

BESCHWERDEKAMMERN
DES EUROPÄISCHEN
PATENTAMTS

BOARDS OF APPEAL OF
THE EUROPEAN PATENT
OFFICE

CHAMBRES DE RECOURS
DE L'OFFICE EUROPEEN
DES BREVETS

Internal distribution code:

- (A) [] Publication in OJ
(B) [] To Chairmen and Members
(C) [X] To Chairmen

D E C I S I O N
of 11 February 1999

Case Number: T 0784/95 - 3.4.1

Application Number: 85306308.9

Publication Number: 0174196

IPC: H01J 29/02

Language of the proceedings: EN

Title of invention:

Material for in-tube components & method of manufacture thereof

Patentee:

Kabushiki Kaisha Toshiba

Opponent:

IMPHY S.A. Elysée la Défense

Headword:

-

Relevant legal provisions:

EPC Art. 100(a), (b), 52(1), 54, 56, 83, 123(2)
EPC R. 86(3)

Keyword:

-

Decisions cited:

T 0198/84, T 0017/85, T 0279/89, T 0666/89

Catchword:

-



Europäisches
Patentamt

European
Patent Office

Office européen
des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number: T 0784/95 - 3.4.1

D E C I S I O N
of the Technical Board of Appeal 3.4.1
of 11 February 1999

Appellant: IMPHY S.A. Elysée la Défense
(Opponent) 19, le Parvis de la Défense - La Défense 4 -
92072 Paris La Défense (FR)

Representative: Le Brusque, Maurice
Cabinet Harlé et Phélip
7, rue de Madrid
75008 Paris (FR)

Respondent: Kabushiki Kaisha Toshiba
(Proprietor of the patent) 72, Horikawa-cho
Saiwai-ku
Kawasaki-shi
Kanagawa-ken 210-8572 (JP)

Representative: Batchellor, Kirk & Co.
2 Pear Tree Court
Farringdon Road
London EC1R 0DS (GB)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 18 July 1995
rejecting the opposition filed against European
patent No. 0 174 196 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: G. Davies
Members: G. Assi
H. K. Wolfrum

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal, received on 14 September 1995, against the decision of the Opposition Division, dispatched on 18 July 1995, rejecting the opposition against the European patent No. 0 174 196 (application number 85306308.9). The fee for appeal was paid on the same day. The statement setting out the grounds of appeal was received on 17 November 1995.

Opposition was filed against the patent as a whole and was based on Article 100(a), (b) EPC, in particular on the grounds that the subject-matter of the patent was not patentable within the terms of Articles 52(1), 54, 56 and 83 EPC.

The Opposition Division held that the grounds of the opposition did not prejudice the maintenance of the patent as granted, having regard *inter alia* to the following documents:

- (D8) E. Josso, Propriétés des alliages fer-nickel à haute teneur en nickel, Centre d'information du nickel, 1956, pages 1-30,
- (D10) J.S. Marsh, The alloys of iron and nickel, vol. I - Special-purpose alloys, The Engineering Foundation, McGraw-Hill Book Company, Inc., 1938, pages 18, 19, 388-391, and
- (D17) US-A-3 948 685.

II. With the statement setting out the grounds of appeal, the appellant filed the following further documents:

(D18) Standards JIS G 0551, 1977,

(D19) Standards ASTM, E 112-88, pages 284-309, and

(D20) Standards JIS G 0552, 1977.

III. Oral proceedings were held on 11 February 1999.

IV. The appellant requested that the decision under appeal be set aside and that the patent be revoked. Furthermore, he requested oral proceedings, as an auxiliary request.

V. The respondent (patent proprietor) requested that the patent be maintained on the basis of the following documents:

Main request:

Claims 1-10 of the granted patent,
description pages 2-7 of the granted patent,
drawing sheets 1/5-5/5 of the granted patent,

First auxiliary request:

Claims 1-8 as filed with the letter dated 11 January 1999,
description and drawings of the granted patent,

Amended first auxiliary request:

Claims 1-10 as filed at the oral proceedings on 11 February 1999,
description and drawings of the granted patent,

Second auxiliary request:

Claims 1-8 as filed with the letter dated 11 January 1999,
description and drawings of the granted patent,

Third auxiliary request:

Claims 1-10 as filed with the letter dated 11 January 1999,
description and drawings of the granted patent,

Fourth auxiliary request:

Claims 1-10 as filed with the letter dated 11 January 1999,
description and drawings of the granted patent,

Fifth auxiliary request:

Claims 1-8 as filed with the letter dated 11 January 1999,
description and drawings of the granted patent,

Sixth auxiliary request:

Claims 1-10 as filed with the letter dated 11 January 1999,
description and drawings of the granted patent.

