IMPROVED ROLLING COMPOUND POWDERS FOR APPLYING ON THE SURFACE OF CHEWING GUM CORE MATERIALS

The present invention relates to rolling compound powders comprising hydrogenated or non-hydrogenated palatinose for applying to the surface of chewing gum core materials, chewing gum products comprising such rolling compound powders, processes for reducing the stickiness of compositions of chewing gum core materials by using hydrogenated or non-hydrogenated palatinose-containing rolling compound powders in chewing gum preparation processes as well as the use of hydrogenated or non-hydrogenated palatinose in rolling compound powders for applying to the surface of chewing gum core materials.
Improved rolling compound powders for applying on the surface of chewing gum core materials

The present invention relates to rolling compound powders comprising hydrogenated or non-hydrogenated palatinose for applying to the surface of chewing gum core materials, chewing gum products comprising such rolling compound powders, processes for reducing the stickiness of compositions of chewing gum core materials by using hydrogenated or non-hydrogenated palatinose-containing rolling compound powders in chewing gum preparation processes as well as the use of hydrogenated or non-hydrogenated palatinose in rolling compound powders for applying to the surface of chewing gum core materials.

It is known to dust products such as chewing gum and chewing gum cores with material such as powdered sugar to improve appearance and initial taste. The dusting also is intended to prevent the chewing gum from sticking to the fingers when handled or to the wrapper when the product is unwrapped.

However, the primary function of dusting compounds for chewing gum core materials is to make the chewing gum core more manageable during processing, including rolling. Dusting compounds used for this purpose are called rolling compounds.

A rolling compound is a powdery material used as a functional release agent between chewing gums or chewing gum cores and facility components and packaging. The rolling compound is applied to a sheet of chewing gum material or chewing gum core material as it
moves through the machinery so to prevent adhesion of the chewing
gum material or chewing gum core material to the machinery.

Conventional known rolling compounds include sucrose, mannitol,
sorbitol, starch, calcium carbonate and talc. Sucrose is a sugar and
therefore cannot be used in a sugar-less gum. Mannitol is today the
most common sugar-less rolling compound, but it does not enhance
initial sweetness of the chewing gum. Sorbitol can cause a burning
sensation in the throat. Starch can give a dry mouth feel and can
cause embrittlement of the gum by drawing water out of the gum
stick. Calcium carbonate and talc can lead to negative sensorial ef-
fects. Currently still in most productions 100 % talc or a combination
of mannitol and talc is used as rolling compound.

US 4,976,972 discloses a chewing gum composition with improved
sweetness employing a xylitol rolling compound. US 5,206,042 dis-
closes a blend of mannitol and sorbitol used as a rolling compound.
US 5,494,685 discloses a chewing gum composition with a rolling
compound containing erythritol and an anti-caking agent such as
talc.

US 201 1/0052756 A1 discloses the use of cooling energy instead of
a rolling compound to prevent the adhesion of a chewing gum sheet
to the machinery. However, this makes the machinery very complex
and needs a lot of energy for cooling thereby increasing the costs.

The technical problem underlying the present invention is to provide
rolling compounds having a good flowability. A further technical prob-
lem underlying the present invention is to provide rolling compounds
having improved adhesion prevention.
A further technical problem underlying the present invention is to provide rolling compounds with improved sensory and taste profiles.

Furthermore, the rolling compounds should have preferably a low hygroscopicity and should be preferably cheap.

The present invention solves the underlying technical problem by the provision of a rolling compound powder for applying to the surface of a chewing gum core material, wherein the rolling compound powder comprises hydrogenated and/or non-hydrogenated palatinose.

In the context of the present invention a rolling compound is applied to or on the surface of a chewing gum core material. Accordingly a chewing gum core material has a rolling compound on its surface.

In a preferred embodiment of the present invention, the rolling compound powder comprises essentially hydrogenated or non-hydrogenated palatinose.

In the context of the present invention the term "comprising" preferably has the meaning of "containing" or "including" meaning that the composition in question at least comprises the specifically identified component without excluding the presence of further components. However, in a preferred embodiment the term comprising is also understood to have the meaning of "consisting essentially of" and in a most preferred embodiment of "consisting". The term "consisting essentially of" excludes the presence of substantial amounts of further components except the specifically identified component of the composition. The term "consisting" excludes the presence of any further compound, no matter in which quantity in the composition identified.
In the context of the present invention the term "comprising essentially" preferably has the meaning that the specifically identified component is the component with the highest proportion in the composition in question compared to the components present in the composition in question. However, in a preferred embodiment the term "comprising essentially" means that the composition in question comprises at least 50 % by weight, even more preferably at least 51 % by weight of the specifically identified component.

If not outlined else, %-values given the in present description mean weight-% on dry matter.

In the context of the present invention the term "at least one" preferably has the meaning that one component or more than one components, for example two, three or more components are present.

