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(87)

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(30) 60/295,100 2001 06 01 (US)

60/295,118 2001 06 01 (US)

(71) , 94588-3335, , 6670

(72) , , 94566, , 3163

, 95117, , 125

(74)

:

(54)

2001 6 1 가 60/295,118 ('Formation of microstructure using piezo deposition of liquid onto substrate') , 가 60/295,100 ('Formation of printed circuit board structure using piezo deposition of liquid onto substrate')

odeposition:PMD) (piezoelectric micr

(traces) 가 가

(acid etch bathes) 가

가, 가

(PMD) . PMD PMD

PMD . PMD PMD

PMD (patterned) 가 가, PMD

(legend) 가 PMD

PMD PMD

PMD 가 (microclocking) , PMD PMD

PMD 가 X Y 2 , PMD 3

/  
 , PMD PMD 가  
 , PMD PMD 가  
 가  
 1 PMD  
 2 1 PMD  
 3 1 PMD  
 4 1 PMD  
 5 1 PMD PMD PMD (mounting bra  
 cket)  
 6  
 PMD 5  
 7 6 PMD 가 PMD  
 8 PMD PMD  
 9 7 PMD 가 PMD 90  
 10 (tray), (soaking reservoir) PMD (capping s  
 tation)  
 11 PMD (docking station) (worki  
 ng bag)  
 12 11  
 13 PMD 가 11  
 14 PMD

15

PMD

PMD

piezoelectric Micro Deposition: PMD) (P

polymers: LEPs)가 ( ), PMD (Light-emitting (PLED) PolyLED)

(deposition)' (droplet) (jet)', ' (discharge)', ' (pattern)' ' PMD (droplet)' ' (drop)'

heet) (roll) PMD (sh 가 PMD

(microstructures)'

2 , 3 가 ( )

PMD PMD

PMD

가

(objects),

, RAM, ROM, EEPROM, CD-ROM

가

PMD

가

PCT

(Temperature Controlled Vacuum Chuck)'

2002 5 31

PCT 2002

5 31 PCT

PCT

가

2002 5 31

PCT

2002 5 31

PCT

2002 5 31

PCT

PMD PMD

PMD

, PMD

, PMD

(capping station), (docking station)  
 PMD 가 PMD  
 / PMD , PMD  
 . PMD / PMD  
 MD , PMD , PMD P  
 . PMD (hepa) ,  
 , PMD 가  
 , PMD PMD PMD . PMD  
 . PMD 가  
 (pitch) ,  
 가 가  
 / PMD  
 가 (trail) ,  
 1 , (12), (14), PMD (16), PMD (18), (20), (22),  
 (24) (26) PMD (10)  
 , (12) PMD (18) (28) (28) PMD (10)  
 PMD (10) , (28) , (28)  
 2 3 1 PMD (12) ( )  
 30) (32) , 2가 (26), (25) (22) (12)  
 1 3 (30) , (14), (30)  
 (34) , (30) 1 X 1 (30) 1  
 (32) (32) (30) 1 Y  
 , PMD 2 (16) , (30) 2 1 2 (34,36) X-Y  
 , (12) (12) X-Y (12) X Y . X-Y  
 PMD (12) PMD (16) (12) ,  
 (14) PMD (12) (securing)  
 4 , (38) (14) (42)  
 (14) (42) 1 Metapor  
 , (42) M - Tec Holding Ltd.(Winterthur) Portec Ltd  
 (42) , ( )  
 14) (44) ,

(14) (45) , (14) PMD (10)  
 (14) (45) , DB9 ,가 가 (14)  
 가 (42) .

4 (38) (14) (38) (ledge suppor  
 t,46) (140) (14) (38) (38)  
 (38) PMD (38) PMD (14) (16)  
 (38) PMD (16)

(14)가 PMG (16) (38) PMD (16)  
 (46) (14) (14)가 PMD (16)  
 (14) 2 (48) (48) (20)  
 (14)가 (14)가 PMD (16)  
 (14)

(56) (14) (38) (14) (52), (54)  
 (56) 1 (58) (52) 2 (60) 가  
 (14) (14)가 (62) 가 (pivotally) .

