

2002 - 0044561
2002 06 15

WO 2002/17296
2002 02 28

(72)	.	5656,	6
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	,	5656,	6
	.	5656,	6
	,	5656,	6

(74)

⋮

(54)

가

2D

()

18a

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

‘

3 ()

. 3

. 3

1
(sweep)
3

(elevation dimension)

2 (2D)

, 2D

가

가

(probe cable)

5,027,820 , 5,229,933 , 5,997,479

, 2D

, 2D 가 ㅈ\ () '479

" " -

1

2 1

3

4a 4c 3

5a 5b " - - (slit - o - vision)"

6a 6b

7a 7b " - - "

8

9

10a 10b

11a, 11b 11c

12 11a, 11b 11c

13

14 13 - (receive sub - aperture) .

15a 15g 13 - .

16 13 .

17 16 .

18a 13 - .

18b - .

18c 18d 2D (single line) (multiline) .

19a 18a .

19b 19c (interpolation) .

20 .

21 20 (time interleaved sampling) .

22 20 (duplex display) .

23 , .

24 .

25 .

26 23 " " .

, 1 , (10) (12) ,
 (myocardium) (elevation) (depres
 sion) (bending surface) , ,
 , 가 , (bisect)
 , , .

2 1 . 2 가 , , x - (x - ray) (broad beam) 가 (radiographic plate) x - x - " (shadow)" (14) 2 3 x - , x - /

3 (ventricular region) (LV) (RV) (chamber) (20) (12) (nonlinear fundamental ret urn) 가 , 가 , 5,980,457 (thresholding) 가 , 4a (20) , 가 (pumped) , (light up) , 가 (18) (1 4b (12) , 가 (12) (16) 2) 가 (capillary bed) (perfusing) , 가 (12, 16, 18) 4c

4b 가 (clutter)가 , 가 (clinician) , (perfused) . LV , (18) 4b / (masking) (post - proxessing) (left ventricle)(18) 가 , (blood pool) . 100% 가 , 6% , 가 가 가 가

(spatial resolution)

(temporal resolution)

가

(,)

(transmit aperture)(

가

)

(higher - order multiline)

가 ,

(fat)" ()

가

(time - of - flight)

가

4c

3

가

4b

2

(16)

(fine capillary bed)

(collector vessel)

가

가

가

(,)

0.1

/

0.2

0.5

가

가

가

1.0

가

가

4b

2

가

가

가

가

가

가

(slit - o - vision)"

(elevation dimension)

(azimuth dimension)

5,305,756

(wavefront)

(acoustic lens)

가

5a

(10)

(30)

EL AZ

(28)

(32)

(30)

(32)

(32)

5b

(60)

(10')

(62)

6a 6b

(30, 60)

(42)

1D

(rocking)

(30, 60)

(32, 62)

(28)

(30, 60)

가

7a 7b

(10")

가

5

1.5D 2D

가

7a

(30)

(60)

5a 5b

7b

가

(30, 60)

(32 62)

7 2D

6

2

(off - axis reflectors)

8 (10)

(26) (11) (36) . , , ,

가 ECG

가

(38)

5,706,819 5,951,478

/ , B

(Doppler processing)

(wall filter) (22) 6,095,980

(variance) (42)

6,036,643

(44)

5,197,477 5,782,7

69 - (40')

B B (24) . B

(40)

B (46)

(100)

(70) 가

Cineloop[®] (56)

3D 가 , , (50) , , (54)

(UIF) (52)

가 5,720,291 3D Cineloop[®] (56) Re 36,564

1D() 1.5D 1.75D() 가 2D((10") 가

9 1.75D() 2D ()

(sparse arrays) / 가

r.f. 6,142,946 6,102,863 (26)

(101) 9 가 () 가 ()

AZ () 128 가 (EL) 6 , 768

가 가 가 , 6 (36a) () ,

6 6 () , 128 가

(11) 128 (36a) 가

10a 10b 0 ° 10a , (102) , (104)

