

(19)  
(12)

(KR)  
(A)

(51) 。 Int. Cl.7  
G01F 1/58

(11)  
(43)

10-2004-0027386  
2004 04 01

(21) 10-2003-0066247  
(22) 2003 09 24

(30) JP-P-2002-00278426 2002 09 25 (JP)  
JP-P-2002-00346918 2002 11 29 (JP)  
JP-P-2003-00169705 2003 06 13 (JP)

(71) 가 가  
1 1 1

(72)  
1 1 1 가 가  
1 1 1 가 가  
1 1 1 가 가  
1 1 1 가 가  
1 1 1 가 가  
1 1 1 가 가  
1 1 1 가 가  
1 1 1 가 가

(74)

:

(54)

					(勵磁)			(4A, 4B) 가	(5A, 5
B)			(4A, 4B)						
4									
1									
2a,	2b,	2c,	2d	2e					
3									
4									
5			1						
6			1						
7									
8									
9	(a)	(b)		1		(勵磁)			
10	(a), (b), (c), (d), (e)	(f)			1				
11									
12			1				가		
13a	13b			1					
14			2						
15			2						
16a	16b						가		
17a	17b			3		(歸還茲路)			
18a	18b			3					
19a	19b			3					
20			3						

21a, 21b 21c 가 .  
 \*  
 1: 7:  
 3A, 3B: 4A, 4B:  
 5A, 5B: 가 6A, 6B:  
 9A, 9B: 10A, 10B:  
 71:

(電磁)

(起電力) (接液)  
 가 ( ) 2  
 가 가 ( 8  
 -304132 ( 1 )).  
 1  
 2001-116598 ( 2 )). , 가 1 3 ( .  
 10 , 1 (10) , ( (10) (e) (11) . (10) (3A, 3B) (8) (1) (i<sub>F</sub>) (2) (2) (7)  
 가 가 (4A, 4B) , (4A, 4B) (4A, 4B) 가 ( (5A, 5B) (6A, 6B) (e<sub>AB</sub>) (6C) (6A, 6 ( B) e) (e) (11) , (e) ( ) (4A, 4B) (2) 가 , (10)

(4A, 4B) (6A, 6B) 가 (5A, 5B) (4A, 4B) (4A, 4B)  
 (同相) (6C) , (4A, 4B)

, 가 (5A, 5B) (3A, 3B) (7A, 7B)

E) (10) (1) ( ) (C) (G) (e) 가

가 (e) (G) (4A, 4B) (6A, 6B) (4A, 4B)

(i<sub>F</sub>) 2a, 2b, 2c, 2d, 2e ( ) 2b 2a (i  
 E) 2c (3A, 3B) (定數)

( ) 가 2d N<sub>d</sub> (e)

, (10) (i<sub>E</sub>) 가

S<sub>P</sub>) , 2e ( )

(2)가 가 (e) (2)

가

, (3A, 3B) 가 50kHz (i<sub>F</sub>)가 (i<sub>F</sub>)  
 , 3 (i<sub>F</sub>)가

(5A, 5B) (7A, 7B) (3A, 3B) 가

, 가

가 가 가 G

, 가

, 가 가 가 가 가

가 가 가 가 가

( )

가

가

가

가

가

가

( 1 )

4

13a, 13b

가

, 4 6 (10), (10) 1 (11)  
 (10) (8)  
 5 (10) 6 (10) (8) (11) 5  
 6 (10) (6)  
 , '1' (1) (7)  
 (3A 3B)  
 , (3A, 3B) (1) (1) (1)  
 '4A', '4B' (1)  
 (5A, 5B) (4A, 4B) (2)가 (4A, 4B) 가 (5A, 5B) ,가  
 가  
 (9A, 9B) (3A, 3B)  
 (71)  
 , 1A1, 1A2 (1B) (71)  
 , (C) (1A1, 1A2) (E) (G)  
 '10A', '10B' 가 (4A, 4B) , 가  
 2 (5A, 5B) ,가 (C) (10A, 10B) (71) (1B)  
 (6) (6A, 6B) (71) (6)  
 , 가 (71) (6)  
 (10A, 10B) , 가 (銅)  
 , (4A, 4B), 가 (5A, 5B) (6A, 6B) , (e) (11)  
 (6A, 6B) (6C) (11A)  
 ( ADC )(11A)  
 ADC (11A) (e) (11B)  
 (8) (8A) 300Hz (8B)  
 , (8B) (8C) (3A, 3B) (i F)  
 , 7, 8 (1) (4A, 4B) x 7 ( )  
 , y z , (4A, 4B)

가  
 (10) , , .

7  
 ( ) 가 , ( ) ( )  
 (4A, 4B) 가 (5A, 5B) ( )  
 ) (6) , ,

(4A, 4B) (6) 8 가 (S)  
 ( ) , (10A, 10B) .

5, 6 (10) (4A, 4B) (G) 가  
 (6C)

(3A, 3B) (3A, 3B)  
 (1A1, 1A2) (G) (9A, 9B) 가 (4A, 4B) 가 (71)  
 (5A, 5B)

(4A, 4B) 가 (5A, 5B) 가 가  
 (1A1, 1A2) (G) .

( ) (7) (71) ,

가 .

