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(54) **PROCESS FOR TREATING HAIR FIBRES**

VERFAHREN ZUR BEHANDLUNG VON HAARFASERN

PROCÉDÉ DE TRAITEMENT DE FIBRES CAPILLAIRES

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Description

[0001] The present invention relates to a process for treating hair fibres.

[0002] It is known to smooth hair fibres with smoothing irons. These irons make it possible to obtain smoothing of keratin fibres at high temperature. However, in order to obtain a good smooth appearance, it is necessary to carry out several passes of the iron, which considerably extends the hair fibre treatment time. Furthermore, the repeated application of the flat smoothing irons can sometimes cause damage to the hair fibres due to the operating temperature of the smoothing iron.

[0003] A device which makes it possible to apply a cosmetic product to the hair, to expose the latter to steam, to subject said hair to heat treatment and to comb it is known from international application WO 2014/064660. The comb is placed downstream of the member for applying the cosmetic product and the combing step is therefore carried out after the product application step.

[0004] There is a need to develop a novel process for treating human keratin fibres which makes it possible to fully benefit from the properties of the cosmetic product applied and which is easy and rapid to carry out.

[0005] The invention aims to meet this need, which is met by providing according to a first aspect a process for treating hair fibres according to claim 1.

[0006] Carrying out the combing before the application of the product makes it possible to facilitate the penetration of the hair product into the treated lock.

[0007] In addition, this makes the treatment of the hair fibres easier by facilitating the movement of the tool(s) carrying out the process along the hair fibres, in particular by decreasing the force which the user must exert in order to deposit a predetermined amount of product.

[0008] The term "hair fibres" denotes human keratin fibres such as the hair or synthetic fibres known as "extensions" which are added to an individual's head of hair by various means, in particular by adhesive bonding, this being in order for example to modify the appearance of an individual's natural head of hair.

[0009] All the steps of the process are carried out using a single tool, in particular using a device for shaping the head of hair configured to carry out the various steps successively in the same portion of hair fibres. Preferably, the steps of the process are carried out by moving the tool(s) along a lock of hair fibres.

[0010] The process of the invention makes it possible to improve the smoothing of the hair, in particular to decrease the hair volume.

[0011] The steps are carried out successively in the following order: - (i), (ii), (iii) then (iv).

[0012] Preferably, steps (i) and (ii) are carried out, for example, during the same session at the hairdresser, with a period between them of less than or equal to 5 min, better still less than or equal to 1 min, even better still less than or equal to 30 s, preferentially less than or equal to 15 s, and more preferentially less than or equal to 5 s.

[0013] Preferably, all the successive steps are carried out with a period between them of less than or equal to 5 min, better still less than or equal to 1 min, even better still less than or equal to 30 s, preferentially less than or equal to 15 s.

[0014] The process comprises a single combing step. The fact that there is only one combing step makes it possible to simplify the process without the efficiency of the treatment being affected thereby.

[0015] Step (iv) is carried out after step (ii), in particular less than 5 min, better still less than 1 min, after step (ii), even better still less than 30 s, preferentially less than 15 s, after step (ii).

[0016] Step (iii) is carried out after step (ii) and before step (iv), in particular less than 5 min, better still less than 1 min, even better still less than 30 s, preferentially less than 15 s, before step (iii) and after step (ii).

[0017] The heat treatment can be carried out by contact of the hair fibres with hot surfaces, in particular hot surfaces applying to the hair a tension that makes it possible for example to smooth, style or disentangle the hair fibres.

[0018] The heat treatment can be carried out at a temperature greater than or equal to 90°C, preferably greater than or equal to 120°C, more preferably greater than or equal to 140°C, even more preferably greater than or equal to 170°C, and/or less than 230°C, preferably less than 220°C, more preferably less than 210°C; the hot surfaces are preferably brought to such temperatures.

