



(18) (10) (12, 14), (12, 14) 가 (16),  
 (16) (18) (18) (12, 14) (12, 14) (16)  
 (12, 14) (12, 14) (16) 가  
 (18a) (18a) (24a) (12a)가  
 (16a)

2

가 가

가

PDA(Personal Digital Assistant))

가

가

(a priori)

가

5,963,145

5,963,145

45

2

IR

5,963,1

PDA, ( ) IR , RF ( , http://www.bluetooth.com  
TM , 5,963,145

가 , IR 가 IR

가 ( ) 가 가

가

1

2 1

3 1

4 1

5 2

6

1 , 가 (10) (10) 4  
(12, 14, 16, 18) (10)

4 (12, 14, 16, 18) (10) (RF)  
(24) 1 , (20, 22, 24) (20, 22)

(12, 14) (12a, 12b, 12c, 14a, 14b, 14c)

(10)가 (14)

(12)

(16)

(PDA)

(12a, 12b, 12c, 14a, 14b, 14c) 가 (16a, 16  
b, 16c) (16a, 16b, 16c)

c) (18) (20, 22) RF (24) (12a, 12b, 12c, 14a, 14b, 14 (16a, 16b, 16c) (18a, 18b) (duplex))

(16a), (12a) (18a) , 2 (10) (12a, ) (16a, )

(16a) (32) 2 ( (12a)( , (32) ) (32) 2 (32) (34) (32) (16a) (33) (32) (32) (12a) (34) 가 (32) (32) (32) (16a) (33) (32) (32) 가 (32) (32) (16a) (33) (32) (32) 가 (32) (32) (16a) (32) (12a) RF (24a) (18a) 가 ( ) (10) (가 ) Analog Devices of Norwood, Massachusetts, (www.analog.com) 가 , ADXL505 가 ( ) 가 , (Kalman) (UWB) 가 , 가 UWB 가 , 가 UWB 가 가 (16a) (28) (10) 2 (16a) 2 (28) (28) University of California at Berkeley 'B99-003'(http://berkeley.edu/mems.html) Murata Manufacturing Co. ENC-03J ENV-05D052 (10) 3 , 3 (x, y, z) X , Y Z (16a) (16a)가 (12a) 2 ( , ) , (x, y, z) ( , ) (12, 14, 16) 가 가 가 가 (0, 0) , Z 3가 , X Y , Z 가 (12, 14, 16) 3 (16a) (16a) (x<sub>1</sub>, y<sub>1</sub>, z<sub>1</sub>) P (x<sub>2</sub>, y<sub>2</sub>, z<sub>2</sub>) (12a) ,

Q, X', Y', Z', X, Y, Z, P, Q', Q, X'Y', N, M, 3, PQ, PQ'N, 1

$$\tan(\phi_1) = Q'N / PN = (y_2 - y_1) / (x_2 - x_1)$$

PQM 2가

$$\cos(\theta_i) = PM / PQ = (z_2 - z_1) / d$$

d=PQ, P (16a) Q (12a)

1, 2, (16a) (12a) (x<sub>2</sub>, y<sub>2</sub>, z<sub>2</sub>)

(31) TM RF (29) RF (24) (18a) (16a) (30) 가 (29) (30) (29) (16a)

(35) (12a) (22a) (35) (18a) (36) (12a) (35) (18a)

4 (40) (12a) (18a)가 (16a) (12a)가

(40) (16a) (x<sub>1</sub>, y<sub>1</sub>, z<sub>1</sub>) (1, 1)가 (16a) (12a) (x<sub>2</sub>, y<sub>2</sub>, z<sub>2</sub>) (41) (40) (18a) =tan<sup>-1</sup> {(y<sub>2</sub> - y<sub>1</sub>) / (x<sub>2</sub> - x<sub>1</sub>)}

(40) 44 (18a) 가 1 (1 - , 1 + )

가 =K · ½ · tan<sup>-1</sup> (w/PQ) 가 w

[ 44 , d=P Q YES , (40) 45 . 45 , =cos<sup>-1</sup> (z<sub>2</sub> -z<sub>1</sub> /d) , = sqrt{(x<sub>2</sub> -x<sub>1</sub>)<sup>2</sup> +(y<sub>2</sub> -y<sub>1</sub>)<sup>2</sup> +(z<sub>2</sub> -z<sub>1</sub>)<sup>2</sup> }] .

