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2003 03 15

(21)
(22)

10 - 2001 - 0055571
2001 09 10

(71)

20

(72)

204 - 1305

1 229 - 758/4

(74)

:

(54)

，
.
(parameter) ， 가 .

10

1 ，

2 ，

3 ，

4 ,

5 ,

6 (PBS) ,

7 ,

8 ,

9 ,

10 (cell gap) .

< >

200 : 1 .

202 : 2 .

204 : 3 .

가 (Liquid Crystal Display Device) ,

가 가

가 , 가

가 , 가

(+) (-)

가 ,

가

(Active Matrix LCD : AM - LCD)가

가

1 (twisted nematic liquid crystal)

(7) , (18) (6) (, ,)(8)
 (17) (T) (5) , (P) (5) (2)
 2) (14) .

(22) , (T)가 (matrix type)
 , 가 (13) (15) .

(P) (13) (15) (P)
 (17) - - (indium - tin - oxide : ITO)

(17) (14) (T) 가
 (14)

가 .

(NW) (NB))

2 3 , 가 .

2 (NW) ,
 (polarizer)

(介在) , (A) 1 (30a) 2 (30b) ()
 (32) (30) , (34) (30) (42,44) ()
 (36) (36)

(36) (50a) (34) (44) (50b)
 (34)

(34) (30) 90 ° ()
 (32) (42) (50c)

가 , (36) (50a) (34)
 (30) (32)

(off state) (32,34) ()
 42,44) (white state)가 .(normally white mode)

3 .

3

2

(34) , (30) (42,44) (32)

(34) .

(34) (36)가 .

(30) (36) (60a) (34) (44) (60b)

(34) (60b) (30) () ,

(34) (44) 가 (32) (42) (60c)

, (60c) (32) .

가 , 가 .(normally black mode) (32,34)

(42,44)

, 4 5 , .

, 4 (normally white) , $\lambda / 4$

(50) (B) .

$\lambda / 4$, (B) (52) (54) , (56)

(50)가 , $\lambda / 4$ (50)

, (56) (60) (70a) (56) .

(70a) $\lambda / 4$ (50) (70b) .

, $\lambda / 4$ (50)

, 45° (50) (70b) . (70a) $\lambda / 4$

(70b) $\lambda / 4$ (50) (52) (70

c) .

, (70c) (54) (52)

, (70d) (70e)

(70e) $\lambda / 4$ (50) (56) (60)

(70f) (56) .

, 가 , 가 .(normally wh

ite mode)

, 가

5

5 $\lambda/4$

(52) , (B) (52) (54) ,
(56)

(70a) (56) (60) (70a) (52) .
(70b) (52) (70b) .
(70b) (54) (70c) .
(70c) (52) () (56)
(60) (70d)

(70d) (56)

가 , 가 .(normally black mode)

e) (normally black mode) (normally white mode)

,

가

가 (normally white mode)

(polarizing beam splitter:PBS)

PBS 가 ,

가 .

PBS 6 .

6 PBS .

(80) (82) PBS(84) 가

, PBS(84) (longitudinal wave : primary wave) P (86) (transverse wave
: secondary wave) S (88)

, P (86) PBS(84) S (88) PBS(84) .

, PBS(84) (cross polarizer) .

, PBS(84) / (on/off) .

7 , 가 , PBS .

, (90) , (90) (92)

, (90) PBS(84) .

, (80) PBS(84) PBS(84) .

, .

, (80) (82) PBS(84) , PBS(84) P (86)

S (88) , P (86) PBS(84) S (88)

PBS(84) (90) .

, S (88) 가 가 , (92)

(90) 가 .

, (90) () $\lambda/4$ 가 $\lambda/2$ 가 가 S (88) P

(92) (86) .

, P (86) PBS (94) .

, 가 (white state)가 .

, 8 가 , PBS .

가 , (90) () 가 ,

(90) .

, (80) PBS(84) , PBS(84)

P (86) S (88) , P (86) PBS(84)

S (88) PBS(84) .

