

(19)  
(12)

(KR)  
(B1)

(51) 。 Int. Cl. <sup>6</sup>  
H01L 21/00

(45)  
(11)  
(24)

2003 04 21  
10 - 0372810  
2003 02 06

(21)  
(22)

10 - 1998 - 0022476  
1998 06 16

(65)  
(43)

1999 - 0007019  
1999 01 25

(30)

97 - 159038

1997 06 16

(JP)

(73)

가 가

3 30 2

(72)

가

581 - 4

가

2235 - 2

가

가 2 19 - 2 - 504

가

1 8 - 8 - 302

(74)

:

(54)

1(A) (E) SOI

2

3 5 ,

6

7

8

9 11 2

12 3

13(A), (B) V

< >

11: Si 12, 12', 12" : Si

13: Si 14: Si

15: 401:

402: 403:

404, 404' : 405, 405' :

406, 406' : 404a, 406a:

404b, 406b: 407:

408: 409:

410: 411:

412: 413, 414:

415, 415' : 415a, 415a', 415a" :

415b, 415b', 415b" : 415c, 415c', 415c" :

415d: 416:

, , .  
 Si 가 , SOI(Silicon On Insulator) 가 (SOI )  
 . SOI , Si 가 .  
 , .  
 (1) 가 .  
 (2) .  
 (3) 가 가 .  
 (4) .  
 (5) .  
 (6) 가 .  
 SOI , 가 , 가 .  
 SOI , Si CVD(Chemical Vapor Deposition)  
 , SOS(Silicon On Sapphire) . SOS , 가 SOI  
 가 . Si  
 , Si , 가 , 가 .  
 .  
 SOS , SIMOX(Separation By ion IMplanted OXYgen) . SIMOX ,  
 가 .  
 , Si , 2 Si  
 , , 가  
 Si , .  
 5 - 21338 , SOI , 가  
 1 , (SiO<sub>2</sub>) 2 , ,  
 , 2 , SOI  
 , SOI , SOI , 가  
 가 , 100Å 10μm SOI 가 SOI  
 가 .

7 - 302889 , 1 2 , 1

(jet)

(hole) 가 , , , .

가

가 .





1(A) , Si (11) , Si (12)  
 . , 1(B) , Si (12) Si (13)  
 . , 1 (10) .

1(C) , , Si (14) ( , SiO<sub>2</sub> )(15) 2 (2  
 0) , 1 (10) 2 (20) , Si (13) (15)  
 . , , 가 , 1 (10) 2  
 (20) . , Si (13) (15) . , (15) ,  
 Si (14) , Si (13)  
 . , 1 2 , 1(C) 가 .

1(D) , 2 , Si (12) . , 2  
 (10" +20) , Si (12" )/ Si (13)/ (15)/ Si (14) 가 . 1  
 (10') , Si (11) (12') 가 가 .

1 (10') , Si (12') , ,  
 1 (10) Si (11) .

1(E) , 2 (10" +20) L (12" )  
 . , Si (13)/ (15)/ Si (14) , , SOI 가  
 .

1(D) , , 2 ( , )  
 Si , Si 2

< 1 >

2 , . (100) ,  
 . , , 가 ,  
 , . (" Water jet," Vol.1, No.1, page 4)

(100) , ( ) , , ,  
 , ,  
 , " (jet)" . , " " . ,  
 , , 가 , 가 , 가 , 가

(100) , (vacuum chuck) (404), (406) 가 , (404), (  
 406) (420) (420)

(420) , (420b) 가 , (100) , (420a),  
 (420b) . (100) (420a) 2 (420a), (420c)  
 . (100) , (420a) 1 1 (10') , (420c) 1  
 2 (10" +20) (420) .

(404) , (405) (401) 가 (403)  
 , (403) (402) , (402)가  
 (404) (420) (402) ,  
 (420) , ( ) , (402)

(406) , (407) (401) 가 (408)  
 , (408) (409) , (402) ,  
 (409) , (420a) (420c) (x ) ,  
 (420) (418) (420a) (420c) , (420a)  
 x (420c)

(420) , (420) (403) (406)  
 , (403), (404), (420), (406), (408)  
 (409) , (402) 2 , (408)

(408) (x ) (411)가 (411) , (420)  
 (404), (406) , (410) (408)  
 (409) (x ) ( 2 ) , (404), (406)가  
 가 (420) , (411) , (410) (x )  
 , (420) 가 가 , (411) , (42) (404),  
 (406) , (41) , 가 (410)