(64) (56) (54) (56) 1 (58) 가 가  
 (62) 2 (60) (14) (66) ( 4 ) (14)가  
 (52) (64) (54) (14) (56) 2 (60)가 (54)  
 (14)가 (62)

(14) (14) (38) PMD (16) (38) PMD  
 PMD (10) (14) (38) PMD (16) (turret) ,  
 (18) (38) PMD (38) PMD (16) .

(20, alignment component) 1 3  
 (20) PMD (18) (14) (20) (48)  
 (38) (38) (38)  
 (38) PMD (16) (38)  
 (38) PMD (10) 10 (38) (38)

0 1 PLED PMD 1  
 (38) (14) , PMD (10) (20)  
 (38) (14) PMD (16) , PMD (16)  
 ) (38) PMD (16) 3 (38) , PMD (16)  
 , PMD (10) (38)

(38) (12) PMD (16) PMD (16)  
(38) (38) (38) (12)가 X PMD PMD  
(38) 가 (12) X Y Y

(38) PMD (16) PMD (16)  
(16) 1 256 (16) ( ) 가 PMD  
(38) PMD (16)

1 4 (22) PMD (16)  
(22) (68) /

(22) PMD (10)  
PMD (10) PMD 가 (10)

(68) (22) (68) (12) (68)  
) (68) (69) PMD (16) (26)  
(69) 2가

(16)가 90 1 PMD 가 1 1 2 PMD  
2 PMD (10) PMD (10) PMD (16) 2 PMD  
/ (68) 가  
PMD (10) PMD (16) 3

PMD  
가 (microclocking)  
(starvation, ) 가

PMD

가 . PMD , PMD 가 , PMD PMD 10 1 PMD 10 1 가

가 , PMD 가 , PMD PMD 10 1 PMD 9 (filler)

10 , PMD 가 10 1 10 1 ,

11% 9 10 1

, PMD 가 ,

, PMD 가 가 0

PMD (pitch) , PMD PMD

Tf - Ts = Tt (Tf) (Ts) (Dt) (Dt/Tt)

가 가 , 가 , 가

(69) 가

) ( 가

3



X-Y X Y

가

(68)  
(satellite)

가 / 가 , PMD 가  
(10) (16)가 PMD (16) , PMD 가 PMD (16)  
, PMD 가 가 PMD (16)  
PMD 가

PMD (10) (22) (20) (22) (20)  
가 (38) 가

(38) PMD (16)  
가 PMD

16) PMD (10) x y 가 , PMD ( )  
, PMD (10) PMD (16)가 PMD PMD  
가

PMD PMD (16) (38)  
, PMD (18) (70)

5-7 PMD (16)가 PMD (18) (70)  
(72) (70) PMD (70) PMD (16)  
(clasp) (74) (76) (74) (76) 9 PMD (16)  
70) (78) (76) (70) (76) PMD (16)  
0) (70) PMD 가 (70) (76) (70) PMD (8)

7 6 (70) PMD (16) , PMD (16)  
(90), (92), (94), PMD (96) (98)  
) , (92) PMD (16) 가 PMD (96) (98)

(96) , PMD (96) (diaphragm) Pb(Zr, Ti)O<sub>3</sub> 'PZ  
T' (98)

(16) PMD PMD (16) 10 (picoliter) 1000 , PMD



9 , , PMD (16) PMD (16) (80)  
 (80) PMD (16)  
 PMD (16) (70) (16) (70) 가 (120)  
 . PMD (16)가 (70)  
 , , (70) PMD (16)

10 (26) (26)  
 (132) (130) (134) (26) 가  
 PMD (16) (134)가 PMD (16) (98) (26) PMD (16) (132) (130)가  
 (134) (134) PMD (16) ( ( , (98)가  
 )  
 (26) PMD (16)  
 (130) (130) (130)  
 (130) (138)

, PMD 가 , PMD  
 PMD 가 PMD  
 ), , PMD 가 PMD 가 가 PMD 가 PMD ( )  
 , PMD 가 PMD 가 PMD PMD  
 D PMD 가 PMD PMD

11 13 (140) PMD (16)가 PMD (16) (140)가 PMD  
 (16)가 PMD PMD PMD  
 (140) PMD

11 12 (140) PMD , (144) (146)  
 (146) PMD (16) (142) (142) 13  
 (144) (98) PMD (16)  
 , (144) , PMD (144)  
 (148) (purging) (144) ( )

