

【DESCRIPTION】**【Invention Title】**

MAKE-UP COLOR DIAGNOSIS METHOD CUSTOMIZED BY SKIN COLOR
AND MAKE-UP COLOR DIAGNOSIS DEVICE CUSTOMIZED BY SKIN COLOR

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【Technical Field】

The present disclosure relates to a make-up color diagnosis method customized by skin color and a make-up color diagnosis device customized by skin color, and more particularly, to a make-up color diagnosis method and device
10 customized by skin color that may provide diagnosis and a guide for skin color matching make-up color.

【Background Art】

Make-up is generally done based on experience or perception. Thus, the
15 degree of perfection of make-up depends on experience, ability, and skills of a person doing make-up.

There are differences between individuals in make-up, and a wide variety of attempts have been made to allow beginners to easily express desired images.

Specifically, referring to Patent Document 1, conventionally, to reduce such
20 differences between individuals, there have been attempts to theoretically approach expressions by make-up and represent in the form of an image map.

Particularly, skin color varies among people in different countries. Thus, it is necessary to apply make-up colors to match various skin colors. That is, because make-up color depends on skin color, there were difficulties in accurately assessing

skin colors of people in each country and providing make-up products of colors desired to express.

【References of the Related Art】

5 **【Patent Document】**

Korean Patent No. 10-0767133 B1

【Disclosure】

【Technical Problem】

10 The present disclosure is directed to providing a color diagnosis method and device customized by skin color that may accurately determine skin color and provide make-up color information to match the skin color.

 Also, the present disclosure is directed to providing a make-up color diagnosis method and device customized by skin color that may accurately classify
15 skin colors of each community or group and provide make-up color information best for a corresponding group.

 Furthermore, the present disclosure is directed to providing a make-up color diagnosis method and device customized by skin color that may enable accurate diagnosis of skin color matching make-up color rapidly irrespective of ability and skills
20 of a person who applies make-up.

【Technical Solution】

 To achieve the objects, a make-up color diagnosis method customized by skin color according to an embodiment of the present disclosure includes measuring skin

color of a subject, classifying a skin color type of the subject as one of a plurality of preset skin color types based on color information of the measured skin color, and providing a guide for at least one of the skin color type of the subject, a make-up color to match the skin color type, and a cosmetic material of the make-up color.

5 Before the measuring of skin color, the make-up color diagnosis method customized by skin color may further include generating make-up color information based on brightness, red color, and yellow color parameters of make-up colors to match each skin color type.

10 Before the measuring of skin color, the make-up color diagnosis method customized by skin color may further include generating skin color type information by measuring skin colors of a plurality of subjects, and dividing and classifying the measured skin colors into sections based on brightness, red color, and yellow color parameters.

15 In the make-up colors, make-up colors to match each skin color type may be set by applying a plurality of make-up cosmetic materials having various pigment compositions to a plurality of subjects, and making comparisons.

 The plurality of skin color types may be set by classifying skin colors into a light tone, a yellow tone, a red tone, and a dark tone based on brightness, red color, and yellow color components of the skin colors.

20 The classifying of a skin color type based on the measured skin color may include classifying the skin color types into a plurality of sections based on brightness of skin colors, and classifying a skin color type as a section in which brightness of the measured skin color belongs, and classifying the skin color type based on a red color component or a yellow color component of the measured skin color, when at least

two skin color types are included in one of the plurality of sections.

A make-up color diagnosis device customized by skin color according to another embodiment of the present disclosure includes a skin color measurement unit to measure skin color of a subject, a control unit to classify a skin color type of the subject as one of a plurality of preset skin color types based on color information of the skin color, and a guide unit to provide a guide for at least one of the skin color type of the subject, a make-up color to match the skin color type, and a cosmetic material of the make-up color.

The control unit may be connected to a database including at least one of multiple skin color type information, multiple make-up color information, and multiple cosmetic material information of make-up colors.

The guide unit may include a display device that presents, as an image, at least one of the skin color type of the subject, the make-up color to match the skin color type, and the cosmetic material of the make-up color.

The skin color measurement unit may be a spectrophotometer or a camera.

