

(19)
(12)(KR)
(A)(51) 。 Int. Cl. 7
G02B 3/00(11)
(43)2002 - 0034915
2002 05 09(21) 10 - 2001 - 0067080
(22) 2001 10 30

(30) 09/702,496 2000 10 31 (US)

(71)

343

(72)

14568

860

14534

60

14502

506

(74)

:

(54)

4

100%

1

1 ,
2 ,
3 ,
4 ,
5 ,
6 ,
7 ,
8 ,
9 ,
10 ,
11 .

10 : 12 :
14 : 24 :
26 : 36 :
40 : 41 :
52 : 54 :
56 : 62 :
70 : 82 :
88 : 가 108 :

(microlens mold)

(optical article)

(injection molding)
 al surface) (rotationally symmetric optic
 (grinding or diamond turning)
 (fill factor),
 / (sag)
 (orbital motion) (scratch) (grinding surface)
 2 (setup)
 가 가 가 가
 2 (polymer reflow)
 가 가
 (underlying surface)
 1996 7 16 (Aoyama) " Method Of Manufacturing Lens Array"
 5,536,455
 100% , 2 가 1
 가
 100
 (aspheric surface)
 (grayscale lithography) 2
 (reactive ion beam etching)
 30
 (high magnification)
 (included angle)
 (tight curvature) 가 (wave
 front) 가 (se
 gmented rings) (Fresnel) 가
 (narrow spacing)
 (Hoopman) 1996 5 21 " Microlens Array With Microlenses Having Modified Po

lygon Perimeters" 5,519,539 1994 4 5 " Method O
 f Making A Microlens Array And Mold" 5,300,263
 (a series of small receptacle)
 (correction)
 (football - shaped intersections) 가 .

(depth of penetration)

4 (half - radius) 가
 (engage)

1 (mold base) 2 , 1 2
 2 가 , 1 2
 가 (a pair of juxtaposed mold cavities)
 1 2 (flexible insert) 1 2
 가 ,

1 2 (molding assemblage) , 2
 1 1 2 2

1 2 , 1 가 2 1
 2 ,

1 2 1 2

가 1 2 2 1

(press close)

(anamorphic shaped surface)

가 가 (contour) 100% 가

(feature)

가 1 3 (10) (14) (10, 16, 20)

(12) 1 (18) 2 (16) (14)

(20) (14) () 3 (2)

2) (10, 16, 20)가

(14) (diamond milling tool)

(14) (nickel plating), (brass)

가

4 5 (10, 16, 20)

4 4 (26) (24) (14)

(12, 18, 22) (10, 16, 20) (14)

(26) 1 (28), 1 (28)

2 (30) 1 (28) 2 (30) (32)

1 (28) (36) 가 (14)

(26) (34) (24) (10, 16 20) (

14)(1 3) (10, 16 20)

5 (40) (41)

(41) 2 (46) 1 (42), 1 2 (46) 1 (42)
 (48) 가 (adjoin) (44) 1 (42)
 (48) (14) (41) (49)
 3) (40) (10, 16 20) (14)(1
 (10, 16 20)

6 , , (1 3)
 (50) (tool holder)(56) 가 (24
 40) (58) (24 40) (26
 41) , (linearly displaceable)(Z가) (14)
 가 (4 5) (64) 가 (14)
 (26 41) (36 48), (24
 40) (64) (K
 eene, New Hampshire) (Precitech, Inc)가 (precis
 ion air bearing lathe) , (50) (52)
 (14) (54) (50) (24 40)
 (14) (solid, non - vibrating base)

6 7 , (14) (24 40)
 6 , (50) (52) (14) , 7 ,
 (60) (62) 3 (14) (1
 4) (14) (64) 가 (64)
 7 X - Y - Z (14) . X - Y - Z (64) X - Y
 - Z (24 40)
 (58) , (26 41) (58)
 (56) (14) 가 (14) (62) (14)
 (62a) (62) (14) (62a)
 , (24 40) (62a) , (14)
 (62b) (64) (X - Y)
 (62) 가 (14)
 (62) (14) (60) 1 3

(center defect) , 4 5
 (26 41) (10, 16, 20) (26
 41) () (34 49) (58)(6 7) (56) ((chat
) 5 (56) (50 60)
 ter) (54) (26
 41)가 (14) (lubrication) 가 (cleanest cut) (26
 24 40) (14) 8 (drag mark) (26 41)() ((clearance)(70)가 (((interfe
 (26 41) (back side) (76) (26) (72) (14) (interfe
 rence)
 ity) , 0.50 (Wave)(0.25) (irregular
 30 250
 100% 80 X 80 가 .
 (7)가 가 , 100%
 가 (41)(5)
 (41)
 (50 60) (10, 16, 20)(1 3)
 9 11 , 가 (80)
 (82) 가 (82)
 (83) 가 (88), (tapered locating bushin
 g)(86) 가 (88) (86) () (80)
 (84) (85) 11 (80)
 (hydraulic), (pneumatic) (108) (104. 106)
 (82) (80) (108) (104)
 (106) 가 (close) , 가 (88) (82)
 (86) (82) (84)
 (82)
 (84) (10) (100) (82)
 가 , 가 , 가