[0019] The amount of steam applied during step (iii) is greater than or equal to 1 g/min, preferably greater than or equal to 2.5 g/min and less than or equal to 10 g/min, more preferably less than or equal to 6 g/min, and even more preferably less than or equal to 4.5 g/min. The steam applied to the hair fibres during step (iii) may contain one or more cosmetic ingredients and/or active agents such as a fragrance, and/or a hair shaping and/or conditioning active agent. alkaline agents, volatile or non-volatile silicones, reactive or chemically inert polymers, pigments, solid organic or inorganic particles, vitamins, plant extracts, or propenetrating agents or fibre-swelling agents.

[0020] The composition applied to the hair fibres is preferably in the fluid state during the application.

[0021] The composition may be aqueous or anhydrous.

[0022] The composition may comprise at least one ingredient chosen from solvents, surfactants, thickeners, preservatives, fragrances, dye precursors, direct dyes, silicone or non-silicone and fixing or non-fixing polymers, fatty substances, in particular mineral, vegetable or synthetic oils, and waxes, reducing agents, oxidizing agents, UV screening agents,

conditioning agents, agents for combating free radicals, sequestering or stabilizing agents, antioxidants, acidifying agents, alkaline agents, volatile or non-volatile silicones, reactive or chemically inert polymers, pigments, solid organic or inorganic particles, vitamins, plant extracts, or propenetrating agents or fibre-swelling agents.

[0023] Preferably, the composition is a hair fibre care composition.

[0024] The step of applying the composition can be followed or preceded by rinsing, by a step of washing the fibres, by a step of hair shaping or controlling the shape, for example using a fixing gel, a hair shaping mousse, a lacquer or a leave-in conditioner in cream form, by a step of permanent, semi-permanent or temporary dyeing, by a step of permanent deformation using a reducing agent and optionally a fixative, by a step of alkaline straightening, in particular with sodium hydroxide or with guanidine carbonate.

[0025] According to a second aspect, which is not part of the present invention, there is disclosed a a process for treating hair fibres, comprising:

(i) a single step of combing the hair fibres,
(ii) applying a composition to the hair fibres,
(iv) heat-treating the hair fibres,

step (i) being carried out before step (ii).

[0026] The process may comprise a step (iii) of treating the hair fibres by applying steam.

[0027] The characteristics described in relation to the process according to the invention also apply to the process according to the second aspect, which does not form part of the invention.

[0028] The invention will be better understood from reading the following detailed description of non-limiting exemplary embodiments thereof and from examining the appended drawing, in which:

- Figure 1 is a diagram illustrating an exemplary embodiment of the process according to the invention,
- Figure 2 is a graph obtained according to Example 1 described hereinafter,
- Figure 3 represents four locks of hair according to Example 2 described hereinafter, and
- Figure 4 represents a graph obtained according to Example 3 described hereinafter.

[0029] Only the examples which make use of a single tool and which follow the steps of the process according to the order given in claim 1 belong to the invention, the other examples are disclosed only for information.

[0030] In the example illustrated in Figure 1, the process comprises four successive steps 10, 12, 14 and 16 carried out on a lock of hair fibres by a device for shaping the head of hair. The device is configured to perform the various steps of the process successively on the hair fibres, by movement of said device along the lock of hair, in particular over a portion of the hair fibres inserted between two arms of said device, forming an iron.

[0031] Step 10 is a step of combing the hair, making it possible to separate the hair fibres, before applying a composition in step 12. The application of the composition 12 is carried out immediately after step 10. The hair fibres are then subjected to a steam treatment 14 which is carried out immediately after step 12. Finally, the hair fibres are subjected to a heat treatment 16 intended to smooth them. They are brought into contact with hot plates, in particular each arranged on one arm of the device, between which they are held tight.

[0032] The application of composition 12 can be carried out using an applying member placed on one of the arms and which holds the portion of hair fibres undergoing treatment tight against a counter-bearing surface of the other arm.

