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(24) 2004 05 18

(21)	10-2001-0043683	(65)	10-2002-0008771
(22)	2001 07 20	(43)	2002 01 31

(30) JP-P-2000-00220770 2000 07 21 (JP)
JP-P-2001-00122998 2001 04 20 (JP)

(73) 가 가
2 2 3

(72) 2 2 3 가 가

2 2 3 가 가

(74)

:

(54) CMOS

/

(1) , (2) , (3) , (4) , (5) , (6) , (1) .
WSi . ; (5) WSiN poly-Si (6) , (6) , W (4)

1

, CMOS , ,

1 1
 2 1 /
 3 2 .
 4 2 .
 5 2 .
 6 2 .
 7 2 .
 8 2 .
 9 2 .
 10 3 .
 11 3 .
 12 .
 13 / .
 14 5 .
 15 5 .
 16 8 .
 17 8 CMOS
 18 9 .
 19 9 .
 20 9 .
 21 9 .
 22 9 .
 23 10 .
 24 10 .
 25 12 .
 26 12 .

1 :
 2 :
 3 :
 4 :
 41 :
 5 :
 6 :
 11 :

MISFET(Metal Insulator Semiconductor Field Effect
 Transistor)
 , poly-Si / MISFET
 , 가
 , CoSi₂ /poly-Si
 , SAC
 , SAC

WSi₂ /poly-Si
 CoSi₂ /poly-Si
 , 가
 , CoSi₂ /poly-Si
 , CoSi₂ /poly-Si
 , SAC(SAlicide: S
 SAC(Self Aligned Conta
 ct)
 , SAC
 , SAC

, 가
 , 가
 , 가
 , SAC

3
 3nm (3) CVD(Chemical Vapor Deposition) (1)
 5 (4) WSi (2)
 6nm (6) (2) WN poly-Si
 (11) W (11) (3),
 8 (11) (6) (4)
 950 (11) (11) (4)
 9 (5) 1.5nm (5)
 WSiN N W (5)
 , WN (11) W (11)
) WN MISFET / (5)
 (5) (4) (11) (5)
 / (11) (5)
 3 2 (11) (4)
 2 7 (11) (5)
 950 (11) (11) (4)
 10 (5) 1.5nm (5)
 SiN W WN (6) (5)
 11 (5) (6) (3),
 4, 11 (5) (6) (5)
 4 1 (5)
 1 (5)
 2 (5) SiN SiO₂, SiON (3)
 -Si (6) W (4) WSi 2 poly
 5 4 (1)
 4, 15 2 (2) 3nm (3). (1)
 poly-Si (2) CVD (4) 100nm (4). (2)
 , (5). (3) WSi (15) 15nm
 11 (6) 3nm (6) 40nm (5) CVD
 (4), (5) (6) (5) W (3),

17

17
 가
 , P (1a) P (1a) CMOS
 (1a), N (1b)
 (2), N (3a),
 (41), (1b)
 (3a, 3b) (5) (6)
 (1a, 1b) / (10a, 10b)
 MOS P MOS
 , 17
 (8) , SAC , P (7) ,
 (9) (4) MOS N MOS
 , 9
 , 2
 가 , /
 , (41) (5) W, Mo, Ti, Ta, Nb, V, Zr, Hf, Cr, Co
 , 9
 8
 22
 , 2
 poly-Si (2) (3) CVD
 , 3nm
 , 100nm
 , 1
 (1) (2)
 (3) WSi (4) 5nm
 (5). (4) 900 18 (41)
 , 4) 가 , 10nm
 , 19
 5nm (41) 20 WN (11) (11) W
 (6) 21 (11) (6) , ,
 (41), 950 (11) (3) (11) (11) (41)
 , (3) (41) (5) 22 (11) (11) (5)
) 1.5nm (11) WN WN W
 , 2 W MISFET / (11) N W (5)
 , (6) SiN (4) [(41) 17 (7)] SAC
 , 10 (5) (3) CVD
 , 9 (11) (11) (41) (3)
 , 9 20

, (4) (41) (18).
 900 가 25 10nm 26 TiN (5) (5) W (6)
 40nm
 , 24 (41), (5) (6) (3),
 (41) SAC
 (6) SiN (4) (41) CVD

(57)

1.