9 11 (i<sub>F</sub>)  
 (i<sub>F</sub>) 11 , 가

11 (dBm)  
 2.5m/sec , 0.5m/sec ,

(2) (2) 가 10Hz , 200Hz -70dBm  
 S/N 200Hz , (2)  
 (8A) 300Hz

(i<sub>F</sub>) ( ) ( ) 9 10 .  
 ( ) ( ) (e) , (整)

9 (a) (i<sub>F</sub>) (f<sub>0</sub>) 1  
 (i<sub>F</sub>) ( )

9 (b) , (f<sub>0</sub>)  
 (i<sub>F</sub>) , (8B) (i<sub>F</sub>) ( ) (8C)

(8B) 9 (b) (f<sub>0</sub>) 3  
 3 (f<sub>3</sub>) (i<sub>F</sub>)

5 (f<sub>5</sub>) (8B)

10 (8B)  
 10 (a), (b) 10 (c) (8B)가 , 10 (d), (e) 10 (f)  
 (8B)

10 (a) (d) ( ) , 10 (b) (e) (e), 10 (c) (f) (e)  
 (S<sub>P</sub>) , 10 (b) (e) (2)가 ,  
 (2)가 (e)

(8B) ( ) 10 (a) ,  
 10 (d)

10 (b) (e) 10 (e)  
 (S<sub>P</sub>)  
 가

(8B) ( ) (e) (8)

12 (4A) (4A, 4B) 가 (5A, 5B)  
 (6A)

C1 (4A) (2) , (1) (4A) 가  
 (5A) (C2) , (2) (Rs) (G)

(C1 C2) (6A) , (C2)

(6A) 가 , 가 (5A) (v<sub>N</sub>) (6A) (v<sub>A</sub>)  
 )

$v_A = (1 + j\omega C_1 R_s) \cdot C_2 / C_1 \cdot v_N$

(4A) (2) (C1) (4A) 가 (5A) (C2)  
 , 가 (5A)

(1) (4A) 가  
 (5A) , 4A 가 (5A) (1)

9, 3 (4A) 가 (5A) (1)  
 , 가 (5A) (6A) 3 1



(10) 가 .

5 6 .

(4A, 4B) 가 (5A, 5B) (1) 가 , , 0.2mm , ,

(4A, 4B) 13a, 13b, 13b (slit) , y .

(10A, 10B) (7) , 가 ,

( )가 ,

가 ( 2 ) ,

2 가 1 (10) (4A, 4B) (6) 1 (10) , ,

(6) (10A, 10B)

2 , 14, 15, 16a, 16b 1 4 2

14 (10) , 15 , 16a, 16b (4A), 가 (5A)

(11) (11) (11A) 1 (21) (11B) (6)가 (10)

(11) ADC (11) 1 (10) 16a, 16b

16a (4A) 가 (5A) (1) , 16b (4A, 4B) (x)

(4A) (4A) , 가 (2)가 z 가 (5A)

) .(y 가 (5A) (4A) , 16a x-y (4A) ,

가 (4A) (4A) , 16b (4A) ,

(4A) (4A) (2)

가 (5A) 가 (5B) 2 16a 16b (1) (1)

가 60 (5A, 5B) (2)가 (z) (1) 60%

(4A)

1

(10A, 10B)  
(6)

가

(4A, 4B)

(6) 가 4 (5A, 5B)

(C)

(10)

(6)

14

15

(10)

(71)

(1)

(1)

(10A, 10B)

(71a, 71b)

(3A, 3B)

(8)  
(71d)

(71c)

(71a, 71b)

(11)

(21)

(21)

(10)  
(6)

(4A, 4B) 가 (5A, 5B)

가 (1)

(21)

(11)

(1)

(1B)

(1A1

1A2)

(10)

(10)

(21)

2

(6)

(6)

(10

A, 10B)

(4A, 4B)

(1)

가

(5A, 5B)

가

(6)

(10)

(21)

가

(2)가

가

( 3 )

3 가 1

(9A, 9

B)

(71)

가

가

2

00Hz

(9A, 9B)

가

(71)

(5A, 5B)

가

(5A, 5B)

(4A, 4B) 가

( 5a, 5b)

(4A, 4B) 가

(5A, 5B

가

가

3

4

6

1

17a, 17b

17a

( y )

(71)

(9A)

(3A)

17b  
(3A)

(9A)

(9A)

(71)  
(71)

(1) ( z )  
 (9B), (71)

18b (7) (3A, 3B) (7)

(5A, 5B) 18a 18b (3A, 3B) 18a (4A, 4B) 가  
 ( )가 (定性)

가 ( ) 가

(9A, 9B) (71) y 20% 30% (3A)

가 가 18b xz (9A) (71)  
 ( x ) y (1x) 가 , z  
 (1z) (1x×1z)

가 가 ( )

3

19a 100Hz(T=10msec) (e) (Sp)  
 (e) 200Hz(T/2=5msec) 18b

가 가 ( )

가 200Hz 19b (e)

가 가 가 200Hz 20

가 (5A(5B)) x 가 21a 21b 21a 21b  
 (1) (5A) (1) z

21b 가 (5A) (1) z (5Aa)

3 (9A, 9B) (1) 가 , 가 (5A, 5B)  
 (3A, 3B) 가 (5A)

21c (4A(4B)) 가 (5A(5B))  
 (4A(4B)) 가 (5A(5B))

가

(4A, 4B) 가 (5A, 5B)  
(4A, 4B) 가 (5A, 5B)  
가

, 가 가 .