Surprisingly, it could be shown that rolling compound powders comprising hydrogenated or non-hydrogenated palatinose have a better flowability compared to mannitol based rolling compound powders. Furthermore the rolling compound powders according to the present invention are a good release agent, i.e they give good adhesion prevention. The rolling compound powders according to the present invention show also an improved sensory profile and give a good initial sweetness of the chewing gum.

In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated or non-hydrogenated palatinose.
In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated and non-hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose.

In the context of the present invention, the term "hydrogenated palatinose" preferably encompasses an isomalt component.

In the context of the present invention, the term "isomalt component" preferably encompasses isomalt, isomalt ST, isomalt GS, an isomalt variant or component thereof. Isomalt is also known as palatinit®.

In a preferred embodiment of the present invention, the hydrogenated palatinose is selected from the group consisting of 1,1-GPS (1-O-a-D-glucopyranosyl-D-sorbitol), 1,1-GPM (1-O-a-D-glucopyranosyl-D-mannitol), 1,6-GPS (6-O-a-D-glucopyranosyl-D-sorbitol), isomalt, isomalt ST and isomalt GS.

In the context of the present invention, isomalt is a mixture of 1,6-GPS and 1,1-GPM, while isomalt ST is a mixture of 53 to 47% 1,6-GPS and 47 to 53% 1,1-GPM. Isomalt GS is a mixture of 71 to 79% 1,6-GPS and 29 to 21% 1,1-GPM, preferably 75% 1,6-GPS to 25% 1,1-GPM (values given in weight-% on dry matter).

In a further preferred embodiment, it is foreseen to use isomalt variants. In the context of the present invention, isomalt variants are for instance mixtures of 10 to 50% 1,6-GPS, 2 to 20% 1,1-GPS and 30 to 70% 1,1-GPM or mixtures of 5 to 10% 1,6-GPS, 30 to 40% 1,1-GPS and 45 to 60% 1,1-GPM. Isomalt variants may also be in form
of 1,6-GPS or 1,1-GPM enriched mixtures. 1,6-GPS enriched mixtures have an 1,6-GPS amount of 58 to 99 % and an 1,1-GPM amount of 42 to 1 %. 1,1-GPM enriched mixtures have an 1,6-GPS amount of 1 to 42 % and an 1,1-GPM amount of 58 to 99 % (values given in weight-% on dry matter).

In a further preferred embodiment of the present invention, the isomalt component used is a milled and agglomerated isomalt, in particular a milled and agglomerated isomalt, wherein the milled isomalt particles have a diameter of less than 100 µm, preferably less than 50 µm. Preferably, such a milled and agglomerated isomalt is isomalt DC.

Particle size as described herein is measured by scanning electron microscopy (SEM) or other optical or scanning techniques, for example using a coulter counter.

In a preferred embodiment of the present invention the rolling compound powder comprises essentially hydrogenated palatinose.

In a preferred embodiment of the present invention the rolling compound powder consists essentially of hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 21 % by weight, more preferably at least 25 % by weight hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 30 % by weight, more preferably at least 40 % by weight hydrogenated palatinose.
In a preferred embodiment of the present invention, the rolling compound powder comprises at least 50 % by weight, more preferably at least 51 % by weight hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 50 % by weight and at most 100 % by weight hydrogenated palatinose. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 50 % by weight and at most around 100% by weight hydrogenated palatinose. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 50 % by weight and at most 99% by weight hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 70 % by weight hydrogenated palatinose. In a preferred embodiment of the present invention the rolling compound comprises at least 72 % by weight, more preferably at least 73 % by weight, even more preferably at least 74 % by weight, especially around 75 % by weight hydrogenated palatinose. The rolling compound powder can also preferably comprise at least 80 % by weight, more preferably at least 90 % by weight, even more preferably at least 95 % by weight hydrogenated palatinose. In a preferred embodiment of the present invention the rolling compound powder can comprise at least 99 % by weight non-hydrogenated palatinose. The rolling compound powder can also comprise around 99 % by weight hydrogenated palatinose or consist essentially of hydrogenated palatinose. The rolling compound powder can also consist of hydrogenated palatinose.
In a preferred embodiment of the present invention the rolling compound powder comprises hydrogenated palatinose and at least one anti-caking agent. In a preferred embodiment of the present invention the rolling compound powder comprises hydrogenated palatinose and an anti-caking agent.

In an alternative embodiment of the present invention the rolling compound powder comprises hydrogenated palatinose and comprises no anti-caking agent.

In a preferred embodiment of the present invention 90 % by weight, more preferably 99 % by weight of the rolling compound powder consists of hydrogenated palatinose and an anti-caking agent. In a preferred embodiment of the present invention the rolling compound powder consists essentially of hydrogenated palatinose and at least one anti-caking agent.