(10₁ 10_n) (11) (36b) 10b 30 ° (104)

30 ° (102) (36b) (104)

11a, 11c 가 ()
 11a (10_m)가 (106)
 ,
 A/D 11b , (10
 m) CCD (108)
 ,
 11c , 128 - (120)
 가 , 6
 (10₁ 10_n) A/D (110) , (112)
 , , FIFO
 (104)
 , (120)
 () ,
 12 (120) N
 - (120₁ - 120_n) , 6
 (26) & () (126)
 (124)
 ,
 가
 0 가 (zero weight)
 (122₁ - 122_n)
 6
 11a 11b
 128 128 (36b)
 , 128 () ,
 (11) (101)
 2D 2D 가 13 3000
 2D (200)
 ,
 2D 12 가
 , ± 30 °
 ,
 ¼가
 13 (200) 12 (202)
 " " (202) 가 14 12
 (202)
 (750) 15a
 15f 가 3 - 3

. 15g 4 , 4
 .
 3000 가 , 12 가
 256 가 256 .
 ,
 .
 2D 12 , 40 ° () ,
 가 가 1/16
 가
 ,
 .
 16 17
 (204) (206) (208) . (208)
 (212) (208)
 (210) 가 , (206)
 가 , (212) 가 () .
 (212) 2 (216)
 (214) 2 (216)
 , (214)
 (220)
 ,
 .
 , 가
 (218) 가 ,
 .
 16 17 16
 가 , (228)
 (228) (230) ,
 가 (230)
 (228) (212)
 (234) , (232)
 (212) (current summing n
 ode)
 (240) ,

(242) 1 (230) 2 (232) (242)
 , 가 , 2
 ,
 (INode)
 1 2 가 , 2
 1 (,)
 가 ,
 , /
 3D
 18 19
 ()
 19a
 19
 19 가 " (fat)"
 250) (270) , (19
 (280) 18a 19x
 (282) , 3072 2D 12 256
 , 19x 19a 19 (281) (252 274) 19
 19 (284) , 8b 256 , B ,
 (100)
 19b
 (361 367) (361 367) 2 r.f.
 (371) (361, 362) ½ 가
 가
 (372) (362, 367)
 (373) (361, 367)
 2 (2⁻¹) 가
 가
 3D

19c 가 가 가 19b 가 (iteration)
 , 가 (381 383, 387 392) (361, 362,
 367) (,) , 2 가 가
 가 (381 383) 가
 $\frac{1}{2}$ 가 (381) ($\frac{1}{2}(361) + \frac{1}{4}(362) + \frac{1}{4}$
 (367)) , 5,940,123 $\frac{1}{4}, \frac{3}{4}$ 가
 , (392) ($\frac{1}{4}(367) + \frac{3}{4}(361)$,
 , ($\frac{1}{4}(367) + \frac{1}{4}(361) + \frac{1}{4}(361) + \frac{1}{4}(361)$.
 19c (384 386) (362, 363, 367)
 , (393 396)
 , r.f. .

(linear interpolation filter kernel) (, ,
) 가 가 , 가

(grating lobe) 가 .

2D -

- ()
 $\lambda/2$,

1D 가 $\lambda/2$ () 가 64 1D
 16 4

r.f. ,
 $\pm \lambda/8$, ,
 1dB , r.f. ,
 $\lambda/4$) $\lambda/8$ 1/16 ($\lambda/2$ (Nyquist)
 $\pm (\lambda/8)/(4*\lambda)$ 1/32
 3.6 가 1.2 가 .

