

Description

The present invention relates to a novel coated foodstuff and more particularly to a foodstuff coated with a particulate material derived from fresh root vegetables.

In the preparation of frozen coated food products such as fish, meat or vegetables suitable for oven-cooking, the foodstuff is usually coated with batter, breaded, prefried, deep-frozen and then packaged. The breading material is normally a particulate material such as bread crumbs or shredded cheese, or it may be a particulate material derived from dehydrated potato, for example, potato flakes, potato powder or potato granules. The average size of the particles is such that they usually have an average diameter of from 0.1 to 2.0 mm and the maximum volume of a particle is not usually more than about 10 cubic millimetres. The amount of breading material used in conventional procedures is normally not more than 10 % by weight based on the total weight of the product, e.g. FR-A 1 548 914 refers to food pieces made of cooked dough coated with e.g. raw potato particles without batter; EP-A 6 455 to food pieces coated with dry particles and US-A 3 035 918 to food pieces coated with potato flour. It would, however, be very desirable to use particulate material derived from fresh root vegetables, such as potatoes, not only from an organoleptic point of view but also because the final product would have a significantly lower fat content to products coated with conventional coating materials due to the lower uptake of oil by the fresh vegetable in the pre-frying process. However, all our attempts up to the present time to use such coating materials have not been successful because in conventional equipment the particles of fresh vegetable material tend to stick together to form agglomerates which complicate the mechanical transport and make it impossible to obtain a satisfactory even coating. For example, US-A 3 547 075 describes a breading machine having a screw conveyor and the employment of a screw conveyor is useless for coating with fresh vegetables containing water as the whole coating would be converted into a porridge-like mass by the action of the screw.

We have now developed a foodstuff coated with a particulate material derived from fresh root vegetables in which the particles do not stick together to form agglomerates and which are distributed evenly upon the foodstuff.

Accordingly, the present invention provides a frozen food product comprising fish or meat coated with batter and a particulate material, which is prefried before being deep-frozen characterised in that the particulate material is derived from fresh root vegetables, the individual particles have a volume from 20 to 250 cubic millimetres and the amount of particulate material applied to the fish or meat is between 10 and 70 % by weight based on the total weight of frozen food product. The fish or meat is usually predusted and coated with the batter by conventional methods before the particulate material is applied. Any type of batter may be used and Tempura batter is particularly suitable.

Preferably the individual particles of the fresh root vegetables have a volume from 30 to 250, preferably from 40 to 200 and especially from 50 to 150 cubic millimetres. Root vegetables which are of particular interest are those which may be cut into relatively firm, substantially uniform pieces, for example, potatoes, carrots, turnips or swedes. Especially suitable materials are potato cubes or potato strips.

Advantageously, the amount of particulate material applied to the fish or meat is from 15 to 50 % and especially from 20 to 40 % by weight based on the total weight of the prefried frozen food product. It should be understood that water is lost from the fresh vegetable material during the pre-frying step and therefore the final product will contain less vegetable material than the amount applied.

Preferably, the particles of fresh root vegetables are coated with a predusting flour before application to the foodstuff. The amount of predusting flour depends on the size of the particulate material and the quantity applied to the foodstuff and is usually from 4 to 12 %, preferably from 5 to 10 % and especially from 6 to 8 % by weight based on the weight of the particulate material. Any conventional predusting material may be used and may be any free flowing flour or starch material for example, granulated potato or potato starch. The coating of the particulate material with a predusting flour is especially advantageous when the individual particles have a volume greater than 20 cubic millimetres.

The product has a significantly lower fat content when compared with pre-fried frozen products coated with conventional "breading" materials and reheats extremely well either by frying or by oven-heating.

The present invention further provides a process for preparing a frozen food product which comprises coating a fish or meat firstly with batter and then with a particulate material, and afterwards pre-frying and deep-freezing, characterised in that the particulate material is derived from fresh root vegetables, the individual particles have a volume from 20 to 250 cubic millimetres and the amount of particulate material applied to the fish or meat is between 10 and 70 % by weight based on the total weight of the frozen food product.