【Advantageous Effects】

According to an embodiment of the present disclosure, there is provided a color diagnosis method and device customized by skin color that may accurately determine skin color and provide make-up color information to match the skin color.

Also, according to an embodiment of the present disclosure, there is provided a make-up color diagnosis method and device customized by skin color that may accurately classify skin colors of each community or group and provide make-up color information best for a corresponding community or group.

Furthermore, according to an embodiment of the present disclosure, there is provided a make-up color diagnosis method and device customized by skin color that may enable accurate diagnosis of skin color matching make-up color rapidly irrespective of ability and skills of a person who applies make-up.

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【Description of Drawings】

Fig. 1 is a flowchart showing a make-up color diagnosis method customized by skin color according to an embodiment of the present disclosure.

Fig. 2 is a graph showing information associated with skin color types according to an embodiment of the present disclosure.

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Fig. 3 is a graph showing a make-up color matching method based on skin color according to an embodiment of the present disclosure.

Fig. 4 is a graph showing a make-up color guiding method based on skin color according to an embodiment of the present disclosure.

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Fig. 5 is a flowchart showing a skin color type classification method according to an embodiment of the present disclosure.

Fig. 6 is a diagram showing a display device of a make-up color diagnosis device customized by skin color according to an embodiment of the present disclosure.

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【Best Mode】

Hereinafter, a make-up color diagnosis method and device customized by skin color according to embodiments of the present disclosure will be described in detail with reference to Figs. 1 through 6.

Fig. 1 is a flowchart showing a make-up color diagnosis method customized by skin color according to an embodiment of the present disclosure, and the make-up color diagnosis method customized by skin color according to an embodiment of the present disclosure includes the steps for generating skin color type information (S10),
5 generating make-up color information (S20), measuring skin color of a subject (S30), classifying a skin color type of the subject as one of the plurality of preset skin color types based on brightness, red color, and yellow color parameters of the measured skin color (S40), and providing a guide for at least one of the skin color type of the subject, a make-up color to match the skin color type, and a cosmetic material of the
10 make-up color (S50).

Skin color varies among different human races. To apply make-up of a desired image, skin color classification suited for a corresponding human race and make-up color match is needed. The present disclosure enables skin color diagnosis and classification specific to each human race. Accordingly, make-up
15 color match is achieved in consideration of skin color, and skin color matching make-up color information is provided.

For example, skin color types of Korean are classified, and make-up color match is performed and make-up colors are provided for each Korean skin color type. Also, when applied to a Korean customer, a skin color type is determined
20 through skin color diagnosis, and a guide for make-up color information to match the corresponding skin color type is provided.

Thus, skin color types are classified for each human race (or community or group), and a make-up color system best for a corresponding skin color is built and developed. Also, skin color of an individual in a corresponding community or group

is accurately diagnosed, and a guide for personalized make-up color information is provided.

Before the step for measuring skin color, the method may further include the step (S20) for generating make-up color information based on brightness, red color, and yellow color parameters of make-up colors to match each skin color type, and the step (S10) for generating skin color type information in which skin colors of a plurality of subjects are measured and the measured skin colors are divided and classified into sections based on brightness, red color, and yellow color parameters.

Thus, characteristics of each community or group are recognized beforehand and skin color type information and make-up color information is generated beforehand, so more accurate analysis and information providing is accomplished.

The skin color type information or make-up color information that is collected beforehand and stored as described above may be repeatedly updated at a preset time interval to provide latest information.

According to an embodiment of the present disclosure, based on the above preset information, the method may further include the step (S30) for measuring skin color of a subject, and the step (S40) for classifying a skin color type of the subject as one of the plurality of preset skin color types based on brightness, red color, and yellow parameters of the measured skin color.

The skin color of the subject is measured and expressed based on the brightness, red color and yellow parameters, and a skin color type of the subject is classified as one of the plurality of skin color types. As the skin color of the subject is directly measured and classified, skin colors of each individual may be accurately classified.

For example, based on brightness, red color, and yellow color parameters, skin color types may be classified into a light tone, a dark tone, a red tone, and a yellow tone, and the skin color of the subject is measured and classified as one of the four skin color types.