1D , , 2D
 , 가 , 가 . 2D
 , (quadrature relationship)
 2D , 18d , 120 °
 $B_{\psi 0}$, $B_{\psi 120}$, $B_{\psi 240}$,
 (ψ)
 (ψ)
 18c (202) (B_0)
 ,
 , 가 .
 18d (280) 가 18b (, $B_{\psi 0}$, $B_{\psi 120}$, $B_{\psi 240}$) 18a -
 (352) (351) n
 (352) r.f. 가 ,
 () , r.f. r.f. ,
 , r.f. , r.f.
 가 , 가 r.f. , N K
 가 M , MN r.f. 가
 K (, + r.f.)
 (100) , (284) ,
 (n) 256
 , 768 ,
 가 ,
 (가) ,
 .
 3 20 2D (20
 0) (300) . (300)
 , , (302)
 (300) (300) (302)
 가 , (302)
 가 가 21
 가 (E_{300})
 (E_{302})가
 .
 22 (100)
 (300) 가 , (304)

306) (100) (300) (302) (304) (306) (302) (304) 가 가 (306) (300) 가 (100) " c" 23 가 (300) (306) (300) (306) (306) (300) (306) E₃₀₀, E₃₀₆, E₃₀₀ 23 (308) 19 (308) 가 (300) (12) (306) 24 26 (300) (310) (312, 314) 25 26 (310) 가 2 (30) (310) 가 (320) (310b) (320) 310a (310a, 310b) 가 (314) (312) (312) (314) (314) (310)

가 , 26 (324) 24
 , " 가 , 26 (h)
 , " " , , 322
 " " ,
 가 .

(57)

1.

(ultrasonic diagnostic scanhead) ,
 (enclosure) ,
 , () 2
 (transducer element) ,
 (microbeamformer) ,
 () ,

2.

1 ,
 ,
 2 - , .

3.

2 ,
 - ,

4.

1 ,
 ,

5.

1 ,

4

6.

5

4

(quadrature relationship)

7.

1

(triangular - based geometry)

3

8.

7

3

9.

가 가 2
가 ,

10.

9

11.

9

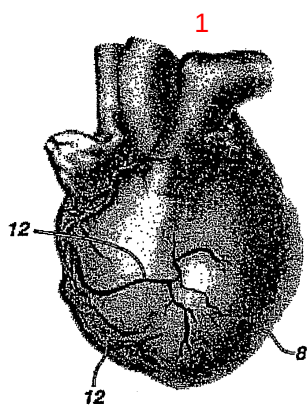
12.

2

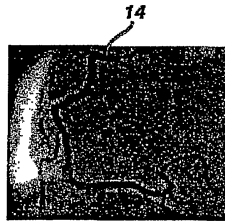
13.

12

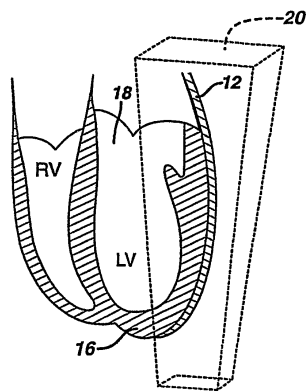
(interpolator)



