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Bezeichnung der Erfindung: Modified petroleum resins and their preparation
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : C08F 240/00

ENTSCHEIDUNG / DECISION

vom / of / du 24 February 1988

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent / Titulaire du brevet : Exxon Research and Engineering Group

Einsprechender / Opponent / Opposant : Akzo N.V.

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 56
"Inventive step, (No)"

Kennwort / Keyword / Mot clé : "Inventive step, (No)"

Leitsatz / Headnote / Sommaire

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Case Number : T 27/87 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 24 February 1988

Appelant : (Proprietor of the patent)
Exxon Research and Engineering Company
P.O. Box 390
200 Park Avenue
Florham Park
New Jersey 07932
USA

Representative :
Bawden, Peter Charles
ESSO CHEMICAL LIMITED
Esso Chemical Research Centre
PO Box 1
Abingdon
Oxfordshire OX13 6BB

Respondent : (Opponent)
Akzo N.V.
Velperweg 76
NL-6824 BM Arnhem

Representative :
Schenkman, Herbert Jan
c/o Akzo nv
Patents Department
Postbus 314
NL-6800 AH Arnhem

Decision under appeal :
decision of the Opposition Division of the European Patent Office dated 6 October 1986 revoking European patent No. 0 021 642 pursuant to Article 102(1) EPC.

Composition of the Board :

Chairman : K. Jahn
Members : J. Arbouw
G.D. Paterson

Summary of Facts and Submissions

I. European patent No. 21 642, incorporating four claims, was granted on 16 February 1983 on the basis of European patent application No. 80 301 849.8 filed on 3 June 1980 and claiming priority of 22 June 1979 (GB-7 921 858).

II. The Opponents filed opposition to the grant on 15 November 1983 and later submissions with additional arguments on the basis of new documents of which the following are relevant for this dicision:

(2) DE-A-2 361 118
(3) US-A-4 056 498

and requested that the patent be revoked in its entirety on grounds of lack of novelty and inventive step.

The Opposition Division introduced inter alia a further document:

(6) Lehrbuch der Lacke und Beschichtungen, Dr. H. Kittel, Verlag, W.A. Colomb in der Heenemann Verlagsgesellschaft m.b.H, Berlin und Oberschwandorf, (1977), pages 399 and 403.

III. By its decision of 6 October 1986, the Opposition Division revoked the patent.

The amended claims on which the decision was based read after correction of clerical errors:

"1. The use as a binder in inks for offset printing of a modified petroleum resin obtained by heating a mixture of (A) cyclopentadiene and/or methyl cyclopentadiene

and/or derivatives thereof containing from 10 to 90 wt.% unsaturated components and (B) from 1 to 15 wt.% of (A) of a carboxylic acid other than an α,β unsaturated dicarboxylic acid at from 270°C to 290°C under a sufficient pressure to maintain the mixture in the liquid phase.

2. A printing ink composition comprising (a) 5 to 30% by weight of a modified petroleum resin obtained by heating a mixture of (A) cyclopentadiene and/or methyl cyclopentadiene and/or derivatives thereof containing from 10 to 90 wt.% unsaturated components and (B) from 1 to 15 wt.% of (A) of a carboxylic acid other than an α,β unsaturated dicarboxylic acid at from 270°C to 290°C under a sufficient pressure to maintain the mixture in the liquid phase and (b) 5 to 30% by weight of a drying oil (c) 20 to 40% by weight of a pigment (d) 0 to 10 wt.% of a process aid and (e) a solvent being the balance, the proportions of components (a), (b), (c), (d) and (e) being based on the total weight of the composition."

IV. The decision to revoke the patent was based on the argument that its subject-matter is not novel with respect to (3).

It was concluded that (3) discloses the production of a tall-oil modified diycylopentadiene resin and that the said resin is suitable for use in heatset and gravure printing ink compositions. It was further considered that tall-oil consists mainly of tall-oil fatty acids, acids falling within the definition of the present claims, i.e. dicarboxylic acids other than α,β unsaturated. The reagents, i.e. a dicyclopentadiene feedstock and tall-oil are reacted at 200 to 290°C.