44 NO , 46 , (12a)가

47 , 가 ( 1 - , 1 + ) ,

가  
=K · ½ · tan<sup>-1</sup> (h/PQ) , 가 h

1 , 가

(40) 47 YES (40) 48 , (12a)가 , ,  
(12a) , NO , 46 .

5 , (10) (12a), (16a) (18a) (50)  
51 . 2 (12a), (16a) (18a) ,  
, 52 (16a)가 (16a) (16a) ( , 12a) (

, 16a) (16a)가 가 . ( , 12a) (

), (50) 53 , (18a)가 , (12a) (12a)  
(40) , (16a) (12a)가 . 54 , (18a) (18a)

54 YES , (50) 54 . 54 , (18a) 가  
(12a) , (16a) , (12a)

54 NO , (50) , (12a) (12a)  
(16a) (32) (12a)

(50) (12) (12a) , , ,  
(32) / (12)

, (50) , 가  
, 가 (12) 가  
(33) . 가 가

(12a) 가 (12a)  
(12a) 가 가  
(50) .

, (12)가 , (18a)  
가 가 , (18a)  
(16a) , (12b, 12c) , (33)  
(description) , (16a) (

, 12c) (18a) , (18a) (12c) (

, (29)가 (12)  
(14) , (30)

(16a) (sweeping motion) (16a) , (12) (14)

2a, 12b, 12c, 14a, 14b, 14c)가 (40) (40) (1

6 (60) (18a, 18b) (12) (60) (12a, 12b, 12c)  
RF IR (61a, 61b)  
RF IR (24a, 24b, 61a, 61b) (60)  
(, 12, 14),  
(18a) (20)  
(, 22) (, 12a) (50, 40)  
(18a)  
(12a, 12b, 12c, 12d) (12a) (18a)가  
(16a) (16a)  
(33) 가

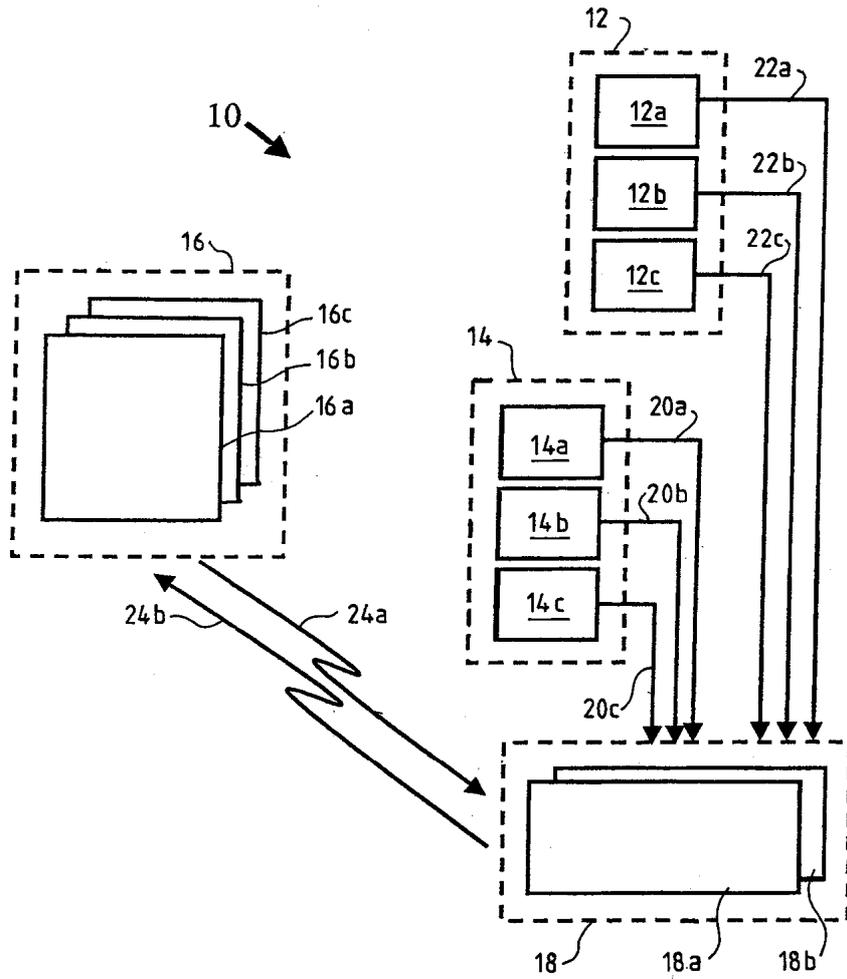
PDA가 RF IR 가 (off-shelf)