11 12 (140)가 (150)  
 (140) (154) (152)  
 (154) (154) , PMD  
 , (152) (weight gauge, 156) (156)  
 (154) (156)  
 , 2- (168) (162) (154) (160)

11 13 (152) (154) PMD (16)  
 (154) 가 가 (164)  
 가 PMD (16) (meniscus)  
 ) PMD (16) (160)

, (150) , (110), (154), (160) (16)

2) (150) PMD (Dupon E. I. Denemours amp; Co. Teflon  
(polytetrafluoroethylene) (lining))

(16) (140) 가 (purging) PMD (16) PMD (purged) PMD  
PMD 가

(104) 가 PMD (16) 13 PMD (140) PMD  
(148) PMD (16) 가 PMD (14) (140)  
PMD (16)

4) 1 (170), (172) (blotting cloth, 174) (24)  
(174) (170) (172) (172) PMD (16)가 (98)  
(24) PMD (16) (172) PMD (16) (98)  
(172) (174) (98) (98) ( (176))  
(scrubbing)

(98) (98) (174) (170)  
(frictionally engage) (174) (174) (98)

(174) 가 (172) PMD (16) (26)

0) 14 가 PMD (200) (22)  
(210) PMD (210)

(slug)

(210) PMD 가 (210)  
PMD (12)가 PMD (16) PMD (210)  
, PMD (210) (38) PMD (16) PMD (210)  
, PMD (16) (16) (surge) PMD (16) PMD (16) PMD  
D (16) PMD (16) PMD PMD (copper - coate

d) 가 PMD PMD (copper - coate  
, PMD  
, PMD  
, PMD

가 가

가 ,

(acid etch bathes)

MD

가  
가

PMD

, P

가

가 가

PMD

가 PMD

PMD

가

(fluid binder)

(suspended)

(crystallized).

가  
가

가

PMD

, PMD

(trails)가

PMD 45 / 135

(geometries)

, PMD /

. PMD /

PMD

PMD  
(robotic)

PMD

, PMD  
)

(acid

, PMD

PMD

(V/m)  
m-m

(l/m<sup>2</sup>)

, Ohm m<sup>2</sup> / m

Oh

2

가

, 1

PMD

1 ohm

100 ohm

, 2

가

가

PMD 가 , (layered) . PMD

가 , (protrude away) , PMD 가 ,

, PMD PMD PMD PMD PMD PMD

15 , PMD (300) PMD (310) PMD (320) PMD (320) PMD (330) PMD (320) PMD (310) PMD (320) X-Y X X-Y Y

, PMD (320) ( ) 1 PMD 2 PMD 3 PMD

20) 가 (33) 가 가 (350) PMD (3

가 가 가 가 (application) PMD (320) PMD (320) (

, PMD PMD

, PMD 가 13 PMD 가 PMD 가

PMD PMD PMD (bag)

PMD 1 PMD 가 , 3 PMD 가 PMD 2 PMD PMD PMD

가  
PMD  
PMD  
가  
PMD  
가 /  
PMD  
가  
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가  
(oleoph  
PMD  
PM  
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/가  
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PMD  
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( , 1?? )  
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가 /  
2가  
가  
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PMD  
PMD  
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PMD  
PMD  
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가  
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가 /  
PMD  
PMD  
가  
가





(microclocking) 가 (starvation)

(blank) (temporal) 가 ,

1 6.

가

7.

7 8.

x y

7 9.

7 10.

7 11.

7 12.

가

가

12 13.

13 14.

가  
(master electronics)

15.

