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DECISIONS OF THE BOARDS OF APPEAL

Decision of Technical Board of Appeal 3.5.2 dated 5 September 2000

T 473/98 - 3.5.2

(Language of the proceedings)

Composition of the board:

Chairman: W. J. L. Wheeler

Members: R. G. O'Connell

B. J. Schachenmann

Patent proprietor/Appellant: BTG INTERNATIONAL LIMITED

Opponent/Appellant: GENERAL ELECTRIC COMPANY

Headword: Magnetic field screen/BTG INTERNATIONAL LIMITED

Article: 54(2),(3), 56, 64, 68, 83, 100(a),(b), 106(3), 107, 111(1) EPC

Keyword: "Opponent adversely affected by revocation decision including findings favourable to the proprietor - (no)" - "Insufficiency - (no)" - "Novelty - (yes)" - "Inventive step - (yes)"

Headnote

I. It is entirely appropriate and desirable in the interests of overall procedural efficiency and effectiveness that an opposition division should include in the reasons for a revocation decision pursuant to Article 102(1) EPC employing the standard

decision formula, by way of obiter dicta, findings which could obviate a remittal in the event of the revocation being reversed on appeal (2.4).

II. An opponent is not adversely affected by such findings favourable to the proprietor included in a revocation decision nor is the proprietor as sole appellant protected against a reformatio in peius in respect of such findings (2.1 to 2.6).

Summary of facts and submissions

I. These are appeals, by the proprietor and opponent respectively, from the revocation by the opposition division of European patent No. 216 590. The reason given for the revocation was that the subject-matter of claim 3 of the patent was not new, having regard to the following prior art document:

E2: EP-A-0 138 270.

Other prior art documents relevant to the appeal are:

D1: EP-A-0 231 879

D2: EP-A-0 167 243

E1: US-A-3 466 499

E11: US-A-4 310 799

II. The minutes of the oral proceedings before the opposition division record the pronouncement of the decision as follows:

"After a break the chairman announced the final decision that the patent in suit was revoked because the subject-matter of claim 3 was not novel with respect to E2. The chairman emphasized that this decision included the following further decisions made by the opposition division:

- the application satisfies the requirements of Article 83 EPC,
- claim 1 is entitled to the earliest priority P1,
- the subject-matter of claim 1 as finally amended during the oral proceedings is novel and satisfies the requirements of Article 123(2) and (3) EPC,
- the subject-matter of claim 14 is novel with respect to D1, E2, or D2 and is inventive with respect to E2 or a combination of E2 with D2,
- document US-A-4 310 799 is introduced into the procedure."

This record in the minutes is echoed in the reasons for the decision under appeal which includes reasoned conclusions to the effect that:

Claims 1 and 3 were entitled to the priority of 20 September 1985 and claim 14 to the priority of 19 June 1986;

The amendments to claim 1 were permissible under Articles 123(2) and (3) EPC;

The subject-matter of amended claim 1 was new;

The subject-matter of independent claim 14 was new and involved an inventive step.

III. Oral proceedings were held before the board on 5 September 2000 in the course of which the proprietor filed a fair copy of claim 1 as amended in the opposition procedure and amendments adapting the description to the amended claim 1. The opponent was, without notice or reason being given, not represented at the oral proceedings.

IV. Claim 1 is worded as follows:

"A method of designing a resistive screening coil for NMR imaging apparatus for selectively screening the field of a magnetic coil comprising calculating the induced current distribution in a hypothetical continuous superconductive metal surface positioned in the place of wires of the screening coil and then calculating the position

and current distribution within the said wires to approximate to said induced current distribution so that the screen acts as a complete reflector of magnetic field."

Claim 2 is dependent on claim 1.

Claim 3 is worded as follows:

"A screen for a magnetic field produced by an electrical coil implementing the method of claim 1, said screen comprising a set of electrical conductors; said screen further including means for supplying the conductors of the set with electrical currents, wherein the electrical conductors of said screen are so positioned and the electrical currents supplied to the conductors are approximately of such a magnitude to satisfy the conditions such that the magnetic field normal to the screen is zero and the tangential magnetic field components are equal to the respective orthogonal current densities in the screen so that the magnetic field on the side of the screen away from the electrical coil is substantially zero at all points."