S (88) (90) 가 ,

(92) .

, 가 가 0 0 S (88)가 (92)

S (88)

. , S (88) PBS(84) (94) 가 .

, (90) 가 (: dark state)가 .

가 , (90) , PBS(84)
(normally white) .

1

	U.S.patent	Φ	Θ	Pretilt angle	d Δn	편광판/ 검광판	반사율 /투과율	NW or NB
Boswell	4,019,807	45°	0°	~ 0°		Crossed	R	NB
Bleha	4,378,955	45°	22.5°	~ 0°	d ~2 μ m	Crossed	R	NW or NB
Leenhouts	4,896,147	10 ~ 80°	10 ~ -60°	~ 0°	0.2 ~ 0.7 μ m	Crossed	T	NW
Velde	4,999,619	0°		<15°	0.5 ~ 0.6 λ	C or P	R	NW
Sonehara	5,105,289	63.6°	0°	~0°	0.33 ~ 0.4 λ	C or P	R	NW or NB
Okumura	5,139,340	0.70°	0°	~0°	0.2 ~ 0.7 μ m	parallel	R	NW
IBM	5,870,164	46 ~ 62°	-6 ~ 6°	<15°	0.7 λ ~ 1.25 λ	Crossed	R	NB

표 1

가

e) 가 (response tim

(d)

(d)

(parameter)

가

1 가

n) 0.1 0.1999 (Φ) 1 89° (Θ) - 44° 44° 0 30° , (d Δ

1 가

1 2

$\Phi = 189^\circ$, $\Theta = 0$
 $(d\Delta n) = 0.1 \quad 0.1999$.
 ; ;
 1 2
 ;
 .

 , 9
 (102) (Θ) , (1) (input director) (102) n (100) (output director) (104)가) (Φ) $(d\Delta n)$.
 2×2 .
 , (1) (3) .

$$\phi = \frac{\cos^{-1}(-a^{-2})}{2\sqrt{1+a^{-2}}} \text{-----}(1)$$

$$\tan 2\theta = \pm \sqrt{a^2 - 1} \text{-----}(2)$$

$$\alpha = d\Delta n \pi / \lambda \quad \text{phi} \text{-----}(3)$$

(1),(2),(3) , 2

α	ϕ	$-\Theta$	$d\Delta n/\lambda$	$d\Delta n(0.55\mu\text{m})$
1.0144	60.0067	3.4214	0.3358	0.1847
1.0750	55.0061	7.6578	0.3168	0.1742
1.1825	50.0035	11.5661	0.3021	0.1662
1.3475	45.0058	15.2595	0.2902	0.1596
1.5940	40.0024	18.8110	0.2806	0.1543
1.9660	35.0026	22.2522	0.2727	0.1500
2.5510	30.0039	25.6185	0.2662	0.1464
3.5300	25.0087	28.9213	0.2610	0.1436
5.3460	20.0043	32.1869	0.2569	0.1413
9.2700	15.0082	35.4128	0.2539	0.1396
20.500	10.0062	38.6201	0.2517	0.1384
81.000	5.0085	41.8103	0.2504	0.1377

표 2

(1),(2),(3)
(simulation)

ϕ	Θ	Pretilt angle	$d\Delta n(\mu\text{m})$	편광판/ 검광판	반사율/ 투과율	NW 또는 NB
1 ~ 89°	-44 ~ 89° (0° 비포함)	< 30°	0.1 ~ 0.1999	직교	반사	NW

표 3

(cell gap) (1 μm)

10

3가

(d Δn)/ λ

(202) 1 (200) 1 $\Phi = 45^\circ$, $\Theta = -15.26$
2 $\Phi = 30^\circ$, $\Theta = -25.62$, 3 (204) 3 $\Phi = 15^\circ$, $\Theta =$
- 35.41

(200,202,204) $d\Delta n/\lambda = 0.2902, 0.2662, 0.2539$
(λ) 550nm $d\Delta n$ 0.13 μm , 0.14 μm , 0.16 μm

(Δn) 0.15

가

1 μm

가

가

9

, , 가 .

