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(54) **Device for storing root crops**

Vorrichtung zum Speichern von Wurzelfrüchten

Dispositif pour stocker des plantes racines

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(56) References cited:
**GB-A- 960 014 NL-A- 9 100 377
US-A- 2 370 539 US-A- 5 425 459**

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Description

Field of the invention

[0001] The present invention relates to a device for barn-storing root crops. The device comprises a main frame with a filling bunker with a movable bottom, a first and second roller module with an adjustable distance between the central axes of adjacent rollers and respective first and second transverse discharge conveyors co-acting therewith, and an end discharge conveyor (see e.g. NL-A-9100377).

[0002] The device is intended for the purpose of receiving a load of root crops, and in particular freshly harvested root crops, and separating and delivering different fractions, including soil tare and undersize root crops, in a continuous process.

Background of the invention

[0003] In a known embodiment of the device stated in the preamble the first roller module situated behind the mouth of the filling bunker is intended for the purpose of cleaning the harvested product. This processing step has the purpose of separating soil tare such as crumbs and balls of soil, stalks, stones and the like from the main product flow. Known roller modules are equipped for this purpose with driven smooth or spiral-shaped rollers oriented at right angles to the product flow direction or rollers having elements of star shape and shapes derived therefrom.

[0004] Provided for the purpose of lateral discharge of the separated fraction is a first transverse discharge conveyor situated at right angles to the product flow direction under the first roller module. The guiding particularly of moist soil crumbs from the first roller module to the first transverse discharge conveyor is a critical part of the process. Moist soil has a strong tendency to stick to static machine parts through adhesion. Soil can then accumulate thereon as a result of cohesion, with possible clogging and blocking of machine parts as a result. An important design requirement therefore is that the contact between loose soil and static machine parts has to be avoided as far as possible. For this reason the choice is made in known devices to adapt the effective width of the first transverse discharge conveyor to the maximum width of the first roller module, i.e. for the situation wherein the set distance between adjacent rollers is maximal.

[0005] In order to adjust the distance between adjacent rollers use is usually made of variants of the known scissor mechanism consisting of a plurality of coupled scissors. In known devices the first roller module and the first transverse discharge conveyor co-act such that, when the first roller module narrows, a part of the first transverse discharge conveyor, as seen from the side of the device, slides under the mouth of the filling bunker.

[0006] In known devices of the present type the first roller module guides the main product flow onto an ad-

jacent second roller module. This second roller module can also be intended for cleaning of the harvested root crops, although applied more often is an embodiment wherein the second roller module is intended for the purpose of sorting the harvested product. The rollers oriented at right angles to the product flow direction can for this purpose be provided with constrictions to allow passage of undersize tubers or bulbs. An example of such a device is described in NL8602843. The second roller module often co-acts here with a second transverse discharge conveyor for lateral discharge of the separated fraction. The second transverse discharge conveyor is often similar here to the first discharge conveyor.

[0007] In known devices the second roller module and the second conveyor belt co-act such that, when the second roller module narrows, the second transverse discharge conveyor will, due to the reduction of the distance between the central axes of adjacent rollers, slide into the space between the first roller module and the first conveyor belt, as seen from the side of the device.

[0008] A first drawback of these known devices is that soil accumulates easily on static parts of the second conveyor belt in a situation where the second transverse discharge conveyor is situated partially in the open space between the first roller module and the first transverse discharge conveyor.

[0009] A second drawback of the known devices referred to here is that a part of what drops through the first roller module unintentionally falls onto the second transverse discharge conveyor in the said situation wherein the second transverse discharge conveyor is situated partially between the first roller module and the first transverse discharge conveyor.

[0010] A third drawback is that the main product flow must always pass over the second roller module, even in situations where the second roller module adds nothing to the process and only costs energy, generates wear and increases the chance of damage, for instance due to abrasion of the harvested product.

[0011] A fourth drawback is that the first and the second transverse discharge conveyor are situated so closely to each other that in practical situations both conveyor belts must discharge their product in opposite directions, for which purpose space must be created on both sides of the device. The space available is often scarce in practical situations.

[0012] It is an object of the present invention, among others, to largely obviate the above outlined drawbacks of known devices.

