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**Datasheet for the decision  
of 13 February 2007**

**Case Number:** T 0121/05 - 3.4.02

**Application Number:** 01126610.3

**Publication Number:** 1209510

**IPC:** G02F 1/13

**Language of the proceedings:** EN

**Title of invention:**

Optical film and reflective liquid crystal display device

**Applicant:**

NITTO DENKO CORPORATION

**Opponent:**

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**Headword:**

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**Relevant legal provisions:**

EPC Art. 111(2)

**Keyword:**

"New features introduced from description - remittal"

**Decisions cited:**

T 0349/05

**Catchword:**

-



Case Number: T 0121/05 - 3.4.02

**D E C I S I O N**  
of the Technical Board of Appeal 3.4.02  
of 13 February 2007

**Appellant:**

NITTO DENKO CORPORATION  
1-2, Shimohozumi 1-chome  
Ibaraki-shi  
Osaka (JP)

**Representative:**

Grünecker, Kinkeldey  
Stockmair & Schwanhäusser  
Anwaltssozietät  
Maximilianstrasse 58  
D-80538 München (DE)

**Decision under appeal:**

Decision of the Examining Division of the  
European Patent Office posted 6 September 2004  
refusing European application No. 01126610.3  
pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** A. Klein  
**Members:** A. Maaswinkel  
C. Rennie-Smith

## Summary of Facts and Submissions

- I. The applicant lodged an appeal on 9 November 2004 against the decision of the examining division, dispatched on 6 September 2004, refusing the European patent application 001126610.3. The fee for the appeal was paid on 9 November 2004 and the statement setting out the grounds of appeal was received on 17 January 2005. In its decision the examining division had objected to the subject-matter of claim 1 according to the main or auxiliary requests then on file as not involving an inventive step in the light of the teaching of document D4 (EP-A-0 939 273) in combination with common general knowledge in the technical field (Articles 52(1) and 56 EPC).
- II. In the statement setting out the grounds of appeal the appellant requested that this decision be set aside and that a patent be granted on the basis of the set of claims of the main or the first to third auxiliary requests filed with this statement. Furthermore oral proceedings were requested if the board was unable to allow the main request.
- III. In a Communication annexed to the summons to oral proceedings the board raised objections under Article 84 EPC. As to the issue of patentability document D4 was considered the closest prior art, in agreement with the position of the appellant and the examining division. This document disclosed an optical film for use in a liquid crystal display (LCD) and such a LCD with the features of the preamble of claim 1 of the main request. According to this request, the optical film according to claim 1 differed from the

film disclosed in document D4 by an anti-reflection film disposed on the surface in which the light exit means were formed. To the skilled person it would appear favourable to have the output layer of the optical film anti-reflection treated, in particular if this film was arranged onto a LCD panel as defined in claim 9. It was noted that claim 1 of the first auxiliary request corresponded to claims 1 and 9 of the main request and was therefore subject to the same considerations. As to the second and third auxiliary requests it was observed that, apart from the clarity objections under Article 84 EPC, the additional features in the independent claims of these requests had not been defined in any of the original or prior dependent claims. Therefore, since these additional features had not been searched, the board contemplated remitting the case to the first instance.

IV. At the oral proceedings of 13 February 2007 the appellant filed a new main and a first auxiliary request and requested that a patent be granted on the basis of one of these requests. The board gave its decision at the end of the oral proceedings.

V. Independent claim 1 of the main request filed at the oral proceedings reads as follows:

"An optical film (1) adapted for achieving balanced display quality in a liquid crystal display, LCD, between an illumination mode with at least one light source (5) of the LCD and an external light mode comprising:

a transparent film (1A) which is transparent to visible light including a repetitive structure of a

plurality of light exit means (A) arranged at intervals of a regular pitch or intervals of irregular pitches in one of opposite surfaces of said transparent film (1A), said repetitive structure of said plurality of light exit means (A) having optical path changing slopes (A1) each inclined to said one surface of said transparent film (1A) at an inclination angle in a range of from 30 to 48 degrees in order to change an optical path of light propagating inside of said transparent film into a direction of thickness of said transparent film (1A) to thereby effectively change the optical path of light into viewing direction of said LCD; and

wherein said optical film (1) is light-transmissible in said direction of the thickness of said film

characterized by an anti-reflection layer (1B) disposed on said one surface of said transparent film (1A) in which said plurality of light exit means (A) are formed, whereby a width of the light exit means (A) is made larger or a pitch is reduced gradually as the light exit means (A) goes farther from a side surface on which light is incident".

