

(19)  
(12)

(KR)  
(A)

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(43)

2001 - 0062063  
2001 07 07

(21) 10 - 2000 - 0072409  
(22) 2000 12 01

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(71) 가 가  
가  
1 4 1

(72)  
4 2610  
가 4 2610  
4 2610  
가 4 2610  
4 2610  
4 2610  
4 2610  
4 2610

(74)

:

(54)

가 ,

1 2 2 : 1 가  
 1 ; 3 x 3 9 1  
 ; 9 -  
 1 2  
 1 2  
 (optical element)

1

1

2

1

3

1

4

1

5

6 (image)

(aberration)

7

1

(photodetecting section)

8

1

9 3 -

10a

10c

11

12

2

13

2

14

2

15

3

16

3

17a

17c

(beam spot)

(major axis)

(track)

18a	18c	(beam spot)	(major axis)	(track)	,
19a	19c	(beam spot)	(major axis)	(track)	45 ° ,
20			4		.
21			4		.

(read wavelength)

, DVD(Digital Versatile Disc), CD(Compact Disc)

(one - chip laser diode)

CD DVD DVD/CD DVD/CD 1 - 2 -

CD DVD DVD (protection layer) (0.6mm) CD  
 가 , DVD  
 CD 가 , CD DVD  
 , CD (information pit) 가 CD DVD  
 , CD DVD

re) (unifocal optical pickup) CD DVD 가 , (numerical apertu  
 가, , DVD , CD ,  
 CD , (bifocal optical pickup) DVD/CD

DVD/CD 1 1 1

가 (light - emitting means); 3 x 3 9 (photo detection means) ; 1 (optical element)

1 2 x 2 9- 4 9 2 9- 4 가

9- 1 2 : 1 2 1 가 , 1

(synthesizing prism) 1 DVD/CD (DVD/CD compatible player) , (beam splitter)(13) , CD 1 (10) DVD (aperture limiting element) (dif

1 (optimal wavelength) (10) , 1 (11) CD (grating)(12) 1 (13) (irradiate) 1 3 (13) 1 (10)

1 (10) (650nm) 2 (15) , 2 (16) DVD (17) 1 (13) 2 (15) , 2 (14)

2 (14) 1 (13) , , 1 (10) 2  
 (15) (18) (19) (19)  
 2 (14) (condensed beam spot) , (in  
 formation reading light) (21) (information recordin  
 g surface)

1 (10) ( ) , (21) (C) ,  
 (19) . 2 (15) ( ) , (21)  
 (D) , (19)

(19) (21) (19)  
 (18) , 2 (14) , (astigmatism generating e  
 lement) (22) , (23) (23) 가  
 (25) , , , (24)

(24)  
 (demodulation) (error correction) . (25) ,  
 (21) (21)  
 (ID) (26) , 98 - 255274  
 ID , (26) 1 (11) 2 (16)

(25) ID 가 CD , (26) 1  
 , 1 (10) (21)  
 (12), 1 (13), 2 (14), (18), (19)  
 (25) ID 가 DVD , (26) 2  
 (16)

, 2 (15) (21) ,  
 (17), 1 (13), 2 (14), (18), (19)  
 , CD (recording density) 가  
 (21) 1 (10) DVD 2 (15)  
 가 (21)  
 , (21)

(21) ( ) (19) (18)  
 , 2 (14) (22) (23) . 1  
 (10) (returning light) 2 (15) ,  
 (optical component) (former light) (latter light)

signal) , 가 (focus servo control)가 가 (focus error , (astigmatism generating element) 가 2 가 1 (10) 가 , , 가 , DVD/CD (synthesizing prism) , 1 (10) 1 (13) (light beam) , 2 (15) 1 (10) 1 (13) , DVD CD CD - R(Compact Disk Recordable) 가 , 2 1 (100) (100) (100) : (50); (tracking error signal (sub beam) (51); (50) (55) (55) (5) (60) (half mirror)(52); (condense) (54); (56); (beam spot) (60) , 3- (50) DVD (50) , CD CD - R 780nm (one - chip) (30) (30) , 4 (30) 3 4 (sub - mounting) (30) 3 6) , 300 $\mu$ m x 400 $\mu$ m x 100~120 $\mu$ m (34) , (34) 650nm (3) -x-y P (33), Al<sub>x</sub>Ga<sub>y</sub>In<sub>1-x-y</sub> P (34), p Al<sub>x</sub>Ga<sub>y</sub>In<sub>1-x-y</sub> P (35) (36) 1 650nm (30) , (38) 780nm (40) , GaAs (31) n Al<sub>x</sub>Ga<sub>1-x</sub>As (37), Al<sub>x</sub>Ga<sub>1-x</sub>As (38) p Al<sub>x</sub>Ga<sub>1-x</sub>As (39) (40) 2 780nm 2

43) 4 $\mu$ m 가 (34,38) (isolation groove) (32)  
 . (30) : GaAs (31) (41); 1  
 650nm Au (42); 2 780nm Au (  
 (50) (30) , 1 2  
 , " " , 가 ,  
 가, , , " " 1 -

4 , (30) , Al (45,46) (44)  
 , " " (30)  
 , (44) (41) 가 , (44) 650nm Al  
 (45) 780nm Al (46) , 650nm (42) 780nm (43) Al  
 (45,46) (lead) (41) Al (45,46)  
 . (41) Al (45) 가 , 650nm 1 (emission wind  
 ow) (47) (41) Al (46) 가 , 780nm 2  
 (emission window) (48) 4 ,  
 , (30) , ,  
 , (50) , .

1 (100) 1  
 (100) (50) , 650nm 1 650nm (36)  
 780nm 2 780nm (40) , 100nm  
 가 . , 2 , 1 (optical path) 2

1 2 가  
 ) ; 1 (Ldr); 2 ( ) ; 2 ( )  
 (Lcr) . 1

(light - emitting section) (36) (37)  
 (50) 100nm , 1 가 2 , , ,

5 , (L) (Y) (Ei) (beam spot)  
 . (L) (Y) (Ei) (Ei)  
 (Ea) (Y) , " " " H" , (aberration)가 . 가  
 , 가

6, DVD가, , D  
 , CD가 , 가 CD가 , DVD 가 ( ) CD  
 VD가 , 가 CD가 , DVD 가 0 , , DVD  
 DVD 가 ( ) 가 CD , DVD  
 , DVD , DVD 가 CD ,  
 , CD 가 , ,

(50) 650nm 1 (100) , 1 , 650nm (36)  
 가, 2 (36) 780nm (37)  
 , DVD 가 CD .  
 2 , DVD CD . (50)  
 (100) ,

DVD (55) , (50) 1 (Ld)(  
 ) , (51) (52) , (53)  
 a) , 0 (0 - order light), ± , 1 , (54)  
 condense) , DVD (54b)가 (55) (D) 1 , 0 DVD (54)  
 (53) , (52) 1 (Ldr) (54)  
 , (60) 1 . (56)

CD (55) , (50) 2 (Lc)(  
 ) 가 (51) (52) , (53)  
 , 0 (0 - order light), ± , 1 , (54a)  
 , (54b) , (54a) 2 , ± 가 CD  
 , (55) (C) , CD (C) (Lc) ±  
 (Lcr) , (54) (53) , (52) 2  
 , (56) (60) 2 (62)

(D,C) (Ldr,Lcr) , (53), (52),  
 (54) (56) (optical component) ,  
 (60) , 가 , 1 2  
 (Ldr,Lcr) 가 .

가 , (100) (60) 1 2  
 , , (Ldr,Lcr) (Ldr,Lcr) 가 7 8  
 , 7 (60) , 8 (60)

7 , 3 - (60) : DVD( 1  
 ) (main beam) 4 (3,4,7 8) 1 (61); CD( 2  
 ) (M2) 4 (1,2,5 6) 2 (62); 1  
 (S1a,S2a) 2 (S1b,S2b) (63a,63b)  
 가 (TE) 1 (61) 2 (62)  
 , (64) 2 (63a,63b) 1 (61) 2 (62)

8 , 1 (61) 2 (62) , (light - receiving surface)  
 (Ldr,Lcr) (main ray) 가, , L  
 1 2 (Ldr,Lcr)

, 1 (61) , (56) 가 (Ldr)  
 , 2 (2) (56) 가 (Lcr)  
 )

(63a,63b) (h) 1 (61) 2 (62)  
 (63a,63b) , 1 (S1a,S  
 2a) 2 (S1b,S2b) ,

1 (61) 2 (62)  
 , 가 가

3 - , 9, 10a 10c , 9 , 3  
 - , (M) Q (S1,S2)  
 (Q) (track pitch)(P) 1/4 (S1,S2)  
 (63a,63b) , (detection output) (TE)가

4 - (4 - segment detecting section) (segmenting line)

, 10b  
 , (FE) " 0" ,  
 , (56) , 10a 10c ,  
 , 가 가 (FE) , 4  
 (spot image) , 가

11 , (TE), (FE) (60)  
 가 RF (81~86) 3 (87~89) 11 (80) 6  
 , (63b) " C" , 1 (63a) " A" 2  
 , (1,2,5 6)

8" (3,4,7 8) " B1" , " B2" , " B5" , " B6" , " B3" , " B4" , " B7" " B

(63a,63b) , 1 2

(63a,63b) (A C) (89) , " A - C"  
(TE)

1 2 (61,62) B1 B8 , 2 (62) (B1,B6) 가  
(81) 가 . , (B2,B5) 가 (82) 가 . 가 (81,82) 가 (85)  
가 . 가 (85) B1+B2+B5+B6 , 2 (62) RF ( (81,82) (87) (87) (B1+B6) - (B2+B  
2 RF ). 가 (81,82) (87) (87) (B1+B6) - (B2+B  
5) , 2 (62) (FE) ( 2 FE ).

1 (61) (B3,B8) 가 (83) 가 . , (B4,B7) 가 (84)  
가 . 가 (83,84) 가 (86) 가 . 가 (86) B3+B8+B4+B7  
, 1 (61) RF ( 1 RF ). 가 (83,84) (88)  
(88) (B3+B8) - (B4+B7) , 1 (61) (FE) ( 1 FE  
) .

(66) (100) 2 12 14  
(66) , 13 (66) . 1 12

12 (66) : 1 2 (M1,M2) , 1 (61)  
2 (62) 가 6 - (65); 1 2 (S1a,S2a,S1b S2b  
) , (TE) (63a,63b) . 6 -  
(65) 6 - (65) 가 (63a,63b) (64)  
6 - (65) (63a,63b)가 .