5 The plurality of skin color types is information that is set by measuring and classifying skin colors of a plurality of subjects beforehand and is stored.

That is, the plurality of skin color types is set by dividing and classifying the measured skin colors of the plurality of subjects into sections based on brightness, red color, and yellow color parameters. For example, skin colors of 1,000 or more
10 subjects may be measured and expressed based on brightness, red color, and yellow color parameters, and may be classified into a light tone, a dark tone, a red tone and a yellow tone as shown in the above example. Particularly, each skin color type may be set and classified as sections of brightness, red color, and yellow color parameters, and the skin color type may be classified by identifying sections in which
15 brightness, red color and yellow color values of the measured skin color of the subject belong.

In the specification, the skin color type is classified into a light tone, a dark tone, a red tone and a yellow tone, but is not necessarily limited thereto, and of course, the skin color type may be classified into more various tones.

20 According to an embodiment, where the skin color type is classified into four as described above, the step for classifying a skin color type based on the measured skin color may include classifying skin color types into a plurality of sections based on brightness of skin colors and classifying a skin type as a section in which brightness of the measured skin color belongs.

However, when at least two skin color types are included in one of the plurality of sections, i.e., when there is a section where it is difficult to definitely classify based on only brightness, the skin color type may be classified based on a red color component or a yellow color component of the measured skin color.

5 Thus, in the skin color type classification, although classification criteria may be vague or different from person to person by individuals' subjective judgments, quantitative classification through an accurate analysis of color parameters leads to classification of skin color types with high accuracy and repeatability through an information processing device.

10 According to an embodiment of the present disclosure, the skin color type is identified, and the method includes the step (S50) for providing a guide for at least one of the skin color type of the subject, a make-up color to match the skin color type, and a cosmetic material of the make-up color.

15 A guide for not only information associated with the skin color type of the subject but also information associated with a make-up color to match the skin color type of the subject and make-up materials of the make-up color is provided to the subject. Thus, the subject identifies the skin color type of the subject, and obtains information associated with the make-up color best for the subject or the make-up materials of such make-up color.

20 According to an embodiment of the present disclosure, for make-up colors that match skin color types, right make-up colors for each skin color type may be set by applying a plurality of make-up cosmetic materials having various pigment compositions to a plurality of subjects beforehand and making comparisons.

More specifically, a plurality of make-up cosmetic materials having various

pigment compositions is applied to a plurality of subjects beforehand and compared and analyzed by specialists (e.g., make-up artists), and right make-up color information for each skin color type is pre-stored.

Accordingly, because make-up color information based on the experts' recognition is pre-stored, when selecting a make-up color, even a person lacking skills or ability may be provided with best make-up color for the person and information associated with such make-up color. It will be more helpful in reducing difficulties in selecting a make-up color and realizing a desired image.

According to an embodiment of the present disclosure, right make-up colors for each skin color type may be preset for each skin color type based on brightness, red color, and yellow color parameters of make-up colors. That is, for objective storage and analysis of information associated with make-up colors, the information associated with make-up colors may be stored, for example, based on brightness, red color, and yellow color parameters, and may be stored as information associated with numerical ranges of brightness, red color, and yellow color parameters best for each skin color type.

According to another embodiment of the present disclosure, a make-up color diagnosis device customized by skin color includes a skin color measurement unit to measure skin color of a subject, a control unit to classify a skin color type of the subject as one of the plurality of preset skin color types based on brightness, red color, and yellow color parameters of the skin color, and a guide unit to provide a guide for at least one of the skin color type of the subject, a make-up color to match the skin color type, and a cosmetic material of the make-up color.

The skin color measurement unit is configured to measure skin color of a

subject, and provide color information associated with the skin color. According to an embodiment of the present disclosure, the skin color measurement unit may be a spectrophotometer or a camera.

5 The control unit may classify a skin color type of the subject as one of the plurality of preset skin color types, based on the color information measured by the skin color measurement unit, i.e., brightness, red color, and yellow color parameters of the skin color.

