

(19)  
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2002 - 0004820  
2002 01 16

(21) 10 - 2001 - 0029346  
(22) 2001 05 28

(30) 2000 - 204179 2000 07 05 (JP)

(71) 가 가

3 2 3

(72) 3 2 3 가 가

(74)

:

(54)

( ) 가 , 가 ,

( ) 1 (G1) , 2 (G2) ,  
3 (G3)

1

1 1

2 1 (諸收差)

3 2

4 2

5

\* \*

G1 : 1 G2 : 2

G3 : 3 L1 : 1

L2 : 2 L3 : 3

L4 : 4 L5 : 5

L6 : 6 L7 : 7

L8 : 8 L9 : 9

L10 : 10 L11 : 11

L12 : 12 L13 : 13

L14 : 14 L15 : 15

L16 : 16 L17 : 17

L18 : 18 L19 : 19

L20 : 20 L21 : 21

L22 : 22 L23 : 23

L24 : 24

가 50 ,

( ) 250 nm 7 - 20385  
가 . , , 1 3  
1 , 2 , 2  
, 가 .

3 - 188407

NA,

가

1  
가

(DVD)

(HDD)

3 - 188407  
(WD)

1

rization)

300 nm

(sola  
(硝材))

250 nm

3

가

, 3  
가

가

2

가

가

가

2

1

3

$$2.5 < | f1/f | < 5 \dots \dots (1)$$

$$30 < | f2/f | < 70 \dots \dots (2)$$

$$15 < | f3/f | < 30 \dots \dots (3)$$

, f1

1

f2

2

f3 3 ,  
f (全系) .

(1) . (1) , (1) 2 가 , 1 2 가  
2 .

(2) 2 . (2) 248 nm ± 3 nm 가 .  
2 가  
, 3 (2) (G3) 2 .

(3) 3 . (3) 248 nm .  
3  
(3) 3 3 (3)  
20, 25 .

1 가 (G1) 2 (G2)  
, 3 (G3) 가 1 (G1)  
2 (G2) 가 3 (G3)

가 , , 200  
2 , ,  
nm 800 nm , ,

가  
가  
356 nm  
nm - OH 가 356  
가 .

(諸元)

5

1

1 1

2 (G2)

3 (G3)

1 (G1)

2 fT 248 nm (全系)  
NA W.D.

가  
R

d

1 1 n248, n486 248 nm, 486.

1 nm

248 nm

$$= (n_{248} - 1) / (n_{248} - n_{486})$$

1

n<sub>248</sub> n<sub>486</sub>

1.508569 1.463166 11.201

1.468016 1.437019 15.098

SrF<sub>2</sub> 1.474122 1.441252 14.424

BaF<sub>2</sub> 1.519923 1.478546 12.565

「mm」가

2

( )

$$f = 4.02$$

NA = 0.55

= 50 ×

W.D. = 7.485

( )

No. R d

1 0.00 7.485

2 - 24.4298 1.30 L1

3 - 127.5017 4.10 L2

4 - 9.2053 0.10

5 - 46.0400 3.10 L3

6 - 20.8995 0.15

7 47.9329 1.30 L4

8 15.6025 4.50 L5

9 - 24.7360 0.15

10 50.5372 4.90 L6

11 - 15.4830 1.35 BaF2 L7

12 17.6252 4.55 L8

13 - 28.3871 0.10

14 64.3340 4.50 L9

15 - 13.7278 1.30 L10

16 9.8383 5.25 L11

17 - 17.1234 1.10

18 - 14.8275 1.30 L12

19 7.7813 4.50 L13

20 - 26.2162 1.50

21 - 13.84011.30 L14

2210.89894.50SrF2L15

23 - 11.28151.30 L16

24 - 45.59260.11

259.21553.20 L17

26 - 301.07271.35 L18

278.395311.50

28 - 38.87261.90 L19

2911.12363.20 L20

30 - 11.86420.30

318.12973.10 L21

32 - 25.37381.30 L22

336.03662.50

34 - 5.62011.30 L23

354.56652.00 L24

3628.1701

( )

$f1 / f = 3.57$

$f2 / f = 60.5$

$f3 / f = 20.47$

2  
51 nm, 1      245 nm, 2      486 nm      ,      248 nm,      2

248 ± 3 nm      486 nm      가

2

3 2

2 (G2) ,

3 (G3)

1 (G1) ,

3

3

( )

$f = 4.02$

$NA = 0.55$

$= 50 \times$

$W.D. = 7.485$

( )

