

2003-0046500
2003 06 12

WO 2002/31575
2002 04 18

[illegible]

(74)

(54)

2 가

/

/

가

3

(speckle)

(4) (6) 가 1 (1) 1 (8) (2),
(12) (2) (10) (4) (10)
(12) (12) (14) (6) (6)
(16) 2 (18) (16) (6)
(16) (6) (4)

2 (16) 가 (12) (16) (17) (6)
(16) (6) 가

(C) , $C=100 \cdot I_{RMS} / I$, I_{RMS}

J.Opt.Soc.A., Vol.66, N0.11, Nov.1976, pp1145-1150, 'Some fundamental properties of speckle' Goodman
n N N

가 N 가 N

가 Goodman N N

Goodman (19) (8) (19) (6)
(6)

가

가

, Goodman

Applied Optics, Vol.37, No.10, Apr. 1998, pp1770-1775 'Speckle reduction in laser projection systems by diffractive optical elements' Wang

) . Wang

(beamlet)

. Wang

[illegible]

Bloom , GLV
GLV가 2

Bloom 2, 2

2 가

2 가

2

/

/

가

1

2

3

4

5

가

6A 6B 6C

7A

7B

가

8

3 (40) (42) (42)
 (44) (42) (46), (48),
 (GLV)(50), Schlieren (52), (54), (56)
 (58) (44) (46), GLV(50),
 (56)
 (44) (46) (46)
 (48) GLV(50) GLV(50) 1 (60)
 (44) GLV(50) GLV(50) Schlieren (52) Schlieren (52) +1
 -1
 Schlieren (54) 가 (54)
 2 (62) (54) (56)
 (44) (58) (58) 2 (56)
 (58) (58) 3 (64)
 (54) (58)
 (58)
 (42) 4 5 가 (42) (42)
 5 (70) (42) 가 (42) (42)
 (46) (72) (74), (76),
 (78) (48) (72) 가 GL
 V(50) 4 45° 가 GLV(50)
 (72) 가 GLV(50) Schlieren (52) GLV(50)
 가 GLV(50)
 GLV(50) (72) +1 -1 , D +1 D -1 , GLV(50) 1080
 R , GLV(50) 1080 5
 R +1 -1 , D +1 D -1 , D +1 D -1
 , +1 -1 , D +1 D -1
 -1 , R , R +1 -1 , D +1 D -1
 Schlieren (52) 1 2 (82 84) Schlieren (80)
 Schlieren (80) R , +1 -1 , D +1 D -1 Schlieren (8
 0) Schlieren (80) 1 (85) Schlier
 en (80) 1 (85)

1 2 (82 84) (54) 2 (62)
 . , 2 (62) (54) GLV(50) .
 +1 -1 , D +1 D -1 R GLV(50) GLV(50) .
 (54) (54) . ,
 (72) 0 2 π 가 , (56)
 (54) (54) , (54)
 가 가 (42) .
 (56) (86) (88) (88)
 (86) (90) (86) (88)
 (92) 2 (94) 가 (88)
 (88) 1 A 2 B 가 (58) (58)
 , 1 A 1 B 가 (88) (58) (58)
 58) , 2 가 (90) , 2 가 (88)
 . 0 가 (58) 가 (88)
 (90) (58) , GLV(50)
 (90)가 2 (58) (HDTV) , GLV(50)
 HDTV 2 1920 * 1080 1920 , GLV(50)
 , GLV(50) (90)가 (58)
 1920 .
 (92) (58) , 가
 3, 4 5 (42) 가 , 2 가 GLV, 2
 (42), 2 가 , 2 가 3가 GLV , , Schlie
 ren . 2 3가 GLV (54) (54) (58) , ,
 (92) (92) , , (90)가
) (58) , 2 , G
 LV , , .
 (54A) 6A 6B (54A) , (106, 108
 109) (110) 가 , (54A) 25.
 5 μ m 가 27.5mm (106)
 4mm , (108) 35mm , (109) 1mm , (108) (106)
 (54A) 가 , (109) (110)
 , 6A 6B

(110) 27.5mm (54A) 27.5mm (108) C (110) 90°가
 , (42)(4 5) (86) (88) 45°가 45° 2 (94)(4 5) (88)
 (58) (88) (92)
 (110), C, (86) (88) (42)(4, 5, 6A
 6B) , 45° C ,