가

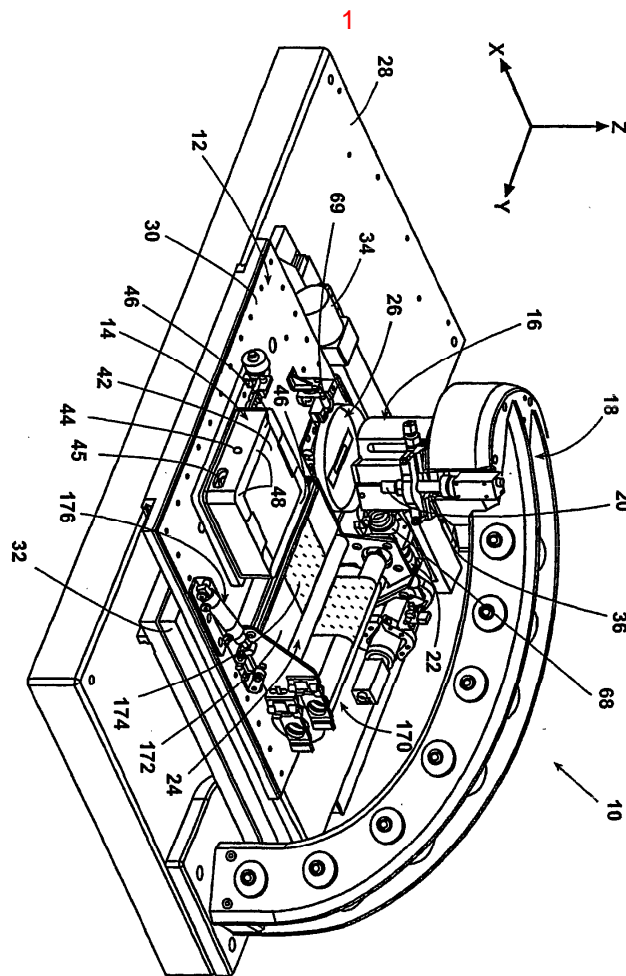
15 16.

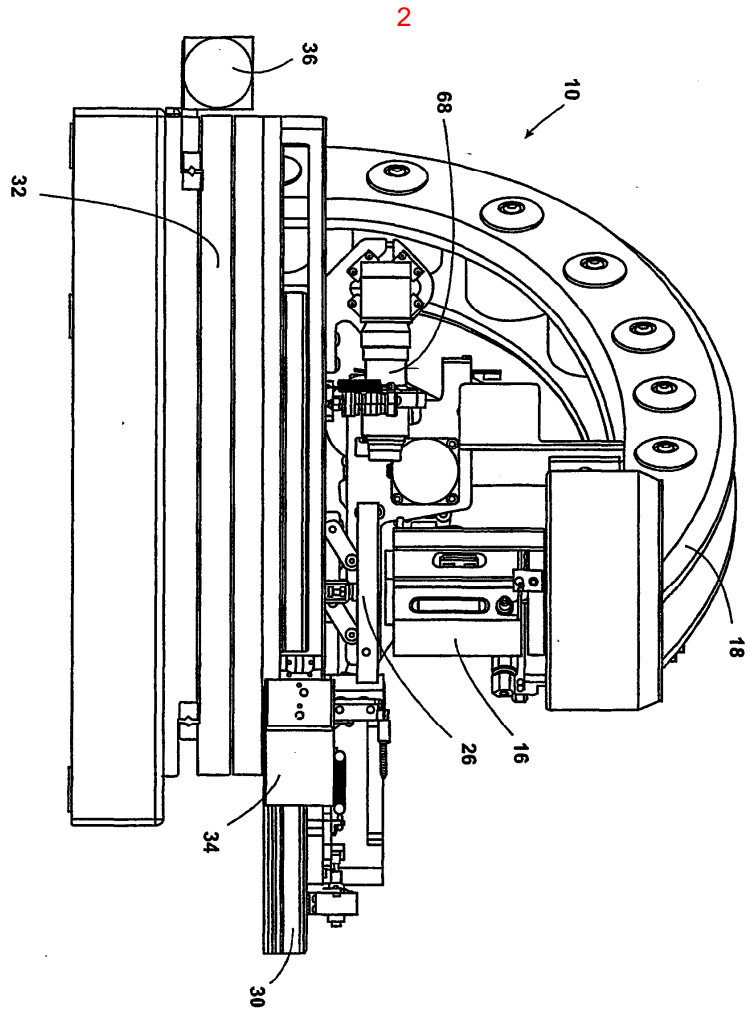
16 17.

15 18.

