all requests (no)"

"Reimbursement of appeal fee (no, former member of the boards of appeal sits beside the representative of a party and assists him at oral proceedings without addressing the opposition division, see point 5 of the Reasons)"

Decisions cited:

G 0002/94, T 0313/05, T 0751/94, T 0729/91

Catchword:

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Case Number: T 0585/06 - 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 29 July 2008

Appellant:
(Opponent)

DR. JOHANNES HEIDENHAIN GmbH
Postfach 1260
D-83292 Traunreut (DE)

Representative:

-

Respondent:
(Patent Proprietor)

Mitutoyo Corporation
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Takatsu-ku
Kawasaki-shi
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Representative:

Altenburg, Udo
Patent- und Rechtsanwälte
Bardehle . Pagenberg . Dost . Altenburg .
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Decision under appeal:

Interlocutory decision of the Opposition
Division of the European Patent Office posted
2 March 2006 concerning maintenance of European
patent No. 0838665 in amended form.

Composition of the Board:

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

Summary of Facts and Submissions

I. The opponent has appealed against the decision of the opposition division that European patent No. 838665 (application number 97 118 720.8, claiming priority of 28.10.1996), as amended according to the first auxiliary request before it, meets the requirements of the Convention. The patent concerns optical displacement detecting apparatus. In the decision under appeal, reference was made to documents including the following:

D3 Burschat R: "Die neue Dimension in der Weg- und Winkelmesstechnik" F&M Feinwerktechnik, vol. 10, October 1996 (1996-1 0), pages 752-756, München, XP000631174

D4 Confirmation letter of the library of the University of Hannover dated 15.05.2003. The document confirms acquisition (in German "Akzessionierung") of F&M periodical, issue 10796, October 1996, on 15.10.1996 under signature L fei Z 10 : ZS 1088 (104,10). The letter states that with the accession "generally the possibility is given, that the public, especially in the specialist field, has access to the document" (in German "grundsätzlich die Möglichkeit gegeben, dass die Öffentlichkeit, insbesondere die Fachwelt, Zugang zur Literaturstelle hat").

D5 Confirmation letter of the Hanser Verlag dated 15.5.2003. The document carries a signed and dated handwritten note to the opponent, that the periodical was finished

at the printer on 04.10.1996 and went for distribution on the same day (in German "das Heft wurde am 04.10.1995 in der Druckerei fertig gestellt und ging am selben Tag in den Versand).

D7 DE 40 06 789 A (Carl Zeiss, DE) 5 September 1991 (1991-09-05).

In the decision under appeal, it is observed that claim 1 of the first auxiliary request includes a feature that the light radiating surface is located outside the gap between the transparent substrate and the light receiving strip. A document available to the public before the priority date of the patent at the University of Hannover, document D3, teaches an almost full integration of all optoelectrical and electrical components on a single optochip, resulting necessarily in the arrangement of the LED within the gap between the transparent substrate and the light receiving chip. Changing from a reflection into a transmission setup would result in less integration so that document D3 teaches away from this. Therefore the subject matter of the claim involves an inventive step.

II. In its appeal, the appellant (= opponent) requested that the decision under appeal be set aside and that the patent be revoked in its entirety. Furthermore, reimbursement of the appeal fee was requested. Oral proceedings were requested on an auxiliary basis.

III. The case of the appellant can be summarised as follows.

Patentability

It has been shown in document D5 that document D3, a monthly periodical, was sent for distribution on 03.10.1996 and its acquisition (in German "Akzessionierung") on 15.10.1996 has been confirmed by Hannover University library in document D4. Document D3 is therefore part of the state of the art.

