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(54) **Title:** METHOD TO ACCESS AND EVALUATE HAIR DAMAGE

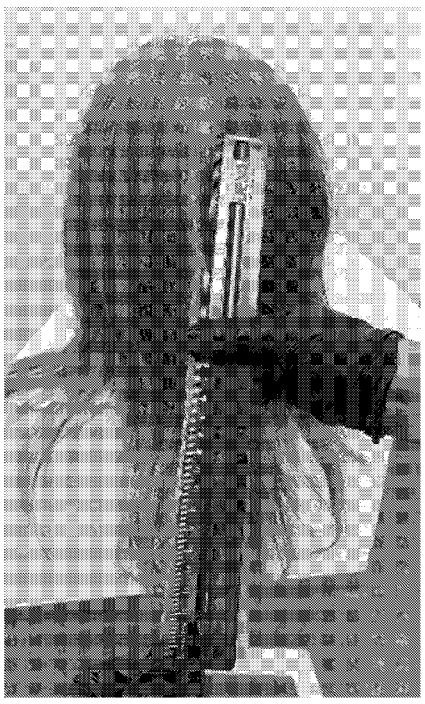

FIGURE 7

(57) **Abstract:** The present invention relates to a method to access and evaluate hair damage based on its resistance to elongation and deformation. The method consists of a six-level scale (0 to 5) of evaluation. The method is based on a standardized gesture protocol. The objective of the method is to evaluate how hair repair technologies work on reducing hair damage or how chemical treatments work on increasing hair damage and provide statistic results.

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METHOD TO ACCESS AND EVALUATE HAIR DAMAGE

TECHNICAL FIELD

The present invention relates to a method to access and evaluate hair damage based on its resistance to elongation and deformation. The method consists of a six-level scale (0 to 5) of evaluation. The method is based on a standardized gesture protocol. The objective of the method is to evaluate how hair repair technologies work on reducing hair damage or how chemical treatments work on increasing hair damage and provide statistic results.

BACKGROUND OF THE INVENTION

Gestures that hairdressers use in hair swatches at the saloon are the current manner to assess and evaluate client's level of hair damage when a chemical treatment (such as bleaching and straightening) is or will be applied to the hair.

This gesture consists of pulling a standardized amount of hair swatches and, through this gesture, the integrity of the fiber is evaluated and classified according to a general scale that hairdressers consider and use in their routines.

Through this current evaluation methodology used by the hairdressers at the saloons, the perceived capillary elasticity and the deformation of the fibers are the main indicators of the level of damage of the hair.

Therefore, the greater the elongation of the hair sample, the greater the perceived elasticity. Consequently, deformation may occur, and it increases the damage level. The elasticity perceived as a sign of damage does not have a direct association with the elastic modulus of the hair fiber, which can be evaluated by the tensile test.

US2021/0259381 describes a methodology that is used to evaluate the hair integrity preservation after the application of the technology patented. It consists of the evaluation of the hair elasticity on wet hair by stretching a hair fiber on both sides. The more elastic it is, the more it returns to its original shape and its integrity is preserved. If the hair breaks after the gesture, it is no longer elastic, and its integrity has not been preserved. No scale was presented, and no details on quantitative data analysis is provided or suggested.

WO2019/016129 describes that the hair elasticity is evaluated by stretching 5-10 hair fiber and it is scored from 1 (not acceptable result) to 5 (excellent - completely elastic recovery). The scale seems to be more qualitative, and no details of quantitative data analysis is provided.

Other documents describing methodologies to evaluate hair integrity or elasticity were found, in most cases the assessment is related to the use of equipment or the physical principle of elasticity.

Consequently, there is the need of a method for assessing hair damage that is standardized and reproducible, and that can be used for evaluating and demonstrating the performance of repair technologies, assessing the impact of chemical treatments on the integrity of the hair fiber and for carrying out hair diagnosis.

The developed method is intended to evaluate hair repair technologies on improving hair damage level, accessing hair integrity by analyzing its elasticity and comparing statistically to a prior damaged reference and to others product's benches performance.

Results can be used to compare the statistically the performance of different technologies of hair repair and to make recommendation regarding the more indicated technology to a certain type of hair damage.

Results can be also used to follow the impact on the hair fiber integrity when chemical treatments are applied successively and to compare the impact of different chemical treatments on the hair fiber.

Therefore, the present invention solves the technical problem with the method to access and evaluate hair damage based on its resistance to elongation and deformation as described herein.

BRIEF DESCRIPTION OF THE INVENTION

The present invention refers to a method to access and evaluate hair damage, the method comprising the steps of:

(a) separating a hair swatch;

(b) spraying water over the hair swatch for a first time,

(c) waiting for 0.5 to 3 minutes;

(d) spraying water over the hair swatch for a second time and removing water excess; and

(e) performing the evaluation gesture,

said evaluation gesture of step (e) comprises the steps of:

(i) holding the top of the evaluation area of the hair swatch with the index finger and thumb of one hand, pressing with the fingers , with a distance of 3.0 to 7.0 cm, and

(ii) holding the bottom of the assessment area with the thumb

and forefinger of the other hand, and

(iii) with the hand that holds the lower part, pulling the hair swatch at least 2 times in a row, and

(iv) repeating the procedure for each assessment zone, starting from zone 1 to zone 3 of the hair swatch.