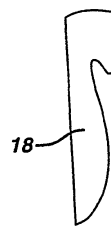
2



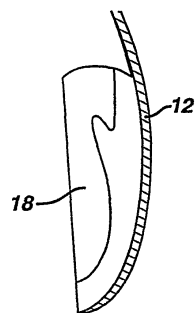
3



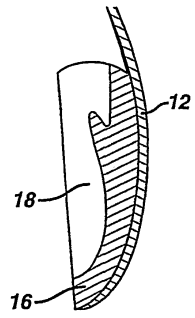
4a



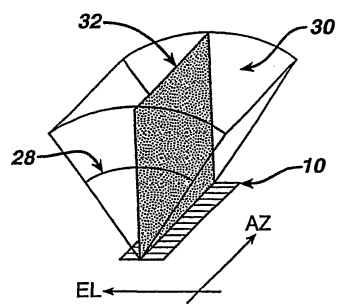
4b



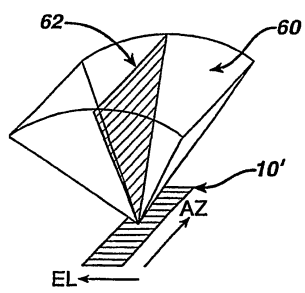
4c



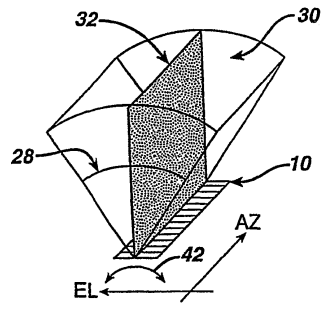
5a



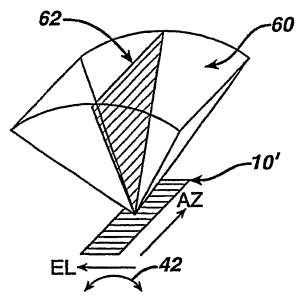
5b



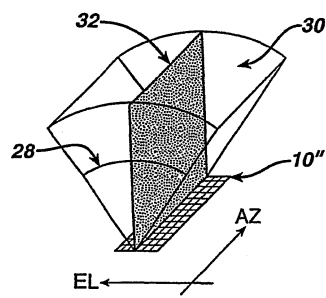
6a



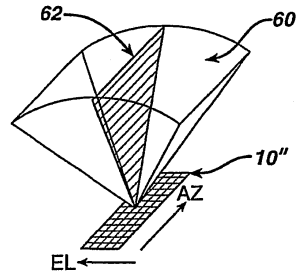
6b



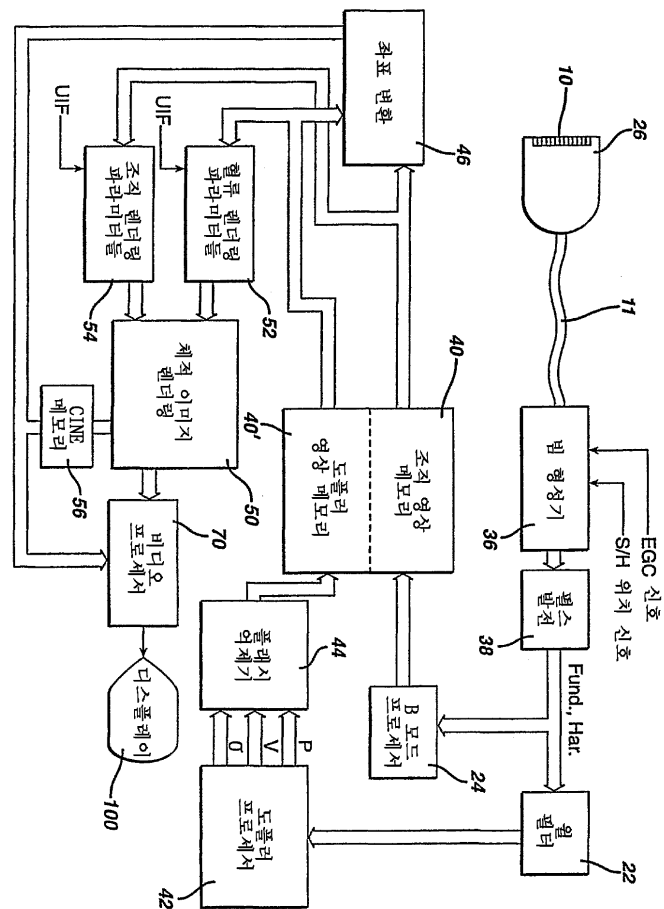
7a