The control unit may be connected to a database including at least one of multiple skin color type information, multiple make-up color information, and multiple
10 cosmetic material information of make-up colors.

That is, the control unit is connected wired or wireless to the database in which information associated with each skin color type, and information associated with make-up colors and cosmetic materials for each corresponding skin color type is pre-stored, to provide a user with information associated with a skin color type or a
15 make-up color and a cosmetic material using the corresponding information.

The information associated with the skin color type, the make-up color and/or the cosmetic material may be continuously updated, and the user may be continuously provided with latest information associated with cosmetic materials or make-up colors.

20 The guide unit may include a display device that presents, as an image, at least one of the skin color type of the subject, the make-up color to match the skin color type, and the cosmetic material of the make-up color.

The make-up color diagnosis device according to an embodiment of the present disclosure may be implemented on a mobile communication terminal.

Through a camera of the mobile communication terminal, skin colors are measured, and through the control unit, information associated with skin color types, make-up colors, and cosmetic materials is provided by means of the display device.

5 Hereinafter, through specific embodiments, a make-up color diagnosis method customized by skin color is described.

【Embodiment 1】

Generation of skin color type information

10 According to an embodiment of the present disclosure, L (brightness), a (red color component) and b (yellow color component) of skin colors of 1088 Korean women were measured using a spectrophotometer (Minolta CM2500d).

The graph of Fig. 2 shows a result of classifying skin color types into four using information associated with skin colors of a plurality of subjects.

15 Specifically, four representative skin colors were derived as shown in Table 1 below. Also, Korean women skin types were classified into a light tone, a yellow tone, a red tone, and a dark tone, to generate skin color types and their skin color information.

[Table 1]

	Number of persons (number)	L	a	b
1 (Dark tone)	211	60.8785	11.7863	20.8453
2 (Red tone)	252	62.4328	11.9032	17.3164
3 (Yellow tone)	361	64.9655	9.6591	20.6893
4 (Bright tone)	264	67.1284	8.6120	18.1696

Generation of make-up color information

Based on foundation products that are used as a base of make-up, make-up color information was generated. Particularly, 45 make-up colors with various compositions were given by adjusting the pigment component composition of YBR (Yellow (Y), Black (B), and Red (R)).

Also, 45 cosmetic materials were applied to subjects with each skin color type, make-up specialists were allowed to evaluate similar skin colors, and make-up colors to match each skin color type were classified to generate make-up product color information.

Fig. 3 is a L (brightness)-b (red)/a (yellow) graph plotting each skin color type and cosmetic materials 1-7. In the graph, cosmetic materials evaluated by specialists as similar skin colors for each skin color type are connected with an arrow.

Through this, make-up color information to match each skin color type was generated.

Also, Fig. 4 is a graph showing make-up color classification sections set through representative skin color information of skin color types based on the data of Fig. 3.

More specifically, a brightness value (L) of a cosmetic material less than or equal to 69.63 is classified as right make-up color for a dark tone, an L value between 68.31 and 71.70 is classified as right make-up color for a red tone, an L value between 68.92 and 71.70 and $b/a > 2$ is classified as right make-up color for a yellow skin tone, and an L value higher than or equal to 71.70 is classified as right make-up color for a light tone.

In this case, make-up color information to match each skin type may be provided using only make-up color information without directly conducting a test.

To find make-up colors that match skin color types better, through a comparative analysis of pigment compositions of cosmetic materials and color parameters of skin color types, pigment compositions that match skin color types better may be adjusted.

As described above, the skin color type information and information associated with right make-up colors and cosmetic materials including them is generated beforehand and stored.

Measurement of skin color of subject

To classify a skin color type of a subject, his/her skin color was measured using a portable skin diagnosis device (SkinTouch made by Amorepacific). In the case of the skin diagnosis device, colors were measured based on RGB (Red (R), Green (G) and Blue (B)) or CMYK (Cyan (C), Magenta (M), Yellow (Y), black (K)), and the RGB or CMYK based color information is converted into L (brightness), a (red color component) and b (yellow color component) and is analyzed.

Classification of skin color type of subject

The skin color information data (L, a, b) of the subject is classified along the flow shown in the flowchart of Fig. 5.