The present invention relates to a method to evaluate and demonstrate the performance of repair technologies, to assess the impact of chemical treatments on the integrity of the hair fiber and to carry out hair diagnosis. The present method can be used to evaluate how hair repair technologies work on reducing hair damage and provide statistic results, and it can be used as training for hairdressers to perform hair diagnosis and score the hair damage level on hair salons.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates the evaluation zones 1, 2, and 3 of hair swatch.

Figure 2 illustrates the 6 levels of hair evaluation, wherein level 0 represents is natural hair, level 1 represents low elasticity, level 2 represents elastic hair, level 3 represents low deformable hair, level 4 represents deformable hair, and level 5 represents hair with immediate break. Images were taken right after the fibers were tensioned.

Figure 3 illustrates how to count the swatches of hair (from the tip of the swatch).

Figure 4 illustrates how the swatch of hair to be evaluated should be held.

Figure 5 illustrates the swatch of hair to be evaluated glued with hot glue.

Figure 6 illustrates the swatch of hair stuck in the support for evaluation, timer and water sprayer.

Figure 7 illustrates the 15cm separation of the evaluation hair swatch for *in vivo* evaluation.

Figure 8 illustrates the elongation of the evaluation hair swatch with the parameter of a ruler.

DETAILED DESCRIPTION OF THE INVENTION

The present invention refers to a method to access and evaluate hair damage comprising the steps of:

(a) separating a hair swatch;

(b) spraying water over the hair swatch for a first time,

(c) waiting for 0.5 to 3 minutes;

(d) spraying water over the hair swatch for a second time and removing water excess; and

(e) performing the evaluation gesture,

said evaluation gesture of step (e) comprises the steps of:

(i) holding the top of the evaluation area of the hair swatch with the index finger and thumb of one hand, pressing with the fingers , with a distance of 3.0 to 7.0 cm, and

(ii) holding the bottom of the assessment area with the thumb and forefinger of the other hand, and

(iii) with the hand that holds the lower part, pulling the hair swatch at least 2 times in a row, and

(iv) repeating the procedure for each assessment zone, starting from zone 1 to zone 3 of the hair swatch.

In a preferred embodiment, in step (a), the hair swatch is an evaluation swatch with about 12 to 35 cm from its top to its end.

In a preferred embodiment, in step (a), the hair swatch is an evaluation swatch and is divided into zone 1, zone 2 and zone 3, wherein zone 1 is the closest to the top of the swatch and zone 3 is the closest to the end of the swatch. Each zone has 5.0 cm.

In a preferred embodiment, the hair swatch of step (a) comprises from about 25 to about 50 fibers, preferably about 30 fibers.

In a preferred embodiment, in step (b), the hair swatch is sprayed over 10 times from the top to the end of the swatch.

In a preferred embodiment, in step (c), the hair swatch is sprayed over 5 times from the top to the end of the swatch.

In a preferred embodiment, in step (c), the waiting time is 1 minute.

In a preferred embodiment, in steps (b) and (c), the water is sprayed to the hair swatch with a distance of about 5 cm between the sprayer and the hair swatch.

In a preferred embodiment, in step (d), the evaluation gesture is performed immediately after spraying water for the second time on the hair swatch and removing water excess.

In a preferred embodiment, in item (i), the distance is 5.0 cm.

Also, the force applied, when pressing with the finger on step (e) (i), the force has to be just enough to ensure that the hair swath will not come loose, or that

the swatch will not slip out during the test.

In a preferred embodiment, in item (iii), the hair swatch is pulled for 3 times in a row and without pause between the pulls that are made on the hair under evaluation.

In a preferred embodiment, in item (iv), the procedure for each assessment zone is repeated from 2 to 5 times.

In a preferred embodiment, the method is a six-level scale evaluation (0 to 5), wherein level 0 is a natural hair, level 1 is a low elastic hair, level 2 is an elastic hair, level 3 is a low deformable hair, level 4 is a deformable hair, and level 5 is hair with immediate break, according to the approximate elongation of the hair as Table 1 below.

Table 1. Approximate elongation (cm) to estimate hair damage level

Approximate elongation (cm)					
Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
0.5	1.0	1.5	1.7	2.0	-

The present invention relates to a method to access and evaluate hair damage, that consists of a scale of 0 to 5 and a standardized gesture. It can be used to evaluate how hair repair technologies work on reducing hair damage and provide statistic results, both *in vitro* and *in vivo*. It can be used as training for hairdressers to perform hair diagnosis and score the hair damage level on hair salons. It can be used on clinical studies as criteria for inclusion or exclusion of volunteers.

The present method is based on a scale linked to a gesture that consists in pulling the hair swatch to be evaluated and observing its behavior throughout the test. Depending on the elongation/deformation perceived, the damage level is classified according to a six-level scale, from 0 to 5.

Level zero (0) on the scale is the reference of natural hair that has not been chemically processed and is extremely firm. The opposite end of the scale is level 5, where breakage occurs in more than 20% of the hair fibers.

Table 2 presents descriptions of each level of the scale.

