

**(19)**  
**(12)**

**(KR)**  
**(A)**

<b>(51) . Int. Cl.<sup>7</sup></b>	<b>(11)</b>	<b>10-2004-0024598</b>
<b>C03B 37/018</b>	<b>(43)</b>	<b>2004 03 20</b>

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(21)	10-2004-7001458		
(22)	2004 01 30		
	2004 01 30		
(86)	PCT/US2002/022763	(87)	WO 2003/011779
(86)	2002 07 18	(87)	2003 02 13

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(30)	60/309,160	2001 07 31	(US)
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(71)	( 14831 )
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(72)	, , . , 14871, ,	11551
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, , . ,	28412, ,	204
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, , . ,	28411, ,	7913
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, , . ,	28425, ,	361
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(74)
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(54)
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가 , / 1 가 ,



(Polarization mode dispersion; PMD)

PMD 가

PMD†

125 μm

가

8 μm

가

50 μm

62.5 μm

50  $\mu$ m

가 . PMD

PMD

PMD

가

, PMD

(preform)'

1

가

가

가

1

1

, 1 1200 2200 , 1300 2100  
 . 1 1450 1950 . 1 1300 1600  
 . 1 1650 2200 . 1 1900 2000  
 1750 2100 . . 1 . .  
 , 1 133Pa(1 Torr) . 1 1.33kPa(10Torr)  
 . 1 13.3kPa(100Torr) . 1 66.7kPa(  
 500Torr) . . 1 73.3kPa(700Torr)

가 ,  
가 .  
가 , 2  
가 .

1 10 1

$$, \quad 2 \quad \quad \quad 1 \quad \quad \quad . \quad \quad \quad 2 \quad \quad \quad 1$$

2

2

2

, 2

2

2100 , 2 1200 2200 . . 2 1300  
 2 1300 1600 2 1450 1950 2 1750 2100  
 . . 2 1900 2000 . .  
 2 66.7kPa(500Torr) 2 73.3kPa(750Torr) 2 73.3kPa(700Torr)  
 2 73.3kPa(760Torr) 2 101kPa(760Torr)  
 orr)

1  
1

Pa(600Torr) 50.7kPa(380Torr) 101kPa(760Torr) 80k

OVD

가

가 , 가 ,

1 , 1 , 1

1600 , 1 1300 1700 , , 1 1400  
 , 1 133Pa(1Torr) 1 13.3kPa(100Torr) 1 1.33kPa(10Tor  
 r)

) ( ,  
 , 1 1 73.3kPa(700Torr)  
 100kPa(750Torr) 101kPa(760Torr) 101kPa(760  
 Torr)

가

가

가  
가

/ /

가

1

2

3

4

5 개

6 가 ( )

가

가

7 가

가

8

가

9 가

가

10 가 가

가

11

가

12

13

14  
가

15 14

가

가

가

( 1 )

$$A_{\text{eff}} = 2\pi \left( \int E^2 r dr \right)^2 / \left( \int E^4 r dr \right)$$

$$\left( \begin{array}{ccccc} -1 & 0 & E & . & . \\ r dr / [dE/dr] & D_{mf}^2 r dr & (Peterman) & , & 2w = D_{mf} \quad w^2 = (2 - E^2) \\ 0 & 0 & . & . & \% \end{array} \right) \quad (2)$$

$$\Delta\% = 100 \times \left( \frac{n_1^2 - n_f^2}{2n_f^2} \right)$$

$n_i$  가 .  $i$ ,  $n_c$

(30) 가

```

graph TD
    A[2] --- B1((32))
    A --- B2((30))
    B1 --- C1((70))
    B2 --- C2((60))
    C1 --- D1((32, 42))
    C2 --- D2((70))
    D1 --- E1((46))
    D2 --- E2((42))
    E1 --- F1((100))
    E2 --- F2((34, 46))
    F1 --- G1((34))
    F2 --- G2((48))
  
```

100

OVD

4 , (lathe)( ) . 4 , (50) (50) (52) (54) ( )

(Inside Vapor deposition process; IV)  
(Modified Chemical Vapor deposition; MCVD)  
가 /

(50) , (58) (50) , (58) , (50) (58)  
(58) (52) (58) (62) 가 (64) (52)  
가 (64) (58) (58) (59) 1 (52) 2  
, (52) 2 (67) (58) (52) (52), (69)  
(65) ) (67) (60) 가 (64A) (58) 가  
가 (61) (66) (66) (66) 가  
(66) ) , 가 (66) (58) 가  
(61) , 가 가 (58) 가 / (61)  
가