The particulate materials are as described hereinbefore and preferably the particulate material is coated with a predusting flour before application to the fish or meat in the amounts indicated above, for instance, by means of an ordinary dry mixer or rotating drum.

The present invention also provides an apparatus for coating a foodstuff with a particulate material derived from fresh root vegetables which comprises a horizontal conveyor for a foodstuff, means for applying the foodstuff to the horizontal conveyor, a first means for applying a particulate material onto the foodstuff, a second means for applying particulate material onto at least part of the horizontal conveyor before the foodstuff has reached that part of the horizontal conveyor and means for transporting excess particulate material which falls off the horizontal conveyor upwardly on

an inclined conveyor for redistribution to the first and second applying means for reuse wherein the horizontal conveyor for the foodstuff comprises at least two endless conveyor belts having horizontal upper runs arranged successively whereby the upper run of the second belt has a portion positioned below the first belt and which travels upwards and forwards to form a horizontal portion level with the horizontal upper run of the other endless conveyor belt characterised in that the first means for applying the particulate material onto the foodstuff is provided by a horizontal conveyor positioned above the horizontal upper run of the second belt of the horizontal conveyor for the foodstuff in which position the foodstuff is already lying on particulate material applied by the second means and the second means for applying particulate material onto the horizontal conveyor before a foodstuff has reached that part of the conveyor may conveniently be achieved by means of another horizontal conveyor positioned between the first belt and the portion of the second belt positioned below the first belt of the horizontal conveyor for the foodstuff, the particulate material being fed from the leading edge onto the portion of the second belt below the first belt from where it is transported forwards and upwards to the horizontal upper run of the second belt.

Although the excess particulate material which falls off the second belt may fall directly onto the inclined conveyor for redistribution, conveniently a further horizontal conveyor belt is positioned below the horizontal portion of the second belt of the conveyor for the foodstuff, for collecting excess particulate material which falls off this second belt and transporting it to the inclined conveyor from where it is distributed to the first and second applying means for reuse.

The present invention also provides a method for coating a foodstuff with a particulate material derived from fresh root vegetables characterised in that foodstuff is fed onto a horizontal conveyor, particulate material derived from fresh root vegetables is coated with a predusting flour and fed onto the foodstuff, further coated particulate material is fed onto at least part of the horizontal conveyor for the foodstuff before the foodstuff has reached that part of the horizontal conveyor, and excess particulate material falls off the horizontal conveyor and is transported upwards on an inclined conveyor to be redistributed and reused.

The presence of the predusting flour coated on the surface of the particulate material derived from fresh root vegetables helps to avoid the formation of agglomerates of the particles so that the transport is smooth and a satisfactory even coating is obtained. The amounts of predusting flour are those indicated above. If the amount of predusting flour is too low or too high, the mechanical circulation of the particulate material in the system will not work satisfactorily. If the amount is too low agglomerates of the particles are formed which complicates the mechanical transport, while if the amount is too high there will be excess "free" predust in the system which will stick to parts of the transport system such as the conveyor belt or rollers and will form

layers which will be of certain bacteriological risk.

It is important that the temperature of the particulate material does not rise appreciably above freezing point during its circulation and it has been found that by tempering the particulate material to a temperature from -1°C to -3°C , its temperature does not normally rise above about $+1^{\circ}\text{C}$ during the average holding time in the system of about 30 minutes.

The present invention will now be further illustrated by way of example with reference to the following drawings in which :

Figure 1 is a diagrammatic sectional side view of the apparatus and

Figure 2 is a diagrammatic top plan view of the apparatus.

Referring to the drawings, the apparatus generally designated 10, comprises a horizontal conveyor for transporting a foodstuff consisting of solid belts 11, 12 and 13 travelling in the direction of the arrows. The upper run of solid belt 12 has a lower horizontal portion 14, an inclined portion 15 and an upper horizontal portion 16. Positioned between the solid belt 11 and lower horizontal portion 14 is a U-shaped endless conveyor belt 17, the upper run of which travels in the direction of the arrows. Positioned above the horizontal portion 16 is a further U-shaped endless conveyor belt 18 the upper run of which travels in the direction of the arrows, and a pressure roller 19. At the leading edge of the horizontal portion 16 is a chute 20 which leads to one end of a conveyor belt 21 at the other end of which is the lower end of an inclined oscillating conveyor belt 22 fitted with transverse ridges (not shown). At the top of conveyor belt 22 are a pair of chutes (not shown) one of each respectively leading to the rear edge of one of the U-shaped belts 17 and 18.