Example 1

[0033] A first device suitable for the treatment is used on locks of natural hair of Caucasian type, having type IV curliness.

[0034] These locks are combed by passing through a comb and then the haircare composition A, the formulation of which is given in Table 1, is applied to said locks, by pinching the locks between an applying member and a counter-bearing surface.

Table 1: Composition A.

INCI Name	% by weight
AMODIMETHICONE (and) TRIDECETH-6 (and) CETRIMONIUM CHLORIDE(1)	1.0
PEG-40 HYDROGENATED CASTOR OIL	0.8
DIMETHICONE (and) LAURETH-23 (and) LAURETH-4 (2)	5.0
BEHENTRIMONIUM CHLORIDE	1.0

(continued)

INCI Name	% by weight
STEARYL ALCOHOL	1.5
Active agents	0.12
Fragrance	0.2
Preservative	0.9
Water	qs 100
(1) XIAMETER MEM-8299 EMULSION sold by the company DOW CORNING (2) XIAMETER MEM-2664 EMULSION sold by the company DOW CORNING	

[0035] The locks are then subjected to steam with a flow rate of approximately 3.5 g/min, then the locks are pinched between two plates of the device, heated to a temperature of 200°C.

[0036] In parallel, a second device is used on locks of hair of the same type as previously. This device makes it possible to carry out the same steps as previously, but the combing step is carried out after the application of the product.

[0037] For these two treatments, the time periods between the various steps are approximately the same and the locks of hair are from the same batch.

[0038] The combing force is measured using a tensile testing machine, in particular a Lloyd LS1® with a 50 N sensor, by measuring the mechanical strength of the device by passing over a lock of hair. The results are given in Table 2 and in Figure 2:

Table 2: Combing force measured for the first and second devices, at equivalent amount of product applied

	COMBING FORCE / APPLICATION (a.u.)	
Condition	**Mean**	**Standard deviation**
Second device	3807.8	1126.9
First device	1356.1	413.6

[0039] It is noted, on the graph of Figure 2, that when the combing step is upstream of the applying step (application with the first device), the force required by the user to move the device along the lock of hair for the same amount of composition applied is on average lower than when the combing step is carried out downstream of the applying step (application with the second device).

[0040] Carrying out the combing step before the applying step facilitates the movement of the device along the lock of hair while preserving good composition application.

Example 2

[0041] A first device suitable for the treatment according to the invention is used on a lock of natural hair of Caucasian type, having type IV curliness.

[0042] The lock is combed by passing through a comb and then composition A is applied to the lock by pinching the latter between an applying member and a counter-bearing surface. The lock is then subjected to steam with a flow rate of approximately 3.5 g/min, and then it is pinched between two plates heated to a temperature of 200°C. The above treatment is carried out by passing the device along the lock of hair for a period of 15 s.

[0043] In parallel, a second device is used on a lock of hair of the same type as previously. This second device makes it possible to carry out the same steps as previously, but the combing step is carried out after the application of the composition. The treatment time is the same.

[0044] For these two devices, the time periods between the various steps are approximately identical.

[0045] Finally, a commercial smoothing device, in this case a Styler® ghd gold classic, is used on a lock of hair of the same type as previously. This smoothing device does not comprise any combing means and means for applying the composition. It is passed along the lock of hair 3 times, each pass lasting 8 s.

[0046] The locks of hair used for these various treatments are from the same batch.

[0047] Figure 3 presents four locks of hair. The first lock 20 starting from the left is a lock of hair of the type previously described, which has undergone no treatment. The second lock of hair 22 is a lock of hair of the same type, which has

been treated with the first device. The third lock of hair 24 is a lock of hair of the same type, which has been treated with the second device. Finally, the last lock of hair 26 is a lock of hair of the same type, which has been treated with the commercial device.

