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**Datasheet for the decision
of 9 January 2008**

Case Number: T 0381/05 - 3.3.03

Application Number: 96100793.7

Publication Number: 0723993

IPC: C08L 1/12

Language of the proceedings: EN

Title of invention:

Cellulose acetate solution and process for the preparation of
the same

Patentee:

FUJIFILM Corporation, et al

Opponent:

Sartorius AG

Headword:

-

Relevant legal provisions:

EPC Art. 56, 123(2)

Relevant legal provisions (EPC 1973):

-

Keyword:

"Main request, first-fourth, seventh, tenth auxiliary requests,
- added subject-matter - yes"
"Fifth-ninth auxiliary requests - inventive step - no"

Decisions cited:

-

Catchword:

-



Case Number: T 0381/05 - 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 9 January 2008

Appellant: FUJIFILM Corporation
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Respondent: Sartorius AG
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Representative: Hock, Joachim
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office announced 13 December
2004 and posted 14 January 2005 revoking
European patent No. 0723993 pursuant to
Article 102(1) EPC.

Composition of the Board:

Chairman: C. Idez
Members: M. C. Gordon
C. Heath

Summary of Facts and Submissions

I. Mention of the grant of European Patent No. 0 723 993 in the names of:

- Fuji Photo Film Co., Ltd
- Daicel Chemical Industries, Ltd.

in respect of European patent application No. 96100793.7 filed on 19 January 1996, published on 31 July 1996 and claiming priorities of JP 6682/95 dated 19 January 1995 and JP 34974/95 dated 23 February 1995, was announced on 11 September 2002 (Bulletin 2002/37) on the basis of 9 claims.

Independent claims 1, 7 and 8 read as follows:

"1. A cellulose acetate solution which comprises cellulose acetate having an average acetic acid content in the range of 58.0 to 62.5% in a solvent, wherein the solvent is an ester having 3 to 12 carbon atoms."

"7. A process for the preparation of a cellulose acetate solution which comprises the steps of:

cooling a mixture of cellulose acetate and a solvent to a temperature of -100 to -10°C, said cellulose acetate having an average acetic acid content in the range of 58.0 to 62.5%, and said solvent being an ester having 3 to 12 carbon atoms;
and

warming the cooled mixture to a temperature of 0 to 50°C to dissolve the cellulose acetate in the solvent."

"8. A process for the preparation of a cellulose acetate film which comprises the steps of:

cooling a mixture of cellulose acetate and a solvent to a temperature of -100 to -10°C, said cellulose acetate having an average acetic acid content in the

range of 58.0 to 62.5%, and said solvent being an ester having 3 to 12 carbon atoms; warming the cooled mixture to a temperature of 0 to 50°C to dissolve the cellulose acetate in the solvent; casting the obtained solution on a support; and evaporating the solvent to form the cellulose acetate film."

Dependent claims 2-6 were directed to preferred embodiments of the solution of claim 1. Dependent claim 9 was directed to a preferred embodiment of the process of claim 8.

- II. An opposition against the grant of the patent was filed on 23 April 2003 by Sartorius AG. The grounds pursuant to Art. 100(a) EPC were invoked, specifically that the subject matter of the patent was neither novel (Art. 54 EPC) nor founded on an inventive step (Art. 56 EPC). The following documents were cited in support of the opposition:
- D1: US-A-2 362 182
- D2: Chemische Textilfasern Filme und Folien, Grundlagen und Technologie, Pummerer, R. (Publ). pp. X, 1256, 1257, 1260-1262.
- In its response to the notice of opposition, dated 26 January 2004 the patentee submitted 4 sets of experimental data entitled "Enclosure A" - "Enclosure D".
- III. In a decision announced orally on 13 December 2004 and issued in writing on 14 January 2005 the opposition division revoked the patent.
- The decision was based on a main request, submitted with the letter of 26 January 2004 and first-fourth

auxiliary requests, all submitted during the oral proceedings.

The decision held that the claims according to the main request did not meet the requirements of Art. 123(3) EPC; that the claims according to the first and fourth auxiliary requests did not meet the requirements of Art. 54 EPC, and that the claims of the second and third auxiliary requests did not meet the requirements of Art. 56 EPC.

The reasoning of the opposition division in respect of the second auxiliary request is of relevance for the present decision and will be discussed in the following. Claim 1 of the second auxiliary request differed from claim 1 as granted (see section I above) by the addition of the following wording at the end of the claim:

"...and further contains an alcohol having 1 to 6 carbon atoms".

The closest prior art, example 6 of D1 disclosed a solution of cellulose acetate, having an acetic acid content of 62 % in ethyl acetate. The subject matter of claim 1 of the second auxiliary request was thus distinguished from the disclosure of this closest prior art by the presence of the alcohol. D2 however established the importance of using a mixture of solvents capable of lowering the viscosity of the solution. In particular, the use of an alcohol such as ethyl or methyl alcohol in combination with acetone was disclosed.

