

(19)  
(12)

(KR)  
(A)

(51) 。 Int. Cl. <sup>7</sup>  
H01L 21/027

(11)  
(43)

2003 - 0022077  
2003 03 15

(21) 10 - 2002 - 0053882  
(22) 2002 09 06

(30) 01307613.8 2001 09 07 EP(EP)

(71) . .  
5503 1110

(72) - 3039 29

- 5503 56

- 5591 15

- 5628 18

(74)

:

(54)

(11) (10) (IFL) 가 (PB) 가 (PB)

1 1 ,

2 3 가 , 1 ,

4 5 2 가 , 2 3 ,

6 2 ,

7 3 ,

8 7 가 3 가 ,

9 7 ,

10 7 가 , 9 ,

11 7 가 , 7 ,

12 3 ,

13 4 (finned) ,

14 15 13 ,

16 17 가 ,

5 18 , 16 17 2 ,

19 가 5 2 ,

20 5 ,

21 22 22 1 가 , 6 2 ,

23 6 ,

24 6 ,

25 6 (grazing incidence)

,

- ,

- ,

- ,

- ,

- ,

- .

" (patterning means)"

(light valve)"

( ) .

- , (binary) , (altern

ating phase - shift)

가 , ( )

( )가 .

- 가 , (viscoelastic control layer)

ea) , ( ) (addressed ar

US 5,296,891 US 5,523,193

- 가 LCD , US 5,229,872

가 ,

가

(IC) , IC

가 (step - and - scan apparatus) (wafer stepper) ( " )  
 V M ( < 1 ) 가 M 가 .  
 , US 6,046,792

( priming ), ( PEB ), IC ( ) ,  
 / 가 ( ) ,  
 , 가 ( )  
 " M  
 icrochip Fabrication: A Practical Guide to Semiconductor Processing" ( 3 , Peter van Zant , McGraw Hi  
 ll , 1997 , ISBN 0 - 07 - 067250 - 4 )

( catadioptric )  
 " " 가 , 2 가 ( / 2 )  
 1 ) 가 " " 가 가  
 1 US 5,969,441 WO 98/40791 가

( dose )  
 가 , ( ) 가 ( integ  
 rator ), ( fly ' s eye lens )  
 가

US 6,013,401

가

US 5,895,737

- -

(linked blade)

가

(pupil)

(asymmetric filling)

(telecentricity)

EUV

umbra)

(pen

가

가

y

가

y

가

가

가

2

가

(dynamic adjustment)

가

가

)

가

( )

( )

(

가 , /

가 (fine grid)

(dense portion) (reflective background) 가  
(near - angle and far - field stray light) (background intensity) (pattern dependent effect) 가

- ;
- ;
- ;
- ;

가 IC 가 , 가  
" " , " " " " 가 " " "

, " " " " ( 365, 248, 193, 157 126nm ) ( 5 20nm ) (EUV)

1

1

- ( , EUV ) (PB) (Ex, IL)( (LA) );

- (MA)( , ) 1 (PM) 1 ( 가 , (PL) ) (MT);

- (W)( , ) 2 ( 가 , (PL) ) (WT);

- (W) (C)(1 ) (MA) (" ") (PL) ( , ) ( , ) (reflective type) . , , 가 ( , ) .

(LA)( , ) (IL) 가 , (Ex) (IL) / ( - - ) (AM) (IN) (CO) (MA) (PB)

1 , (LA) ( , (LA) ) (가 , ) (LA)

(PL) (PB) (MT) (MA) (MA) (PB) (W) (C) (PB) . 2 ( (IF))(PW) (WT) , (PB) (C) (MA) , 1 (PM) , (MA) (MT, WT) , (PB) (MA) (long - stroke module) ( ) ( ) (MT)

가

1. " ) (C) (MT) (WT) x / y , ( , " ) (C)가 (PB)

2. , (C)가 " " (MT) v ( " " , y ) (PB) (WT) V=M v , , M (PL) ( M=1/4 M=1/5 ) (C)가

2 3 (11) (10) (10) (PB) (IL) (MA) (MA)

가 (facet mirror) 가 가

(11) (IFL) 가 ( ( ( (tail - off) 가 (12)가

4 5 가 (11) 2 3 가 ( - ) (11) 10% 가 가 4 64mm 60 가 , EUV NA = 0.25 = 0.5 30mm (stand - off distance)가 1/4 1/5 , 가 , DUV

curation) 가 가 (obs (12) 가 (12) (10) 4가 (10) (calibration run) (12) ( 13) 가 가

2 , . EUV

(10)

(IFL)가

(11)

가

1

가

가

3

가 , 1 2  
가

가

가  
가

4

가

1

가

/

가

(XY )

2

2

1

6 2

(20)  
(IFL) 가

(Y)

가

(22)

1

가 . 1 가 , 가 .

