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D E C I S I O N
of 12 June 1997

Case Number: T 0924/93 - 3.2.5

Application Number: 85104145.9

Publication Number: 0158941

IPC: B41N 1/08

Language of the proceedings: EN

Title of invention:
Aluminium alloy material plate for printing

Patentee:
FUJI PHOTO FILM CO., LTD., et al

Opponent:
Vereinigte Aluminium Werke AG
Alcan Deutschland GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty and inventive step (yes) - after amendment"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0924/93 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 12 June 1997

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 20 August 1993 revoking European patent No. 0 158 941 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: G. O. J. Gall
Members: W. D. Weiß
H. P. Ostertag

Summary of Facts and Submissions

I. The appellant (proprietor of the patent) lodged an appeal against the decision of the Opposition Division on the revocation of the European patent No. 0 158 941.

Two oppositions were filed against the patent as a whole and based on Article 100(a) in connection with Articles 54 and 56 EPC (lack of novelty and inventive step).

The Opposition Division held that the grounds for opposition mentioned prejudiced the maintenance of the patent having regard to the following documents:

D1: D. Altenpohl "Aluminium von innen betrachtet", 4th edition (1979), Aluminium-Verlag, Düsseldorf, pages 12, 129 and 202;

D2: W. Hufnagel "Key to Aluminium alloys", 4th edition, pages 145, 195 and 197;

D3: D. Altenpohl "Aluminium und Aluminiumlegierungen", Springer-Verlag Berlin etc. (1965), pages 357 to 360, 372, 408, 409 and 420 to 422;.

In particular, it was held that the subject-matter of Claim 1 as granted was not novel having regard to document D3, when considered in the light of the general knowledge represented by the documents D1 and D2, and that the subject-matter of a single Claim according to an auxiliary request lacked an inventive step having regard to document D3 considered together with document

D5: L. F. Mondolfo "Aluminium Alloys: Structure and properties", Butterwoods (1976, pages v, ix and 282 to 286),

cited by the proprietor during the opposition proceedings.

II. In a communication issued together with the summons for oral proceedings the Board expressed as its provisional opinion that the subject-matter of Claim 1 as granted as well as of a single "Alternative Claim", which had been filed as a first auxiliary request together with the Grounds for Appeal, did not involve an inventive step having regard to document

D6: EP-A-0 067 056

in combination with document D3.

Document D6, which is mentioned in the Search Report, was suggested by the appellant in the Grounds of Appeal to be the closest prior art.

The Board, in the said communication, pointed to the fact that neither Claim 1 as granted nor the Claim according to the first auxiliary request contained the features which referred to the particular type of printing plate on which the problem of the patent in suit as well as the arguments of the appellant appeared to be based.

III. At the end of the oral proceedings of 12 June 1997 the following requests were submitted:

The appellant (proprietor) requested that the decision under appeal be set aside and the patent be maintained as granted (main request) or be maintained as amended with Claim 1 submitted together with the grounds of

appeal (first auxiliary request) or be maintained as amended on the basis of the "Alternative Claim" and the amendments to the description filed during oral proceedings (second auxiliary request).

The respondents (opponents) requested that the appeal be dismissed.

IV. The wording of Claim 1 as granted (main request) reads as follows:

"1. A printing aluminum alloy material plate obtained from an aluminum alloy material which is cold-rolled at a reduction rate of plate thickness from 20 to 95% after being subjected to intermediate annealing at a temperature of 400 to 550 °C

wherein said aluminum alloy comprises 0.25 wt% or less Si, from 0.05 to 1.0 wt% Fe, 0.03 wt % or less Cu, 0.10 wt% or less Ti, and 0.03 wt% or less Mg and the balance is unavoidable impurities and Al; and

wherein the Si wt% is within a range which satisfies the expressions (1) and (2)

$$(\text{Si wt\%}) = 0.08 - 4(\text{Cu wt\%} - \text{Mg wt\%}) \quad (1)$$

$$(\text{Si wt\%}) \leq 2T/625 - 1.28 \quad (2)$$

wherein T is the temperature in °C of the intermediate annealing, and the difference between the Cu wt% and Mg wt% is in a range which satisfies the expression (3)

$$0 \leq (\text{Cu wt\%} - \text{Mg wt\%}) \leq 0.03 \quad (3)."$$

The wording of the single claim according to the first auxiliary request reads as follows:

"Use of an aluminum alloy material obtained by intermediate annealing at a temperature of 400 to 550 °C and subsequent col-rolling at a reduction rate of from 20 to 95% of an aluminum alloy material comprising 0.08 wt% or less Si, from 0.05 to 1.0 wt% Fe, 0.03 wt % or less Cu, 0.10 wt% or less Ti, and 0.03 wt% or less Mg and the balance representing unavoidable impurities and Al;
said Si wt% being within a range which satisfies the expressions (1) and (2)

$$(\text{Si wt\%}) = 0.08 - 4(\text{Cu wt\%} - \text{Mg wt\%}) \quad (1)$$

$$(\text{Si wt\%}) \leq 2T/625 - 1{,}28 \quad (2)$$

wherein T is the temperature in °C of the intermediate annealing, and the difference between the Cu w% and Mg wt% being in a range which satisfies the expression (3)

$$0 < (\text{Cu wt\%} - \text{Mg wt\%}) \leq 0.03 \quad (3)$$

as a support member for an offset or lithographic printing plate."