가 가 3 가

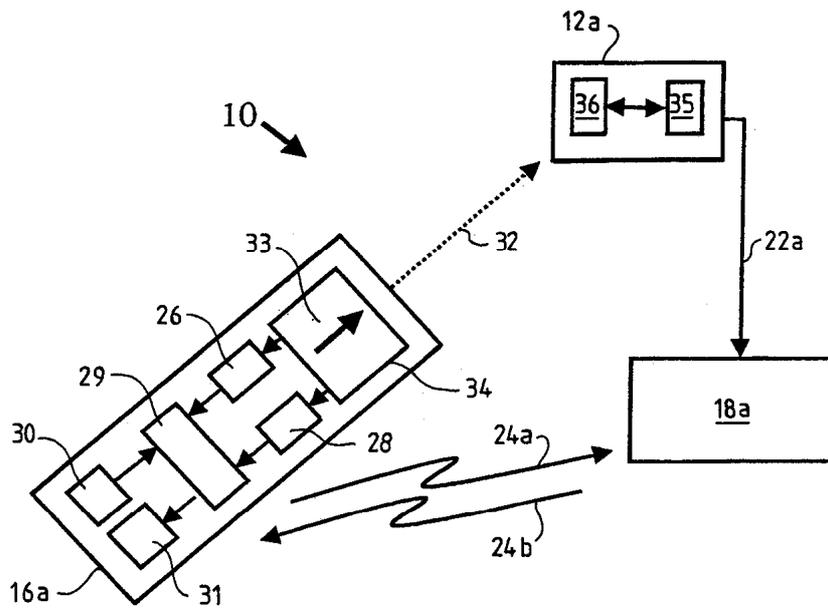
- (57)
1. 가 가
  2. 1 가 가
  3. 1 가 가

- 1     **4.**     3                     ,  
                   가                     , .
- 1     **5.**     4                     ,  
                                   .
- 1     **6.**     5                     ,  
가            UWB                     .
- 1     **7.**     6                     ,  
                   .
- 1     **8.**     7                     ,  
                                   ,            ,
- 1     **9.**     8                     ,  
                   .
- 2     **10.**    3            9                     ,  
                   .