, 가 ,

S/N , 가 .

, ,  
,  
.

, , 가 , .

, 가 , 가 . ,

, , , ,  
, ,

, . , ,

, 가 , , ,

, , , ,

, 가 , 가 , , 가

, , 가 가 . ,

( )

(57)

1. 가

,

,

,

,

가 ,

,

가

,

,

가

,

,

,

,

,

,

,

,

,

가

,

2.

1

,

가

3.

가

,

,

,

,

가 ,

,

가

,

,

가

,

,

,

,

,

,

4.

3

5.

3

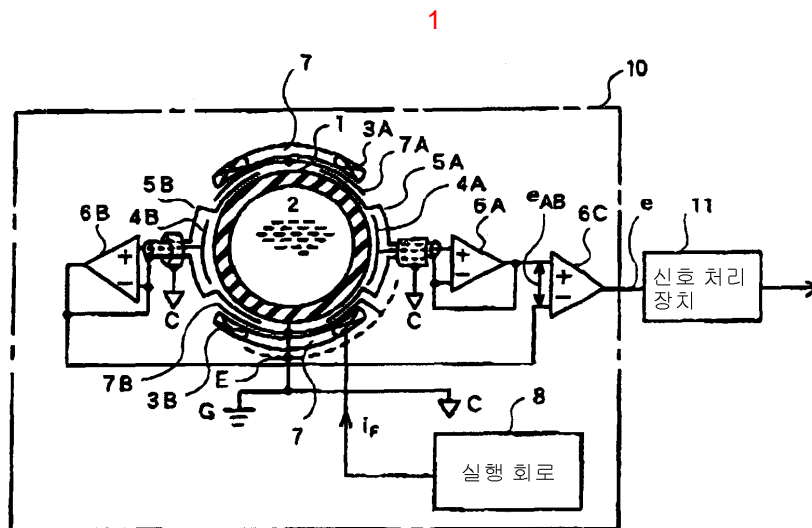
6.

3

가  
가

7.