(100) (42) , (413),(414) 가 (401)  
 (412) (412a) (420) , ,  
 (410) , (406) (420) , ( 2 ) ,  
 (404),(406)

(412) , y 2 (420) 2  
 (412) , x,y,z 3 (420)  
 (420) 가 ,

가 , (420a) X  
 , , 2 , (404), (406)

(420) , ( ) , (415) 가 (420)  
 (415) , (415) , X 가 (401)  
 (416) , (417) , (415) 가

(420) , (419) ( , ) (418) , (4  
 18) , (415)  
 , (415) , (420) , (415)  
 , (420)



3 5 , , (415) (415a) (415)  
b) (430) (420) (415c) 가 , (415c) , (418) ,  
6 , (418)  
(430) (415) (430) , (415c)  
(415) , (418) , (415) (415a) ,  
(415c) (419)

(420) , 가 V (420d) 가 V  
(420d) , 1 ( 1 10) Si 2 ( 1 20) Si  
가 (chamfer) V (420d) (430)  
(420)

13(A), (B) V 1  
3(A) , V (420d) , 13(B) , V V  
(420d) , (a), (a') (420)  
, V (b), (b') (420)  
(420d) 가 ( )  
V U , (420)  
, V 가, 가

, 가 V (420d) , V  
,

(420) , (420) ( ) (420d)  
12)) , Si ( (420a) , 1 (420b)( 1 , ( )  
0c)) , 1 , (13) 가 Si (11)) ( (42

(415a) 3 5 ,  
(415a) , (418) (415c)

(415b) , (420) (y ) 가  
, (420) (x ) (415b) (tj) , (420)  
가 V (420d) (ts) vgu  
d (420d) ( 13(A)),

, (420) (x ) (415B) , 가 (420) ,  
, (420b) , (417) , (415b)

, (415)가 (420) , 4 , (420)  
(415b)

(415) (415c) , (415c) , (415) ,  
 , (wedge shape) . 7 8 ,  
 .

(100) , , 가 .

(1) ( ) , .

(2) .

(3) .

(4) .

(5) ( , )가 가 ,  
 가 .

(6) 가 .

(7) ( , , ) 가 .

(8) 가 , ( , , ) .

, , ( , ,  
 ) , , (100) , (418)  
 , , (415) ,  
 , , 가 .

(9) , 가 .

, , 0.1 0.3mm  
 가 . ,

, , 가 (100)  
 , (4150) ,  
 가 .

(10) .

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 가 가 . , V ,  
 가 , , 가 ,  
 , 가 , 가 .

, (100), ,  
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 2  
 , 1 , 1  
 가 . 9 11 , 2 .  
 (415') , (420) , (420)  
 ( , ) (415d) 가 .  
 3  
 , ,  
 .  
 12 , 3 , 1 (100)  
 가 , .  
 (100') , ((404'), (406')) 가  
 . , (404'), (406') , 12 (420) ,  
 (420) 가 V (420d) (404a), (406a) 가 .  
 (404a), (406a) , (415c) 가 , , (41  
 8) (420) V (420d) . (404a), (406a) ,  
 (404') (406') . , (404a), (406a) ,  
 .  
 (404'), (406') , (420) (404b), (406b)  
 (404b), (406b), (420)  
 (240) , 가 ,  
 가 .  
 (420) (100) , 2 (404'), (406')가 , ,  
 (411) (410)가 , (420) (404')  
 , (404') (411)  
 (410) , (406') (420) , (406')  
 .  
 , (411) (410) , .  
 , (402) (420) , (418)  
 가 , 1 (100) 가 , (420a) (40  
 9) x , (420c) .  
 가 , , 2 , ,  
 (404'), (406')

(100') , (420) (404'), (406') , (418)  
 (420) 가, ( )  
 ( ) , 1 (417) ) 가

1(A) (E) SOI

1

Si (11) , 가 625 [ $\mu\text{m}$ ] , 5 [inch] , 0.01 [  $\cdot\text{cm}$ ] p n (100)  
 Si (11) HF , 가 10 [ $\mu\text{m}$ ] , (p  
 orosity)가 15 [%] (12) .( 1(A)).