2 (20) 가 가 .

4 (22) 가 가 (20)가 1 1, 2

(arcuate illumination field) 가 , 가 ,

3

3 , 7 (MA) 2 , 가

(31) (32) (30)

7 가 8 가 (Y) 가 가 (IFL) (Y)

가 가

(31) 10 (IFL) (31)

(IFL) (33) 가 U (32) 가 (32)

(31)가 가 (IFL)

11 (31) 가 , (31) U

(35) (35) (35) (36)

12 (37)가 (35)

, 3

4

(Y) 4 1 , 가

(41) (43) (44) (41) 13 (44)

(Z) (41)가 (45) (3) (45) 가 14 (PB) (43) (45) 가  
 (voice coil) 0% 100% 가 가  
 (46) (45) 가  
 (46) 가 가

(41) (spark erosion) (gray scale adjustment) 가  
 (parallel arrangement)

5 (IFL) (Y) 가 (IFL)  
 5 16 17 (51) 17  
 (50) (51) 가

18 (IFL) (52) 가 2 (51) (5  
 2) Y 가 X 19 (53)  
 ( ) 20 (51)가 ( )  
 Y (52, 53)

6 21 25 6 가 5

6 (61) (IFL) 가 (62)  
 (61) (62) ( )  
 (64) (63) 가 22  
 가 (64) 가 (64)가  
 (65) (dummy) (66) 23  
 (61) 가 24 (67)가 (61) 가  
 (64) (61) (grazing incidence)

(61)가 가  
 (61) (61)

(61)

(68)가

가

(ridge)가

7

7 ( )

가

(arm)

(57)

1.

- ,

- ,

- ,

- ,

- ,

2.

1 ,

가

3.

1 2 ,

4.

1 3 ,

5.

4 ,

가

6.

1 2 ,

7.

6 ,

가

8.

7 ,

9.

7 8 ,

가 U , U

10.

7 8 ,

가 가

11.

1 ,

(fin) ,

2

1 가

12.

1 ,

가

13.

12 ,

14.

12 ,

15.

1 14 ,

가

16.

- ;

- ;

- ;

- ,

17.

16 ,

.

18.

17 ,

,

.

19.

17 18 ,

가

,

.

20.

17 19 ,

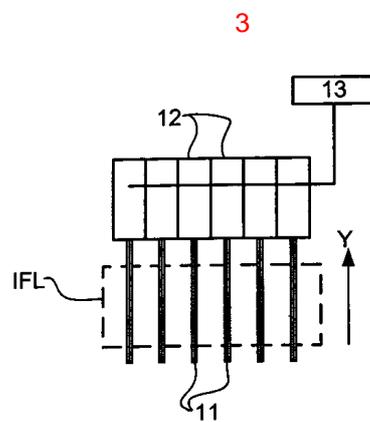
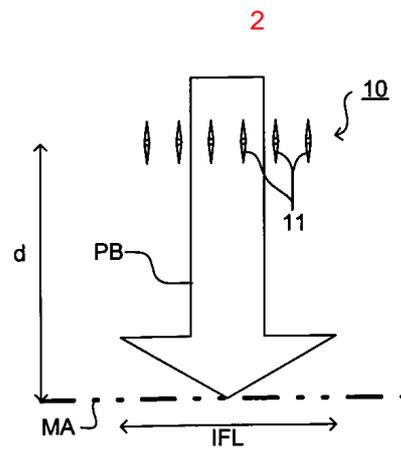
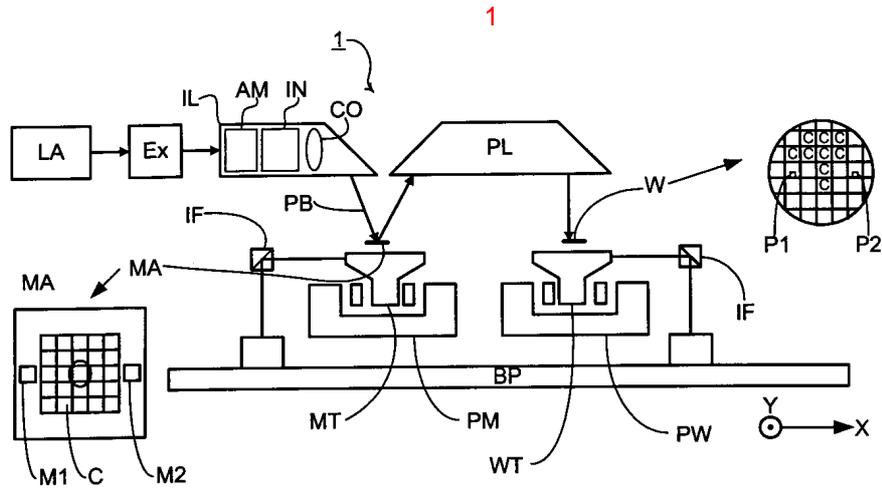
가