No.Rd

10.007.485

2 - 26.56251.30 L1

3 - 127.50174.10 L2

4 - 9.21300.10

5 - 44.87023.10 L3

6 - 20.34110.15

756.58621.30 L4

815.09585.70 L5

9 - 25.51300.15

1046.00734.90 L6

11 - 16.25741.35BaF2L7

1217.51224.90 L8

13 - 28.83930.10

1465.61964.50 L9

15 - 14.52081.30 L10  
169.87936.20 L11  
17 - 17.42041.10  
18 - 15.14151.30 L12  
197.69544.80 L13  
20 - 27.19411.50  
21 - 14.06091.30 L14  
2211.17824.50SrF2L15  
23 - 11.72541.30 L16  
24 - 49.63950.11  
259.17943.20 L17  
26 - 648.17081.35 L18  
278.329511.50  
28 - 41.57611.90 L19  
2911.06863.20 L20  
30 - 11.74110.30  
318.19963.10 L21  
32 - 24.76251.30 L22  
336.05792.50  
34 - 5.59631.30 L23  
354.55992.00 L24  
3627.9908  
( )  
 $f1 / f = 3.66$   
 $f2 / f = 46.94$



, f1 1 ,  
 f2 2 ,  
 f3 3 ,  
 f (全系) .

2.

1 , 2 1 3 .

3.

1 2 , 3 1 1 .

4.

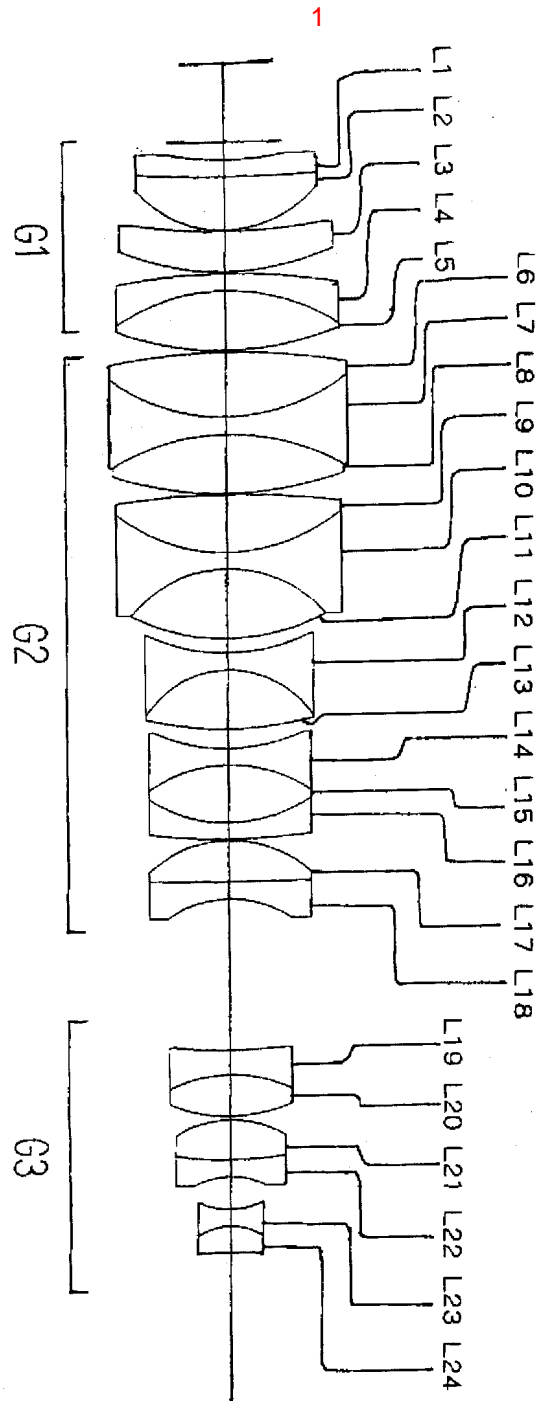
1 3 1 , 1 1 1 .

5.

