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(54) **Reflective color liquid crystal display device**

(57) Deviation in phase difference of the light passing each of the red, green, and blue dots, i.e., $2\pi(\alpha \cdot d_R \cdot \Delta n_R + Re_R)/\lambda_R$, $2\pi(\alpha \cdot d_G \cdot \Delta n_G + Re_G)/\lambda_G$, and $2\pi(\alpha \cdot d_B \cdot \Delta n_B + Re_B)/\lambda_B$, are matched when thickness of a liquid crystal layer 7 at red, green, and blue dots are d_R , d_G , and d_B ; wavelength of a visible light passing each dot is λ_R , λ_G , and λ_B ; refractive index anisotropy of the liquid crystal layer 7 in the visible light wavelengths λ_R , λ_G , and λ_B is Δn_R , Δn_G , and Δn_B ; and

retardations of a retardation plate are Re_R , Re_G , and Re_B . This enables the achievement of a reflective color LCD with high achromatic color during white display and high contrast display.



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EUROPEAN SEARCH REPORT

Application Number
EP 00 10 7323

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	EP 0 821 261 A (SHARP KK) 28 January 1998 (1998-01-28) * page 2, line 3 - line 20; figure 1 * * page 3, line 28 - line 29 * * page 3, line 33 - page 4, line 44 * * page 4, equation (3) * * page 7, line 21 - line 41; figure 6 * * page 9, line 21 - line 55 *	1,5, 8-12,15	G02F1/1333 G02F1/1335
Y	---	2-4,6	
A		7,13,14, 16	
Y	US 4 632 514 A (OGAWA TETSU ET AL) 30 December 1986 (1986-12-30) 1st, 3rd and 4th embodiments * figures 15,19,20 *	2-4,6	
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A	PATENT ABSTRACTS OF JAPAN vol. 017, no. 619 (P-1644), 15 November 1993 (1993-11-15) -& JP 05 196930 A (CANON INC), 6 August 1993 (1993-08-06) PAJ abstract * paragraphs [0006],[0009],[0012]-[0014] *	1-16	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G02F
A	ISHINABE T ET AL: "OPTICAL DESIGN OF R-OCB MODE FULL-COLOR REFLECTIVE LCD WITH WIDE VIEWING ANGLE AND HIGH CONTRAST" JOURNAL OF THE SOCIETY FOR INFORMATION DISPLAY, SOCIETY FOR INFORMATION DISPLAY, SAN JOSE, US, vol. 6, no. 4, 1998, pages 243-246, XP000940356 ISSN: 1071-0922 whole document --- -/--	1-16	
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 18 December 2003	Examiner Thomas, K
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 L: document cited for other reasons &: member of the same patent family, corresponding document	

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Application Number
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A	SHIN-TSON WU ET AL: "A biaxial film-compensated thin homogeneous cell for reflective liquid crystal display" JOURNAL OF APPLIED PHYSICS, 15 APRIL 1998, AIP, USA, vol. 83, no. 8, pages 4096-4100, XP002265552 ISSN: 0021-8979 whole document	1-16	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 18 December 2003	Examiner Thomas, K
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 L : document cited for other reasons & : member of the same patent family, corresponding document			

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

EP 00 10 7323

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
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专利名称(译)	反光彩色液晶显示装置		
公开(公告)号	EP1045272A3	公开(公告)日	2004-02-25
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申请(专利权)人(译)	松下电器产业有限公司.		
当前申请(专利权)人(译)	松下电器产业株式会社		
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IPC分类号	G02F1/1333 G02F1/1335 G02F1/13363		
CPC分类号	G02F1/133371 G02F1/133377 G02F1/133514 G02F2203/02 G02F2413/09		
优先权	1999103422 1999-04-12 JP		
其他公开文献	EP1045272A2		
外部链接	Espacenet		

摘要(译)

通过红色，绿色和蓝色点中的每一个的光的相位差的偏差，即 $2\pi * (\alpha^* dR * \Delta nR + ReR) / \lambda R$ ， $2\pi * (\alpha^* dG * \Delta nG + ReG) / \lambda G$ ，和当红色，绿色和蓝色点处的液晶层7的厚度为dR，dG和dB时， $2\pi * (\alpha^* dB * \Delta nB + ReB) / \lambda B$ 匹配;通过每个点的可见光的波长是 λR ， λR 和 λB ;可见光波长 λR ， λR 和 λB 中的液晶层7的折射率各向异性是 ΔnR ， ΔnG 和 ΔnB ;延迟板的延迟和延迟是ReR，ReG和ReB。这使得能够在白色显示和高对比度显示期间实现具有高无彩色的反射彩色LCD。



European Patent Office

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to		
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Y	PATENT ABSTRACTS OF JAPAN vol. 017, no. 619 (P-1644) 15 November 1993 (1993-11-15) - & JP 05 196930 A (CANON INC). 6 August 1993 (1993-08-06) * paragraphs [0006], [0009], [0012] - [0014] *	2-4, 6		
A	ISHINABE T ET AL: "OPTICAL DESIGN OF R-DCB MODE FULL-COLOR REFLECTIVE LCD WITH WIDE VIEWING ANGLE AND HIGH CONTRAST" JOURNAL OF THE SOCIETY FOR INFORMATION DISPLAY, SOCIETY FOR INFORMATION DISPLAY, SAN JOSE, US, vol. 8, no. 4, 1998, pages 243-246, XP000940356 ISSN: 1071-0922 whole document	1-5, 7-16 1-16	TECHNICAL FIELD SEARCHED (INCL. 7) G02F	
A	---	1-16		

The present search report has been drawn up for all claims

Place of search

MUNICH

Date of completion of the search

18 December 2003

Examiner

Thomas, K

CATEGORY OF CITED DOCUMENTS

1. priority documents underlying the invention

2. other prior art documents, for instance cited in the application

3. documents cited in the application

4. documents cited for other reasons

5. prior art documents

6. intermediate documents