Summary of the invention

[0013] A device of the above specified type according to the invention is for this purpose characterized in that between the first and the second roller module a space is present in which a transport module is situated for receiving the root crops from the first roller module and delivering thereof to the second roller module. An advan-

tage of this feature is that the space between the first and second roller modules can be utilized to create a space for receiving a part of the width of the second discharge conveyor in the situation where the second roller module is adjusted such that the distance between adjacent rollers is not maximal.

[0014] The space spanned by the transport module, as measured between the final roller of the first roller module and the first roller of the second roller module, amounts to a minimum of 0.2 m. Sufficient space is hereby created to receive the second transverse discharge conveyor without it extending to below the first roller module. This effectively prevents whatever drops through the first roller module from falling onto the second transverse discharge conveyor.

[0015] The transport module according to the present invention has an endless, substantially smooth closed conveyor belt with a drive having an independent continuously variable drive speed. The independent continuously variable drive speed results in the particular advantage that the possibility is hereby created of singulating the root crops. This enhances the sorting effect of the second roller module.

[0016] The device according to the invention also comprises a first sub-frame in which the first transverse discharge conveyor and the transport module are held. The first sub-frame is connected here for displacement in the longitudinal direction to the main frame and is further coupled with first coupling means to the first roller module such that an adjustment of the distance between the central axes of adjacent rollers of the first roller module results in a displacement of the first sub-frame in a measure which is substantially equal to the sum of the changes in the distances between the respective adjacent rollers.

[0017] The device further comprises a second sub-frame in which the second transverse discharge conveyor and the end discharge conveyor are held. The second sub-frame is connected here for displacement in the longitudinal direction to the main frame and is coupled with second coupling means to the second roller module such that an adjustment of the distance between the central axes of adjacent rollers of the second roller module results in a displacement of the second sub-frame in a measure which is substantially equal to the sum of the changes in the distances between the respective adjacent rollers.

[0018] The device is further characterized in that the second roller module couples the first sub-frame to the second sub-frame by means of respective second and third coupling means such that a displacement of the first sub-frame results in a substantially equal displacement of the second sub-frame. The transport module extends here over a part of the second transverse discharge conveyor at a setting wherein the distance between adjacent rollers of the second roller module is minimal. The features of the invention stated here effectively prevent separated soil tare from the first roller module accumulating on the edge of the second transverse discharge conveyor

and prevent soil tare mixing with the undersize tubers or bulbs separated by the second roller module. The invention further provides a relatively simple adjusting mechanism for optimum spatial positioning of the first and second transverse discharge conveyors relative to respectively the first and second roller modules.

[0019] According to a particular embodiment of the invention, the transport module is held by the first sub-frame for rotation about a shaft and co-acts here with the second transverse discharge conveyor such that in the operational mode the flow with root crops is guided by the transport module onto the second transverse discharge conveyor. A bypass is thus realized in simple and effective manner for the purpose of avoiding the second roller module.

[0020] Because the first and second transverse discharge conveyors are situated adjacently of each other instead of partially above each other, the option is created of discharging both separated fractions in the same direction using the transverse discharge conveyors. For both transverse discharge conveyors use is preferably made here of drives with an adjustable drive direction so that the discharge direction can be adapted to the space available around the device in the operational mode.

Short description of the drawings

[0021] The invention is elucidated with reference to two figures. Figure 1 herein shows a detailed perspective view of the device according to the invention. Known accessories, such as a feed reel and a roller cleaner, are omitted for the sake of clarity. Figure 2 shows a highly simplified schematic side view of the characterizing aspects of the device. A more detailed elaboration of the device according to the invention is dispensed with since it adds nothing to the essence of the present invention but serves only by way of example of well-known technical measures.

Exemplary embodiment of a device according to the invention

[0022] The invention will be further elucidated hereinbelow by way of example with reference to one exemplary embodiment shown in the drawings. Figure 1 herein shows a perspective view of device 1 for storing root crops according to the invention. Device 1 is provided with a main frame 2 with a chassis 3 and with a filling bunker 4 for receiving in buffer supply a load of root crops from for instance a tipper truck and gradually delivering this buffer supply via the mouth to a so-called cleaning unit 5. Filling bunker 4 is embodied for this purpose with a movable bottom 6, for instance in the form of an endless belt. Cleaning unit 5 consists of at least a first and a second roller module 7, 8. Roller modules 7, 8 are similar to known roller modules which consist of a plurality of hydraulically or electrically driven smooth, spiral-shaped or otherwise profiled rollers which are oriented at right an-

