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(12) (A)

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(71) -6301 , 12
(72) , -6332, 24
, -6300, 28A
, , -5400, 2
(74)

:
(54) 가

(2) (1) , (4) 가
(4) (13) (x,y) (1)
, (13) 0.4 mm 가 (x,y)
가 (M) (M)
(13) (M) 가 0.1 m
m (4) , (2)

1 (Security Element)

(thin layer composite)

(light-modifying relief structures) (embede

(cut out)

d)

4,856,857

(carrier film)

2 129 739A

0 429 792 B1

가

05 099

가

가

(adjoining portion)

(embossing)

(security

profile)

(punch)

(seal)

가

가

(x,y)

가

0.1 mm

(M)

(x,y)

(M)

(portion-wise steady)

가

0.4 mm

- 1
- 2
- 3

4a 4b (matt)

5 (additive superimposition)

6 2

7a 7c (tilt angle)

1 (1) 2 (2) (4) 3 (M) (2)

x, y 가 M(x,y) (M) ,

x, y 가 M(x,y) 0 (M) 3 P(x,y) ,

z(x,y) 1 (M) P(x,y) z

0 375 833 A1 (matt) -

(38) (raster) (4) 0 375 833 A (field comp (38

1 onent) 1 M(x,y) 2 (line element) /

(38) (4) 가 (2) (4) 가

0.05 mm 1 mm

2 (3) (1) (1) (

(5), (6), (7) (8) (5) (6) (9

) (4) (5) (6)

(7) (8) (3) (() (10)

(10) 가 (4) (2) 가

(1) (3) (1)

2 129 739A

(6) (7) (11) (4)(1) (M) (12)

(12) , H_{St} (6) (7) (12)

(valley) , M(x,y) (11) (11) (6) (7) (12)

(chromium), (tantalum) 4,856,857 5 (conducti

vity) , (11) 가 (9) (reflection capability)

(inorganic dielectrics) 4,856,857 1 4

(11) (10) 가 (11)

(1) , (4) 가 (web)

(2) 가 (8) (3) (3)

M(x,y) (4) (13)(10)

M(x,y) = 0.5 · (x² + y²) · K, M(x,y) = a · { 1 + sin(2 F_x · x) · sin(2 F_x · y) } ,

M(x,y) = a · x^{1.5} + b · x, M(x,y) = a · { 1 + sin(2 F_y · y) } (13)

frequency)(F) , F_x , F_y , x, y , $M(x,y)$ (spatial frequency)(F) 20 /mm 0.4
 mm 가 , (4) , 5 /mm (detail) (裸眼) 가 (13) (F) 20 /mm 0.4
 (11) (seal), (M) (13) (4) (4) (embossed) 가 (M) (cameo) 가 3 $M(x,y) = 0$
 가 (M)가 (M) 가 $M(x,y) = 0$
 (1) (3) (1) (3) (1) (3) (engagement surface) 3 μm 100 μm (6) (M) 5 μm
 (5) (1) (M) $H_{st} = 40 \mu m$ 가 $P(x,y)$ $H_{st} = M(x,y)$, $h = z(x,y) - z_0$
 (M) z_0 $P(x_0, y_0)$ (h) , $z_0 = M(x,y)$, $h = z(x,y) - z_0$
 h_r 가 (A) z (11) (6) (A) x, y (12) $A(x,y)$
 (1) (M) (h) (4) (M)가 H_{st} (A) (H)
 (h) (A) (M) (h_R)가 H , $h_R =$ (h) modulo (14)가
 H'가 (1) , (14) ' $A(x,y) = \{ M(x,y) + C(x,y) \}$ modulo $H - C(x,y)$ ' $M(x,y)$
) 가 , $C(x,y)$ (4) H 30 μm , $H = 0.5 \mu m$ $H = 4 \mu m$ (Pn)
 40 μm $S(x,y)$ 300 μm , $H = 2$
 (A) (A) , 2 (14) (M) , (1)가
 (4) , (1) / (M) , 3
 3 (A) (11)(1) (9)(2)
 (12) 30 nm 가 (9) (1) (9)
 (1) (16) (15) (1)
 (12) (7) (17, 18, 19) , a, b, c (15)
 (A) (surface normal)(20, 21, 22) , grad $M(x, y)$ (local inclination) , (15) = 0°
 1 , 1 (17) 1 (20) = 1 (23) 2
 (9) (20)