Accordingly the patent was revoked.

IV. An appeal against this decision was filed by the patentees on 22 March 2005, the necessary fee being paid on the same day.

V. The statement of grounds of appeal was filed on 24 May 2005.

The patentee, now the appellant submitted a single request, consisting of 15 claims.

Claim 1 of this request differed from claim 1 as granted in that it was additionally specified that the solution contained an alcohol having 1 to 6 carbon atoms, i.e. this claim was identical to claim 1 of the second auxiliary request considered by the opposition division (see section III above).

Claim 8 read as follows. The features which had been added compared to the corresponding claim as granted (claim 7 - see section I above) being indicated in **bold**:

"8. A process for the preparation of a cellulose acetate solution which comprises the steps of:

swelling cellulose acetate with methyl acetate while stirring to form slurry, said cellulose acetate having an average acetic acid content in the range of 58.0 to 62.5 %;

cooling **the slurry** of the cellulose acetate and **methyl acetate** to a temperature of -100 to -10°C and warming the cooled mixture to a temperature of 0 to 50°C to dissolve the cellulose acetate in **methyl acetate**."

Claim 13 corresponded to granted claim 8 (see section I above), which however had been modified in an analogous manner to the aforementioned claim 8.

Claims 9 and 14 additionally specified the presence of an alcohol of 1 to 6 carbon atoms.

- (a) With regard to Art. 123(2) EPC it was submitted, *inter alia* that a basis for the feature "stirring" was provided by page 16, line 10 of the application as filed, (corresponding to page 7, lines 9 and 10 of the published application) The feature relating to formation of a slurry was derivable from examples 33 and 34 of the application (corresponding to examples 1 and 2 of the patent as granted). These examples further disclosed that the swelling step yielded a slurry of cellulose acetate in the solvent.
- (b) With respect to Art. 54 EPC, it was submitted *inter alia* with regard to claim 8 that the prior art cited in the opposition procedure did not disclose the specified method ("cooling dissolution method").
- (c) With regard to Art. 56 EPC it was submitted that the invention aimed to provide a solution of cellulose triacetate providing a stable solution enabling the preparation of superior cellulose triacetate products and to provide a process for the preparation of such solution. The closest prior art was D1 since this was the only document relating to cellulose triacetate. The passages of D2 relied upon by the opponent related to a different cellulose ester, namely cellulose diacetate, as confirmed by the fact that these materials were disclosed in D2 as being soluble in acetone. The subject matter of claim 1 differed from the solutions disclosed in D1 in that the specified alcohol was present. As shown by example 46 of the application as filed the effect of the addition of the alcohol was to increase the stability of the

prepared solution. Further the application and patent revealed that this resulted in an increase in the strength of the gel, reference being made to the examples submitted during the first instance proceedings.

D1 did not suggest the use of such a combination of solvents. D2 related to different cellulose esters in different solvents and did not discuss the issue of stability or gel strength.

Specifically, D2 was related to cellulose diacetate and could not provide any teaching concerning solutions of cellulose triacetate. Regarding the teaching of D2 with respect to the viscosity-lowering effect of the alcohol (see also considerations in the decision under appeal, reported in section III above), it was submitted that D2 only reported this in respect to acetone, but was silent with respect to other solvents. Hence the subject matter of claim 1 was founded on an inventive step.

VI. In its response, dated 27 January 2006 the respondent (opponent) submitted the following additional documents:

- D2: pages 1272-1279 in addition to those pages submitted with the notice of opposition - see section II above);
 - An experimental report concerning the stability of the solutions of D1.
- (a) An objection pursuant to Art. 123(2) EPC was raised in respect of the amended set of claims submitted with the statement of grounds of appeal.
- (b) An objection pursuant to Art. 84 EPC was raised in respect of claims 8 and 13, it being submitted that an essential feature, specifically that the

swelling be carried out at room temperature, was missing.

- (c) Novelty objections (Art. 54 EPC) against the amended claims were not raised.
- (d) With respect to inventive step (Art. 56 EPC), *inter alia* it was disputed that D1 was the only document which related to cellulose triacetate. As shown by the newly cited pages of D2, this document also related to solutions of cellulose triacetate and hence would be taken into consideration by the skilled person.

VII. Together with a letter dated 1 September 2006 the appellant submitted revised main and first to fifth auxiliary requests.

With respect to the further pages of D2 submitted by the respondent, it was submitted that these were filed late and were not more relevant than the parts of this document submitted together with the notice of opposition.

In the case that the board were minded to introduce the pages 1272-1279 of D2, the complete chapter was submitted (pages 1255-1288) in order to provide a clearer picture of the teaching thereof.