In a preferred embodiment of the present invention, the anti-caking agent is SiO₂ or talcum. In a preferred embodiment of the present invention, the anti-caking agent is SiO₂. In a preferred embodiment of the present invention, the anti-caking agent is talcum. In a preferred embodiment of the present invention, the anti-caking agent is SiO₂ and talcum.

In a preferred embodiment of the present invention, the rolling compound comprises hydrogenated palatinose and SiO₂. In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose and talcum. In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose, SiO₂ and talcum.
In a preferred embodiment of the present invention, the rolling compound powder consists of hydrogenated palatinose and at least one anti-caking agent. Preferably the anti-caking agent is talcum and/or SiO$_2$. In a preferred embodiment of the present invention, the rolling compound powder consists of hydrogenated palatinose and talcum. In a further preferred embodiment of the present invention the rolling compound powder consists of hydrogenated palatinose and SiO$_2$. Alternatively, the rolling compound powder can consist of hydrogenated palatinose, talcum and SiO$_2$.

In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose and around 0.5 to around 5 % by weight SiO$_2$. Even more preferred the rolling compound powder comprises hydrogenated palatinose and at least 1.5 % by weight SiO$_2$. In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose and at least 1.5 and at most 5 % by weight SiO$_2$.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 21, more preferably at least 25, even more preferably at least 51 % by weight hydrogenated palatinose and at least 1.5 and at most 5% by weight SiO$_2$.

In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose and at least 5 % by weight talcum. In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose and at least 20 % by weight talcum. In a preferred embodiment of the present invention, the rolling compound powder comprises
hydrogenated palatinose and at most 60 % by weight, more preferably at most 49 % by weight talcum.

In an alternative embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose and at least 5 and at most 10 % by weight talcum.

In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose and at least 20 and at most 49 % by weight talcum.

In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose, at least 20 to at most 49 % by weight talcum and at least 0.5 to at most 5 % by weight SiO₂.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 21, more preferably at least 25, even more preferably at least 51 % by weight hydrogenated palatinose and at most 75, more preferably at most 70, even more preferably at most 49 % by weight talcum.

In a preferred embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose.

In a preferred embodiment of the present invention the rolling compound powder comprises essentially non-hydrogenated palatinose.

In a preferred embodiment of the present invention the rolling compound powder consists essentially of non-hydrogenated palatinose.
Non-hydrogenated palatinose, also termed isomaltulose, is a disaccharide made from sucrose by the enzymatic rearrangement of the alpha-1,2-linkage between glucose and fructose to an alpha-1,6-linkage.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 21% by weight, more preferably at least 25% by weight non-hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 30% by weight, more preferably at least 40% by weight non-hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 50% by weight, more preferably at least 51% by weight non-hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 50% by weight and at most 100% by weight non-hydrogenated palatinose. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 50% by weight and at most around 100% by weight non-hydrogenated palatinose. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 50% by weight and at most 99% by weight non-hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 70% by weight non-hydrogenated palatinose. In a preferred embodiment of the present invention the rolling compound comprises at least 72% by weight, more preferably at least 73% by weight, even more preferably at least 74% by
weight, especially around 75 % by weight non-hydrogenated palatinose. The rolling compound powder can also preferably comprise at least 80 % by weight, more preferably at least 90 % by weight, even more preferably at least 95 % by weight non-hydrogenated palatinose. In a preferred embodiment of the present invention the rolling compound powder can comprise at least 99 % by weight non-hydrogenated palatinose. The rolling compound powder can also comprise around 99 % by weight non-hydrogenated palatinose or consist essentially of non-hydrogenated palatinose. The rolling compound powder can also consist of non-hydrogenated palatinose.

In a preferred embodiment of the present invention the rolling compound powder comprises non-hydrogenated palatinose and at least one anti-caking agent. In a preferred embodiment of the present invention the rolling compound powder comprises non-hydrogenated palatinose and an anti-caking agent.

In an alternative embodiment of the present invention the rolling compound powder comprises non-hydrogenated palatinose and comprises no anti-caking agent.

In a preferred embodiment of the present invention the rolling compound powder comprises non-hydrogenated palatinose and at least one anti-caking agent. In a preferred embodiment of the present invention the rolling compound powder comprises non-hydrogenated palatinose and an anti-caking agent.

In a preferred embodiment of the present invention 90 % by weight, more preferably 99 % by weight of the rolling compound powder consists of non-hydrogenated palatinose and an anti-caking agent. In a preferred embodiment of the present invention the rolling com-
pound powder consists essentially of non-hydrogenated palatinose and at least one anti-caking agent.

In a preferred embodiment of the present invention, the anti-caking agent is SiO$_2$ or talcum. In a preferred embodiment of the present invention, the anti-caking agent is SiO$_2$. In a preferred embodiment of the present invention, the anti-caking agent is talcum. In a preferred embodiment of the present invention, the anti-caking agent is SiO$_2$ and talcum.