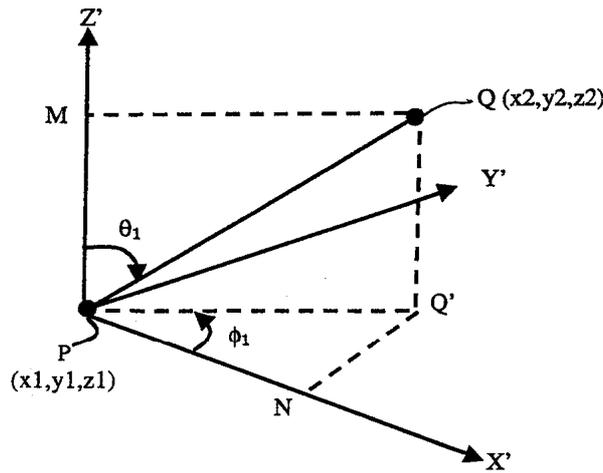
1



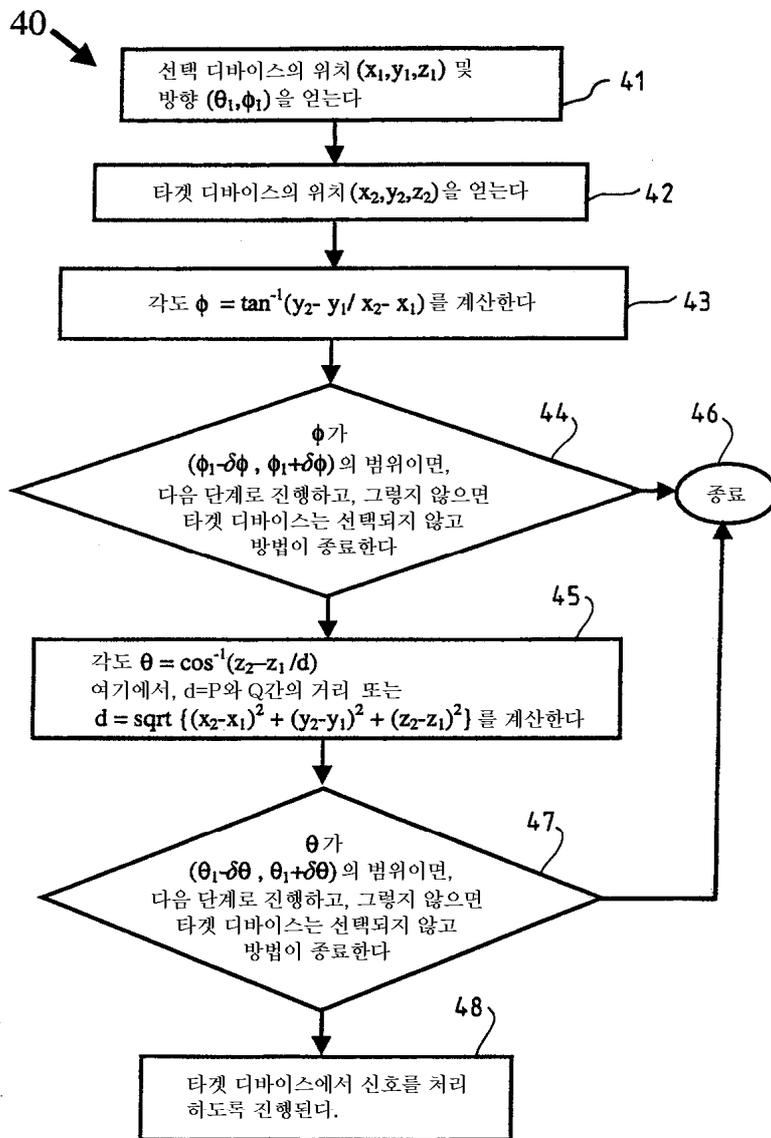
2



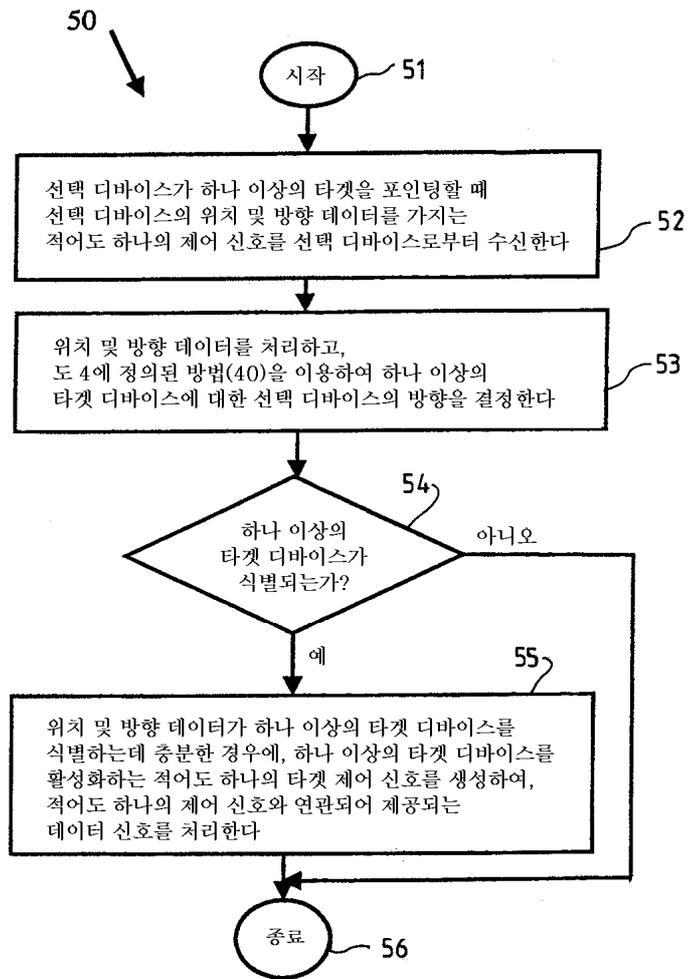
3



4



5



6