The Opposition Division further considered that heat-set printing inks belong to the broader category of offset inks.

V. A notice of appeal was filed by the Appellants on 5 December 1986 and the appeal fee was paid. The statement of grounds for appeal submitted on 7 February 1987 runs essentially as follows. It is an error that heat-set printing inks belong to the broader category of offset inks. The properties required for offset printing inks are specific and different from those for inks used in e.g. heat-set gravure printing. It is vital that the offset ink will not mix with the aqueous layer on the hydrophylic areas of the printing plate.

It was further submitted that document (3) discloses an acid modified petroleum resin suitable for use in heat-set and gravure printing ink compositions. Document (3) does however not suggest that the unmodified base resin is particularly suitable as a binder in offset printing ink compositions.

VI. The Respondents argued the present ink resin is known as such from document (3). Consequently, the properties thereof are also known. So, one had nothing more to do than check whether the prior art printing ink binder, which actually had the required characteristics, give satisfactory results upon application in an offset printing ink. This, however, constitutes exactly the routine work which is expected from a skilled person. This is the more so, because heatset printing ink binders are generally only used in offset printing inks.

VII. The Appellants request that the decision under appeal be set aside and that a patent be reinstated, which is interpreted by the Board as meaning that the patent be

maintained in amended form on the basis of the Claims 1 and 2 filed on 25 May 1984. The Respondents request that the appeal be dismissed.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.

2. Claim 1 relates to the use of a modified petroleum resin as a binder in inks for offset printing. The patent as granted only comprises claims relating to the modified petroleum resin (Claim 2) and the process for its production (Claim 1) and to printing ink compositions comprising the modified petroleum resin as a binder.

The Board has considerable doubts whether a change of category from: a printing ink composition comprising the modified petroleum resin as a binder (Claims 3 and 4 as granted) to: the use of the modified petroleum resin as a binder in inks for offset printing (current Claim 1) is allowable under Article 123(3) EPC.

However, in view of the Board's decision as regards inventive step this issue need not be decided here.

2.2 There is no formal objection to the current version of Claim 2, since it is adequately supported by the original documents and does not extend the protection conferred by the patent as granted. Claim 2 is based on Claims 1 and 4 of the application as filed and the patent as granted.

3. According to the finding of the Board the closest prior art is represented by (2) because this document also deals with a binder suitable for use in off-set printing ink. This

document discloses a binder for off-set printing ink composition comprising a modified petroleum based resin obtained by heating a mixture of cyclopentadiene and/or methyl cyclopentadiene and/or derivatives thereof with an unsaturated carboxylic acid and reacting the product thus obtained with a phenol-formaldehyde resin (see Claim 1 in connection with page 3, para. 1 and page 5, last para.).

The binder according to the patent-in-suit differs therefrom in that a different resin - i.e. a modified petroleum resin obtained by heating a mixture of cyclopentadiene and/or methyl cyclopentadiene and/or derivatives thereof and a carboxylic acid other than an α,β unsaturated dicarboxylic acid at from 270°C to 290°C under a sufficient pressure to maintain the mixture in the liquid phase - is used.

The technical problem underlying the patent-in-suit, with respect to (2) can be seen in providing a further binder for use in an off-set printing ink composition.

In order to solve this problem the Patentee essentially proposed to use the binder resin according to Claim 1.

The Board is satisfied that the binder resin according to the patent-in-suit solves this technical problem. Since this point was not an issue in the appeal, it need not be further considered.

4. Examination of the cited documents has revealed that this technical teaching is not disclosed there. Consequently, the method according to Claim 1 of the patent-in-suit is novel having regard to the prior art. As the Respondent has not challenged the novelty of the subject-matter, it is not necessary to enter into details.

5. It still remains to be examined whether the requirement for inventive step is met by the subject-matter claimed. As already mentioned it was known from (2) that the printing ink composition described there can be used in off-set printing (see page 9, paragraph 4). As indicated in paragraph 3 above, the only difference between the ink compositions according to (2) and to the patent-in-suit lies in the binder resin - i.e. the modified petroleum resin.