6C (110) (110)
 (silica)(1.46 532nm 가)
 (54A) 25.5μm (86)가 f/25 가
 :

6C

D 4μm

E 3.5

F 2

G 8.5

H 578nm

H H= / [2(n-1)] , n
 (88)가 (42)(4 5) 2 (94)

(54A)
 (54A) 400-700nm BBAR(
)

(92) (58) , 가

:

$$= (1 + \text{proj2} / \text{eye})^{1/2} / (1 + \text{proj1} / \text{eye})^{1/2}$$

proj1 = 1 , (54)가
 (42)

proj2 = 2 , (54) 가
 (42)

eye =

(42) (54) , 1 proj1 2
 (54) proj2 가 (56)

가 (58)
 (92)

$$\begin{aligned} & \text{(92)} \quad \text{total}(x, t) \text{가 } t \text{ (58)} \\ & \text{total}(x, t) = \text{screen}(x) + \text{beam}(x - vt) \end{aligned}$$

$$\text{screen} =$$

$$\text{beam} =$$

$$x = \quad (58)$$

$$v = \quad (92)$$

$$10\mu s$$

$$\begin{aligned} & \text{1, 2, 3, 4} \quad \text{2} \quad \text{(58)} \quad \text{1, 2, 3} \\ & \text{7A 7B 7A가} \quad \text{(150, 152, 154 156)} \quad \text{1, 2, 3} \quad \text{4} \quad \text{(150, 152, 154 156)} \\ & \text{4} \quad \text{2} \quad \text{(158)} \quad \text{2} \quad \text{(158)} \quad \text{t}_1 \end{aligned}$$

$$1 \quad (t_1) \quad , \quad :$$

$$\psi(t_1) = A_1 e^{i\phi'} + A_2 e^{i\phi''} + A_3 e^{i\phi'''} \quad (150)$$

$$A_1 = 1 \quad (150) \quad 1$$

$$A_2 = 2 \quad (152) \quad 2$$

$$A_3 = 3 \quad (154) \quad 3$$

$$\phi' = 1 \quad (150) \quad 1$$

$$\phi'' = 2 \quad (152) \quad 2$$

$$\phi''' = 3 \quad (154) \quad 3$$

$$\phi' = \phi'' = \phi''' = 0 \quad \text{가} \quad , \quad (t_1) \quad :$$

$$(t_1) = -A_1 + A_2 + A_3$$

$$1 \quad (t_1) \quad 1 \quad I(t_1) \quad :$$

$$I(t_1) = (t_1)^2 = A_1^2 + A_2^2 + A_3^2 - 2A_1 A_2 - 2A_1 A_3 + 2A_2 A_3$$

$$\begin{aligned} & \text{7B} \quad \text{2, 3, 4} \quad \text{(58)} \quad \text{2} \quad \text{(158)} \quad \text{2} \quad \text{(158)} \\ & \text{(152, 154 156)} \end{aligned}$$

$$2 \quad (t_2) \quad , \quad :$$

$$\psi(t_2) = A_2 e^{i\phi''} + A_3 e^{i\phi'''} + A_4 e^{i\phi''''}$$

$$A_4 = 3 \quad (156) \quad 3$$

$$\phi'''' = 4 \quad (156) \quad 4$$

, " $\text{''} = \text{''}$ ", " $\text{''} = \text{''} = 0$ " 가 . , (t_2) :

$$(t_1) = -A_2 + A_3 + A_4$$

$$2 \quad (t_2) \quad 2 \quad I(t_2) \quad :$$

$$I(t_2) = (t_2)^2 = A_2^2 + A_3^2 + A_4^2 - 2A_2A_3 - 2A_2A_4 + 2A_3A_4$$

$$\begin{matrix} t_1 & t_2 & \text{가} \\ 1 & 2 & \\ 1 & 1 & \end{matrix} \quad , \quad \begin{matrix} I(t_1) & I(t_2) \\ (+2A_2A_3) & I(t_2) \end{matrix} \quad , \quad \begin{matrix} 1 & 2 \\ 2 & (-2A_2A_3) \end{matrix} \quad , \quad \begin{matrix} I(t_1) & I(t_2) \\ I(t_1) & I(t_2) \end{matrix} \quad , \quad \begin{matrix} 1 & 2 \\ 1 & 2 \end{matrix} \quad I(t_2)$$

1 GLV(50) , Schlieren 4 5
1 (82)
1 (82)

2 GLV(50) , Schlieren 4 5
2 (82)
1 (82)

3 Schlieren Schlieren Offner Schlieren Offner
D₋₁ +1 -1 D₊₁ D₋₁ (54) R +1 -1 D₊₁
+1 -1 D₊₁ D₋₁ +1 -1

가 8 (54B) 1 2 (136 138)
(139) 2 (140) 1 (139)
(42)(4, 5 8) (90) (54B)
(42) (139) 1 2
(136 138) (136 138)
(4, 5 8)

가 (54A) 가 가 가
1 (54A)가 1 44%가 2
2.2 (N) (54A) 20%가
(40)

가

(57)

1.