Table 2. Six-level scale of the intended method

	Natural Hair	Low Elasticity Hair	Elastic Hair	Low Deformable Hair	Deformable Hair	Hair with Immediate Break
Scale	0	1	2	3	4	5
Description	Hair that hasn't gone through chemical transformation. When pulled stays extremely firm.	When pulled, the swatch almost does not stretch and returns to its initial state after the test.	The swatch presents elasticity when pulled, but still returns to its initial state after the test.	The swatch presents elasticity when pulled and after the test, the fibers show a slight deformation. A partial break can be noticed. (**)	The swatch presents elasticity, and after the test, it remains highly deformed. A partial break can be noticed. (**)	The swatch does not resist and break during the test.

The tests were also performed in the following conditions:

a) blind evaluation; and

b) 2 accredited operators.

In scales 3 and 4 above, the reference (**) describe the partial breakage, which occurs when there is breakage of less than 20% of the hair fibers on the swatch.

The evaluation swatch is divided into three regions, as Figure 1 illustrates, where the gesture will be performed in: zone 1, zone 2 and zone 3. Zone 3 is always the one closest to the end of the swatch. Each region has preferably 5.0 cm.

During the evaluation, a scale data is obtained for each of the three zones of the swatch. The Hair Damage Level (HDL) is the average of these three zones, according to the equation below:

$$\mathbf{HDL} = \frac{\mathbf{Score\ zone\ 1 + Score\ zone\ 2 + Score\ zone\ 3}}{\mathbf{3}}$$

To access statistical analyses of the results, it is necessary to follow the standards established for the method, considering *in vitro* and *in vivo* studies, detailed respectively below in sections "In Vitro Hair repair technologies evaluation" and "In Vivo Evaluation".

A. HAIR INTEGRITY EVALUATION

A.1. Equipment and Materials

- Gloves (preferably black for bleached fibers);
- Spray bottle with water; and

- Timer.

A.2. Evaluation swatch preparation

For the evaluation, a 30-fiber swatch will be used, which should be prepared from the swatch referring to the condition to be evaluated.

Counting the fibers (Figure 3): the fibers must be counted from the tips of the main swatch, to avoid broken fibers in the evaluation swatch.

A.3. Evaluation protocol

Pre-gesture standardized method: Spray water 10 times over the swatch, dividing into 2 sprays of 5 along the swatch. Distribute the sprays evenly up to the tips, with a distance of approximately 5 cm between the sprayer and the swatch. Set the timer to 1 minute and, after the end of the time, spray 5 more times the water on the swatch. Follow immediately with the evaluation gesture below.

Evaluation gesture (Figure 4): Hold the top of the evaluation area with the index finger and thumb of one hand, pressing with the fingers. Establish a distance of 5.0 cm and hold the bottom of the assessment area with the thumb and forefinger of the other hand. With the hand that holds the lower part, pull for 3 times in a row, without a pause. Repeat the procedure for each assessment zone. Always start from zone 1 to zone 3.

B. *IN VITRO* HAIR REPAIR TECHNOLOGIES EVALUATION

B.1. Equipment and Materials

- Hot glue pistol or equivalent;
- Thermal glove;
- Metal spatula;
- Scissors;
- Labeler;
- Support for hair swatches; and
- Towel.

B.2.1. Number of swatches per condition evaluated

Six evaluation swatches per condition are prepared. Each evaluation swatch must come from a main swatch of 30-fiber swatch.

The same number of swatches per condition should be prepared for 2 operators, and the two swatches of the same condition should come from the same main swatch.

B.2.2 - Preparation of the *In vitro* evaluation swatches

After counting the fibers, as described in item A.2, it should be cut at the top of the main swatch and then the process described below should be followed to glue the top.

• Glue process: place the 30 hair fibers on a surface, preferably glass. With the help of the hot glue pistol or equivalent equipment, place on the top (referring to the beginning of the first evaluation zone) of the evaluation swatch, the amount equivalent to a coin of hot glue (Figure 5), then press with a spatula until it cools down.

B.2.3 - Evaluation swatch and room conditions

Swatches that undergo chemical transformations such as bleaching and/or straightening must be prepared preferably maximum two days before the application of the test products.

Room temperature and humidity must always be constant: 22°C or 72°F and 55%.

Standardization of product batches: use the same batch of products for all the evaluated conditions.

B.3. Preparing for the Hair Integrity Evaluation

The evaluation swatches prepared should be attached to a support, so that they are firm and resist tension, without loosening when pulled. The support must be on top of a surface that offers height regulation so it can be adjusted for each operator.

The evaluation must be done at the day after product application, for all the conditions referring to the same number of product/routine application. Evaluations must also be done by the two operators at the same day.

The reference swatch, without product application, must be evaluated on the same day of the swatches with product application. If the reference swatches are prepared more than a day before, it is recommended to spray water 10 times with a 5 cm distance from the spray to the swatch, the day before the evaluation.

Follow the evaluation follow the protocol described in item A.3 above.

At the moment of the evaluation, the data referring to the notes of each region of the swatch must be collected.

C. *IN VIVO* EVALUATION

C.1. Equipment and Materials

- Ruler (minimum of 20 cm); and
- Hair clip.

C.2 *In vivo* hair swatch Preparation and Evaluation

For evaluation of *in vivo* repair technologies, the number of hair swatches evaluated per condition and the location of the swatches on the head will depend on the study design.