Claims 4 to 13 and claim 15 are further screen claims, ie apparatus claims, dependent on claim 3. Claim 14 is an independent apparatus claim worded as follows:

"A screen system for a magnetic field created by a coil, the coil being surrounded by two or more active magnetic screening coils through which current is passed, each respective screening coil comprising a set of electrical conductors and means for supplying the conductors of the set with electrical currents characterised in that the system comprises an inner screen and an outer screen, the inner screen lying between the coil and the outer screen, the magnitudes of the electrical currents are such that there is no appreciable magnetic field outside the outer screen and the field within the inner screen substantially corresponds to the field that would be provided by the coil if the screens were not present."

V. The proprietor argued essentially as follows:

The screening coil disclosed in E2 was not of the same design as that claimed in claim 3 of the opposed patent. The field produced by the E2 screen was different from that produced by that of the opposed patent as was demonstrated by the three curves in the document filed by the proprietor with his statement of grounds of appeal and entitled Appendix IIE. The first curve depicted the unscreened field which started at -1 000 Gauss (-100 mT) in the immediate neighbourhood of the screen, rose smoothly and monotonically to a maximum value of +500 Gauss(+50 mT) at a distance of 2 m and fell off smoothly and monotonically to a substantially zero value somewhere beyond a distance of 5m. The second curve, which depicted the field of a screening coil designed in accordance with the teaching of E2, started at a value of about -300 Gauss (-30 mT), oscillated wildly in a band between a maximum of about +900 Gauss (+90 mT) and a minimum of about -600 Gauss (-60 mT)in a region extending to a distance of about 2.5 m. Only outside this region did the field decline in magnitude to assume a substantially zero value. By contrast the third curve corresponding to the field of a screen in accordance with claim 3 of the opposed patent maintained a substantially zero field not only in the far region beyond 2.5 m but also right in to the close neighbourhood of the screen.

The curves demonstrated that the field produced by a screening coil designed in accordance with the teaching of E2 was not identical with the field produced by a screening coil in accordance with claim 3 of the opposed patent. Since the fields were different the respective coil windings generating these fields were necessarily different.

VI. The opponent's arguments can be summarised as follows:

VI.I Admissibility of the opponent's appeal

(a) The opponent's appeal was directed against the decisions of the opposition division relating to the validity of the respective priority dates, the objection under Article 100(b) EPC, the novelty of amended claim 1, and the patentability of independent claim 14.

(b) In the opposition procedure the opponent had requested that the patent be revoked in its entirety based on the grounds of Article 100(a) and (b) EPC. Any decision in which one of these grounds was found not to apply to one or other of the claims of the opposed patent was inconsistent with such a request. Hence on the interpretation of "adversely affected" laid down in decision J 12/85, the opponent's appeal was admissible.

(c) Furthermore the decision under appeal involved a substantial procedural violation justifying reimbursement of the appeal fee because the opposition division had needlessly decided the issues noted above. The opponent had been obliged to appeal since, in view of decision G 9/92 the proprietor as sole appellant would be protected against the *reformatio in peius* which any reversal of these inappropriate decisions would imply.

VI.II Substantive issues

(a) Claim 1

(i) The amendments to claim 1 contravened Article 123(3) EPC. The term "resistive" comprised "superconductive" and therefore did not represent any limitation of claim 1 as granted. The step "calculating the induced current distribution in a hypothetical superconductive metal surface" was either implicit in claim 1 as granted in which case its insertion did not overcome the grounds for opposition or it was an *aliud* extending the protection conferred.

(ii) Claim 1 covered solutions for which no enabling disclosure was provided and was accordingly objected to under Article 100(b) EPC.

(iii) The amendments to claim 1 effected in the written opposition procedure and in the oral proceedings before the opposition division did not confer novelty. The insertion "for NMR imaging apparatus" did not specify a technical feature which would restrict the method of designing the screening coil as such.