Referring to Fig. 5, the skin color information data (L, a, b) of the subject is measured (S110), and brightness (L) is compared first (S121-S127).

When the skin color type can be definitely distinguished by only brightness (L)

(S121, S123, S125, S127), if it falls within a corresponding section, the skin color type may be each distinguished as a dark tone (S141), a red tone (S143), a yellow tone (S145) and a light tone (S147).

However, when the skin color type cannot be definitely distinguished by only
5 brightness (L), a red color component (a) and a yellow color component (b) are compared (S131, S132, S133), and the skin color type may be distinguished as a dark tone (S141), a red tone (S143), a yellow tone (S145) and a light tone (S147).

Providing of skin color type, make-up color, and cosmetic material

information

Through the skin color type information of the subject measured and
classified as described above and the make-up color information generated
beforehand and stored, at least one of skin color type information, right make-up
color information, and cosmetic material information of the corresponding make-up
15 color is provided.

Fig. 6 shows a display screen according to an embodiment. In the case of
Fig. 6, skin color of a subject is measured as a dark tone and a measured value is
provided to a user, and a guide for information associated with a make-up cosmetic
material (make-up cosmetic material color best for the subject) is provided.

【CLAIMS】**【Claim 1】**

A make-up color diagnosis method customized by skin color, comprising:

measuring skin color of a subject;

5 classifying a skin color type of the subject as one of a plurality of preset skin color types based on color information of the measured skin color; and

providing a guide for at least one of the skin color type of the subject, a make-up color to match the skin color type, and a cosmetic material of the make-up color.

10 **【Claim 2】**

The make-up color diagnosis method customized by skin color according to claim 1, before the measuring of skin color, further comprising:

generating make-up color information based on brightness, red color, and yellow color parameters of make-up colors to match each skin color type.

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【Claim 3】

The make-up color diagnosis method customized by skin color according to claim 1, before the measuring of skin color, further comprising:

generating skin color type information by measuring skin colors of a plurality
20 of subjects, and dividing and classifying the measured skin colors into sections based on brightness, red color, and yellow color parameters.

【Claim 4】

The make-up color diagnosis method customized by skin color according to

claim 2, wherein the generating of make-up color information comprises applying a plurality of make-up cosmetic materials having various pigment compositions to a plurality of subjects, making comparisons, and setting make-up colors to match each skin color type.

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【Claim 5】

The make-up color diagnosis method customized by skin color according to claim 1, wherein the plurality of skin color types is set by classifying skin colors into a light tone, a yellow tone, a red tone, and a dark tone based on brightness, red color,
10 and yellow color components of the skin colors.

【Claim 6】

The make-up color diagnosis method customized by skin color according to claim 1, wherein the classifying of a skin color type based on the measured skin color
15 comprises:

classifying the skin color types into a plurality of sections based on brightness of skin colors, and classifying a skin color type as a section in which brightness of the measured skin color belongs; and

classifying the skin color type based on a red color component or a yellow
20 color component of the measured skin color, when at least two skin color types are included in one of the plurality of sections.

【Claim 7】

A make-up color diagnosis device customized by skin color, comprising:

a skin color measurement unit to measure skin color of a subject;

a control unit to classify a skin color type of the subject as one of a plurality of preset skin color types based on color information of the skin color; and

5 a guide unit to provide a guide for at least one of the skin color type of the subject, a make-up color to match the skin color type, and a cosmetic material of the make-up color.

【Claim 8】

10 The make-up color diagnosis device customized by skin color according to claim 7, wherein the control unit is connected to a database including at least one of multiple skin color type information, multiple make-up color information, and multiple cosmetic material information of make-up colors.

【Claim 9】

15 The make-up color diagnosis device customized by skin color according to claim 7, wherein the guide unit includes a display device that presents, as an image, at least one of the skin color type of the subject, the make-up color to match the skin color type, and the cosmetic material of the make-up color.

20 **【Claim 10】**

The make-up color diagnosis device customized by skin color according to claim 7, wherein the skin color measurement unit is a spectrophotometer or a camera.