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(54) Title: DRY SHAMPOO COMPOSITION

(57) **Abrégé/Abstract:**

The present invention is directed to a dry shampoo composition that is based on a specific combination of clay, natural starches and a natural oil absorbent. The composition is highly absorbent, fine, light and resistant to clumping. It can be used as an alternative to conventional wet shampoo methods for cleaning the hair.



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DRY SHAMPOO COMPOSITION

The present invention relates to a dry shampoo composition. In particular, it relates to a dry shampoo composition containing *Oryza sativa* (Rice) hull powder and a smectite clay together with a specific combination of natural starches.

5 The practice of regularly washing head hair has become ubiquitous in modern society. Frequently, the hair is washed using a conventional liquid or gel shampoo, which is applied to the hair and then rinsed out with water. However, dry shampoos, which do not require the use of water, are becoming increasingly popular. The use of a dry shampoo can save time and provide added convenience since no rinsing with water is needed; rather, removal
10 of the dry shampoo can be effected simply by brushing or blotting it from the scalp. Furthermore, it has been suggested that excessively frequent wet-washing can be associated with damage to the hair, particularly for those with fine hair. The use of dry shampoos may therefore provide an alternative or complementary method for maintaining the cleanliness and appearance of the hair without incurring the damaging effects of
15 excessive washing in water.

However, dry shampoos currently on the market can have various disadvantageous characteristics. Some such shampoos contain a number of synthetic components such as, for example, bulking agents, which can be undesirable both from a customer perception perspective and from an environmental viewpoint. Dry shampoo powders may also have
20 unsatisfactory capacity to absorb oil, have a heavy feel or a tendency to form clumps of particles (which can both reduce the effectiveness of the product and give rise to unsightly residues in the hair). Still further, when the intended use is for a subject with dark hair, it has often been considered necessary for the dry shampoo powders additionally to incorporate pigments to avoid leaving unattractive and obviously visible light-coloured
25 remnants of material in the hair after cleaning.

There is therefore a need for new dry shampoo compositions for use as an alternative to conventional wet shampoo and dry shampoo products. Especially valuable would be dry shampoo compositions that incorporate substantially or exclusively natural ingredients. It would also be particularly desirable to provide such a dry shampoo composition that is
30 fine, light and highly absorbent and preferably which is suitable for cleaning dark hair without the need to incorporate additional colorant materials.

According to one aspect of the present invention there is provided a dry shampoo composition comprising: 0.5 to 5 wt% of *Oryza sativa* (Rice) hull powder; 1 to 10 wt% of a smectite clay; 30 to 60 wt% of tapioca starch; 30 to 60 wt% of corn starch; and 3 to 20 wt% of potato starch.

5 According to another aspect of the present invention there is provided a product comprising a dry shampoo composition of the present invention and a spray bottle adapted to deliver the dry shampoo composition as a powder spray.

In another aspect of the present invention there is provided a method of cleaning the hair, which comprises applying a dry shampoo composition of the present invention to the hair.

10 Where indicated herein, the components of the dry shampoo composition of the present invention are identified by reference to their INCI names. INCI (International Nomenclature of Cosmetic Ingredients) is an international designation for the declaration of the ingredients on the packaging of cosmetics. INCI names are specific and uniform scientific names which are neither trade names nor common names.

15 One component of the dry shampoo composition of the present invention is *Oryza sativa* (Rice) hull powder (which is an INCI name). *Oryza sativa* (Rice) hull powder is commercially available from Soliance and is referred to interchangeably herein as rice silk. *Oryza sativa* (Rice) hull powder is a natural product that is obtained from the hull surrounding rice grains. It is an ultra-fine, natural powder capable of matifying skin and
20 hair by absorbing excess sebum. It has been found to impart a silky, smooth feel to the composition of the present invention, to improve the manageability of hair. It has an exceptionally high oil absorption capacity (greater than 300%).

The *Oryza sativa* (Rice) hull powder is preferably present in the dry shampoo composition of the present invention in an amount of 0.5 to 2 wt%, more preferably still 0.75 to 1.5
25 wt%.

Another component of the composition is a smectite clay. Smectite clays are a group of clay minerals that are able to adsorb water. In the composition of the present invention, the smectite clay has been found to help the powder flow and to prevent it from clumping. It is a non-abrasive material and typically is a soft, white powder.

30 Preferably the composition comprises hectorite (which is an INCI name) as the smectite clay.

The smectite clay is preferably present in the dry shampoo composition of the present invention in an amount of 1 to 4 wt%, more preferably still 1.5 to 2.5 wt%.

Another component of the composition is tapioca starch (which is an INCI name). Tapioca starch is a product that is naturally derived from cassava root. It is a velvety, soft after-feel
5 cleanser, which absorbs oil, reduces greasiness and cleans the hair. It has been found that it also imparts softness and smoothness to the finished dry shampoo composition of the present invention.