[0048] It is noted that, when the combing step is carried out upstream of the applying step, better smoothing is obtained. The hair fibres are straighter and as a result exhibit better alignment with one another. The hair fibres also occupy a smaller volume.

Example 3

[0049] A first treatment is carried out on a lock of natural hair of Caucasian type, having type IV curliness.

[0050] In a first applying step, a first device is used. The device makes it possible to comb the lock by passing through a comb, then to apply composition A to said lock by pinching between an applying member and a counter-bearing surface. The first device performs two passes lasting 15 s over the lock of hair.

[0051] In a second smoothing step, the lock of hair passes through a commercial smoothing device, in this case the Styler® ghd gold classic previously used. This smoothing device makes it possible to pinch the lock of hair between two plates heated to a temperature of 190°C. It is passed along the lock of hair twice, each pass lasting 15 s.

[0052] In parallel, a second treatment is carried out on a lock of hair of the same type as previously. The second treatment is identical to the first, except that the applying step is carried out with a second device. The latter makes it possible to carry out the same steps as previously, but the combing step is carried out after the application of the composition. The treatment time and the number of passes over the lock of hair are the same.

[0053] For the two treatments, the time periods between the various steps are approximately identical.

[0054] The combing force as a function of the amount of product applied is determined by measuring the resistance of each device to the passing over a lock of hair using a tensile testing machine, in particular a Lloyd LS1® with a 50 N sensor. The measurements are taken for each applying and smoothing step.

[0055] The measurements are taken on three different locks of hair of the abovementioned type.

[0056] The results are presented in Figure 4.

[0057] It is noted, on the graph of Figure 4, that when the combing step is upstream of the applying step (application with the first device), the forces required by the user to move the first device and the smoothing device during the first treatment along the lock of hair for the same amount of composition applied are on average lower than those required with the second device and the smoothing device during the second treatment.

[0058] Carrying out the combing step before the applying step facilitates the movement of the devices along the lock of hair while preserving good composition application.

Claims

1. Process for treating hair fibres, comprising the following steps in the successive following order:

   (i) combing (10) the hair fibres,
   (ii) applying (12) a composition to the hair fibres,
   (iii) treating the hair fibres by applying steam (14),
   (iv) heat-treating (16) the hair fibres by conduction and/or radiation,

   wherein the successive steps are carried out using a single tool, the amount of steam applied during step (iii) being greater than or equal to 1 g/min and less than or equal to 10 g/min.

2. Process according to Claim 1, which is free of any combing step after step (ii) within a period of 15 s.

3. Process according to either of the preceding claims, comprising a single combing step.

4. Process according to any one of Claims 1 to 3 , step (iii) being carried out after step (ii) and before step (iv), in particular less than 5 min, better still less than 1 min, even better still less than 30 s, and preferentially less than 15 s, before step (iii) and after step (ii).

5. Process according to any one of the preceding claims, step (i) being carried out less than 5 min, better still less than 1 min, even better still less than 30 s, preferentially less than 15 s, and more preferentially less than 5 s, before step (ii).

6. Process according to any one of the preceding claims, step (iv) being carried out less than 5 min, better still less

than 1 min, even better still less than 30 s, and preferentially less than 15 s, after step (ii).

7. Process according to any one of Claims 1 to 6, the steps of the process being carried out using a device for shaping the head of hair configured to carry out the various steps successively in the same portion of hair fibres.

8. Process according to claim 7, the steps of the process being carried out by moving the tool(s) along a lock of hair fibres.

9. Process according to any one of the preceding claims, the heat treatment being carried out by contact of the hair fibres with hot surfaces.

10. Process according to any one of the preceding claims, the heat treatment being carried out at a temperature greater than or equal to 90°C, preferably greater than or equal to 120°C, more preferably greater than or equal to 140°C, even more preferably greater than or equal to 170°C, and/or less than 230°C, preferably less than 220°C, more preferably less than 210°C.

11. Process according to any one of the preceding claims, the composition being in the fluid state during the application.