VI. The wording of **Claim 1** according to the **main request** reads as follows:

"1. A material, suitable for use in-tube components of a colour cathode ray tube, whose main component is an Fe-Ni alloy of which the main constituent is Fe, and containing at least 25-45 wt% Ni, 0.3-10 wt% Cr which may be partially replaced by Mn, and 0-10 wt% Co, and which is of grain density 2,000-40,000 grains/mm²."

The wording of **Claim 1** according to the **first auxiliary request** reads as follows:

"1. A material, suitable for use in in-tube components of a colour cathode ray tube, whose main component is an Fe-Ni alloy of which the main constituent is Fe, and containing at least 25-45 wt% Ni, 0.3-10 wt% Cr which may be partially replaced by Mn, and 0-10 wt% Co, formed to have at least an 80% austenitic structure and which is of grain density 2,000-40,000 grains/mm²."

The wording of **Claim 1** according to the **amended first auxiliary request** reads as follows:

"1. A material, suitable for use in-tube components of a colour cathode ray tube, whose main component is an Fe-Ni alloy capable of being etched and having a thermal expansion coefficient less than $90 \cdot 10^{-7}$ /°C and a 0.2% yield point below 20 kg/mm² of which the main constituent is Fe, and containing at least 25-45 wt% Ni, 0.3-10 wt% Cr which may be partially replaced by Mn, and 0-10 wt% Co, and which is of grain density 2,000-40,000 grains/mm²."

The wording of **Claim 1** according to the **second auxiliary request** reads as follows:

"1. A material, suitable for use in-tube components of a colour cathode ray tube, whose main component is an Fe-Ni alloy of which the main constituent is Fe, and containing at least 25-45 wt% Ni, 0.3-10 wt% Cr which may be partially replaced by Mn, and 0-10 wt% Co, formed to have at least an 80% austenitic structure and which is of austenite grain density 2,000-40,000 grains/mm²."

The wording of **Claim 1** according to the **third auxiliary request** reads as follows:

"1. A material, suitable for use in-tube components of a colour cathode ray tube, whose main component is an Fe-Ni alloy of which the main constituent is Fe, and consisting of at least 25-45 wt% Ni, 0.3-10 wt% Cr which may be partially replaced by Mn, 0-10 wt% Co, the remainder Fe and unavoidable impurities and which is of grain density 2,000-40,000 grains/mm²."

The wording of **Claim 1** according to the **fourth auxiliary request** reads as follows:

"1. A material, suitable for use in-tube components of a colour cathode ray tube, which is an Fe-Ni alloy of which the main constituent is Fe, and consisting of at least 25-45 wt% Ni, 0.3-10 wt% Cr which may be partially replaced by Mn, 0-10 wt% Co, the remainder Fe and unavoidable impurities and which is of grain density 2,000-40,000 grains/mm²."

The wording of **Claim 1** according to the **fifth auxiliary request** reads as follows:

"1. A material, suitable for use in-tube components of a colour cathode ray tube, whose main component is an Fe-Ni alloy of which the main constituent is Fe, and containing at least 25-45 wt% Ni, 0.3-10 wt% Cr which may be partially replaced by Mn, 0-10 wt% Co, the remainder Fe and unavoidable impurities and formed to have at least an 80% austenitic structure and which is of austenite grain density 2,000-40,000 grains/mm² as defined in Japanese Industrial Standard JIS-G0551."

The wording of **Claim 1** according to the **sixth auxiliary request** reads as follows:

"1. A material, suitable for use in-tube components of a colour cathode ray tube, whose main component is an Fe-Ni alloy of which the main constituent is Fe, and containing at least 25-45 wt% Ni, 0.3-10 wt% Cr which may be partially replaced by Mn, 0-10 wt% Co, the remainder Fe and unavoidable impurities and which is of austenite grain density at least 9 to 11 as defined in Japanese Industrial Standard JIS G0551."