The wording of independent claim 9 of the main request reads as follows:

"A reflective liquid-crystal display device (10) comprising:

a reflective liquid-crystal display panel (2) including at least one light source (5) on one of side surfaces of said liquid-crystal display panel (2);

characterized by

an optical film (1) according to claim 1 and provided on a viewing side of said reflective liquid-crystal display panel (2) so that one surface of said optical film (1) in which a plurality of light exit means (A) are formed faces outward".

Claims 2 to 8 are dependent claims.

The wording of the claims of the first auxiliary request filed at the oral proceedings is not relevant for the present decision.

VI. The arguments of the appellant can be summarised as follows:

In claim 1 the additional feature has been added that "the width of the light exit means is made larger or a pitch is reduced gradually as the light exit means goes farther from a side surface on which light is incident". This feature is supported in the description on page 23, lines 3 to 17. Therefore this amendment complies with Article 123(2) EPC.

Document D4 is considered the closest prior art. The optical film defined in claim 1 differs from the prior art device in that it is an optical film which is adapted for achieving balanced display quality between an illumination mode and an external light mode in a liquid crystal display which is achieved by an anti-reflection layer disposed on one surface of a transparent film in which a plurality of light exit means are formed and, in addition, that a width of the light exit means is made larger or a pitch is reduced gradually as the light exit means goes farther from a

side surface on which light is incident. The problem that is solved by these features is to optimise the display quality for both internal and external light and to improve the uniformity of light emission from the optical film. Although the objective problem of generally improving the display quality of a LCD, as such, might not be inventive, the available prior art does not disclose or suggest the particular claimed solution. It is noted that there may be many ways in which the display quality may be improved. However, it is felt that the idea of disposing an anti-reflection layer on the film surface where the light exit means are arranged is not obvious to the skilled person because, in contrast to other planar optical surfaces, this surface is a structured layer and the skilled person would not immediately assess the consequences of such an anti-reflection layer on the performance of the film, in particular the light propagating within the film. In this context reference is made to paragraph [0073] of document D4, which discloses that an anti-reflection layer may be provided on the polarizer plate on the viewing side, which is the interface between layers 4 and 5 in Figure 6. Therefore, in this document the anti-reflection film is applied on a smooth planar surface (the outer surface of the polarizer 5) and not on the structured surface of the light guide plate 1 in Figure 6. In the patent application it has been shown in the Examples, Comparative Examples, and the Evaluation Test on page 58, that although this solution may appear simple, it results in a remarkable improvement of both display modes. Therefore it is argued that the present situation is comparable with that in appeal case T 349/95, in which the board found even a simple form of a simple device resulting in a

major improvement may constitute evidence of the inventiveness of the claimed solution. Finally, the newly introduced feature relating to the width of the light exit means solves the problem of providing uniformity of light emission from the optical film. Neither this problem nor its solution is mentioned anywhere in the known prior art. Hence, the subject-matter of claim 1 is neither anticipated nor rendered obvious by the known prior art.

### **Reasons for the Decision**

1. The appeal is admissible.
2. *Amendments*
  - 2.1 With respect to the new expression introduced in independent claim 1 the board is satisfied with the support in the application documents as filed indicated by the appellant, therefore the amendment complies with Article 123(2) EPC.
  - 2.2 Furthermore the concerns expressed in the board's Communication relating to clarity of the former sets of claims have been overcome, therefore the claims are also allowable under Article 84 EPC.
3. *Allowability of the appeal and further procedure*
  - 3.1 By virtue of the introduction into claim 1 of the main request of new features related to gradual changes of the width or the pitch of the light exit means, the reasons for refusing the application as set out in the



decision under appeal no longer apply. This decision must therefore be set aside.

3.2 The newly introduced features of claim 1 had not been included in any prior claim. Therefore it cannot be ascertained whether these features have been taken into account by the European Search Report. Nor were they the subject of any of the main or first or second auxiliary requests filed during the oral proceedings before the examining division. Hence the examining division did not have the possibility to assess the possible contribution of these features to inventive step.

3.3 Therefore the board considers it appropriate to remit the case for further prosecution to the department of first instance.

**Order**

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

1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution on the basis of the main request filed during the oral proceedings.

The Registrar:

The Chairman:

M. Kiehl

A. G. Klein