Patentansprüche

1. Verfahren zur Behandlung von Haarfasern, umfassend die folgenden Schritte in der aufeinanderfolgenden Reihenfolge:

(i) Kämmen (10) der Haarfasern,
(ii) Aufbringen (12) einer Zusammensetzung auf die Haarfasern,
(iii) Behandeln der Haarfasern durch Aufbringen von Dampf (14),
(iv) Wärmebehandeln (16) der Haarfasern durch Wärmeleitung und/oder Bestrahlung,

wobei die aufeinanderfolgenden Schritte unter Verwendung eines einzigen Werkzeugs durchgeführt werden, wobei die während Schritt (iii) aufgebrachte Dampfmenge größer als oder gleich 1 g/min und kleiner als oder gleich 10 g/min ist.

2. Verfahren nach Anspruch 1, welches innerhalb eines Zeitraums von 15 s nach Schritt (ii) frei von jeglichem Schritt des Kämmens ist.

3. Verfahren nach einem der vorhergehenden Ansprüche, umfassend einen einzigen Kämmschritt.

4. Verfahren nach einem der Ansprüche 1 bis 3, wobei Schritt (iii) nach Schritt (ii) und vor Schritt (iv) durchgeführt wird, insbesondere weniger als 5 min, besser noch weniger als 1 min, noch besser noch weniger als 30 s und bevorzugt weniger als 15s, vor Schritt (iii) und nach Schritt (ii).

5. Verfahren nach einem der vorhergehenden Ansprüche, wobei Schritt (i) weniger als 5 min, besser noch weniger als 1 min, noch besser noch weniger als 30 s, bevorzugt weniger als 15 s, und bevorzugter weniger als 5 s, vor Schritt (ii) durchgeführt wird.

6. Verfahren nach einem der vorhergehenden Ansprüche, wobei Schritt (iv) weniger als 5 min, besser noch weniger als 1 min, noch besser noch weniger als 30 s, und bevorzugt weniger als 15 s, nach Schritt (ii) durchgeführt wird.

7. Verfahren nach einem der Ansprüche 1 bis 6, wobei die Schritte des Verfahrens unter Verwendung einer Vorrichtung zum Formen des Kopfes des Haares durchgeführt werden, welches ausgestaltet ist, die die verschiedenen Schritte aufeinanderfolgend in demselben Teil der Haarfasern durchzuführen.

8. Verfahren nach Anspruch 7, wobei die Schritte des Verfahrens durch Bewegen des Werkzeugs (der Werkzeuge) entlang einer Locke der Haarfasern ausgeführt werden.

9. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Wärmebehandlung durch Kontakt der Haarfasern mit heißen Oberflächen durchgeführt wird.

10. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Wärmebehandlung bei einer Temperatur größer als oder gleich 90°C, bevorzugt größer als oder gleich 120°C, bevorzugter größer als oder gleich 140°C, noch bevorzugter größer als oder gleich 170°C, und/oder weniger als 230°C, bevorzugt weniger als 220°C, bevorzugter weniger als 210°C durchgeführt wird.

11. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Zusammensetzung sich während des Aufbringens in dem flüssigen Zustand befindet.

Revendications

1. Procédé de traitement de fibres capillaires, comportant les étapes suivantes dans cet ordre de succession :

    (i) un peignage (10) des fibres capillaires,
    (ii) une application (12) d'une composition sur les fibres capillaires,
    (iii) un traitement des fibres capillaires par l'application de vapeur (14),
    (iv) un traitement thermique (16) des fibres capillaires par conduction et/ou rayonnement,

    dans lequel les étapes successives sont exécutées à l'aide d'un seul outil, la quantité de vapeur appliquée au cours de l'étape (iii) étant supérieure ou égale à 1 g/min et inférieure ou égale à 10 g/min.

