

Internal distribution code:

- (A) Publication in OJ
(B) To Chairmen and Members
(C) To Chairmen

D E C I S I O N
of 29 November 1993

Case Number: T 0247/93 - 3.4.2
Application Number: 89305530.1
Publication Number: 0345064
IPC: G02F 1/133, C08G 73/10

Language of the proceedings: EN

Title of invention:
Liquid crystal display device

Applicant:
Sharp Kabushiki Kaisha

Opponent:
-

Headword:
-

Relevant legal norms:
EPC Art. 54, 56, 123(2)

Keyword:
After amendments:
"Additional subject-matter (no)"
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-



Europäisches
Patentamt

European
Patent Office

Office européen
des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number: T 0247/93 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 29 November 1993

Appellant: Sharp Kabushiki Kaisha
22-22 Nagaike-cho
Abeno-ku
Osaka 545 (JP)

Representative: West, Alan Harry
R.G.C. Jenkins & Co.
26 Caxton Street
London SW1H 0RJ (GB)

Decision under appeal: Decision of the Examining Division of the European Patent Office dated 9 October 1992 refusing European patent application No. 89 305 530.1 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: E. Turrini
Members: M. Chomentowski
B.J. Schachenmann

Summary of Facts and Submissions

I. European patent application No. 89 305 530.1 (publication No. 0 345 064) was refused by the Examining Division on the grounds that the claimed liquid crystal display device comprising an alignment film formed from a polyimide obtained by polycondensation of an alicyclic tetracarboxylic acid and a diamine in the absence of a long chain amine, was not novel in respect of the device obtained from tetracarboxylic acids of the same type such as cyclohexanetetracarboxylic acid dianhydride of

D2: EP-A-0 249 881,

whereby the selection of other alicyclic moieties was considered as obvious for the person skilled in the art.

The Examining Division took the view that the skilled person knows that, as in D2 and in

D1: DE-A-3 727 945,

amines are generally used in the polycondensation of a tetracarboxylic acid anhydride and a diamine, so that also in the preparation process of the claimed device an amine is inevitably present, despite this not being mentioned explicitly in the application document.

II. The Appellant (Applicant) lodged an appeal against this decision and filed a new set of device claims as well as results of comparative measurements annexed to the Statement of Grounds of Appeal.

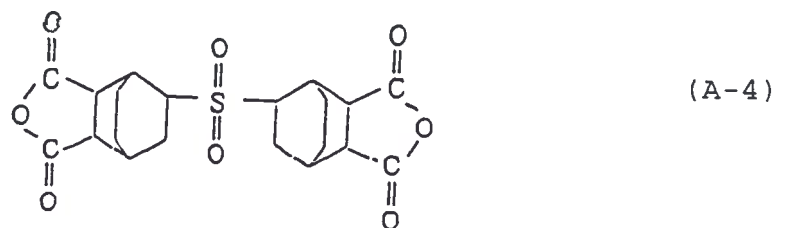
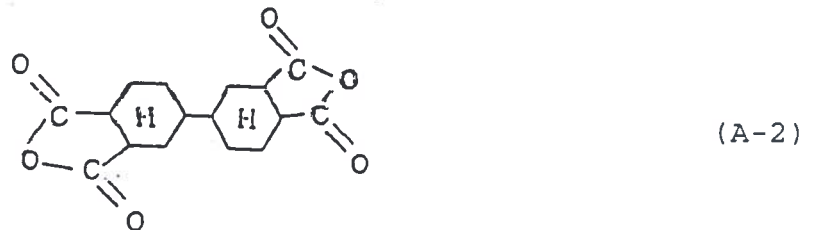
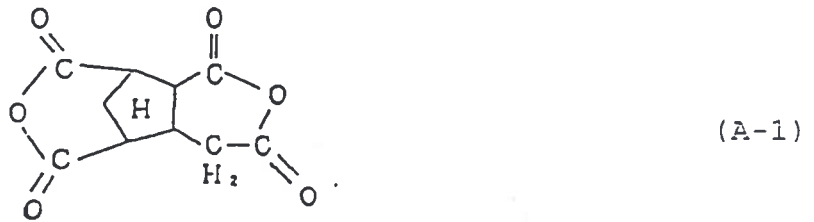
III. During the oral proceedings which had been requested auxiliarily by the Appellant and which were held on 29 November 1993, a new set of Claims 1 to 3 was filed

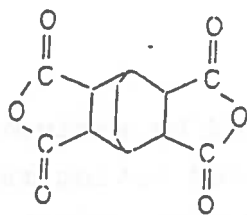
with the request that the decision under appeal be set aside and that a patent be granted on the basis of said new set of claims, a description to be adapted and the original drawings.