: 7 [ $\text{mA}/\text{cm}^2$ ]

:  $\text{HF}:\text{H}_2\text{O}:\text{C}_2\text{H}_5\text{OH}=1:1:1$

: 11 [min]

400 [ ] 가 , 1 Si (12) CVD 0.3 $\mu\text{m}$  Si (12)  
 Si (13)  
 ( (1B)),

가 :  $\text{SiH}_4$

가 :  $\text{H}_2$

: 850 [ ]

:  $1 \times 10^{-2}$  [torr]

: 3.3 [nm/sec]

5) , Si ( Si )(13) 500nm  $\text{SiO}_2$  (15) , 500nm  $\text{SiO}_2$  (1  
 Si (14) ,  $\text{SiO}_2$  , 700 [ ] 2  
 ( 1(C)).

3 (100') , 250 [kg  
 ( 1(D)). , 0.2 [mm] ,  
 f/ $\text{cm}^2$ ] , 1 , 2  
 , ,

2 (100') , Si  $\text{HF}:\text{HNO}_3:\text{CH}_3:\text{COOH}$   
 Si Si  
 가 ,  $\text{SiO}_2$  (15) , 가 0.2 $\mu\text{m}$  Si (13) 가  
 SOI .( 1(E)).

SOI , , Si(15) , , . ,  
 Si (15) , , .  
 , 1(B) Si ( (13) SiO<sub>2</sub> , 가  
 SOI .  
 Si ( Si (11)) , Si Si , 1  
 , Si 1 ,  
 가 (chamfer) .  
 2  
 , 1 , 3 (100') 1 2  
 (100) , 1.  
 0 [ mm ] , 850 [ kgf/cm<sup>2</sup> ] , V 0.625 [ mm ]  
 , 0.625 [ mm ] .  
 V , V ,  
 V ,  
 , SOI , 1 SOI 가 .  
 , SOI ,  
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 가 .

(57)

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11 , 2  
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14.

13 , 가 , 2 가  
가 , 가 .

15.

12 14 , 가  
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18 , 가  
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23.

22 , V 가 .

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18 19 ,  
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가 .

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가 .

26.

25 , ,  
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27.

26 가 , 가 , 가  
 가 , 가  
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28.

25 27 , 가 .

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25 , 가 .

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29 , V 가 .

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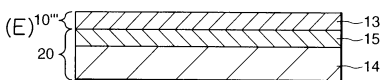
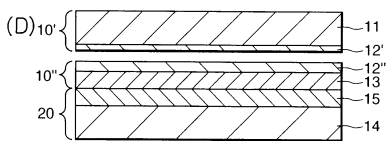
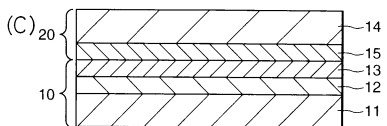
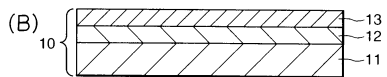
44 , 가 가 .

46.

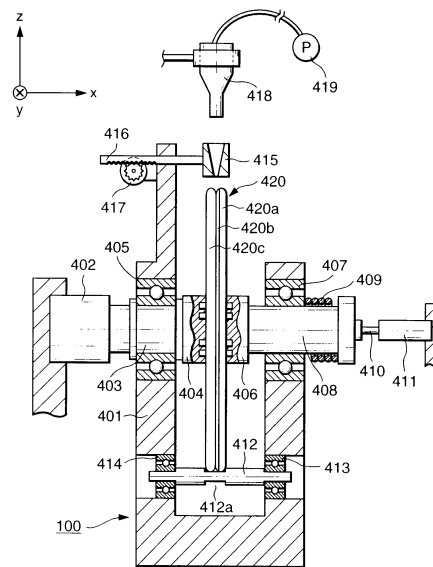
44 , 1

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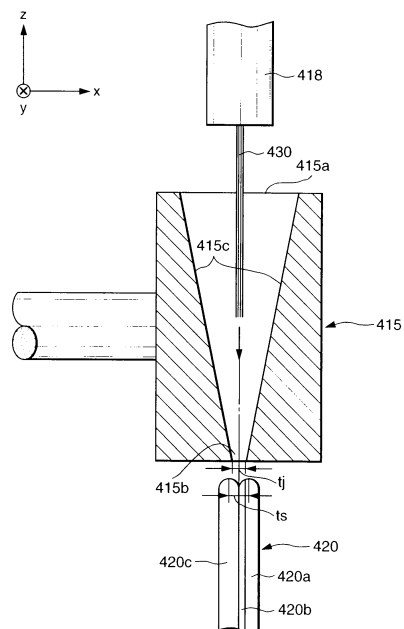
1