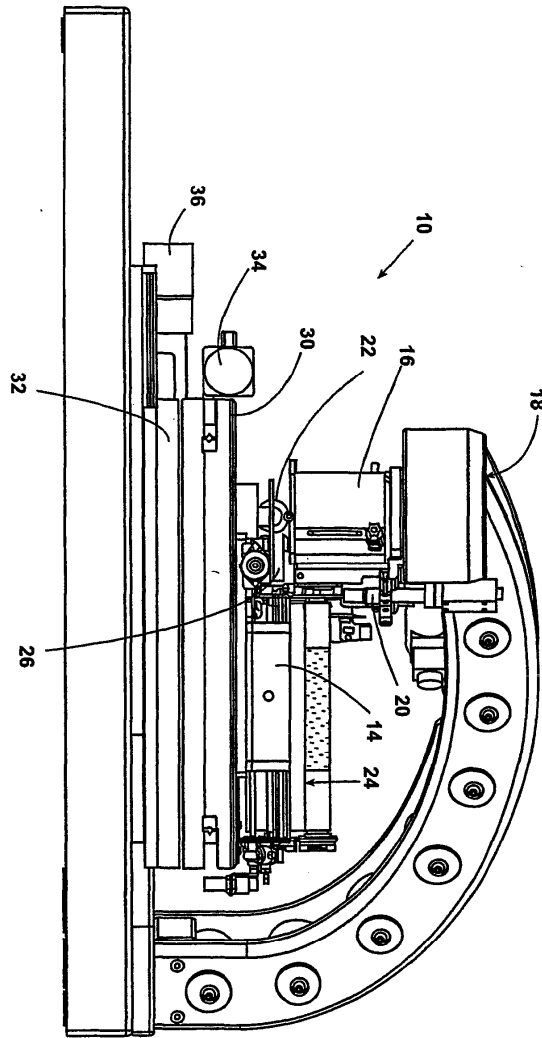
가

15 19.