To prepare *in vivo* evaluation swatch, the method below should be followed:

After counting the fibers following the protocol described in item A.2, the ruler must be used to define where the first evaluation zone of the swatch will start.

Count 15 cm (Figure 7) from the tip of the swatch towards the scalp and fix it with a hair clip just above the beginning of the first evaluation zone.

Evaluate the swatch according to the protocol and gesture described in Section A.3.

Terms

Other than in the operating examples, or where otherwise indicated, all numbers expressing quantities of ingredients and/or reaction conditions are to be understood as being modified in all instances by the term “about,” meaning within 10% of the indicated number (e.g., “about 10%” means 9%-11%, “about 2%” means 1.8%-2.2%, and so on).

It should be understood that the precise numerical values used in the specification, including the examples and claims, form additional embodiments of the invention, and are intended to include any ranges which can be narrowed to any to end points disclosed within the exemplary ranges and values provided. Efforts have been made to ensure the accuracy of the numerical values disclosed. However, any measured value can inherently contain certain errors resulting from the standard deviation found in its respective measuring technique.

As used herein, the use of the singular forms “a,” “an,” “the,” and “at least one” are understood to encompass the plural as well as the singular unless the context clearly dictates otherwise. The articles “a” and “an,” as used herein, mean one or more when applied to any feature in embodiments of the present invention described in the specification and claims. Thus, the use of “a” and “an” does not limit the meaning to a single feature unless such a limit is specifically stated and the expression “one or more” means “at least one” and includes individual components as well as mixtures/combinations. As used herein the article “any” means one, some, or all indiscriminately of whatever quantity.

"At least one," as used herein, means one or more and thus includes individual components as well as mixtures/combinations.

The term "comprising" (and its grammatical variations) as used herein is used in the inclusive sense of "having" or "including" (or "comprise," "have," and "include"), and are used in their open, non-limiting sense.

The term "consisting essentially of" as used herein refers to the specifically recited materials or steps but may include materials or steps that do not materially affect the basic and novel characteristics of the compositions or their use.

All percentages and ratios are calculated by weight unless otherwise indicated, and unless otherwise specified herein, all percentages and ratios of components are by weight relative to the total weight of the final composition.

For purposes of the present disclosure, it should be noted that to provide a more concise description, some of the quantitative expressions given herein are not qualified with the term "about." It is understood that whether the term "about" is used explicitly or not, every quantity given herein is meant to refer to the actual given value, and it is also meant to refer to the approximation to such given value that would reasonably be inferred based on the ordinary skill in the art, including approximations due to the experimental and/or measurement conditions for such given value.

All ranges and amounts given herein are intended to include sub-ranges and amounts using any disclosed point as an end point. Thus, a range of "1% to 10%, such as 2% to 8%, such as 3% to 5%," is intended to encompass ranges of "1% to 8%," "1% to 5%," "2% to 10%," and so on. All numbers, amounts, ranges, etc., are intended to be modified by the term "about," whether or not so expressly stated. Similarly, a range given of "about 1% to 10%" is intended to have the term "about" modifying both the 1% and the 10% endpoints.

The term "about" is used herein to indicate a difference of up to +/- 10% from the stated number, such as +/- 9%, +/- 8%, +/- 7%, +/- 6%, +/- 5%, +/- 4%, +/- 3%, +/- 2%, or +/- 1%. Likewise, all endpoints of ranges are understood to be individually disclosed, such that, for example, a range of 1:2 to 2:1 is understood to disclose a ratio of both 1:2 and 2:1.

As used herein, the terms "spraying water over the hair swatch" and variations of this phrase are intended to mean contacting the hair with the water at least one of the compositions of the disclosure, spraying water along the entire swatch of hair under evaluation, from the top to the end of the swatch. The number of sprays

will vary according to the stage of the process.

Unless specifically indicated otherwise, as used herein, the terms "substantially free" or "essentially free," which are used interchangeably, mean that the specific material may be present in small amounts that do not materially affect the basic and novel characteristics of the compositions according to the disclosure. For instance, there may be less than 2% by weight of a specific material added to a composition, based on the total weight of the compositions (provided that an amount of less than 2% by weight does not materially affect the basic and novel characteristics of the compositions according to the disclosure.

Similarly, the compositions may include less than 2%, less than 1.5%, less than 1%, less than 0.5%, less than 0.1%, less than 0.05%, or less than 0.01%, or none of the specified material. Furthermore, all components that are positively set forth in the instant disclosure may be negatively excluded from the claims, e.g., a claimed composition may be "free," "essentially free" (or "substantially free") of one or more components that are positively set forth in the instant disclosure.

The term "substantially free" or "essentially free" as used herein may also mean that the specific material is not added to the composition but may still be present in a raw material that is included in the composition, in an amount that does not materially affect the basic and novel characteristics of the compositions according to the disclosure.

As used herein, the terms such as "access", "evaluate" (and its grammatical variations) refers to the analysis and evaluation of the hair swatches based on the method of the present disclosure.