2

- a. , 1 , ;
- b. 2 , ;
- c. 2 가 / .
2. 1 , .
3. 2 , .
4. 3 , 2 1 / .
5. 1 , .
6. 1 , .
7. 1 , .
8. 1 , .
9. 1 , .
10. 9 , .
11. 9 , / , .
12. 2 , ,
- a. ;
- b. 가 1 1 ;
- c. , 1 , ;
- d. 2 가 2 ;
- e. 2 ;

f. 2^3 가

3^2 .

13.

12 , .

14.

13 , , 3

.

15.

14 , +1 -1

.

16.

15 , .

17.

12 , .

18.

12 , .

19.

2^2 ,

a. ;

b. 가 1 1 ;

c. 1 , , ;

d. , 2 2 ;

e. 2 , 가 ;

f. 가 ;

g. 가 , 가 2

.

20.

,

a. 가 ;

b. 가 ;

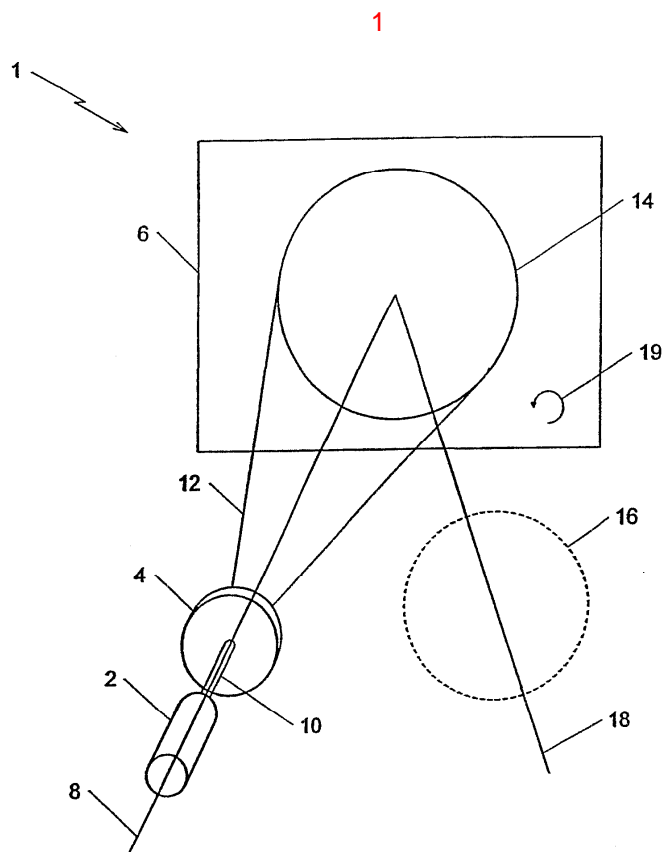
- c. ;
- d. ;
- e. 2 가 .

21.

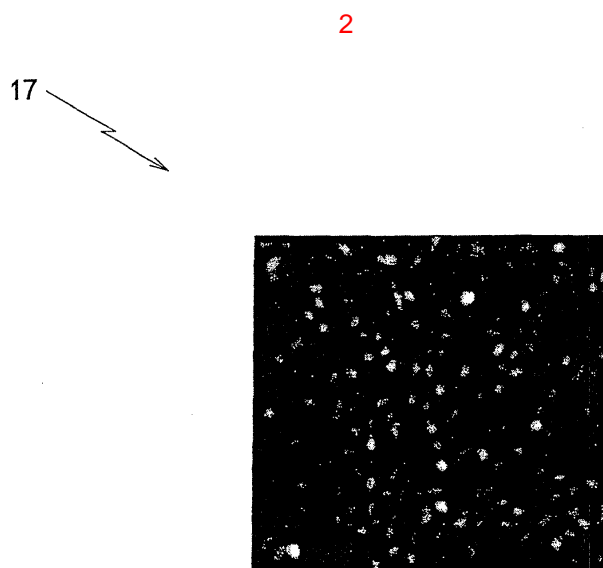
- a. , 1 , 가 ;
- b. , / .