Document D3 discloses so called "flip chip" or "face down" bonding in optical displacement detecting apparatus. The differing subject matter in claim 1 of the main request occurs in the characterising part of the claim, i.e. the light radiating device is located outside the gap between the transparent substrate and the light receiving chip, which gap is filled by a transparent resin. The problem addressed with respect to document D3 can only be reducing gap size, and not more general problems of stability and precision as postulated by the patent proprietor, because stability, as such, is already present in the teaching of document D3, and precision is not dependent on the position of the LED. Were the skilled person to be presented with the problem of reducing the size of the gap, i.e. the unit consisting of light receiving chip and transparent substrate, then this person would have taken the LED out of the gap. This step was obvious as the skilled person was fully acquainted with transmission and reflection systems. Of course the skilled person knew that an LED is differently positioned in a transmission system and that therefore there could only be partial integration at the receiver side, in the sense that the LED could not be provided therein. There are no problems of differing thermal expansions because any

different expansion occurs at a different place. The subject matter claimed does not therefore involve an inventive step. In relation to the auxiliary requests, it does not matter where the LED is positioned, at the same or on an opposite side of the member 1. This is no more than alternative LED fixing which cannot amount to an invention. With respect to auxiliary request II, the feature relating to an optical grating being formed on the light detecting device is standard practice as can be seen for example from the Abstract of document D7.

Reimbursement of Appeal Fee

The opponent was not informed that a former member of the Boards of Appeal was to be present at the oral proceedings before the opposition division, nor was the former member recognised by the opponent at the oral proceedings. Accordingly, the opponent was not able to object during the proceedings. The former member was declared as a member of the public by the chairman of the opposition division and sat next to the representative of the patent proprietor, obviously taking part and whispering instructions to the latter, who, visibly for all present, acted as the former member's mouthpiece. There is a concern that this led to partiality of the opposition division. Only in the Minutes of the oral proceedings was the former member referred to as a consultant. Although decision G 002/94 of the Enlarged board of Appeal is not applicable 1:1, nevertheless, the unambiguous expression of Point 7 of the reasons in relation to appearance applies, three years being recommended in point 8, yet the present case involving only 2 months. Case G 0002/98 was not restricted to appearance before the boards of appeal

but referred to appearance before the European Patent Office in point 7. Reimbursement of the appeal fee is therefore justified.

- IV. The respondent (= patent proprietor) requested that the appeal be dismissed (main request) or, in the alternative (auxiliary request I), be maintained on the basis of a set of claims filed before the opposition division as auxiliary request II, or, furthermore (auxiliary request II) the set of claims filed before the opposition division with the letter dated 29.12.2003. The respondent also requested that the following question be referred to the Enlarged board of Appeal: "Which standard of proof has to be applied to establish publication date of a document ("up to the hilt" or "balance of probability")?" Moreover, the respondent requested that reimbursement of the appeal fee be refused.
- V. The case of the respondent can be summarised as follows.

Patentability

The respondent disputed that document D3 was available to the public before the priority date of the patent, as acquisition and allocation of a classification number considered as a mere possibility of access to the document is not sufficient. The wording "generally the possibility is given, that the public has access to the document" used in the letter of the university leaves open the possibility of an exception, for example the situation may have been different in the case of document D3. There is no proof that anybody actually read the document.

In other words, if the board decides the document is part of the prior art, then this is not established according to the "up to the hilt" line of practice, but only along the "balance of probabilities" line. Reference is made to decision T 0315/05 in relation to these lines of practice. Reference to the Enlarged Board should be made to ask which standard of proof is to be applied.

In any case, the whole purpose of document D3 is integration, so it is hard to imagine that the skilled person is told to remove the LED. Additionally, removing the LED from the gap means it has to be placed elsewhere, so any space saved is needed somewhere else. Different obvious measures are conceivable, such as looking for smaller LEDs, using stronger adhesives, working with more precise tools or using smaller dimensions. A teaching that leads away from the invention cannot render that invention obvious. If the state of the art points in a different direction, then the could/would question arises. Thus although the skilled person could switch to transmission mode, this would run against the objective of improving accuracy and stability, the problem to be solved, and the skilled person would not have so done. The simplicity of the solution claimed is a strong indication of inventive step. There is thus no doubt that the subject matter claimed can be considered to involve an inventive step. With respect to auxiliary request I, claim 1 is restricted to a transmission type decoder and claim 2 to a specific reflection type decoder. In both cases, the source of light being removed from the light receiving chip reduces negative effects thereon.