1400 1600 1400 1500

가

1450

(58)

(100)





9 (100)

가 (64)가

가 , 가  
가

(60)가

1  
가 , 가

, (100) (30) , 가 , (100) 가 ,

(100)

가 . ,  
가 . ,  
가

(60)

- 가  
(60)  
가

가

, 가  
(60)가

(60)가

(100)가

가 가

)

, ,  
( , 가

(55)

(100)

가 ),  
(60)

1

1

가

가 , /  
가가 , /  
가가 , /  
가, 가  
PMD

가

가



가 ; 가 ; 가 ; 가

(rod-in-tube)

(rod-in-tube)

가 1999 4 26 60/131,012 가 60/131033 , 가 2000 4  
 26 09/558,770 ,  
 , 1420 1550 1400 16  
 ) ,  
 ( 3 9 ) 가 1900 4 2000 , 8 1950 2100 , 가 , 가  
 ,  
 0mm 가 , 10mm 5mm 30mm  
 가

(238)	(60)		(264)	.	,	(260)
	(232)			(hollow portion; 266)		.
(266)	(60)	가	.	가	,	
(60)		.	.	,	200μm	2mm
mm		.	.	,	(260)	0.2 0.5
			,	(266)	0.3mm	0.4mm

가 1460  
6  
가 .  
0.015ps/km<sup>1/2</sup>, 2000  
PMD

1450 , , 2000 가 . 6

(wetting) (re-wetting)

, 가 , 가 , 가 / ,  
가 , , 가 . . . .  
가 , , , , , ,  
(60) 가 , , , , , ,  
가 , , , , , , , ,

(57)

1. 가 가 가 (preform)

1 , 1

2.

1 ,

1

3.

1

1

4.

1

1            1450            1950

5.

1

1            1300            1600

6.

1

1            1650            2200

7.

1

1            ,        10Torr

8.

1

1            100Torr

9.

1

1            500Torr

10.

1

,            1            ,            2            ,            2

11.

10

2            1

12.

10

,

13.