It was apparent that Chapter A from pages 1255-1272 of D2 dealt exclusively with films of cellulose diacetate whereas Chapter B, starting at page 1272 dealt with films of cellulose triacetate. D2 taught that the only solvents used in practice for cellulose triacetate were mixtures of 90% chlorinated hydrocarbons with 10% alcohol. Thus Chapter B of D2 dealt exclusively with cellulose acetate being as such soluble in specific solvents with no reference to other solvent systems in which cellulose acetate was not directly soluble. D2

did not provide any hint to using an alcohol having 1 to 6 carbon atoms in combination with a solvent, in which cellulose acetate was not soluble at room temperature, e.g. an ester with 3 to 12 carbon atoms. Thus Chapter B of D2 dealt with cellulose acetate being soluble in specific solvents without referring to other solvent systems in which cellulose triacetate was not directly soluble. Accordingly D2 did not provide any hint to use an alcohol having 1 to 6 carbon atoms in combination with a solvent wherein cellulose acetate was not soluble at room temperature, for example an ester having 3 to 12 carbon atoms. Accordingly the subject matter claimed was inventive with respect to the disclosure of D1 and D2.

The appellant further stated that the experimental report referred to by the respondent (see section VI above) had not been received.

- VIII. The board issued on 20 April 2007 a summons to attend oral proceedings.
In the accompanying communication it was stated, *inter alia* that it would have to be decided whether the additional parts of D2 cited by the two parties were to be admitted to the procedure.
- IX. Together with a letter dated 7 May 2007 the respondent (re)submitted copies of the experimental report referred in sections VI and VII above.
- X. Together with a letter dated 15 June 2007 the appellant submitted amended main and first to tenth auxiliary requests.
(a) Independent claims 1 and 6 of the main request read as follows:

"1. A cellulose acetate solution which comprises cellulose acetate having an average acetic acid content in the range of 58.0 to 62.5 % in a solvent, wherein the solvent is an ester having 3 to 12 carbon atoms and further contains an alcohol having 1 to 6 carbon atoms."

"6. A process for the preparation of a cellulose acetate solution which comprises the steps of: swelling cellulose acetate with methyl acetate, said cellulose acetate having an average acetic acid content in the range of 58.0 to 62.5%; cooling the mixture of cellulose acetate and methyl acetate to a temperature of -100 to -10°C; and warming the cooled mixture to a temperature of 0 to 50°C to dissolve the cellulose acetate in methyl acetate".

Independent claim 7 differed from claim 6 in that it was directed to a process for the preparation of a cellulose acetate film, analogously to granted claim 8 (see section I above).

The dependent claims 2-5 and 8 corresponded to dependent claims 2, 3, 5, 6 and 9 of the patent as granted.

- (b) The first auxiliary request differed from the main request in that claims 6 and 7 thereof specified as the first two steps of the process:
"gradually adding cellulose acetate to methyl acetate, said cellulose acetate having an average acetic acid content in the range of 58.0 to 62.5%; swelling cellulose acetate with methyl acetate;".
- (c) The second auxiliary request differed from the first auxiliary request in that claims 6 and 7 specified additionally the feature "while stirring

at room temperature" between the terms "methyl acetate" and "said cellulose acetate".

- (d) According to the third auxiliary request, claim 1 differed from claim 1 of the main request in that the ester was restricted to methyl acetate. Claims 5 and 6 of third auxiliary request were identical to claims 6 and 7 of the first auxiliary request.
- (e) The fourth auxiliary request: Claim 1 was identical claim 1 of the third auxiliary request; claims 5 and 6 were identical to claims 6 and 7 of the second auxiliary request.
- (f) The fifth auxiliary request consisted only of claims directed to the solution. Claim 1 thereof was identical to claim 1 of the main request.
- (g) The sixth auxiliary request differed from the fifth auxiliary request in that the ester was restricted to methyl acetate. Hence claim 1 of this request was identical to claim 1 of the third auxiliary request.
- (h) The seventh auxiliary request, like the sixth auxiliary request consisted only of claims directed to the solution whereby the ester was limited to methyl acetate. Claim 1 of this request however employed a "product by process" formulation and read as follows:
"1. A cellulose acetate solution which comprises cellulose acetate having an average acetic acid content in the range of 58.0 to 62.5% in methyl acetate and an alcohol having 1 to 6 carbon atoms, the solution being obtainable by gradually adding cellulose acetate to methyl acetate while stirring at room temperature, said cellulose acetate having an average acetic acid

content in the range of 58.0 to 62.5%;
swelling cellulose acetate with methyl acetate;
cooling the mixture of cellulose acetate and
methyl acetate to a temperature of -100 to -10°C;
and
warming the cooled mixture to a temperature of 0
to 50°C to dissolve the cellulose acetate in
methyl acetate".

