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D E C I S I O N
of 5 October 1999

Case Number: T 0842/95 - 3.3.5

Application Number: 87308464.4

Publication Number: 0267681

IPC: D06M 15/41

Language of the proceedings: EN

Title of invention:

Treating fibrous polyamide articles

Patentee:

Minnesota Mining and Manufacturing Company

Opponent:

E.I. Du Pont de Nemours & Company, Inc.

Headword:

Aqueous solution for treating polyamide fibres/3M

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step - no, aggregation of known components with expected result"

Decisions cited:

-

Catchword:

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Boards of Appeal

Chambres de recours

Case Number: T 0842/95 - 3.3.5

D E C I S I O N
of the Technical Board of Appeal 3.3.5
of 5 October 1999

Appellant: Minnesota Mining and Manufacturing Company
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 16 August 1995
revoking European patent No. 0 267 681 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: R. K. Spangenberg
Members: G. J. Wassenaar
M. B. Günzel

Summary of Facts and Submissions

I. The appeal is from the decision of the Opposition Division to revoke European patent No. 0 267 681, which was granted in response to European patent application No. 87 308 464.4.

II. During oral proceedings, which were held on 5 October 1999, the appellant submitted new sets of claims as main request and auxiliary requests 1, 2, 3 and IV. All these requests contained an independent product claim. The broadest product claim was claim 8 of the main request and auxiliary request 1 and claim 1 of auxiliary request IV and reads as follows:

"An aqueous solution for providing stain resistance to fibrous polyamide materials, said solution comprising a normally solid, water-soluble, partially sulfonated novolak resin, a water-soluble salt of magnesium other than that of a phenol/aldehyde condensation product and a fluorochemical oil and water repellent composition."

Claims 8 of auxiliary requests 2 and 3 differ therefrom by the additional requirement that the said solution has a pH in the range from 2-12.

III. The respondent submitted that these product claims lacked an inventive step over the prior art. Reference was made, inter alia, to the following prior art documents:

D1: VERONA, Farben Revue, No. 21, 1972 USA, pages 11 to 25

D4: US-A-4 501 591

D5: US-A-4 592 940.

The arguments can be summarised as follows:

Apart from the presence of a fluorochemical the claimed solution, having a pH in the required range, was known from D1. It was generally known in the art to provide polyamide fibres with stain resistance by treating the fibres with fluorochemicals as exemplified by D4 and D5. In order to improve the ability of the magnesium salt containing solution of D1 to impart stain resistance to polyamide fibres it was obvious to add a fluorochemical to such a solution.

IV. The appellant contested the respondent's arguments and submitted that D1 did not disclose that a magnesium salt containing solution was suitable for providing stain resistance. In this respect a report of Mr Chang, one of the inventors of the patent in suit, comprising comparative examples, was submitted. It was further argued that D4 and D5 were correlated and disclosed that the ability of sulfonated novolak to impart stain resistance to polyamide fibres could be increased by the addition of sodium silicate. There was no suggestion to improve it by adding a magnesium salt or a fluorochemical. Moreover D4 and D5 did not disclose that the fluorochemical could provide water and oil repellency.

V. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the appellant's main request submitted during

the oral proceedings. As auxiliary request, the appellant requested to maintain the patent on the basis of any of auxiliary requests 1 to IV, submitted during the oral proceedings.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.
2. *Claim 8 of the main request and auxiliary request 1 and claim 1 of auxiliary request IV*
 - 2.1 The claim under consideration relates to a sulfonated novolak containing solution for providing stain resistance to fibrous polyamide material. Sulfonated novolak containing solutions for said purpose are known in the art. D1, a periodical of "Farbenfabriken Bayer GmbH", discloses aqueous solutions comprising "Mesitol NBS" for the treatment of goods comprising polyamide fibres. It is undisputed that "Mesitol NBS" is a partly sulfonated novolak resin within the meaning of the patent in suit. In particular D1 discloses the use of such solutions for improving the wet fastness of dyed polyamide fibres (pages 11 to 16), for rendering polyamide fibres resistant to dyestuffs which are used to dye cellulose fibres (pages 17 to 18) and as resisting agent to produce multicolour effects on uniform polyamide material (pages 19 to 24). In connection with its use as wet fastness improving agent, it discloses that the after treatment bath is

adjusted to a pH of 4-5 and that the effect can often be increased if electrolytes such as sodium sulphate or magnesium sulphate are added (page 11, last paragraph). Specifically disclosed is an after treatment bath comprising 2% Mesitol NBS having a pH of 4-5, to which 5% magnesium sulphate is added (page 13). The amounts are related to the dry weight of the fibres (owf). In connection with Mesitol NBS as resisting agent, D1 discloses as guide formulation 2-3% Mesitol NBS with a pH of 4-5 adjusted with acetic acid. In connection with this formulation it is indicated that to increase the effect, about 10% sodium sulphate can be added (page 21). Since D1 teaches that the addition of sodium sulphate improves both the stain resistance and the water fastness of polyamide fibres when treated with a sulfonated novolak solution and the effect of magnesium sulphate is said to be similar to that of sodium sulphate, it would, in the Board's judgement, have been evident to the skilled person that the addition of magnesium sulphate would also improve the stain resistance. But even if the appellant's submission were to be followed that improvement in wet fastness did not automatically mean that stain resistance is improved, it can certainly not be inferred from D1 that the presence of a magnesium salt in the sulfonated novolak solution would adversely affect its ability to impart stain resistance. Thus D1 unambiguously discloses an aqueous solution comprising a sulfonated novolak and magnesium sulphate which is suitable for providing stain resistance to polyamide fibres treated therewith. The appellant's submission that a solution comprising 2% Mesitol NBS and 10% magnesium sulphate based on the weight of the fibres is not satisfactory with respect to stain resistance, is not contradictory to the

