[0084] C5. Modification 5

[0085] In the above embodiments, the color of the user-specified location on the targeted color image has been determined as a representative color, but other various methods may also be employed to set representative colors, such as those disclosed in Japanese Patents 2,896,319 and 2,896,320, the disclosures of which are hereby incorporated by reference for all purposes. For example, as disclosed in Japanese Patent 2,896,319, a histogram of the image may be prepared to determine a color of high frequency as a representative color. Alternatively, a color patch may be displayed to allow the user to select a representative color among them, as disclosed in Japanese Patent 2,896,320.

[0086] Although in the above embodiments a final representative color has been determined based on the color of the user-specified location, it is also possible to re-calculate the representative color according to the cluster grouping results (**FIG. 7**) for the individual colors. That is, if the grouping result is obtained as shown in **FIG. 7**, the center of gravity of plural colors in each cluster (a group of colors that belong to a same representative color cluster) may then be determined as its representative color. The cluster grouping may then be performed once more by using this new representative color. However, as in the above embodiments, processing speeds will be greater by determining the final representative color based on the color of the user-specified location and then by performing the cluster grouping just once.

[0087] C6. Modification 6

[0088] In each of the above embodiments, a black reference point has been employed as the origin of color vectors, but a white reference point may also be employed. For example, if region segmentation is desired to divide a printed matter containing plural single color gradations into plural regions printed with each ink, it may sometimes be preferable to set the origin of color vectors to a white reference point.

[0089] Although the present invention has been described and illustrated in detail, it is clearly understood that the same is by way of illustration and example only and is not to be taken by way of limitation, the spirit and scope of the present invention being limited only by the terms of the appended claims.

What is claimed is:

1. A method for dividing an image region of a color image according to colors, comprising the steps of:

(a) setting a plurality of representative colors;

(b) calculating plural angle indices for each pixel color in the color image, the plural angle indices for a pixel color representing angles between an individual color vector of the pixel color and representative color vectors of the plurality of representative color vectors in a predetermined color space of at least two dimensions;

(c) calculating plural distance indices for each pixel color in the color image, the plural distance indices for a pixel color representing distances between the pixel color and the plural representative colors in the color space;

(d) calculating plural composite distance indices for each pixel color in the color image based on the distance indices and the angle indices, the plural composite distance indices being associated with the plurality of representative colors, respectively; and

(e) classifying pixels in the color image into plural representative color regions associated with the plural representative colors, according to the composite distance indices, thereby dividing the image region of the color image into the plural representative color regions.

2. A method in accordance with claim 1, wherein each composite distance index includes a sum of an angle index and a corresponding distance index.

3. A method in accordance with claim 1, wherein each composite distance index includes a product of an angle index and a corresponding distance index.

4. A method in accordance with claim 1, wherein the step (e) includes the step of assigning each pixel to one of the plural representative color regions that gives a minimum value of the composite distance indices.

5. A method for dividing an image region of a color image according to colors, comprising the steps of:

(a) setting a plurality of representative colors;

(b) calculating plural angle indices for each arbitrary individual color in the color space, the angle indices for an arbitrary individual color representing angles between an individual color vector of the arbitrary individual color and representative color vectors of the plurality of representative colors in a predetermined color space of at least two dimensions;

(c) calculating distance indices for each arbitrary individual color in the color space, the distance indices for an arbitrary individual color representing distances between the arbitrary individual color and the plural representative colors in the color space;

(d) calculating composite distance indices for each arbitrary individual color in the color space based on the distance indices and the angle indices, the plural composite distance indices being associated with the plurality of representative colors, respectively;

(e) relating each arbitrary individual color in the color space with one of the plural representative colors according to the composite distance indices, and preparing a lookup table storing the correspondence between each arbitrary individual color and the plural representative colors; and

(f) classifying pixels in the color image into plural representative color regions associated with the plural representative colors, with the aid of the lookup table, thereby dividing the image region of the color image into the plural representative color regions.

6. A method in accordance with claim 5, wherein each composite distance index includes a sum of an angle index and a corresponding distance index.

7. A method in accordance with claim 5, wherein each composite distance index includes a product of an angle index and a corresponding distance index.

8. A method in accordance with claim 5, wherein the step (e) includes the step of relating each arbitrary individual color to one of the plural representative colors that gives a minimum value of the composite distance indices.