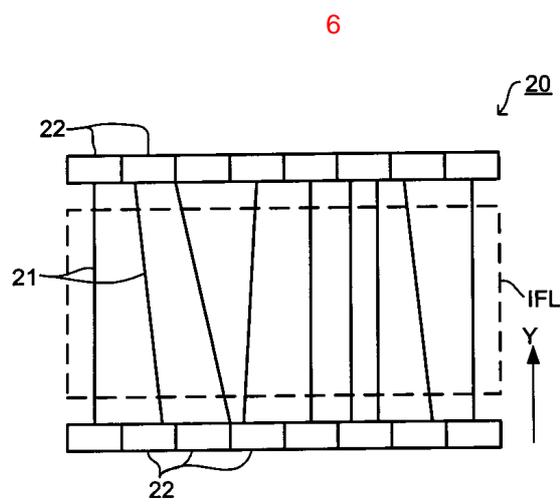
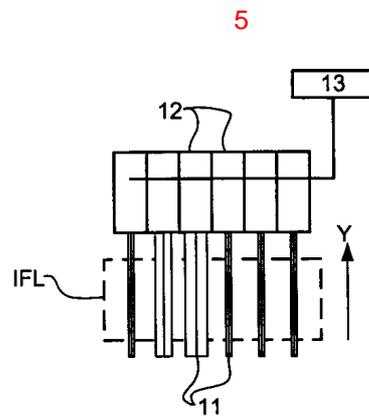
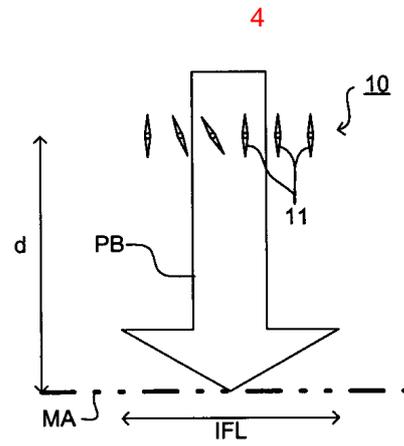
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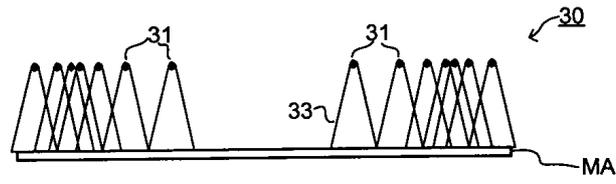
16 20

.