(M1) (66) , 13 (64) , 1  
, (main ray) L , 2 (M2)

14 (66) , 6 - (65) , (63a,63b) 1  
2 (main rays) . 1 (M1)  
, 2 (M2) , 1 ,

12 , 1 (M1) (65) (2,3,5 6) ,  
2 (M2) (65) (1,2,4 5) . , (65)  
(2,5) (M1,M2)

1 (2,3,5 6) B2  
 +B6+B3+B5 DVD RF (B2+B6) - (B3+B5) DVD  
 (FE) 2 , B1+B5+B2+B4 CD RF , (B1+B  
 5) - (B2+B4) CD (FE) (TE) 1 A - C  
 1 (60)

(70) (100) 3 15 16  
 (70) 1 가 , 1 15  
 (70) , 16 (70) .  
 (70) : 3 x 3 (1-9) 9- (71); 1 2  
 (S1a,S2a,S1b S2b) , (TE)  
 (63a,63b) 9- (71) 9- (71) 가  
 (63a,63b) (64) 9- (71) ( )  
 63a,63b)가 , (70) , 16  
 (64) , 1 (M1) , 2 ( )  
 M2) , (main ray) L .

15 (M1) (5,6,8 9) , 2  
 (M2) (1,2,4 5) . 1 , B5+B9+B6+B8  
 DVD RF , (B5+B9) - (B6+B8) DVD (FE) , 2  
 , B1+B5+B2+B4 CD RF , (B1+B5) - (B2+B4) CD (FE) .  
 (TE) 1 2 A - C .

9- (71) (70) ,  
 (50) .  
 (66)가 , (66) (50) , 8  
 , 9- (71) (70) ,  
 , (70) , 17a 17c, 18a 18c  
 19a 19c .

17a 17c , 가 , (55)  
 , (50)가 .  
 , 17a , (a  
 djoining pit) . (resolution) , RF , (detection  
 precision) . , (ON track)  
 . (track count) (desired addre  
 ss) (search) , .

, 9- (71) 1 (main beam)(M1) (2,3,5 6)  
 , 9- (71) 2 (main beam)(M2) , 17b  
 , (1,2,4 5) (70) , 17c (guide structure)  
 , (main rays) 1 2  
 (light - receiving point) 가 (desired value) ,  
 (70) , , " X" 가 1 2 (light - receiving point)

18a 18c , 가 (55)  
 (50) , 18a  
 , (resolution)가 17a ,  
 17a (track detection precis  
 ion)

5) , 9- (71) 1 (main beam)(M1) (1,2,4,  
 , 9- (71) 2 (main beam)(M2) , 18b  
 , (4,5,7 8) .  
 , (M1,M2) , 17b (70) ,  
 . 1 2 가 17b ,  
 (guide structure) (70) 가 , 17c  
 , " X" .

19a 19c , 가 45 ° (55)  
 , (50)가 , 17a - 17c 18a - 18c  
 (ON track detection precision) 가

, 9- (71) 1 (main beam)(M1) (2,3,5 6)  
 , 9- (71) 2 (main beam)(M2) , 19b  
 , (4,5,7 8) , (M1,M2) , (70)  
 , 1 2 가 17b 18b  
 , (70) , (guide structure) , (main rays)  
 , 19c " Y" .

가 ,  
 , 18a - 18c , RF (precision of photoelectric conversion of the RF signal)  
 RF (conversion power of the RF signal) ,  
 , 17a - 17c , (track detection precision)



1 2 , (optical element)  
1 2 ,

2.

1 2 x 2 1 2 9- 9 4 1  
, 2 x 2 , 9- 4 , 9- 1  
4 4 2

3.

2 , 4 가 ,

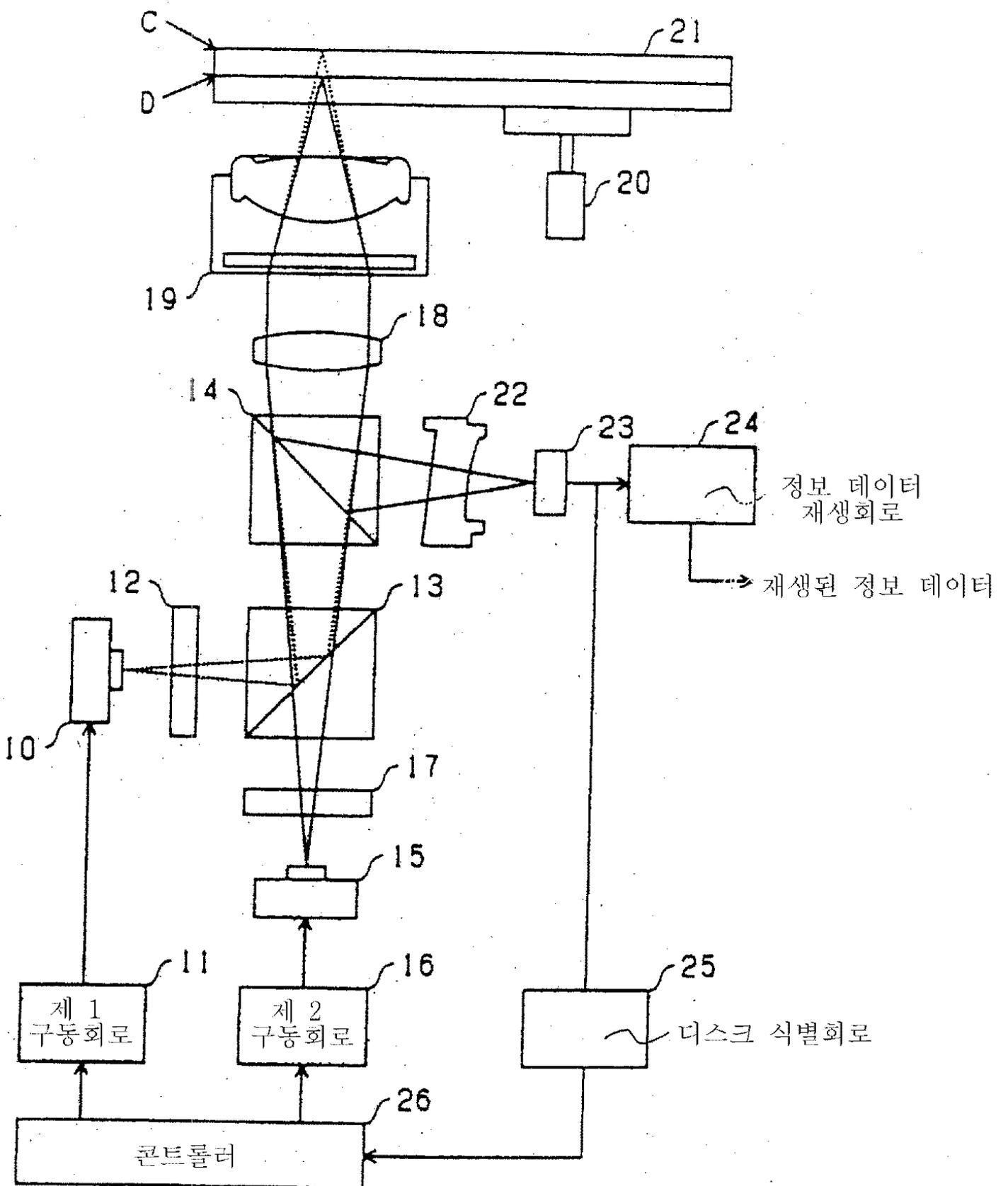
4.

2 , 1 9- 1  
, 2 2 1 2 1

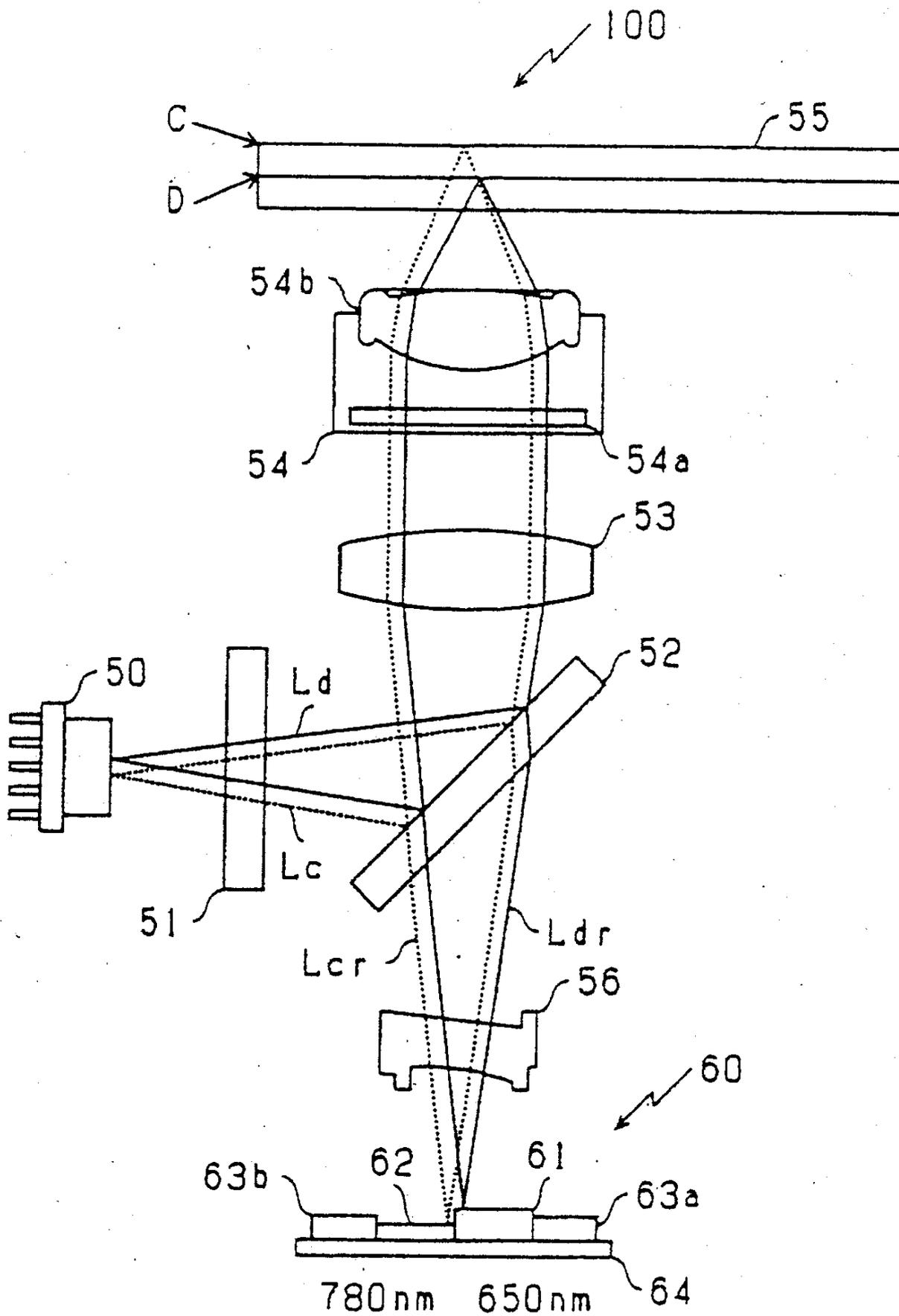
5.