2

(a)

(b)

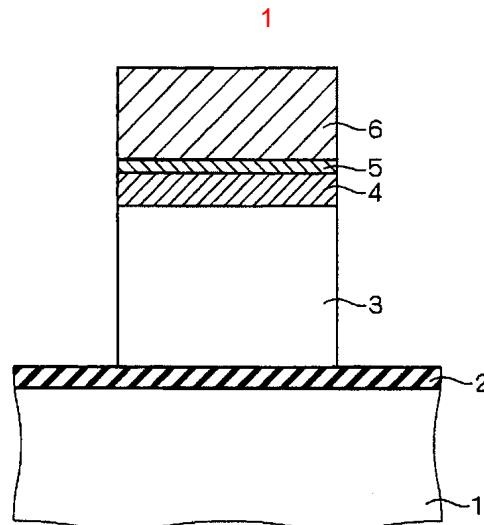
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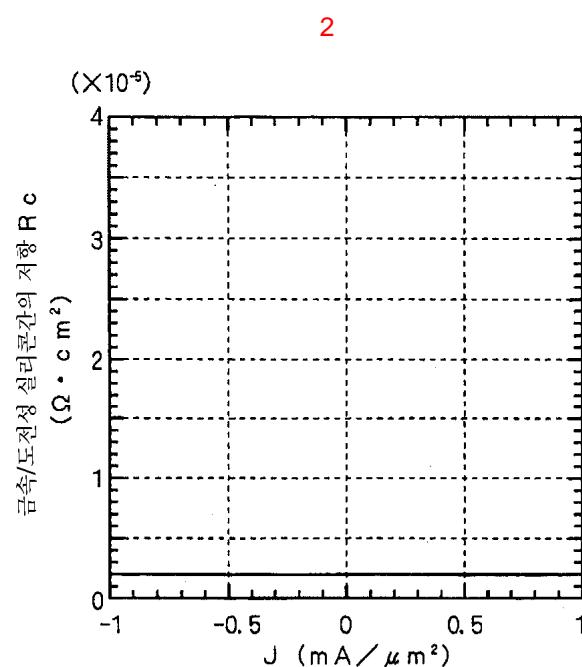
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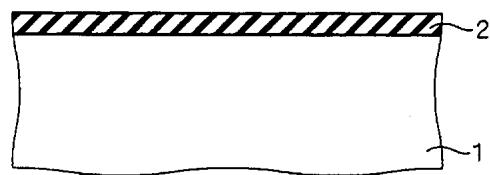
, , 가 , , ,
 1 2 , , ,
 1 2 , , ,
 1 2 가 / CMOS
 1 2 , , ,



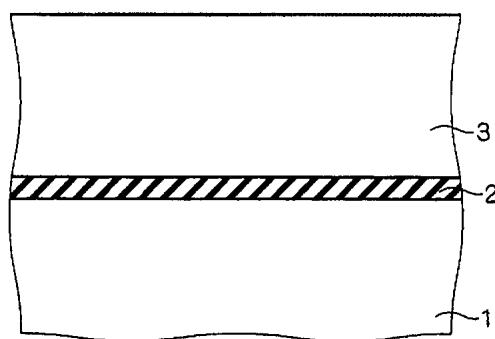
- 1 : 반도체 기판
- 2 : 게이트 절연막
- 3 : 도전성 실리콘막
- 4 : 실리사이드막
- 5 : 배리어막
- 6 : 금속막