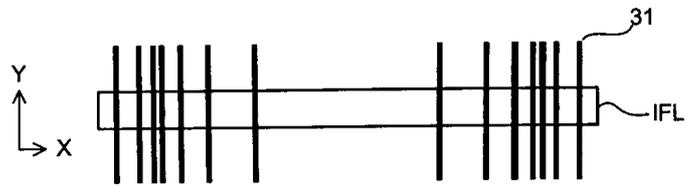
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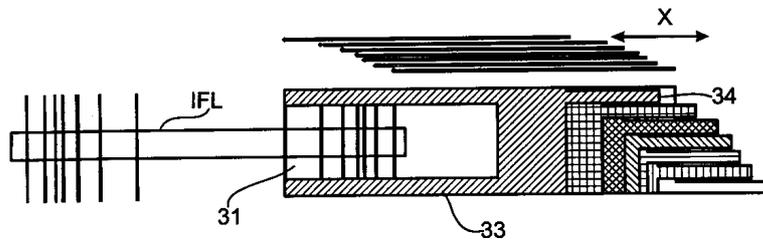
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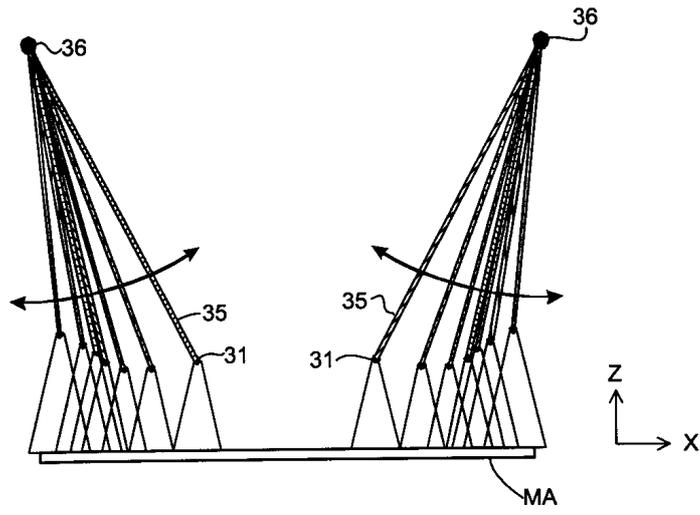
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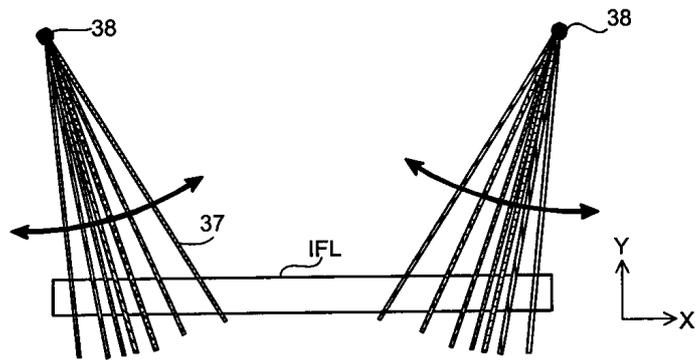
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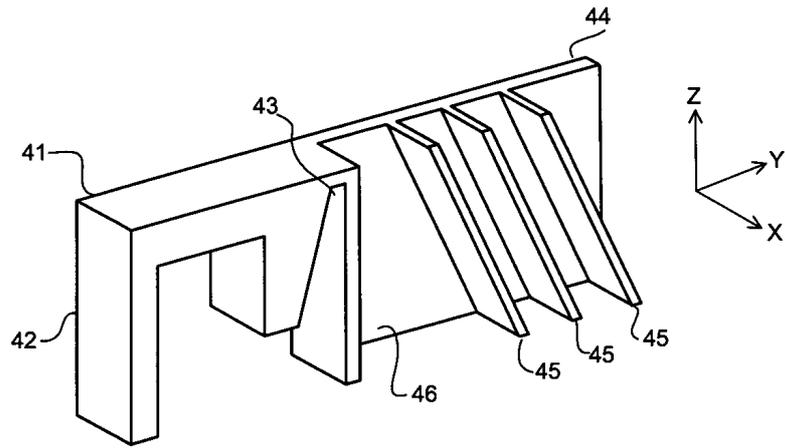
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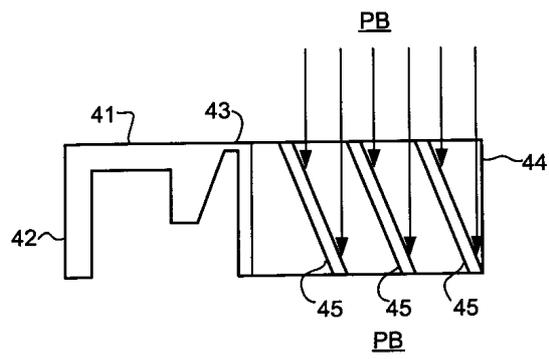
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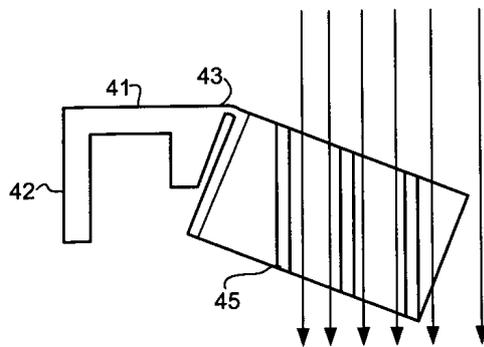
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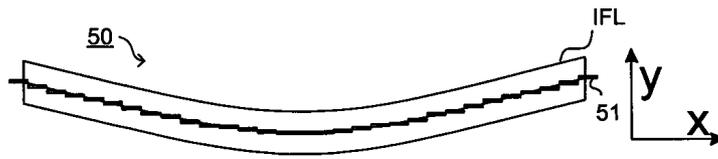