3 , 1 9- 1  
, 2 2 1 2 1

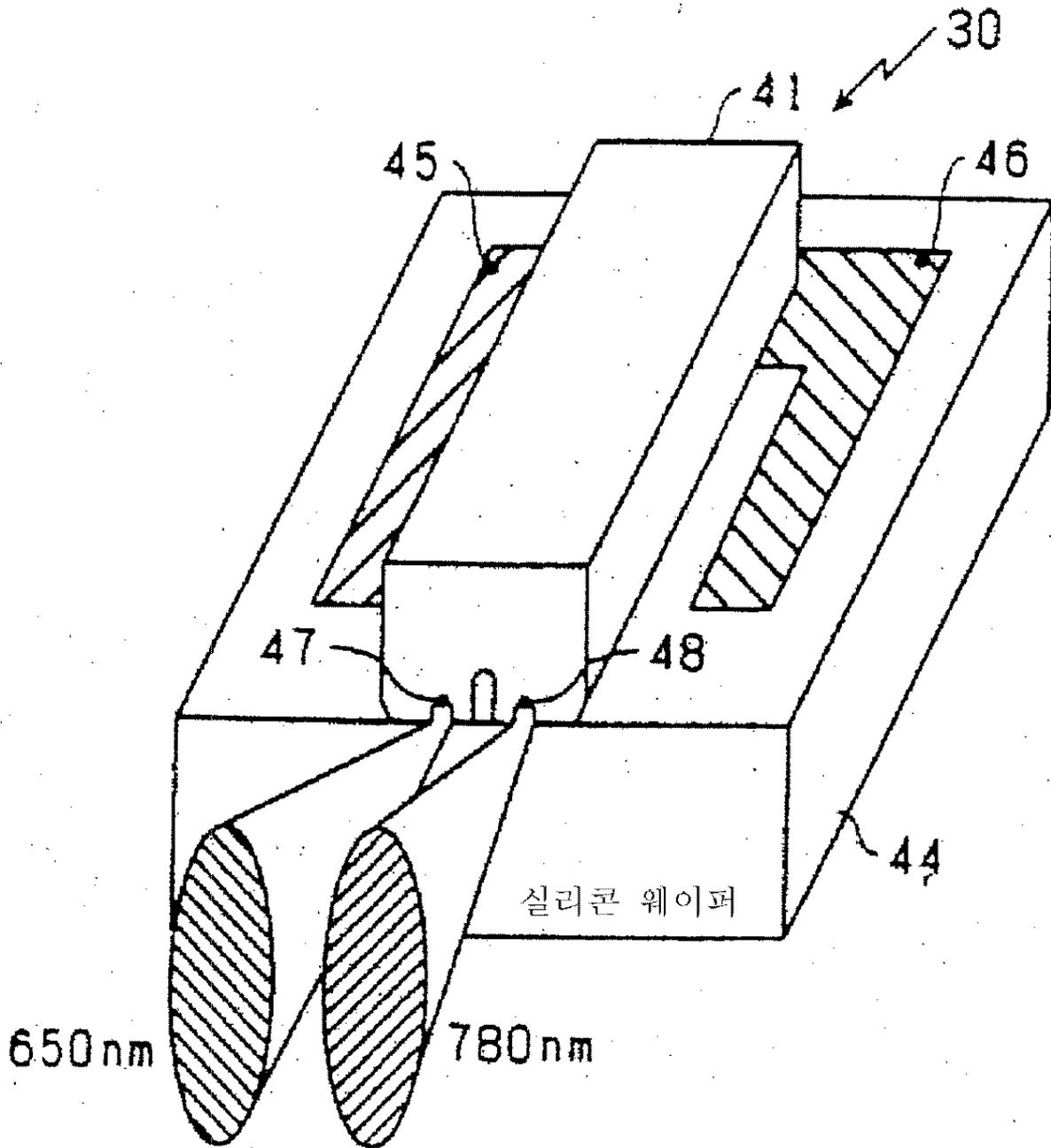
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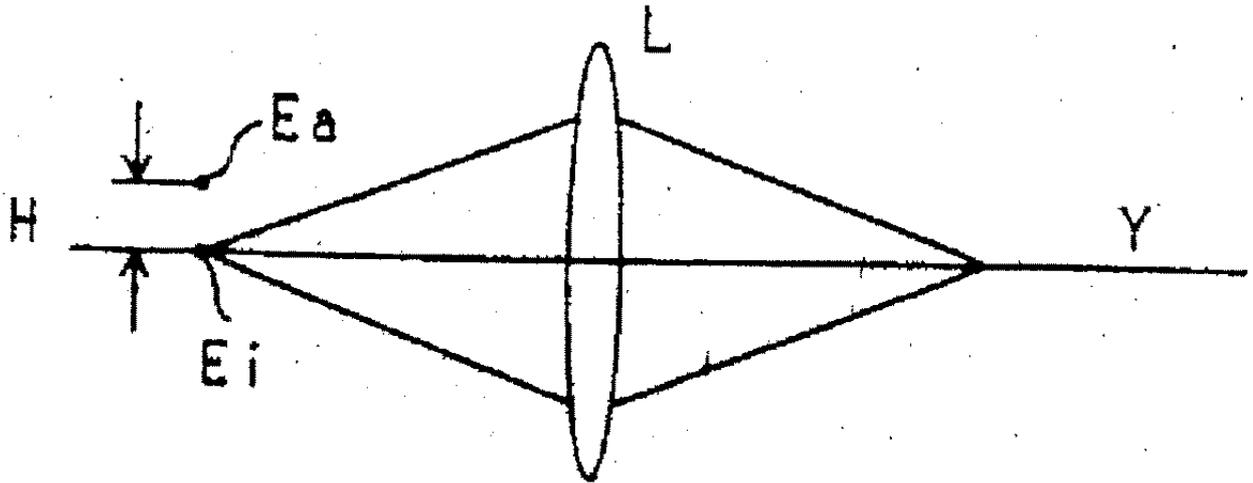
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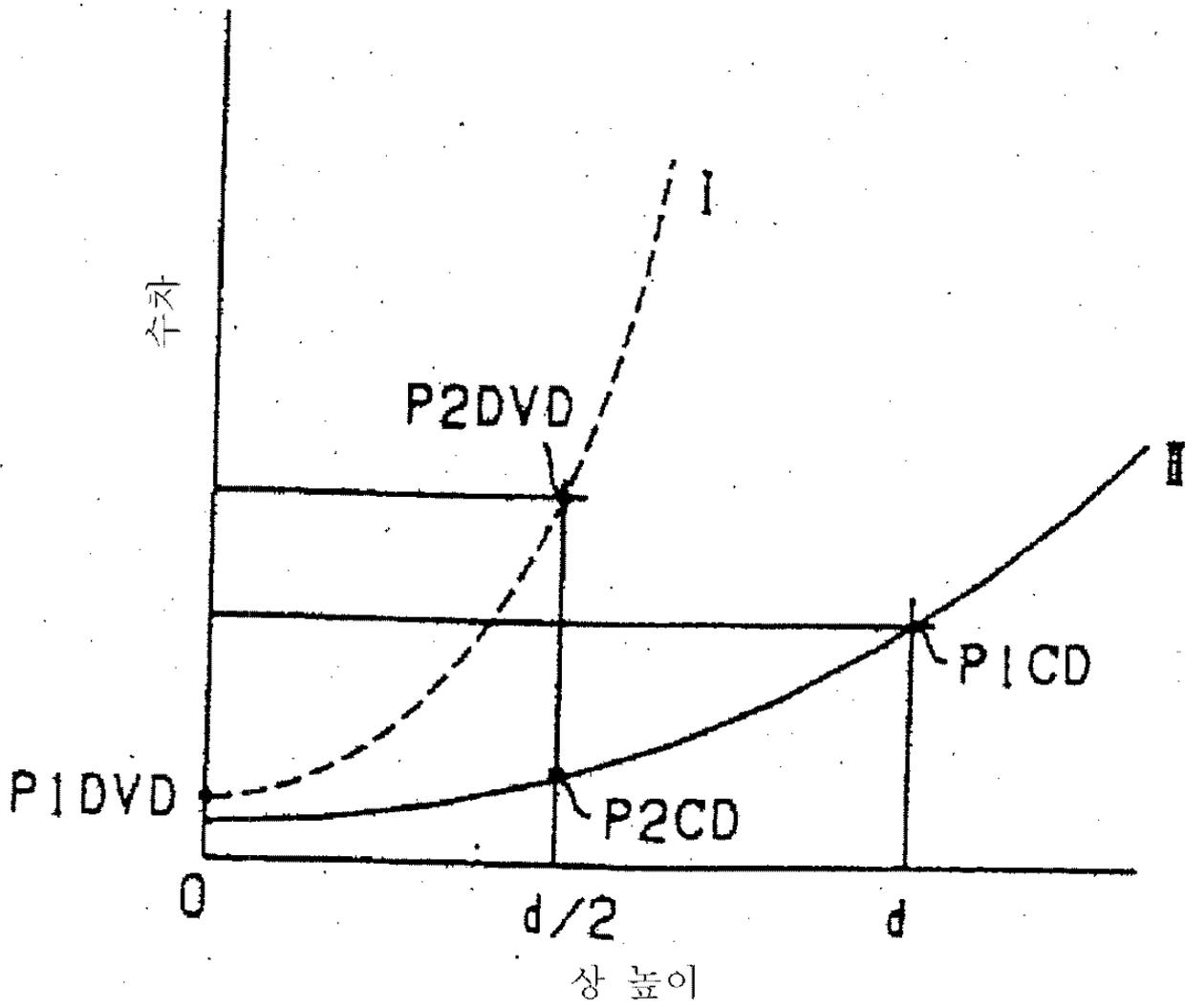




