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# D E C I S I O N
# of 27 April 1999

**Case Number:** T 0917/96 - 3.3.1

**Application Number:** 89911249.4

**Publication Number:** 0435943

**IPC:** C09D 9/00

**Language of the proceedings:** EN

**Title of invention:**
Use of (C-1 to C-5) alkyl esters of aliphatic (c-8 to C-22) monocarboxylic acids for removing inks and the like from printing machines

**Applicant/Patentee:**
UNICHEMA CHEMIE B.V.

**Opponent:**
ARIZONA CHEMICAL COMPANY

**Headword:**
Alkyl esters/UNICHEMA

**Relevant legal provisions:**
EPC Art. 56

**Keyword:**
"Inventive step (yes)"
"Non-obvious solution of the technical problem underlying the patent in suit"
"Could/would approach"

**Decisions cited:**
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**Catchword:**

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Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

**Case Number:** T 0917/96 - 3.3.1

**D E C I S I O N**
**of the Technical Board of Appeal 3.3.1**
**of 27 April 1999**

**Appellant:** (Proprietor of the patent)
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**Representative:**
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**Respondent:** (Opponent)
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**Decision under appeal:** **Decision of the Opposition Division of the European Patent Office posted 7 August 1996 revoking European patent No. 0 435 943 pursuant to Article 102(1) EPC.**

**Composition of the Board:**

**Chairman:** J. M. Jonk
**Members:** P. P. Bracke
S. C. Perryman

## Facts and Submissions

I. The Appellant (proprietor of the patent) lodged an appeal against the decision of the Opposition Division by which European patent No. 0 435 943 was revoked in response to an opposition, which had been filed against the patent as a whole.

II. The decision was based on two sets of claims as main and auxiliary requests. The only independent claims according to the auxiliary request read as follows:

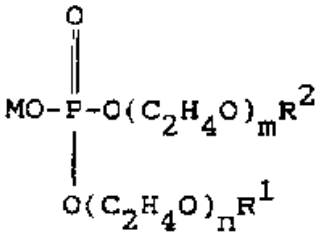
"1. Use of a ($C_1$-$C_5$) alkyl ester of an aliphatic ($C_8$-$C_{22}$) monocarboxylic acid or a mixture of such esters for removing inks and the like from offset printing machines."

"12. An agent for removing inks and the like from offset printing machines, characterized in that it consists of a mixture comprising 50-99.95% by weight of a ($C_1$-$C_5$)alkyl ester of an aliphatic ($C_8$-$C_{22}$)mono-carboxylic acid or mixture of such esters, 5-50% by weight of vegetable oil and 0.05-10%, preferably 0.4-2% by weight of surfactant, said mixture being optionally emulsified in water in such amount that the water phase comprises up to 50%, preferably 25-35% by weight of the emulsion, using an emulsifier in an amount of 1-10%, preferably 3-5% by weight of the emulsion and optionally adding a corrosion inhibitor in an amount of up to 2%, preferably 0.5-1% by weight of the emulsion; said surfactant and said emulsifier not including water-in-oil emulsifier compounds selected from the group consisting of

(i) di($C_9$-$C_{20}$)alkylsulfosuccinic acid and alkali metal, alkaline earth metal, ammonium and mono-, di- and tri($C_1$-$C_4$)alkyl and alkanol ammonium salts thereof,

(ii) di($C_9$-$C_{20}$)alkyl ammonium chloride, bromide, methyl sulfate, nitrate and acetate and di($C_9$-$C_{20}$)alkyl imidazolium quaternary ammonium compounds,

(iii) alkyl or alkyl ethoxy diesters of phosphoric acid having the formula



in which both $R^1$ and $R^2$ are ($C_9$-$C_{20}$)alkyl groups, m and n are from zero to 8, and M is hydrogen or a salt forming cation, and

(iv) mixtures thereof."

"22. A method of removing inks and the like from offset printing machines, characterized by cleaning the machine with an agent according to any of the claims 12-21."

III. The oppositions were supported by several documents including documents:

(1) the English translation of JP-A-59 130 360, and
(2) US-A-3 804 640.