In operation, battered frozen fish portions 23, which had initially been deglazed with steam and predusted with grilled cracker meal 454, each weighing 50 g are fed from a freezer (not shown) on to solid belt 11. Fresh potato strips 24 having dimensions of 3mm x 3mm x 7 mm are coated with 7% by weight of granulated potato based on the weight of potato strips, tempered to -2°C and are fed continuously from a means (not shown) on to the U-shaped belt 17 to flow in the direction of the arrows until they fall off the leading edge onto the lower horizontal portion 14 to form a layer which is transported upwards along the inclined portion 15 to the upper horizontal portion 16 of belt 12. The battered frozen fish portions 23 are transferred from the upper run of belt 11 on to the upper horizontal portion 16 of belt 12 where they lie on the layer of potato strips. Further coated fresh potato strips 24 of the same dimensions are fed continuously from a means (not shown) on to the U-shaped belt 18 to flow in the direction of the arrow until they fall off the leading edge onto the fish portions on the upper horizontal portion 16 of belt 12. The fish portions coated with 35% by weight of potato strips based on the total weight are then transported under a pressure roller 19 and on to conveyor belt 13 which transports them to the fryer. Excess potato strips 24 fall off the

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leading edge of belt 12 onto the chute 20 where they are carried to conveyor belt 21 which transports them to the inclined conveyor belt 22. Here the fresh potato strips are transported upwards, the transverse ridges preventing the potato pieces from sliding backwards, where they are distributed to two chutes one leading to the rear edge of U-belt 17 and the other leading to the rear edge of U-belt 18 on which they are transported for reuse. After frying, the completely coated fish portions are deep-frozen.

The final pre-fried product had the following composition:

Fish - 50%

Steam (as water) - 1%

Milled cracker meal 454 - 4%

Batter - 10%

Potato - 23%

Granulated potato - 2%

Oil - 10%

In this invention, the application to a foodstuff of a particulate coating material derived from fresh root vegetables in larger amounts and comprising particles of a larger size in comparison with conventional coated food products results in an entirely new product concept, with especially desirable organoleptic properties and a lower fat content, the production of which has hitherto not been possible. The products also have an interesting, attractive appearance quite different from conventionally coated products.

Claims

1. A frozen food product comprising fish or meat coated with batter and a particulate material, which is prefried before being deep-frozen characterised in that the particulate material is derived from fresh root vegetables, the individual particles have a volume from 20 to 250 cubic millimetres and the amount of particulate material applied to the fish or meat is between 10 and 70 % by weight based on the total weight of the frozen food product.

2. A frozen food product according to claim 1 characterised in that the individual particles have a volume from 40 to 200 cubic millimetres.

3. A frozen food product according to claim 1 characterised in that the amount of particulate material applied to the fish or meat is from 15 to 50 % by weight based on the total weight of the frozen food product.

4. A frozen food product according to claim 1 characterised in that the particulate material is coated with from 4 to 12 % by weight of a predusting flour based on the weight of the particulate material before it is applied to the fish or meat.

5. A frozen food product according to claim 1 characterised in that the particulate material is derived from fresh potatoes.

6. A process for preparing a frozen food product which comprises coating fish or meat firstly with batter, then with a particulate material and afterwards prefrying and deep-freezing characterised in that the particulate material is derived from fresh root vegetables, the individual particles have a vol-

ume from 20 to 250 cubic millimetres and the amount of particulate material applied to the fish or meat is between 10 and 70 % by weight based on the total weight of the frozen food product.