In a preferred embodiment of the present invention, the rolling compound comprises non-hydrogenated palatinose and SiO$_2$. In a preferred embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose and talcum. In a preferred embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose, SiO$_2$ and talcum.

In a preferred embodiment of the present invention, the rolling compound powder consists of non-hydrogenated palatinose and at least one anti-caking agent. Preferably, the anti-caking agent is talcum and/or SiO$_2$. In a preferred embodiment of the present invention, the rolling compound powder consists of non-hydrogenated palatinose and talcum. In a further preferred embodiment of the present invention, the rolling compound powder consists of non-hydrogenated palatinose and SiO$_2$. Alternatively, the rolling compound powder can consist of non-hydrogenated palatinose, talcum and SiO$_2$.

In a preferred embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose and around 0.5 to around 5% by weight SiO$_2$. Even more preferred, the rolling compound powder comprises non-hydrogenated palatinose and at
least 1.5 % by weight SiO₂. In a preferred embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose and at least 1.5 and at most 5% by weight SiO₂.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 21, more preferably at least 25, even more preferably at least 51 % by weight non-hydrogenated palatinose and at least 1.5 and at most 5% by weight SiO₂.

In a preferred embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose and at least 5% by weight talcum. In a preferred embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose and at least 20 % by weight talcum. In a preferred embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose and at most 60 % by weight, more preferably at most 49 % by weight talcum.

In a alternative embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose and at least 5 and at most 10 % by weight talcum.

In a preferred embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose and at least 20 and at most 49 % by weight talcum.

In a preferred embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose, at least 20 to at most 49 % by weight talcum and at least 0.5 to at most 5 % by weight SiO₂.
In a preferred embodiment of the present invention, the rolling compound powder comprises at least 21, more preferably at least 25, even more preferably at least 51 % by weight non-hydrogenated palatinose and at most 75, more preferably at most 70, even more preferably at most 49 % by weight talcum.

Beside hydrogenated palatinose or non-hydrogenated palatinose the rolling compound powder can of course comprise further ingredients. In some preferred embodiments of the present invention the rolling compound powder comprising hydrogenated palatinose and/or non-hydrogenated palatinose does not comprise some specific ingredients.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least one anti-caking agent, more preferably an anti-caking agent. In an alternative embodiment of the present invention, the rolling compound powder comprises essentially no anti-caking agent. In an alternative embodiment of the present invention, the rolling compound powder comprises no anti-caking agent.

In a preferred embodiment of the present invention, the anti-caking agent is SiO₂ or talcum. In a preferred embodiment of the present invention, the anti-caking agent is SiO₂. In a preferred embodiment of the present invention, the anti-caking agent is talcum. In a preferred embodiment of the present invention, the anti-caking agent is SiO₂ and talcum.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 0.1 % by weight and at most 5 % by weight SiO₂.
In a preferred embodiment of the present invention, the rolling compound powder comprises at least 1.5 % by weight and at most 2.5 % by weight SiO₂.

In a preferred embodiment of the present invention, the rolling compound powder comprises around 2 % by weight SiO₂.

In an alternative embodiment of the present invention, the rolling compound powder comprises no SiO₂.

In an alternative embodiment of the present invention, the rolling compound powder comprises essentially no SiO₂.

In a preferred embodiment of the present invention, the rolling compound powder comprises at most 50 % by weight talcum, more preferably at most 49 % by weight talcum.

In an alternative embodiment of the present invention, the rolling compound powder comprises essentially no talcum.

In an alternative embodiment of the present invention, the rolling compound powder comprises no talcum.

In a preferred embodiment of the present invention, the rolling compound powder comprises starch. In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose and starch. In an alternative embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose and starch. In a preferred embodiment of the present invention the starch is native starch. In a preferred embodiment of the present invention the starch is rice starch.
In a preferred embodiment of the present invention, the rolling compound powder comprises rice starch. In a preferred embodiment of the present invention, the rolling compound powder comprises hydrogenated palatinose and rice starch. In an alternative embodiment of the present invention, the rolling compound powder comprises non-hydrogenated palatinose and rice starch.

In a preferred embodiment of the present invention the rice starch is native rice starch. In a preferred embodiment of the present invention the rice starch is raw rice starch. A suitably rice starch is for example Beneo® Remy®, especially Beneo® Remy® FG.

In a preferred embodiment of the present invention, the rolling compound powder comprises at least 1% by weight rice starch. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 10% by weight rice starch. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 20% by weight rice starch. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 30% by weight rice starch. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 40% by weight rice starch.

In a preferred embodiment of the present invention, the rolling compound powder comprises at most 90% by weight rice starch. In a preferred embodiment of the present invention, the rolling compound powder comprises at most 80% by weight rice starch.
embodiment of the present invention, the rolling compound powder comprises at most 70 % by weight rice starch. In a preferred embodiment of the present invention, the rolling compound powder comprises at most 60 % by weight rice starch.