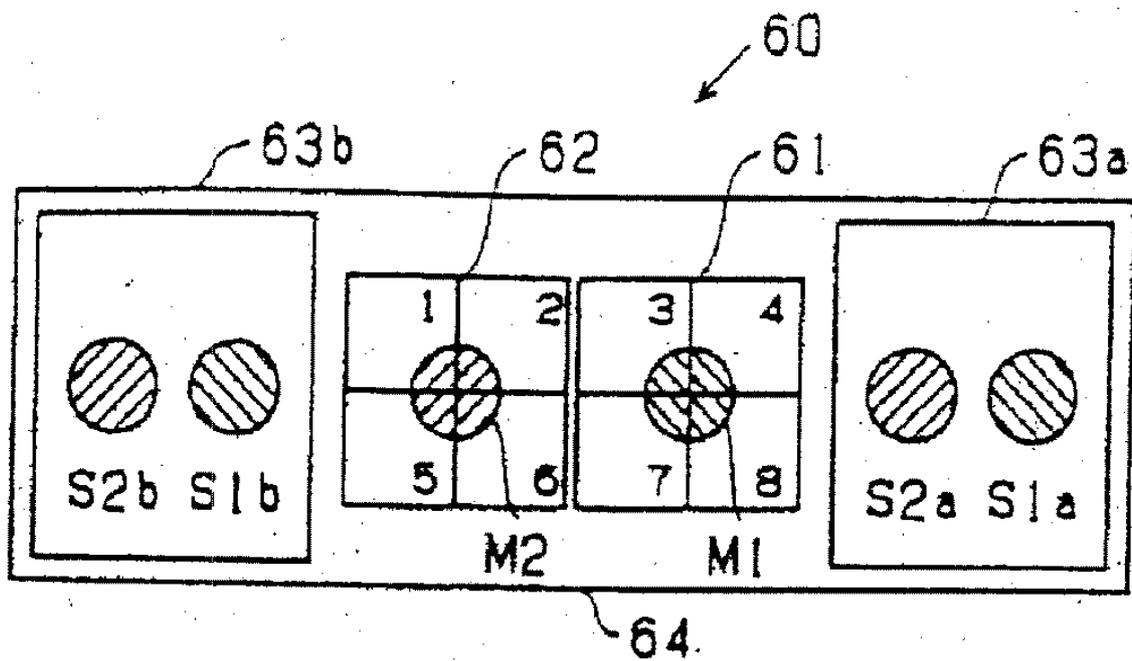


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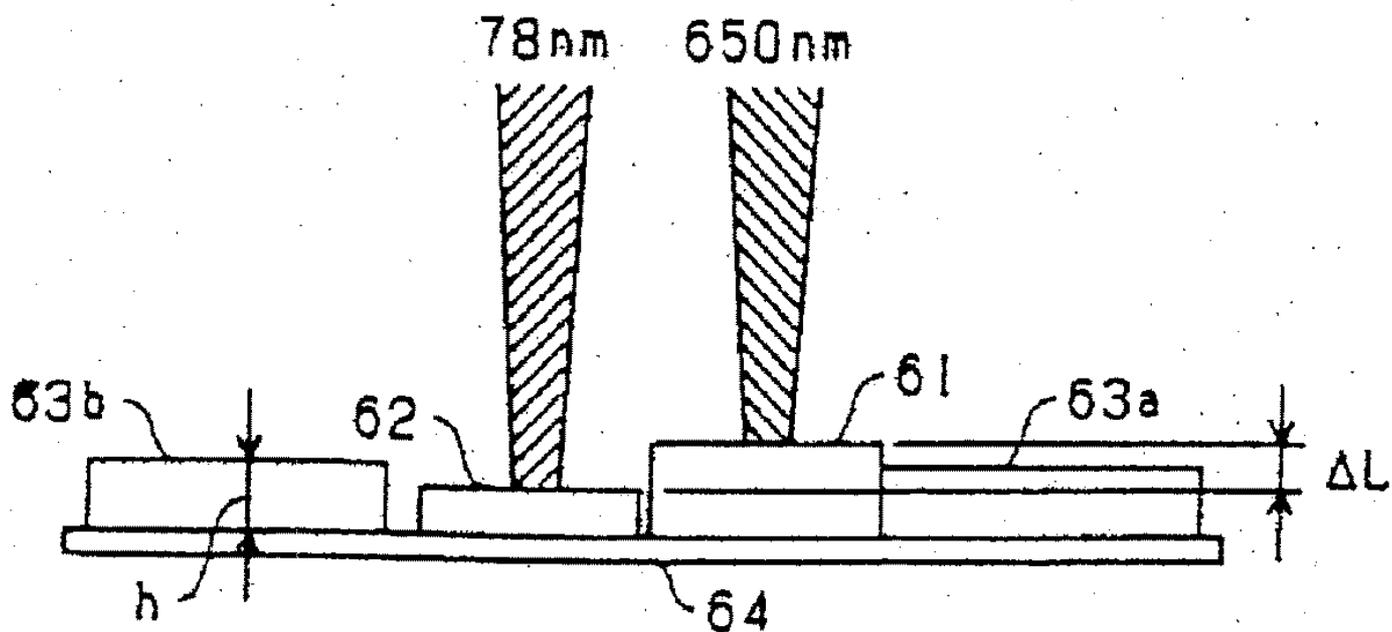


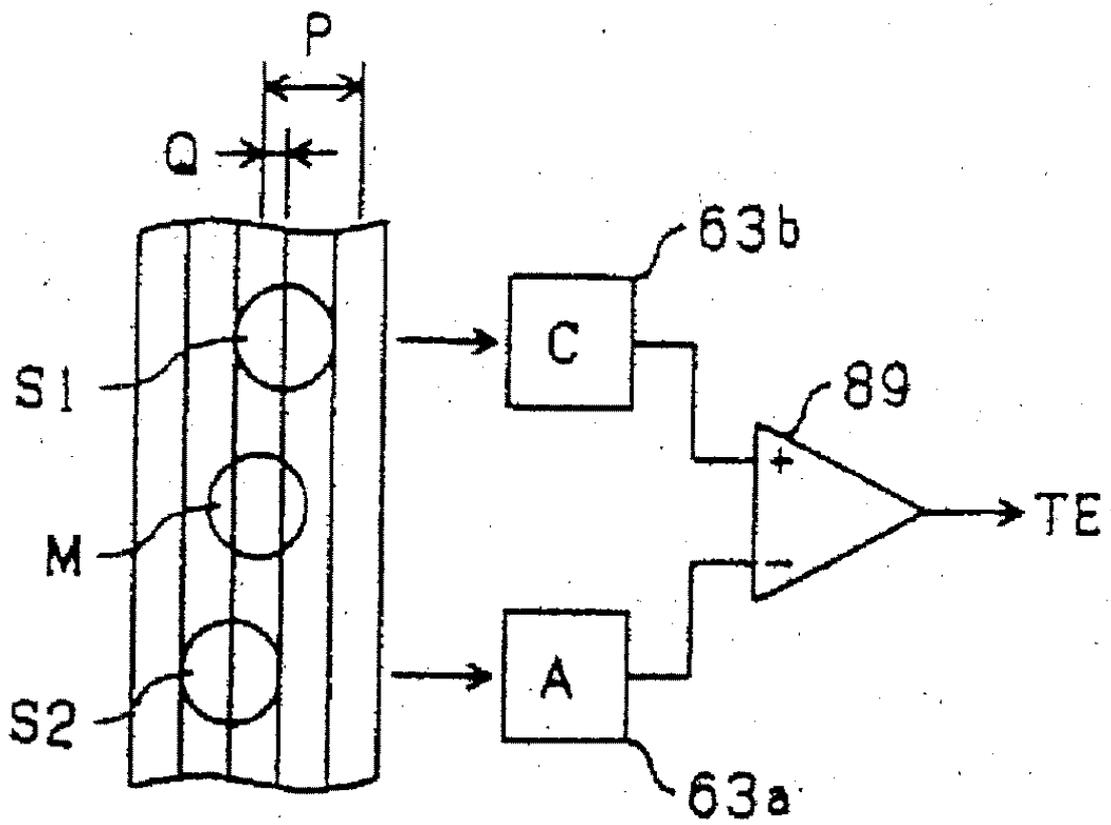


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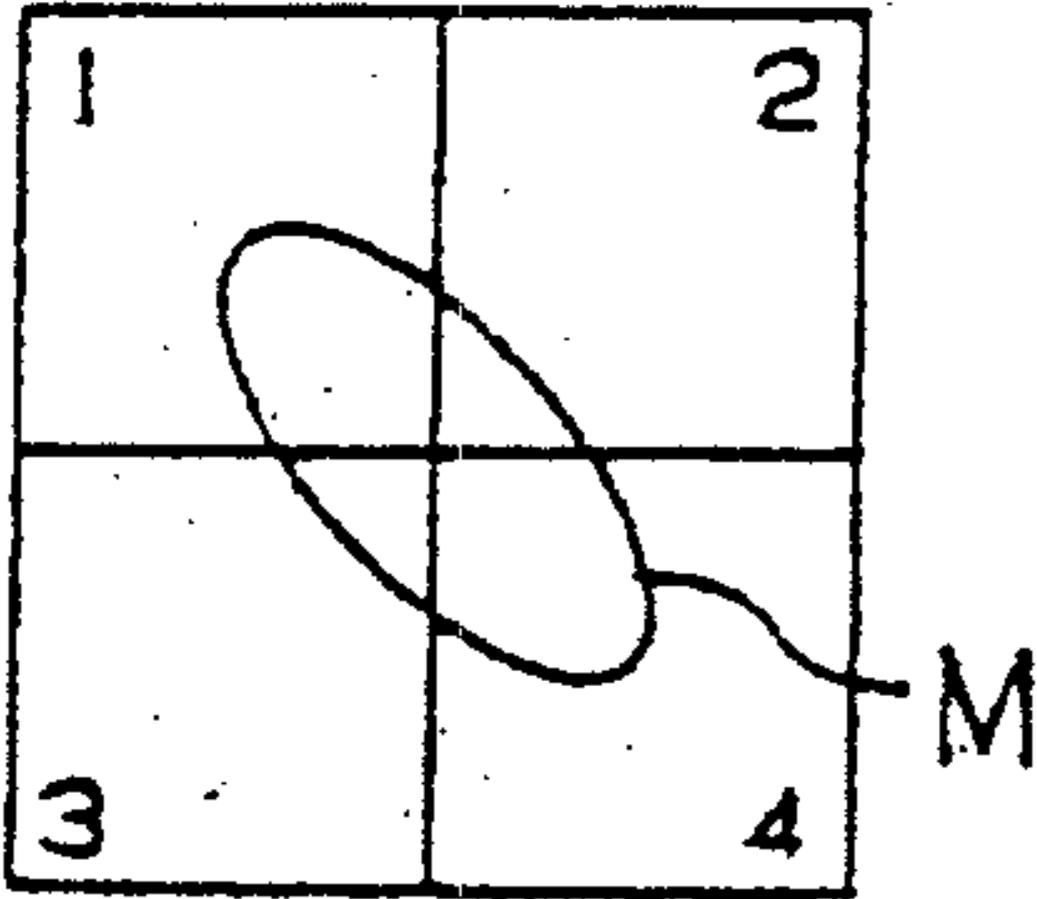