VII. The appellant's arguments may be summarised as follows.

The subject-matter of Claim 1 according to the main request was not novel having regard to D17 which disclosed a material having the same chemical composition, the same grain density and which was suitable for use in in-tube components of a CRT. The objection raised by the Board that Claim 1 as amended according to the third and fourth auxiliary requests did not meet the requirements of Article 123(2) EPC was well-founded because the application as originally filed did not provide any support for the feature that the alloy "consisted" of the claimed elements.

The subject-matter of Claim 1 according to the first auxiliary, second auxiliary, fifth auxiliary and sixth auxiliary requests was not novel or lacked inventive step having regard to D17, considering that the austenitic structure was a feature implicit to the kind of alloy disclosed in D17.

VIII. The respondent's arguments may be summarised as follows.

Document D17 had no specific disclosure that any exemplified alloy was indeed useful for in-tube components. The known alloys were employed in glass-to-metal seals, in particular in vacuum tubes. By a correct interpretation, Claim 1 according to all requests included implicit features relating to properties of the material like thermal expansion coefficient, 0.2% yield value and etching characteristics (these properties were explicitly mentioned in Claim 1 of the amended first auxiliary request). A material with the claimed chemical composition, grain density and the mentioned properties rendering it suitable for in-tube applications was neither known, nor suggested by any prior art document cited. Moreover, the feature concerning the austenitic structure of the alloy could not be considered as obvious or implicit because, other structures being possible, it could be achieved only by the provision of particular measures.

Reasons for the Decision

1. The appeal is admissible.

2. Documents D18, D19 and D20

Documents D18, D19 and D20 were introduced for the first time with the grounds of appeal. However, since they refer to standards applied to metallic materials, they are not considered as late-filed documents cited against the patent in suit. The Board, therefore, admits them into the procedure.

3. Main request

3.1 Claim 1 refers to a material with the following characteristics:

- It is **suitable** for in-tube components of a colour cathode ray tube. This means that a document disclosing a material with the same composition and structure but useful for another use would anticipate the claimed subject-matter, if it may be concluded that the known material is also suitable for the claimed purpose.
- It has an Fe-Ni alloy as **main component**, which has a given composition **containing** Fe, Ni, Cr, Co and, possibly, Mn. The wording of the claim does not exclude the presence of other constituents.
- It has a given grain density. It is noted that the claimed range essentially corresponds to the range 8-12.3 according to the ASTM standards or 8-12 of the JIS G 0551 and JIS G 0552 standards (see D18, D19 and D20).

3.2 Document D17 discloses a fine-grained alloy useful for glass-to-metal seals, in particular in vacuum tubes (see column 1, lines 8-18). The following five alloys are disclosed in Table II (the ranges according to the present Claim 1 are also given for comparison; all values are wt%):

	patent in suit	D17				
	Claim 1	Table II				
		1	2	3	4	5
Fe	main constituent	balance	balance	balance	balance	balance
Ni	25-45	40.6	42.0	41.8	41.6	42.0
Cr	0.3-10	5.95	5.49	5.40	5.44	5.44
Co	0-10	0.03	0.03	0.028	0.025	0.03
Mn	may replace Cr, in part	0.19	0.23	0.13	0.15	0.18

3.2.1 It is clear that, with regard to the known alloys 1-5, the values for the constituents Ni, Cr and Co (as well as Cr together with Mn) fall within the respective ranges of Claim 1. The known alloys also contain other constituents, this fact, however, being irrelevant because the wording of Claim 1 does not exclude this possibility. Thus, the claimed chemical composition is not novel.

3.2.2 According to D17, column 4, lines 11-14, the grain size numbers of the alloys 1-5 are all smaller than 6 ASTM (see also Claim 1, last line), and for the most part they are smaller than 8 ASTM. For a better understanding of the meaning of this sentence it is useful to consider the nominal "diameter" of average grain section (see D19, Table 2 on page 287):

- present Claim 1: 2,000-40,000 grains/mm² → 5-22 μm (8-12.3 ASTM),

- D17: grain size smaller than 6 ASTM → < 45 μm
(all),
grain size smaller than 8 ASTM → < 22 μm
(most part).

