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**Datasheet for the decision  
of 13 March 2012**

**Case Number:** T 1870/08 - 3.4.03

**Application Number:** 88302050.5

**Publication Number:** 282286

**IPC:** H01L 39/24, H01B 12/00

**Language of the proceedings:** EN

**Title of invention:**

Superconducting wire and method of manufacturing the same

**Patentee:**

Kabushiki Kaisha Toshiba

**Opponent:**

SIEMENS AKTIENGESELLSCHAFT

**Headword:**

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**Relevant legal provisions:**

EPC Art. 54(3), 69(1), 123(2)(3)

EPC R. 43(1)

RPBA Art. 21

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

EPC Art. 54, 56, 83, 100(a)(b), 123(2)

EPC R. 29(1),

**Keyword:**

"Test for compliance with Art. 123(2) EPC of undisclosed disclaimers in the light of G 1/03 and G 2/10"

**Decisions cited:**

G 0001/03, G 0002/10, G 0001/93, T 0451/99, T 0507/99,

T 1107/06, T 1068/07, T 1049/08

**Catchword:**

The test of G 2/10 also applies to an amendment involving an undisclosed disclaimer by means of which a claim has been rendered new over a European patent application according to Article 54(3) EPC. The examination of the admissibility of the amendment for compliance with Article 123(2) EPC must be made separately for the disclaimer *per se* and for the subject-matter remaining in the claim (see point 4. of the Reasons).



Case Number: T 1870/08 - 3.4.03

**D E C I S I O N**  
**of the Technical Board of Appeal 3.4.03**  
**of 13 March 2012**

**Appellant:**  
(Opponent 1)

SIEMENS AKTIENGESELLSCHAFT  
Postfach 22 16 34  
D-80506 München (DE)

**Respondent:**  
(Patent Proprietor)

Kabushiki Kaisha Toshiba  
72, Horikawa-cho  
Saiwai-ku  
Kawasaki-shi  
Kanagawa-ken 210-8572 (JP)

**Representative:**

Granleese, Rhian Jane  
Marks & Clerk LLP  
90 Long Acre  
London  
WC2E 9RA (GB)

**Decision under appeal:**

Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
10 July 2008 concerning maintenance of European  
patent No. 282286 in amended form.

**Composition of the Board:**

**Chairman:** G. Eliasson  
**Members:** T. Häusser  
T. Bokor

## Summary of Facts and Submissions

- I. The appeal of the opponent concerns the interlocutory decision of the opposition division to maintain European patent EP-B-282286 as amended during the opposition proceedings (Article 102(3) EPC 1973).
- II. The opposition had been filed against the patent as a whole. The grounds of opposition were insufficiency of the disclosure and lack of novelty and lack of inventive step (Articles 100(a), (b), 54 and 56 EPC 1973).
- III. At the oral proceedings before the board the appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained in an amended form on the basis of claims 1-36 filed as the main request or on the basis of claims 1-36 filed as the first auxiliary request, or on the basis of claims 1-36 filed as the second auxiliary request, all filed with letter dated 10 February 2012, and an appropriately modified description.

- IV. Reference is made to the following documents:

D1: EP 0 281 444 A1,  
D2: EP 0 285 319 A2,  
D3: DE 23 51 226 A1,  
D5: US 3 623 221 A,  
D7: EP 0 073 128 B1,  
D9: EP 0 181 496 A1,

D15: US 3 471 925 A.

V. The wording of independent claim 1 of the main request reads as follows (board's labelling):

- (i) "A superconducting wire comprising:
- (ii) a tubular sheath member (2); and
- (iii) an oxide superconductor (1) filled in said sheath member,
- (iv) said sheath member being formed of a material resistant in an oxidizing atmosphere to oxidation at the temperature of heat treatment used to form said superconducting wire,
- (v) said material being selected from Au, Ag or an alloy thereof and
- (vi) when said sheath is Ag or an alloy thereof, said oxide superconductor is not of the  $K_2NiF_4$  type."

The wording of independent claim 12 of the main request reads as follows:

"A method of manufacturing a superconducting wire comprising the steps of:  
filling a starting material for forming an oxide superconductor (1), in a tubular sheath member (2) to form a filled member;  
processing said filled member into a wire shape; and  
performing a heat treatment in an oxidizing atmosphere on said filled member to convert the starting material filled in said sheath member (2) into a oxide superconductor (1) which is formed of a material resistant to oxidation during said heat treatment, said

material being selected from Au, Ag or an alloy thereof and when said sheath is Ag or an alloy thereof, said oxide superconductor is not of the  $K_2NiF_4$  type."

VI. With respect to the main request the parties argued essentially as follows:

(a) Sufficiency of disclosure

The appellant (opponent) argued that the expression "resistant in an oxidizing atmosphere" would be interpreted by experts in the field in such a way that no oxidation would occur in an oxidizing atmosphere. Even though such oxidation was unavoidable at higher temperatures in the case of silver, no measures had been disclosed in the application documents for avoiding oxidation. The teaching of the invention could therefore not be carried out by the skilled person.

The respondent (patent proprietor) argued that detailed examples had been described in the priority documents explaining how the skilled person could fabricate a wire according to claim 1. Furthermore, the objection actually concerned the clarity of the claims and was thus inadmissible in opposition proceedings.

(b) Amendments

The appellant (opponent) argued that in order to decide whether the amendment introducing the disclaimer (vi) into claim 1 infringed Article 123(2) EPC the test set out under point 4.5 of decision G 2/10 of the Enlarged Board of Appeal had to be applied. That test was whether the amendment presented the skilled person with

new technical information. Since silver had a different melting point from that of the other sheath materials originally described, disclaiming a silver sheath in combination with an oxide superconductor of the  $K_2NiF_4$  type presented the skilled person with new technical information. Furthermore, the reason why the disclaimer was introduced was irrelevant for deciding whether an amendment was allowable. Therefore the introduction of the disclaimer (vi) into claim 1 infringed Article 123(2) EPC.