6



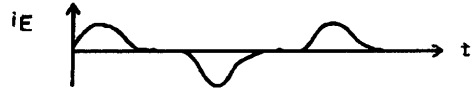
종래기술

2a



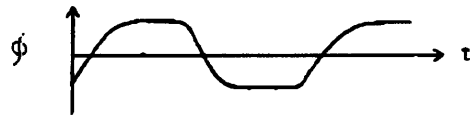
종래기술

2b



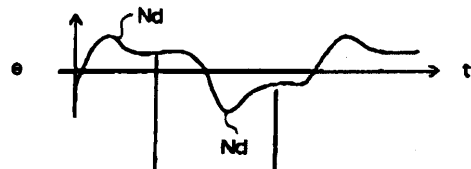
종래기술

2c



종래기술

2d



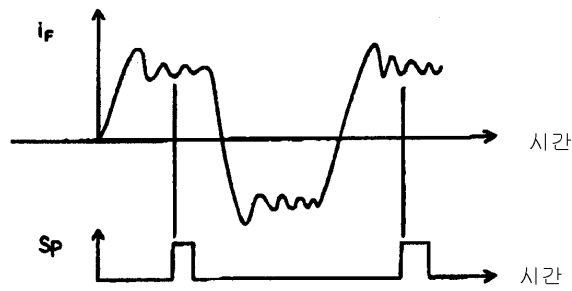
종래기술

2e



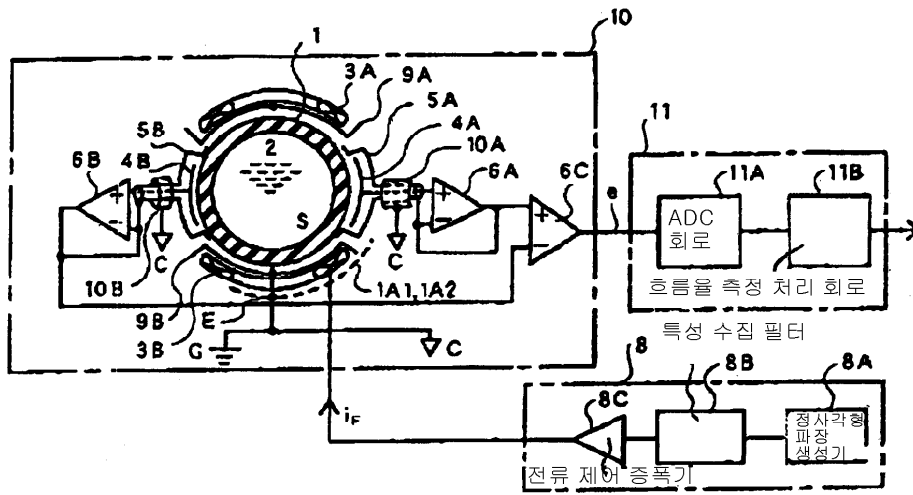
종래기술

3

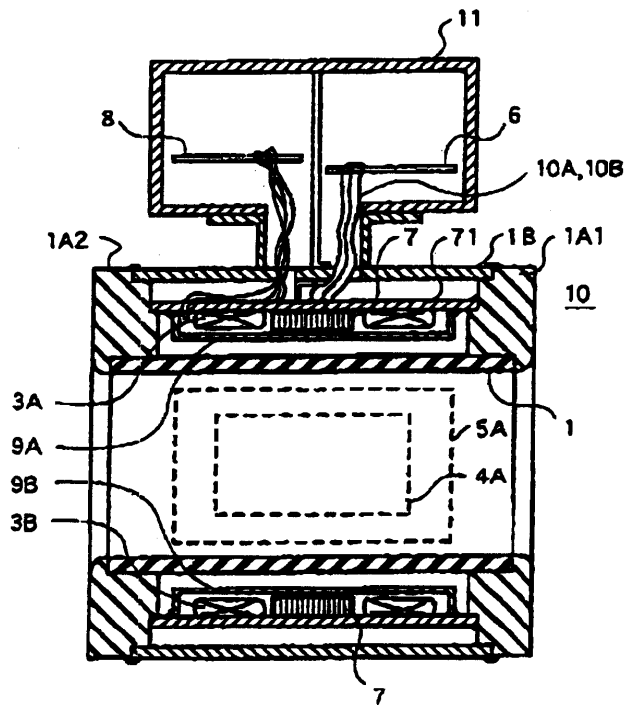


종래기술

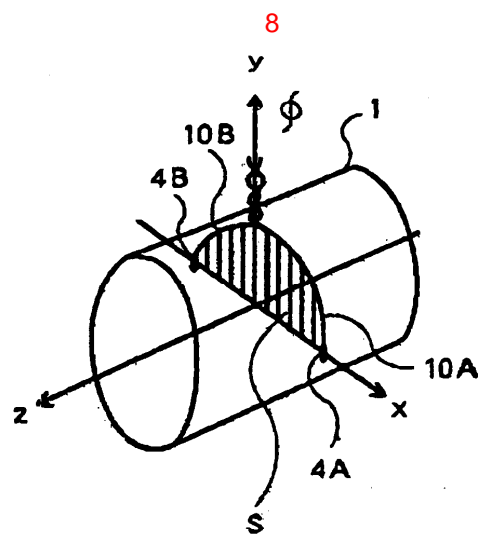
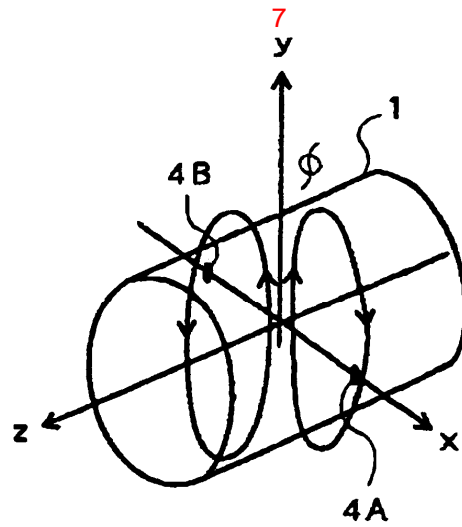
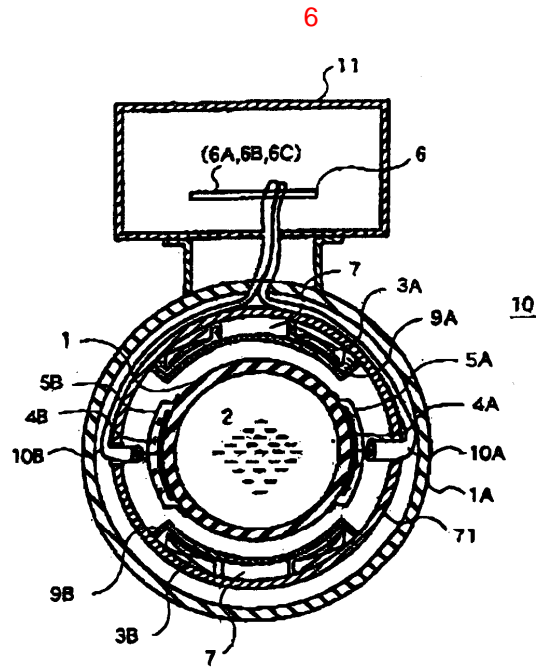
4