10

2            500Torr

**14.**

10 ,  
2 700Torr

**15.**

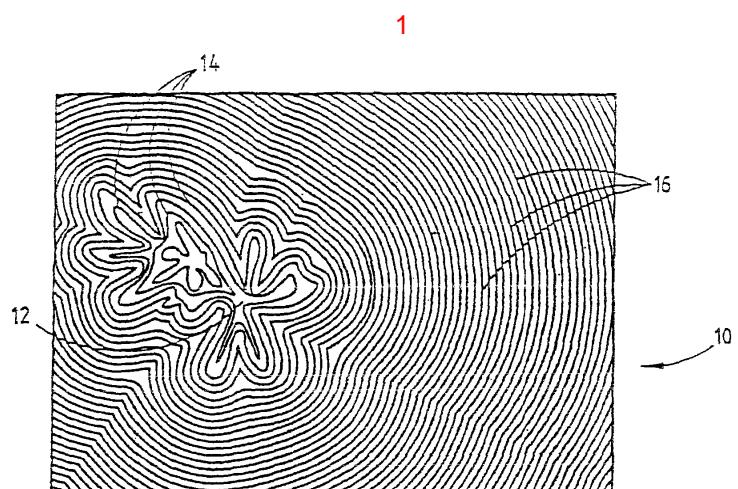
10 ,  
2 760Torr

**16.**

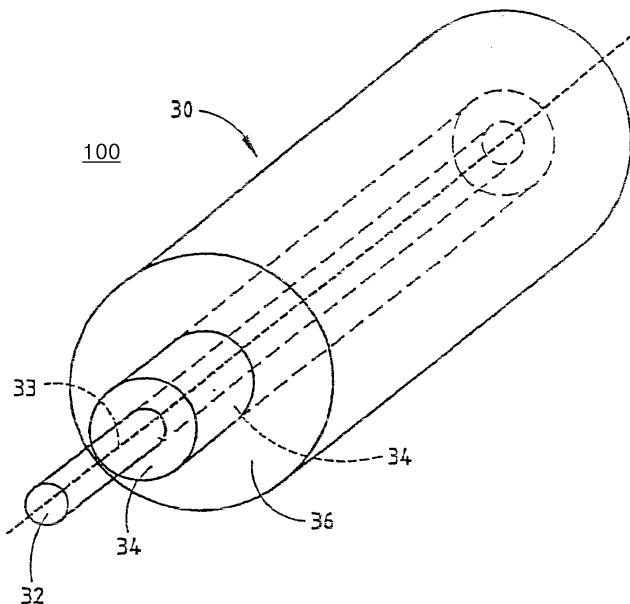
1 ,  
가 1 , 2  