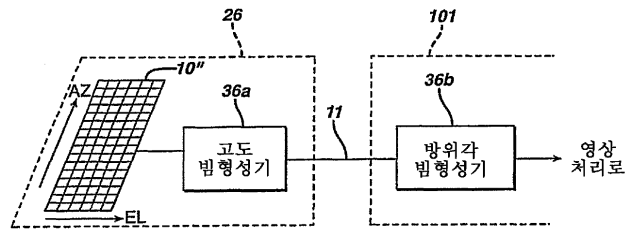
7b



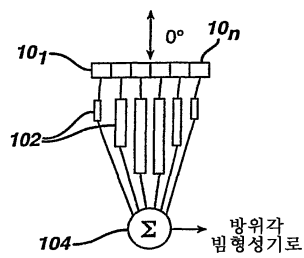
8



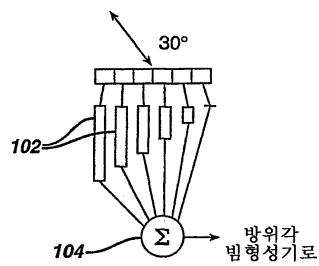
9



10a



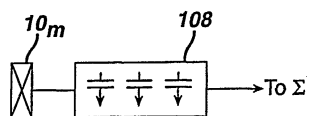
10b



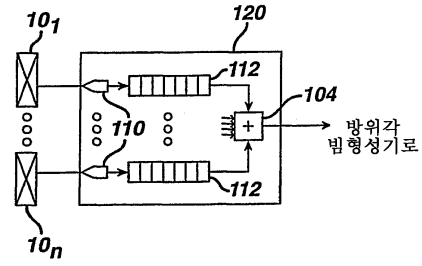
11a



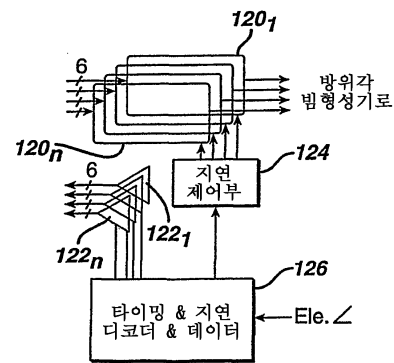
11b



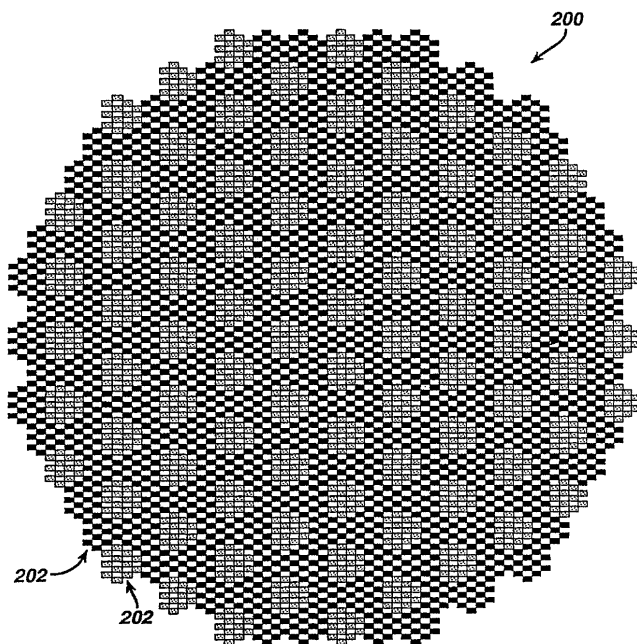
11c



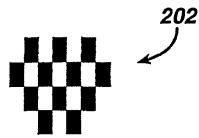
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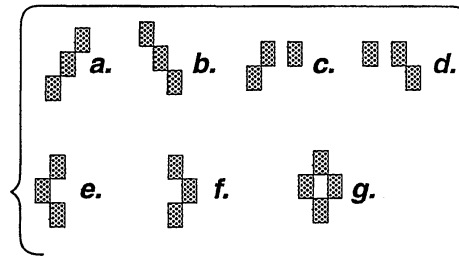