Furthermore, the appellant (opponent) argued that interpreting the expression "resistant in an oxidizing atmosphere" as meaning "difficult to be oxidized" contravened Article 123(3) EPC.

The respondent (patent proprietor) took the view that the expression "subject-matter remaining in the claim after the introduction of the disclaimer" in decision G 2/10 had to be interpreted as meaning that after the amendment there should be embodiments still falling within the scope of the claim. In the present case examples 4 and 9 of the priority document JP 56856/87 still fell within the scope of claim 1, so that the test of G 2/10 implied that the introduction of the disclaimer was allowable. Furthermore, the disclaimer was drafted in accordance with decision G 1/03 of the Enlarged Board of Appeal in order to establish novelty with respect to the prior right document D1. The skilled person would recognize that there was a disclaimer and also why it was present as this was indicated in the description. Therefore the introduction of the disclaimer (vi) into claim 1 did not infringe Article 123(2) EPC.

(c) Novelty

According to the appellant (opponent) the feature that the sheath material was formed of a material that was resistant in an oxidizing atmosphere to oxidation was first disclosed in the priority document JP114312/87 of 11.05.1987. In the priority document JP56856/87 of 13.03.1987 it was merely disclosed (see page 9, first paragraph of the English translation) that the material was "difficult to be oxidized". Furthermore, the only oxide superconductor mentioned in any of the priority documents which was *not* of the  $K_2NiF_4$  type was  $YBa_2Cu_3O_{7-\delta}$ , which was first mentioned in the priority document JP114315/87 of 11.05.1987. That date was therefore the effective date of claim 1 and thus relevant for determining the state of the art, which comprised novelty-destroying documents.

The respondent (patent proprietor) argued that claim 1 explicitly recited the sheath material to be Au, Ag or an alloy thereof and that these materials were also mentioned in the applications of the earliest priority date. Furthermore, oxide superconductors were recited in these priority documents and the disclaimer could not affect the priority issue. Therefore, claim 1 was entitled to the earliest priority date 13.03.1987.

(d) Inventive step

According to the appellant (opponent), the subject-matter of claim 1 did not involve an inventive step over any one of documents D3, D5, D7, D9 or D15. In particular, the appellant (opponent) considered



document D3 to represent the closest state of the art, from which the subject-matter of claim 1 differed in comprising an oxide superconductor. The objective problem was to raise the critical temperature. Oxide superconductors were however known at the priority date of the opposed patent as acknowledged in the earliest priority documents of the opposed patent. It would therefore have been obvious to the skilled person to arrive at the subject-matter of claim 1.

The respondent (patent proprietor) argued that D3 did not relate to superconducting wires *per se*. Rather, the known oxide superconductors were considered to represent the closest state of the art. The objective technical problem was to provide a superconducting wire. Document D9 concerned a method of manufacturing a superconducting wire using a sheath. However, in that document the use of silver as a sheath was explicitly discouraged (column 4, second paragraph). Furthermore, neither oxidation of the sheath material nor oxygen diffusion was recognized in the available prior art. It would therefore not have been obvious to the skilled person to arrive at the claimed subject-matter.

## **Reasons for the Decision**

### 1. Admissibility

The appeal is admissible.

2. Discussion of the requests

In the following - under points 3. to 8. - the main request will be discussed.

3. Sufficiency of disclosure

According to the appellant (opponent) the disclosure of the invention was not sufficiently clear and complete in relation to the feature of claim 1 that the sheath member was formed of a material resistant in an oxidizing atmosphere to oxidation at the temperature of heat treatment used to form the superconducting wire (see point V. above, feature (iv)).

However, claim 1 also comprises the feature that the material of the sheath member was selected from Au, Ag or an alloy thereof (see point V., feature (v)).

The person skilled in the art of superconductor technology would therefore interpret feature (iv) in the context provided by feature (v). In the description it is however described that gold, silver and their alloys are not easily oxidized and that oxygen can be sufficiently supplied from the outside during the heat treatment when the sheath member is made of these materials (see column 5, lines 15-33). In view of the description the skilled person would therefore interpret feature (iv) to mean that the material of the sheath member was not easily oxidized at the relevant temperature.

Furthermore, in the description of the patent (column 5, lines 15-33; column 9, line 21 - column 10,

line 40) concrete examples of sheath members being formed of silver, gold or an alloy thereof and the corresponding heat treatments used to form the superconducting wire are described.

Therefore, the board is satisfied that the patent describes the superconducting wire according to claim 1 in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Articles 83 and 100(b) EPC 1973).

4. Amendments - Article 123(2) EPC

4.1 Claim 1 specifies that the sheath member is

- filled with an oxide superconductor (point V., feature (iii)) and
- formed of a material selected from Au, Ag or an alloy thereof (point V., feature (v)).

Feature (vi) of claim 1 specifies that when said sheath is Ag or an alloy thereof, the oxide superconductor is not of the  $K_2NiF_4$  type. The following subject-matter is therefore disclaimed:

The combination of

- an oxide superconductor of the  $K_2NiF_4$  type and
- a sheath made of Ag or an alloy thereof.

4.2 The indication that the oxide superconductor is of the " $K_2NiF_4$  type" relates to the crystal structure of the superconductor and means that this structure is of the same type as that of potassium nickel fluoride  $K_2NiF_4$ .

In the application documents as originally filed it is disclosed (see page 4, lines 22-34; claims 2 and 6) that the oxide superconductor may have a perovskite

type crystal structure. Furthermore, layered perovskite oxides and oxygen deficient perovskite oxides are mentioned. It is also disclosed that the sheath member contains a material selected from the group of: Ag, Au, Pt, Pd, and their alloys. Furthermore, combinations of specific superconducting compositions and specific sheath materials have been disclosed in the examples of the invention on pages 18-29.

However, the combination of an oxide superconductor of the  $K_2NiF_4$  type and a sheath made of Ag or an alloy thereof is not disclosed as subject-matter of the invention or as a possible negative feature in the application as filed. The feature (vi) is therefore regarded to be an *undisclosed disclaimer*.