22.

- a. 가 ;
- b. ;
- c. ;
- d. .

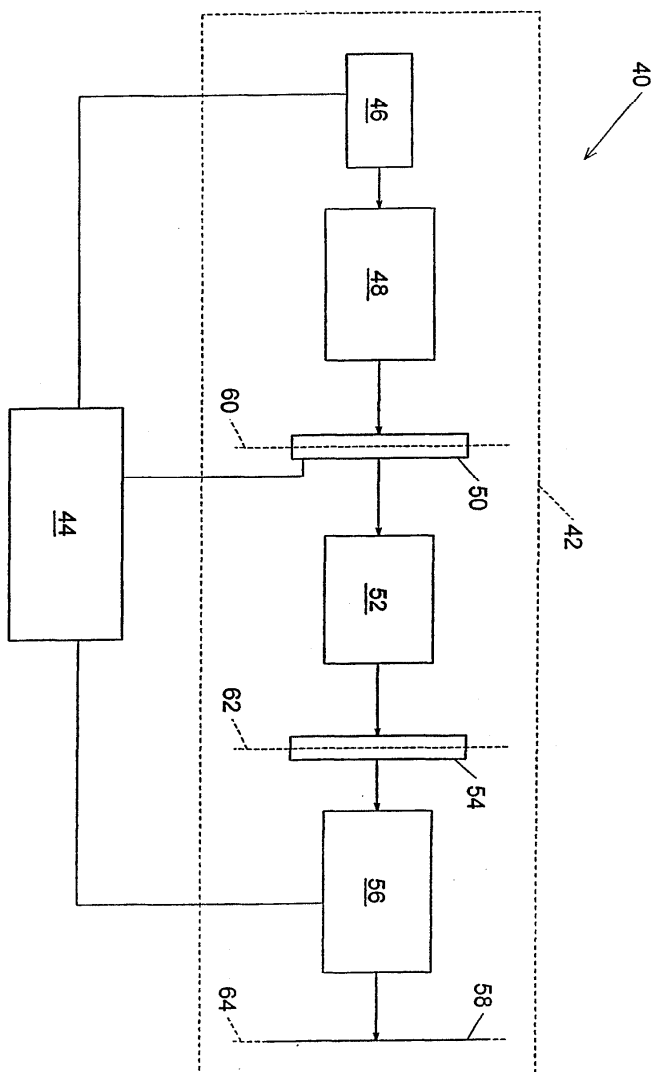


(이전 기술)