IV. The Opposition Division held that the claimed subject-matter of the disputed patent did not involve an inventive step in the light of the teaching of document (1) alone or in combination with the teaching of document (2).

V. With the statement setting out the grounds of appeal (telefax of 16 December 1996) the Appellant filed a set of 23 claims, which corresponded with the claims according to the auxiliary request underlying the contested decision.

Oral proceedings were held on 27 April 1999.

VI. The Appellant argued that the use of soy bean oil as a cleaning agent for removing ink residues and the like from offset printing machines as indicated in the patent in suit, having the advantage of avoiding the negative effects of the traditionally used organic solvents on human health and environment, represented the closest prior art. Moreover, he argued essentially that, in the light of this closest prior art, a skilled person faced with the technical problem to find an improved cleaning agent for cleaning offset printing machines would not have considered documents (1) and (2) as a suitable source of information, because both documents related to totally different technical fields. Furthermore, he argued essentially that, if the skilled person had taken these documents into consideration, he would not have derived any incentive from them that this technical problem could be solved by using the alkyl esters of the patent in suit.

VII. The Respondent agreed that the use of soy bean oil as

an agent for cleaning offset printing machines represented the closest prior art. He argued essentially that the claimed subject-matter did not involve an inventive step in the light of the combined teachings of documents (1) and (2). In this context, he argued in particular that document (1) disclosed the use of alkyl esters of the patent in suit as cleaning agents for removing heavy stains, such as ink, from textile fibre surfaces, i.e. from substrates being more difficult to clean than smooth printing machine surfaces, and that it was known from document (2) that the alkyl esters in question were good solvents for components of ink compositions providing a high level of fluidity. Moreover, he contended that the technical problem underlying the patent in suit was not solved within the whole scope of present Claim 1.

VIII. The Appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of Claims 1 to 23 filed with telefax of 16 December 1996.

The Respondent requested that the appeal be dismissed.

IX. At the conclusion of the oral proceedings the Board's decision was pronounced.

## Reasons for the decision

1. The appeal is admissible.

2. In the Board's judgment, the present claims comply with the requirements of Article 123 EPC.

Furthermore, after examination of the cited prior art documents, the Board has also reached the conclusion that the subject-matter as defined in the present claims is novel.

Since these issues were not disputed, it is not necessary to give reasons for these findings.

3. The remaining issue to be dealt with is whether the subject-matter of the claims involves an inventive step.

3.1 Article 56 EPC sets forth that an invention involves an inventive step if, having regard to the state of the art (in the sense of Article 54(2) EPC), it is not obvious to a person skilled in the art.

3.2 For deciding whether or not a claimed invention meets this criterion, the Boards of Appeal apply the "problem-solution-approach", which consists essentially in (a) identifying the closest prior art, (b) assessing the technical results (or effects) achieved by the claimed invention when compared with the closest state of the art established, (c) defining the technical problem to be solved as the object of the invention to achieve these results, and (d) examining whether or not a skilled person starting from the closest prior art **would** arrive at something falling within Claim 1 by following the suggestions made in the prior art in the sense of Article 54(2) EPC.

In this context, the Board notes that the technical problem to be considered is likely to be that apparent from the patent in suit, unless strong reasons would

speak against this.

3.3 Therefore, in the present case, the Board considers, in agreement with the parties, that the method for removing ink and the like from printing machines using vegetable oils, such as soy bean oil, as the cleaning agent represents the closest prior art (see also page 2, lines 18 and 19, of the patent in suit).

3.4 Regarding this prior art, the Appellant submitted by referring to the test-report:

S. Salerno e.a.: "Application of the Method of Organizational Congruences to the Substitution of Organic Solvents with Vegetable Agents for the Cleaning of Offset Printing Machine, ENEA 1995"

that the use of soy bean oil instead of the organic solvents traditionally applied was not quite satisfying due to the increase of the time needed for cleaning the offset printing machines, involving the cleaning of the ink rollers, printing pate, rubber blankets and the ink fountain, from about six minutes to about nine minutes, i.e. an increase of the cleaning time of about 50% (see in particular page 22 of said test-report).