- (i) The eighth auxiliary request corresponded to the sixth auxiliary request, but differed therefrom in that in claim 1 the alcohol was specified as being selected from methanol, ethanol, propanol and isopropanol.
- (j) The ninth auxiliary request corresponded to the eighth auxiliary request whereby the alcohol was restricted to ethanol.
- (k) The tenth auxiliary request contained only process claims. Claims 1 and 2 thereof were identical to claims 6 and 7 of the second auxiliary request.
- (l) Submissions were made, *inter alia* concerning the criticality of the process step of swelling at room temperature.

XI. A further letter, dated 6 July 2007 was received from the respondent providing further details in relation to the experimental report referred to in sections VI and VII above.

XII. Oral proceedings were held on 9 January 2008.

- (a) During the course of the proceedings, the appellant requested that those parts of D2 submitted by the respondent with its letter of 27 January 2006 not be admitted to the proceedings (see section VI above). The two parts of the cited

portion of D2 were not connected, as was evident from the entire Chapter submitted by the appellant with the letter of 1 September 2006 (See section VII above).

Following deliberation the board decided that the entire Chapter was admitted to the proceedings.

(b) The respondent stated that it had no objections to admitting the requests (main and 1st-10th auxiliary) submitted by the appellant with the letter of 15 June 2007 (see section X above).

(c) The appellant submitted that the process feature "swelling" was clear to the skilled person.

In response to an enquiry from the board regarding the basis in the application as filed for the process step of swelling as specified in claims 6 and 7 of the main request, the appellant referred to page 6, lines 23-25 and page 7, lines 9-10 of the A-publication, where it was stated that the cellulose acetate was swelled but not dissolved with the solvent. The swelling arose as a matter of time after contacting with the solvent. It was merely needed that a volume increase occurred within a broad range. The swelling was a result of allowing the mixture of the cellulose acetate and solvent to stand, which would be done in every case.

The respondent submitted with reference to page 6, lines 23-28 of the A-publication that the swelling was presented as a phenomenon, which occurred to "some extent", or such that the cellulose triacetate was "limitedly swelled". The whole concept of what was meant hereby was unclear.

(d) With regard to the first-fourth auxiliary requests the arguments were identical to those for the main request.

(e) With regard to the fifth auxiliary request, the respondent raised no objections pursuant to Art. 54, 84 or 123(2) EPC.

With respect to Art. 56 EPC the respondent submitted that D2 represented the closest prior art. Concerning the proposed formulation of the problem as set out by the appellant in the statement of grounds of appeal (see section V.(c) above), i.e. to obtain a stable solution, it was submitted that it was not clear what was to be understood by "stability" - it appeared to mean homogeneity. The proposed problem could in any case not be derived from the application as filed. The respondent submitted that the problem to be solved was in fact to provide a solution of cellulose triacetate capable of providing good films which did not employ MeCl_2 . D1 disclosed good solvents which avoided the use of MeCl_2 , namely esters.

The use of alcohols as a co-solvent was known from both parts of D2, i.e. in relation to cellulose diacetate and cellulose triacetate. D2 taught that the use of alcohols resulted in lowered viscosity and increased gel temperature.

The reported reduction in viscosity arose because alcohol was a precipitation agent which would result in gelling at higher temperatures. This effect would be understood to apply to the entire teaching of D2. It was known that the added solvent disrupted the bonds between free OH groups, which groups were present both in cellulose

diacetate and cellulose triacetate.

The respondent further submitted that according to examples 45 and 46 of the application as filed (without/with alcohol) the addition of alcohol had no effect on the film properties. It was further observed that the operative claim did not indicate the concentration of alcohol to be used.

It was not inventive to move from the esters disclosed in D1 to the subject matter of the fifth auxiliary request.

The appellant submitted that the closest prior art was in fact represented by the teaching of D1 since this related to solutions of cellulose triacetate in esters. The problem according to D1, col. 1 lines 25-40 was to avoid toxic solvents, which problem was solved by the use of specific solvents. It was also an aim to obtain solutions having improved stability and gel strength and good film-forming properties.

The problem to be solved by the subject matter of claim 1 of the fifth auxiliary request was derivable from paragraphs [0016] and [0052] of the patent and from examples 46 and 47 of the application as filed. These showed a stable dope. According to Table 12 of the application as filed, the composition of example 47 had good peeling characteristics and stability. Reference was also made to the data submitted with the letter of 26/1/04 as Enclosure A (see section II above). With respect to the apparent identity of properties between examples 45 and 46 of the application as filed, the appellant submitted that this arose as a consequence of the reporting of

the results in categories (denoted by letters "A", "B", etc) rather than as precise numerical values. The subject matter of claim 1 of the fifth auxiliary request was not derivable from D1. It was also not obvious to combine the teachings of D1 and D2 since D2 was a review article written some 12 years after D1 and referred to technology rejected in D1, i.e. MeCl_2 as solvent. Thus D2 taught away from D1. Further D2 was concerned only with viscosity and did not refer to gel strength. D2 did not teach any link between the addition of alcohol and a reduction in viscosity. The teachings of D2 with respect to cellulose diacetate were not relevant for cellulose triacetate. Nor did D1 or D2 contain any teaching to the advantages set out in paragraph [0052] of the patent in suit.