$$(y) = -0.5 \cdot y^2 \cdot K \quad (13) \quad M(y) = 0.5 \cdot y^2 \cdot K \quad (13) \quad M(y) = -0.5 \cdot y^2 \cdot K \quad (13)$$

$$\begin{aligned} & 7a \quad 7c \quad (2) \quad (4) \quad (1) \quad 6 \quad M(y) = 0.5 \cdot \\ & y^2 \cdot K \quad 가 \quad (31) \quad (13) \quad (4a) \quad M(y) \\ & = -0.5 \cdot y^2 \cdot K \quad 2 \quad 3 \quad (32, 33) \quad K \quad (M) \quad y/z - \\ & \quad (M) \quad (gradient), \quad grad(M) \quad (31, 32, 33) \quad = 0^\circ \quad 180^\circ \\ & 가 \quad z \quad 7a \quad 가 y/z - \quad = \pm 30^\circ \end{aligned}$$

$$\begin{aligned} & 가 \quad (9) \quad (4a) \quad (2) \quad (31, 32, 33) \quad (strip) \quad (34) \\ &) \quad (26) \quad (3) \quad (27) \quad (3) \quad (34) \quad K \\ & 가 \quad (34) \quad (28) \quad (34) \quad (K) \\ &) \quad (A) \quad (11) \quad 가 \quad (34) \quad (37) \\ & (11) \quad (34) \quad (31, 32, 33) \quad 6 \end{aligned}$$

$$\begin{aligned} & 7b \quad (2) \quad 가 \quad (28) \quad 2 \quad 3 \quad (13, 15) \quad 1 \quad (14) \quad (4) \quad (1) \\ & (34) \quad (28) \quad (M) \quad (2) \quad (4) \quad (2) \\ & (34) \quad (26) \quad (3) \quad 가 \end{aligned}$$

$$\begin{aligned} & 7c \quad (28) \quad 7c \quad (\quad) \quad (\\ & 4) \quad (1) \quad (34) \quad (4) \quad (1) \quad (31) \quad 2 \quad (32, 33) \quad (2) \\ & (4) \quad (M) \quad (4) \quad 가 \quad (11) \\ & 가 \quad (M) \end{aligned}$$

(57)

$$\begin{aligned} & 1. \quad (x,y) \quad (6) \quad (embedded) \quad (12) \\ & (12) \quad 가 \quad (7) \quad (1) \quad (6) \quad (12) \\ & (4) \quad (6) \quad (4) \quad (13, 31, 32, 33) \quad (6) \quad (2) \quad (1) \\ & (6) \quad (7) \quad (11) \quad (2) \quad (13, 31, 32, \\ & 33) \quad (12) \quad (11) \quad 0.4 \text{ mm} \quad 가 \quad (M) \quad (13, 31, 32, \\ & 0.1 \text{ mm} \quad (M) \quad (portion-wise steady) \quad 가 \quad (2). \\ & (x,y) \quad 가 \end{aligned}$$

2.

1 ,

(4) (31, 32, 33) ,

(M) 1 (31) , (-M) (32, 33) ,

2 (M, -M) (16) 가
(2).

3.

1 2 ,

(M) 5 /mm (F) (2).

4.

1 2 ,

(M) 가
(2).

5.

1 4 ,

(6) (A) (H_{St}) 40 μm (C) , (C)
(A) modulo (H) (M) (C) (H_{St}) 1/2
(H) (H_{St}) , (2).

6.

1 5 ,

(M) (x,y) (R) 가 (31)가
(t) 가 , (R) 2400 /mm (f) , 5 μm (R)
(M) (31) (R)
(2).

7.

1 5 ,

(M) (x,y) (R) 가 - 가
, 200 nm 5 μm (Ra) 가 , (M)
(R) (2).

8.

1 7 ,

(11) (2).

9.

1 7 ,

(11) (full-area) /
(2).

10.

1 9 ,

(1) (6) (5)
(2).