7. An apparatus for coating a foodstuff with a particulate material derived from fresh root vegetables comprising a horizontal conveyor for a foodstuff, means for applying the foodstuff to the horizontal conveyor, a first means for applying a particulate material onto the foodstuff, a second means for applying particulate material onto at least part of the horizontal conveyor before the foodstuff has reached that part of the horizontal conveyor, and means for transporting excess particulate material which falls off the horizontal conveyor upwardly on an inclined conveyor for redistribution to the first and second applying means for reuse wherein the horizontal conveyor for the foodstuff comprises at least two endless conveyor belts having horizontal upper runs arranged successively whereby the upper run of the second belt has a portion positioned below the first belt and which travels upwards and forwards to form a horizontal portion level with the horizontal upper run of the other endless conveyor belt characterised in that the first means for applying the particulate material onto the foodstuff is provided by a horizontal conveyor positioned above the horizontal upper run of the second belt of the horizontal conveyor for the foodstuff and the second means for applying particulate material onto the horizontal conveyor before a foodstuff has reached that part of the conveyor is achieved by means of another horizontal conveyor positioned between the first belt and the portion of the second belt positioned below the first belt of the horizontal conveyor for the foodstuff, the particulate material being fed from the leading edge onto the portion of the second belt below the first belt from where it is transported forwards and upwards to the horizontal upper run of the second belt.

8. A method for coating a foodstuff with a particulate material derived from fresh root vegetables characterised in that using the apparatus claimed in claim 7 foodstuff is fed onto a horizontal conveyor, particulate material derived from fresh root vegetables is coated with a predusting flour and fed onto the foodstuff, further coated particulate material is fed onto at least part of the horizontal conveyor for the foodstuff before the foodstuff has reached that part of the horizontal conveyor, and excess particulate material falls off the horizontal conveyor and is transported upwards on an inclined conveyor to be redistributed and reused.

9. A method according to claim 8 characterised in that the particulate material is tempered to a temperature from -1°C to -3°C before being introduced into the system.

Patentansprüche

1. Gefrorenes Nahrungsmittelprodukt, das wenigstens teilweise aus einem mit einem Teig und einem teilchenförmigen Material überzogenen Fisch oder Fleisch besteht und das vor dem Tiefgefrieren vorgebraten ist, dadurch gekennzeichnet, daß das teil-

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leading edge of belt 12 onto the chute 20 where they are carried to conveyor belt 21 which transports them to the inclined conveyor belt 22. Here the fresh potato strips are transported upwards, the transverse ridges preventing the potato pieces sliding backwards, where they are distributed to two chutes one leading to the rear edge of U-belt 17 and the other leading to the rear edge of U-belt 18 on which they are transported for reuse. After frying, the completely coated fish portions are deep-frozen.

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2. A frozen food product according to claim 1 characterised in that the individual particles have a volume from 40 to 200 cubic millimetres.

3. A frozen food product according to claim 1 characterised in that the amount of particulate material applied to the fish or meat is from 15 to 50 % by weight based on the total weight of the frozen food product.

4. A frozen food product according to claim 1 characterised in that the particulate material is coated with from 4 to 12 % by weight of a predusting flour based on the weight of the particulate material before it is applied to the fish or meat.

5. A frozen food product according to claim 1 characterised in that the particulate material is derived from fresh potatoes.

6. A process for preparing a frozen food product which comprises coating fish or meat firstly with batter, then with a particulate material and afterwards prefrying and deep-freezing characterised in that the particulate material is derived from fresh root vegetables, the individual particles have a vol-

ume from 20 to 250 cubic millimetres and the amount of particulate material applied to the fish or meat is between 10 and 70 % by weight based on the total weight of the frozen food product.