5.1 Document (3) (see column 1, lines 28 to 30) describes synthetic resins which can be used in printing ink including heat set and gravure ink (see column 2, lines 62-65). The resins according to (3) are produced in a two step process which comprises (see column 2, lines 10 to 23):

1. Copolymerising a reaction mixture consisting essentially of:

   (a) a predominate amount of dicyclopentadiene, and lesser amounts of

   (b) mixture consisting essentially of dimerized conjugated aliphatic cyclic and non-cyclic dienes of five carbon atoms, and

   (c) tall oil, to form a base resin; and

2. Reacting the base resin with at least one ethylenically unsaturated lower aliphatic dicarboxylic acid or anhydride in an amount sufficient to produce a modified resin having an acid number higher than the acid number of the base resin.

The base resin which is produced in the first step is a resin obtained by thermal polymerization in the absence

of a catalyst (see column 5, lines 7 to 9) of the same starting materials using identical temperatures and pressures (see column 4, lines 49 to 63) which are used for producing the resin according to the patent-in-suit.

Document (3) further teaches that the base resin has low acid number (i.e. less than 5, see column 2, lines 48 to 49) and a softening point in the range of 130 to 160°C (see column 2, lines 47 to 48), which corresponds to the values for acid number and softening point of the binders used according to the patent-in-suit (see page 2, lines 40 to 53).

Therefore, the base resin according to (3) is considered to be identical to the resin according to the patent-in-suit.

Although document (3) teaches that the base resin preferably is modified by reacting it with an ethylenically unsaturated lower aliphatic dicarboxylic acid or anhydride in order to obtain a resin having a higher acid number (see column 5, lines 28 to 33) it also clearly states that the base resin may be used directly - i.e. without modification - in printing compositions (see column 5, lines 27 to 28).

5.2 The Appellants cannot be heard with the argument that the state of the art fails to teach the importance of low acid number for offset printing and therefore does not suggest the direct use of the base resin according to (3) in offset printing inks. On the contrary, the Appellants have admitted (see the description of the patent-in-suit, page 2, lines 25-27) that it is common general knowledge that the presence of free polar groups - i.e. a high acid number - renders the resins unsuitable for use in offset printing.

This is further supported by document (6) (see page 403, lines 26-31) where it is stated: "the component of an offset printing ink should not be too hydrophylic".

5.3 Therefore, the man skilled in the art faced with the technical problem of making available merely a further offset printing ink will rather choose the unmodified resin according to (3) since this has a lower acid number (see column 5, lines 31-33) and is therefore less hydrophylic.

The man skilled in the art would have expected that the base resin according to (3) could solve the technical problem as defined under 3 above.

5.4 The Appellants' argument that the man skilled in the art would not have taken into account document (3) in view of its different objectives cannot be accepted. It is true that document (3) is silent on off-set printing inks, but the statement that the described "synthetic resins have properties desirable for use in printing ink compositions, including heat set and gravure inks" does not exclude their use in off-set printing (see column 2, lines 62-65).

The Board concedes that the considerable differences in the printing techniques in accordance with off-set, gravure and heat-set printing result in corresponding differences in the inks provided for each type of printing. However, the Board holds the view that the skilled man in the art of printing inks is in the position in the light of his common general knowledge to adapt inks based on the same binders to the envisaged printing technique, for example, by choice of solvent and viscosity.

5.5 Therefore, in view of the problem underlying the patent-in-suit, the use of the known resin as a binder in inks for offset printing lacks an inventive step.

5.6 As to Claim 2 directed to a printing ink composition comprising the known resin and further components, the Board holds the view that these further components are usual in the art (see e.g. (3), column 8, lines 45-51 and (6), page 403, table 67).

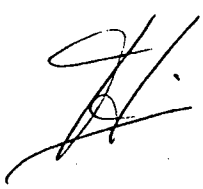
Therefore, the composition according to Claim 2 also lacks an inventive step.

Order

For these reasons, it is decided that:

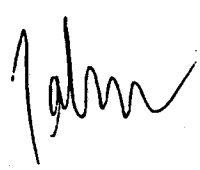
The appeal is dismissed.

The Registrar



F.Klein

The Chairman



K. Jahn