Thus, the grain density according to the present Claim 1 is a sub-range of the known intervals. In this respect, it has to be assessed whether the selection of a sub-range of numerical values from a broader range should be considered as new or not. In several decisions of the Boards of Appeal (see T 198/84, OJ EPO 1985, 209; T 17/85, OJ EPO 1986, 406; T 279/89 (not published); T 666/89, OJ EPO 1993, 495), it has been stated that, in order for a selected sub-range to be held to be new, the sub-range should be narrow, should be sufficiently removed from the preferred part of the known range, and should not be an arbitrary selection from the prior art, but instead a purposive selection. The Board does not have any reason to depart from this case law in the present case. With regard to the first criterion mentioned, it does not appear to be met for the following reasons. The ranges according to D17 are unlimited from a formal point of view only. In practice, they are not. Indeed, in order to avoid the known problem of "rough pits" (see the patent in suit, page 5, lines 5-8), the skilled person will refrain from choosing an excessive fineness of the grains, in other words he will know that there is a lower limit, which should not reasonably be far away from the value 5 μm . It follows that the claimed sub-range cannot be narrow with reference to the known interval, in particular the preferred (most probable) one. Also the second criterion does not appear to be met, because the sub-range in part coincides with the preferred (most probable) part of the known interval. Thus, the claimed grain density feature is not novel.

3.2.3 In view of the foregoing, there is no reason to believe that the alloys known from D17 should not be suitable for in-tube components of a colour cathode ray tube, because they do not differ from the material according to Claim 1 with regard to the chemical composition and grain density. A support for this view is indeed to be found in the fact that the values of the thermal expansion coefficient of the known alloys (see D17, Table I, in particular the range $8.5 \cdot 10^{-6}$ - $9.2 \cdot 10^{-6}$ /°C) are comparable to those of the material according to the present invention (see the patent, page 5, lines 37-39).

3.3 For these reasons, the subject-matter of Claim 1 according to the main request is not new, having regard to D17.

Thus, the main request cannot be allowed.

4. *First auxiliary request*

4.1 As compared with Claim 1 as granted (i.e. according to the main request), Claim 1 of the first auxiliary request includes the further feature that the alloy has at least an 80% austenitic structure. This feature is disclosed in the original Claim 4, so that the amendment complies with the requirements of Article 123(2) EPC.

4.2 D17 discloses an Fe-Ni alloy comprising all the features of Claim 1 according to the main request (see points 3.2-3.3 above).

Moreover, the alloys 1-5 disclosed in Table II of D17, which have a Ni percentage between 40.6 and 42 wt%, are austenitic in view of the fact that, as the appellant pointed out at the oral proceedings before the Board on the basis of document D8 (see Figure 1, page 2, left-

hand column and right-hand column, first half), Fe-Ni alloys comprising more than 27-30 wt% Ni have an austenitic structure (see also D10, page 18, first sentence of point 11). This fact renders irrelevant the respondent's argument that other structures besides the austenitic one are possible.

Thus, the subject-matter of Claim 1 of the first auxiliary request differs from the material as known from D17 only in that **at least 80%** of the alloy structure is austenitic. In view of the fact that the alloys 1-5 disclosed in D17 are essentially austenitic, the claimed range, in particular the choice of the lower limit, cannot be regarded as inventive.

- 4.3 For these reasons, the subject-matter of Claim 1 according to the first auxiliary request lacks inventive step, having regard to D17 and D8. Thus, the first auxiliary request cannot be allowed.

5. *Amended first auxiliary request*

With the annex to the summons to attend oral proceedings, dated 1 December 1998, the Board raised the objection that the subject-matter of Claim 1 according to the main request might lack novelty having regard to document D17 (see point 2.1.1 of the communication). This objection being known to the parties, the respondent filed a set of six auxiliary requests with its reply dated 11 January 1999. At the beginning of the oral proceedings on 11 February 1999, the respondent, while pleading for novelty of the subject-matter of Claim 1 according to the main request, drew attention to the importance of correctly interpreting the claim. In his opinion, the thermal expansion coefficient of the alloy, the 0.2% yield point and the etching characteristics should be considered as implicit features of Claim 1 of the main

request limiting the extent of protection of the claim. For the sake of clarity these features were explicitly mentioned in Claim 1 according to the amended first auxiliary request submitted at the oral proceedings before the Board. However, in view of the fact that the respondent had had enough time before the scheduled date of the oral proceedings to consider the objection of lack of novelty and to file amended claims to overcome this objection, and that the respondent had not been confronted with new facts or arguments at the beginning of the oral proceedings, the Board considers that the late filing of the amended first auxiliary request was not justified. Therefore, pursuant to Article 111(1) EPC, the Board exercises its power of discretion under Rule 86(3) EPC and rejects as inadmissible the late-filed claims according to the amended first auxiliary request.