7. An apparatus for coating a foodstuff with a particulate material derived from fresh root vegetables comprising a horizontal conveyor for a foodstuff, means for applying the foodstuff to the horizontal conveyor, a first means for applying a particulate material onto the foodstuff, a second means for applying particulate material onto at least part of the horizontal conveyor before the foodstuff has reached that part of the horizontal conveyor, and means for transporting excess particulate material which falls off the horizontal conveyor upwardly on an inclined conveyor for redistribution to the first and second applying means for reuse wherein the horizontal conveyor for the foodstuff comprises at least two endless conveyor belts having horizontal upper runs arranged successively whereby the upper run of the second belt has a portion positioned below the first belt and which travels upwards and forwards to form a horizontal portion level with the horizontal upper run of the other endless conveyor belt characterised in that the first means for applying the particulate material onto the foodstuff is provided by a horizontal conveyor positioned above the horizontal upper run of the second belt of the horizontal conveyor for the foodstuff and the second means for applying particulate material onto the horizontal conveyor before a foodstuff has reached that part of the conveyor is achieved by means of another horizontal conveyor positioned between the first belt and the portion of the second belt positioned below the first belt of the horizontal conveyor for the foodstuff, the particulate material being fed from the leading edge onto the portion of the second belt below the first belt from where it is transported forwards and upwards to the horizontal upper run of the second belt.

8. A method for coating a foodstuff with a particulate material derived from fresh root vegetables characterised in that using the apparatus claimed in claim 7 foodstuff is fed onto a horizontal conveyor, particulate material derived from fresh root vegetables is coated with a predusting flour and fed onto the foodstuff, further coated particulate material is fed onto at least part of the horizontal conveyor for the foodstuff before the foodstuff has reached that part of the horizontal conveyor, and excess particulate material falls off the horizontal conveyor and is transported upwards on an inclined conveyor to be redistributed and reused.

9. A method according to claim 8 characterised in that the particulate material is tempered to a temperature from -1°C to -3°C before being introduced into the system.

Patentansprüche

1. Gefrorenes Nahrungsmittelprodukt, das wenigstens teilweise aus einem mit einem Teig und einem teilchenförmigen Material überzogenen Fisch oder Fleisch besteht und das vor dem Tiefgefrieren vorgebraten ist, dadurch gekennzeichnet, daß das teil-



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chenförmige Material aus frischen Wurzelgemüsen gewonnen ist, die individuellen Teilchen ein Volumen von 20 bis 250 mm³ aufweisen und die Menge des teilchenförmigen Materials, das auf den Fisch oder das Fleisch aufgebracht ist, zwischen 10 und 70 Gew.-%, bezogen auf das Gesamtgewicht des gefrorenen Nahrungsmittelprodukts, beträgt.

2. Gefrorenes Nahrungsmittelprodukt nach Anspruch 1, dadurch gekennzeichnet, daß die individuellen Teilchen ein Volumen von 40 bis 200 mm³ aufweisen.

3. Gefrorenes Nahrungsmittelprodukt nach Anspruch 1, dadurch gekennzeichnet, daß die Menge des teilchenförmigen Materials, das auf den Fisch oder das Fleisch aufgebracht ist, von 15 bis 50 Gew.-%, bezogen auf das Gesamtgewicht des gefrorenen Nahrungsmittelprodukts, beträgt.

4. Gefrorenes Nahrungsmittelprodukt nach Anspruch 1, dadurch gekennzeichnet, daß das teilchenförmige Material mit von 4 bis 12 Gew.-%, bezogen auf das Gewicht des teilchenförmigen Materials, eines Voreinstäubmehls überzogen ist, bevor es auf den Fisch oder das Fleisch aufgebracht wird.

5. Gefrorenes Nahrungsmittelprodukt nach Anspruch 1, dadurch gekennzeichnet, daß das teilchenförmige Material aus frischen Kartoffeln gewonnen ist.

6. Verfahren zur Herstellung eines gefrorenen Nahrungsmittelprodukts, das das Überziehen von Fisch oder Fleisch zuerst mit einem Teig, dann mit einem teilchenförmigen Material und anschließend ein Vorbraten und Tiefgefrieren umfaßt, dadurch gekennzeichnet, daß das teilchenförmige Material aus frischen Wurzelgemüsen gewonnen ist, die individuellen Teilchen ein Volumen von 20 bis 250 mm³ aufweisen und die Menge des teilchenförmigen Materials, das auf den Fisch oder das Fleisch aufgebracht wird, zwischen 10 und 70 Gew.-%, bezogen auf das Gesamtgewicht des gefrorenen Nahrungsmittelprodukts, beträgt.