7

, .

(57)

1.

1 가 , 1 2 ,

4° , , (Φ) 1 89° 1 (Θ) - 44° 4
(dΔn) 0.1 0.1999 0 30° , .

2.

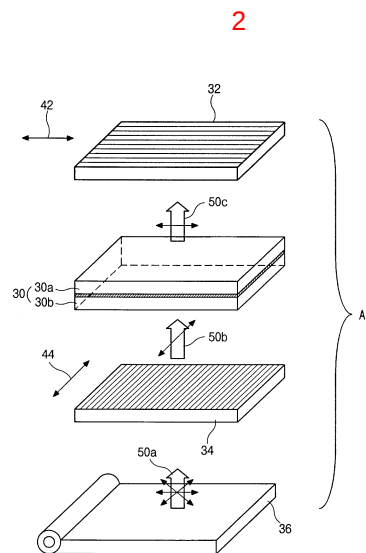
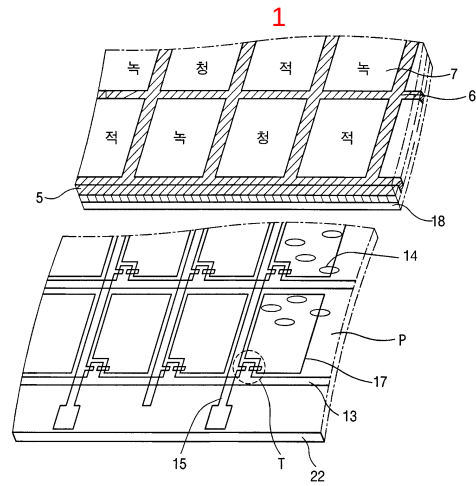
1 가 , 1 2 ,

4° , , (Φ) 1 89° 1 (Θ) - 44° 4
(dΔn) 0.1 0.1999 0 30° ;

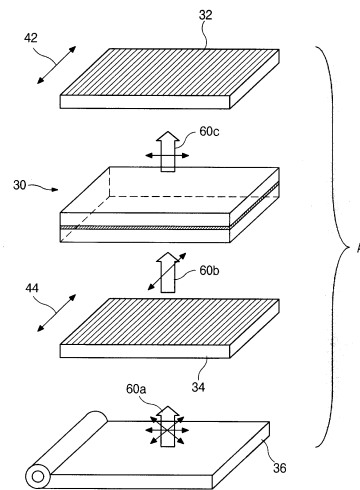
;

2 , 1 ;

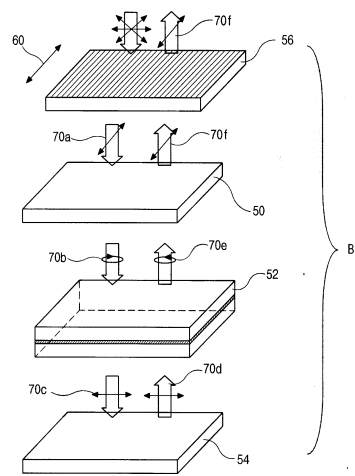
.