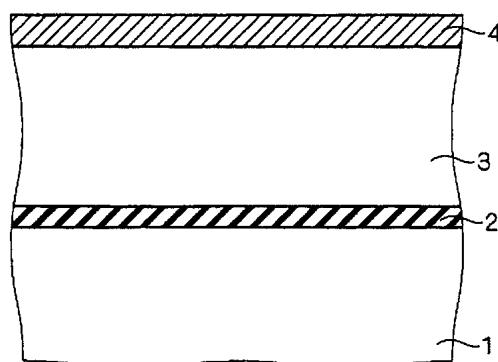
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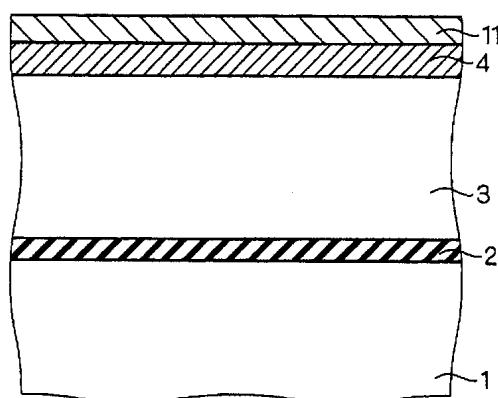
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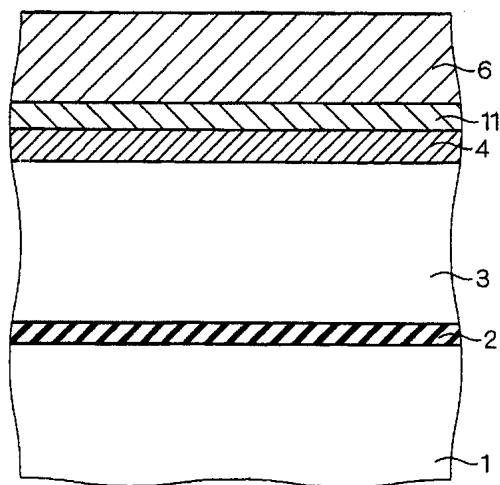


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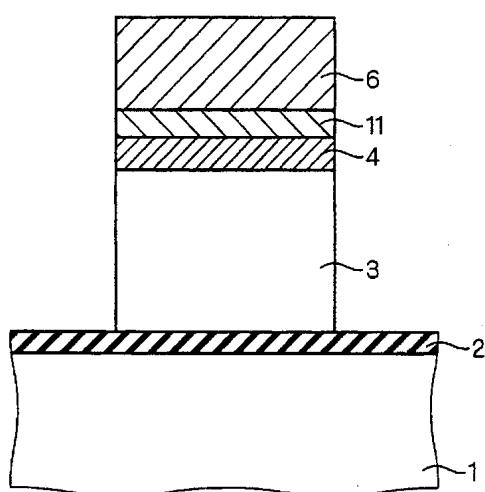