(preform) 가

가

가

가

(one - sided)

가

(side - to - side)

10

(80)

(82)

(98)

(100)

(96)

9

(100)

(98),

(85)

(102)

(100)

가

가

가

가

가

(26, 41)

(24, 40)

(50, 60)가

10

2

25mm

가 12.5mm

(1)

80 X 80

가

. 4

ST & F Precision Technologies and Tools

0.250mm

0.500mm

33

4

(36)

(26)

(26)

(26)

1000rpm

(mineral o

il)

2

가

1

(0.5

)

가

(polymethylmethacrylate

microlens arrays)

(2)

가

1

(3)

13 X 13

가

-

recision Technologies and Tools
 1.30mm 가 1
 1.5
 3.20mm 가 0.30
 213 (0.15)
 ST & F P

(4)

715 0.062mm 0.568mm 가 1 0.500mm

(5)

63.5 X 88.9mm 125 X 175 21,760
 0.5008mm 4 Chardon Tool
 0.50932 0.16609 가
 1

(6)

9 가 , 가
 (26)(4) Contour Fine Tooling
 1.475mm 0.750mm 99 가
 1 0.3 (0.15) 가
 (rotational misalignment) (tapered lock bushings)
 30 가

(57)

1.

(a double - sided microlens)
 1 (a first mold base) 2 1 (flexibly mount) 2 (a
 1 2 corresponding alignment feature) (a corresponding insert) -
 (a corresponding mold cavity) 가 -

(a generally polygonal substrate)
(corresponding pairs of microlens molds)

1 1 (a first platen) 2 (an opposed second platen)

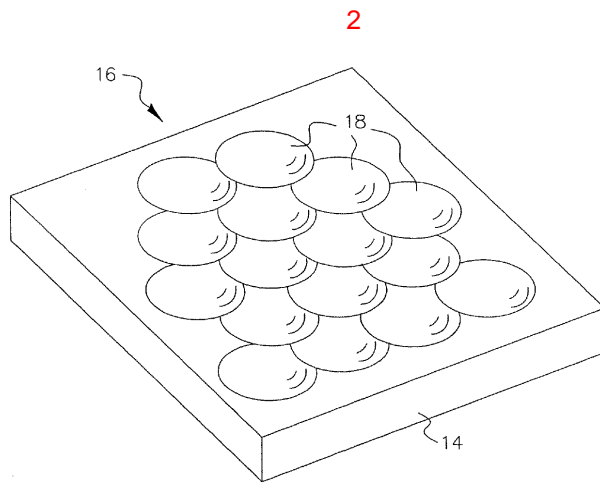
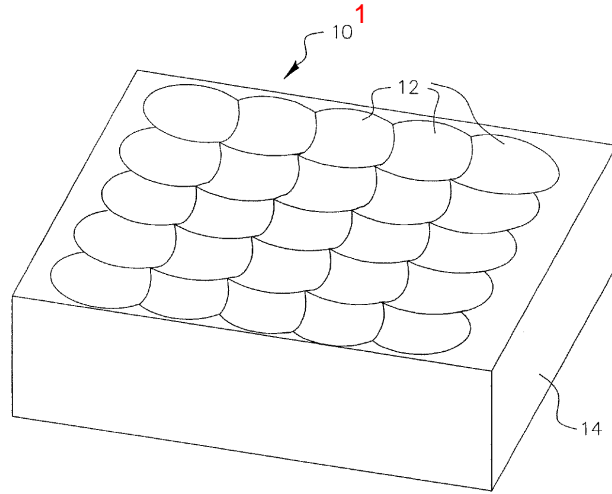
2 가 1 1 (press close) 2
(solidify)

2.

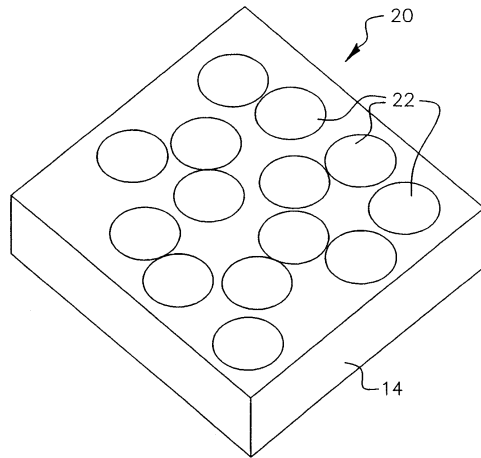
1 (a diamond cutting member)

3.