The claim according to auxiliary request II offers an advantage in allowing the grating to be formed in the production process of the light detecting device

Reimbursement of Appeal Fee

Decision G 0002/94 of the Enlarged Board of Appeal deals with the question of whether an accompanying person may make submissions before a board of appeal. The opposition division is an administrative body so neither the order nor the underlying considerations in G 0002/94 are relevant to the present case. The former member of the boards of appeal did not make any submission and was present as a consultant, not a lawyer. The purpose and sense of a consultant is to be available for consultation, but the former member was not active in the proceedings. Only if an accompanying person is intended to make oral submissions is it necessary to announce his presence in advance and it was clear that the former board member, while an accompanying person, did not make oral submissions. That the representative of the patent proprietor was influenced, is only speculation. The allegation of whispering by the former member has not been proven and would have disturbed the oral proceedings and have been stopped by the chairman. The opponent had an opportunity to object to such conduct.

- VI. The independent claims presented in the requests of the respondent are worded as follows:

Main Request

"1. An optical displacement detecting apparatus, comprising:
a first member (1) having a first optical grating (12);
a light radiating device (2) for radiating light to the first optical grating (12) of said first member (1);
and
a second member (3) having a second optical grating, separated from said first member (1) by a gap so that said first member and the said second member can be relatively moved, for receiving the light radiated from said radiating device (2) through the first optical grating and the second optical grating so as to detect the relative displacement between said first member and said second member,
wherein said second member (3) has a transparent substrate (4) which has a front surface facing said first member (1) and a reversed surface on which thin film electrodes (43) are disposed, and a light receiving chip (5) which has a light detecting device for receiving the light and solder bumps (54) formed on the light receiving chip corresponding to the thin film electrodes (43) on the reverse surface of the transparent substrate, said light receiving chip being disposed on the reverse surface of the transparent substrate (4) through the solder bumps (54) and the thin film electrodes (43) by face-down bonding method,
and
wherein the second optical grating is disposed on at least one of the transparent substrate (4) and the light receiving chip (5);
characterized in that

the light radiating device is located outside the gap between the transparent substrate (4) and the light receiving chip (5) which gap is filled by a transparent resin (10)."

Auxiliary Request I

"1. An optical displacement detecting apparatus, comprising:
a first member (1) as main scale having a first optical grating (12);
a light radiating device (2) for radiating light to the first optical grating (12) of said first member (1);
and
a second member (3) having a second optical grating, separated from said first member (1) by a gap so that said first member and the said second member can be relatively moved, for receiving the light radiated from said radiating device (2) through the first optical grating and the second optical grating so as to detect the relative displacement between said first member and said second member,
wherein said second member (3) has a transparent substrate (4) which has a front surface facing said first member (1) and a reversed surface on which thin film electrodes (43) are disposed, and a light receiving chip (5) which has a light detecting device for receiving the light and solder bumps (54) formed on the light receiving chip corresponding to the thin film electrodes (43) on the reverse surface of the transparent substrate, said light receiving chip being disposed on the reverse surface of the transparent substrate (4) through the solder bumps (54) and the thin film electrodes (43) by face-down bonding

method, and

wherein the second optical grating is disposed on at least one of the transparent substrate (4) and the light receiving chip (5);

characterized in that

a gap between the transparent substrate (4) and the light receiving chip (5) is filled by a transparent resin (10), and in that said second member (3) is disposed on the opposite side of said light radiating device (2) to said first member (1) and receives transmitted light of the first optical grating.

2. An optical displacement detecting apparatus, comprising:

a first member (1) as main scale having a first optical grating (12);

a light radiating device (2) for radiating light to the first optical grating (12) of said first member (1);

and

a second member (3) having a second optical grating, separated from said first member (1) by a gap so that said first member and the said second member can be relatively moved, for receiving the light radiated from said radiating device (2) through the first optical grating and the second optical grating so as to detect the relative displacement between said first member and said second member,

wherein said second member (3) has a transparent substrate (4) which has a front surface facing said first member (1) and a reversed surface on which thin film electrodes (43) are disposed, and a light receiving chip (5) which has a light detecting device for receiving the light and solder bumps (54) formed on the light receiving chip corresponding