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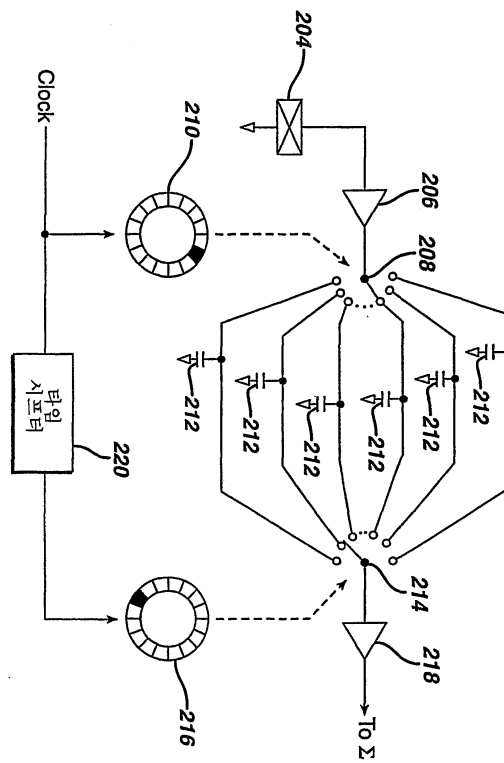
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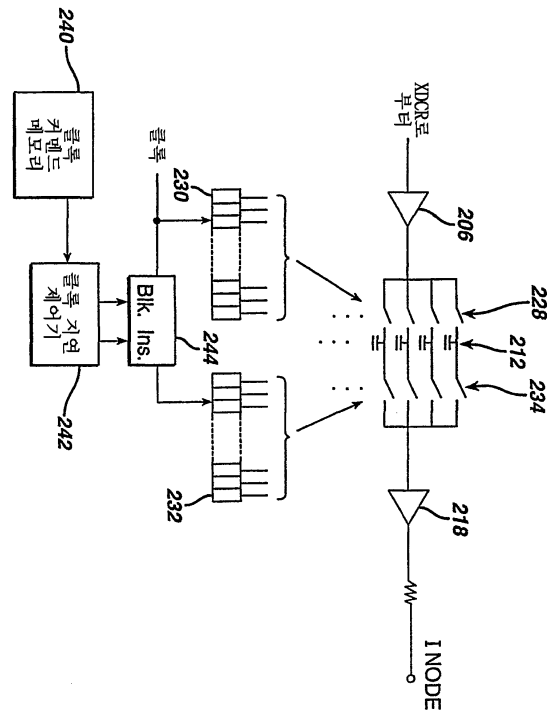
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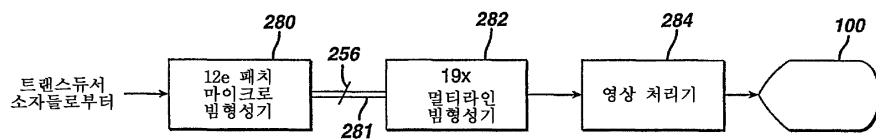
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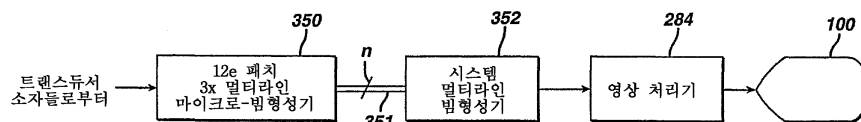
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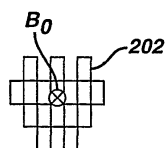
18a