By means of the disclaimer (vi) the subject-matter of claim 1 has been rendered new over document D1, a European patent application according to Article 54(3) EPC (see point 6.5 below).

- 4.2.1 The appellant argued that the disclaimer was inadmissible in the light of G 2/10. The disclaimer obviously had a technical effect, because Ag as mentioned in the disclaimer clearly had different physical properties from the other materials. For example, it was well known that Au and Ag had quite different melting temperatures, which could have a significant impact on their applicability as a sheath material. This technical teaching was not derivable from the application as filed. Hence, the subject-matter "remaining in the claim after the introduction of the disclaimer" would not pass the test as set out in G 2/10.

4.3 Disclaimers in the light of decision G 1/03

4.3.1 Both referring decisions T 451/99 and T 507/99 leading to decision G 1/03 (and G 2/03) of the Enlarged Board of Appeal posed the question whether an undisclosed disclaimer may be allowable when its purpose is to meet a lack-of-novelty objection pursuant to Article 54(3) EPC 1973. This question is answered in the Order of G 1/03.

Article 54(3) EPC is essentially equivalent to Article 54(3) EPC 1973. Decision G 1/03 is therefore concerned with the same situation as in the present case and has to be considered carefully. This is especially the case in view of the board's obligations under Article 21 of the Rules of Procedure of the Boards of Appeal (OJ EPO 2007, 536).

4.3.2 Point 2.1 of the Reasons of decision G 1/03 is of particular relevance in relation to state of the art under Article 54(3) EPC. It was explained there that for a proper interpretation of the law the purpose of Article 54(3) EPC 1973 had to be taken into account.

There followed a discussion of the two traditional solutions in Europe which dealt with the problem of how a later application should be affected by an earlier application which had not been published at the filing or priority date of the later application ("whole contents approach" vs. "prior claim approach"). The corresponding discussions in the preparatory work to the EPC were also mentioned. Although eventually the "whole contents approach" was, at least in principle,

accepted for the EPC, it was qualified in important respects and could not be said to implement the "philosophical" basis of the "whole contents approach", i.e. that nothing be patented that had already been disclosed to the patent office.

The legal history made it clear that the intention was to restrict the effect of the earlier application as far as possible in order to avoid unfairness resulting from the concept of a fictional publication. Furthermore, delimitation against an earlier application was a traditional and well-known exercise under the "prior claim approach" and it might be assumed that the highly controversial "whole contents approach" would never have been accepted in the preparatory work to the EPC if it had been suggested not only to extend the state of the art to be considered for novelty by a legal fiction but also to do away with the practice of delimitation against earlier applications.

For the interpretation of Article 123(2) EPC 1973 it was deduced from the discussion on Article 54(3) EPC 1973 that the purpose of the disclaimer excluding a conflicting application was merely to take account of the fact that different applicants were entitled to patents in respect of different aspects of inventive subject-matter and not to change the given technical teaching.

The following conclusion was reached: "Such a disclaimer, only excluding subject-matter for legal reasons, is required to give effect to Article 54(3) EPC [1973] and has no bearing on the technical

information in the application. It is, therefore, not in contradiction to Article 123(2) EPC [1973]."

(point 2.1.3, second paragraph, of the Reasons).

As will be apparent below, the correct interpretation of the finding that an admissible disclaimer "has no bearing on the technical information in the application" is decisive for the question whether a claim may be found to infringe Article 123(2) EPC.

4.3.3 In the discussion on Article 54(3) EPC 1973 cited above, reference is made (see point 2.1.1 of G 1/03), *inter alia*, to Article 54(4) EPC 1973. According to the transitional provisions under Article 7 of the Act revising the EPC of 29 November 2000 (Special edition No. 1, OJ EPO 2007, 197) in conjunction with Article 1, last sentence of the Decision of the Administrative Council of 28 June 2001 on the transitional provisions under Article 7 of the Act revising the European Patent Convention of 29 November 2000, Article 54(4) EPC 1973 shall apply to patents already granted at the time of entry into force of the EPC 2000. Furthermore, Article 123(2) EPC is essentially equivalent to Article 123(2) EPC 1973. The board therefore concludes that the reasoning of G 1/03 referred to above applies to the present case.

4.4 The decision G 2/10

4.4.1 The appellant (opponent) argued that the introduction of the disclaimer (vi) into claim 1 infringed Article 123(2) EPC, especially in view of decision G 2/10 of the Enlarged Board of Appeal.

In the referring decision T 1068/07 leading to decision G 2/10 of the Enlarged Board of Appeal it was held (see point 14. of the Reasons) that the subject-matter of the disclaimer had been disclosed as an embodiment of the invention in the application as filed. This is also reflected in the question put to the Enlarged Board of Appeal.

In G 2/10 (see point 2.3 of the Reasons) the term "embodiment" in the referred question was understood to be addressing the issue of disclaiming "subject-matter", which is consequently reflected in the Order of G 2/10. That decision therefore concerns an amendment to a claim by the introduction of a disclaimer disclaiming from it subject-matter disclosed in the application as filed.

The present case, by contrast, relates to an undisclosed disclaimer (see point 4.2 above). Decision G 2/10 is therefore, *prima facie*, not concerned with the same situation as in the present case, so it may be questioned whether that decision is applicable at all to the present case.

4.4.2 The appellant (opponent) argued in particular that in order to decide whether the amendment introducing the disclaimer (vi) into claim 1 infringed Article 123(2) EPC, the test set out under point 4.5 of G 2/10 had to be applied.