EMBODIMENT

A non-limitative example of the method to access and evaluate hair damage of the present invention comprises the steps of:

(a) separating a 30-fiber hair swatch;

(b) spraying water 10 times over the 30-fiber hair swatch for a first time,

(c) waiting for 1 minute;

(d) spraying 5 times water over the 30-fiber hair swatch for a second time and removing water excess; and

(e) immediately performing the evaluation gesture,

said evaluation gesture of step (e) comprises the steps of:

(i) holding the top of the evaluation area of the hair swatch with the index finger and thumb of one hand, pressing with the fingers , with a distance of 5.0 cm, and

(ii) holding the bottom of the assessment area with the thumb and forefinger of the other hand, and

(iii) with the hand that holds the lower part of the 30-fiber hair swatch, pulling the hair swatch 3 times in a row and without pause, and

(iv) repeating the procedure for each assessment zone, starting from zone 1 to zone 3 of the hair swatch.

SET OF CLAIMS

1. METHOD TO ACCESS AND EVALUATE HAIR DAMAGE, characterized by comprising the steps of:

(a) separating a hair swatch;

(b) spraying water over the hair swatch for a first time,

(c) waiting for 0.5 to 3 minutes;

(d) spraying water over the hair swatch for a second time and removing water excess; and

(e) performing the evaluation gesture,

said evaluation gesture of step (e) comprises the steps of:

(i) holding the top of the evaluation area of the hair swatch with the index finger and thumb of one hand, pressing with the fingers , with a distance of 3.0 to 7.0 cm, and

(ii) holding the bottom of the assessment area with the thumb and forefinger of the other hand, and

(iii) with the hand that holds the lower part, pulling the hair swatch at least 2 times in a row, and

(iv) repeating the procedure for each assessment zone, starting from zone 1 to zone 3 of the hair swatch.

2. METHOD, according to claim 1, characterized in that, in step (a), the hair swatch is an evaluation swatch with about 15 cm from its top to its end.

3. METHOD, according to claim 1, characterized in that, in step (a), the hair swatch is an evaluation swatch and is divided into zone 1, zone 2 and zone 3, wherein zone 1 is the closest to the top of the swatch and zone 3 is the closest to the end of the swatch.

4. METHOD, according to claim 3, characterized in that each zone has 5.0 cm.

5. METHOD, according to claim 1, characterized in that the hair swatch of step (a) comprises 25 to 50 fibers, preferably 30 fibers.

6. METHOD, according to claim 1, characterized in that in step (b) the hair swatch is sprayed over 10 times from the top to the end of the swatch.

7. METHOD, according to claim 1, characterized in that in step (c) the hair swatch is sprayed over 5 times from the top to the end of the swatch.

8. METHOD, according to claim 1, characterized in that, in step (c), the waiting time is 1 minute.

9. METHOD, according to claim 1, characterized in that, in steps (b) and (c), the water is sprayed to the hair swatch with a distance of about 5 cm between the sprayer and the hair swatch.

10. METHOD, according to claim 1, characterized in that, in step (d), the evaluation gesture is performed immediately after spraying water for the second time on the hair swatch and removing water excess.

11. METHOD, according to claim 1, characterized in that, in item (i), the distance is 5.0 cm.

12. METHOD, according to claim 1, characterized in that, in item (iii), the hair swatch is pulled for 3 times in a row and without pause between the pulls that are made on the hair under evaluation.

13. METHOD, according to claim 1, characterized in that it consists of a six-level scale evaluation (0 to 5), wherein level 0 is a natural hair, level 1 is a low elastic hair, level 2 is an elastic hair, level 3 is a low deformable hair, level 4 is a deformable hair, and level 5 is hair with immediate break.