The appellant also submitted that since the subject matter claimed was *prima facie* not obvious there was no need to demonstrate an unexpected technical effect.

- (f) With respect to the 6th auxiliary request the appellant argued that the use of methyl acetate instead of ethyl acetate (the only ester used in the examples of D1) conferred advantages with respect to the preparation of the solution, which advantages supported an inventive step. There was no clear teaching in D1 to use methyl acetate as the solvent.
- (g) With regard to the remaining requests, reference was made to the arguments already exchanged.

XIII. The appellant (patentee) requested that the decision under appeal be set aside and that the patent be

maintained on the basis of the main request or any of the auxiliary requests 1-10, all filed with letter of 15 June 2007.

The respondent (opponent) requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. *Documents in the proceedings*

Together with the notice of opposition, a number of pages of D2 were submitted (see section II above). During the course of the appeal proceedings, the respondent submitted further pages of this document (see section VI above). The appellant submitted the entire Chapter in question, i.e. pages 1255-1288 of D2 (see section VII above), the purpose of this being to "obtain a clear picture of the teaching of D2" (page 4 of the letter of 1 September 2006, referred to in section VII above).

The request of the appellant at the oral proceedings was, in the light of the "clear picture" of the teaching of D2 provided by the entire chapter, to decide not to admit the partial citation therefrom submitted by the respondent (section VI above). However in order to comply with this request it was necessary for the board to consider the disclosure of the document submitted by the appellant. This could only be done however if the document were admitted to the proceedings.

Accordingly the entire Chapter of D2, as submitted by

the appellant (section VII above) was admitted to the proceedings.

3. *Main request*

3.1 Claim 6 of the main request defines a process for the preparation of a cellulose acetate solution which comprises the steps of "swelling cellulose acetate with methyl acetate..." (see section X.(a) above).

3.1.1 According to the application as filed, the cellulose acetate is "preferably swelled in the solvent at room temperature, but is preferably not dissolved in the solvent. The swell is a phenomenon that a substance adsorbs a liquid to increase its volume." (page 6, lines 24-26) or "...cellulose acetate is gradually added to the solvent while stirring at room temperature. Cellulose acetate is swelled with the solvent, but is not dissolved at this stage" (page 7, lines 9-11).

3.1.2 From the cited passages it is apparent that in the application as filed the swelling is presented as being a "phenomenon" which is a consequence of the process step of combining the cellulose acetate with the solvent.

3.1.3 In contrast thereto, in the operative claim 6 of the main request "swelling" is defined as being a step of the process in its own right i.e. implying some activity or step to be carried out by the operator.

3.1.4 There is however no basis for such a discrete process step in the application as filed. In particular no indication is given as to the conditions under which this swelling is to be accomplished or allowed to occur,

or indeed that any intervention on the part of the process operator is necessary. Further no information is provided which would allow the skilled person to ascertain whether such a process step had in fact been completed.

3.1.5 It is true that during the opposition and appeal procedures the discussion of the accomplishment of the swelling formed a significant part of the exchanges and gave rise to a number of experimental reports. However and critically, the manner in which this was accomplished in the experiments, including *inter alia* the emphasis, by both parties on the presence of absence of a step of allowing the cellulose to swell at room temperature prior to cooling has no basis in the application as filed, as is apparent from the discussion in sections 3.1.1-3.1.4 above.

3.1.6 Accordingly the definition in claim 6 of the main request of a discrete process step of "swelling" the cellulose acetate has no basis in the application as filed and consequently contravenes the requirements of Art. 123(2) EPC.

3.2 The same objections as noted in respect of claim 6 of the main request apply to claim 7 thereof.

3.3 Accordingly the main request does not meet the requirements of Art. 123(2) EPC and must therefore be refused.

4. *First auxiliary request*

Claims 6 and 7 of the first auxiliary differ from the correspondingly numbered claims of the main request in

that the feature "gradually adding" is specified (see section X.(b) above).

The objections raised in respect to the main request (see section 3 above) apply also to claims 6 and 7 of the first auxiliary request.

Accordingly the first auxiliary request does not meet the requirements of Art. 123(2) EPC and must be refused.

5. *Second auxiliary request*

Claims 6 and 7 of the second auxiliary request differ from the corresponding claims of the main request in that the features "gradually adding..with stirring at room temperature" are specified (see section X.(c) above).