5 In a preferred embodiment of the present invention, the rolling compound powder comprises at least 1 % by weight and at most 80 % by weight rice starch. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 10 % by weight and at most 70 % by weight rice starch. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 20 % by weight and at most 60 % by weight rice starch.

10 In a preferred embodiment of the present invention, the rolling compound powder comprises at least 30 % by weight and at most 70 % by weight rice starch and at least 30 % by weight and at most 70 % by weight hydrogenated palatinose. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 30 % by weight and at most 70 % by weight rice starch and at least 30 % by weight and at most 70 % by weight non-hydrogenated palatinose.

15 In a preferred embodiment of the present invention, the rolling compound powder comprises at least 40 % by weight and at most 60 % by weight rice starch and at least 40 % by weight and at most 60 % by weight hydrogenated palatinose. In a preferred embodiment of the present invention, the rolling compound powder comprises at least 40 % by weight and at most 60 % by weight rice starch and at least 40 % by weight and at most 60 % by weight non-hydrogenated palatinose.
In a preferred embodiment of the present invention, the rolling compound powder consists essentially of at least 40 % by weight and at most 60 % by weight rice starch and at least 40 % by weight and at most 60 % by weight hydrogenated palatinose. In a preferred embodiment of the present invention, the rolling compound powder consists essentially of at least 40 % by weight and at most 60 % by weight rice starch and at least 40 % by weight and at most 60 % by weight non-hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder consists of at least 40 % by weight and at most 60 % by weight rice starch and at least 40 % by weight and at most 60 % by weight hydrogenated palatinose. In a preferred embodiment of the present invention, the rolling compound powder consists of at least 40 % by weight and at most 60 % by weight rice starch and at least 40 % by weight and at most 60 % by weight non-hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder consists of at least 45 % by weight and at most 55 % by weight rice starch and at least 45 % by weight and at most 55 % by weight hydrogenated palatinose. In a preferred embodiment of the present invention, the rolling compound powder consists of at least 45 % by weight and at most 55 % by weight rice starch and at least 45 % by weight and at most 55 % by weight non-hydrogenated palatinose.

In a preferred embodiment of the present invention, the rolling compound powder comprises essentially no sugar alcohol selected from the group consisting of mannitol, xylitol, sorbitol, erythritol and mix-
tures thereof. In a preferred embodiment of the present invention, the rolling compound powder comprises at most only traces of a sugar alcohol selected from the group consisting of mannitol, xylitol, sorbitol, erythritol and mixtures thereof.

In a preferred embodiment of the present invention, the rolling compound powder comprises no sugar alcohol selected from the group consisting of mannitol, xylitol, sorbitol, erythritol and mixtures thereof.

In a preferred embodiment of the present invention, the rolling compound powder comprises no mannitol. In a preferred embodiment of the present invention, the rolling compound powder comprises no xylitol. In a preferred embodiment of the present invention, the rolling compound powder comprises no sorbitol. In a preferred embodiment of the present invention, the rolling compound powder comprises no erythritol.

In a preferred embodiment of the present invention, the rolling compound powder comprises at most 39 % by weight, more preferably at most 24 % by weight a sugar alcohol selected from the group consisting of mannitol, xylitol, sorbitol, erythritol and mixtures thereof.

In a preferred embodiment of the present invention, the rolling compound powder comprises mannitol. In a preferred embodiment of the present invention, the rolling compound powder comprises at most 39 % by weight, more preferably at most 24 % by weight mannitol.

In a preferred embodiment of the present invention, the rolling compound powder comprises no sugar alcohol selected from the group consisting of xylitol, sorbitol, erythritol and mixtures thereof.
In a preferred embodiment of the present invention, the rolling compound powder is sugar-free. In a further preferred embodiment, the rolling compound is free of sucrose, free of glucose, free of lactose and/or free of fructose or free of combinations of at least two of these sugars.

In a preferred embodiment of the present invention, the rolling compound powder is tooth-friendly.

In a particularly preferred embodiment of the present invention, the hydrogenated or non-hydrogenated palatinose is the only sweetening agent present in the rolling compound powder of the present invention. In a preferred embodiment of the present invention, the non-hydrogenated palatinose is the only sugar present in the rolling compound of the present invention. In a further preferred embodiment of the present invention, the hydrogenated palatinose is the only sugar alcohol present in the rolling compound powder of the present invention. In a further preferred embodiment, the hydrogenated or non-hydrogenated palatinose is the only sweetening agent providing a body to the rolling compound powder of the present invention. Thus, in this preferred embodiment, in addition to the hydrogenated or non-hydrogenated palatinose, an intense sweetener may also be present in the rolling compound powder.

In a preferred embodiment of the present invention, the non-hydrogenated palatinose is essentially the only sugar present in the rolling compound of the present invention. In a further preferred embodiment of the present invention, the hydrogenated palatinose is the essentially only sugar alcohol present in the rolling compound powder of the present invention. In a further preferred embodiment,
the hydrogenated or non-hydrogenated palatinose is the essentially only sweetening agent providing a body to the rolling compound powder of the present invention.