11 : 금속질화막

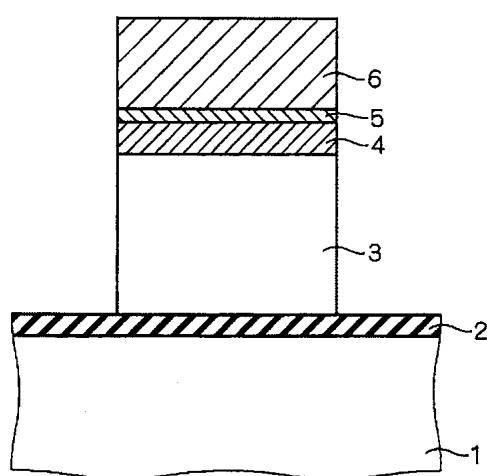
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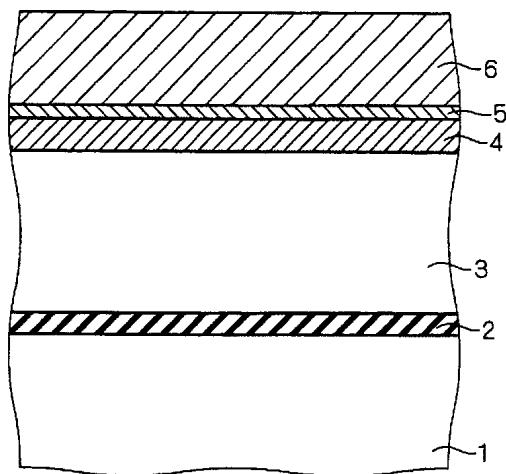
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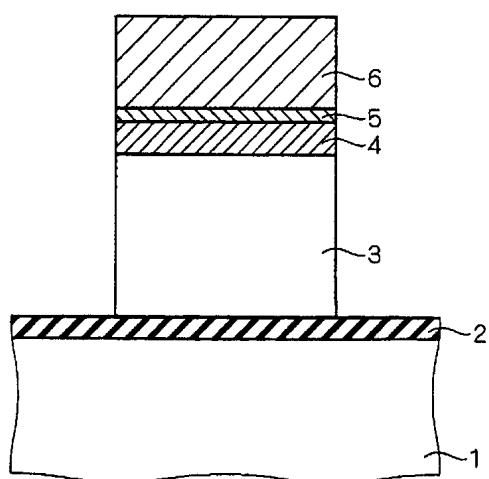
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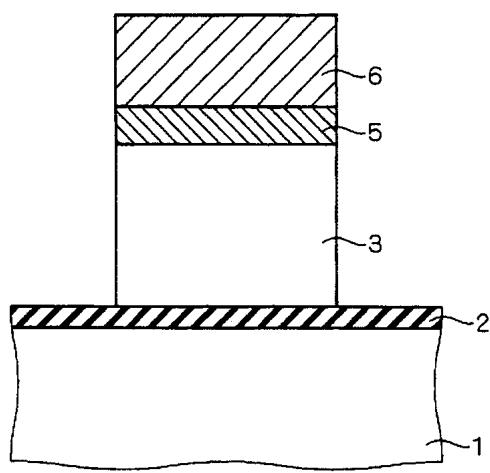
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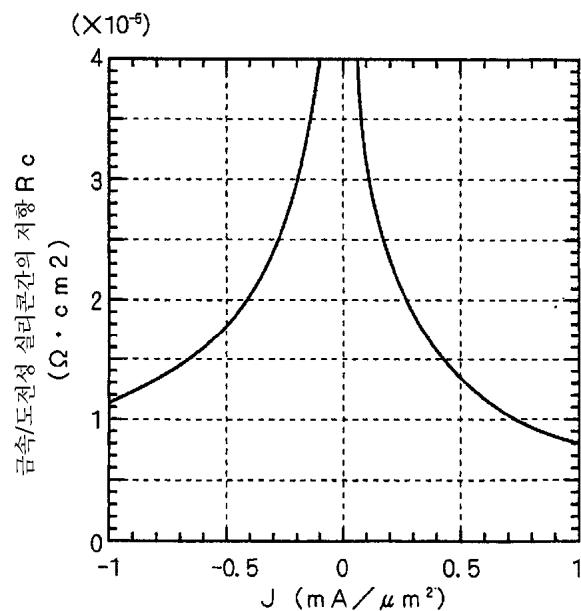