The objections raised in respect to the main request (see section 3 above) apply also to claims 6 and 7 of the second auxiliary request.

Accordingly the second auxiliary request does not meet the requirements of Art. 123(2) EPC and must be refused.

6. *Third auxiliary request*

Process claims 5 and 6 of the third auxiliary request are identical to process claims 6 and 7 of the first auxiliary request (see section X.(d) above).

Accordingly for the reasons explained in section 4 above, claims 5 and 6 of the third auxiliary request do not meet the requirements of Art. 123(2) EPC.

The third auxiliary request must therefore be refused.

7. *Fourth auxiliary request.*

Process claims 5 and 6 of the fourth auxiliary request are identical to process claims 6 and 7 of the second auxiliary request (see section X.(e) above).

Accordingly for the reasons explained in section 5

above, claims 5 and 6 of the fourth auxiliary request do not meet the requirements of Art. 123(2) EPC. The fourth auxiliary request must therefore be refused.

8. *Fifth auxiliary request.*

The fifth auxiliary request consists only of claims directed to the solution. Claim 1 of this request is identical to claim 1 of the main request (see section X.(f) above).

No objections pursuant to Art. 54, 84 or 123(2) were raised against this request (see section XII.(e) above). Nor has the Board any objections of its own. Objections were however raised against this request pursuant to Art. 56 EPC.

8.1 *The patent in suit - the technical problem*

According to paragraphs [0001] and [0002] of the patent in suit the invention concerns solutions of cellulose acetate for the preparation of a cellulose acetate film. It is not disputed between the parties that the content of acetic acid specified in the claim, and in paragraph [0003] of the patent in suit indicates that the particular cellulose acetate under consideration is cellulose triacetate.

According to paragraph [0008] of the patent in suit halogenated hydrocarbons are known to be suitable solvents for cellulose triacetates. These solvents however have a number of disadvantages, arising in particular from environmental considerations, both on a global and local, i.e. working conditions scale. According there is a need to seek for alternative solvents.

The solution according to claim 1 of the 5th auxiliary

request is to employ as solvent an ester having 3 to 12 carbon atoms which further contains an alcohol having 1 to 6 carbon atoms.

8.2 *The closest prior art.*

According to the case law of the Boards of Appeal, the document selected as closest prior art must be a document which discloses subject-matter conceived for the same purpose or aiming at the same objective as the claimed invention and having the most relevant technical features in common (see "Case Law of the Boards of Appeal of the European Patent Office", 5th Edition, 2006, section I.D.3).

Both D1 and D2 have been canvassed as representing the closest prior art, by the appellant and respondent respectively (see section XII.(e) above).

Both D1 and D2 concern solutions of cellulose triacetate, which solutions are employed for film formation.

D2 employs as solvent halogenated solvents (see D2 page 1272 and 1273, section B.1). D1 also discloses that methylene chloride is an effective solvent for cellulose triacetate. However it is taught at page 1, lh column lines 24-30 of D1 that halogenated solvents have certain problems relating to toxicity and corrosiveness. D1 thus proposes at page 1, rh column lines 32-40 as suitable solvents two ketones (acetone and methyl ethyl ketone) and six esters (methyl-propyl acetate and formate).

Accordingly while both D1 and D2 address the problem of providing solutions of cellulose triacetate for film forming, only D1 addresses the aspect specifically considered in the patent in suit, namely the need to identify solvents other than halogenated hydrocarbons. Further the solution adopted in D1 has a technical

feature in common with the claimed subject matter, namely the use of ester solvents, which technical feature is absent from D2.

Accordingly, pursuant to the above referenced case law it is concluded that D1 represents the closest prior art.

The teaching within D1 which is of most relevance is example 6 which discloses a solution of cellulose triacetate in ethyl acetate.

8.3 *The objective technical problem compared to D1, its solution.*

8.3.1 Example 45 of the application as filed (which example became Example 9 in the granted patent) relates to a composition of:

Cellulose acetate 100 parts (acetic acid content 60.2%);
Methyl acetate 470 parts;
diethyl phthalate 15 parts.

This composition thus corresponds to the teaching of D1. Example 46 of the application as filed (which example was not in the patent as granted) differs from example 45 in that it relates to a solution containing 70 parts of an alcohol (ethanol), the content of methyl acetate being correspondingly reduced to 400 parts. This example thus corresponds to the subject matter of the operative claims.

According to the results of the evaluation of the resulting cast films (reported in Table 12 of the application as filed) these two solutions result in films of identical properties. These properties are reported in terms of categories, denoted by letters "A"- "C", denoting that the properties of interest lie in specified ranges, which ranges are explained in the

application as filed (see also the discussion at the oral proceedings, reported in section XII.(e) above). In the case of examples 45 and 46 the results of the test of peeling characteristics of the film are both reported as being "A" whereas the results of the test of stability of solution are in both cases reported as "B" (any uncertainty concerning the precise meaning of stability - see section XII.(e) above notwithstanding). Example 47 of the application as filed (which example was not in the granted patent), which employed a solvent composition of methyl acetate/ethanol in the proportions 375/95 demonstrated an improvement in respect of stability of solution (evaluated as "A"), the peeling properties being the same as for examples 45 and 46.