4.4.3 This test, which in the following the board will refer to as the "test of G 2/10", is that an amendment to a claim by the introduction of a disclaimer infringes Article 123(2) EPC if the *subject-matter remaining in*



*the claim after the introduction of the disclaimer is not, be it explicitly or implicitly, directly and unambiguously disclosed to the skilled person using common general knowledge, in the application as filed (see G 2/10, part 1a of the Order, Reasons 4.5.1 and 4.5.2). Determining whether or not that is the case requires a technical assessment of the overall technical circumstances of the individual case under consideration, taking into account the nature and extent of the disclosure in the application as filed, the nature and extent of the disclaimed subject-matter and its relationship with the subject-matter remaining in the claim after the amendment (see G 2/10, part 1b of the Order and Reasons 4.5.3 to 4.5.5).*

- 4.4.4 On the other hand, in G 1/03 the conclusion that the disclaimer was not in contradiction to Article 123(2) EPC 1973 was based on essentially legal considerations, taking into account the purpose of Article 54(3) EPC 1973 and having particular regard to the preparatory work to the EPC (see point 4.3 above). Even though the notion of 'remaining subject-matter' is mentioned, how it should be determined or defined is not dealt with any further (see for example the last sentence of point 2.1.3 of the Reasons). Accordingly, it is not immediately apparent how, or to what extent, the test of G 2/10 should be applied to the present case, if applicable at all. For example, decision T 1049/08 of 6 December 2011 held that G 2/10 applies exclusively to disclosed disclaimers (see point 4.4 of the Reasons, fourth paragraph). At the same time the board is aware that some passages of G 2/10 strongly suggest otherwise, as explained hereafter.

- 4.4.5 Point 4.7 of the Reasons of G 2/10 discusses the President's suggestion that, where the subject-matter remaining in the claim was not directly and unambiguously derivable from the application as filed, the criteria established in G 1/03 should be applied regarding the allowability of the disclaimer. This was suggested since otherwise, in the case of state of the art according to Article 54(3) EPC 1973, an applicant disclaiming disclosed subject-matter could be in a worse position than an applicant disclaiming subject-matter for which there was no disclosure in the application.
- 4.4.6 The Enlarged Board examined this question and held that this discrepancy does not exist. More importantly, it did not interpret decision G 1/03 "to have intended, in its answer 2, to exhaustively determine the conditions under which, if fulfilled, an amendment by introduction of an undisclosed disclaimer was to be regarded as allowable under Article 123(2) EPC under all circumstances." It is, however, not explicitly stated in G 2/10 what other conditions had to be fulfilled for such an amendment to be allowable. On the other hand, there can be little doubt that in the opinion of the Enlarged Board, claims containing an undisclosed disclaimer may well be found to infringe Article 123(2) EPC. This is most clearly seen from the last statement of point 4.7 of the Reasons: "Hence, in that decision [i.e. G 1/03] it was not decided that, the requirements of answer 2 being fulfilled, an undisclosed disclaimer would always be allowable under Article 123(2) EPC." Furthermore, from the overall context of the President's proposal and the answer of the Enlarged Board, as described above, it appears that in the

opinion of the Enlarged Board such an infringement of Article 123(2) EPC would have the same cause as in the case of the disclaimers disclaiming disclosed subject-matter, namely the lack of disclosure of the subject-matter remaining in the claim. In other words, the test of G 2/10 also applies for undisclosed disclaimers.

- 4.4.7 This may convey the impression that the two decisions contradict, given that an undisclosed disclaimer - as part of the definition of the claimed subject-matter - could obviously not have been disclosed to the skilled person in the application as filed.

The board therefore needs to examine how the test as set out in G 2/10 is applicable in the present case without running counter to the *ratio decidendi* of G 1/03. In this the board also attaches considerable weight to the fact that in G 2/10 the Enlarged Board at no point states or suggests that the findings of G 1/03 are not valid, although this decision is analysed in great detail (G 2/10, points 3, 4.3, 4.4 of the Reasons).

- 4.5 Applicability of the teaching of G 2/10 to the present case

- 4.5.1 The question is whether the test of G 2/10 may in fact require that an undisclosed disclaimer, being part of the definition of the claimed subject-matter, also needs to have a basis in the application as filed.

This would mean that undisclosed disclaimers would no longer be possible. Such a conclusion would have required the Enlarged Board to have made a clear

statement to this effect, which it did not, however, as observed above (see point 4.4.7).

4.5.2 It therefore follows that in G 2/10 the Enlarged Board in fact meant something else. For this reason, the board is of the opinion that the above-cited last sentence of point 4.7 of the Reasons was intended to mean that it was not decided in G 1/03 that, the requirements of answer 2 of G 1/03 being fulfilled, an *amendment involving* an undisclosed disclaimer would always be allowable under Article 123(2) EPC. A similar formulation is in fact also used by the Enlarged Board in the preceding paragraph: "... an amendment by introduction of an undisclosed disclaimer ..." (G 2/10, point 4.7, fourth paragraph, second sentence, of the Reasons).

4.5.3 This board believes that the Enlarged Board intended to refer to an amendment by which the addition of an undisclosed disclaimer results in an amended claim in which the subject-matter remaining in the claim *after the amendment* - but *not* the undisclosed disclaimer itself - needs to be examined for its compatibility with Article 123(2) EPC. The question now remains as to how this examination should be done.

4.5.4 Such an interpretation of G 2/10 makes it possible to maintain the crucial distinction between, on the one hand, the disclaimer *per se*, namely a feature of the claim which contributes to the definition of the claimed subject-matter, which may be itself allowable on the basis of G 1/03 even when undisclosed, and, on the other hand, the subject-matter remaining in the claim after the introduction of the disclaimer. The

possibility of such a distinction is in line with the findings of G 1/03, and is not in contradiction with G 2/10, as will be explained hereafter. At the same time, the notion of the 'subject-matter remaining in the claim' makes sense independently of whether the disclaimer *per se* was disclosed or not. It is another matter that ascertaining compliance with Article 123(2) EPC may require a different examination, depending on whether the disclaimer was disclosed or not.