(iv) Neither did the step of "calculating the induced current distribution in a hypothetical continuous superconductive metal surface" make the claim new. In column 4, lines 39 ff of E1, there was described "an example for the required current distribution on coaxial right circular cylinders", in which "the required linear current densities for producing a zero external magnetic field" were given by specific formulas, ie calculated. One of these cylinders, referred to as "outer current sheet 41" in column 4, lines 29 to 38, was obviously a hypothetical surface, defined only by windings contained in it (column 7, lines 24 to 25). It was obvious to the skilled person that the definitions of the current distributions to be calculated according to present claim 1 and according to E1 were identical: in order for the external magnetic field to be zero, the current distribution to be induced in the cylinders of E1 must be the same as the one which would be induced in a superconducting surface. Hence, although defined in different words, the method of claim 1 was materially identical to that described in E1.

(b) Claim 14

(i) Figure 2B of D1 showed a coil set in which two coils 20, 30 were arranged coaxially (page 6, lines 3 to 5), such that a field outside both coils will be zero (page 6, lines 17 to 18). Lines 20 to 23 further disclosed that more than two coils could be provided, so long as the sum of the magnetic fields had the desired gradient inside and a substantially zero value outside the coil set. From this the skilled person would recognise without further reflection that if three or more coils are to be used, these would also have to be arranged concentrically. Hence claim 14 was anticipated by D1.

(ii) In addition claim 14 was suggested by E2. The decision under appeal considered that the subject-matter of claim 14 differed from E2 in by virtue of the feature:

"the magnitudes of the electrical currents are such that there is no appreciable magnetic field outside the outer screen and the field within the inner screen substantially corresponds to the field that would be provided by the coil if the screens were not present."

(iii) Contrary to the opinion of the opposition division, this feature was positively suggested by the prior art. It was recognised in E2 itself, particularly in the paragraph spanning pages 5 and 6 that if a screening system having a single coil 22 is used for cancelling an external field generated by a coil system, the internal field of said coil system will be considerably reduced. No such reduction would occur if the screen system could be constructed in such a way that the field inside it substantially corresponded to the field that would be provided if the screening system were not present. Insofar the definition of the field within the screening system given in claim 14 was a mere desideratum and therefore obvious by itself.

(iv) As indicated, eg in the abstract of D2 a screening system may comprise more than one screening coil. If one of these coils was to compensate part of the field generated by another, it was obvious to the skilled person that the coils must be located in such a way that the fields will overlap in a region where the compensation was to be achieved. If this region to be compensated was inside a screening coil, it was evident that the two screening coils must be located one inside the other.

(v) Hence the skilled person could arrive at the subject-matter of claim 14 from a combination of E2 and D2 without the exercise of an inventive step.

VII. The proprietor requested that the decision under appeal be set aside and that the patent be maintained, in amended form, in the following version:

Claims: 1 as filed in the oral proceedings on 5 September 2000;
2 to 15 of the patent specification.

Description: pages 2 and 4 to 23 of the patent specification,
page 3 as filed in the oral proceedings on 5 September 2000;

Drawings: Figures 1 to 38 of the patent specification.

VIII. The opponent requested that the unnecessary findings recorded in the decision under appeal, ie other than the decision that the subject-matter of claim 3 was not new, be reversed and that his appeal fee be reimbursed pursuant to Rule 67 EPC.

Reasons for the decision

1. The proprietor's appeal is admissible.

2. Admissibility of the opponent's appeal

2.1 The formula of the decision under appeal is expressed on EPO Form 2331 as: "European patent No. 0216590 is revoked" and the heading provided on this form to indicate a possible "additional decision" is crossed out.

2.2 Hence the decision revoked the patent **in its entirety**, ie did not revoke it partially by maintaining it in amended form by interlocutory decision appealable separately pursuant to Article 106(3) EPC. Independently of the reasons for the decision, the patent was therefore deemed not to have had the effects specified in Article 64 EPC (cf Article 68 EPC). In this sense the decision was fully consistent with the request of the opponent in the opposition procedure that the patent be revoked in its entirety. He was therefore not adversely affected by the decision within the meaning of Article 107 EPC, first sentence, as interpreted, eg by decision J 12/85, Inadmissible appeal/Kureha (OJ EPO 1986, 155), and is accordingly not a party who may appeal under that provision.

2.3 The fact that the patent was opposed in the notice of opposition "in vollem Umfang" (in its entirety), meaning that all claims were opposed, does not, according to the established jurisprudence and practice of the EPO, mean that the opponent's request is for a decision that no claim of the patent meets the requirements of the EPC. It means rather that the request is that the patent should not be maintained even in amended form by deletion of some claims - a request which was fully complied with by the decision under appeal.