The evidence of examples 45-47 of the application as filed is thus that the presence of alcohol - on its own - does not necessarily and inevitably lead to any change in the properties of the solution. Although example 47 does report an improvement this improvement occurs both with respect both to example 45 which contains no alcohol, and example 46 which does contain alcohol albeit in a different amount than example 47. Accordingly on the strength of the evidence of the examples the existence of an improvement in solution stability relies not simply on the presence or absence of alcohol but on the content of alcohol present. As however observed by the respondent at the oral proceedings (see section XII.(e) above) the operative claim does not specify the concentration of the alcohol. The appellant submitted in this respect that the manner of reporting the experimental results, i.e. in broad categories rather than as precise numerical values was such as to not reveal improvements, which it was at

least implicitly alleged existed (see section XII.(e) above). The Board notes in this connection that the manner in which a patent application is drafted, and in particular the form in which the results of the examples is presented is a matter under the sole control of the patentee. In particular it is the responsibility, and in the interest of the patentee to ensure that the examples are presented with sufficient detail, or "resolution" to demonstrate any technical effect which is being alleged, or upon it is wished to rely. If, as in this case the examples do not show any improvement in properties then the inevitable conclusion will be that, according to the standards or categorisation of results applied by the drafter of the application or patent, i.e. the patentee, no improvement was considered to have been obtained.

- 8.3.2 Accordingly the examples in the application as filed provide no evidence of a technical effect arising from the presence of alcohol in the solvent.
- 8.3.3 The appellant has referred to the examples submitted as "Enclosure A" during the opposition procedure (see sections II and XII.(e) above). This enclosure reports two experiments. According to example 11 of the enclosure a solution of 5000 parts methyl acetate and 1000 parts of cellulose acetate (60.2% acetic acid content) was prepared. Example 12 differed from this example in that the solvent employed was a mixture of 4500 parts of methyl acetate and 500 parts of ethanol. According to the results of storage at room temperature for one month, the solution of example 11 had become "slightly turbid" whereas the solution according to

example 12 was "still transparent and uniform".

The properties of the resulting films, reported in qualitative terms are identical.

8.3.4 Firstly, these examples report the results only in the vaguest of qualitative terms. It is thus considered that it is not possible to understand and hence to reproduce the measurements carried out.

Accordingly for this reason these examples are not suitable to demonstrate any technical effect arising from the presence of alcohol in the solution.

8.3.5 Further, accepting for the sake of argument that the examples of "Enclosure A" do in fact demonstrate an improvement in "stability", this cannot overcome or invalidate the clear evidence of examples 45-47 of the application as filed (see section 8.3.1 above). As noted above, these examples show that the "stability" of the solution depends not simply on the presence or absence of alcohol but critically on the proportion thereof.

8.3.6 Since there is no evidence that the distinguishing feature compared to the disclosure of D1, i.e. the presence of alcohol, results in a technical effect, the objective technical problem can only be formulated as being the minimal one, namely the provision of further solutions of cellulose acetate of the specified acetic acid content.

8.4 *Obviousness*

8.4.1 D2 relates according to the title to films of acetic acid esters of cellulose.

The first part of D2, i.e. Section A (pages 1255 to

1272) relates, according to the title to films from acetone soluble acetyl cellulose, in other words, as submitted by the appellant (See section VII above) to cellulose diacetate. This submission has not been disputed by the respondent.

Section B of D2 (pages 1272 to 1288) relates, according to the title to solutions of cellulose triacetate.

In Section A on page 1256 of D2 the use of mixed solvents of acetone and alcohol, specifically methanol or ethanol is taught. This leads to a lower viscosity of the solution and provides advantages in film forming (evaporation).

In part 2 of Section A, relating specifically to casting apparatus and the casting process, there is on page 1262 (penultimate paragraph) a reference to solutions of cellulose triacetate in methylene chloride/methanol solution. Further references to cellulose triacetate is to be found on page 1264 of part 2 of Section A, also in the context of drying films prepared from a methylene chloride/methanol solution.

In the introduction to Section B, Part 1 it is stated that all the considerations previously discussed concerning the casting process and apparatus apply also to cellulose triacetate. It is also taught that the only practically usable solvent is a mixture of 90% chlorinated hydrocarbon with 10% methyl, ethyl, propyl or butyl alcohol.

