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**D E C I S I O N**  
of 3 April 2002

**Case Number:** T 0893/98 - 3.3.1

**Application Number:** 95902869.7

**Publication Number:** 0734428

**IPC:** C09K 19/46

**Language of the proceedings:** EN

**Title of invention:**  
Ferroelectric Liquid Crystal Devices

**Patentee:**  
QinetiQ Limited

**Opponent:**  
-

**Headword:**  
Ferroelectric Liquid Crystal/QINETIQ

**Relevant legal provisions:**  
EPC Art. 123(2)

**Keyword:**  
"Amendment - supported by application as filed in view of the  
common general knowledge (no) "

**Decisions cited:**  
-

**Catchword:**  
-



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Boards of Appeal

Chambres de recours

Case Number: T 0893/98 - 3.3.1

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.1  
of 3 April 2002

**Appellant:** QinetiQ Limited  
85 Buckingham Gate  
London, SW1 6TD (GB)

**Representative:** -

**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 25 February 1998  
refusing European patent application  
No. 95 902 869.7 pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** A. J. Nuss  
**Members:** P. F. Ranguis  
S. C. Perryman

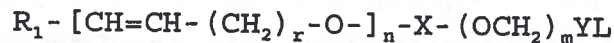
## Summary of Facts and Submissions

- I. This appeal lies from the Examining Division's decision refusing the European patent application No. 95 902 869.7 (Publication No. 0 734 428) pursuant to Article 97(1) EPC.
- II. The reasons for the decision were that the subject-matter of the then pending main request lacked novelty over *inter alia* document
- (5) WO-A-89/05792
- and that the then pending auxiliary request did not meet the requirements of Articles 84 and 123(2) EPC.
- III. With the statements of grounds of appeal, the Appellant filed as sole request a new set of claims and abandoned the requests submitted before the Examining Division.
- IV. In a communication dated 27 November 2001 accompanying the summons to oral proceedings, the Board informed the Appellant that clarity (Article 84 EPC) and novelty (Article 54 EPC) of Claim 1 of this request were questionable over document (5), in particular example No. 2.
- V. In his response, the Appellant abandoned the previous request and filed in lieu thereof, three sets of claims as main request and first and second auxiliary request.
- VI. Oral proceedings before the Board took place on 3 April 2002.
- VII. During oral proceedings, the Board informed the Appellant that, as a preliminary opinion, the same objections of lack of novelty over document (5) and

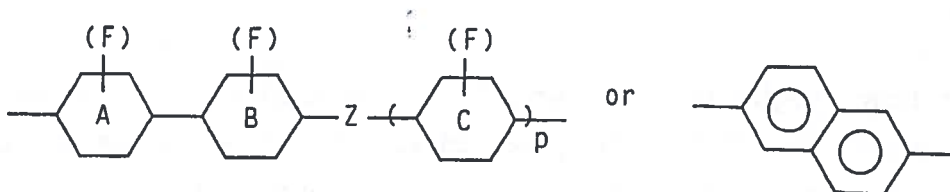
lack of clarity raised against Claim 1 of the request filed with the statement of grounds of appeal (cf. points III and IV above) might be maintained against the subject-matter of Claim 1 of each pending request. The Appellant then withdrew the three requests and filed in lieu thereof as sole request a set of 15 claims, Claim 1 (the sole independent claim) reading as follows:

"1. Use of a smectic liquid crystal material consisting of two components A and B where the two components are given by:

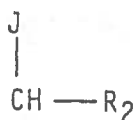
Component A being present in the range of 0.1-50wt% and is one or more optically active compounds capable of imparting a spontaneous polarisation to the material and is given by the formula:



wherein  $R_1$  is selected from hydrogen,  $C_1$ - $C_{12}$  alkyl, alkoxy, perfluoroalkyl and perfluoroalkoxy and may be straight chain or branched chain;  $r$  is an integer 1-10,  $n$  and  $m$  are independently 0 or 1;  $X$  is a group of general formula:

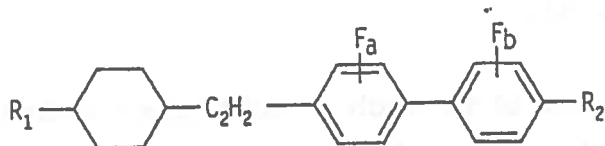
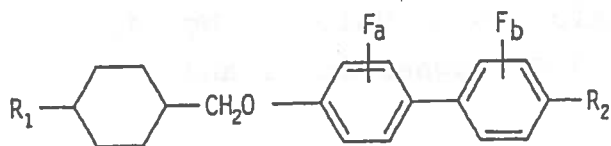
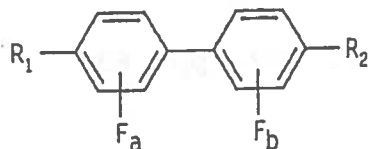
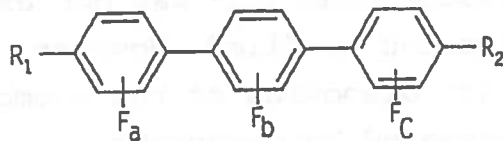
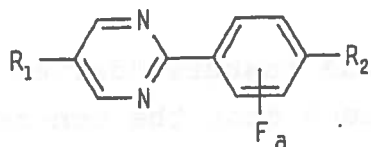


A, B and C may be independently phenyl or cyclohexyl; (F) indicates that the relevant ring may carry 1 or 2 fluorine substituents;  $p$  is 0 or 1; Z is a single bond when  $p$  is 0 and COO or a single bond when  $p$  is 1; Y may be  $CO_2$  or  $O_2C$ ; L may be a chiral epoxide or is given by the formula:



J may be CN, F, Cl, CH<sub>3</sub> or CF<sub>3</sub>; R<sub>2</sub> is alkyl, which may be C<sub>1-8</sub> straight chain, C<sub>1-15</sub> branched chain or cyclic;

**Component B** is present in the range sufficient to enable A+B= 100wt% and is at least two compounds selected from:



wherein a, b and c are independently 0, 1, 2; R<sub>1</sub> and R<sub>2</sub> are C<sub>1-15</sub> straight or branched chain alkyl or alkoxy, preferably C<sub>3-12</sub>. In the above (for component B) CH=CH

linking groups may be replaced by  $C_2H_4$  and  $CH_2O$  linking groups may be replaced by  $OCH_2$ ;

in a ferroelectric liquid crystal device comprising two spaced cell walls each bearing electrode structures and treated on at least one facing surface with an alignment layer, a layer of a smectic liquid crystal material enclosed between the cell walls wherein the device exhibits a minimum in its response time versus voltage curve and is driven by a multiplex addressing scheme such that the non-select combination of data and strobe voltages provide a voltage to the cell greater than  $\tau_{min}$ ".

The Appellant admitted that the feature "driven by a multiplex addressing scheme such that the non-select combination of data and strobe voltages provide a voltage to the cell greater than  $\tau_{min}$ " was not explicitly disclosed in the application as filed. However, the person skilled in the art disposing of the common general knowledge represented by documents:

- (9) Ferroelectrics, 1991, Vol. 122, pp. 63-79,  
P.W.H Surguy and al,
- (10) Liquid Crystals, 1993, Vol. 13, No. 4,  
pp. 597-601, J.R. Hughes et al and
- (11) Displays, Volume 14 Number 2, 1993, pp. 86-93,  
J.C. Jones et al,

would have understood that such a multiplex addressing scheme was a method to use the device according to the invention.