- 4.5.5 Decision G 1/03 introduced the notion that the subject-matter remaining in the claim may well be defined and identified even without the subject-matter of the disclaimer *per se*, see G 1/03, point 2.1.3 of the Reasons, last sentence: "The remaining subject-matter is not modified by the disclaimer." This finding of the Enlarged Board is understood by the present board to mean that the disclaimer does not form part of the remaining subject-matter, in the sense that its technical effects - or more precisely any teaching which may possibly be derived from a technical analysis of the features used in the formulation of the disclaimer - must simply be disregarded when the claim is compared with the original teaching in the application as filed. It is another matter that the disclaimer is required to identify those possible embodiments of the original technical teaching which are no longer covered by the amended claim, but are nevertheless still covered by the original technical teaching, i.e. the original disclosure normally understood as defining the subject-matter for the purposes of Article 123(2) EPC.

4.5.6 The Enlarged Board at no point stated in G 2/10 that the distinction between disclaimers and other features of the claim is no longer tenable. On the contrary, the Enlarged Board confirmed that disclaimers are special in the sense that they are not to be considered as belonging to the invention, that is the technical subject-matter: "By contrast, the technical subject-matter defined in the disclaimer does not make the disclaimed subject-matter as such a part of the definition of the claimed invention" (G 2/10, point 4.5.2, second paragraph, of the Reasons).

4.5.7 It needs no particular emphasis that the use of undisclosed disclaimers may be quite common in certain technical areas, yet it must be considered as an exceptional tool in claim drafting. Its exceptional character is well illustrated by the fact that G 1/03 laid down strict conditions for its applicability. The board observes that the possibility of using undisclosed disclaimers has been derived from the legislative intent, and not from the wording of the EPC. Accordingly, such a possibility cannot and need not be explained on the basis of an interpretation which is derived only from the wording of the EPC. However, given that this latter interpretation is the basis of most proceedings before the European Patent Office, care must be taken not to deviate from this "standard" interpretation of the Convention more than absolutely necessary. This explains the required exceptional approach to the examination of claim amendments involving undisclosed disclaimers as opposed to claim amendments involving disclosed features.

4.5.8 Article 123(2) EPC refers to the subject-matter of an application or patent as a whole, which may not be amended beyond the original content of the application. The claim is part of the application, and therefore it appears natural that Article 123(2) EPC also applies to the subject-matter of the claim. The term "subject-matter" as used in the EPC mostly refers to the technical teaching of the invention. This is best illustrated by comparing the wording of paragraphs (2) and (3) of Article 123 EPC, with the former referring to *subject-matter* as opposed to the (scope of) *protection conferred*.

4.5.9 Furthermore, the patent system normally awards legal protection to the patent proprietor for exactly the subject-matter which had been disclosed as the invention, i.e. a technical solution. Even when the original full disclosure of an application is limited later in the light of the state of the art, it is to be expected that the remaining subject-matter can be qualified as a complete and fully disclosed invention. However, when "subject-matter" is considered as the "subject-matter of a claim", it suddenly develops a legal dimension. Besides expressing the technical teaching of the invention (what has been taught by the inventor to solve a technical problem), it also defines the legal subject-matter, namely the legal scope of protection (what others are excluded from exploiting). These are assumed to be the same, by virtue of Article 69(1) EPC in conjunction with Rule 43(1) EPC (Rule 29(1) EPC 1973), the latter requiring that the claims define the protection sought (i.e. the legal subject-matter) in terms of the technical features of the invention. Though not expressly stated in this

Rule, it is of course presumed that here a possibly limited invention in conformity with Article 123(2) EPC is meant.

- 4.5.10 The "subject-matter *remaining in the claim*" is doubtless also subject-matter of a claim, and as such it may also refer to both technical and legal subject-matter. As long as technical and legal subject-matter are the same, "subject-matter" may appear to be freely interchangeable between its technical and legal meaning. This is not the case when the subject-matter remaining in the claim results from an amendment by an undisclosed disclaimer.
- 4.5.11 Indeed, in the case of a claim comprising such a disclaimer the scope of the technical and of the legal subject-matter may be different. The scope of protection sought is less than the scope as taught by the invention, through the use of the purely legal limitation which as such does not make the subject-matter defined by the disclaimer part of the definition of the claimed invention. From this it also follows that technical and legal subject-matter are no longer freely interchangeable. On the contrary, the notion 'subject-matter remaining in the claim' as used in G 1/03 and G 2/10 must be carefully examined at every stage to ascertain whether it refers to the technical or legal subject-matter.
- 4.5.12 It appears to the board that it is unproblematic to read the concepts 'subject-matter remaining in the claim' and 'subject-matter disclosed in the application as filed' in the Order of G 2/10 as technical subject-matter, i.e. the features of the invention as taught.



This also holds true for the concept 'disclaimed subject-matter', given that it was the precondition of the referral for G 2/10 that the disclaimed subject-matter was disclosed in the application as filed.

4.5.13 If, on the other hand, the Order of the Enlarged Board in decision G 2/10 had to be read as also applying to a claim which has been amended by means of an (admissible) undisclosed disclaimer, as apparently suggested by the Enlarged Board (see point 4.4.6 above), then the meaning of the expression "subject-matter remaining in the claim after the introduction of the disclaimer" must inevitably change to *legal* subject-matter in certain instances, namely whenever the effects of the disclaimer are examined. Put simply, in order to avoid comparing apples and pears during the examination for compliance with Article 123(2) EPC, one must always keep in mind that the purely legal subject-matter of the disclaimer cannot by definition modify the original technical subject-matter.

4.5.14 Furthermore, if the disclaimer was undisclosed, it would not find any support in the sense of implicit or explicit disclosure in the application. Having anything undisclosed in a claim may not appear to be conform with Article 123(2) EPC according to its normal or usual interpretation, i.e. when all claim features, without exception, are expected to be directly and unambiguously derivable from the application as filed. However, assuming that Article 123(2) EPC only sets up a requirement for the technical subject-matter, while at the same time accepting that the disclaimer cannot modify the technical subject-matter, then it is not Article 123(2) EPC which is violated. Rather, claims

containing (admissible) undisclosed disclaimers are exempted from complying with Rule 43(1) EPC, since the claim will contain features which might be technical *per se*, but they will not be those of *the invention*.