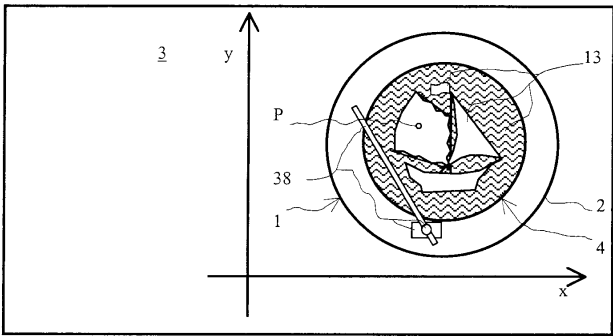
11.

1 10 ,
(4) - / (38)
(2).

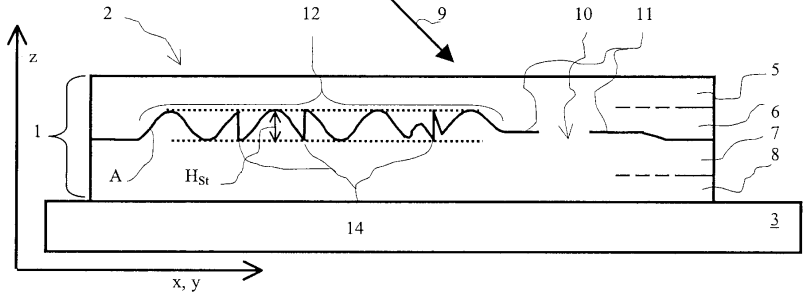
12.

1 11 ,
40 μm 가 (2).

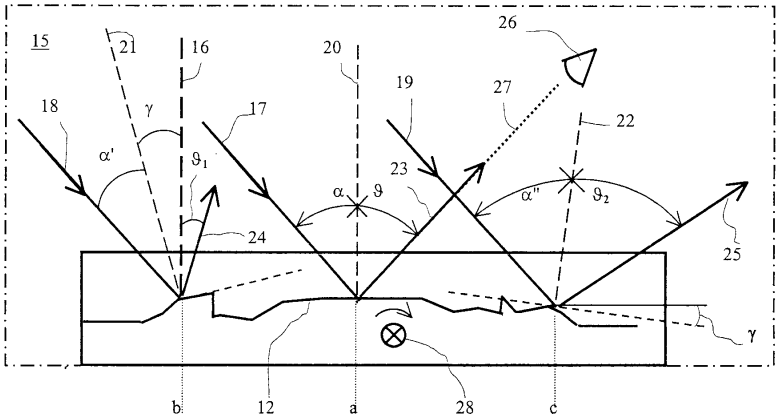
1



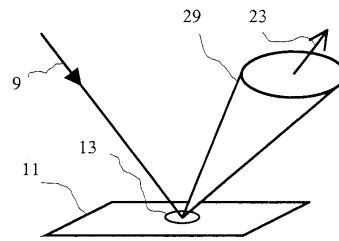
2



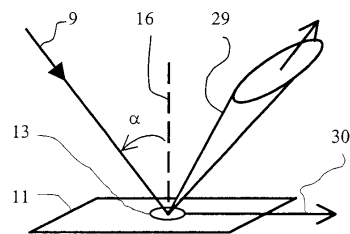
3



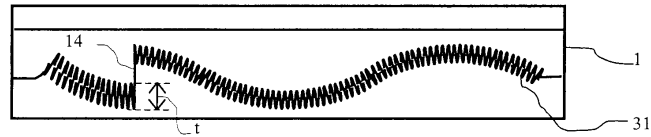
4a



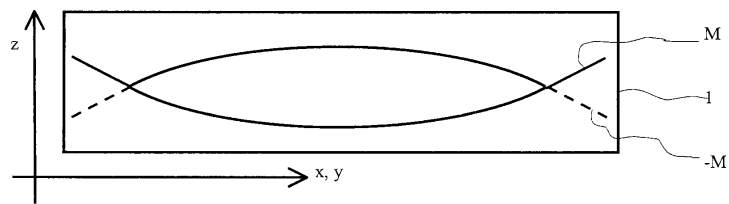
4b



5



6



7a