gles to the longitudinal axis or main flow direction and the shafts of which are received bearing-mounted at both outer ends in multiple scissor constructions. Known roller modules are provided for this purpose with a central adjusting device. The first and the second roller module 7, 8 are preferably applied respectively for separating soil tare such as soil, stalks and stones and for sorting undersize root crops from the main product flow. The fractions separated by the first and second roller modules 7, 8 are discharged laterally by means of respectively a first and a second transverse discharge conveyor 9, 10. The main product flow is discharged in lateral or longitudinal direction by an end discharge conveyor 11, not further specified here. Created according to the invention between the first and the second roller module 7, 8 is a space which is spanned by a transport module 12. Transport module 12 takes up the main product flow from first roller module 7 and delivers it to second roller module 8. Transport module 12 preferably comprises an endless, substantially smooth and closed conveyor belt and a drive with a continuously variable drive speed. According to the invention the space spanned by transport module 12, as measured between the final roller of first roller module 7 and the first roller of second roller module 8, measures a minimum of 0.2 m.

[0023] The co-action between the above stated components of cleaning unit 5 and the associated structural features are elucidated hereinbelow with reference to figures 2a-d. Figure 2a shows a schematic side view of a part of filling bunker 4 with movable bottom 6 and main frame 2 with chassis 3. A first and second sub-frame 13, 14 are connected to main frame 2 for displacement in the longitudinal direction, i.e. in the direction of the main product flow. First sub-frame 13 comprises the first transverse discharge conveyor 9 and transport module 12. The final roller 15, as seen in the direction of the main product flow, is coupled with first coupling means 16 for rotation about a shaft to first sub-frame 13. The shaft of final roller 15 of first roller module 7 or the shaft of first roller 17 of transport module 12 can for instance serve here as rotation shaft. In the latter case coupling means 16 are preferably attached fixedly to the scissor of final roller 15. First roller 18 of the first roller module is coupled with fourth coupling means 19 for rotation about a shaft to filling bunker 4 close to the mouth. Available under movable bottom 6, at the mouth of filling bunker 4, is a space for receiving a part of the first transverse discharge conveyor 9. In an operational mode wherein the set distance between the central axes of adjacent rollers of first roller module 7 is minimal, a part of the transverse discharge conveyor 9 is situated in the space under the mouth of movable bottom 6. This situation is shown schematically in figure 2a. Figure 2b shows an operational mode in which the set distance between the adjacent rollers of first roller module 7 is maximal. In this situation the extended first roller module 7 has displaced the sub-frame 13 coupled thereto with first coupling means 16 to the rear in the direction of the main product flow. The first

transverse discharge conveyor 9 is situated here substantially wholly beneath first roller module 7.

[0024] Second sub-frame 14 comprises the second transverse discharge conveyor 10 and end discharge conveyor 11. Second roller module 8 here connects first sub-frame 13 to second sub-frame 14 by means of second and third coupling means 20, 21 in a manner similar to that in which first sub-frame 13 is coupled to filling bunker 4 by first roller module 7 and the first and fourth coupling means 16, 19. Owing to the coupling of first and second sub-frames 13, 14 outlined here a displacement of first sub-frame 13, as a result of an adjustment of the distance between adjacent rollers of first roller module 7, results in a substantially equally great displacement of second sub-frame 14.

[0025] In the operational mode according to figure 2b the set distance between adjacent rollers of second roller module 8 is minimal. In this situation the second transverse discharge conveyor 10 is situated partially in the space under transport module 12.

[0026] In the operational mode according to figure 2c the set distance between adjacent rollers of second roller module 8 is maximal. In this situation the extended second roller module 8 has displaced the sub-frame 14 coupled thereto with third coupling means 21 to the rear in the direction of the main product flow. The second transverse discharge conveyor 10 is situated here substantially wholly under second roller module 8.

[0027] It will be apparent from figures 2a-c that applying a transport module 12 avoids in effective manner soil accumulating on the edge of the second transverse discharge conveyor 10 and the undersize product separated from the main product flow by second roller module 8 mixing with soil tare separated by first roller module 7. The invention further results in the considerable advantage that the first and second transverse discharge conveyors 9, 10 are situated in a preferred embodiment adjacently of each other and at the same height. This enhances convenience of use.