to the thin film electrodes(43) on the reverse surface of the transparent substrate, said light receiving chip being disposed on the reverse surface of the transparent substrate (4) through the solder bumps (54) and the thin film electrodes (43) by face-down bonding method,

wherein the second optical grating is disposed on at least one of the transparent substrate (4) and the light receiving chip (5), and

wherein said second member (3) is disposed on the same side as said light radiating device (2) to said first member (1) and receives reflected light of said first member (1)

characterized in that

the light radiating device (2) is located aside the light receiving chip (5) and outside the gap between the transparent substrate (4) and the light receiving chip (5), and in that said gap is filled by a transparent resin (10)."

Auxiliary Request II

"1. An optical displacement detecting apparatus, comprising:

a first member (1) as main scale having a first optical grating (12);

a light radiating device (2) for radiating light to the first optical grating (12) of said first member (1);

and

a second member (3) having a second optical grating, separated from said first member (1) by a gap so that said first member and the said second member can be relatively moved, for receiving the light radiated from said radiating device (2) through the first optical

grating and the second optical grating so as to detect the relative displacement between said first member and said second member, wherein said second member (3) has a transparent substrate (4) which has a front surface facing said first member (1) and a reversed surface on which thin film electrodes (43) are disposed, and a light receiving chip (5) which has a light detecting device for receiving the light and solder bumps (54) formed on the light receiving chip corresponding to the thin film electrodes (43) on the reverse surface of the transparent substrate, said light receiving chip being disposed on the reverse surface of the transparent substrate (4) through the solder bumps (54) and the thin film electrodes (43) by face-down bonding method, and wherein the second optical grating is disposed on at least one of the transparent substrate (4) and the light receiving chip (5); characterized in that a gap between the transparent substrate (4) and the light receiving chip (5) is filled by a transparent resin (70), and in that said second optical grating is formed on said light detecting device."

- VII. Oral proceedings were appointed by the board. In a communication attached to the summons, the board drew attention to the question of applying techniques used in reflective systems to transmissive systems and what the skilled person really would have done in the context of miniaturisation. Moreover, in connection with the request to reimburse the appeal fee, the board observed that not only was the procedure before the opposition division and not a board of appeal, but, it

seemed also, the former member did not speak as, or even under the control of, a representative.

VIII. During the oral proceedings, the chairman observed in relation to document D3 that, in view of the lapse of time, it would not be easy in practice to find a person who had actually read document D3 in the University of Hannover Library before the priority date of the patent. In practice, document D3 would have been distributed not just to the library but to all subscribers. The legal member remarked that, to his knowledge, the procedure for dealing with periodicals meant that document D3 would have been laid out immediately for the public inspection. On the substance, the chairman wondered if simply alternative fixings could amount to an invention.

The chairman informed the parties that the board had not seen any concrete reason implying partiality of the opposition division by virtue of the presence of the former member of the board of the appeal. The legal member of the board observed that the former member was, at the time of the oral proceedings, no longer an employee of the European Patent Office and that by virtue of the fundamental principle of freedom to exercise a profession was not, in principle, hindered in working as a consultant in the field of patent law, this not being prohibited by any provision in the European Patent Convention.

IX. The board gave its decision at the end of the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.
2. Status of Document D3
 - 2.1 In case T 0313/05, referred to by the respondent, the document considered was alleged to have been distributed during a workshop and also to people from America (see points 35 and 36 of the reasons). The matter up for decision did not therefore involve a periodical as in the present case, which therefore differs therefrom. Another case referred to in decision T 0313/05, namely decision T 0751/94, does involve a periodical, but there the evidence for publication provided was only a printed date on the periodical and a handwritten note by an unidentified person on an enquiry to the publisher "mailed 10/6/87", i.e. before the priority date of the patent application. Counter evidence from the applicant conflicted by indicating actual date of receipt by actual subscribers after the priority date of the patent application concerned. The present case is therefore different in that the person confirming distribution is named, a subscriber confirms receipt (the library) in good time and there is no conflicting evidence.
 - 2.2 The present case is, in fact, not unlike that considered in decision T 0729/91, where receipt of a periodical by a library without conflicting evidence that it had not been published was concerned. As in that case, in the present case the respondent has not provided any counter evidence to that of the appellant, which proves by virtue of document D5 dispatch to and