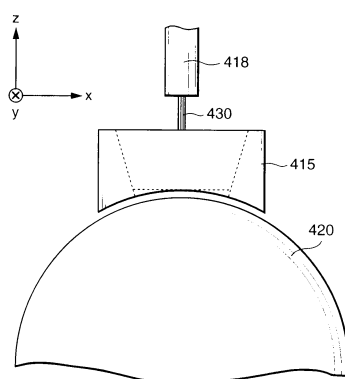
2



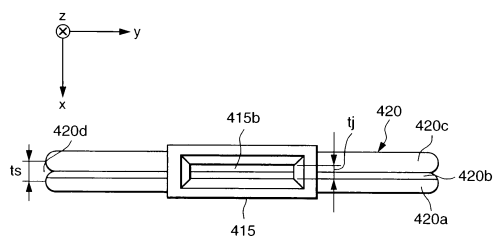
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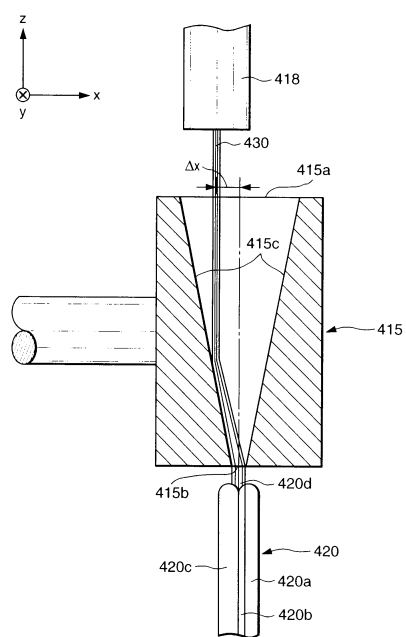
4



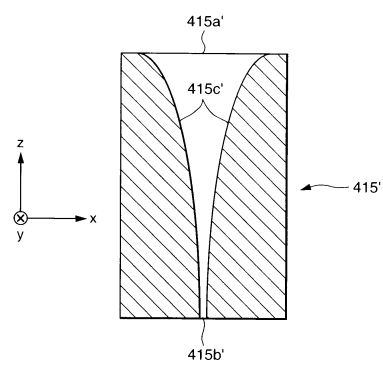
5



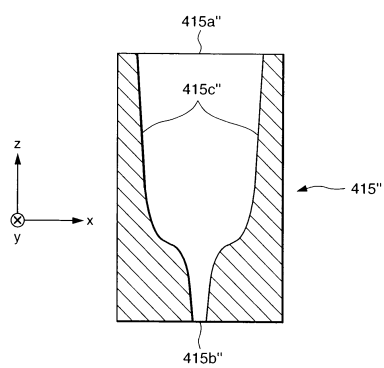
6



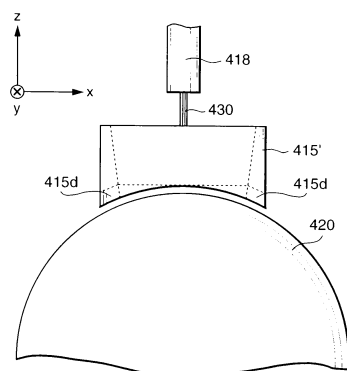
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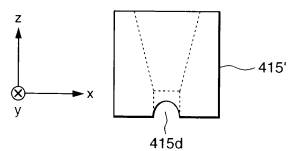
8



9

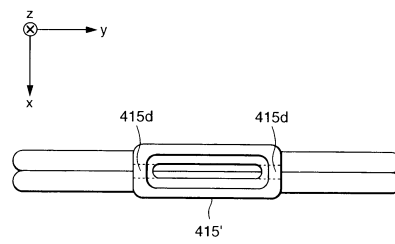


10

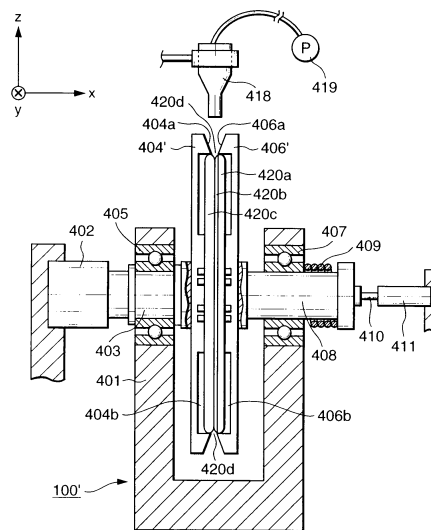




11



12



13