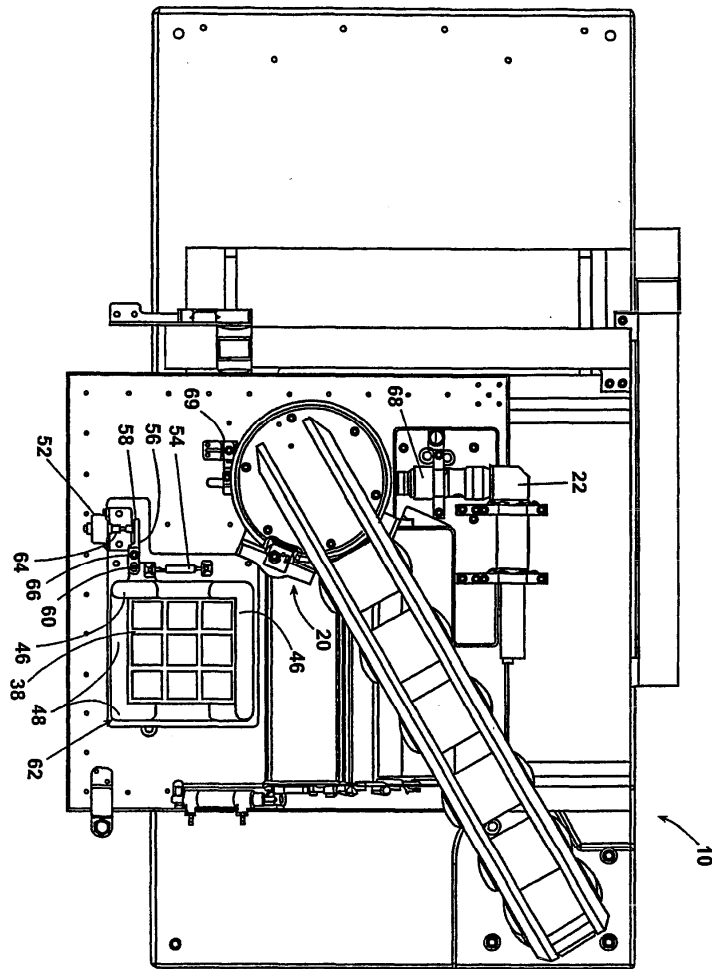




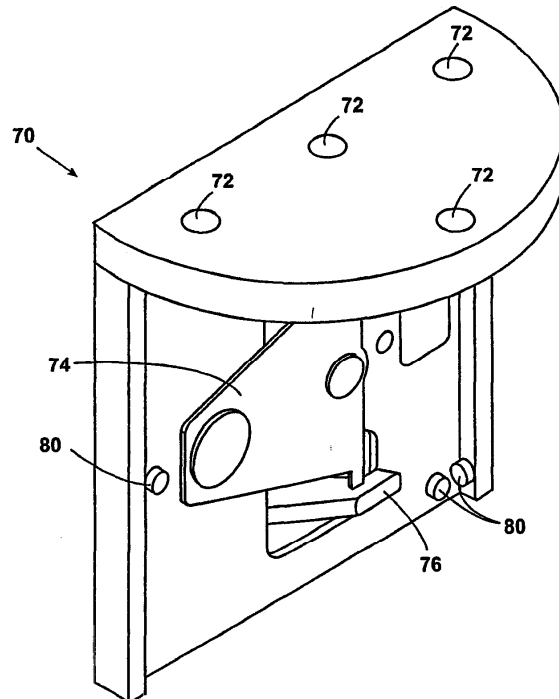
3

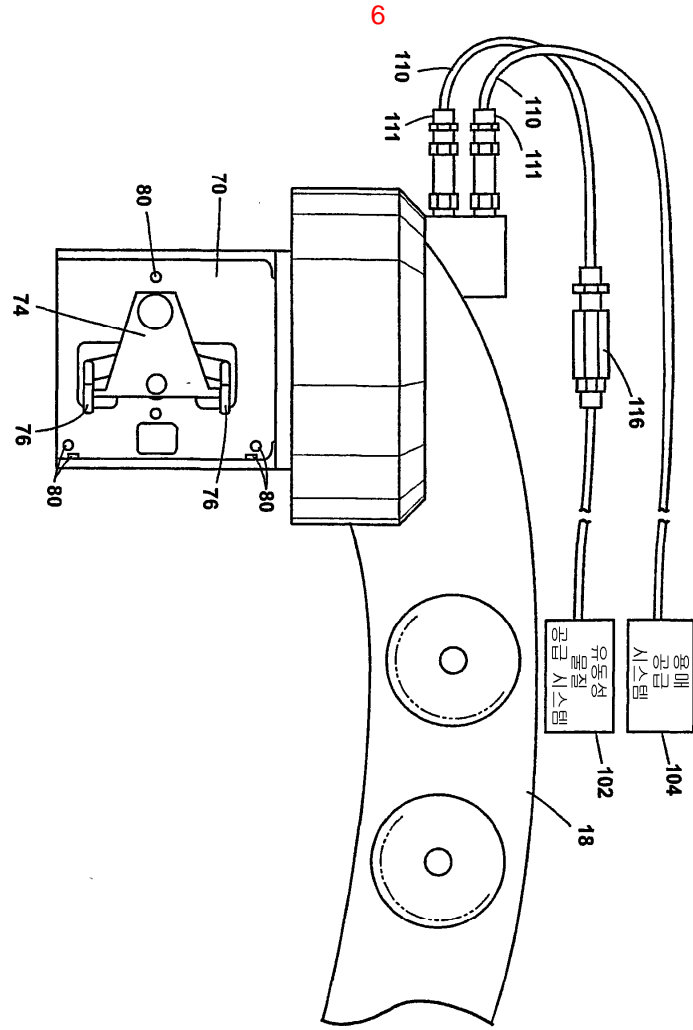