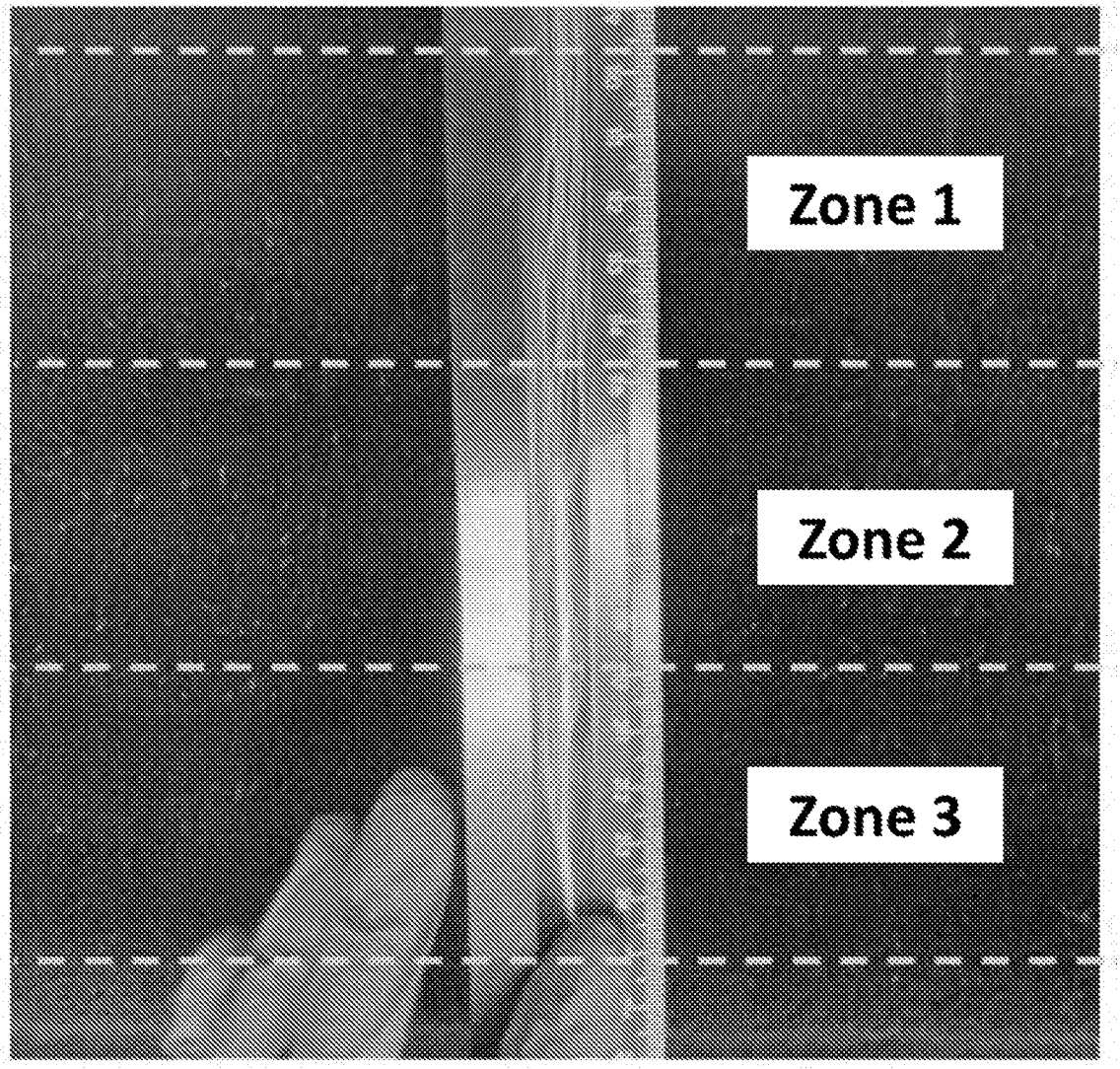

FIGURE 1

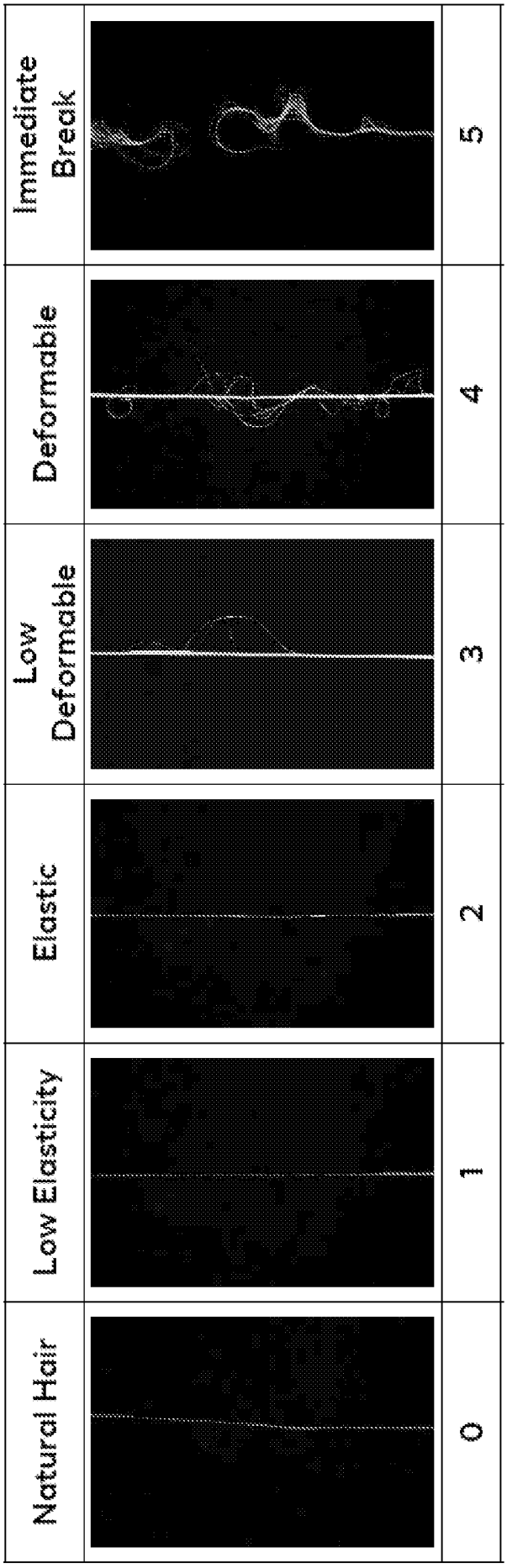
Natural Hair
0
Low Elasticity
1
Elastic
2
Low Deformable
3
Deformable
4
Immediate Break
5