Moreover, he submitted that by using the esters of the patent in suit, compared to the use of soy bean oil in accordance with the closest prior art, the cleaning efficiency could be improved, so that the cleaning could be performed in substantially the same way as by using cleaning agents based on organic solvents.

3.5 Thus, the Board sees the technical problem underlying

the patent in suit in the light of the closest state of the art in the provision of a more efficient way for removing inks and the like from offset printing machines, so that the cleaning takes less time (page 2, lines 17-22, 37 and 38).

3.6 The patent in suit suggests, as the solution to this problem, the use of one or more esters as specified in Claim 1, i.e. of a ($C_1$-$C_5$)alkyl ester of an aliphatic ($C_8$-$C_{22}$)monocarboxylic acid, or a mixture of such esters.

3.7 Having regard to the Example and the Compararive Example in the patent in suit, the Board considers it plausible that by using these esters the technical problem as defined above has been solved. In fact, the Respondent did not challenge the improved cleaning efficiency of the present esters.

3.8 However, the Respondent alleged that the improved removal of ink and the like from offset printing machines in accordance with the patent in suit would not be achieved within the whole scope of the claimed invention.

In this context, the Board notes that the technical problem underlying the patent in suit must indeed be solved within the whole scope of the claims, but that according to the established case law of the Boards of Appeal the burden of proof in this respect rest on the opponent(s).

Thus, in the present case, wherein the Respondent's allegation has not been supported by any evidence, this submission cannot be accepted by the Board because of

lack of convincing proof.

3.9 The question now is whether the cited documents would have suggested to a person skilled in the art solving the above-defined technical problem in the proposed way.

3.9.1 Document (1) teaches that when a composition comprising an ester as defined in present Claim 1 of the patent in suit and a nonionic surface active agent having an HLB of less than 14 is imparted to fiber-forming material having heavy stains, such as heavy oils, printing ink and grease, it permeates between the fibre and the heavy stains stubbornly adhered to the fibre **slowly** to decrease the adhesion bonding force between them, and that therafter the heavy stains can be removed easily during later ordinary cleaning (page 3, lines 20 to 29, and page 4, lines 6 to 13). It also discloses that, in order to heighten the cleaning effect, it is better to perform cleaning after leaving a material to stand **more than 5 to 60 minutes, preferably more than several hours**, than to perform washing immediately after imparting these compounds to the material (page 6, lines 28 to 35). Moreover, the only two examples relate to the removal of heavy oil stains from a fabric by dropping a mixture of methyl oleate and a nonionic surface active agent having an HLB of 10.9 on the fabric to permeate the stained portion, leaving it to stand **one day**, and then subjecting the fabric to ordinary washing with water and drying.

Having regard to the disclosure of this document, the Respondent submitted essentially that it would have been obvious to the skilled person to use the same

esters for cleaning offset printing machines, since the method of removing printing ink stain from fabrics as described in document (1) differed from the method of removing ink and the like from offset printing machines according to the patent in suit only by the nature of the substrates, and because the skilled person would have understood that the required contact time for cleaning printing machines would be shorter than the time needed for cleaning fabrics, since it could be expected that the smooth parts of an offset printing machine to be cleaned hold the ink residues with less tenaciousness than fabrics.

However, in the Board's judgment, the skilled person in reading document (1) would rather have derived from this document that the washing method of heavy stained fabrics, involving a **pretreatment** using esters corresponding to those of the patent in suit during preferably more than several hours (one day according to the examples), and subsequently an ordinary washing of the pretreated fabrics with water, would not be suitable for removing ink residues and the like from offset printing machines within an appropriate cleaning time comparable to the time needed in using the traditionally applied organic solvents, i.e. within about six minutes (see point 3.4 above). In this context, the Board notes that the Respondent's allegation that the skilled person would have understood that the time needed for the pretreatment as described in document (1) would be shorter in the case of cleaning printing machines appears to be based on hindsight. In any case, document (1) does not suggest that the esters used in accordance with document (1) would have better dissolving properties regarding ink

residues than soy bean oil, or in other words would be more effective as a cleaning agent for offset printing machines than said vegetable oil. Thus, in the Board's judgment, this document does not provide an incentive to the claimed solution of the technical problem underlying the patent in suit as defined above.