2.4 The board agrees with the opponent's contention that the opposition division should not have purported to decide - in the strict sense - that certain priorities were correctly claimed and that the subject-matter of claim 14 was new and inventive when these matters were not necessary for the conclusion that the subject-matter of claim 3 lacked novelty, which was the ratio decidendi founding the formula of the decision under appeal. The board, however, regards this as an error of expression rather than a substantial procedural violation. It was entirely appropriate and desirable in the interests of overall procedural efficiency and effectiveness that an opposition division should include in its decision, by way of obiter dicta, reasoned findings which could obviate a remittal in the event of a revocation flowing from a certain ratio being reversed on appeal. The mere fact that in the present case such findings were somewhat misleadingly referred to in the pronouncement as "further decisions" "included" in the decision proper did not, in the judgment of the board, constitute a substantial procedural violation. As indicated above (2.1) the decision formula makes it abundantly clear in the present case that no "additional decisions" were in fact made, and equally clear what findings and reasons therefor constituted the ratio; those findings which the opponent rightly objects to being described as decisions could not be ratio since they manifestly do not support the formula.

In particular the decision formula makes it indisputably clear that the decision under appeal was not an interlocutory decision maintaining the patent in amended form pursuant to Article 102(3) EPC.

2.5 In this context the board observes that the finding of the opposition division in relation to the novelty of the amended claim 1 was by no means supererogatory as implied in the opponent's submission. In the present case the reference in claim 3 to claim 1 causes the amendments to claim 1 to have a knock-on effect on claim 3 and the novelty of the subject-matter of claim 1 is at least arguably inheritable by claim 3 via this link in such a way that findings in relation to these matters were indeed necessary for the conclusion and hence are ratio.

2.6 The board also observes that a corollary of the opponent not being adversely affected by the revocation is that, contrary to the opponent's submission, the

proprietor is not protected against a reformatio in peius. Decision G 9/92, Non-appealing party/BMW (OJ EPO 1994, 875), applies only to interlocutory decisions maintaining a patent in amended form, which may adversely affect both proprietor and opponent. Accordingly the opponent in his capacity as a party to the appeal proceedings as of right pursuant to Article 107 EPC, second sentence is not restricted in his requests or arguments in any way by his non-appellant status.

2.7 Since, for the reasons given above, the opponent was not adversely affected by the decision under appeal the opponent's appeal does not meet the requirement of Article 107 EPC, first sentence, for an admissible appeal.

2.8 Accordingly the opponent's submissions will be treated hereinafter as those of respondent in the admissible appeal of the proprietor.

3. Amendments - Article 123(2) and (3) EPC

In the judgment of the board the amendments are permissible under Article 123(2) and (3) EPC for the reasons given in the decision under appeal. The opponent's submissions on this point in the statement of grounds of appeal essentially repeat what was argued in the opposition procedure and the board has nothing to add to the opposition division's considerations and conclusions on this point.

4. Article 100(b) EPC

4.1 In effect the opponent's contention is that the disclosure and the scope of claim 1 are not commensurate. The board is not persuaded by either prong of this argument. The teaching of claim 1 involves an approach to the design of a screening coil which is radically different from prior art approaches and is therefore claimed in a way which appropriately reflects this difference. On the other hand the manner in which this design approach can be implemented is set out and developed in a systematic pedagogic fashion in the description, starting with the example of screening an infinite straight current-carrying wire and progressing to the screening of saddle coils producing a gradient field.

4.2 Neither does the board accept the opponent's characterisation of claim 1 as claiming all ways of achieving a result. The result is a substantially zero external field but the claim is explicitly directed to a specific method of achieving that result.

5. Claim 1

5.1 Novelty

5.1.1 The opponent's argument that the amendment by insertion of the phrase "for NMR imaging apparatus" does not restrict the claim was, in the judgment of the board, refuted in the oral proceedings before the opposition division (points 7 and 8 of the minutes) where it was pointed out that suitability for the NMR imaging application requires access to an imaging volume. The essentially two-dimensional ("endless Z' axis") screening approach taught for particle accelerator quadrupole magnet screening in E1 would therefore not be suitable for NMR imaging and could not destroy novelty. Making the assumption in favour of the opponent that the person skilled in the art would know how to deal with end-effect problems would still not mean that there was even an implicit actual disclosure of a coil design method suitable for NMR imaging.