The tapioca starch is preferably present in the dry shampoo composition of the present invention in an amount of 37 to 53 wt%, more preferably still 40 to 50 wt%.

10 Another component of the composition is corn starch. Corn starch, also known as maize starch, is an unmodified, natural starch that is extracted from corn kernels. It is a natural, biodegradable, sustainable and non-irritating substance. It is anti-inflammatory and is capable of soothing itchy skin and scalp. When incorporated into the composition of the present invention, the corn starch has been found to provide a unique powdery-dry, smooth
15 after-feel, to controls immediate and residual shine and oiliness and to reduce any perceivable tackiness and stickiness.

Preferably the corn starch is Zea Mays (Corn) Starch (which is an INCI name). Zea Mays (Corn) Starch is obtained from the corn *Zea mays* L., Gramineae.

The corn starch is preferably present in the dry shampoo composition of the present
20 invention in an amount of 37 to 53 wt%, more preferably still 40 to 50 wt%.

Another component of the composition is potato starch. Potato starch is a starch that is extracted from potatoes and it is thus another natural product. When incorporated into the composition of the present invention, the potato starch has been found to enhance hair
25 combing manageability, generate a clean and fresh feel, leave the hair feeling soft and conditioned and leave the hair looking smooth and silky.

Preferably the potato starch is Solanum Tuberosum (Potato) starch (which is an INCI name).

The potato starch is preferably present in the dry shampoo composition of the present invention in an amount of 3 to 10 wt%, more preferably still 5 to 8 wt%.

30 The composition may further contain at least one preservative. A preferred compound as the at least one preservative is potassium sorbate, which is a white crystalline powder with

strong antimicrobial properties. Other suitable preservatives include salicylic acid, sodium sulphite, sodium benzoate and benzoic acid.

If present, the at least one preservative is preferably present in the dry shampoo composition of the present invention in an amount of not more than 3 wt%, for example in
 5 an amount of not more than 2 wt% such as in an amount of 0.1 to 2 wt% (wherein all of these amounts refer to the total content of the least one preservative).

The composition may further contain at least one fragrance. The incorporation of fragrances in cosmetic products such as shampoos is well established and those of skill in the art would routinely be able to select a suitable fragrance or combination of fragrances
 10 to achieve the desired odour. Preferably the at least one fragrance consists of natural fragrances, i.e. fragrant compounds that are derived from natural sources rather than being synthetically produced. Example of suitable such fragrances include limonene, linalool and eugenol (all of which are INCI names).

If present, the at least one fragrance is preferably present in the dry shampoo composition
 15 of the present invention in an amount of not more than 1 wt% for example in an amount of not more than 0.5 wt% such as in an amount of 0.05 to 0.5 wt% (wherein all of these amounts refer to the total content of the least one fragrance).

A particularly preferred composition of the present invention comprises (e.g. consists of):

- 0.5 to 2 wt% of *Oryza sativa* (Rice) hull powder;
- 20 - 1 to 4 wt% of a smectite clay (preferably hectorite);
- 37 to 53 wt% of tapioca starch;
- 37 to 53 wt% of corn starch;
- 3 to 10 wt% of potato starch;
- up to 2 wt% of at least one preservative; and
- 25 - up to 0.5 wt% of at least one fragrance.

One exemplary such composition contains:

- about 1 wt% of *Oryza sativa* (Rice) hull powder;
- about 2 wt% of a smectite clay (preferably hectorite);
- about 45 wt% of tapioca starch;
- 30 - about 45 wt% of corn starch;
- about 6.3 wt% of potato starch;
- about 0.5 wt% of at least one preservative; and

- about 0.2 wt% of at least one fragrance.

In this disclosure, “about” means plus or minus ten percent of the specified amount. For example, about 1 wt% means 0.9 to 1.1 wt% (plus or minus ten percent, namely 0.1, of 1).

The dry shampoo composition of the present invention is typically a dry powder.

- 5 Preferably the dry shampoo composition of the present invention contains at most 1 wt% (more preferably no more than 0.5 wt%, more preferably still less than 0.1 wt% and most preferably substantially 0 wt% or 0 wt%) of water. Preferably the dry shampoo composition of the present invention contains at most 1 wt% (more preferably no more than 0.5 wt%, more preferably still less than 0.1 wt% and most preferably substantially 0
- 10 wt% or 0 wt%), in total, of any liquid substance. Typically the dry shampoo composition does not comprise an aerosol propellant.

- Preferably the dry shampoo composition of the present invention contains no more than 1 wt% (more preferably no more than 0.1 wt% and most preferably 0 wt%) of any synthetic or partially synthetic bulking agent, for example aluminium starch octenylsuccinate (which
- 15 is an INCI name).