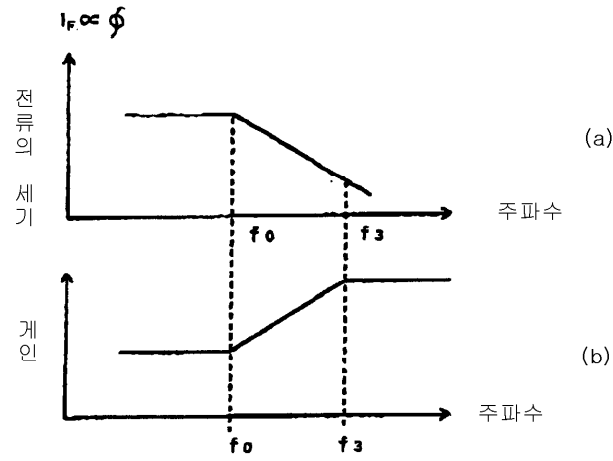
5



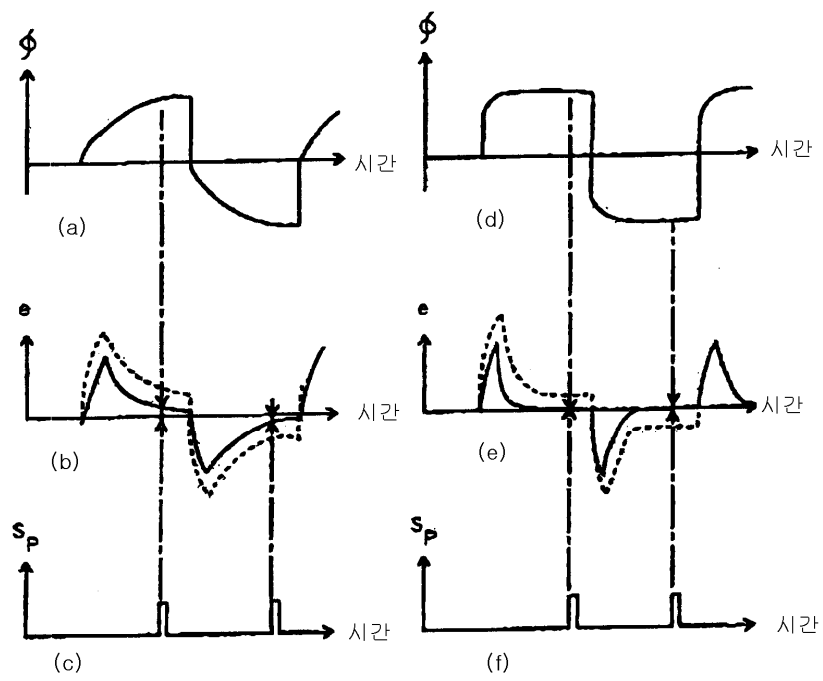




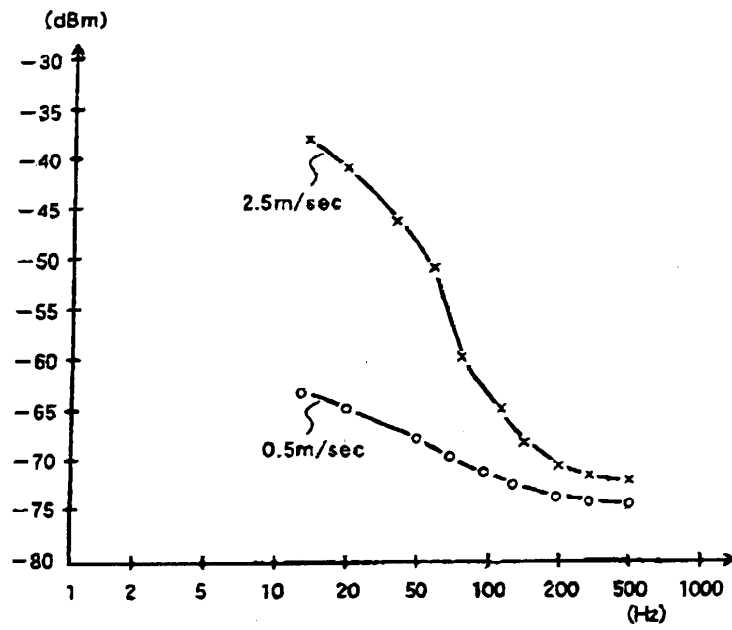
9



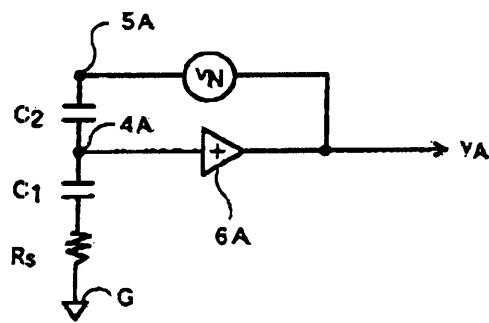