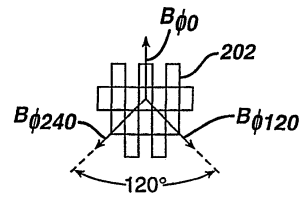
18b



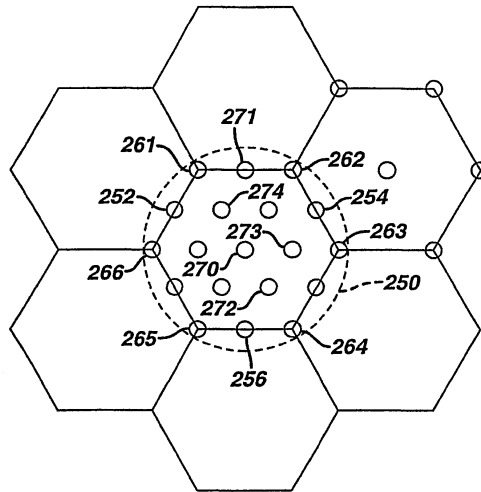
18c



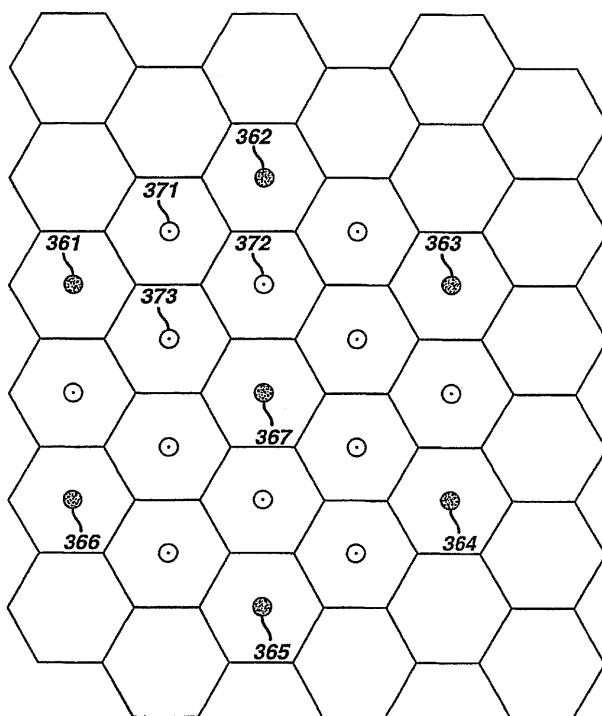
18d



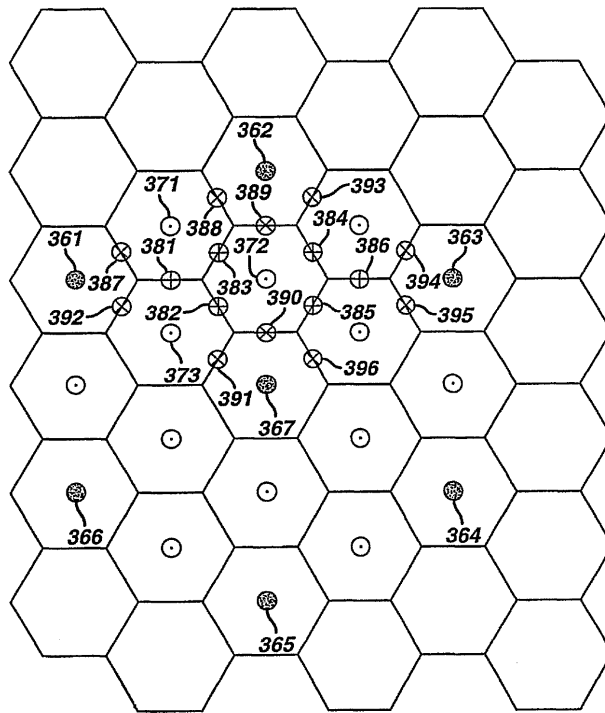
19a



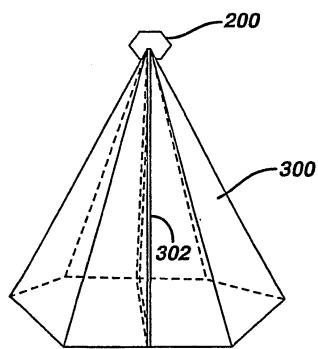
19b



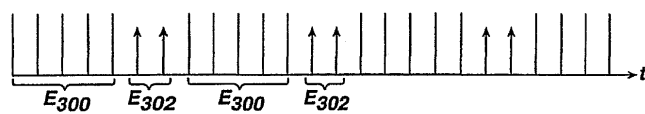
19c



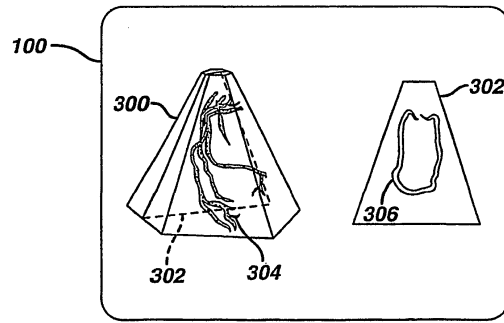
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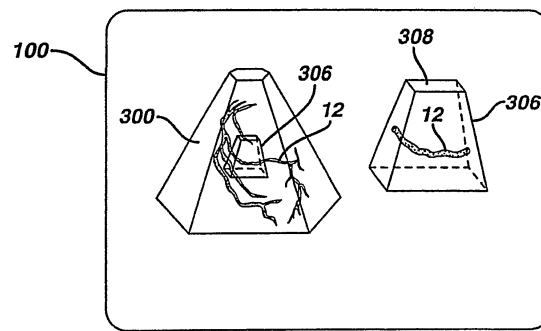
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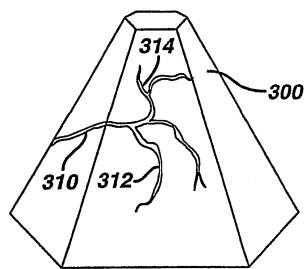
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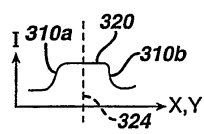
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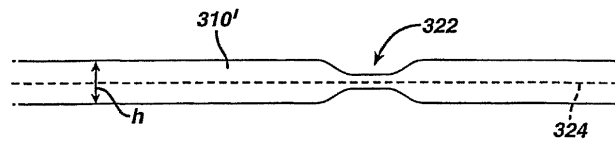
24



25



26



专利名称(译)	具有多线贴片的超声诊断成像系统换能器阵列		
公开(公告)号	KR1020020044561A	公开(公告)日	2002-06-15
申请号	KR1020027005169	申请日	2001-08-14
[标]申请(专利权)人(译)	皇家飞利浦电子股份有限公司		
申请(专利权)人(译)	科宁欣克利凯恩菲利普斯日元.V.		
当前申请(专利权)人(译)	科宁欣克利凯恩菲利普斯日元.V.		