Preferably the dry shampoo composition of the present invention contains no more than 1 wt% (more preferably no more than 0.1 wt% and most preferably 0 wt%) of either silica or talc, which are bulking agents commonly used in other cosmetic products.

- Preferably the dry shampoo composition of the present invention does not contain a
- 20 pigment (also referred to herein as a colorant).

- Preferably the dry shampoo composition of the present invention contains not more 5 wt% (preferably no more than 2 wt%, more preferably not more than 1 wt% and most preferably substantially 0 wt% or 0 wt%) in total of components other than the *Oryza sativa* (Rice) hull powder, smectite clay, tapioca starch, corn starch, potato starch, (optional) at least one
- 25 preservative and (optional) at least one fragrance. Preferably the dry shampoo composition of the present invention contains not more 5 wt% (preferably no more than 2 wt%, more preferably not more than 1 wt%) in total of components other than the *Oryza sativa* (Rice) hull powder, smectite clay, tapioca starch, corn starch and potato starch.

- It has surprisingly been found that the specified combination of ingredients, in the
- 30 specified relative amounts, gives rise to a dry shampoo composition that has particularly advantageous properties. These properties include high absorbency (of the oil/grease that builds up in the hair and which motivates cleaning it), fineness, lightness, and resistance to

clumping. By contrast, other dry shampoo compositions tested by the present inventors and which incorporated different components, for example different combinations of starches, were found to have inferior performances with regard to at least one of these characteristics. Additional details may be found in the specific Example disclosed herein.

5 Furthermore, the dry shampoo composition of the present invention consists at least substantially of natural components, namely natural starches, rice silk, and naturally occurring smectite clay. That the composition of the present invention consists almost exclusively of natural ingredients is beneficial both from an environmental perspective and in view of the increasing sensitivity of consumers to cosmetic compositions that
10 incorporate synthetic ingredients.

It has also been found that the dry shampoo composition of the present invention can readily be used to clean the hair of subjects who have any hair colour. For example, the composition can be used to clean the hair of subjects who have dark hair, without leaving unsightly traces of light-coloured material in the hair after use. Without wishing to be
15 bound by theory, this may be due to the fineness, lightness and resistance to clumping of the powder composition. Accordingly there is advantageously no need to incorporate a pigment in the composition when it is formulated for use with dark hair. This is in contrast to some previously known dry shampoo compositions, where it has been necessary to prepare a range of commercial products incorporating pigments adapted for different hair
20 colours.

A still further advantage of the dry shampoo composition of the invention is that a relatively small weight of the composition (e.g. of the order of 15 grams) is sufficient to clean the hair a large number of times (e.g. of the order of 100 or more times). Thus a commercial product incorporating the dry shampoo composition of the invention is
25 suitable for cleaning the hair many more times than would be a conventional wet shampoo product of equivalent weight.

The dry shampoo composition of the present invention can advantageously be formulated in a spray bottle adapted to deliver the dry shampoo composition as a powder spray. Typically the bottle is adapted to delivery the dry shampoo composition as a non-aerosol
30 powder spray. Thus, the product that comprises the dry shampoo composition and the spray bottle preferably does not comprise an aerosol propellant.

The spray bottle adapted to deliver the dry shampoo composition as a powder spray may comprise a directional nozzle. The directional nozzle is a nozzle that extends away from the main body of the bottle, for examples it may extend away from a cylindrical bottle body. For example, the direction nozzle may extend in a substantially perpendicular
5 direction away from the axis of a cylindrical bottle body. The directional nozzle assists in ensuring that the dry shampoo composition can be effectively delivered to the desired site on the surface of the subject's head, i.e. it allows for easy and thorough access to the scalp and hair. An example of an exemplary spray bottle design is shown in CN 202697535, the content of which is herein incorporated by reference in its entirety. Preferably the spray
10 bottle is not an aerosol bottle.

The method of cleaning the hair of the present invention comprises applying a dry shampoo composition of the present invention to the hair. The method typically further comprises removing (e.g., by brushing or blotting) the composition from the hair. In between the steps of applying the composition to the hair and removing it from the hair,
15 the method may further comprise one or both of the following steps: (i) after application, leaving the dry shampoo composition on the hair for a period of time, for example from 20 seconds to 5 minutes (preferably from 30 seconds to 2 minutes, e.g. for about 1 minute); and (ii) massaging the composition into the scalp (for example, by running fingers through the hair).

20 If the dry shampoo composition is contained within a spray bottle, it may be preferable to shake the bottle before use. Optionally clothing can be protected before spraying, i.e. before applying the composition of the present invention to the hair.

It may be beneficial to apply the composition to the hair in a stepwise fashion, namely by parting the hair in sections and applying the composition to each section in turn.