4.5.15 In this case, the claimed subject-matter is not amended so as to extend beyond the original content when compared with the originally disclosed (technical) subject-matter of the application, because the disclaimer does not modify the teaching of the invention, as a matter of law: it is not part of the definition of the invention. It only exists in a legal sense: it provides the limitation which is solely intended to play a role when the scope of protection needs to be determined, but cannot be considered when the original technical merits of the invention are examined. However, this limiting effect in itself, i.e. the result of the limitation (but not the features which have resulted in the limitation), may still have an effect on the technical subject-matter, as will be illustrated below.

4.5.16 Finally, it is mentioned that apart from the question of compliance with Article 123(2) EPC as prescribed by decision G 2/10, the amended claim, including the disclaimer, also needs to fulfil the other requirements laid down by G 1/03, such as clarity and conciseness (see point 2.4 of the Order) and restriction of the amendment to the minimum (see point 2.2 of the Order).

4.6 The test of G 2/10

4.6.1 The exceptional character of an amendment by way of an undisclosed disclaimer, as explained above, dictates that the examination of the admissibility of such an amendment is made with due regard to this exceptional character. In particular, the examination of the admissibility of the amendment for compliance with Article 123(2) EPC must be made separately for the disclaimer *per se* and for the subject-matter remaining in the claim (see point 4.5.4 above).

4.6.2 The examination must start with the question whether the formal conditions for the use of an undisclosed disclaimer as laid down in decision G 1/03 are given. In the present case this is uncontentious, because the disclaimer is intended to delimit the invention against a European patent application according to Article 54(3) EPC.

It would appear wrong to the board first to examine any technical effect of the proposed disclaimer in order to decide on its admissibility, as proposed by the appellant (see point 4.2.1). Most disclaimers are worded using technical terms, so that such an examination would inevitably find technical effects as a result of the technical terms used. This would consequently make all such disclaimers inadmissible, which could not have been the intention of the Enlarged Board in view of G 1/03. Accordingly, the arguments of the appellant cannot stand.

Furthermore, it appears wrong to the board to require at this stage in the examination of the proposed

amendment that implicit or explicit support for the disclaimer *per se* should be found in the application as filed. As stated above, this would automatically disqualify all undisclosed disclaimers.

4.6.3 The test as laid down in decision G 2/10 should thus take place after an examination of the legal preconditions for admitting the use of undisclosed disclaimers according to G 1/03 and *after* the insertion of the proposed disclaimer in the claim. It is only at this stage that the examination of the "subject-matter remaining in the claim" should be made, corresponding to the Order of G 2/10. This procedure is not in contradiction to the findings and the Order of G 2/10: the subject-matter remaining in the claim "after the introduction of the disclaimer" must be examined (see point 1a of the Order of G 2/10). The wording of the Order leaves it open whether the disclaimer *per se* must fulfil Article 123(2) EPC or not.

4.6.4 There is also nothing in G 2/10 itself which would imply the contrary. Similar formulations are used throughout the decision, e.g.: "Whether the skilled person is presented with new information depends on how he or she would understand the *amended* claim" (emphasis by the board, see point 4.5.2, third paragraph, of the Reasons). This board only adds that the skilled person, when reading the amended claim, is expected to be aware that the claim contains an undisclosed disclaimer, given that G 1/03 instructs that undisclosed disclaimers must be drafted so that they are readily identifiable as such (see the last paragraph of point 3. of the Reasons). Therefore, the skilled person will be able to read the claim keeping in mind the

differences between the technical and legal subject-matter, as explained above (see point 4.5.9). Other board decisions have also readily accepted that the remaining subject-matter can be examined independently of whether there is any basis for the disclaimer itself (see for example T 1107/06, point 45. of the Reasons).

4.6.5 Again, in the opinion of this board, the Order of decision G 2/10 not only makes it clear that the test which it lays down applies to the amended claim, but the test is also applicable to amendments involving an undisclosed disclaimer. It is true that point 1b of the Order concentrates on the examination of the technical content: determining whether or not the amendment infringes Article 123(2) EPC "requires a technical assessment of the overall technical circumstances of the individual case under consideration". The emphasis put on the technical content is understandable given that the referrals plainly concerned disclaimers apparently not benefiting from the special status of admissible undisclosed disclaimers. Yet the Order does not imply that the disclaimer *per se* needs to have a basis in the application as filed. Rather, the above determination of whether or not the amendment infringes Article 123(2) EPC should be made "taking into account the nature and extent of the disclosure in the application as filed, the nature and extent of the disclaimed subject-matter and its relationship with the subject-matter remaining in the claim after the amendment" (see point 1b of the Order).

4.6.6 Put differently, the test of G 2/10 can be used for examining the remaining subject-matter with due regard to the fact that the disclaimer is an undisclosed one

that, as such, does not add *technical subject-matter* as a matter of law. As explained above, given that the skilled person is aware that the undisclosed disclaimer needs to be treated as such, the skilled person will also be able to determine whether the *technical subject-matter* remaining within the *legal scope of the claim* has been properly disclosed as required by G 2/10.

- 4.6.7 This said, the Board now needs to determine how the requirement for the amended claim to meet the test of G 2/10 may possibly be satisfied.

In the first place, it must be examined whether the proposed disclaimer is indeed a proper disclaimer, in the sense that the remaining legal subject-matter is less than that of the unamended claim. If any subject-matter can be identified which falls within the scope of the claim after amendment by the proposed disclaimer, but which did not do so before the amendment, the disclaimer is improper. For example, a negative formulation removing a restricting feature may look like a disclaimer, but may in fact extend the legal scope of protection. The board takes it that such an amendment, not being a disclaimer at all, would also fail the test of G 1/03 so that any further examination under G 2/10 would in fact be redundant.