7. Vorrichtung zum Überziehen eines Nahrungsmittels mit einem teilchenförmigen Material, das aus frischen Wurzelgemüsen gewonnen ist, die einen waagerechten Förderer für ein Nahrungsmittel, eine Einrichtung zum Aufbringen des Nahrungsmittels auf den waagerechten Förderer, eine erste Einrichtung zum Aufbringen eines teilchenförmigen Materials auf das Nahrungsmittel, eine zweite Einrichtung zum Aufbringen von teilchenförmigem Material auf wenigstens einen Teil des waagerechten Förderers, bevor das Nahrungsmittel diesen Teil des waagerechten Förderers erreicht hat, sowie eine Einrichtung zum Transportieren von überschüssigem teilchenförmigem Material, das von dem waagerechten Förderer herabfällt, nach oben auf einen geeigneten Förderer aufweist, um es wieder auf die erste und die zweite Aufbringeinrichtung zu seiner Wiederverwendung zu verteilen, bei der der waagerechte Förderer für das Nahrungsmittel wenigstens zwei endlose Förderbänder mit waagerecht angeordneten oberen Trümp aufweist, die aneinander anschließend angeordnet sind, wobei das obere Trümp des zweiten Bandes einen Bereich aufweist, der unterhalb des ersten Bandes angeordnet ist und sich nach vorn oben bis zur Ausbildung eines waage-

rechten Niveaubereichs zusammen mit dem waagerechten oberen Trümp des anderen endlosen Förderbandes erstreckt, dadurch gekennzeichnet, daß die erste Einrichtung zum Aufbringen des teilchenförmigen Materials auf das Nahrungsmittel mit einem waagerechten Förderer versehen ist, der oberhalb des waagerechten oberen Trümps des zweiten Bandes des waagerechten Förderers für das Nahrungsmittel angeordnet ist, und daß die zweite Einrichtung zum Aufbringen des teilchenförmigen Materials auf den waagerechten Förderer, bevor ein Nahrungsmittel diesen Teil des Förderers erreicht hat, durch einen weiteren waagerechten Förderer gebildet wird, der zwischen dem ersten Band und dem Bereich des zweiten Bandes, der unterhalb des ersten Bandes des waagerechten Förderers für das Nahrungsmittel angeordnet ist, angeordnet ist, wobei das teilchenförmige Material von der Vorderkante auf den Bereich des zweiten Bandes unterhalb des ersten Bandes zugeführt wird, von wo es nach vorn und oben zum horizontalen oberen Trümp des zweiten Bandes transportiert wird.

8. Verfahren zum Überziehen eines Nahrungsmittels mit einem teilchenförmigen Material, das aus frischen Wurzelgemüsen gewonnen ist, dadurch gekennzeichnet, daß unter Verwendung der in Anspruch 7 beanspruchten Vorrichtung das Nahrungsmittel auf einen waagerechten Förderer aufgegeben wird, ein teilchenförmiges Material, das aus frischen Wurzelgemüsen gewonnen ist, mit einem Voreinstäubmehl überzogen und auf das Nahrungsmittel aufgebracht wird, weiteres überzogenes teilchenförmiges Material auf wenigstens einen Teil des waagerechten Förderers für das Nahrungsmittel aufgebracht wird, bevor das Nahrungsmittel diesen Teil des waagerechten Förderers erreicht hat, und überschüssiges Material von dem waagerechten Förderer herabfällt und nach oben auf einem geeigneten Förderer zur Wiederverteilung und Wiederverwendung transportiert wird.

9. Verfahren nach Anspruch 8, dadurch gekennzeichnet, daß das teilchenförmige Material vor seiner Einführung in die Anlage auf eine Temperatur von -1°C bis -3°C temperiert wird.

Revendications

1. Produit alimentaire congelé comprenant du poisson ou de la viande enrobé de pâte à frire et d'une matière en particules, qui est préfrit avant d'être congelé à basse température, caractérisé en ce que la matière en particules provient de racines alimentaires fraîches, les particules individuelles ont un volume de 20 à 250 mm³ et la quantité de matière en particules appliquée au poisson ou à la viande est comprise entre 10 et 70 % en poids sur la base du poids total du produit alimentaire congelé.