[0028] Because transport module 12 is equipped with drive means with a variable drive speed independent of other drives, the option is created of pulling apart the product flow at the transition from first roller module 7 to transport module 12, whereby root crops initially joined together are singulated. This enhances the effectiveness of second roller module 8.

[0029] Figure 2d shows an operational mode wherein transport module 12 delivers the root crops onto the second transverse discharge conveyor 10. In order to realize a relatively short drop height, with the object of avoiding damage to the root crops, transport module 12 is for this purpose mounted for rotation about a shaft on first sub-frame 13. In order to create additional space for the product flow, according to the exemplary embodiment in figure 2d the second roller module 8 is uncoupled from first sub-frame 13 and rotated upward via the rotation shaft of coupling means 21. The thus realized bypass of second roller module 8 is a useful operational mode for spar-

ing the root crops and second roller module 8 in situations where separation of undersize product is not desired.

Claims

1. Device (1) for storing root crops comprising a main frame (2) with a filling bunker (4) with a movable bottom (6), first and second roller modules (7, 8) with an adjustable distance between the central axes of adjacent rollers, with respectively a first and a second transverse discharge conveyor (9, 10) co-acting therewith, and an end discharge conveyor (11), **characterized in that** between the first and the second roller module (7, 8) a space is present in which a transport module (12) is situated for receiving the root crops from the first roller module (7) and delivering thereof to the second roller module (8).
2. Device (1) as claimed in claim 1, **characterized in that** the space spanned by the transport module (12), as measured between the final roller of the first roller module (7) and the first roller of the second roller module (8), amounts to a minimum of 0.2 m.
3. Device (1) as claimed in claim 1 or 2, **characterized in that** the transport module (12) comprises an endless, substantially smooth closed conveyor belt with a drive having an independent continuously variable drive speed.
4. Device (1) as claimed in any of the claims 1-3, **characterized in that** the device (1) comprises a first sub-frame (13), in which first sub-frame (13) the first transverse discharge conveyor (9) and the transport module (12) are held, which first sub-frame (13) is connected for displacement in the longitudinal direction to the main frame (2) and which first sub-frame (13) is coupled with first coupling means (16) to the first roller module (7) such that an adjustment of the distance between the central axes of adjacent rollers of the first roller module (7) results in a displacement of the first sub-frame (13) in a measure which is substantially equal to the sum of the changes in the distances between the respective adjacent rollers.
5. Device (1) as claimed in any of the claims 1-4, **characterized in that** the device (1) comprises a second sub-frame (14) in which the second transverse discharge conveyor (10) and the end discharge conveyor (11) are held, which second sub-frame (14) is connected for displacement in the longitudinal direction to the main frame (2) and which second sub-frame (14) is coupled with second coupling means (20) to the second roller module (8) such that an adjustment of the distance between the central axes of adjacent rollers of the second roller module (8) results in a displacement of the second sub-frame

(14) in a measure which is substantially equal to the sum of the changes in the distances between the respective adjacent rollers.

6. Device (1) as claimed in claims 4 and 5, **characterized in that** the second roller module (8) couples the first sub-frame (13) to the second sub-frame (14) by means of respective second and third coupling means (20, 21) such that a displacement of the first sub-frame (13) results in a substantially equal displacement of the second sub-frame (14).
7. Device (1) as claimed in any of the claims 1-6, **characterized in that** the transport module (12) extends over a part of the second transverse discharge conveyor (10) at a setting wherein the distance between adjacent rollers of the second roller module (8) is minimal.
8. Device (1) as claimed in any of the claims 1-7 and 4, **characterized in that** the transport module (12) is held by the first sub-frame (13) for rotation about a shaft and co-acts with the second transverse discharge conveyor (10) such that in the operational mode the flow with root crops is guided by the transport module (12) onto the second transverse discharge conveyor (10).
9. Device (1) as claimed in any of the claims 1-8, **characterized in that** the first and the second transverse discharge conveyors (9, 10) are situated at the same height in the main frame (2) in the operational mode.
10. Device (1) as claimed in any of the claims 1-9, **characterized in that** the first and the second discharge conveyors (9, 10) are each provided with a drive with an adjustable drive direction.