, 1 2 , 2

**17.**

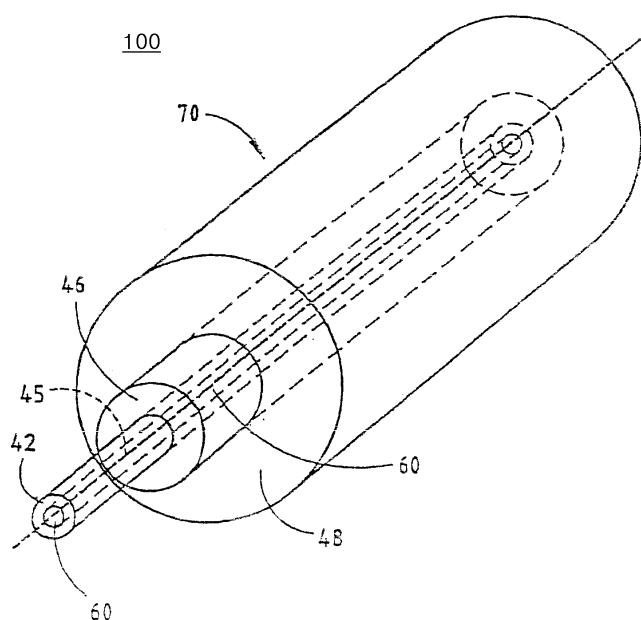
1 ,  
OVD



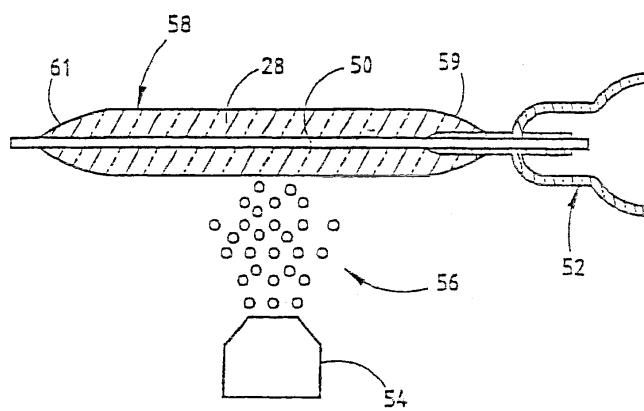
2

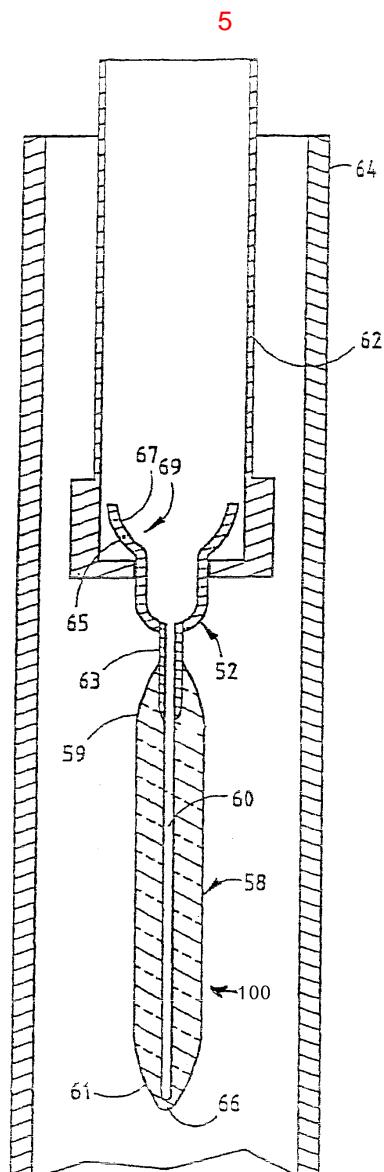


3

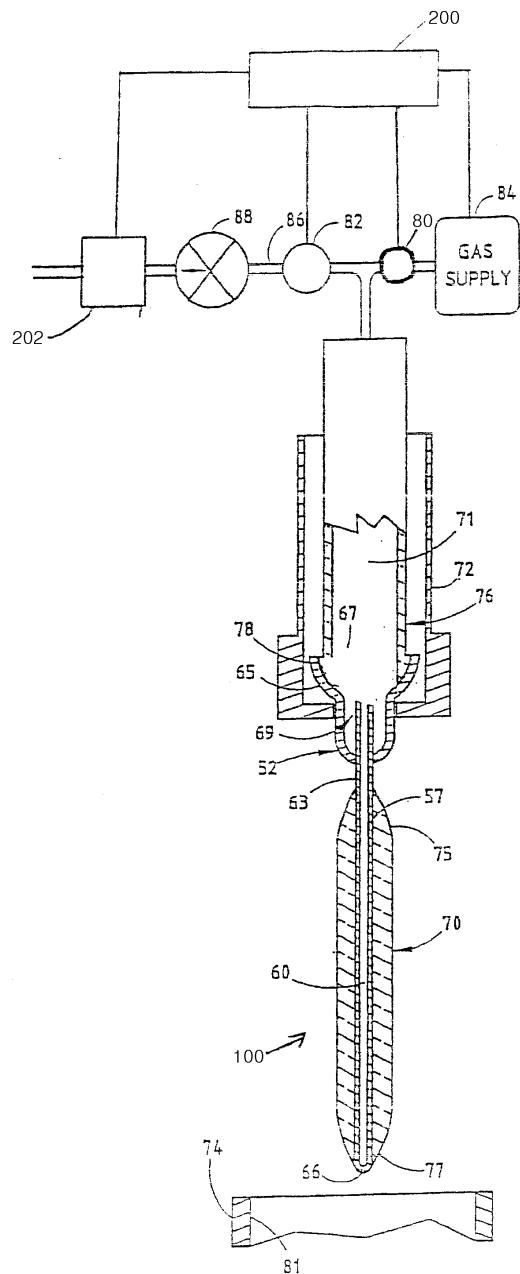