2. Produit alimentaire congelé selon la revendication 1, caractérisé en ce que les particules individuelles ont un volume de 40 à 200 mm³.

3. Produit alimentaire congelé selon la revendication 1, caractérisé en ce que la quantité de matière en particules appliquée au poisson ou à la viande est comprise entre 15 et 50 % en poids sur la base du poids total du produit alimentaire congelé.



4. Produit alimentaire congelé selon la revendication 1, caractérisé en ce que la matière en particules est enrobée avec 4 à 12 % en poids d'une farine de pré-saupoudrage sur la base du poids de la matière en particules avant qu'elle soit appliquée au poisson ou à la viande.

5. Produit alimentaire congelé selon la revendication 1, caractérisé en ce que la matière en particules provient de pommes de terre fraîches.

6. Procédé pour préparer un produit alimentaire congelé qui consiste à enrober du poisson ou de la viande d'abord avec de la pâte à frire, puis avec une matière en particules et à procéder ensuite à une préfriture et une congélation à basse température, caractérisé en ce que la matière en particules provient de racines alimentaires fraîches, les particules individuelles ont un volume de 20 à 250 mm³ et la quantité de matière en particules appliquée au poisson ou à la viande est comprise entre 10 et 70 % en poids sur la base du poids total du produit alimentaire congelé.

7. Appareil pour enrober un produit alimentaire avec une matière en particules provenant de racines alimentaires fraîches, comprenant un transporteur horizontal pour un produit alimentaire, des moyens destinés à appliquer le produit alimentaire sur le transporteur horizontal, un premier moyen destiné à appliquer une matière en particules sur le produit alimentaire, un second moyen destiné à appliquer une matière en particules sur au moins une partie du transporteur horizontal avant que le produit alimentaire ait atteint cette partie du transporteur horizontal, et des moyens destinés à transporter vers le haut la matière en particules en excès qui tombe du transporteur horizontal jusque sur un transporteur incliné pour la redistribuer aux premier et second moyens d'application afin qu'elle soit réutilisée, appareil dans lequel le transporteur horizontal pour le produit alimentaire comprend au moins deux bandes transporteuses sans fin ayant des brins supérieurs horizontaux disposés l'un à la suite de l'autre de manière que le brin supérieur de la seconde bande comprenne un tronçon placé au-dessous de la première bande et qui se déplace vers le haut et vers l'avant pour former un tronçon horizontal de niveau avec le brin supérieur horizontal de l'autre bande transporteuse sans fin, caractérisé en ce que le premier moyen destiné à appliquer la matière en particules sur le produit alimentaire est constitué par un transporteur horizontal placé au-dessus du brin supérieur horizontal de la seconde bande du transporteur horizontal pour le produit alimentaire et le second moyen destiné à appliquer la matière en particules sur le transporteur horizontal avant qu'un produit alimentaire ait atteint cette partie du transporteur est réalisé au moyen d'un autre transporteur horizontal placé entre la première bande et le tronçon de la seconde bande placé au-dessous de la première bande du transporteur horizontal pour le produit alimentaire, la matière en particules étant amenée du bord avant sur le tronçon de la seconde bande au-dessous de la première bande d'où elle est transportée vers l'avant et vers le haut jusqu'au brin supérieur horizontal de la seconde bande.

8. Procédé pour enrober un produit alimentaire avec une matière en particules provenant de racines alimentaires fraîches, caractérisé en ce qu'en utilisant l'appareil selon la revendication 7, le produit alimentaire est amené sur un transporteur horizontal, une matière en particules provenant de racines alimentaires fraîches est enrobée avec une farine de pré-saupoudrage et amenée sur le produit alimentaire, une quantité supplémentaire de matière en particules enrobée est amenée sur au moins une partie du transporteur horizontal pour le produit alimentaire avant que le produit alimentaire ait atteint cette partie du transporteur horizontal, et de la matière en particules en excès tombe du transporteur horizontal et est transportée vers le haut sur un transporteur incliné pour être redistribuée et réutilisée.

9. Procédé selon la revendication 8, caractérisé en ce que la matière en particules est tempérée à une température de -1°C à -3°C avant d'être introduite dans le système.