teaching of D1. In fact, the table in Mr Chang's report shows that the addition of 10% magnesium sulphate is indeed less effective than the addition of 10% sodium sulphate, but it also shows that the stain resistance is still improved when compared with a solution containing only 2% Mesitol NBS.

2.2 In the Board's judgement D1 represents the closest state of the art. During oral proceedings the appellant submitted that the object of the invention was to provide an alternative method for providing stain resistance to polyamide fibres which is economically feasible. "Economically feasible" was further explained as meaning lower costs and less pollution. Since in the claimed solution the amounts of sulfonated novolak and magnesium sulphate are not restricted the Board cannot see that the use of the claimed solution reduces costs and/or pollution. According to the patent in suit the addition of the fluorochemical composition to the solution of sulfonated novolak and magnesium salt provides water and oil repellency to the polyamide fibres treated therewith (page 4, lines 42 to 50). Thus with respect to the product claim, starting from D1, the problem underlying the invention can be seen in providing an aqueous solution for treating polyamide fibres suitable for making the fibres not only stain resistant but also water and oil repellent. According to the product claim this problem is solved by the addition of a fluorochemical oil and water repellent composition to the aqueous solution disclosed in D1. The comparative examples in the patent in suit show that the addition of commercial fluorochemical compositions (FX-364 and FC-231, both available from 3M Company) improves the water and oil repellency of the

- fibres treated therewith. Thus the Board is satisfied that the above-mentioned technical problem is thereby solved.
- 2.3 The problem of oil and water repellency is not treated in D1 so that this document does not provide any hint towards the claimed solution of the above-stated problem. The problem is, however, well known in the art as is evident from the discussion of the prior art in the patent in suit (page 3, lines 11 to 18) and documents D4 and D5.
- 2.4 According to D4, a US patent specification relating to a process for providing stain resistant polyamide carpets, the usual commercial approach to minimizing staining of polyamide carpet has been to coat the polyamide fibres with a fluorochemical to prevent wetting of the carpet surface and thus minimize contact between the staining substance and the carpet surface (column 1, lines 46 to 51). A similar statement is made in D5, a US patent specification relating to stain resistant nylon carpets (column 1, lines 61 to 64). To prevent wetting of the carpets implies that water is repelled. It is true that D4 and D5 are silent about oil resistance, but it belongs to the general knowledge in the art of treating fabrics that fluorochemicals are used as treating agent for making the fibres both water and oil repellent as confirmed by the prior art acknowledged in the patent in suit (page 3, lines 11 to 18). A skilled person trying to improve the water and oil repellency of polyamide fibres, treated with a solution comprising sulfonated novolak and magnesium sulphate as stain resisting additives would, therefore, have considered the addition of fluorochemicals to such

a solution.

Table 2 of the patent in suit shows that the addition of fluorochemicals to a solution comprising sulfonated novolak and divalent metal salts such as barium, calcium and zinc chloride, reduces the stain resisting properties of the solution. On that basis the appellant argued that it was not obvious to add fluorochemicals to solutions containing divalent metal salts. However, this line of argument must fail, since the adverse effect of fluorochemicals on the stain resisting property is not observed when magnesium chloride is used as additive. Moreover, the adverse effect of fluorochemicals on the stain resisting property of sulfonated novolak solutions containing some divalent metals did not form part of the state of the art but was discovered by the appellant. Therefore, in the absence of any indication in the prior art that fluorochemicals, used in the art as water and oil repellent additives, were not compatible with sulfonated novolak and magnesium sulphate containing solutions for providing stain resistance, the skilled person had no reason to disregard the above-mentioned prior art and to refrain from adding the known fluorochemical oil and water repellent compositions to the known sulfonated novolak and magnesium sulphate containing aqueous solution in order to solve the above-mentioned technical problem. For this reason the Board holds that the claimed subject matter is merely an obvious aggregation of known components having known properties to obtain a product having the expected properties, and thus lacks an inventive step within the meaning of Article 56 EPC.

3. *Claim 8 of auxiliary requests 2 and 3*

Claim 8 of auxiliary requests 2 and 3 differs from claim 8 of the main request only in that the pH of the solution is defined as being in the range of 2 to 12. Since the pH of the solutions disclosed in D1 runs from 3 to 5, the claimed range does not bring any further limitation over the prior art. Claim 8 of auxiliary requests 2 and 3, therefore, lacks an inventive step for the same reasons as claim 8 of the main request. Since all the requests contain at least one unallowable claim the appeal must fail.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

S. Hue

R. Spangenberg