The wording of the single claim according to the second auxiliary request reads as follows.

"An offset or lithographic printing plate having an aluminum alloy material support obtained from an aluminum alloy material which is cold-rolled at a reduction rate of plate thickness from 20 to 95% after being subjected to intermediate annealing at a temperature of 400 to 550 °C, which support has been surface-roughened and subjected to a burning treatment at a temperature of from 250 to 300 °C and thereafter

has a yield strength of 10 kg/mm^2 or more combined with a high ink stain resistivity and a uniformly roughened surface, wherein said aluminum alloy comprises 0.08 wt% or less Si, from 0.05 to 1.0 wt% Fe, 0.03 wt % or less Cu, 0.10 wt% or less Ti, and 0.03 wt% or less Mg and the balance representing unavoidable impurities and Al; and wherein said Si wt% is within a range which satisfies the expressions (1) and (2)

$$(\text{Si wt\%}) = 0.08 - 4(\text{Cu wt\%} - \text{Mg wt\%}) \quad (1)$$

$$(\text{Si wt\%}) \leq 2T/625 - 1,28 \quad (2)$$

wherein T is the temperature in °C of the intermediate annealing, and the difference between the Cu w% and Mg wt% is in a range which satisfies the expression (3)

$$0 \leq (\text{Cu wt\%} - \text{Mg wt\%}) \leq 0.03 \quad (3)."$$

V. The appellant (proprietor) argued as follows:

The Opposition Division was wrong in finding that the subject-matter of Claim 1 as granted lacked novelty with respect to document D3, because the designation of the plate as "printing plate" implied a certain shape and certain dimensions. Since document D3 was completely silent about the later use of plate, as well as about the shape and thickness of the plate before the intermediate annealing and the shape and dimension of the final plate depend on the thickness of the plate before processing, it could not be argued that D3 inherently disclosed a plate suitable for use as a printing plate support.

The Opposition Division, when judging inventive step starting from document D3 as the closest prior art, had focused on only one aspect of the problem posed, namely the burning ability and neglected completely the ink stain resistivity and surface treatment ability

properties which are indispensable for the qualification as a photosensitive printing plate. The general considerations applied by the Opposition Division thus amounted to an inadmissible hindsight interpretation.

One of the documents cited in the European Search Report dealing with lithographic printing plate supports, i.e. document D6, would better be chosen as closest prior art. There was, however, no teaching in this or other prior art documents which would render the invention obvious.

VI. The respondents argued as follows:

The last sentence of the description as granted proved that the subject-matter of Claim 1 as granted was intended to cover an aluminium alloy plate in general and was not restricted to its intended use as a printing plate. However, the production of such a plate did at least not involve an inventive step but originated from the general knowledge of a skilled practitioner which was represented by document D3 together with the definitions given in documents D1 and D2.

The subject-matter of the claims according to the auxiliary requests which involved the use as a printing plate of alloys with a reduced Si-content was obvious with respect to document D6 and D3, because it had been known that Silicon increased the tendency of an alloy to recrystallize. The equations (1) to (3), when analysed thoroughly, had no further restrictive effect on the alloy composition.

Reasons for the Decision

1. *Main Request*

1.1 Novelty

1.1.1 Claim 1 as granted concerns "a printing aluminum alloy material plate". The Board agrees with the Opposition Division insofar as this designation does not restrict the scope of the claim to the use of said plate as a support of a printing plate. This does not mean, however, that this designation, when interpreting the scope of the claim, may be neglected at all. On the contrary, this functional designation is restrictive in the sense that the plate must be adapted to be usable for the function indicated in the designation. This implies in the present case that for instance the shape and dimensions of the plate must be such as to permit its use as support of a printing plate. This way of interpretation has been steady practice of the European Patent Office (see Guidelines Part C, Chapter III, 4.8) and the Board, in the present case, sees no reason to deviate from this practice.

Document D3, which according to the decision under appeal (page 8, second paragraph) should destroy the novelty of Claim 1, is silent about the final shape and dimensions as well as about the intended use of the plates resulting from the experimental treatments described there. Consequently, the subject-matter of Claim 1 as granted is novel with respect to document D3.