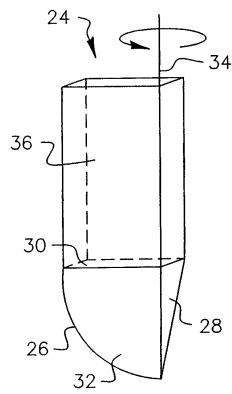
2 (hardened nickel), (brass),



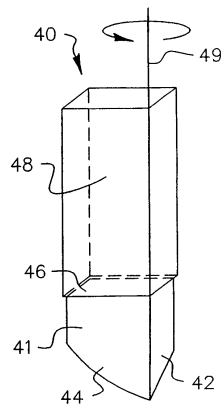
3



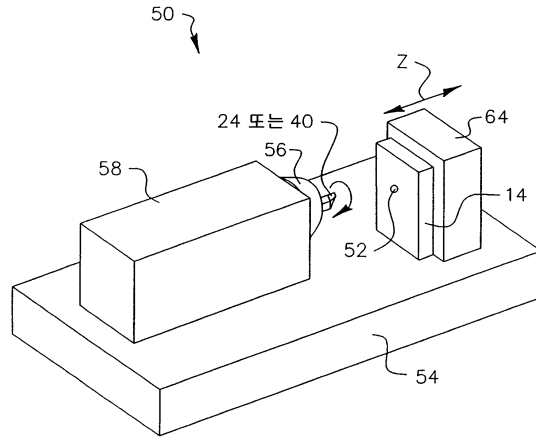
4



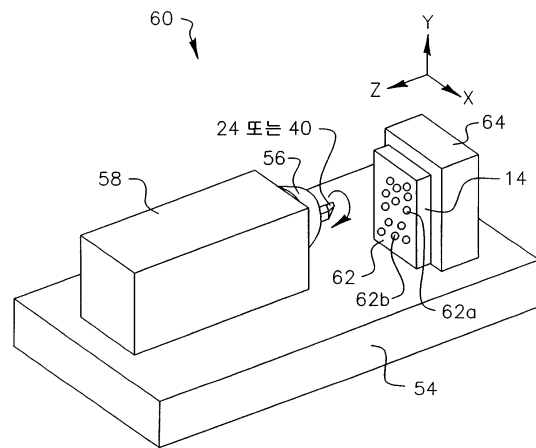
5



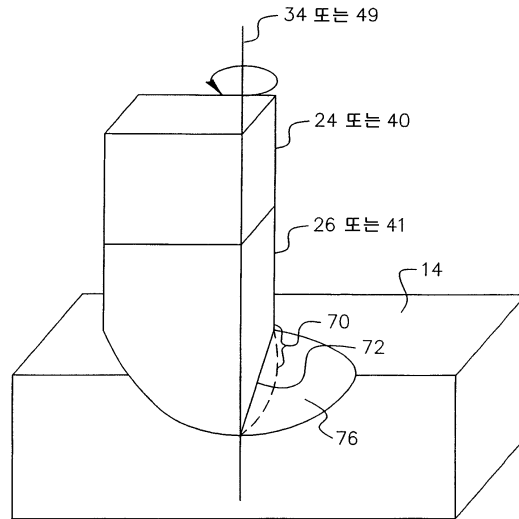
6



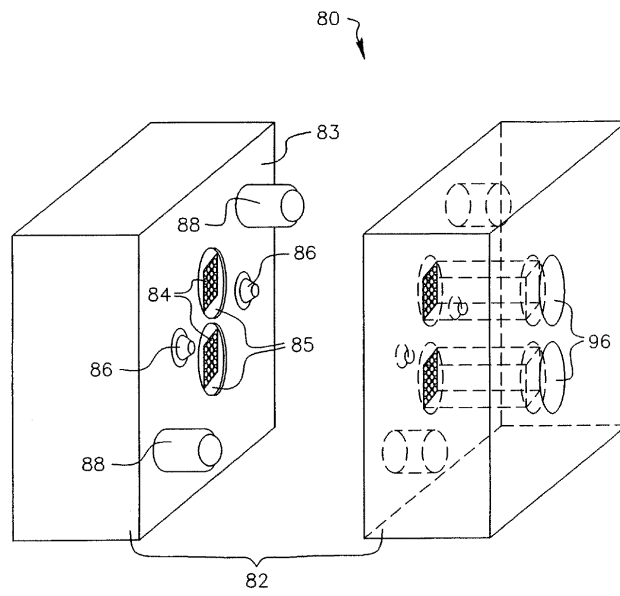
7



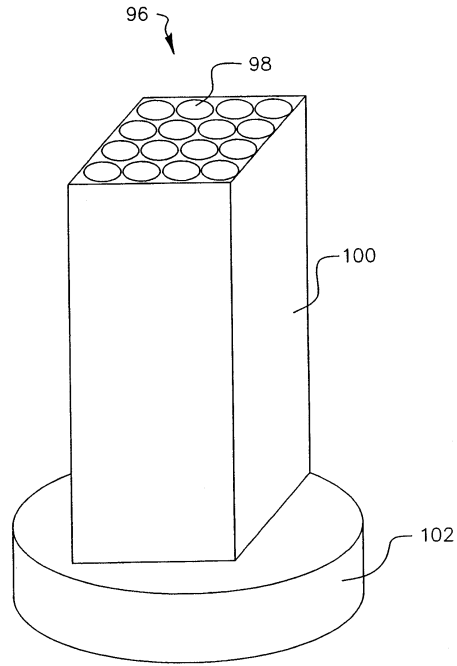
8



9



10



11