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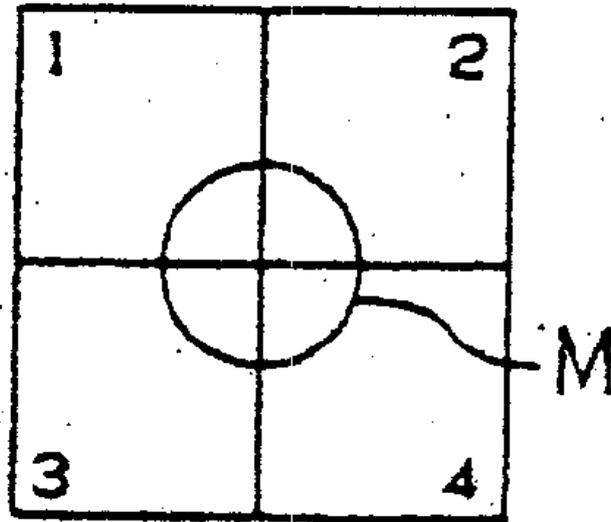




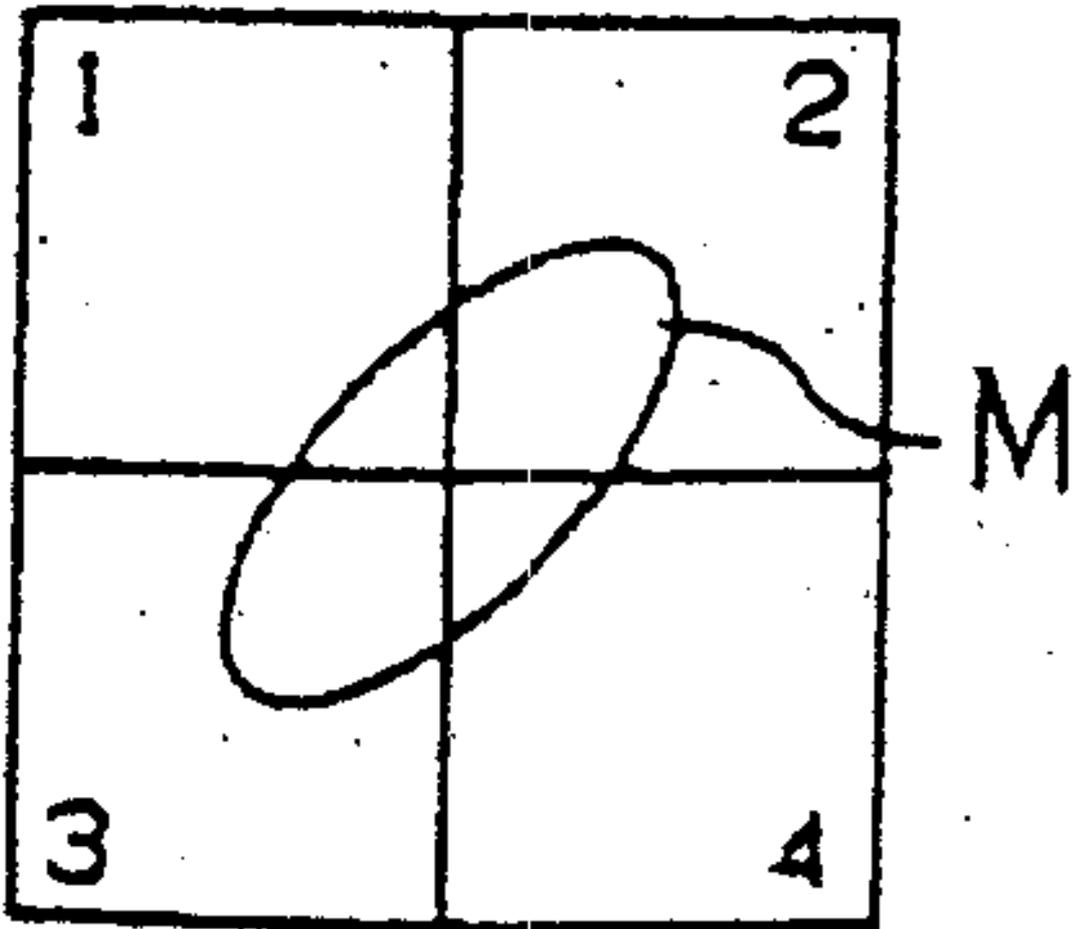
10a

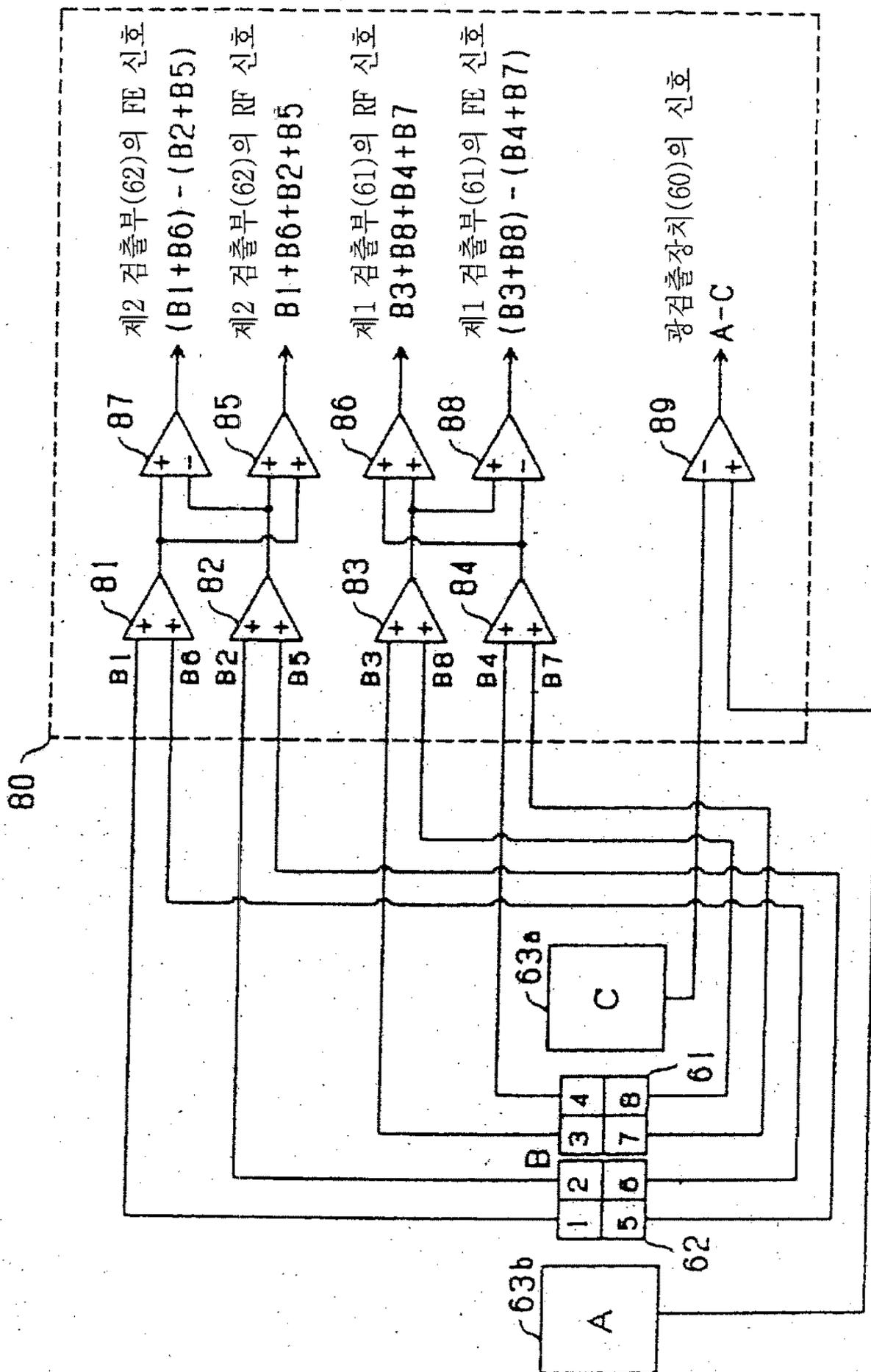


10b

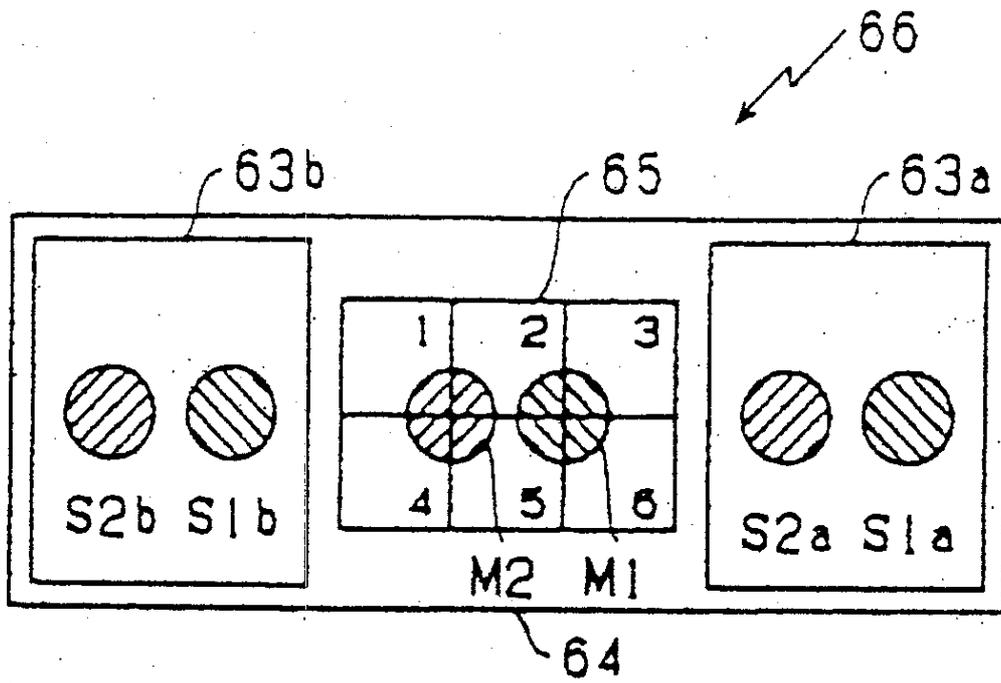


10c

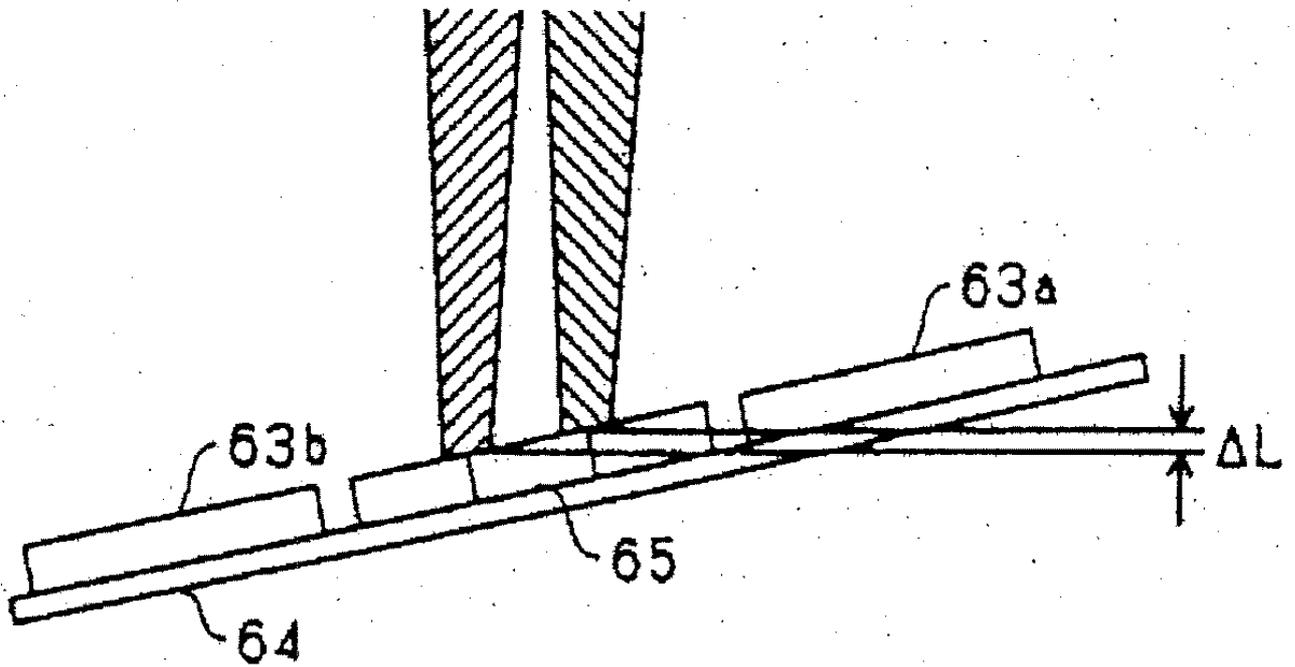




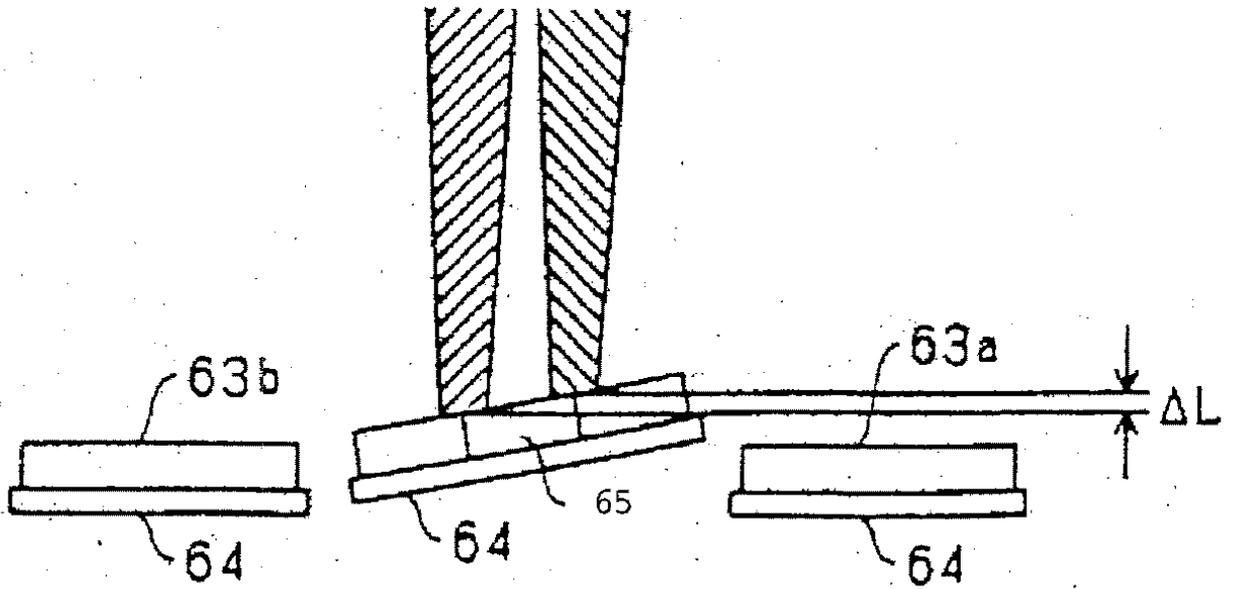