3.9.2 Document (2) is concerned with a fast drying, **solvent-free** printing ink vehicle comprising three principal components, namely, (a) an ester of an aliphatic alcohol and a $C_{12}$ to $C_{20}$ unsaturated fatty acid, (b) a film forming resin, and (c) a metal salt of peroxydiphosphoric acid as a catalyst, as well as a fast drying, **solvent-free** printing ink comprising a major portion of such a ink vehicle (see column 1, lines 56 to 66). The printing inks as disclosed in this document are extremely fast drying (drying times of less than one second), have a high level of fluidity, and are less hazardous to the environment because of the absent of solvents causing air pollution resulting from solvent vapours and fumes (see column 2, lines 2 to 10 and 13 to 19).

Concerning this document, the Respondent especially referred to the passage in column 2, lines 63 to 67, indicating that the esters of aliphatic alcohols and $C_{12}$ to $C_{20}$ unsaturated fatty acids are characterised by the ability to dissolve film forming resins in large amounts while retaining a high level of fluidity. Moreover, he submitted in this respect that this passage gave a clear hint to the skilled person that, in view of the fact that inks normally contained film forming resins, these esters would be good agents for dissolving inks, and therefore would be suitable for

removing ink residues and the like from offset printing machines.

However, the technical problem underlying the invention as disclosed in document (2), i.e. the provision of a fast drying, solvent-free printing ink having a high level of fluidity (see column 1, lines 49 to 52), is totally unrelated to the technical problem underlying the patent in suit as defined above. Therefore, in the Board's judgment, the skilled person would not have taken document (2) into account for finding a solution to the present technical problem.

Moreover, it is the Board's position that even if the skilled person had not disregarded document (2), he would not have derived from the solution to the completely different technical problem as disclosed therein, which comprises the use of specific esters **as comonomers having high fluidity** and **specific catalysts preventing the ink for being too viscous** (see column 3, lines 3 to 9), that the esters would be better cleaning agents for removing ink residues from offset printing machines than soy bean oil.

3.9.3 The Board notes in this respect that in view of the teaching of documents (1) and (2) a skilled person indeed **could** have tested ($C_1$-$C_5$)alkyl esters of aliphatic ($C_8$-$C_{22}$)monocarboxylic acids as to their suitability for cleaning offset printing machines. However, according to the consistent case law of the Boards of Appeal for determining lack of inventive step, it is necessary to show that considering the teaching of the relevant prior art as a whole, without using hindsight based on the knowledge of the claimed

invention, the skilled person **would** have arrived at the **claimed solution of the technical problem to be solved**. However, as indicated above, a skilled person, when trying to solve the technical problem underlying the patent in suit, would not have found any reason in the state of the art to replace soy bean oil as used in accordance with the closest state.

3.10 For the above reasons, the Board concludes that the solution of the existing technical problem as claimed in Claim 1 was not obvious in the light of the cited documents. Therefore, the subject-matter of Claim 1 involves an inventive step in the sense of Article 56 EPC. Moreover, this conclusion is also valid for the subject-matter of the independent Claims 12 and 22, relating to an agent and a process for removing ink and the like from offset printing machines, respectively, for the same reasons. Furthermore, the dependent Claims 2 to 11, 13 to 21, and 23, which relate to specific embodiments of the subject-matters of the independent Claims 1, 12 and 22, respectively, derive their patentability from that of the respective independent claims.

**Order**

**For these reasons, it is decided that:**

1. The decision under appeal is set aside.

2. The matter is remitted to the first instance with the order to maintain the patent on the basis of Claims 1 to 23 filed with telefax of 16 December 1996 and a description to be adapted.

The Registrar: The Chairman:

E. Görgmaier J. Jonk