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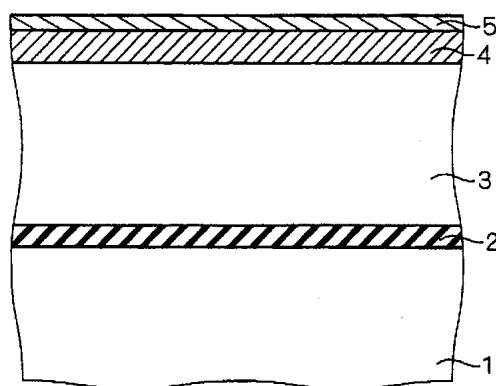
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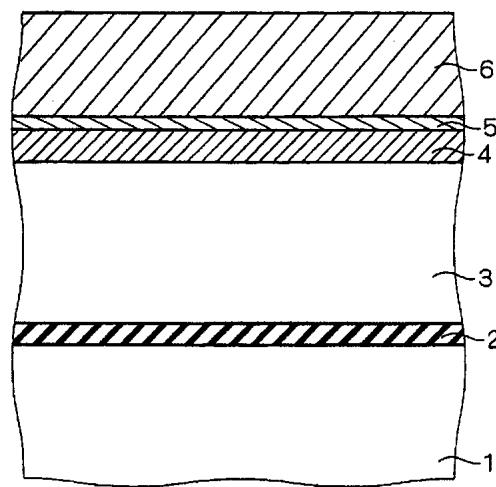
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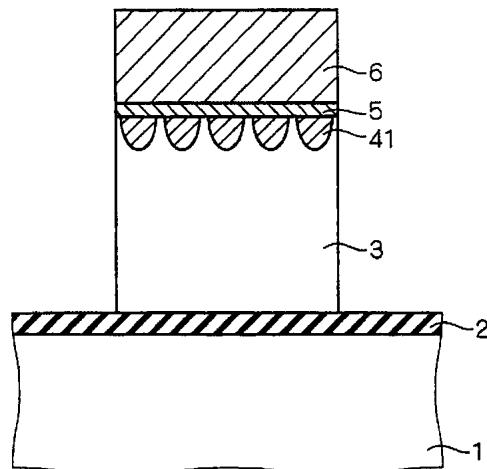
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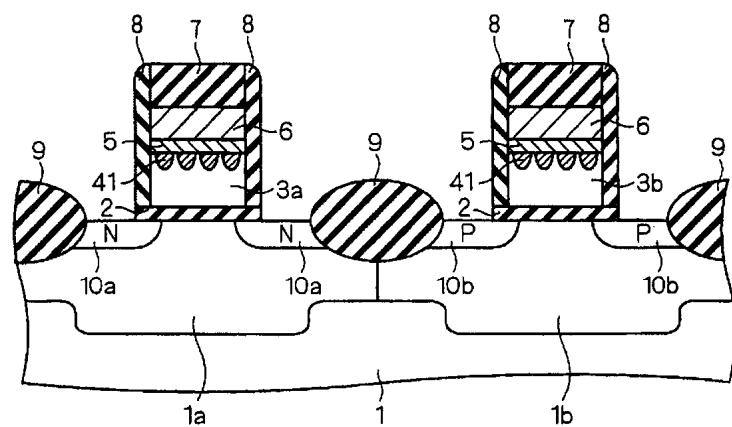


