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### **EUROPEAN PATENT APPLICATION**

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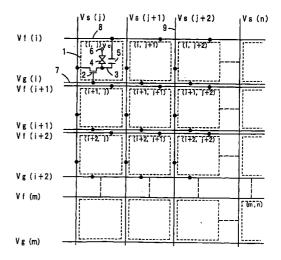
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#### (54)Active matrix liquid crystal display panel and method of driving the same

(57)Conventionally, a modulating voltage for modulating the potential of a pixel electrode through an auxiliary capacitance is superimposed on a scanning signal and applied to a scanning electrode. On the contrary, a modulating electrode for applying a modulating voltage is provided separately from the scanning electrode. Consequently, the amplitude of the scanning signal output from the output IC so as to be applied to the scanning electrode is greatly reduced and the level output is binary, so that the area of the IC chip is greatly reduced. As a result, the cost of the IC is greatly reduced. Moreover, since the modulating electrode is provided below the pixel electrode and no auxiliary capacitance is formed between the pixel electrode and the scanning electrode, the load capacitance of the scanning electrode is reduced, so that the width of the scanning electrode can be reduced to significantly improve the numerical aperture.

Fig. 1





# **EUROPEAN SEARCH REPORT**

Application Number EP 98 11 0819

Category	Citation of document with indication, where appropriate, of relevant passages			Relevant o claim	CLASSIFICATION OF THE APPLICATION (int.Cl.6)	
Y	* column 21, line 2 figures 12,22,27 * * column 20, line 1 20,21 * * column 16, line 3 figures 13-17 *	TSUSHITA ELECTRIC .) 2 November 1994 52 - column 26, line 15 21 - column 23, line 7; 10 - line 24; figures 33 - column 18, line 28; 9 - column 12, line 10; 7 - line 22 * - line 15 *		5	G09G3/36 G02F1/136	
X Y	* Abstract *	.TOSHIBA) 7 April 1993 - column 9, line 43;	3 2		TECHNICAL FIELDS SEARCHED (Int.Cl.6)	
Y		ET AL.) 14 May 1996 - column 5, line 42;	2		G09G G02F	
Α	* Abstract *	- column 2, line 51;	4			
A	figures 1,5-9,11-12 * column 8, line 57	June 1990 3 - column 5, line 16; 2B * 7 - column 9, line 31 * 14 - column 12, line 39		3,5,6		
	The present search report has I	peen drawn up for all claims				
Place of search THE HAGUE		Date of completion of the search  22 March 1999		C02	Examiner Si, F	
X : part Y : part doci A : tech O : non	ATEGORY OF CITED DOCUMENTS icularly relevant if taken alone icularly relevant if combined with anotument of the same category inological background-written disclosure rmediate document	T : theory or print E : earlier patent after the filing D : document cite L : document cite	documer date ed in the ed for othe	erlying the nt, but publi application er reasons	invention shed on, or	

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# **EUROPEAN SEARCH REPORT**

Application Number EP 98 11 0819

	DOCUMENTS CONSIDERE  Citation of document with indicat		Dolovers	01 4001510 45:00: 05
Category	of relevant passages	on, where appropriate,	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.6)
A	EP 0 691 565 A (NEC CO * Abstract * * column 4, line 6 - 1 *	<del>-</del>	6	
Y,P	PATENT ABSTRACTS OF JAI vol. 98, no. 10, 31 Aug & JP 10 123482 A (MAT IND. CO. LTD.), 15 May * abstract *	gust 1998 SUSHITA ELECTRIC	3,6	
				TECHNICAL FIELDS SEARCHED (Int.Cl.6)
	The second of the		_	
	The present search report has been		1	
	THE HAGUE	Date of completion of the search  22 March 1999	Cor	Examiner Si, F
X : part Y : part docu A : tech O : non	ATEGORY OF CITED DOCUMENTS  icularly relevant if taken alone icularly relevant if combined with another iment of the same category inological background -written disclosure rmediate document	T: theory or princip E: earlier patent do after the filing da D: document cited L: document cited t	le underlying the i cument, but publi- tte in the application or other reasons	nvention shed on, or

#### ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 98 11 0819

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-03-1999

	atent document d in search repo	-	Publication date		Patent family member(s)	Publication date
EP	622655	Α	02-11-1994	JP	7230075 A	29-08-199
EP	535954	Α	07-04-1993	DE DE JP	69225105 D 69225105 T 5210121 A	20-05-199 07-01-199 20-08-199
				US JP	5686932 A 5216442 A	11-11-199 27-08-199
US	5517342	A	14-05-1996	KR KR DE FR GB GB JP US	9704882 B 9616796 B 4407043 A 2702286 A 2275809 A,B 2308218 A,B 6301059 A 5767926 A	08-04-199 21-12-199 08-09-199 09-09-199 07-09-199 18-06-199 28-10-199
EP	373565	Α	20-06-1990	JP JP DE DE US	2157815 A 2568659 B 68924836 D 68924836 T 5296847 A	18-06-199 08-01-199 21-12-199 04-07-199 22-03-199
EP	691565	Α	10-01-1996	JP JP US	2797972 B 8015670 A 5745194 A	17-09-199 19-01-199 28-04-199

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