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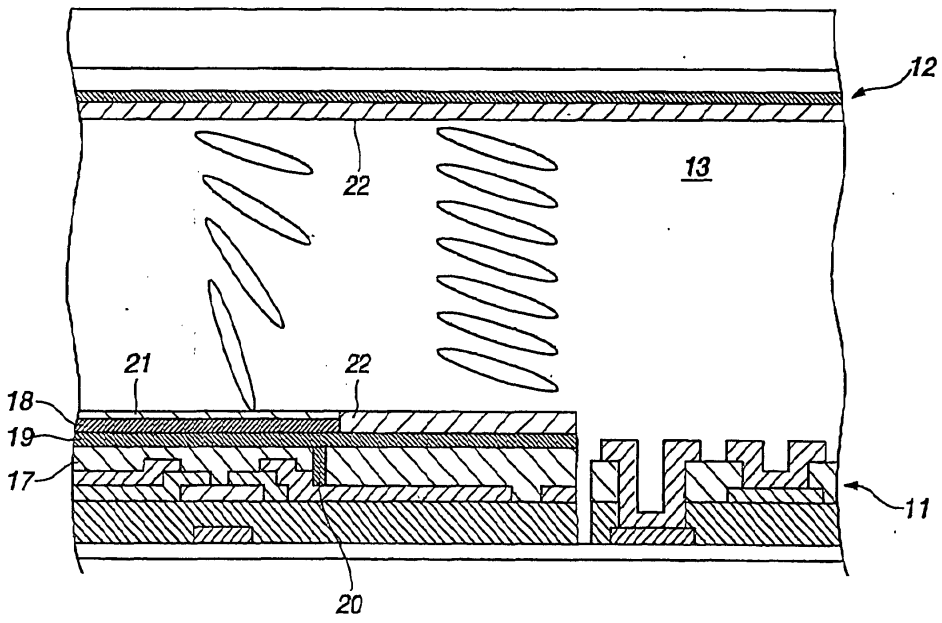
(54) **Transflective liquid crystal display device**

(57) A liquid crystal display device comprises a first substrate (11) including a thin film transistor, a second substrate (12), and a liquid crystal layer (13) of liquid crystal molecules. The LC layer (13) is interposed by the first and second substrates (11,12). The first substrate (11) includes a reflective electrode (18) in a reflective region and a transmissive electrode (19) in a transmissive region. The LC layer (13) includes a first group of liquid crystal molecules aligned in the reflective region to provide a first retardation and a second group of liquid crystal molecules aligned in the transmissive region to provide a second retardation. The second retardation is different from the first retardation.

FIG.3



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EUROPEAN SEARCH REPORT

Application Number
EP 02 01 8278

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 10, 17 November 2000 (2000-11-17) -& JP 2000 187220 A (SHARP CORP), 4 July 2000 (2000-07-04) -& US 6 341 002 B1 (ITOH YASUHISA ET AL) 22 January 2002 (2002-01-22)	1,2,6,8, 11	G02F1/1335 G02F1/1333 G02F1/13363
Y	* the whole document *	3,7	

X	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 05, 14 September 2000 (2000-09-14) -& JP 2000 047194 A (SHARP CORP), 18 February 2000 (2000-02-18) -& US 6 295 109 B1 (BAN ATSUSHI ET AL) 25 September 2001 (2001-09-25)	1,2,5,6, 8,11	
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D,X	US 6 195 140 B1 (BAN ATSUSHI ET AL) 27 February 2001 (2001-02-27)	1,2,5,6	
Y	* the whole document *	3,7	TECHNICAL FIELDS SEARCHED (Int.Cl.7)

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Y	EP 0 996 028 A (SHARP KK) 26 April 2000 (2000-04-26) * figure 11 *	7	

A	US 6 226 061 B1 (TAGUSA YASUNOBU) 1 May 2001 (2001-05-01) * column 26, line 20 - line 26; figure 8B *	7	

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~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
MUNICH	21 February 2003	Wolfrum, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

European Patent Office

Application Number
EP 02 01 8278

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

1-9,11-12

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 01 8278

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 5 982 464 A (SU KAI C ET AL) 9 November 1999 (1999-11-09) * figures 1,3 * ---	9	
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 08, 30 June 1999 (1999-06-30) -& JP 11 084371 A (CITIZEN WATCH CO LTD), 26 March 1999 (1999-03-26) -& US 6 295 108 B1 (KANEKO YASUSHI) 25 September 2001 (2001-09-25) * Fourth embodiment * * figures 14-16 * ---	12	
A	EP 0 996 027 A (CITIZEN WATCH CO LTD) 26 April 2000 (2000-04-26) * paragraph [0037]; figure 11 * -----	12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
MUNICH	21 February 2003	Wolfrum, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 02 01 8278

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-5,8

Liquid crystal display device comprising a first substrate with a TFT, with a reflective electrode in a reflective region and with a transmissive electrode in a transmissive region, a second substrate and a liquid crystal layer between both substrates providing a different retardation in the different regions
wherein the reflective electrode is formed on the colour filter of the first substrate and the second substrate includes another colour filter.

2. Claims: 1,6,7

Liquid crystal display device comprising a first substrate with a TFT, with a reflective electrode in a reflective region and with a transmissive electrode in a transmissive region, a second substrate and a liquid crystal layer between both substrates providing a different retardation in the different regions
wherein the liquid crystal molecules in the reflective region are aligned in the HAN alignment mode whereas the liquid crystal molecules in the transmissive region are aligned in the homogeneous alignment mode or in the TN alignment mode.

3. Claims: 1,8,9,11,12

Liquid crystal display device comprising a first substrate with a TFT, with a reflective electrode in a reflective region and with a transmissive electrode in a transmissive region, a second substrate and a liquid crystal layer between both substrates providing a different retardation in the different regions
wherein the second substrate has a quarter-wave plate which has an opening in the transmissive region.

4. Claims: 1,8,10

Liquid crystal display device comprising a first substrate with a TFT, with a reflective electrode in a reflective region and with a transmissive electrode in a transmissive region, a second substrate and a liquid crystal layer between both substrates providing a different retardation in the different regions
wherein the second substrate has a quarter-wave plate and a cholesteric liquid crystal layer on the remote side from the liquid crystal layer.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 02 01 8278

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21-02-2003

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	透反液晶显示装置		
公开(公告)号	EP1286204A3	公开(公告)日	2003-04-23
申请号	EP2002018278	申请日	2002-08-22
申请(专利权)人(译)	NEC公司		
当前申请(专利权)人(译)	NLT科技有限公司.		
[标]发明人	IKENO HIDENORI SUZUKI MASAYOSHI		
发明人	IKENO, HIDENORI SUZUKI, MASAYOSHI		
IPC分类号	G02F1/1337 G02F1/1335 G02F1/13363 G02F1/1343 G02F1/1368 G02F1/1333		
CPC分类号	G02F1/133555 G02F1/133514 G02F1/133753 G02F2001/133638		
代理机构(译)	贝滕＆RESCH		
优先权	2001251089 2001-08-22 JP		
其他公开文献	EP1286204A2		
外部链接	Espacenet		

摘要(译)

一种液晶显示装置，包括：第一基板（11），包括薄膜晶体管;第二基板（12）;以及液晶分子的液晶层（13）。 LC层（13）插入第一和第二基板（11,12）。第一基板（11）包括反射区域中的反射电极（18）和透射区域中的透射电极（19）。 LC层（13）包括在反射区域中排列以提供第一延迟的第一组液晶分子和在透射区域中排列的第二组液晶分子以提供第二延迟。第二延迟与第一延迟不同。

FIG.3