IV. Claim 1 reads as follows:

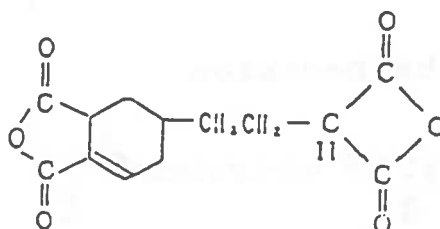
"1. A method for the production of a twisted nematic liquid crystal display device which comprises the steps of

(i) preparing a polyimide by polycondensation in the absence of a monamine (read "monoamine") of an alicyclic tetracarboxylic acid dianhydride and a diamine, the alicyclic tetracarboxylic acid dianhydride being selected from



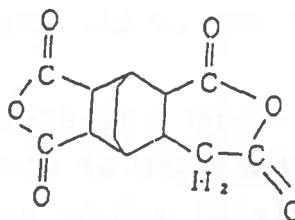


(A-5)



(A-6)

and



(A-7)

- (ii) forming an alignment film of the polyimide on the surfaces of the electrode substrates; and
- (iii) disposing the electrode substrates with the alignment films facing each other and with a liquid crystal material in a twisted orientation filling the space between the electrode substrates."

Claims 2 and 3 are dependent claims.

V. The Appellant submitted the following arguments in support of his requests:

A process using no monoamine is derivable from the original disclosure of the patent application. Both D1 and D2 are directed to a process using such a monoamine, and the process of the Comparative Examples 1 and 2 of D2, wherein the use of a monoamine is not mentioned, comprise tetracarboxylic acid dianhydride compounds different from those of the present Claim 1.

A problem of the prior art is the cost related to the use of a monoamine, which in the presently claimed

process is solved by excluding said monoamine while a device is obtained having reliable properties as shown by the provided measurement results, against the teaching of D1 and D2.

Reasons for the Decision

1. The appeal is admissible.
2. *Allowability of the amendments*
 - 2.1 Present Claim 1 is drafted as a method claim and based on a combination of Claim 1 and dependent Claim 5, both device claims and as originally filed, and additionally specifying that
 - (a) the alignment film is formed in the absence of a monoamine,
 - (b) the tetracarboxylic acid is an alicyclic tetracarboxylic acid dianhydride which is selected from the list of compounds A-1 to A-7 shown on pages 11 and 12 as originally filed for this purpose.

A process for preparing devices according to said features is originally disclosed in particular on page 5, last paragraph to page 7, second paragraph and page 14, first paragraph to page 15, second paragraph, and the Examples in Table 1, on pages 16 to 18, which refer to the mentioned compounds A-1 to A-7.

With regard especially to the above-mentioned feature (a), although no monoamine is mentioned in the original specification in relation to the preparation of the

alignment film, this would not necessarily exclude a process utilising monoamine. However, the Appellant's argument that the exclusion of a monoamine is derivable from the original disclosure is convincing for the following reasons:

According to the application as filed (see page 6, second paragraph), the alicyclic polyimide film can be formed by dissolving the tetracarboxylic acid and the diamine, or polyamic acid or polyimide prepared by polycondensation between the tetracarboxylic acid and the diamine, in a polar solvent. This is an indication that no further compound such as a monoamine is to be used during the polycondensation; moreover, for the person skilled in the art reading the present application at the relevant date, the absence in the general description and in all the mentioned examples of any teaching concerning the utilisation of a monoamine during the polycondensation step is a further indication that the use of monoamine was not intended because specific information, of the type provided in the available prior art, would be necessary if such monoamine were included.

Thus, the person skilled in the art would recognise that no monoamine is involved and, therefore, the European patent application has not been amended in such a way that it contains subject-matter which extends beyond the content of the application as filed (Article 123(2) EPC).