6. *Second auxiliary request*

Claim 1 according to the second auxiliary request essentially corresponds to Claim 1 of the first auxiliary request ("austenite" has been added before "grain density").

For the same reasons mentioned in point 4 above, the subject-matter of Claim 1 lacks inventive step, having regard to D17 and D8, and the second auxiliary request cannot be allowed.

7. *Third auxiliary request*

As compared with Claim 1 as granted, Claim 1 according to the third auxiliary request has been amended in such a way that it includes the feature that the alloy consists of given quantities of Ni, Cr (which may be partially replaced by Mn) and Co, the remainder being Fe and unavoidable impurities. The description as originally filed discloses the alloy as containing the

said chemical elements (see page 3, lines 6-10), so that the presence of other elements is not excluded. Indeed, according to all the embodiments the alloy also comprises C, Si, P and S, the weight percentage of which may vary considerably, for instance with a factor 10 having regard to C according to the first and the second embodiment (see page 13, lines 7-10, page 15, lines 22-25, page 16, lines 21-24, page 17, lines 16-18). Moreover, in Embodiment 2, the elements C, Si, P and S are described as "incidental constituents", which expression, however, is not equivalent to "unavoidable impurities" in Claim 1. For these reasons, the claimed chemical composition of the alloy extends beyond the disclosure of the application as filed. Claim 1 thus contravenes Article 123(2) EPC and the third auxiliary request cannot be allowed.

8. *Fourth auxiliary request*

Claim 1 according to the fourth auxiliary request also comprises the amendments that the alloy **consists of** given quantities of Ni, Cr (which may be partially replaced by Mn) and Co, **the remainder being Fe and unavoidable impurities**. Therefore, the fourth auxiliary request is not allowable for the same reasons explained with regard to the third auxiliary request.

9. *Fifth auxiliary request*

- 9.1 As compared with Claim 1 as granted, Claim 1 according to the fifth auxiliary request includes the features that the alloy comprises unavoidable impurities and that the alloy has at least an 80% austenitic structure, the grain density range being referred to this structure. These amendments comply with the requirements of Article 123(2) EPC.

9.2 D17 discloses an Fe-Ni alloy comprising all the features of Claim 1 according to the main request (see points 3.2-3.3 above).

The known alloys comprise unavoidable impurities (see column 2, line 13, "residuals") and have an austenitic structure for the reasons mentioned in point 4.2 above.

Thus, as is the case for Claim 1 of the first auxiliary request, the subject-matter of Claim 1 of the fifth auxiliary request differs from the material as known from D17 only in that at least 80% of the alloy structure is austenitic. For the same reasons mentioned in point 4.2 above, this difference is not regarded as inventive.

9.3 Therefore, the subject-matter of Claim 1 according to the fifth auxiliary request lacks inventive step, having regard to D17 and D8.

The fifth auxiliary request cannot be allowed.

10. *Sixth auxiliary request*

10.1 As compared with Claim 1 as granted, Claim 1 according to the sixth auxiliary request includes the feature that the alloy comprises unavoidable impurities.

Moreover, whereas Claim 1 as granted mentions a grain density range 2,000-40,000 grains/mm² corresponding to the interval 8-12 as defined in the Standard JIS 0551 (see the patent in suit, page 2, line 48), the range in the amended Claim 1 is 9-11 according to JIS G0551.

These amendments comply with the requirements of Article 123(2) EPC (see the application as filed, page 10, lines 10-12, 19, 20, 29, 30, page 11, lines 1-3).

- 10.2 D17 discloses an Fe-Ni alloy comprising all the features of Claim 1 according to the main request (see points 3.2-3.3 above).
The known alloys comprise unavoidable impurities (see column 2, line 13, "residuals") and have an austenitic structure for the reasons mentioned in point 4.2 above. As far as the grain density range is concerned, the same arguments mentioned in point 3.2.2 above with regard to the range of Claim 1 as granted also apply to the amended sub-interval 9-11 JIS G0551, so that also this feature is not regarded as novel.
- 10.3 For these reasons, the subject-matter of Claim 1 according to the sixth auxiliary request is not new, having regard to D17.
Thus, the sixth auxiliary request cannot be allowed.
11. None of the requests submitted by the respondent are allowable. The grounds for opposition mentioned in Article 100(a) EPC prejudice the maintenance of the European patent. Therefore, the patent must be revoked.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

M. Beer

G. Davies