Patentansprüche

1. Vorrichtung (1) zum Lagern von Wurzelnbauern, die aufweist: einen Hauptrahmen (2) mit einem Füllbunker (4) mit einem beweglichen Boden (6), erste und zweite Walzenmodule (7, 8) mit einem einstellbaren Abstand zwischen den Mittelachsen benachbarter Walzen, wobei jeweils ein erster und ein zweiter Querabzugsförderer (9, 10) damit zusammenwirken, und einen Endabzugsförderer (11), **dadurch gekennzeichnet, dass** zwischen dem ersten und zweiten Walzenmodul (7, 8) ein Raum vorhanden ist, in dem ein Transportmodul (12) angeordnet ist, um die Wurzelnbauern von dem ersten Walzenmodul (7) zu empfangen und sie an das zweite Walzenmodul (8) zu liefern.
2. Vorrichtung (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Raum, der von dem Transport-

modul (12) überspannt wird, zwischen der abschließenden Walze des ersten Walzenmoduls (7) und der ersten Walze des zweiten Walzenmoduls (8) minimal 0,2 m beträgt.

3. Vorrichtung (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Transportmodul (12) ein endloses, im Wesentlichen glattes geschlossenes Förderband mit einem Antrieb aufweist, der eine unabhängige stufenlos variable Antriebsgeschwindigkeit hat.
4. Vorrichtung (1) nach einem der Ansprüche 1 - 3, **dadurch gekennzeichnet, dass** die Vorrichtung (1) einen ersten Teilrahmen (13) aufweist, wobei in dem ersten Teilrahmen (13) der erste Querabzugsförderer (9) und das Transportmodul (12) gehalten werden, wobei der erste Teilrahmen (13) für die Verschiebung in der Längsrichtung mit dem Hauptrahmen (2) verbunden ist und wobei der erste Teilrahmen (13) mit ersten Kopplungseinrichtungen (16) mit dem ersten Walzenmodul (7) gekoppelt ist, so dass eine Einstellung des Abstands zwischen den Mittelachsen benachbarter Walzen des ersten Walzenmoduls (7) zu einer Verschiebung des ersten Teilrahmens (13) in einem Maß führt, das im Wesentlichen gleich der Summe der Änderungen in den Abständen zwischen den jeweiligen benachbarten Walzen ist.
5. Vorrichtung (1) nach einem der Ansprüche 1 - 4, **dadurch gekennzeichnet, dass** die Vorrichtung (1) einen zweiten Teilrahmen (14) aufweist, in dem der zweite Querabzugsförderer (10) und der Endabzugsförderer (11) gehalten werden, wobei der zweite Teilrahmen (14) für die Verschiebung in der Längsrichtung mit dem Hauptrahmen (2) verbunden ist und wobei der zweite Teilrahmen (14) mit zweiten Kopplungseinrichtungen (20) mit dem zweiten Walzenmodul (8) gekoppelt ist, so dass eine Einstellung des Abstands zwischen den Mittelachsen benachbarter Walzen des zweiten Walzenmoduls (8) zu einer Verschiebung des zweiten Teilrahmens (14) in einem Maß führt, das im Wesentlichen gleich der Summe der Änderungen in den Abständen zwischen den jeweiligen benachbarten Walzen ist.
6. Vorrichtung (1) nach den Ansprüchen 4 und 5, **dadurch gekennzeichnet, dass** das zweite Walzenmodul (8) den ersten Teilrahmen (13) mittels jeweiliger zweiter und dritter Kopplungseinrichtungen (20, 21) derart mit dem zweiten Teilrahmen (14) koppelt, dass eine Verschiebung des ersten Teilrahmens (13) zu einer im Wesentlichen gleich großen Verschiebung des zweiten Teilrahmens (14) führt.
7. Vorrichtung (1) nach einem der Ansprüche 1 - 6, **dadurch gekennzeichnet, dass** das Transportmodul

(12) sich bei einer Einstellung, bei der der Abstand zwischen benachbarten Walzen des zweiten Walzenmoduls (8) minimal ist, über einen Teil des zweiten Querabzugsförderers (10) erstreckt.

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8. Vorrichtung (1) nach einem der Ansprüche 1 - 7 und 4, **dadurch gekennzeichnet, dass** das Transportmodul (12) von dem ersten Teilrahmen (13) für die Drehung um eine Welle gehalten wird und mit dem zweiten Querabzugsförderer (10) derart zusammenwirkt, dass der Fluss der Wurzelanbauernten im Betrieb von dem Transportmodul (12) auf den zweiten Querabzugsförderer (10) geleitet wird.
9. Vorrichtung (1) nach einem der Ansprüche 1 - 8, **dadurch gekennzeichnet, dass** die ersten und zweiten Querabzugsförderer (9, 10) im Betrieb auf der gleichen Höhe in dem Hauptrahmen (2) angeordnet sind.
10. Vorrichtung (1) nach einem der Ansprüche 1 - 9, **dadurch gekennzeichnet, dass** die ersten und zweiten Abzugsförderer (9, 10) jeweils mit einem Antrieb mit einer einstellbaren Antriebsrichtung versehen sind.