In a preferred embodiment of the present invention, the intense sweetener is selected from the group of cyclamate, saccharin, aspartame, glycyrrhicine, neohesperidine-dihydrochalcone, stevioside, thaumatin, monellin, acesulfame, alitame, sucralose or a mixture thereof.

The present invention solves the underlying technical problem by the provision of a chewing gum product comprising a chewing gum core material wherein a rolling compound powder is applied to the surface of said chewing gum core material and wherein the rolling compound powder comprises hydrogenated or non-hydrogenated palatinose. In a preferred embodiment of the present invention the rolling compound powder is a rolling compound powder according to the present invention as it is outlined above.

In a preferred embodiment of the present invention there is thus provided a chewing gum product comprising a chewing gum core material and a rolling compound according to the present invention wherein at least one layer comprising the rolling compound of the present invention is present on the surface of said chewing gum core material.

Accordingly, the chewing gum product according to the present invention comprises a chewing gum core made from a chewing gum core material and a rolling compound powder comprising hydrogenated or non-hydrogenated palatinose.
In general, the chewing gum core can be manufactured using the well-known method of manufacturing chewing gum by sequentially combining the various chewing gum ingredients in a commercially available mixer known in the art.

After the ingredients have been thoroughly mixed, the gum mass is discharged from the mixer and shaped into the desired form such as by rolling into sheets and cutting into sticks, extruding into chunks or casting into pellets. Generally, ingredients of the chewing gum core material are mixed by first melting the gum base and adding it into the running mixer. The base may also be melted in the mixer itself. Colour or emulsifiers may also be added at this time. A softener such as glycerine may also be added at this time along with syrup and a portion of bulking agent. Further portions of the bulking agent may then be added to the mixer. A flavouring agent is typically added with a final portion of the bulking agent. The entire mixing procedure typically takes from 5 to 15 minutes, but longer mixing times may sometimes be required. Those skilled in the art will recognise that many variations of the above-described procedure may be followed.

In a preferred embodiment of the present invention, the chewing gum core material is a filled or non-filled chewing gum core material.

In a preferred embodiment of the present invention, the chewing gum core material comprises further at least one additive.

In a preferred embodiment of the present invention, the at least one additive is selected from the group consisting of sugars, preferably tooth-friendly sugars, sugar alcohols, intense sweeteners, hydrocolloid, gum base, plastifiers, lubricant, emulsifiers, protein components, milk components, dairy ingredients, fat and fat substitutes, vegetable
fat, vitamins, minerals, pharmaceutically active ingredients, preservatives, aroma, flavourings, such as peppermint, menthol, fruit, strawberry flavour, colours, TiO$_2$, edible acids, such as citric acid, dietary fibres and mixtures thereof.

In a preferred embodiment of the present invention, the chewing gum core material is tooth-friendly. In a preferred embodiment of the present invention, the chewing gum product is tooth-friendly.

In a preferred embodiment of the present invention, the chewing gum core material is sugar-free, in particular free of sucrose, free of glucose, free of lactose and/or free of fructose or free of combinations of at least two of these sugars.

In a preferred embodiment of the present invention, the chewing gum core material comprises at least one tooth-friendly sugar or sugar alcohol.

In a preferred embodiment of the present invention, the at least one tooth-friendly sugar in the chewing gum core material is selected from the group consisting of isomaltulose, nutriose, leukrose and polydextrose. In a preferred embodiment, the sugar is isomaltulose. In a further preferred embodiment, the amount of non-tooth-friendly ingredients is at maximum 1 weight-% (on total weight of the confectionery product).

In a further preferred embodiment of the present invention, the at least one tooth-friendly sugar alcohol in the chewing gum core material is selected from the group of hydrogenated palatinose, xylitol, mannitol, maltitol, erythritol, lactitol or sorbitol.
In a further preferred embodiment of the present invention, the only sugar present in the chewing gum core is non-hydrogenated palatinose. In a further preferred embodiment of the present invention, the only sugar alcohol present in the chewing gum core is hydrogenated palatinose. In a further preferred embodiment of the present invention, the only sugar present in the chewing gum core is non-hydrogenated palatinose and the only sugar alcohol present in the chewing gum core is hydrogenated palatinose.

The present invention solves the underlying technical problem by the provision of a process for reducing the stickiness of a composition of a chewing gum core material in a chewing gum preparation process, comprising the following steps: a) providing a hydrogenated and/or non-hydrogenated palatinose-containing rolling compound powder, b) providing a chewing gum core material and c) applying the rolling compound powder comprising the hydrogenated and/or non-hydrogenated palatinose provided in step a) on the surface of the chewing gum core material provided in step b) so as to reduce stickiness of the chewing gum core material to a chewing gum processing machinery. Preferably the rolling compound powder comprises hydrogenated or non-hydrogenated palatinose.