Secondly, it may be examined whether there is *any* remaining subject-matter at all. A comparison of the originally disclosed and remaining subject-matter may reveal that a proper interpretation of the disclaimer in fact leaves the amended claim empty, in the sense that no technically realistic or feasible embodiments

can be identified on the basis of the original application which would still fall under the amended claim.

Thirdly, even if the second examination is passed, it may still be justified to examine whether the remaining subject-matter could plausibly be considered as belonging to the invention as presented in the application. For example, some existing remaining subject-matter may well be positively identified purely on the basis of claim logic. Nevertheless, a technical assessment of the original application may show that the amended claim is restricted to such a combination of parameters which the skilled person would never have contemplated as belonging to the invention from a technical point of view, for example because it would not solve the technical problem underlying the original invention.

It must be emphasized that these types of examinations are given only as examples potentially suitable for determining whether the remaining subject-matter can be considered as properly disclosed in the sense of G 2/10. It goes without saying that other types of examinations may offer themselves, depending on the technical content of the application and the proposed disclaimer.

#### 4.7 The present case

- 4.7.1 In the present case, the board is satisfied that the subject-matter remaining in the claim has been properly disclosed and that the respondent (patent proprietor) is not benefiting from an unwarranted advantage as a

result of the amendment (G 1/93, point 9. of the Reasons).

4.7.2 In particular, in the application documents as originally filed it is disclosed (see page 4, lines 24-34; claim 2) that the oxide superconductor may have a perovskite type crystal structure in the broad sense. This comprises structures which are not of the  $K_2NiF_4$  type, which was also known to the person skilled in the art of superconductor technology at the priority date. For instance, in example 10 (see page 21, lines 20-28) a superconducting wire is disclosed in which the components were mixed at a mixing ratio of  $(Y_{0.4}Ba_{0.6})CuO_3$ , which is not of the disclaimed type. Furthermore, it is disclosed (see page 5, lines 2-5; claim 6) that the sheath member contains a material selected from the group of: Ag, Au, Pt, Pd, and their alloys.

From the priority document JP56856/87 of 13.03.1987 (see the English translation, page 6, first paragraph; examples 9, 10, and 14) it can also be derived that the oxide superconductor has a perovskite type crystal structure which is not of the  $K_2NiF_4$  type as described above, and that the sheath member is composed of Ag, Au or an alloy thereof.

Thus it is clear that there are genuine and realistic embodiments still encompassed by the amended claim. Furthermore, there is no pointer in the application or any evidence on file that the embodiments still covered by the claim would not provide the advantages of the invention or that the skilled person could not have reproduced them at the priority date. Put differently,



there is no pointer in the application for *not* considering these embodiments as belonging to the invention.

4.7.3 Accordingly, the board is satisfied that the technical subject-matter remaining in the claim has been properly disclosed to the skilled person in the application as filed. The board is also satisfied that the disclaimer is clear and concise, and properly restricted in relation to the anticipating content of European patent application D1. For these reasons the board is of the opinion that the amendment introducing the disclaimer (vi) into claim 1 is not contrary to the requirements of Article 123(2) EPC, and is allowable in the light of both G 1/03 and G 2/10.

5. Amendments - Article 123(3) EPC

The appellant (opponent) argued that interpreting the feature of claim 1 that the sheath member was formed of a material resistant in an oxidizing atmosphere to oxidation (see point V. above, feature (iv)) in such a way that the material was difficult to be oxidized contravened Article 123(3) EPC.

However, feature (iv) was already present in claim 1 as granted. Furthermore, the board has no reason to doubt that in view of the description as granted, in particular column 5, lines 15-33, the skilled person would interpret that feature in the same way as indicated above under point 3. Therefore, the patent was not amended in such a way as to extend the protection it confers (Article 123(3) EPC).

6. Novelty

6.1 The subject-matter of claim 1 was held to be new in the decision under appeal. This was disputed by the appellant (opponent) merely in so far as claim 1 was not considered to be entitled to the earliest priority date of 13.03.1987. Further documents which disclosed the subject-matter of claim 1 therefore became relevant for the novelty assessment.

6.2 In section 3. above it was reasoned that the skilled person would interpret feature (iv) of claim 1 to mean that the material of the sheath member was not easily oxidized at the relevant temperature. In the priority document JP 56856/87 it is explicitly mentioned (see the paragraph bridging pages 8 and 9 of the English translation) that silver is "difficult to be oxidized". To the skilled person this is also known to be the case for gold. Furthermore, in the above priority document the sheath member is explicitly described to be composed of gold, silver or an alloy thereof (page 6, first paragraph and claim 4 of the English translation). The board is therefore satisfied that features (iv) and (v) are directly and unambiguously derivable from this priority document.

6.3 Furthermore, in view of the reasons presented under point 4.7 above, the introduction of feature (vi) does not affect the right to priority from the earliest priority document JP 56856/87.

For these reasons the effective date of claim 1 is the earliest priority date of 13.03.1987.

- 6.4 As the earliest priority date of document D2 (01.04.1987) is after that date, document D2 is not relevant for the assessment of novelty of the subject-matter of claim 1.
- 6.5 Document D1 is a European patent application with an earliest priority date (05.02.1987) before the earliest priority date of 13.03.1987 of the opposed patent, i.e. the effective date of claim 1, and a publication date (07.09.1988) after this date. Document D1 is therefore relevant for the assessment of the novelty of the subject-matter of claim 1 under Article 54(3) EPC. Furthermore, the states DE, FR, and GB, which are designated in the present patent, are also designated in the European patent application D1 (Article 54(4) EPC 1973).

Both document D1 and its priority document JP 25224/87 having the earliest priority date of 05.02.1987 disclose (see claims 1 and 4 of the priority document JP 25224/87 and claims 1, 2, and 7 of D1) a superconducting wire comprising a metal pipe filled with a body of  $K_2NiF_4$  type superconducting oxide. The metal pipe is made of Cu, Ni, Fe, Cr, Ag, Ti, Mo, W or an alloy thereof.