Revendications

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1. Dispositif (1) pour stocker des racines comprenant un bâti principal (2) avec une trémie de remplissage (4) avec un fond mobile (6), des premier et second modules de rouleaux (7, 8) avec une distance ajustable entre les axes centraux des rouleaux adjacents, respectivement avec un premier et second transporteurs de décharge transversal (9, 10) coagissant avec ces derniers et un transporteur de décharge d'extrémité (11), **caractérisé en ce que**, entre le premier et le second modules de rouleaux (7, 8), on trouve un espace dans lequel un module de transport (12) est situé pour recevoir les racines du premier module de rouleaux (7) et leur distribution au second module de rouleaux (8).
2. Dispositif (1) selon la revendication 1, **caractérisé en ce que** l'espace couvert par le module de transport (12), tel que mesuré entre le dernier rouleau du premier module de rouleaux (7) et le premier rouleau du second module de rouleaux (8), s'élève à un minimum de 0,2 m.
3. Dispositif (1) selon la revendication 1 ou 2, **caractérisé en ce que** le module de transport (12) comprend une courroie transporteuse sans fin, fermée sensiblement lisse avec un entraînement ayant une vitesse d'entraînement à variation continue indépendante.

4. Dispositif (1) selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** le dispositif (1) comprend un premier bâti auxiliaire (13), dans lequel le premier bâti auxiliaire (13), le premier transporteur de décharge transversal (9) et le module de transport (12) sont maintenus, lequel premier bâti auxiliaire (13) est raccordé, pour le déplacement dans la direction longitudinale, au bâti principal (2) et lequel premier bâti auxiliaire (13) est couplé avec des premiers moyens de couplage (16) au premier module de rouleaux (7), de sorte qu'un ajustement de la distance entre les axes centraux des rouleaux adjacents du premier module de rouleaux (7) se traduit par un déplacement du premier bâti auxiliaire (13) dans une mesure qui est sensiblement égale à la somme des changements des distances entre les rouleaux adjacents respectifs.
5. Dispositif (1) selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** le dispositif (1) comprend un second bâti auxiliaire (14) dans lequel le second transporteur de décharge transversal (10) et le transporteur de décharge d'extrémité (11) sont maintenus, lequel second bâti auxiliaire (14) est raccordé, pour le déplacement dans la direction longitudinale, au bâti principal (2), et lequel second bâti auxiliaire (14) est couplé avec des seconds moyens de couplage (20) au second module de rouleaux (8) de sorte qu'un ajustement de la distance entre les axes centraux des rouleaux adjacents du second module de rouleaux (8) se traduit par un déplacement du second bâti auxiliaire (14) dans une mesure qui est sensiblement égale à la somme des changements des distances entre les rouleaux adjacents respectifs.
6. Dispositif (1) selon les revendications 4 et 5, **caractérisé en ce que** le second module de rouleaux (8) couple le premier bâti auxiliaire (13) au second bâti auxiliaire (14) au moyen de deuxièmes et troisièmes moyens de couplage (20, 21) respectifs, de sorte qu'un déplacement du premier bâti auxiliaire (13) se traduit par un déplacement sensiblement égal du second bâti auxiliaire (14).
7. Dispositif (1) selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** le module de transport (12) s'étend sur une partie du second transporteur de décharge transversal (10) à un réglage dans lequel la distance entre les rouleaux adjacents du second module de rouleaux (8) est minimale.
8. Dispositif (1) selon l'une quelconque des revendications 1 à 7 et 4, **caractérisé en ce que** le module de transport (12) est maintenu par le premier bâti auxiliaire (13) pour la rotation autour d'un arbre et co-agit avec le second transporteur de décharge transversal (10) de sorte que, dans le mode de fonctionnement, le flux avec les racines et guidé par le module de transport (12) sur le second transporteur de décharge transversal (10).
9. Dispositif (1) selon l'une quelconque des revendications 1 à 8, **caractérisé en ce que** le premier et le second transporteur de décharge transversal (9, 10) sont situés à la même hauteur dans le bâti principal (2) dans le mode opérationnel.
10. Dispositif (1) selon l'une quelconque des revendications 1 à 9, **caractérisé en ce que** le premier et le second transporteur de décharge (9, 10) sont chacun prévus avec un entraînement avec une direction d'entraînement ajustable.