4

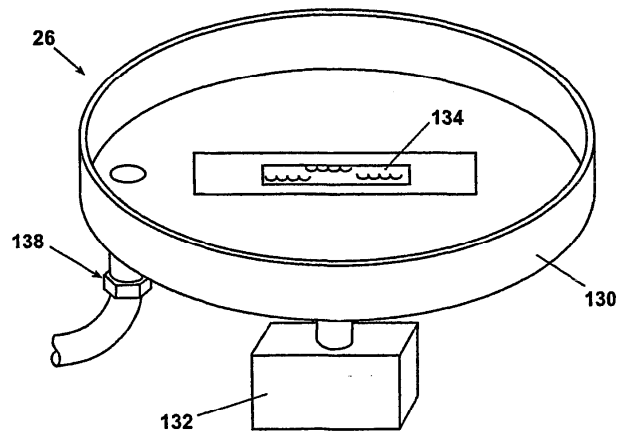
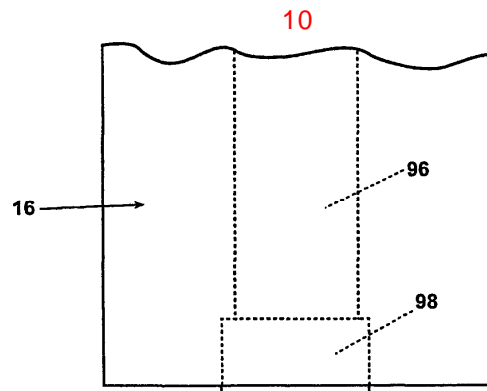
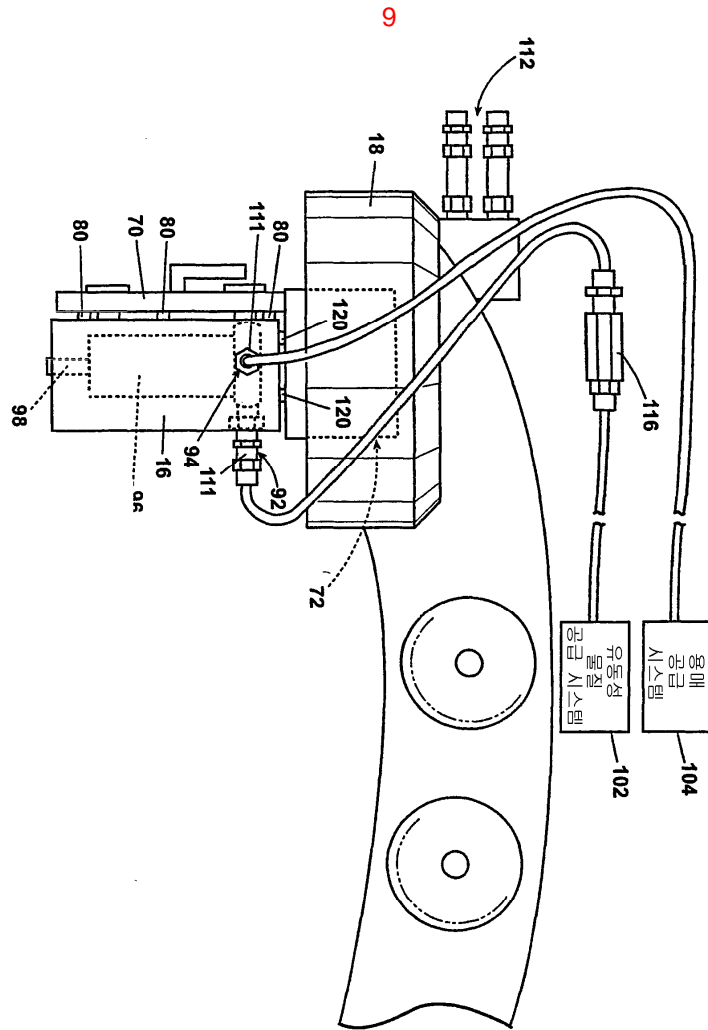