4

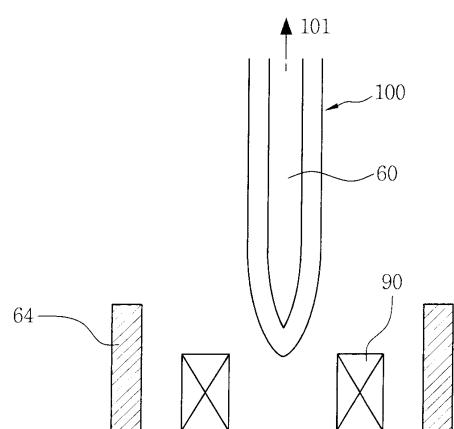


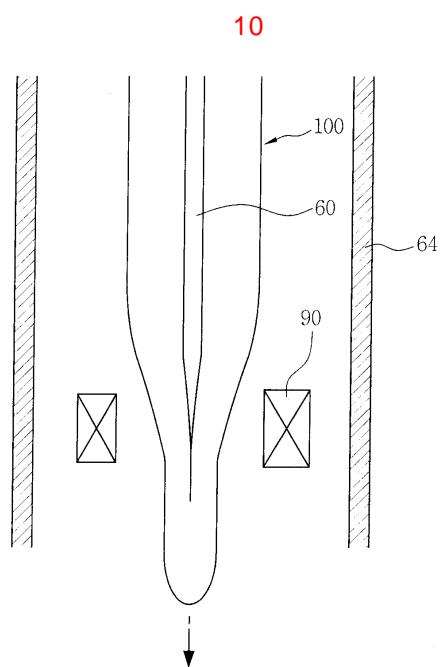
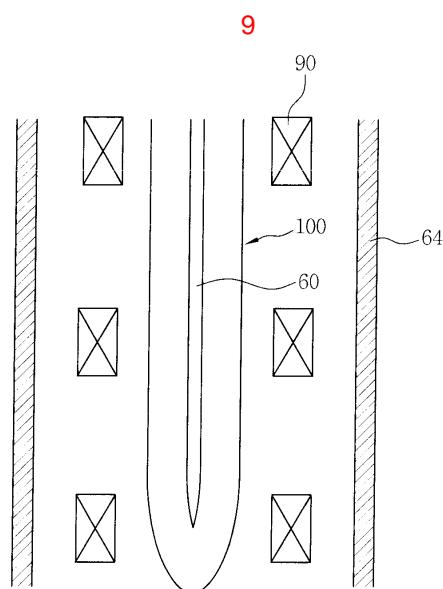
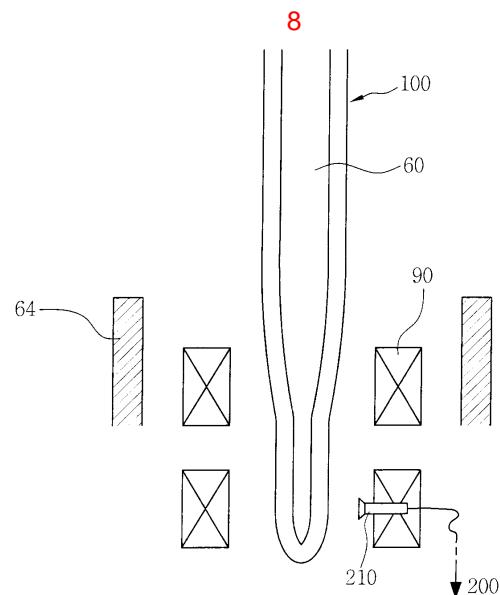