2. Procédé selon la revendication 1, étant dépourvu d'étape de peignage après l'étape (ii) dans un délai de 15 s.

3. Procédé selon l'une des revendications précédentes, comportant une unique étape de peignage.

4. Procédé selon l'une quelconque des revendications 1 à 3, l'étape (iii) ayant lieu après l'étape (ii) et avant l'étape (iv), notamment moins de 5 min, mieux moins de 1 min, encore mieux moins de 30 s, et préférentiellement moins de 15 s avant l'étape (iii) et après l'étape (ii).

5. Procédé selon l'une quelconque des revendications précédentes, l'étape (i) ayant lieu moins de 5 min, mieux moins de 1 min, encore mieux moins de 30 s, préférentiellement moins de 15 s, et encore préférentiellement moins de 5 s avant l'étape (ii).

6. Procédé selon l'une quelconque des revendications précédentes, l'étape (iv) ayant lieu moins de 5 min, mieux moins de 1 min, encore mieux moins de 30 s, et préférentiellement moins de 15 s après l'étape (ii).

7. Procédé selon l'une quelconque des revendications 1 à 6, les étapes du procédé étant réalisées à l'aide d'un dispositif de mise en forme de la chevelure configuré pour mettre en œuvre les différentes étapes successivement sur une même portion de fibres capillaires.

8. Procédé selon la revendication 7, les étapes du procédé étant effectuées par déplacement du ou des outil(s) le long d'une mèche de fibres capillaires.

9. Procédé selon l'une quelconque des revendications précédentes, le traitement thermique étant réalisé par contact des fibres capillaires avec des surfaces chaudes.

10. Procédé selon l'une quelconque des revendications précédentes, le traitement thermique étant réalisé à une température supérieure ou égale à 90°C, de préférence supérieure ou égale à 120 °C, de préférence encore supérieure ou égale à 140°C, de manière encore plus préférée supérieure ou égale à 170°C, et/ou inférieure à 230°C, de préférence inférieure à 220°C, de préférence encore inférieure à 210°C.

11. Procédé selon l'une quelconque des revendications précédentes, la composition étant à l'état fluide pendant l'application.

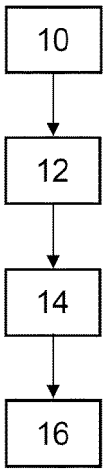
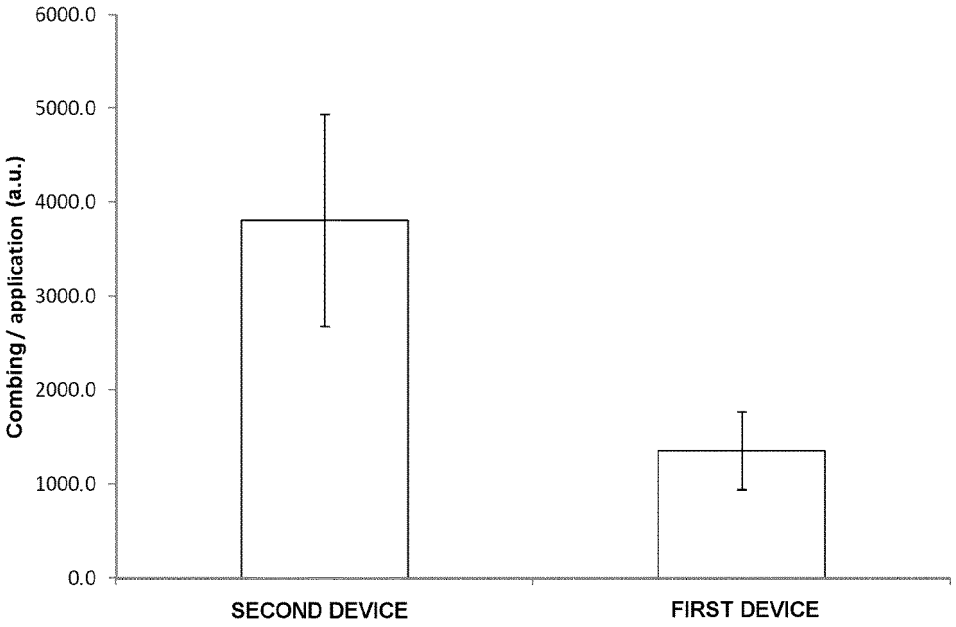