- 8.4.2 D2 therefore teaches as a general measure to add an alcohol, specifically methyl, ethyl, propyl or butyl alcohol to solutions of acetyl esters of cellulose. The addition of such an alcohol is further taught to be

applicable to both types of cellulose ester considered in D2, i.e. cellulose diacetate and triacetate, regardless of the fact that different primary solvents are required for each of these (acetone or methylene chloride). Accordingly from D2 the skilled person learns that the addition of alcohols to solutions of cellulose acetates is a generally known method to reduce the viscosity of such solutions, specifically in the context of film forming.

8.4.3 Therefore for the skilled person seeking to solve the objective technical problem with respect to D1 (see section 8.3.6 above), the teaching of D2 would render it obvious that this could be achieved by employing an alcohol as an additional solvent.

8.5 Since the subject matter claimed according to claim 1 of the fifth auxiliary request is obvious, this subject matter does not meet the requirements of Art. 56 EPC.

8.6 The fifth auxiliary request must therefore be refused.

9. *Sixth auxiliary request.*

No objections pursuant to Art. 54, 84 or 123(2) were raised against this request (see section XII.(f) above). Nor has the Board any objections of its own. It is therefore necessary to consider the issue of inventive step (Art. 56 EPC).

9.1 Claim 1 of the sixth auxiliary request differs from claim 1 of the fifth auxiliary request in that methyl acetate is defined as the ester solvent to be employed (see section X.(g) above). At the oral proceedings (see section XII.(f) above the appellant submitted that the

use of methyl acetate conferred advantages in respect of the process for preparing the solutions.

Claim 1 of the sixth auxiliary however is directed to a product, i.e. a solution of cellulose acetate of specified acetic acid content and not to a process for preparing said solution. Hence any alleged advantages in respect of the process by which this solution is obtained are of no relevance for consideration of the inventive step in relation to the product claim.

9.2 No evidence has been advanced that the replacement of ethyl acetate (the solvent employed in example 6 of D1) by another of the esters specifically disclosed in D1, namely methyl acetate, gives rise to any technical effect in respect of the properties or characteristics of the solution.

Accordingly the technical problem to be solved by this feature is the same as that in the case of the fifth auxiliary request, namely to provide a further solution based on the teaching of D1.

9.3 One obvious route to solve this problem is to select instead of ethyl acetate one of the other solvents explicitly disclosed in D1. Methyl acetate is such a solvent (D1 page 1, right hand column line 34).

9.4 Since the subject matter of claim 1 of the sixth auxiliary request results in an obvious manner from the disclosure of D1 this subject matter does not meet the requirements of Art. 56 EPC.

9.5 The sixth auxiliary request must therefore be refused.

10. *Seventh auxiliary request*

Claim 1 of the seventh auxiliary request is directed to a cellulose acetate solution, which solution is however defined in terms of the process for its manufacture. In other words claim 1 is in the format "product by process" (see section X.(h) above).

Since the process aspects are in substance identical to the features of claim 6 of the main request, the same conclusions apply namely that this claim does not meet the requirements of Art. 123(2) EPC (see section 3 above).

Further insofar as the features of the solution are identical to those of claim 1 of the sixth auxiliary request, it is also apparent that this subject matter does not meet the requirements of Art. 56 EPC (see section 9 above).

Accordingly the seventh auxiliary request must be refused.

11. *Eighth auxiliary request*

Claim 1 of the eighth auxiliary request corresponds to claim 1 of the sixth auxiliary request. The alcohol is however restricted to methanol, ethanol, propanol and isopropanol (see section X.(i) above).

Two of these alcohols, namely methanol and ethanol are explicitly disclosed in D2 (see section 8.4.1 above). Since no technical effect has even been alleged, much less demonstrated to arise from the noted restriction of the alcohols, the conclusions reached in respect of inventive step for claim 1 of the sixth auxiliary request apply *mutatis mutandis* to claim 1 of the eighth auxiliary request.

Accordingly the eighth auxiliary request must be refused.

12. *Ninth auxiliary request*

Claim 1 of the ninth auxiliary request further restricts the solvent to methyl acetate and ethanol (see section X.(j) above).

Ethanol is one of the alcohols explicitly disclosed in D2 (see section 8.4.1 above).

As explained in relation to the eighth auxiliary request no technical effect has been demonstrated to arise from the restriction of the claimed subject matter to a solution containing ethanol as the alcohol. According the conclusions in respect of the eighth auxiliary request apply also to the ninth auxiliary request.

Accordingly the ninth auxiliary request must be refused.

13. *Tenth auxiliary request*

Claim 1 of the tenth auxiliary request is identical to claim 6 of the second auxiliary request (see section X.(k) above).

Accordingly the considerations and conclusions reached in respect of that claim (see section 5 above) apply equally to claim 1 of the tenth auxiliary request.

Accordingly the tenth auxiliary request must be refused.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

C. Idez