by virtue of document D4 receipt of the document at the library. The priority date of the patent is 28.10.1996, and that of accession by the library is 15.10.1996, thirteen days earlier. Experience in real life is that libraries lay documents out for reading, tallying with the remark in document D4. In other words, since the respondent only argues that document D3 may not have been laid out in the library contrary to normal life experience, without explaining why this is probable, there are scarcely probabilities to balance. Furthermore, it must be borne in mind that the other subscribers would have received their copies by the same distribution process.

2.3 The respondent considered it necessary to find a person who actually read the document in the library to establish that the document is part of the state of the art. However, as the board pointed out, it is rather difficult to find such a person after a number of years. Moreover, since public availability of the document on its own is enough to make it part of the prior art, it is not necessary to find such a person.

2.4 It is not necessary to refer the question relating to lines of argument, as posed by the respondent, to the Enlarged Board of Appeal, because the present board does not diverge from the board issuing decision T 0313/05 as the facts differ. In addition, the board observes that the reference to "up to the hilt" made by the respondent occurs mainly in case law relating to prior use, where evidence is provided by one side, which is not the situation presently at issue. In the present case, the respondent could have tried to

provide counter evidence, e.g. along the lines in T 0751/94.

2.5 Accordingly, the board is satisfied that document D3 is part of the state of the art.

3. Patentability - Main Request

3.1 A review of the patent in dispute reveals that the main teaching from which advantages in construction flow, is the use of a face down bonding technique and a transparent filler. This can be seen from, for example, column 3, lines 26 to 36; column 5, lines 37 to 55; column 6, lines 15-26; column 8, lines 5 to 8; and column 8, lines 46 to 56. In the opposition proceedings, the opposition division established that the face down bonding method and transparent filler were known from document D3.

3.2 The opposition division went on to identify the features of the claim novel over document D3 as being defined in the characterising part of claim 1, an analysis with which neither the respondent nor the appellant differed in the appeal proceedings. The board has thus not been presented with any reason to diverge from this position, with which it too agrees. In other words the novel features in which an inventive step is seen by the respondent are concerned with the position of the light source outside the gap filled with resin and between the transparent substrate and the light receiving chip. Therefore, if there is an inventive step, it must derive from the configuration of displacement detecting apparatus, not the face down bonding, as such.

3.3 During the appeal proceedings, there has been some discussion about the problem solved by the novel features, the respondent seeing the problem as providing an optical displacement detecting apparatus which is more stable and reliable, simpler and cheaper to produce, and provides more precise measurement. The board does not agree with this approach because, for example, the sentence bridging the middle and right column on page 754 already specifies that the resin contributes to stability, implying corresponding reliability. Moreover, the board agrees with the appellant that that precision is not dependent on LED position. There is no proof of production costs. The board thus considers the position of the appellant, who saw the problem as reducing the size of the gap to be more realistic. In fact, this also chimes with the more general assessment of the opposition division, i.e. decreasing the size of the sensor. The remark of the respondent that the LED would have to be put somewhere else does not bear on the size of the gap.

3.4 Inventive step therefore turns on the question of whether the technique of document D3 is tied to the particular reflective apparatus therein disclosed or would be understood by the skilled person as more generally applicable, in particular, also, for example, to transmissive type apparatus. The appellant explained that the skilled person was fully conversant with other types of apparatus and that face down bonding with such types using the transparent member for carrying the receiver would have been obviously applied thereto. Concepts relating to smaller LEDs, using stronger adhesives, working with more precise tools or using

smaller dimensions apply to all types of apparatus. Miniaturisation is achieved by partial integration, i.e. carrying chips not including the LED by face down bonding on the transparent substrate, the skilled person knowing the LED must structurally be located elsewhere for such other types of apparatus.