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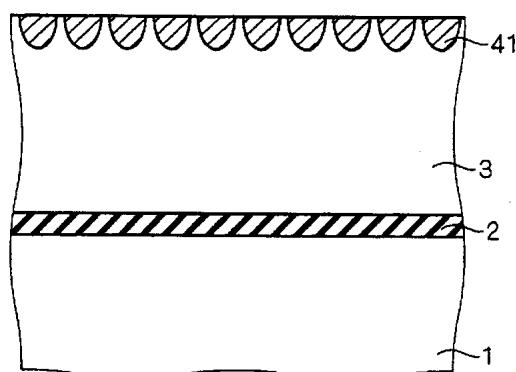


4 1 : 섬 형상 실리사이드막

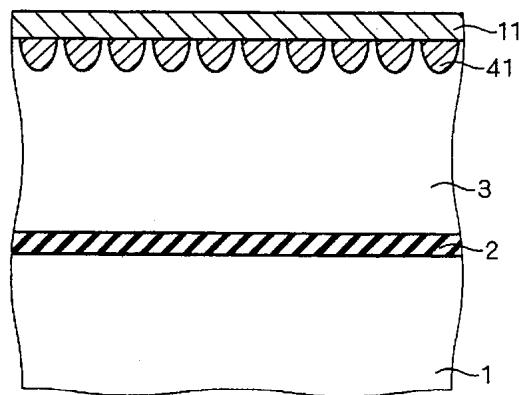
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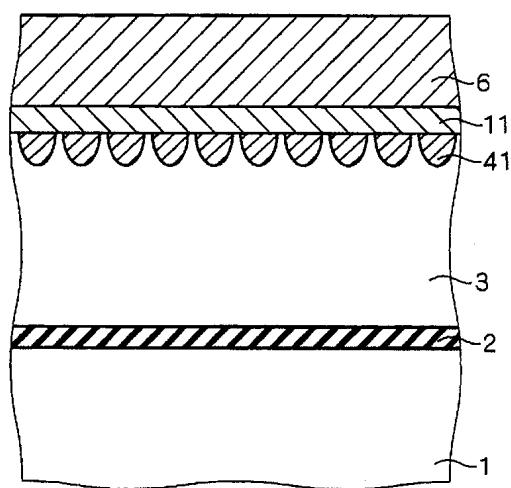
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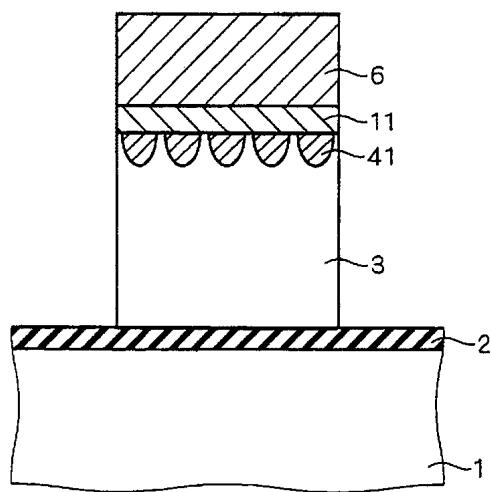
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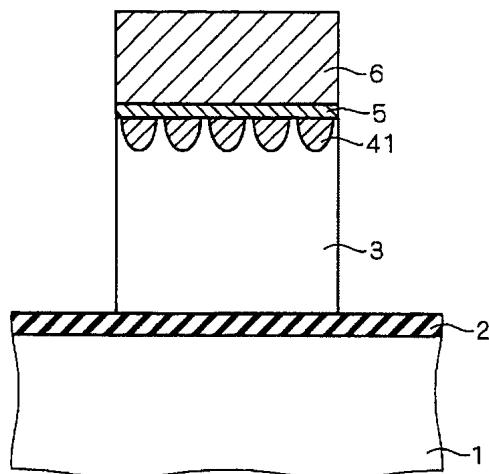
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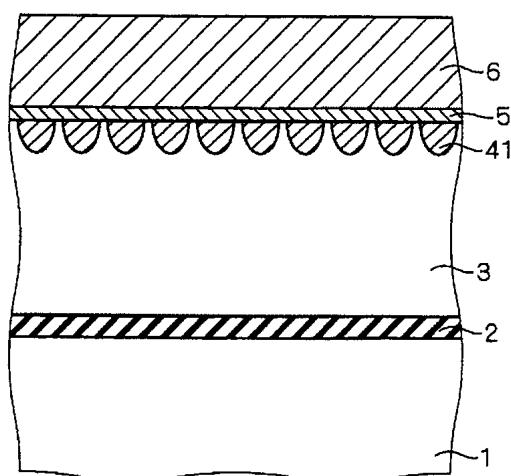
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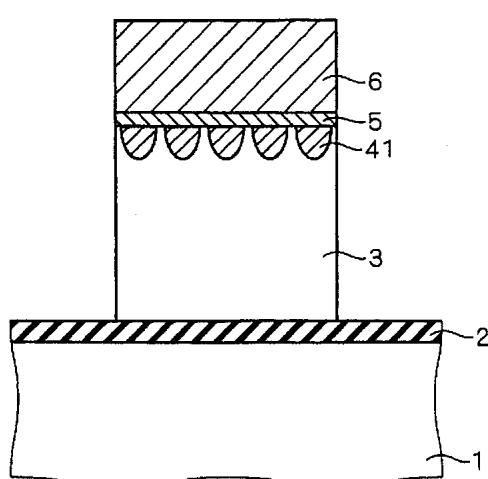
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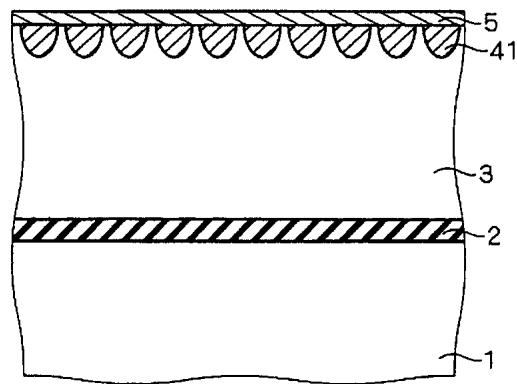
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