25 Aspects of the invention are illustrated by the following specific Example.

A variety of dry shampoo compositions were prepared containing the components set out in Table 1. Ex 1 to Ex 3 shows representative compositions of the invention, while C1 to C13 are a range of comparative compositions.

In this table, all amounts are expressed in %w/w. Amaze XT™ is dehydroxanthan gum
30 (INCI name), which is commercially available from AkzoNobel™ as an off-white powder. PVP is polyvinylpyrrolidone.

Component	Composition							
	Ex 1	Ex 2	Ex 3	C1	C2	C3	C4	C5
Rice silk	1	1	1	1			1	1
Clay	2 ^a	2 ^a	2 ^a		2 ^{b1}	5 ^{b2}	2 ^{b1}	2 ^{b1}
Tapioca starch	45	40	45					
Corn starch	45 ^d	47.5 ^c	45 ^d	93.1 ^c	47.6 ^d	59.4 ^d	31.4 ^d	65 ^c
Potato starch	6.3	10	7.5		47.8	30	60	31.4
Rice starch								
Oat kernel flour						5	5	
Amaze XT™				5	2			
PVP								
Aloe				0.3				
Potassium sorbate	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
Fragrances	0.2							

Table 1

Component	Composition							
	C6	C7	C8	C9	C10	C11	C12	C13
Rice silk	2	1	1					
Clay	10 ^a	2 ^a	2 ^a	2 ^a	4.5 ^a	10 ^{b1}	4 ^a	4 ^a
Tapioca starch				47.5	30	10	45	25
Corn starch	67.4 ^c	80 ^c	80 ^d	50 ^c	30 ^c	29.5 ^c	34.5 ^c	20 ^c
Potato starch	20	16.4	16.4					
Rice starch					35	50	15	47.5
Oat kernel flour								
Amaze XT™								
PVP							1	3
Aloe								
Potassium sorbate	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5
Fragrances								

Table 1 continued

^aHectorite (INCI name);

^{b1}Kaolin (INCI name), a white kaolinite clay;

^{b2}Kaolin (INCI name), a brown kaolinite clay

^cCorn starch from AkzoNobel™ (Purity 21C starch™);

5 ^dCorn starch from Roquette™.

Compositions were tested by a panel of in-house testers, who assessed them for factors such as absorbency, fineness, lightness, and resistance to clumping. It was considered that the composition of Ex 1 achieved a good combination of these properties. The
10 compositions of C1 to C13 were considered however to have inferior properties.

CLAIMS

1. A dry shampoo composition comprising:
 - 0.5 to 5 wt% of *Oryza sativa* (Rice) hull powder;
 - 5 - 1 to 10 wt% of a smectite clay;
 - 30 to 60 wt% of tapioca starch;
 - 30 to 60 wt% of corn starch; and
 - 3 to 20 wt% of potato starch.
- 10 2. The dry shampoo composition according to claim 1, wherein the smectite clay is hectorite.
3. The dry shampoo composition according to claim 1 or 2, which comprises 0.5-2 wt% of the *Oryza sativa* (Rice) hull powder.
- 15 4. The dry shampoo composition according to any one of the preceding claims, which comprises 1 to 4wt% of the smectite clay.
5. The dry shampoo composition according to any one of the preceding claims, which
20 comprises 37 to 53 wt% of the tapioca starch.
6. The dry shampoo composition according to any one of the preceding claims, which comprises 37 to 53 wt% of the corn starch.
- 25 7. The dry shampoo composition according to any one of the preceding claims, which comprises 3 to 10 wt% of the potato starch.
8. The dry shampoo composition according to any one of the preceding claims, which
30 further comprises at least one preservative, which at least one preservative is preferably present in a total amount of not more than 2 wt%.

9. The dry shampoo composition according to claim 8, wherein the at least one preservative comprises potassium sorbate.
10. The dry shampoo composition according to any one of the preceding claims, which
5 further comprises at least one fragrance, which at least one fragrance is preferably present in a total amount of not more than 0.5 wt%.
11. The dry shampoo composition according to any one of the preceding claims, which
10 contains not more than 5 wt% in total of components other than the *Oryza sativa* (Rice) hull powder, smectite clay, tapioca starch, corn starch and potato starch.
12. The dry shampoo composition according to any one of the preceding claims, which is formulated as a sprayable powder.
- 15 13. A product comprising a dry shampoo composition as defined in any one of claims 1 to 12 and a spray bottle adapted to deliver the dry shampoo composition as a powder spray.
- 20 14. A method of cleaning the hair, which comprises applying a dry shampoo composition as defined in any one of claims 1 to 12 to the hair.
15. The method according to claim 14, which comprises using the product as defined in claim 13 to apply the dry shampoo composition to the hair as a powder spray.