FIGURE 2

FIGURE 3

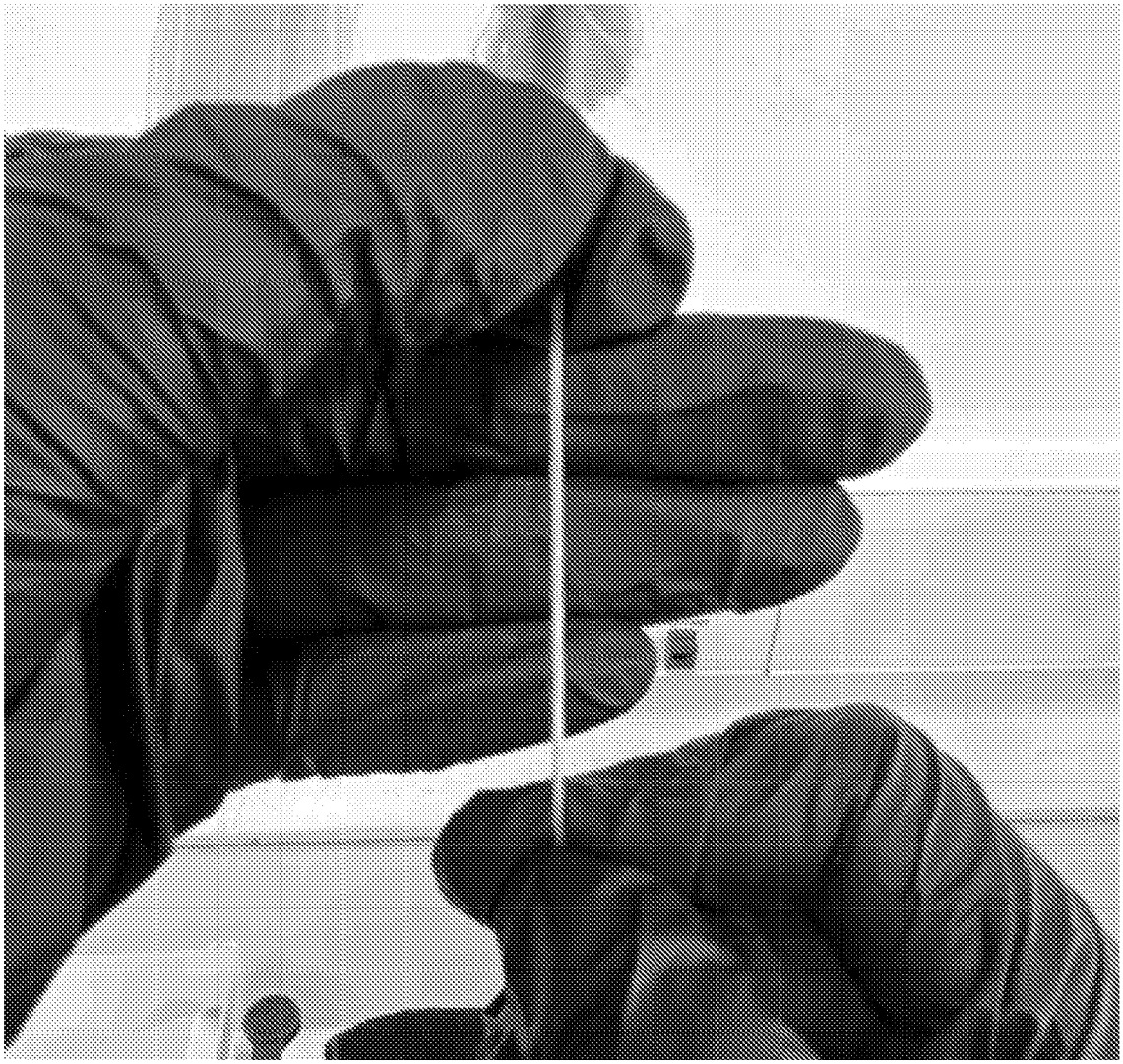

FIGURE 4

FIGURE 5

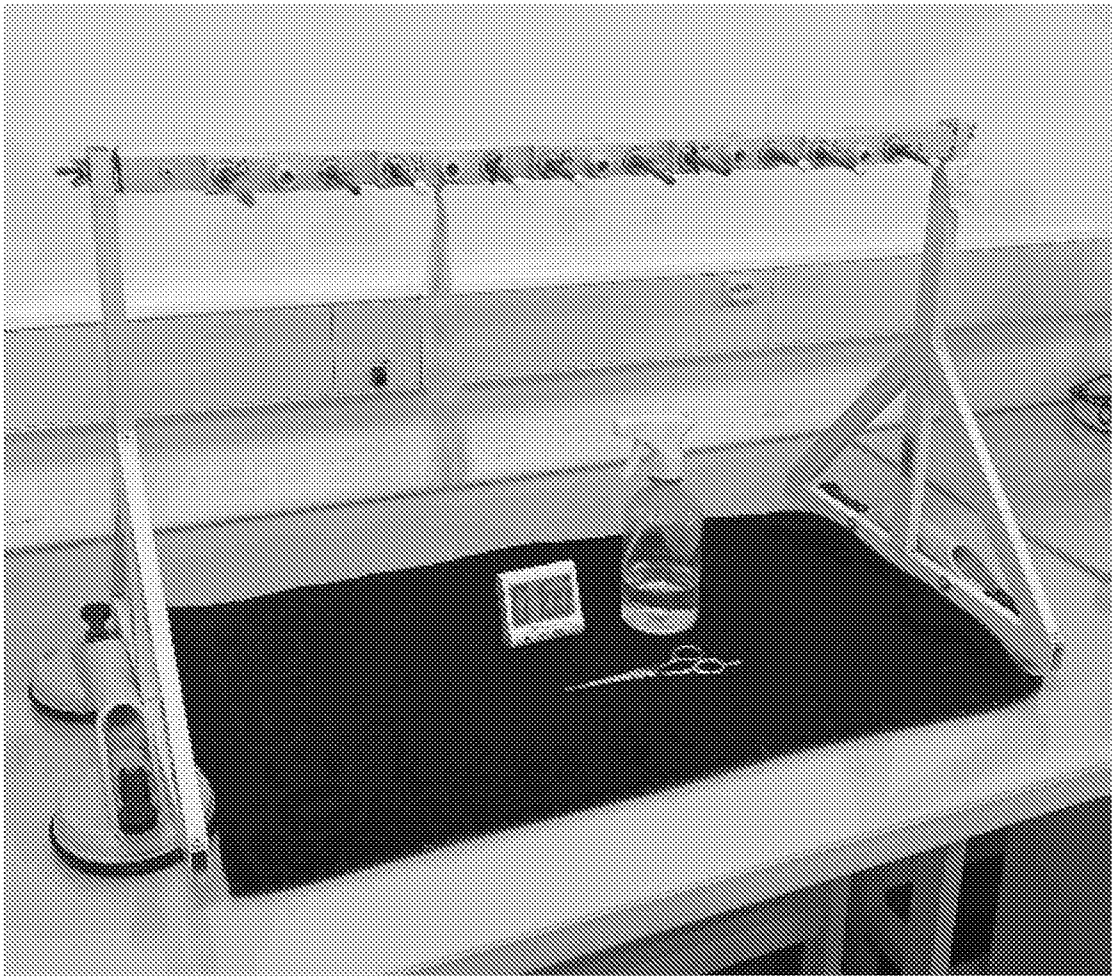

FIGURE 6

FIGURE 7

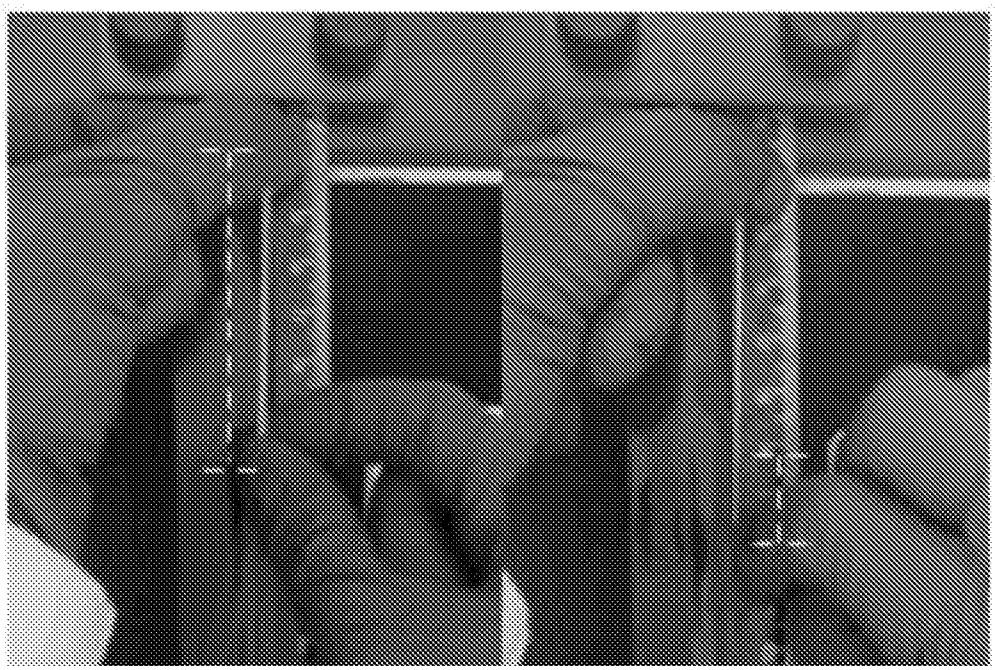

FIGURE 8

INTERNATIONAL SEARCH REPORT

International application No
PCT/BR2023/050475

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B5/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Organic Colour Systems Global: "Importance of the Wet Stretch Test", , 17 April 2018 (2018-04-17), XP093169902, Retrieved from the Internet: URL:https://www.youtube.com/watch?v=xZMCfXymZP4&list=PLAcn_xZjDIOEmKo_JAqostIjsWbA8pz2o&index=6&t=54s the whole document	1-13
A	US 4 972 718 A (SAID HAYEL M [US] ET AL) 27 November 1990 (1990-11-27) figures 1,4 column 4, lines 22-45 column 5, line 41	13

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
4 June 2024	14/06/2024

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Sarcia, Regis

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/BR2023/050475

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4972718 A	27-11-1990	AU 7581591 A	10-10-1991
		US 4972718 A	27-11-1990
		WO 9114156 A1	19-09-1991