10



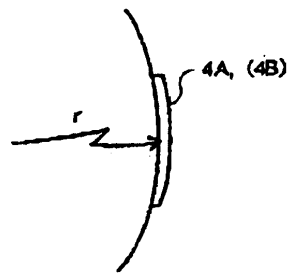
11



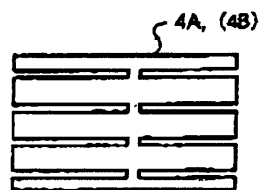
12

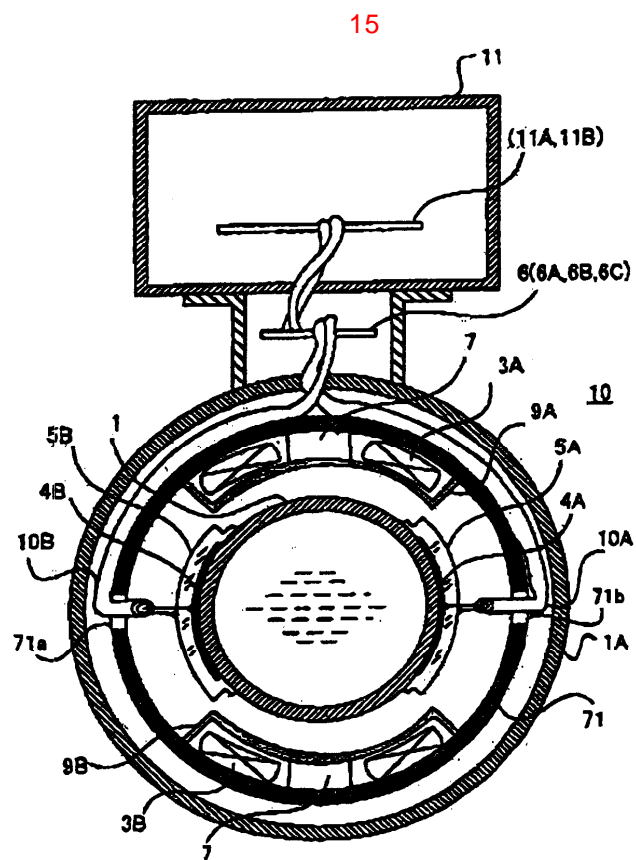
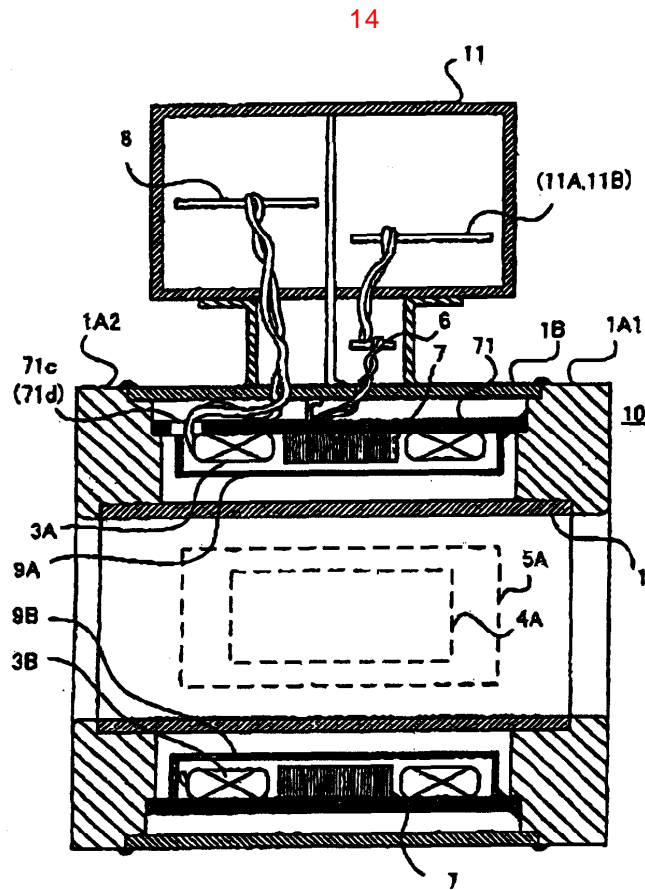