In the context of the present invention "chewing gum product" or "chewing gum" refers to the chewing gum core material to/on which the rolling compound powder is applied. When the rolling compound powder is already applied to the chewing gum core material "chewing gum product" or "chewing gum" can also refer to the chewing gum core material together with the rolling compound powder.
In a preferred embodiment the chewing gum core material is provided in step b) as a sheet.

In a preferred embodiment of the present invention the rolling compound powder used in the process is a rolling compound powder according to the present invention as it is outlined above.

The rolling compound powder comprising the hydrogenated or non-hydrogenated palatinose can be applied on the surface of the chewing gum core material with techniques known for applying rolling compound powders of the state of the art.

In a preferred embodiment of the present invention the rolling compound powder is applied to the chewing gum core material in a quantity of about 0.5 % to about 7 %, more preferably of about 1 % to about 3 % by weight of the resulting chewing gum product.

In a preferred embodiment of the present invention the rolling compound powder is applied to the chewing gum core material in a quantity of at least 0.5 % to at most 7 %, more preferably of at least 1 % to at most 3 % by weight of the resulting chewing gum product.

In a preferred embodiment of the present invention the rolling compound powder is applied to the chewing gum core material in a quantity of about 1 % to about 15 %, more preferably of about 5 % to about 10 % by weight of the resulting chewing gum product.

In a preferred embodiment of the present invention the rolling compound powder is applied to the chewing gum core material in a quantity of at least 0.5 % by weight of the resulting chewing gum product.
pound powder is applied to the chewing gum core material in a quantity of at most 15% by weight of the resulting chewing gum product.

In a preferred embodiment of the present invention a rolling compound powder is applied to the chewing gum core material at a level from about 4 to about 65 grams of the rolling compound powder per m² of the surface area of the chewing gum core material. In a preferred embodiment of the present invention a rolling compound powder is applied to the chewing gum core material at a level from about 15 to about 30 grams of the rolling compound powder per m² of the surface area of the chewing gum core material.

The present invention therefore provides chewing gum products comprising a chewing gum core material and a rolling compound powder and processes to obtain them wherein said chewing gum products may be coated or non-coated chewing gum products. Thus, the present invention foresees in one embodiment to provide non-coated chewing gum products such as chewing gum sticks. In another preferred embodiment the present invention foresees to coat the chewing gum product prepared according to the present invention with at least one layer of coating material so as to produce a coated chewing gum product and wherein said at least one layer is enveloping the rolling compound present on the surface of the chewing gum core material.

The present invention solves the underlying technical problem also by the use of hydrogenated or non-hydrogenated palatinose in a rolling compound powder for applying to the surface of a chewing gum core material. Preferably a rolling compound according to the pre-
sent invention as outlined above is used. Preferably a chewing gum core material as outlined above is used.

Further preferred embodiments of the present invention are the subject-matter of the subclaims.

Figure 1 shows the flowability of various of rolling compound powders according to the present invention compared with rolling compound powders of the state of the art.

The invention is illustrated by way of the following examples and figure 1:

Example 1: Flowability of the rolling compound according to the present invention:

The flowability of various rolling compound powders according to the present invention comprising hydrogenated palatinose were compared with according rolling compound powders according to the state of the art comprising mannitol. Flowability was measured by using a funnel having a nozzle with a diameter of 15 mm. The flowability was measured as seconds per 100 g rolling compound (s/100g). The measuring method was performed according to the book Europaisches Arzneibuch, 3rd edition, 1997, pages 150 and 151, point 2.9.1.6.

The measured flowabilities of the different rolling compound powders are shown in figure 1.

Following rolling compound powders were measured:

1: mannitol, fine
2: talc

3: 0,5 % SiO₂ (Aerosil 200F), 25 % talc, 74,5 % hydrogenated palatinose

4: 25 % talc, 75 % mannitol

5 5: 1 % SiO₂ (Syloid FP), 25 % talc, 74 % hydrogenated palatinose

6: 25 % talc, 75 % hydrogenated palatinose (50 % isomalt ST PF + 25 % isomalt ST C)

7: 0,5 % SiO₂ (Syloid FP), 25 % talc, 74 % hydrogenated palatinose

8: 25 % talc, 70 % hydrogenated palatinose, 5 % rice starch (Remy AX-DR)

9: 25 % talc, 70 % hydrogenated palatinose, 5 % rice starch (Remy FG)

10 10: 25 % talc, 74 % hydrogenated palatinose, 1 % rice starch (Remy AX-DR)

11: 25 % talc, 74 % hydrogenated palatinose, 1 % rice starch (Remy FG)