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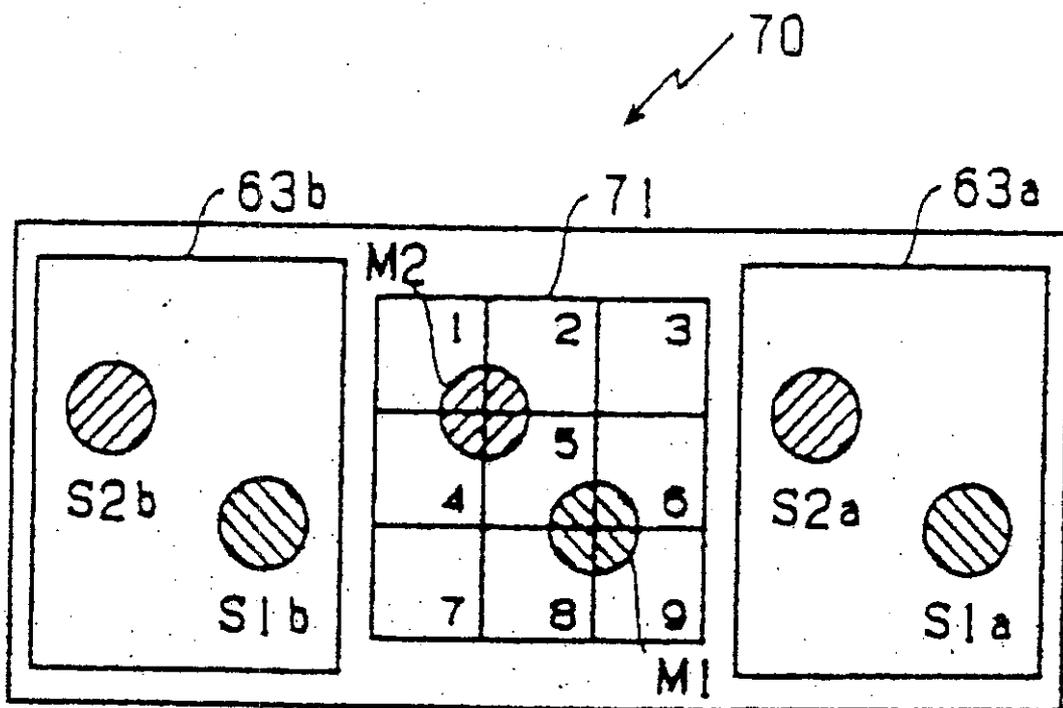
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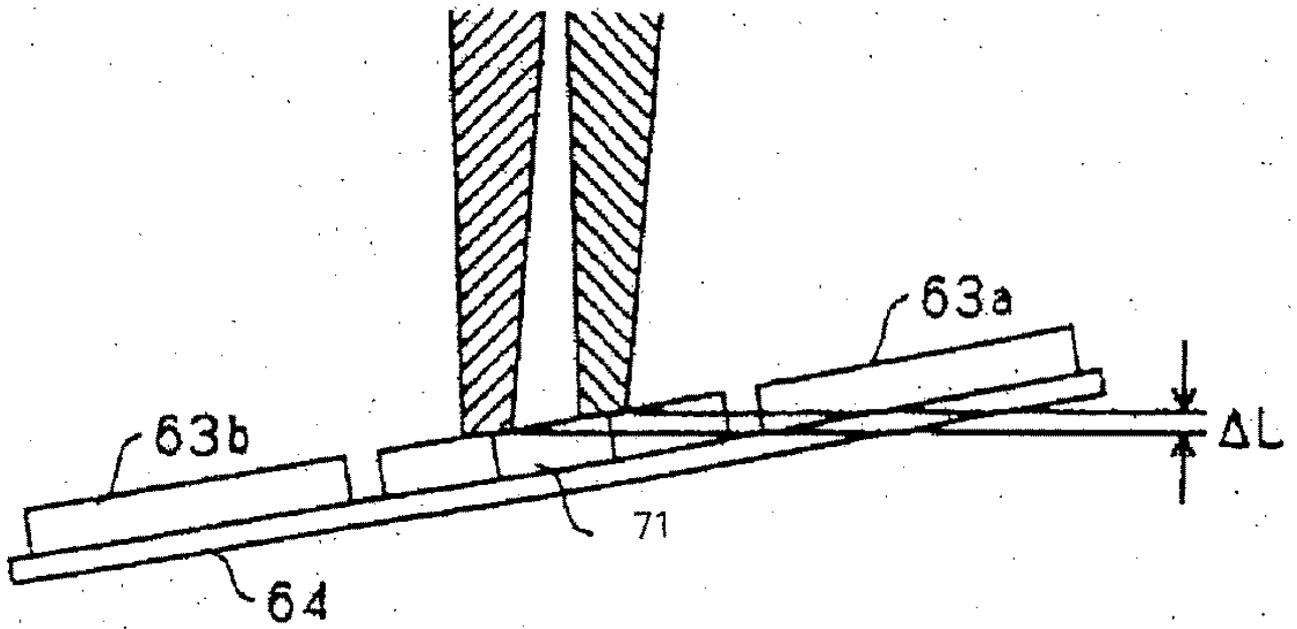
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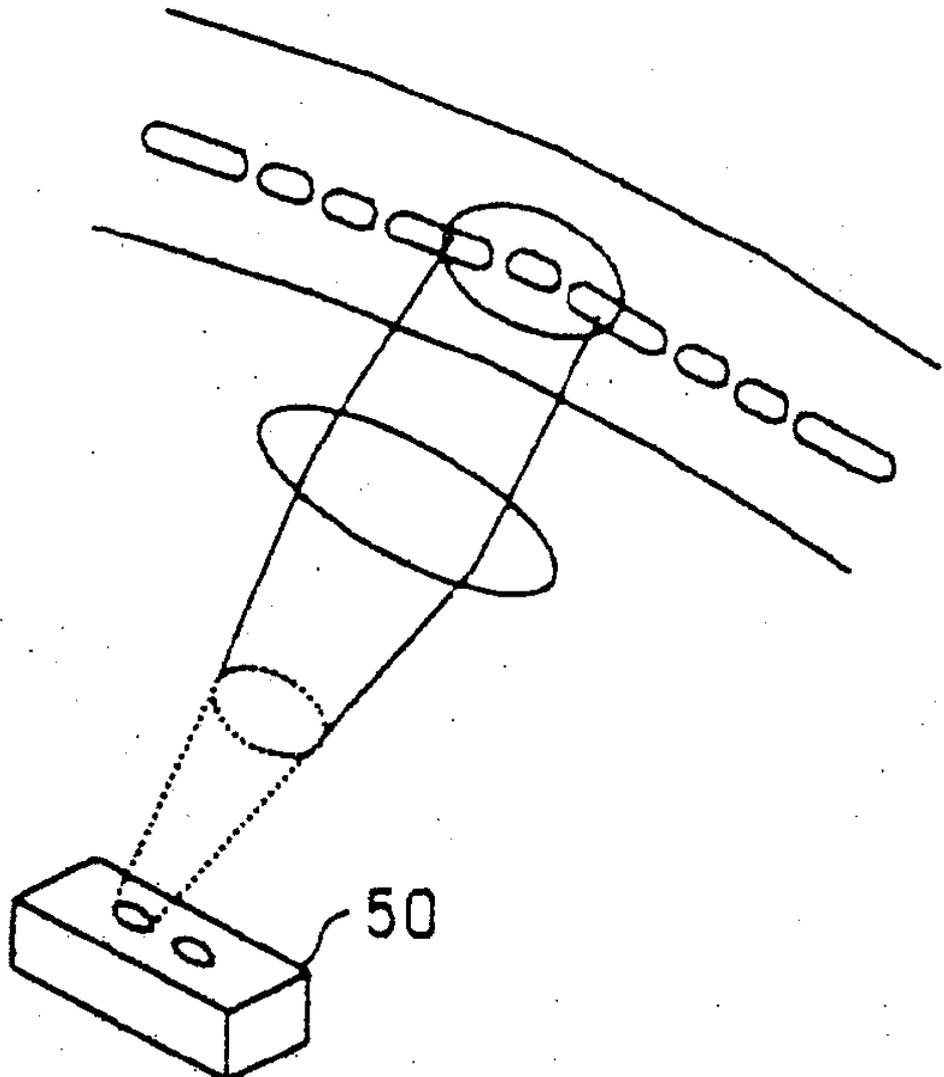
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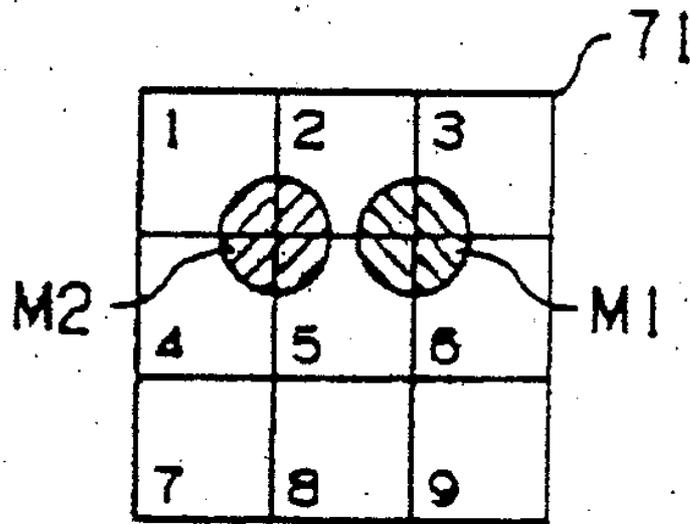
16