13a

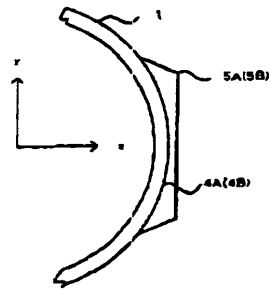


13b

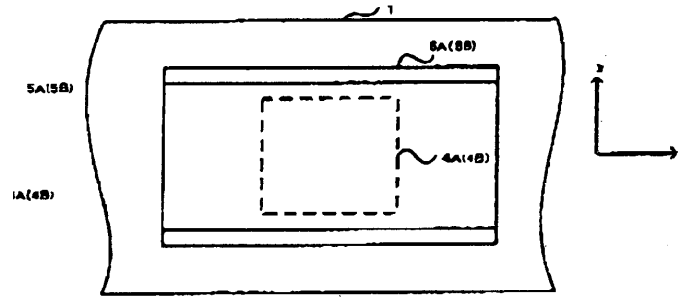




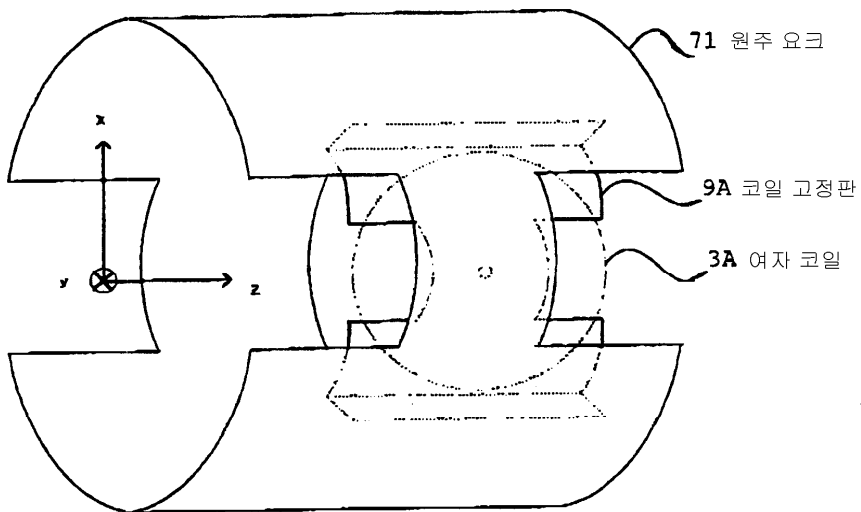
16a



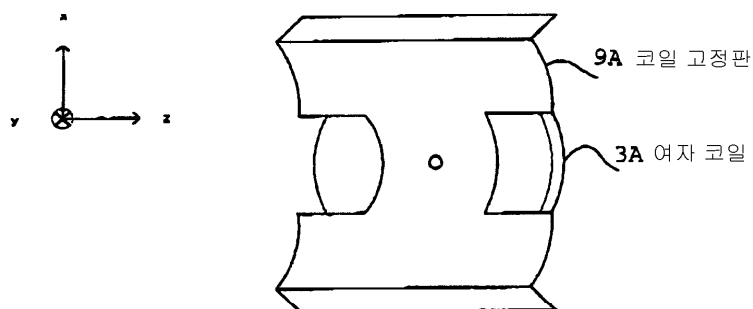
16b



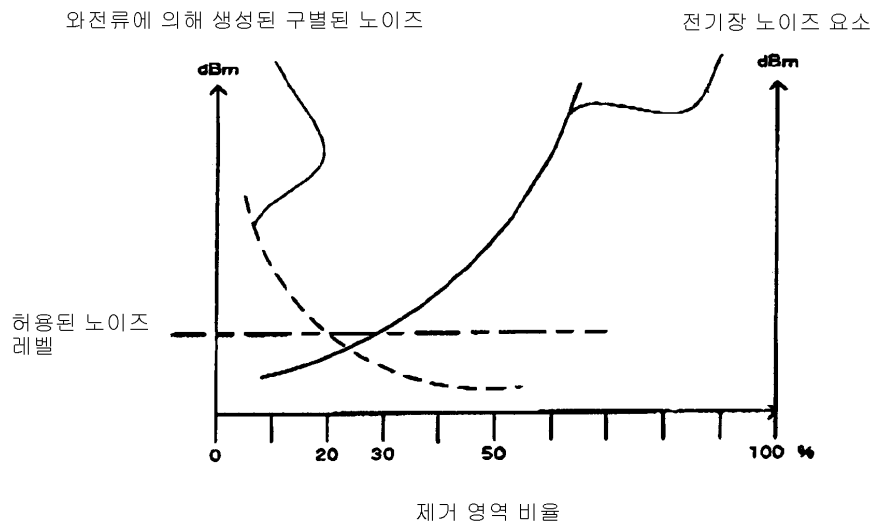
17a



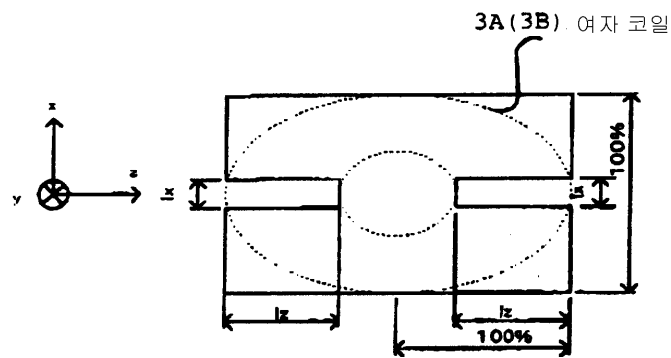