By means of the disclaimer (vi) the subject-matter of claim 1 has been rendered new over the European patent application D1, in so far as its earliest priority of 05.02.1987 is validly claimed.

- 6.6 The board is therefore satisfied that the subject-matter of claim 1 is new over the available state of the art.

6.7 Independent method claim 12 corresponds to independent device claim 1, and claims 2 to 11 and 13 to 36 are dependent on claims 1 and 12, respectively, and provide further limitations. The novelty of the subject-matter of these claims was not disputed by the appellant (opponent).

Accordingly, the board sees no reason to doubt that the subject-matter of claims 1 to 36 is new (Article 54(1), (2) EPC 1973 and Article 54(3) EPC).

7. Inventive step

7.1 Closest state of the art

7.1.1 The appellant (opponent) regards document D3 to represent the closest state of the art.

That document relates to (see pages 1 to 3 of the description) a metallic material comprising - preferably non-metallic - additives, e.g. to a contact material. In particular, D3 is concerned with providing a desired - preferably uniform - distribution of the additives. This is accomplished in that the additives in powder form are compressed in metal pipes which are subsequently compressed and drawn. The resulting wires are bundled and inserted into a metal pipe which is again drawn to produce the desired metallic material.

In document D3 it is mentioned on page 4, paragraph 1, that the metallic material of D3 was not only suitable as a contact material, but also usable in the manufacture of superconductors. It is however not

indicated in D3 in which way the metallic material was usable for the manufacture of superconductors. Furthermore, it is not mentioned that the metallic material itself could be superconducting.

Moreover, the only embodiments described in D3 (see pages 7 and 8) relate to using cadmium oxide as additive in silver pipes, which is described in D3 as being known to overcome the problems created by electric arcs on switching high power switching contacts (e.g. sticking of contact areas).

Document D3 is therefore not regarded as being directed to the same purpose or effect as the invention, namely to providing a superconductor.

7.1.2 In the description of the patent it is admitted (see column 1, lines 8-38) that oxide ceramic-based superconductors having a crystal structure such as perovskite and layered perovskite superconductors were known in the state of the art. Furthermore, it is described that since sintering was performed in the manufacture of the oxide superconductors, only pellets could be manufactured. It was therefore impossible to apply the oxide superconductor to a superconducting magnet or transmission line. The object of the invention was to provide a superconducting wire using an oxide superconductor.

The board regards this to be a realistic description of the starting situation faced by the inventor and agrees with the respondent (patent proprietor) in regarding the known oxide superconductors as the closest state of the art.

## 7.2 Objective technical problem

The subject-matter of claim 1 differs from the closest state of the art in comprising the features relating to the superconducting wire and the sheath (see point V., features (i), (ii), (iv)-(vi) and part of feature (iii)). The effect of these features is that the superconductor is in the form of a wire. The objective technical problem is therefore to achieve this effect.

## 7.3 Obviousness

7.3.1 It remains to be considered whether it would be obvious for the skilled person to arrive at the distinguishing features when attempting to solve the posed objective technical problem.

7.3.2 For reasons corresponding to those mentioned above under point 7.1.1 the board is of the opinion that the skilled person would not consider document D3 when attempting to solve the objective technical problem.

7.3.3 From the description of the patent it emerges (see column 5, lines 2-33) that the claimed choice of the material of the sheath member (point V., features (iv) and (v)) allows oxygen to be supplied to the starting materials of the superconductor from the outside during heat treatment, thus "avoiding a short supply of oxygen" which is necessary for the formation of the oxide superconductor in order to exhibit the desired superconducting characteristics.

The appellant (opponent) was of the opinion that silver-encased superconductors were known from the state of the art documents D5, D7, D9 and D15 and argued that the mere substitution of the respective superconductor used in these documents by an oxide superconductor was obvious to the skilled person.

All these documents describe superconducting materials encased in a sheath. The superconducting materials described in detail in documents D5, D7 and D15 are alloys comprising niobium or vanadium, e.g.  $Nb_3Sn$  or  $V_3Si$ , whereas those described in document D9 (also mentioned in document D7) are superconducting chevrel phases, e.g.  $PbMo_6S_8$ . Furthermore, all of the documents mention copper, aluminium, silver and at least two further metals as examples of the material to be used as sheath material.

The materials mentioned in documents D5, D7, D9 and D15 as examples of the sheath material are known to have very different tendencies to oxidize. On the other hand, since the superconducting materials mentioned in documents D5, D7, D9 and D15 do not comprise oxygen, the considerations mentioned above related to ensuring the sufficient supply of oxygen play no role in these documents. It would thus not be obvious to the skilled person from the teaching of these documents to select silver, gold or an alloy thereof (see point V., feature (v)) in order to solve the posed technical problem.

The subject-matter of claim 1 is therefore regarded as involving an inventive step over the available prior art.

7.3.4 Independent method claim 12 corresponds to independent device claim 1 and claims 2 to 11 and 13 to 36 are dependent on claims 1 and 12, respectively, and provide further limitations.

Accordingly, the board finds that the subject-matter of claims 1 to 36 involves an inventive step (Article 56 EPC 1973).

8. Other requirements of the EPC

In order to comply with the requirements of Article 84 EPC 1973 the description has been brought into conformity with the amended claims. These requirements of the EPC are therefore also fulfilled.

9. Conclusion

In view of the above the board is satisfied that the main request meets the requirements of the EPC. Consideration of the first and second auxiliary requests is therefore not necessary.



## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
  
2. The case is remitted to the department of first instance with the order to maintain the patent in an amended form on the basis of the following documents:  
Description, Pages  
2a, 3-9 as filed during oral proceedings on 17.10.2007 before the opposition division,  
2 as filed during oral proceedings before the board,  
Claims  
1-36 as filed with letter dated 10 February 2012 and marked "Main Request",  
Drawings, Sheets  
1/3-3/3 of the patent specification.

The Registrar:

The Chairman:

S. Sánchez Chiquero

G. Eliasson