3. *Clarity and adaptation of the description*

- 3.1 The Board is satisfied that the claims as they stand correctly define the invention to be protected and are thus clear in the sense of Article 84 EPC.

However, it is to be noted that some inconsistencies and errors are to be corrected within the description. They, in particular, concern the relation between the information derivable from Table 2, especially the mentioning of cyclohexane in the left part of its line (a), on the one hand, and the corresponding examples in Table 1 referring to formula A-1, which compound is not directly related to a cyclohexane, on the other hand.

4. *Novelty*

- 4.1 Contrary to the presently claimed method, D2 (see page 2, lines 20 to 29) is directed to a method using a monoamine for the fabrication of a liquid crystal aligning agent. Indeed, in D2 (see page 6, lines 4 to 25, Comparative Examples 1 and 2), there are examples in which no monoamine is used; however, the cyclobutanetetracarboxylic acid dianhydride used in these examples does not correspond to any of the alicyclic tetracarboxylic acid dianhydrides related to the formulae A-1 to A-7 of present Claim 1.

From D1 (see page 4, lines 41 to 54; page 5, line 66 to page 7, line 17; page 7, lines 42 to 54; page 9, lines 35 to 56) a process is derivable wherein, contrary to the presently claimed method, an amine, especially a long chain amine, is added to the polyamide acid which has been synthesised from tetracarbon acid dianhydride and diamine. Therefore, the subject-matter of present Claim 1 is novel in the sense of Article 54 EPC.

5. *Inventive step*

5.1 Since D2 (see page 2, lines 20 to 36; page 3, lines 1 to 8) discloses a method of the same type as the presently claimed method using in particular a compound such as cyclohexanetetracarboxylic acid dianhydride as the alicyclic tetracarboxylic acid dianhydride, and since D2 (see page 6, lines 4 to 25) also discloses Comparative Examples 1 and 2 of the method but without the use of a monoamine, it is the closest prior art document.

5.2 The Appellant has argued that, in the methods proposed in D2 including the use of monoamine, a problem of cost can arise because of said use of the monoamine, which in the presently claimed method is solved by excluding it while still obtaining adequate alignment films as confirmed by the results of comparative measurements provided in the application and in the Statement of Grounds of Appeal.

5.3 Indeed, D2 is directed to the fabrication of alignment films by using a monoamine. Starting from the method of D2 (see page 2, lines 20 to 36 and page 3, lines 1 to 6; see also page 4, lines 26 to 57) using a diamine, an alicyclic tetracarboxylic acid dianhydride such as cyclohexanetetracarboxylic acid dianhydride, and a monoamine, the skilled person would not be incited to exclude the monoamine, because the comparison between the Examples 1 and 2 and the Comparative Examples 1 and 2 in D2 shows, that with the same ingredients but no monoamine, less reliable results in the properties of the alignment films are obtained.

Moreover, if the skilled person were incited for any reason to start from the Comparative Examples 1 and 2 of D2, he would derive from the teaching of the whole content of D2 to add a monoamine in order to obtain

better results. He would not, however, receive any indication from D2 to replace cyclobutanetetracarboxylic acid dianhydride, a compound which, with all other ingredients being the same and in the same proportions, provides adequate results as can be seen from Examples 1 and 2 of D2 (see page 4, lines 26 to 57), by any other compound of the same type, such as cyclopentanetetracarboxylic acid dianhydride or cyclohexanetetracarboxylic acid dianhydride, which are also disclosed in D2, because again the whole content of D2 in no way indicates that the poor results are to be related with the selection of the butane compound.

5.4 D1 does not provide any indication either to exclude a monoamine during the fabrication process.

5.5 Thus, the Appellant's argument can be accepted.

5.6 Therefore, the subject-matter of present Claim 1 involves an inventive step in the sense of Article 56 EPC.

6. For these reasons, a patent can be granted (Articles 52(1) and 97(2) EPC).

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division with the order to grant a patent on the basis of the Appellant's request filed during the oral proceedings of 29 November 1993 and consisting of the following documents:

Claims: 1 to 3 filed during said oral proceedings,

Description: to be adapted, and

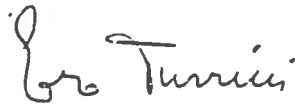
Drawings: as originally filed.

The Registrar:



P. Martorana

The Chairman:



E. Turrini

MCH
←
B. Sch.