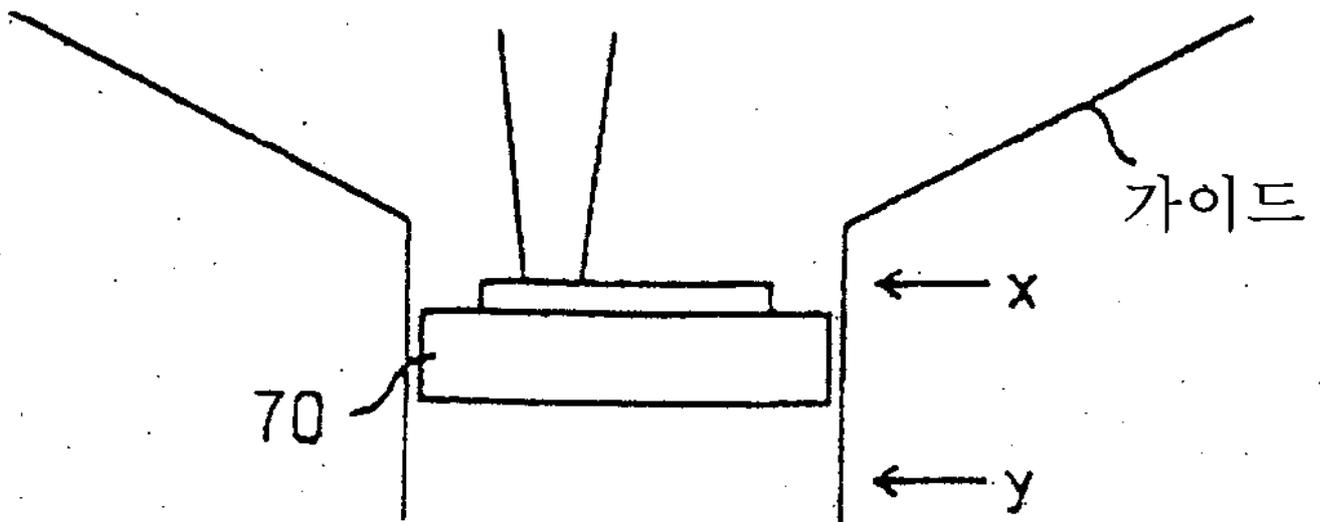
17a



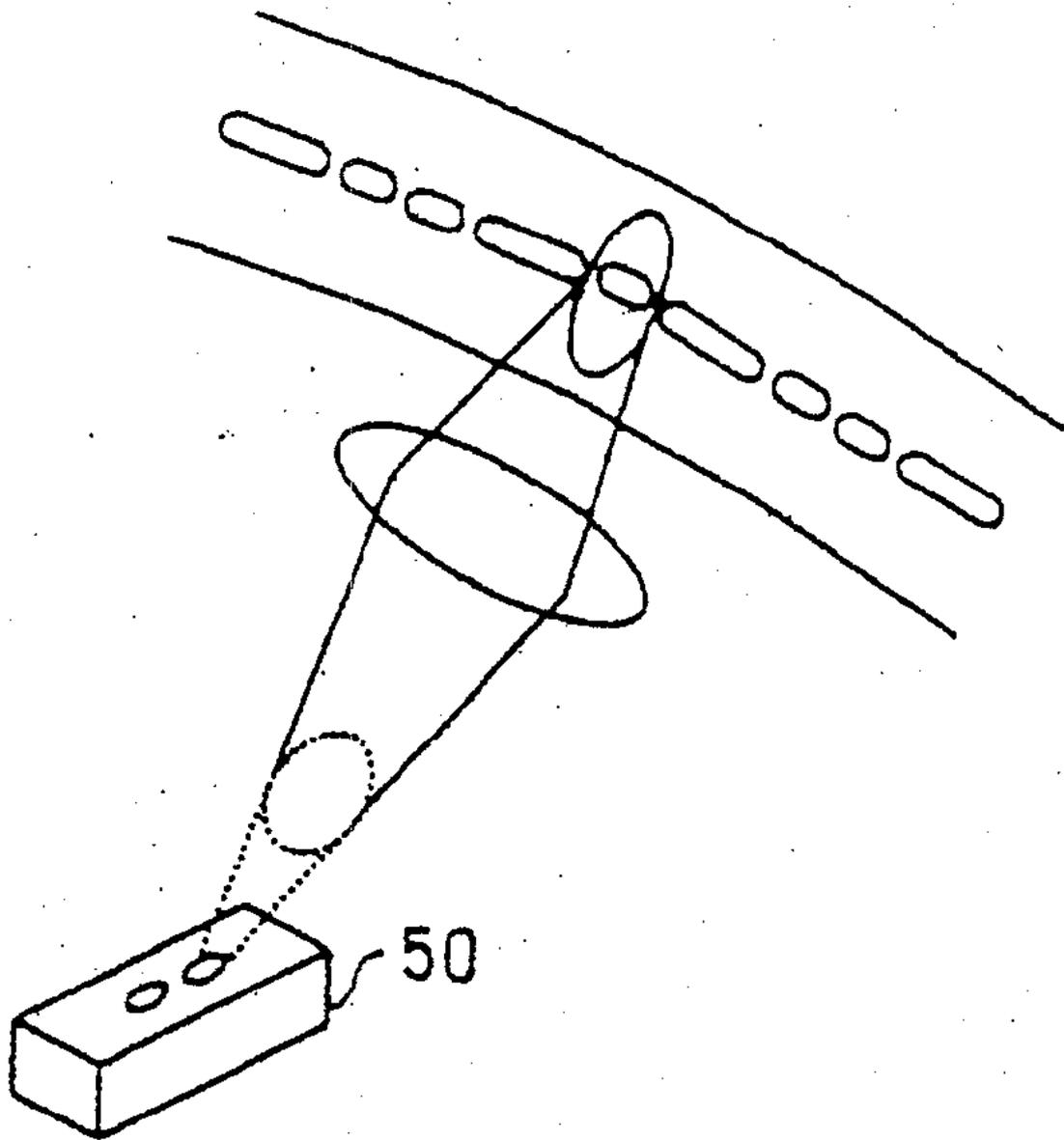
17b



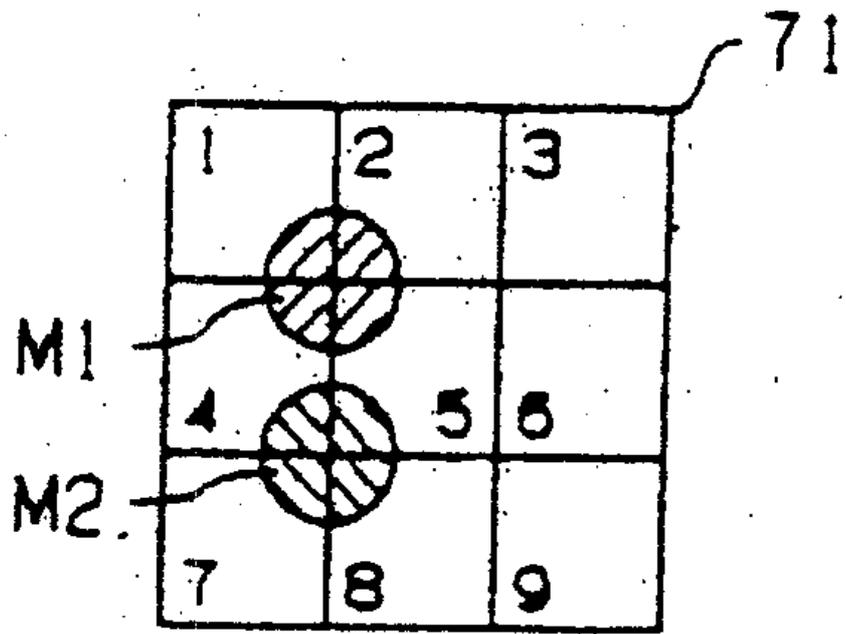
17c



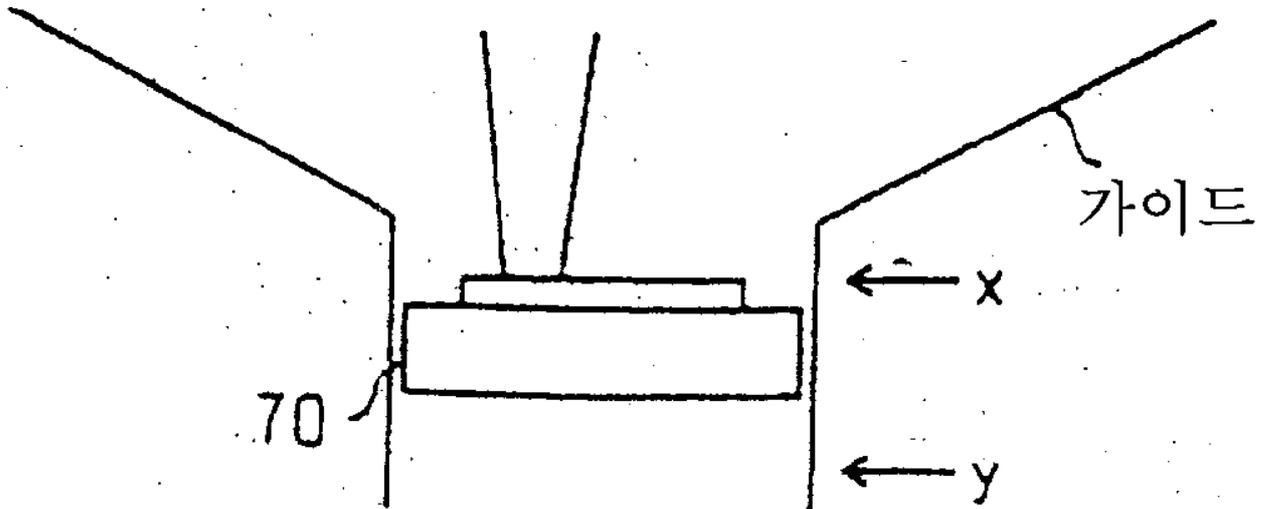