5.1.2 Neither is the board convinced by the opponent's further argument that the current distribution on the surfaces of the coaxial right circular cylinders in the example at column 4, lines 39 ff, of E1 must be the same as that specified by the method of claim 1 since they both achieve the same zero external field. Apart from the fact that this argument ignores the fact that this example is a two-dimensional geometry not suitable for NMR imaging, the board observes that the claim does not claim the result achieved but the method of achieving it, ie the method of arriving at the current distribution, so that even if the assumption is made in favour of the opponent - although he has not discharged the onus of proving this to be the case even for a particular geometry - that at least in the ideal or mathematical limit the current distributions were the same, the method of claim 1 would still be new, since the physical design steps, ie the positioning of wires and the dimensioning of currents, by which the approach to the ideal theoretical current distribution proceeds,

are different, being based on mathematically distinct calculation methods. This is not a case of granting a patent for a new and ingenious way of describing a known process, it is rather a case of denying the proposition that identity of stated goal implies identity of path theretoward.

5.1.3 For the avoidance of a possible misunderstanding of the board's position, it should be emphasised that although the hypothetical superconductive surface is by definition not a tangible feature of the method it is a legitimate way of defining the design algorithm which leads to physical design steps of selection of wire position and current magnitudes and magnetic field, just as, eg a notional mirror plane may be used to describe the location of an array of tangible objects.

5.1.4 Accordingly the board concludes that the subject-matter of claim 1 is novel over E1. The opponent has not adduced any arguments alleging lack of novelty of the subject-matter of claim 1 over any other document.

5.2 Inventive step

5.2.1 The decision under appeal does not include a finding as to whether the subject-matter of claim 1 is to be considered as involving an inventive step within the meaning of Article 56 EPC. Neither has the opponent addressed the issue in his submissions in the appeal procedure and, since he was not represented at the oral proceedings before the board, it was not possible to invite him to make good this omission on that occasion. Having regard to the technical facts in the present case (see 5.2.2 below), the board does not see this as a reason to remit the case to the department of first instance - a view which is reinforced by the consideration that the opposed patent has been pending at the EPO since 1986. Nor has the opponent requested such remittal. Accordingly the board will decide this issue, exercising the power vested in it by Article 111(1) EPC, second sentence.

5.2.2 In the present case, the finding by the opposition division at point 3 of the decision under appeal, when dealing with novelty, that:

"None of the cited pertinent documents to be considered ...under Article 54(2) EPC, namely documents E1 to E11 and K2 discloses, in the context of a method of designing a screening coil for NMR imaging apparatus, the step of calculating the induced current distribution in a hypothetical continuous superconductive metal surface positioned in the place of wires of the screening coil, as contained in present claim 1."

is, in the judgment of the board, tantamount to a finding that, having regard to the prior art on file, the method of designing a resistive screening coil specified in claim 1 including the step referred to was not obvious for the person skilled in the art. The reason why the board feels able, exceptionally, to extrapolate from novelty to non-obviousness in this case is that the design approach based on a hypothetical superconductive surface is so radically different from the known approaches that it would be impossible for the prior art to suggest it without mentioning it. Even the use of a real superconductive surface amounts to teaching away from the use of a hypothetical superconductive surface which lies at the heart of the insight underlying the invention claimed in claim 1. Hence, irrespective of which of the prior art documents is taken as closest prior art in a problem and solution approach, the conclusion is that the solution of claim 1 is not derivable from that alone or in combination with any other document on file or common general knowledge in the art.

5.2.3 For completeness it should also be mentioned that although the decision under appeal refers at point 5 to the possibility that "E11 could play a role in the discussion of the existence or otherwise of an inventive step in present claim 1" as a reason for introducing E11 into the procedure, no argument based on E11 was adduced in the appeal procedure and the board does not see itself as called upon to devise such an argument on behalf of the opponent.