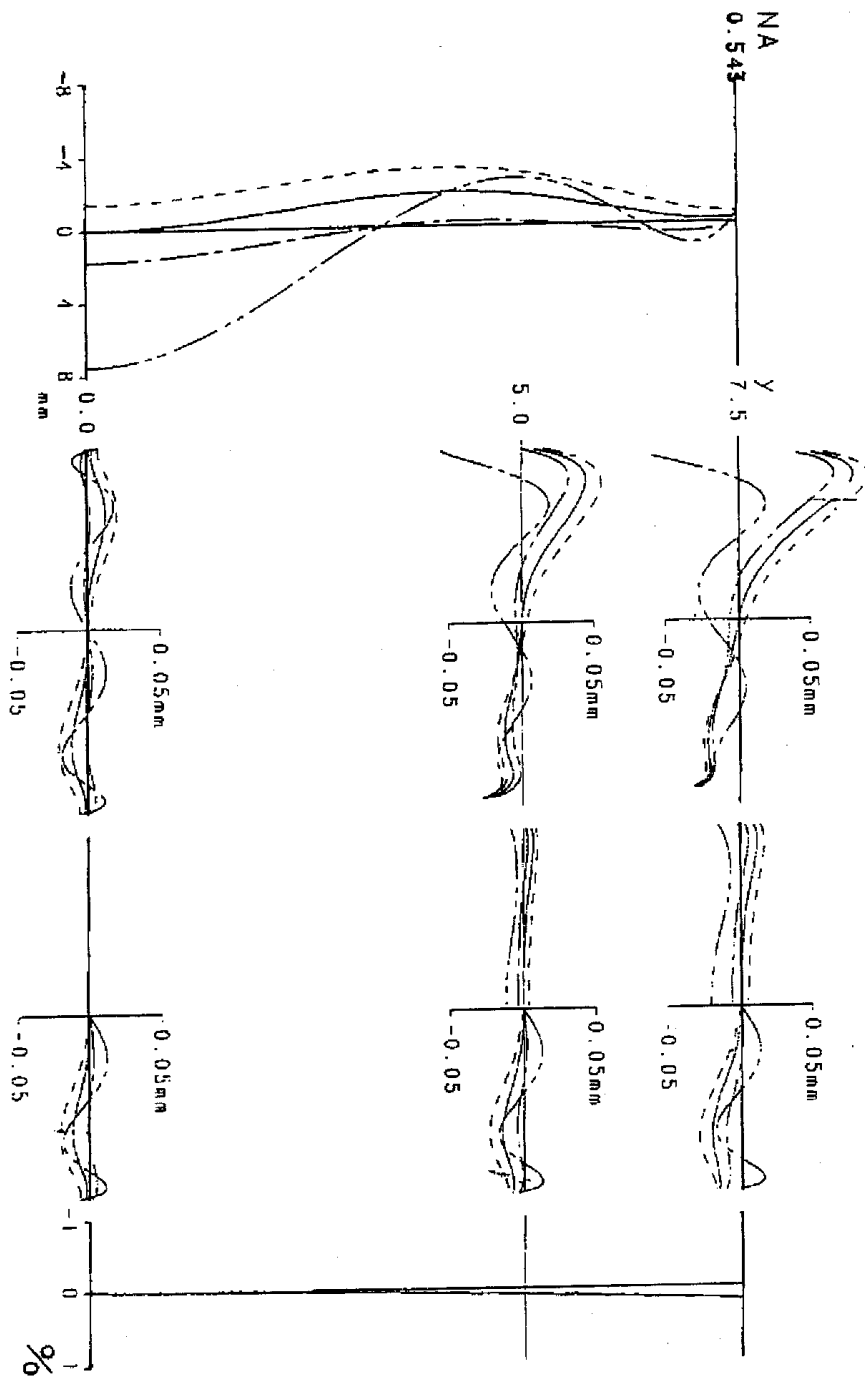
1 3 , 가 , , .

6.

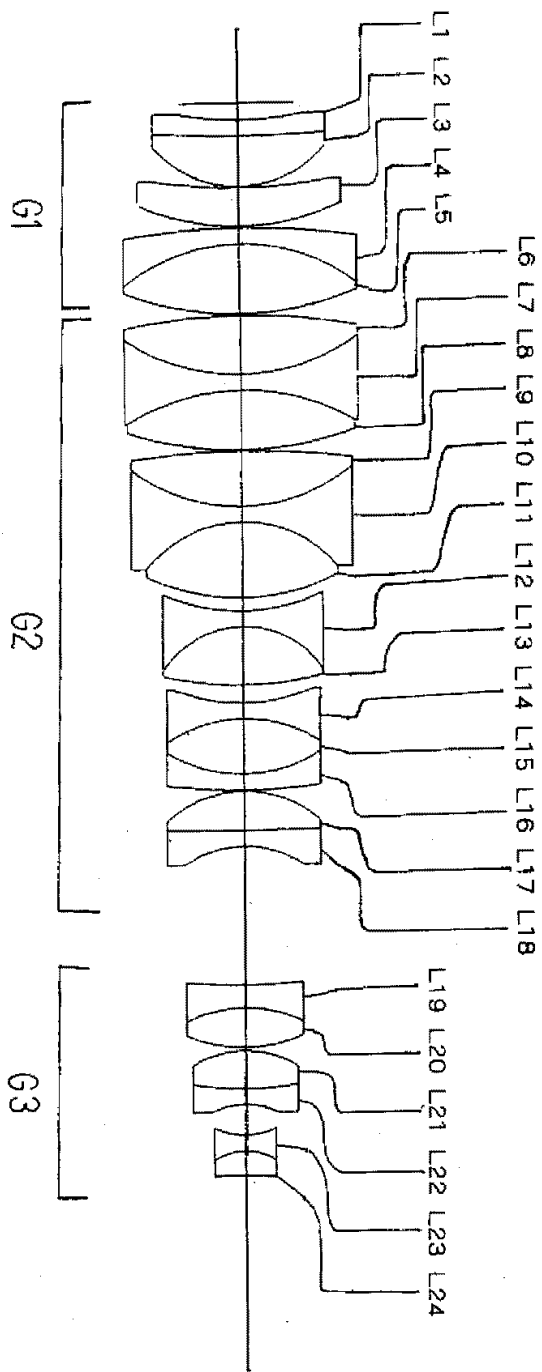
1 , 가 .



구면수차      코마수차 (메리디오널)      코마수차 (서지탈)      왜곡수차



3





5