3.5 The respondent's more formalistic could/would approach was less convincing in the present case, because it was unrealistically blind to the knowledge of the skilled person about structural imperatives of other, such as transmissive, position measuring apparatus with which the skilled person was conversant, the approach being based only on the concept that less miniaturisation by removing the LED for the particular type of apparatus disclosed in document D3 does not fit with the teaching about that particular apparatus. The board therefore reached the conclusion that the skilled person not only could have applied a face down bonding to such other apparatus, such as transmissive type apparatus, but would have done so, thus reaching the subject matter of claim 1 of the main request, which, accordingly, cannot be considered to involve an inventive step within the meaning of Article 56 EPC.

3.6 Therefore, the main request of the respondent does not succeed.

Patentability - Auxiliary Request I

3.7 Claim 1 of this request, while clumsily worded, differs from the main request effectively by defining structure such that received light has been transmitted through the first member. In other words, a transmissive

apparatus is concerned. Accordingly, this claim can do no more than make explicit that the face down bonding is applied, not to apparatus as disclosed in document D3, but to a transmissive apparatus. For the reasons already given above for the main request, this subject matter cannot be considered to involve an inventive step within the meaning of Article 56 EPC.

- 3.8 Claim 2 of this request differs from the main request in that the light radiating device and light receiving chip are specified as on the same side of the first member. In this case, the apparatus is structurally somewhat more like that of document D3, therefore the issue of why remove the LED as stressed by the respondent could be thought to become more credible in the context of patentability. Nevertheless, the concept of face down bonding is taught by document D3. Thus against the respondent's position has to be weighed the other question raised during the proceedings, namely "can it be an invention, just to change the fixing of the LED?". Since the board is convinced of obviousness of partial integration, i.e. carrying chips not including the LED by face down bonding on the substrate, it reached the view, following the line of the appellant that it does not matter in that case where the LED is, whether positioned transmissively or reflectively, and consequently that the logical answer to the question is in the negative. For this reason, analogously to the main request, the differing subject matter cannot be considered to involve an inventive step within the meaning of Article 56 EPC.

- 3.9 Therefore, auxiliary request I of the respondent does not succeed, and, even had claim 1 and 2 been filed in

separate requests, neither of these request would have succeeded.

4. Patentability - Auxiliary Request II

4.1 Claim 1 of this request differs from the main request by virtue of recitation of the second optical grating being formed on the light detecting device. The Abstract of document D7 referred to by the appellant recites that the grating is directly deposited on the sensor surface of a sensor integrated in a semiconductor substrate. The grating can therefore be made with the manufacture of the semiconductor substrate.

4.2 In view of this disclosure, the board concluded that the differing feature is a standard feature, the use of which is obvious and does not amount to an inventive step.

4.3 Therefore, auxiliary request II of the respondent does not succeed.

5. Reimbursement of the Appeal Fee

5.1 The board has not identified any reason justifying reimbursement of the appeal fee as neither a substantive procedural violation nor reasons of equity are present for the following reasons.

5.2 At the time the former member of the Boards of Appeal attended the oral proceedings before the opposition division he was no longer employee of the EPO. By virtue of the fundamental principle of freedom to

exercise a profession he was in principle not hindered to work as a consultant on the field of patent law. Moreover, no provision of the EPO forbids work as consultant.

- 5.3 The former member did not act as an authorised representative but only as consultant of the patent proprietor. He did not address the opposition division, even not under the control of the representative of the respondent. This amounts to an important difference to the facts of case G 0002/94, where a former member of the boards of appeal presented his case before his former colleagues.
- 5.4 In the present case, the former member gave only hints by whispering to the authorised representative who was absolutely free to accept them or not, but he did not make any intervention of his own motion.
- 5.5 The representative of the appellant accepted at the beginning of the oral proceedings that the former member sit beside the representative of the respondent and assist him. Even during the oral proceedings no objection was made against his presence.
- 5.6 The former member was obviously not a member of the public as he did not sit in the back of the room. Furthermore the representative of the appellant was free to ask more and detailed questions as to the function and identity of the former member.
- 5.7 No substantiated reasons of partiality of the opposition division were submitted by the appellant.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.
3. The request for reimbursement of the appeal fee is refused.

The Registrar

The Chairman

M. Kiehl

A. G. Klein