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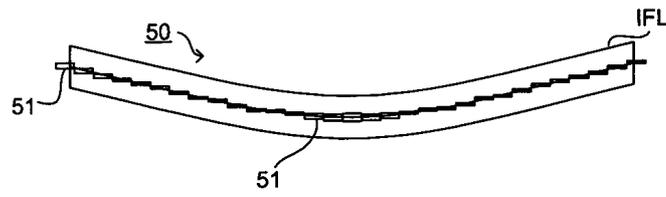
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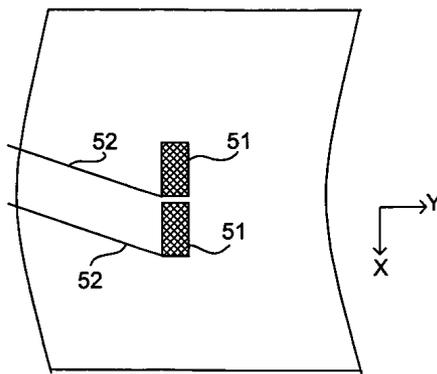
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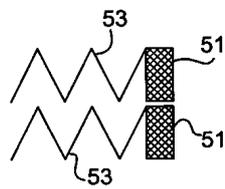
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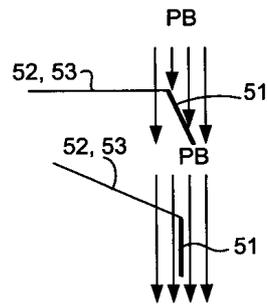
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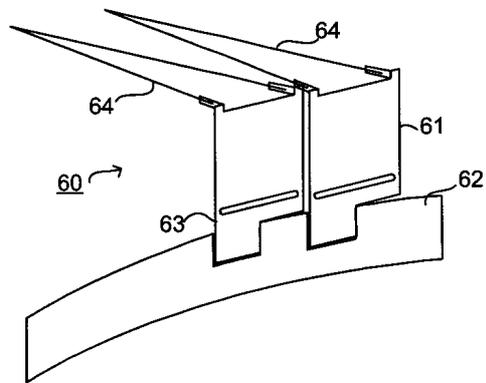
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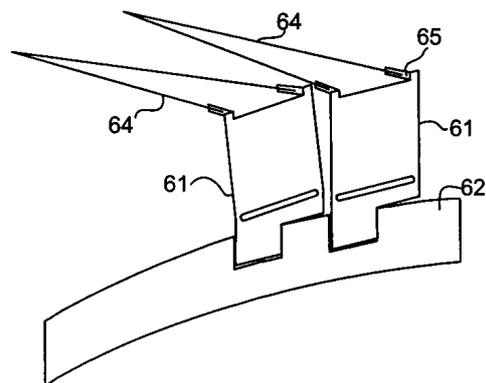
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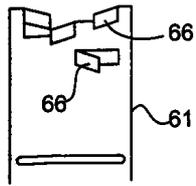
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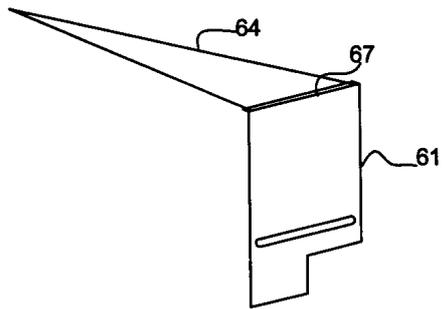
22



23



24



25

