US006754419B2

(12) **United States Patent**
Ide et al.

(10) **Patent No.: US 6,754,419 B2**
(45) **Date of Patent: Jun. 22, 2004**

(54) **DISCRETE PATTERN**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 129 days.

(21) Appl. No.: **10/127,102**

(22) Filed: **Apr. 19, 2002**

(65) **Prior Publication Data**

US 2003/0098834 A1 May 29, 2003

(30) **Foreign Application Priority Data**

Apr. 19, 2001 (JP) 2001-121785

(51) **Int. Cl.**[7] **G02B 6/04**; G02B 6/00
(52) **U.S. Cl.** **385/120**; 385/147; 345/30
(58) **Field of Search** 385/120–126, 385/147; 257/14, 24, 321; 345/30

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(57) **ABSTRACT**

A discrete pattern, formed by dots discretely arranged in two dimensions, is provided wherein the dots included in a rectangular area having a longitudinal length of Lx and a transverse length of Ly satisfy expression (1),

$$D \leqq 0.13N^{-1.15} \tag{1}$$

(in expression (1), N denotes the number of dots included in a predetermined area, and D is obtained by expression (2), wherein A(x,y) defines the number of dots, of a total of N dots, included in a rectangular area for which a line segment extended from reference coordinates (0,0) to an arbitrary coordinate point (x,y) is a diagonal line), [Ex. 2]

$$D(L_x, L_y; N) = \int\int_{L_x L_y} \left[\frac{A(x,y)}{N} - \frac{xy}{L_x L_y}\right]^2 \frac{dxdy}{L_x L_y} \tag{2}$$

and wherein S_1 that is obtained by expression (3) [Ex. 3]

$$S_1(r_1, r_2) = \int_{r_1}^{r_2} dr |g_1(r; r_1, r_2) - g_{av}| \tag{3}$$

is equal to or smaller than 0.7. (In expression (3), g_1 is obtained by dividing the average radial distribution function g(r) of each dot in the area by an integration value of g(r) over a range of from r_1 to r_2, and g_{av} is the average value of g_1 within the range of from r_1 to r_2. When the dots are arranged in a square lattice to satisfy a given filling rate, r_1 and r_2 are chosen as one and four times the value of the lattice constant Dr respectively. The dot filling rate is a value obtained by multiplying the square of the maximum diameter of a dot by the number of dots, and dividing the product by the size of the area.

66 Claims, 34 Drawing Sheets