1.1.2 The description of the patent in suit (page 2, second paragraph) clearly states that rolled plates having a plate-thickness of from about 0.1 to 0.5 mm made inter alia from 1050 standard alloys have been generally used as lithographic printing aluminium alloy material plates. Such known printing material plates are typically produced by a method comprising the steps of cold-rolling the material to the final thickness at a reduction rate of 20 to 95 % after being subjected to an intermediate annealing.

This acknowledgement of the state of the art is in line with respective statements on the state of the art in document D6 (page 1 to page 3, first paragraph).

The alloy compositions defined by the rules of Claim 1 as granted broadly overlap with the definition of the standard alloy n° 1050 (see for instance document D2). Although the specification given in Claim 1 allows for higher contents of Fe and Ti, the majority of the alloy compositions mentioned in the exemplary tests follow the 1050 standard.

Consequently, printing aluminium alloy material plates obtained from an aluminium alloy material having compositions falling in the ranges indicated in Claim 1 as granted which are cold-rolled at a reduction rate of plate thickness of from 20 to 95% after being subjected to an intermediate annealing at a temperature normally used for this purpose belong to the state of the art.

Document D6 (see page 1 to page 3, first paragraph), like the patent in suit (see page 2, lines 5 to 13), in its acknowledgement of the state of the art, which is the starting point for its own invention, is silent about the particular temperature at which the intermediate annealing before the final cold-rolling step there had been performed. (The intermediate

annealing temperature of 350°C mentioned in example 1 of D6 is applied to an aluminium of less purity than the 99.5 % purity of the standard alloy 1050 treated in the prior state of the art, see D6 the paragraph bridging pages 4 and 5, and page 10 second paragraph).

1.1.3 Since the state of the art represented by the other documents cited lies even farther away, the subject-matter of this claim 1 as granted is novel.

1.2 Inventive step

1.2.1 Conventionally produced "printing aluminum alloy material plates" according to the prior art acknowledged in the description of the patent in suit as well as of document D6 (see point 1.1.2 above) are the prior art closest to the subject-matter of Claim 1.

According to the analysis discussed above, the subject-matter of Claim 1 as granted differs from this state of the art by specifying that the temperature of the principally known intermediate annealing is performed at a temperature of 400 to 550 °C.

1.2.2 It is general professional knowledge of a person skilled in the art (see for instance document D3, page 359, figure 289a) that the tendency of Al99.5 to recrystallize, and therefore to loose strength, after a 75% reduction by cold rolling is decreased when an intermediate annealing before the cold rolling step is performed at temperatures between 300°C and 500 °C. The recrystallization is delayed the more the higher the annealing temperature is chosen in the said temperature range. Therefore, it has been known to perform the conventional intermediate annealing in the temperature range between 300°C and 500 °C and to prefer the higher temperatures whenever a loss of strength by a later heat (burning) treatment is to be reliably avoided.

1.2.3 In view of the above consideration, the subject-matter of Claim 1 as granted does not involve and inventive step and the appellant's main request is, therefore, not allowable.

2. *First Auxiliary Request*

2.1 Novelty

The single claim according to this request differs from Claim 1 as granted in that it is directed to a "Use of an aluminum alloy material plate ... as a support member for an offset or lithographic printing plate" and in that the upper limit of the Si-content is reduced to 0.08 wt%.

Since these two changes are restrictions with respect to Claim 1 as granted, the fact that the subject-matter of Claim 1 as granted is novel implies the novelty of the subject-matter of the claim according to the first auxiliary request.

2.2 Inventive Step

The aluminium alloy material plates on the basis of the 1050 standard alloy which are acknowledged in the introductory (state of the art) part of the description of document D6 (see page 1 to page 3, second paragraph) were equally used as support member for an offset or lithographic printing plate.

Moreover, it has been general knowledge of the skilled practitioner (see e.g. document D3, page 358, first paragraph) that rising Si contents reduce the grain growth inhibiting effect of the iron content. Consequently, the person skilled in the art was induced

by the same desire to maintain the stability of the strength properties, which had guided him to use the higher temperatures for the intermediate annealing (see point 1.2.2 above), to vary the 1050 alloy in the direction of lower Si contents.

Consequently, the subject-matter of the claim according to the first auxiliary request does not involve an inventive step either. The first auxiliary request is, therefore, not allowable.

3. *Second Auxiliary Request*

3.1 Clarity

The respondents have objected against the use of the words "high" and "uniformly" in connection with "ink stain resistivity" and "roughened surface", respectively, as being unclear relative formulations which are objectionable under Article 84 EPC. Although this objection may often be pertinent when these words are used in a claim, it is not justified in the context of the present claim. They clearly define that the printing plates thus characterised produce a printing product which is acceptable to the clients, i.e. is marketable.