12: 1 % SiO₂ (Aerosil 200F), 99 % hydrogenated palatinose

13: 2 % SiO₂ (Syloid FP), 25 % talc, 73 % hydrogenated palatinose
14:  95 % hydrogenated palatinose, 5 % rice starch (Remy AX-DR)
15:  25 % talc, 75 % rice starch (Remy AX-DR)
16:  25 % talc, 75 % hydrogenated palatinose (isomalt ST PF)
17:  100 % hydrogenated palatinose (80 % isomalt ST PF + 20 % isomalt ST C)
18:  2 % SiO₂ (Aerosil 200F), 25 % talc, 73 % hydrogenated palatinose
19:  100 % hydrogenated palatinose (80 % isomalt ST PF + 20 % isomalt DC 100)
20:  100 % hydrogenated palatinose (isomalt ST PF)
21:  100 % rice starch
22:  2 % SiO₂ (Aerosil 200F), 98 % rice starch
23:  2 % SiO₂ (Aerosil 200F), 98 % mannitol
24:  2 % SiO₂ (Aerosil 200F), 98 % hydrogenated palatinose

Pure mannitol shows no flowability at all. A rolling compound powder consisting of 75 % hydrogenated palatinose and 25 % talcum shows a much better flowability than a rolling compound powder consisting of 75 % mannitol and 25 % talcum. The best flowability was found for a rolling compound powder consisting of 98 % hydrogenated palatinose and 2 % SiO₂.

Example 2: Adhesion to the machinery
A rolling compound powder consisting of 55% hydrogenated palatinose and 45% talcum was applied to the surface of sheets of a conventional chewing gum core material.

The use of the rolling compound powder consisting of 55% hydrogenated palatinose and 45% talcum showed a good prevention of adhesion to the used machinery such as rolling machines and scoring machines having steel surfaces and other polished surfaces and also such as conveyor belts having teflon or plastic surfaces.

Accordingly, the rolling compound powder according to the present invention is a good release agent to prevent the adhesion of a chewing gum core material during the processing steps after forming the chewing gum core.
Claims

1. A rolling compound powder for applying to the surface of a chewing gum core material, wherein the rolling compound powder comprises hydrogenated palatinose.

2. The rolling compound powder according to claim 1, comprising at least 70 % by weight hydrogenated palatinose.

3. The rolling compound powder according to any of claims 1 to 2 comprising at least 0.1 % by weight and at most 5 % by weight SiO₂.

4. The rolling compound powder according to any of claims 1 to 3 comprising around 2 % by weight SiO₂.

5. The rolling compound powder according to any of claims 1 to 4 comprising at most 50 % by weight talcum.

6. The rolling compound powder according to any of claims 1 to 4 comprising no talcum.

7. The rolling compound powder according to any of claims 1 to 6 comprising at least 1 % by weight and at most 80 % by weight rice starch.

8. The rolling compound powder according to any of claims 1 to 7 comprising at least 20 % by weight and at most 60 % by weight native rice starch.
9. The rolling compound powder according to any of claims 1 to 8 comprising no sugar alcohol selected from the group consisting of mannitol, xylitol, sorbitol, erythritol and mixtures thereof.

10. A chewing gum product comprising a chewing gum core material and a rolling compound powder according to any of claims 1 to 9 wherein a layer comprising the rolling compound is present on the surface of said chewing gum core material.

11. A process for reducing the stickiness of a composition of a chewing gum core material in a chewing gum preparation process, comprising the following steps:

   a) providing a hydrogenated palatinose-containing rolling compound powder,

   b) providing a chewing gum core material and

   c) applying the rolling compound powder comprising the hydrogenated palatinose provided in step a) to the surface of the chewing gum core material provided in step b) so as to reduce stickiness of the chewing gum core material to a chewing gum processing machinery.

12. A process according to claim 11, wherein the hydrogenated palatinose-containing rolling compound powder is a rolling compound powder according to any of claims 1 to 9.

13. Use of hydrogenated palatinose in a rolling compound powder for applying to the surface of a chewing gum core material.
14. Use according to claim 13, wherein the rolling compound powder comprises rice starch.
# INTERNATIONAL SEARCH REPORT

## A. CLASSIFICATION OF SUBJECT MATTER

**INV.** A23G4/06

**ADD.**

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

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A23G

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
- WPI Data
- BIOSIS
- FSTA

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td><strong>US 5399 365 A</strong> (YATKA ROBERT J [US] ET AL) 21 March 1995 (1995-03-21) * column 1, lines 15-35; examples 1-20 and 134; claims 1-10 *</td>
<td>1-14</td>
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<td>A</td>
<td><strong>WO 92/22217</strong> AI (WRIGLEY WM JUN CO [US]) 23 December 1992 (1992-12-23) * examples 110, 122-125 and 126-134; claims 1-18 *</td>
<td>1-14</td>
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Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:
  - "A" document defining the general state of the art which is not considered to be of particular relevance
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  - "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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  - "Z" document member of the same patent family

Date of the actual completion of the international search: 27 March 2013

Date of mailing of the international search report: 08/04/2013

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