VIII. The Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the set of claims filed at the oral proceedings

IX. At the end of the oral proceedings the decision of the Board was announced orally.

### Reasons for the Decision

1. The appeal is admissible.
2. *Article 123(2) EPC*
  - 2.1 The only question to be decided is whether or not by the introduction in Claim 1 of the feature "driven by a multiplex addressing scheme such that the non-select combination of data and strobe voltages provide a voltage to the cell greater than  $\tau_{\min}$ ", the European patent application has been amended in such a way that it contains subject-matter which extends beyond the content of the application as filed.
  - 2.2 For assessing whether an amendment complies with Article 123(2) EPC, what matters is what a skilled person, using common general knowledge, would have directly and unambiguously derived from the description, drawings and claims as originally filed.
  - 2.3 The Appellant conceded that the added feature "driven by a multiplex addressing scheme such that the non-select combination of data and strobe voltages provide a voltage to the cell greater than  $\tau_{\min}$ " was not explicitly disclosed in the application as filed (cf. point VII above). However, he submitted that this added feature was implicitly disclosed in the application as filed for the person skilled in the art using his common general knowledge represented by documents (9), (10), (11).

2.4 In that context, the Board observes, first, that in the application as filed the sole mention of the addressing scheme for ferroelectric liquid crystal devices exhibiting a minimum in their response time versus voltage curve can be found on page 3, lines 4 to 7, namely "it is well understood that devices having such a minimum in their response time vs voltage curve can be multiplex driven at high duty ratio with higher contrast than other ferroelectric liquid crystal devices". It is, therefore, necessary to examine whether or not this information **unequivocally** corresponds to the way of driving the device as now defined in Claim 1. In that respect, common general knowledge may be used.

2.5 The first question which arises is whether documents (9), (10) and (11), which are scientific papers published in 1991, 1991 and 1993 respectively, can be considered as common general knowledge of the man skilled in the art. The Boards of Appeal have already addressed the question of what constitutes common general knowledge within the meaning of the EPC. As a general principle, general technical literature or standard textbooks are within common general knowledge while patent specifications or scientific publications are not. By way of exception, however, patent specifications and scientific publications may be considered to form part of the common general knowledge where the invention is in a field of research so new that the relevant technical knowledge is not yet available from textbooks (cf. Case Law of the Boards of Appeal of the European Patent office 4<sup>th</sup> edition, page 145, English version). In the present case, it remains questionable whether in 1993, the field of addressing schemes for ferroelectric liquid crystal displays was still so new that the man skilled in the art would have derived his knowledge from sources such as scientific



papers not yet available from textbooks. In view of the outcome of the appeal, the Board is ready to accept in this case for the sake of argument the view that documents (9), (10) and (11) can be considered as part of the common general knowledge of the man skilled in the art in the field of the addressing schemes for ferroelectric liquid crystal displays.

2.6 However, even in considering that those three documents represent common general knowledge, the Board is not convinced that the added feature derives directly and unambiguously from the application as filed for the following reasons:

- Document (10) relates to a new set of high speed matrix addressing schemes for ferroelectric liquid crystals displays. The schemes use the minimum in the response time-voltage characteristic found in certain mixtures and deliver improved operating speed and contrast ratio compared with previously reported schemes operating in this mode (cf. abstract, page 597). The Board can accept that the claimed devices might be driven according to the those addressing schemes since they exhibit a minimum.
  
- However, this scientific paper discloses experiments made with the material SCE 8 commercially available prior to the filing date of the present application and of unknown composition. Furthermore, as shown in document (10), in figure 3, page 599, the operating voltages are within a range extending between the  $\tau$  minimum and an upper value:

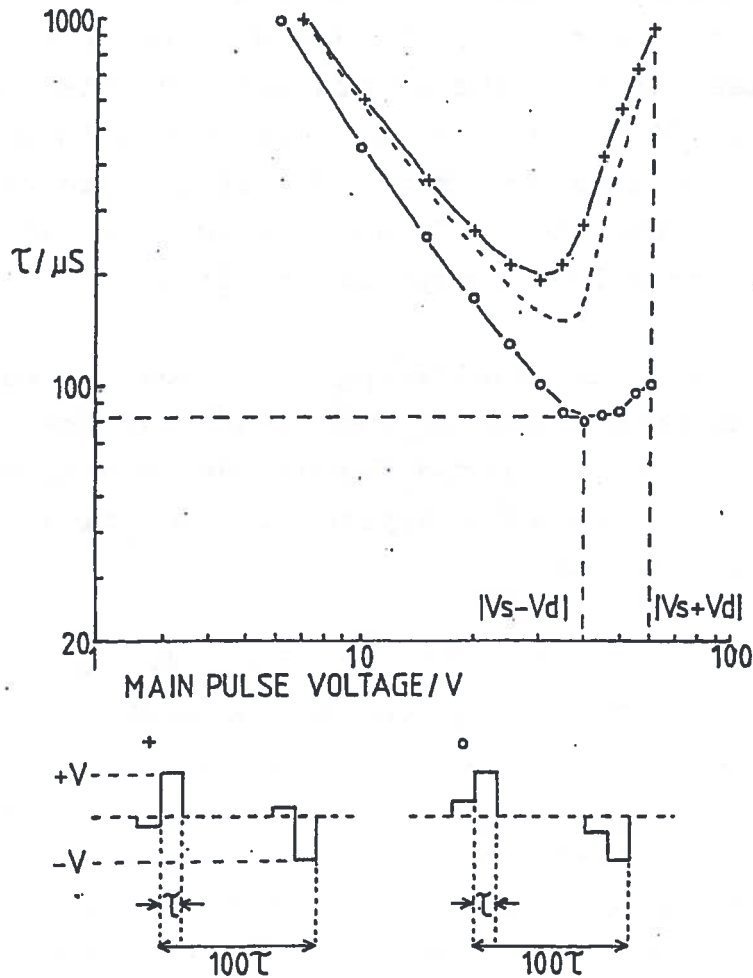


Figure 3. Response time as a function of voltage required to switch the device between states for the material SCE 8, simulating the resultant pulses encountered in the JOERS/Alvey addressing scheme under conditions of  $V_s = 50V$ ,  $V_d = 10V$ . The curves relate to the  $(V_s + V_d)$  resultant pulse (+) which has a leading part of opposite polarity and amplitude 0.166 of the main pulse, and the  $(V_s - V_d)$  resultant pulse (O) which has a leading part of the same polarity and amplitude 0.25 of the main pulse. The broken line shows the response measured with a monopolar pulse as illustrated in figure 1 (b). The operating voltages are denoted by vertical lines and the fastest operating point by a horizontal line.

Therefore, from this document, the skilled person can only derive that for a specific material, of unknown composition, a voltage range comprised between the value at  $\tau_{min}$  and a determined upper value must be applied (cf. legend: "the operating voltages are denoted by vertical lines...") but not that for any material within the claimed invention, the claimed devices are "driven by a

multiplex addressing scheme such that the non-select combination of data and strobe voltages provide a voltage to the cell greater than  $\tau_{\min}$ ". The term "greater" is an undefined upper value which has no basis in that document.

- The documents (9) and (11) relate to similar experiments with the material SCE 8 and provide the same curves (cf. document (9), page 74, figure 7 and document (11), page 91, figure 10) and cannot rebut this finding.

2.7 For the above reasons, the Board holds that the added feature "driven by a multiplex addressing scheme such that the non-select combination of data and strobe voltages provide a voltage to the cell greater than  $\tau_{\min}$ " is neither explicitly nor implicitly disclosed, even by reference to what might be common general knowledge, in the application as filed. Claim 1 thus contravenes the requirements of Article 123(2) EPC.

2.8 Since the Board can only decide on a request as a whole, the request must be rejected as it contains unallowable Claim 1 and, therefore, the appeal dismissed.

### Order

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

The appeal is dismissed.

The Registrar



N. Maslin

The Chairman



A. Nuss