17b



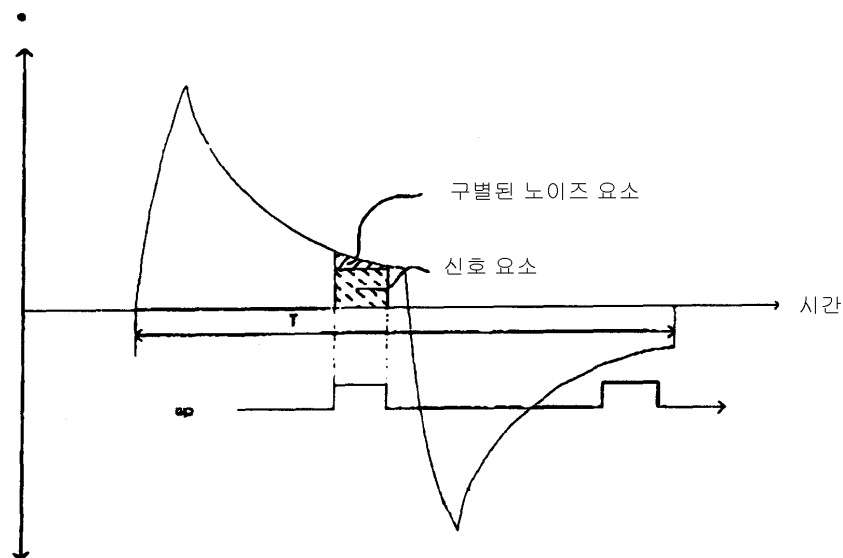
18a



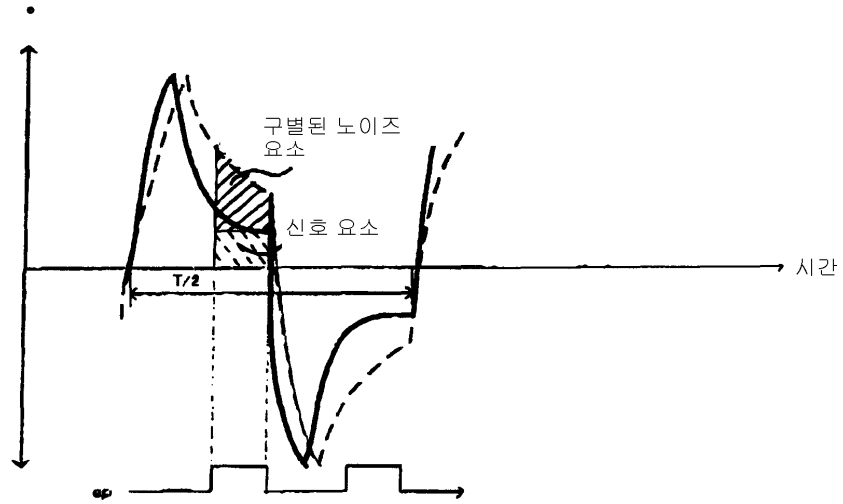
18b



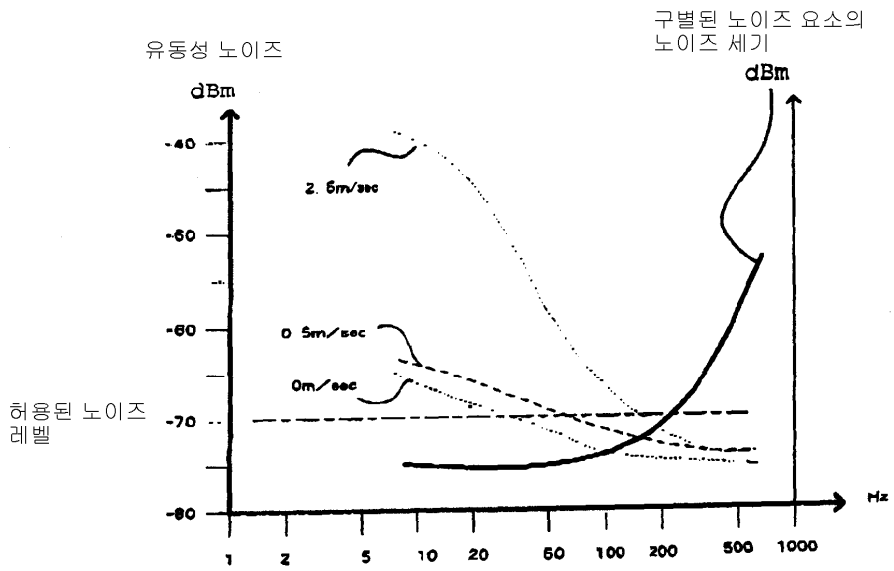
19a



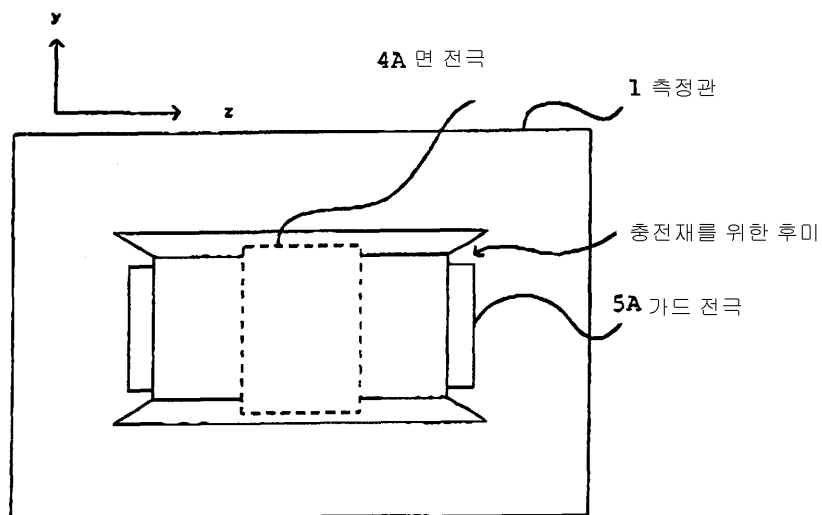
19b



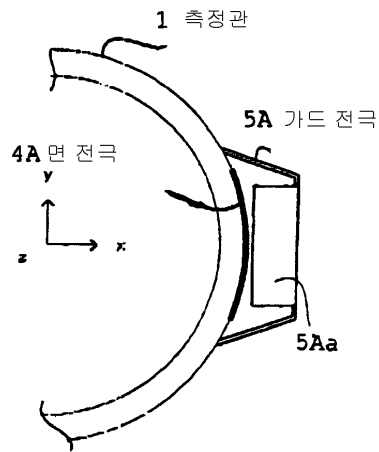
20



21a



21b



21c