6

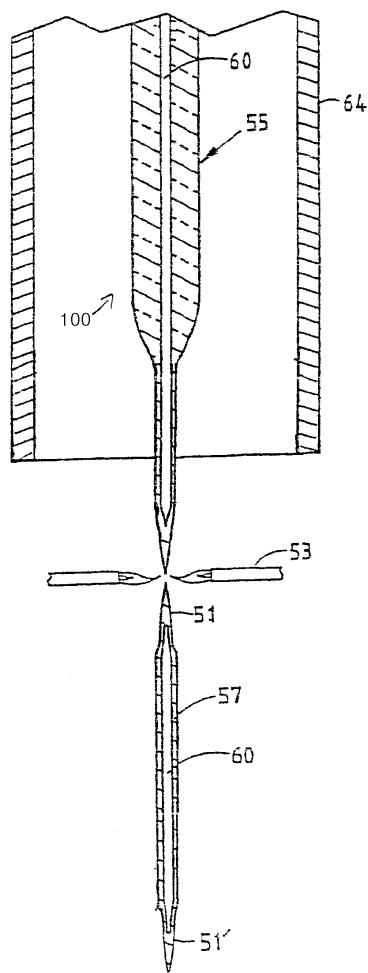


7

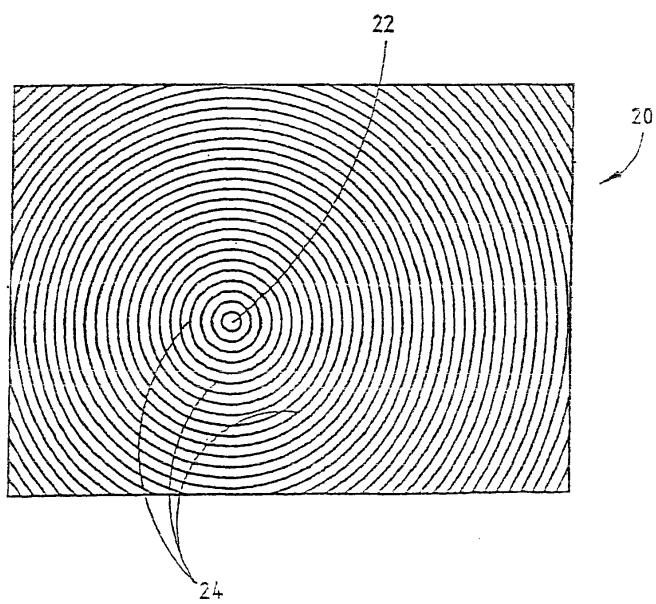




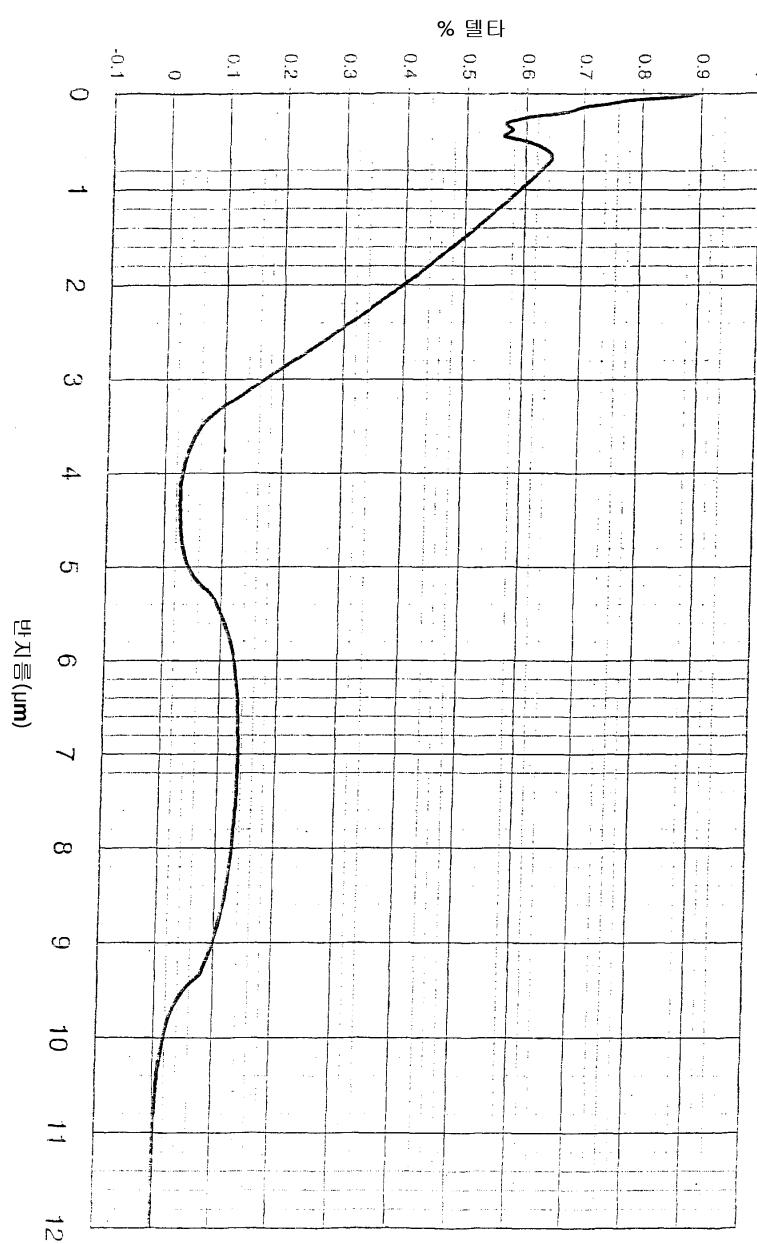
11



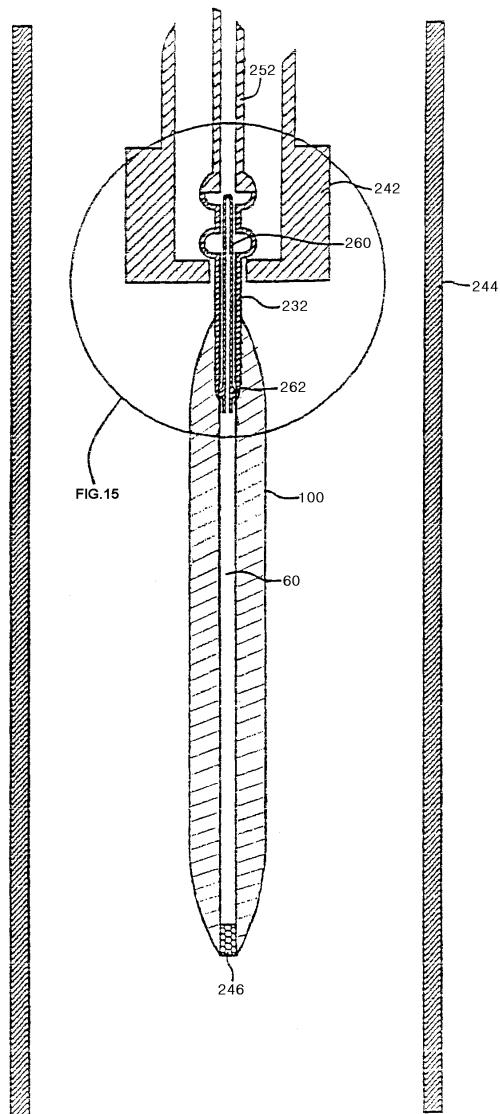
12



13



14



15