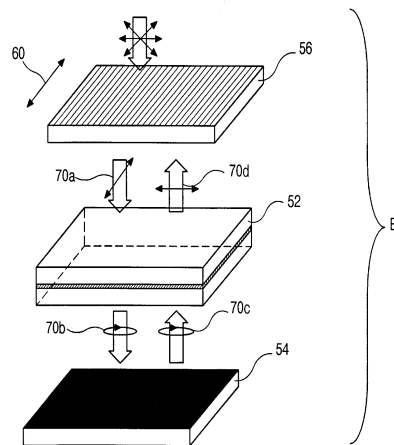
3



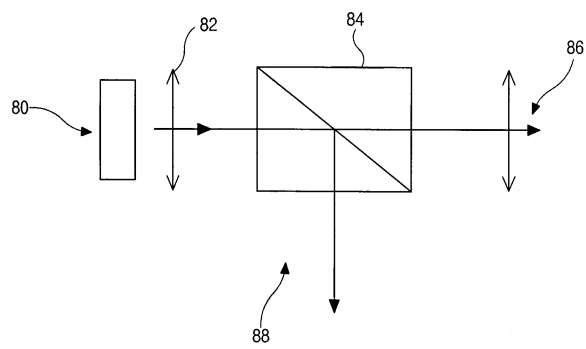
4



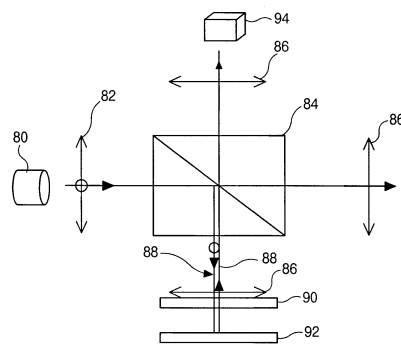
5



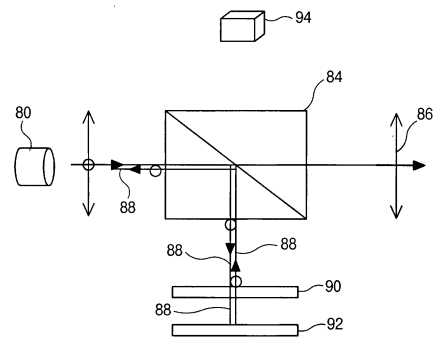
6



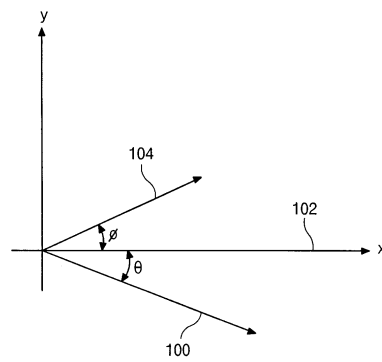
7



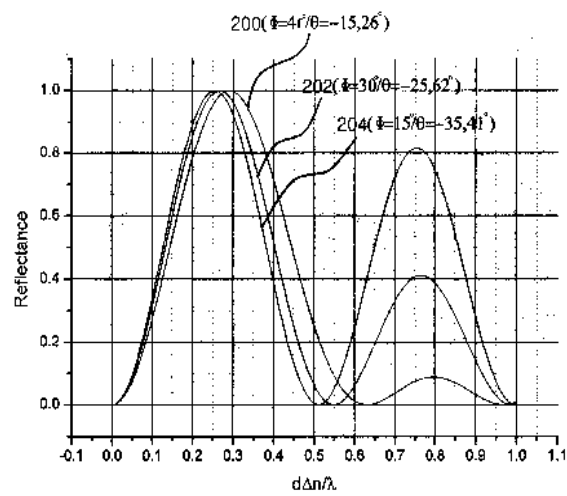
8



9



10



专利名称(译)	反光液晶显示器		
公开(公告)号	KR1020030021973A	公开(公告)日	2003-03-15
申请号	KR1020010055571	申请日	2001-09-10
[标]申请(专利权)人(译)	乐金显示有限公司		
申请(专利权)人(译)	LG显示器有限公司		
当前申请(专利权)人(译)	LG显示器有限公司		
[标]发明人	KIM WANSOO 김완수 JIN HYUNSUK 진현석		
发明人	김완수 진현석		
IPC分类号	G02F1/1335		
代理人(译)	贞媛KI		
外部链接	Espacenet		

摘要(译)

液晶显示装置技术领域本发明涉及液晶显示装置，更具体地涉及用作在大型光学显示装置内部配置的光转换器的反射型液晶显示装置。本发明提出一种反射型液晶面板的设计参数，用于快速诱导液晶的响应时间，以便在设计反射型液晶面板时实现运动图像，从而实现大型光学显示装置的运动图像。 10