5

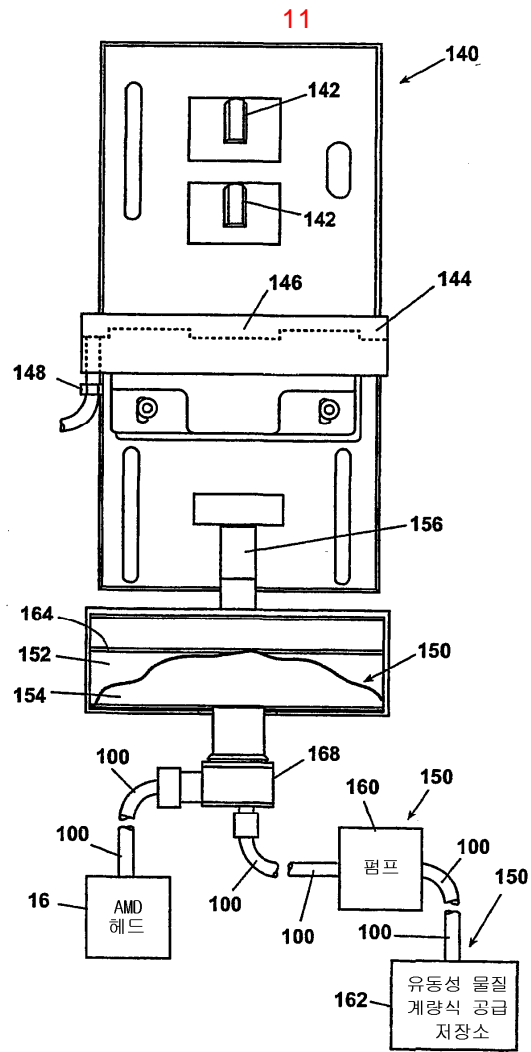


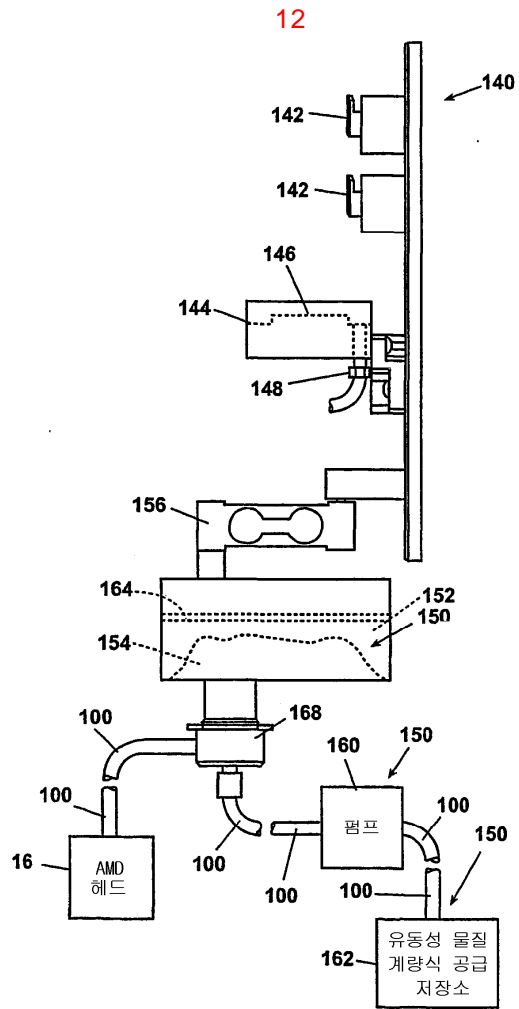




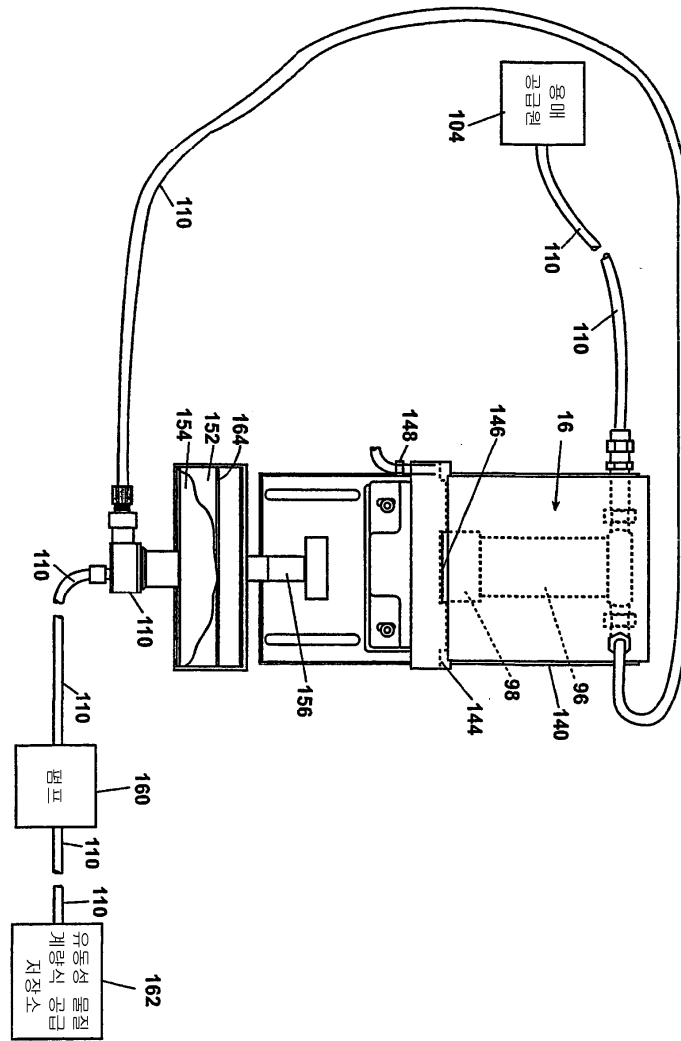








13



14