[标]发明人	POWERS JEFFRY E 파워스제프리이 AVERKIOU MICHALAKIS 애버큐미칼라키스 BRUCE MATTHEW 브루스매튜 SKYBA DANNY M 스키바대니엠 ENTREKIN ROBERT R FRASER JOHN D COOLEY CLIFFORD R ROBINSON BRENT S ROUNDHILL DAVID N 라운드힐데이비드엔 SCHWARTZ GARY A PESQUE PATRICK R		
发明人	파워스제프리이. 애버큐미칼라키스 브루스매튜 스키바대니엠. 엔트레킨로버트알. 프레이저존디. 쿨리클리포드알. 로빈슨브렌트에스. 라운드힐데이비드엔. 슈바르츠개리에이. 페스퀘패트릭알.		
IPC分类号	A61B8/06 G01S7/52 G01S15/89 G06T1/00 G10K11/34 A61B8/00		
CPC分类号	A61B8/06 A61B8/0883 A61B8/0891 A61B8/4472 A61B8/481 A61B8/483 A61B8/543 G01S7/52025 G01S7/52074 G01S7/5208 G01S7/52095 G01S15/8918 G01S15/8925 G01S15/894 G01S15/8963 G01S15/8979 G01S15/8993 G10K11/341 Y10S128/916 G10K11/346		
代理人(译)	李，何炳 李昌勋		
优先权	09/645872 2000-08-24 US 09/910148 2001-07-19 US		
外部链接	Espacenet		
摘要(译)			

报道了使用二维阵列换能器描绘体积区域的超声成像方法和装置。超声布线包括2D阵列换能器，用于在元件组和微束形成器的阵列中在探针中形成束信号。微束束形成器可以响应于单播事件产生多线（不同操作的接收波束）。它被组合在由多线贴片信号产生的超声系统处理器中，扫描线是多线波束成形或多线插值。二维阵列换能器，体积区域，超声成像，超声布线，微束成形器，多线，扫描线。