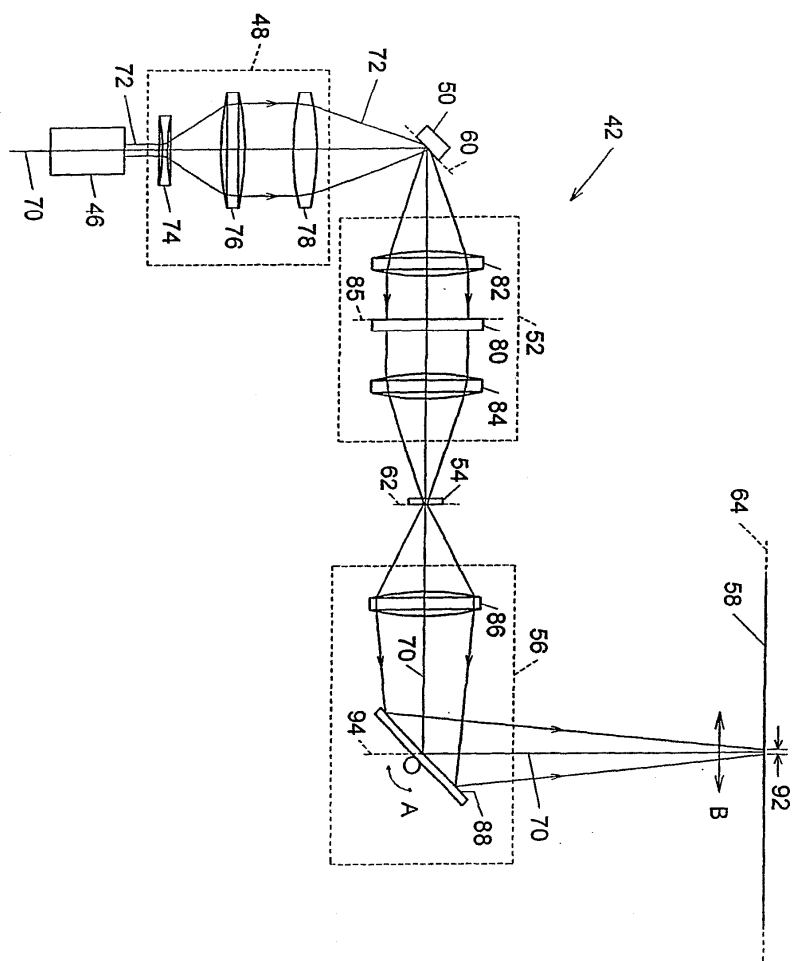


(이전 기술)

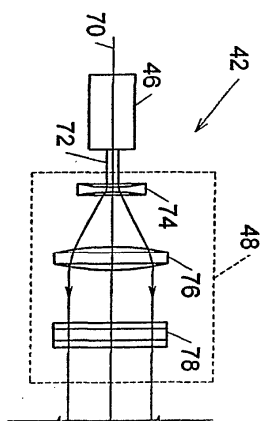
3



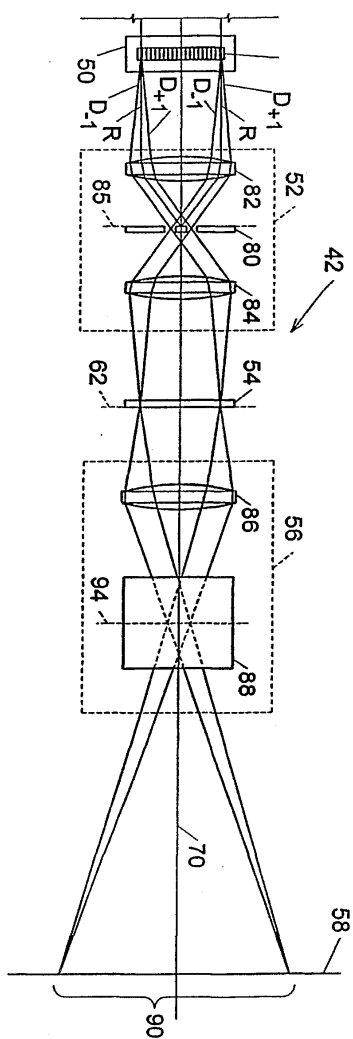
4



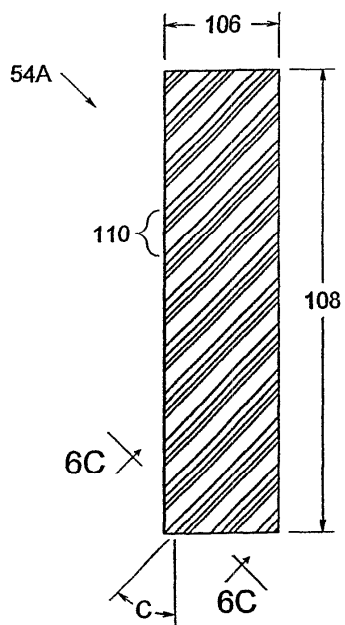
5A



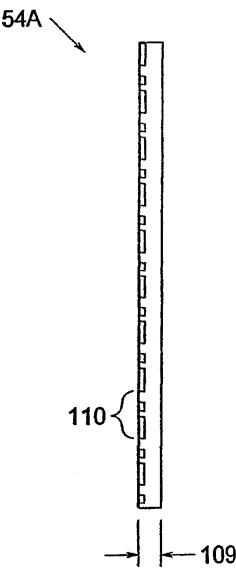
5B



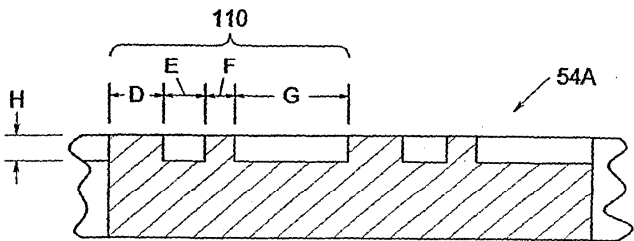
6A



6B



6C



7A