3.2 Novelty

The single claim according to this request is directed to an offset or lithographic printing plate the support of which is obtained from an aluminium alloy material which has the same composition as specified in the claim of the first auxiliary request which has been subjected to a treatment comprising certain steps and thereafter has a certain combination of properties.

The description of the patent in suit is in congruence with the description of document D6 when stating that modern fast running printing equipment which run at increased printing speeds and involve higher burning temperatures (250 to 300 °C) for the photo-sensitized cover layer of the printing plate called for the support material to have a combination of properties (surface treatment ability, burning ability and ink stain resistivity) which the plates conventionally produced on the basis of the standard 1050 alloy had not been able to meet.

The presence of this combination of properties after having executed a particular treatment as now specified in the claim defines a type of printing plate which is quite distinct from the conventional printing plates which are acknowledged in both the introductory parts of the patent in suit as well as of document D6 (see point 1.1.2 above).

The novelty of the subject-matter of this claim the scope of which has been still further reduced when compared to its predecessors has not been questioned.

3.3 Inventive Step

3.3.1 Since document D6 is the only citation concerning an offset or lithographic printing plate, i.e. a plate which has a shape, dimensions and surface finish which qualify for an immediate use with a respective printing machine, this document is the closest prior art also with respect to the subject-matter of this claim.

Document D6, in the introductory part of its description (see page 1 to page 4, first paragraph), finds fault with the conventional printing plates, i.e. produced on the basis of standard alloy 1050, that dot-form defects may be generated upon both chemical or

electrochemical surface treatments causing stains in prints obtained. Accordingly, they have turned out to be disadvantageous with respect to obtaining high print quality. Moreover, when put under stress in modern printing machines involving higher printing speeds, the conventional plates often had insufficient strength resulting in deformations or breaks of the plates to occur. Although document D6, in its list of drawbacks inherent in the conventional plates, does not specifically mention the tendency of the plate support material to lose strength after a burning treatment at higher temperatures (250 to 300 °C) involved with the formation of modern photo-sensitised films, the Board, for the sake of simplicity, takes for granted that document D6, starting from conventional printing plates, strives at developing higher grade printing plates having the same combination of properties as does the patent in suit according to this amended version of the claim.

Document D6 (page 6, last paragraph) suggests as a solution to this complex problem to produce a composite alloy material plate by uniting an aluminium material which is particularly adapted to ink stain resistivity with a regenerated aluminium base plate which is available at a low price and has high mechanical strength.

All the alloy compositions specifically mentioned in document D6 either for the ink stain resistant cover plate or for the high strength core material lie outside the composition ranges indicated in the patent claim as now amended.

Moreover, the temperature of 350 °C at which the laminate subjected during the intermediate annealing falls outside the range of 400 to 550 °C used according to the patent in suit.

3.3.2 Starting from this teaching of document D6 as the closest prior art, the problem to be solved by the patent in suit consists in avoiding the composite material for the printing plate support and to create a printing plate having the combination of properties mentioned above the metallic support of which consists of one single aluminium alloy material.

3.3.3 There is no indication whatsoever in document D6 which leads to particular high grade (defined by the combination of properties indicated in the claim) printing plate the support of which is obtained from an aluminium alloy material having a composition and being treated as indicated in the claim.

3.3.4 The chain of arguments, based on the combinatory consideration of the documents D6, D3 and D2 which led to the conclusion that the subject-matter of the claims according to the previous versions of the claim was obvious (see points 1.2 and 2.2 above) does not provide an obvious guidance leading a person to the high grade plates aimed at by the patent in suit. This chain of arguments was only valid as long as the scope of the claim still embraced supports for conventional printing plates. For the low property requirements of these conventional plates the additional alloying rules represented by the equations (1) to (3) have no significant importance, because the low requirements of these conventional plates are equally met by compositions falling outside and inside the additional limits defined by the equations.

The rules defined by these equations have, however, to be strictly kept, whenever the production of a high grade printing plate as defined in the now amended claim is aimed at. This fact is impressively demonstrated by the numerous examples given in the patent in suit.

3.5 The subject-matter of the claim according to the second auxiliary request, therefore involves an inventive step.

4. The claim according to the second auxiliary request, therefore, defines a patentable invention within the meaning of Article 52(1) EPC.

The amended description is also not subject to objections.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent as amended in the following version:

claims: single claim ("Alternative claim 2") as submitted during oral proceedings of 12 June 1997,

description: pages 2, 4 to 17 as granted, and page 3 as submitted during oral proceedings of 12 June 1997,

drawings: as granted.

The Registrar: The Chairman:

A. Townend G. Gall

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE ★ CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS ★ BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

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