6. *Claim 3*

6.1 The board is not persuaded by the reasoning at point 6 of the decision under appeal. References are made at 6(a) to very substantial portions of the description

and claims of E2 which are alleged to disclose "all the apparatus features referred to in present claim 3", but the specific features of the claim have not been read onto the disclosure of E2 in a perspicuous and convincing way. Thus claim 9 of E2 is referred to, although this claim specifies "cylinders of a superconducting material", whereas claim 3 of the opposed patent is specifically restricted to "a resistive screening coil" via its reference to claim 1.

6.2 This last point is one of the reasons why the board does not agree with the assertion at 6(b) of the decision under appeal that the method features included in claim 3 via the reference to claim 1 cannot add a restriction to the screen as such. Another way in which claim 3 inherits a restriction from claim 1 is, contrary to the finding of the opposition division, in the quality of the approximation to a substantially zero field on the side of the screen away from the electrical coil. Following the calculation step of claim 1 will result, for a given specific geometry, in specific magnitudes of currents and specific positions of conductors in the screen and, in the judgment of the board, it has not been plausibly demonstrated that the same magnitudes and positions would result from following the teaching of E2. In particular it cannot be assumed that because E2 aspires to produce a screen which "at least partly compensates for an external magnetic stray field of the first magnet" (E2, page 2, lines 9 to 10), using a completely different mathematical design rule involving the field strengths and cross-sections of the first and second coils (ibid, lines 22 to 37), that the currents and wire positions and magnetic fields in the screen thus produced would be substantially identical with those existing in a screen as specified in claim 3 of the opposed patent. On the contrary, the evidence filed by the proprietor on appeal - which has not been challenged by the opponent - shows a significantly different external field for the two screens. In the view of the board, the external magnetic field produced by the screen in use is an apparatus feature which is capable of distinguishing the claimed screen from a prior art screen and the evidence on file suggests plausibly that it does so in fact.

7. Claim 14

7.1 Novelty over D1 (Article 54(3) EPC)

Although the opponent in his submissions on appeal challenged the procedural regularity of the opposition division finding that claim 14 of the opposed patent was entitled to a priority date of 19 June 1986, he has not challenged the factual correctness of this finding and indeed relies implicitly on this finding in continuing to contend, on appeal, that D1, published on 12 August 1987 and claiming priority of 6 February 1986, destroys the novelty of the subject-matter of claim 14 by virtue of Article 54(3) EPC. This contention was refuted at point 4(a) of the decision under appeal and the board has nothing to add to this refutation.

7.2 Novelty - Article 54(2) EPC

The reason given in the decision under appeal at point 4(a)(ii) for regarding the subject-matter of claim 14 as new over all pre-published documents on file has not been challenged on appeal. Neither does the board see any reason to disagree with this finding.

7.3 Inventive step

The opponent's argument on appeal that, having regard to a combination of E2 and D2, the subject-matter of claim 14 does not involve an inventive step has also largely been refuted in the decision under appeal at point 4(b). The notion that it was an obvious desideratum to construct a two-coil screening system in such a way that the reduction of the field within the inner screen is avoided does not persuade the board in view of the fact that, as pointed out in the decision under appeal, *ibid*, in D2 this reduction was accepted as a given fact (D2, paragraph bridging pages 7 and 8). Further, the opponent's reference to "more than one screening coil" in the abstract of D2 is somewhat misleading. In the terminology of D2 the "first set of coils" is the set of coils producing the desired field in the working volume while the "second set of coils" is the single set of screening coils in a three-coil Maxwell configuration (D2, page 7, last paragraph). In the judgment of the board, the screening function of these three axially mutually spaced coils vis-à-vis the Maxwell triple of main field coils does not provide any suggestion in the direction of a configuration of one screening coil located inside another as specified in claim 14.

8. In the view of the board the patent, as amended in accordance with the single request, and the invention to which it relates meet the requirements of the EPC.

Order

For these reasons it is decided that:

1. The opponent's appeal is rejected as inadmissible.
2. The decision under appeal is set aside.
3. The case is remitted to the department of first instance with the order to maintain the patent in amended form in the following version:

Claims: 1 as filed in the oral proceedings on 5 September 2000;
2 to 15 of the patent specification.

Description: pages 2 and 4 to 23 of the patent specification,
page 3 as filed in the oral proceedings on 5 September 2000;

Drawings: Figures 1 to 38 of the patent specification.