18a



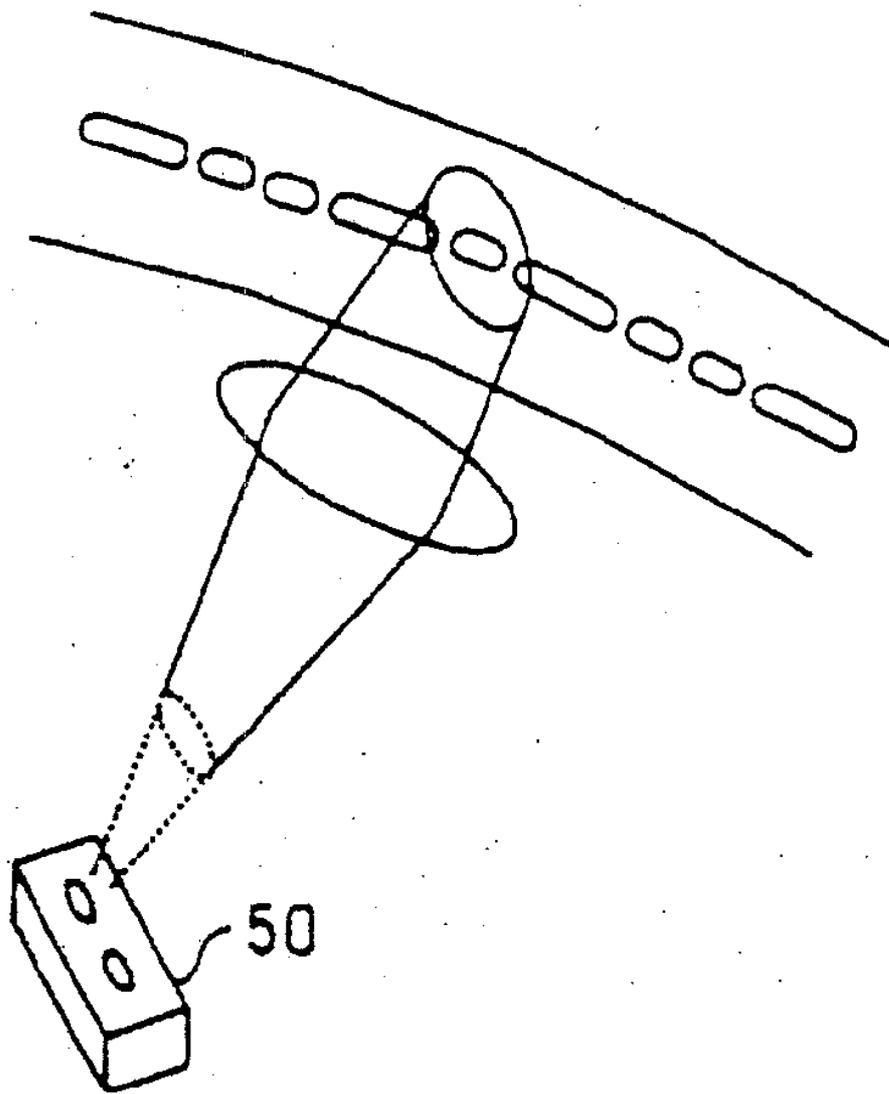
18b



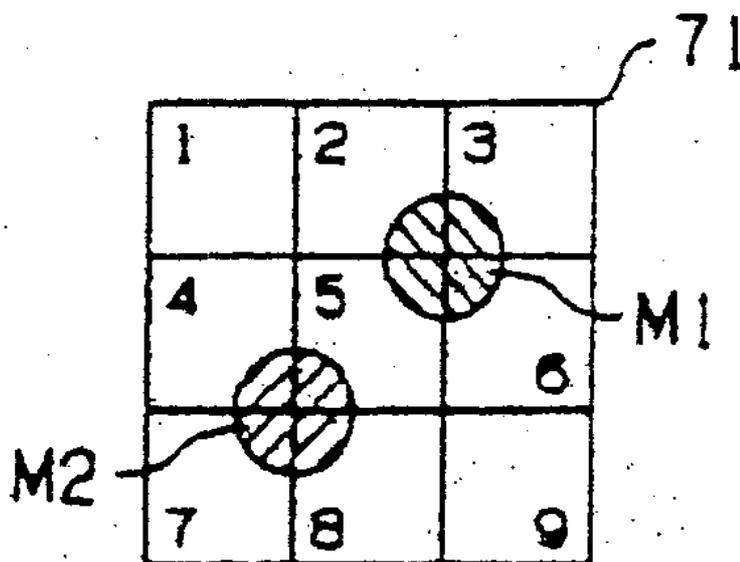
18c



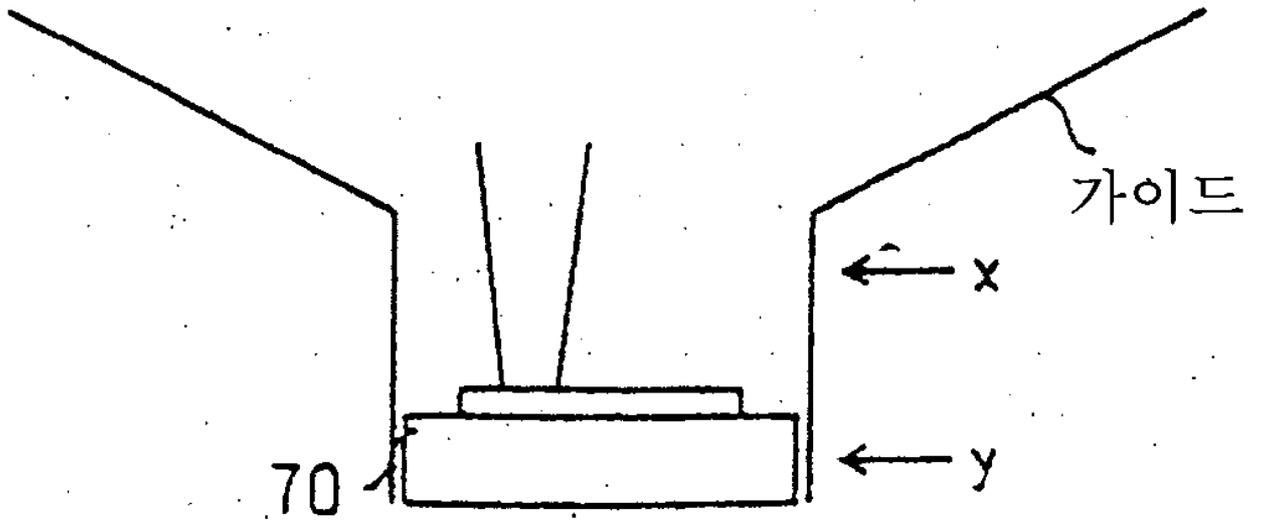
19a



19b



19c



20