10
12
14
16

Fig. 1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FIRST DEVICE

Fig. 2

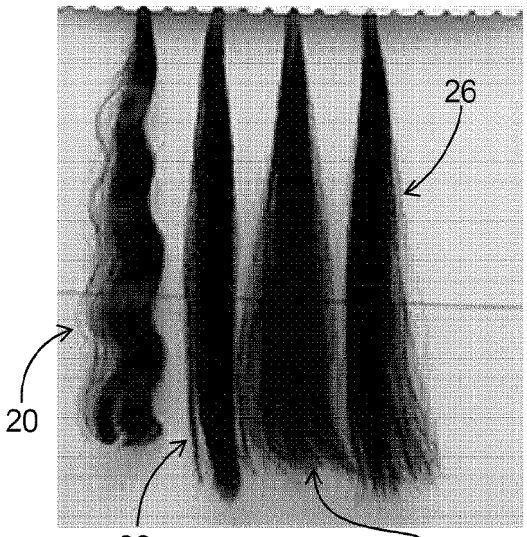
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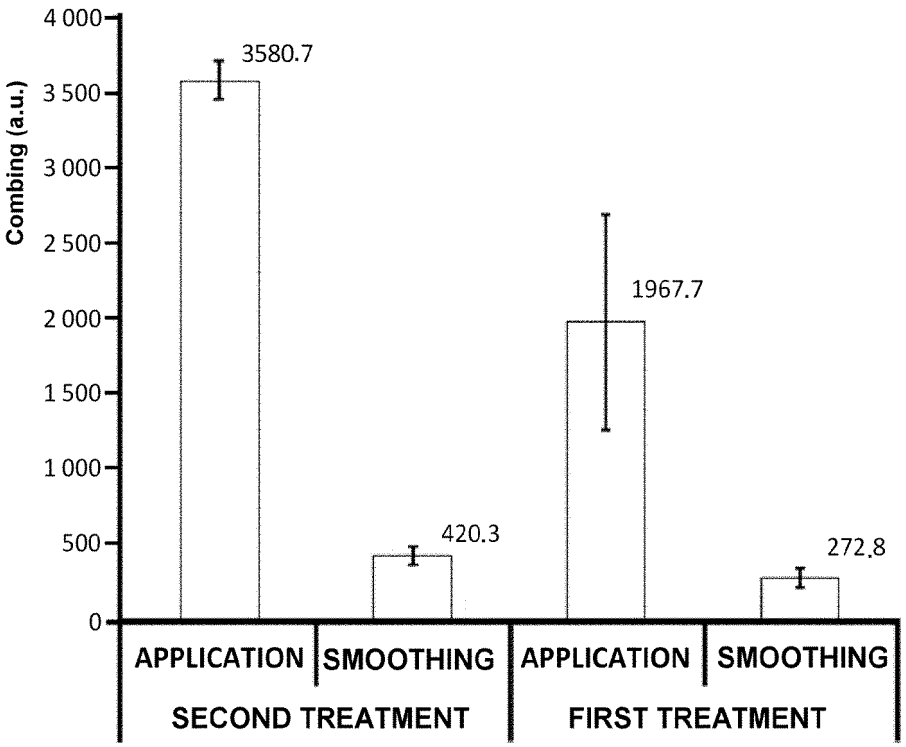
Fig. 3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APPLICATION
SMOOTHING
APPLICATION
SMOOTHING
SECOND TREATMENT
FIRST TREATMENT

Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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