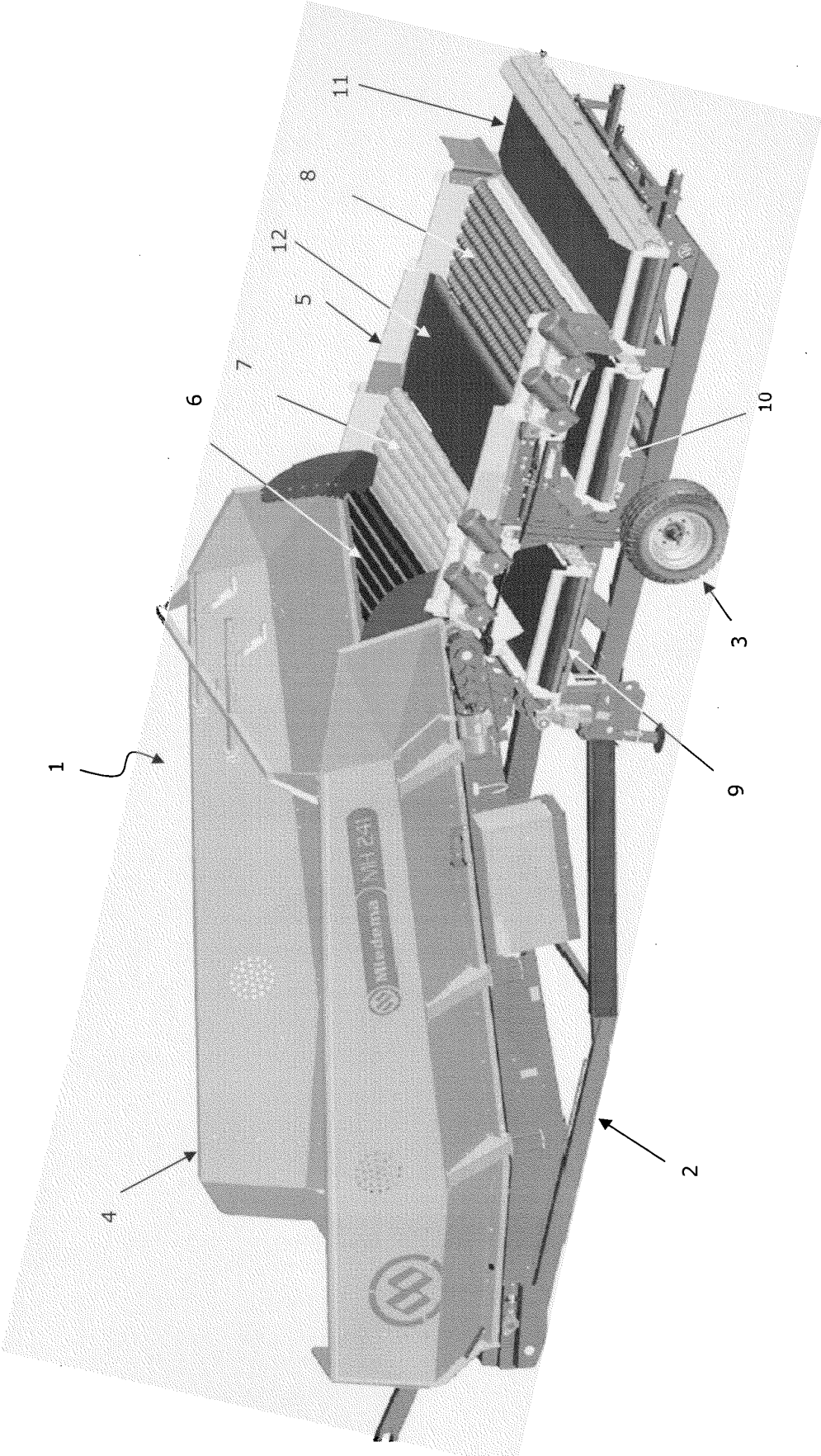


Fig. 1

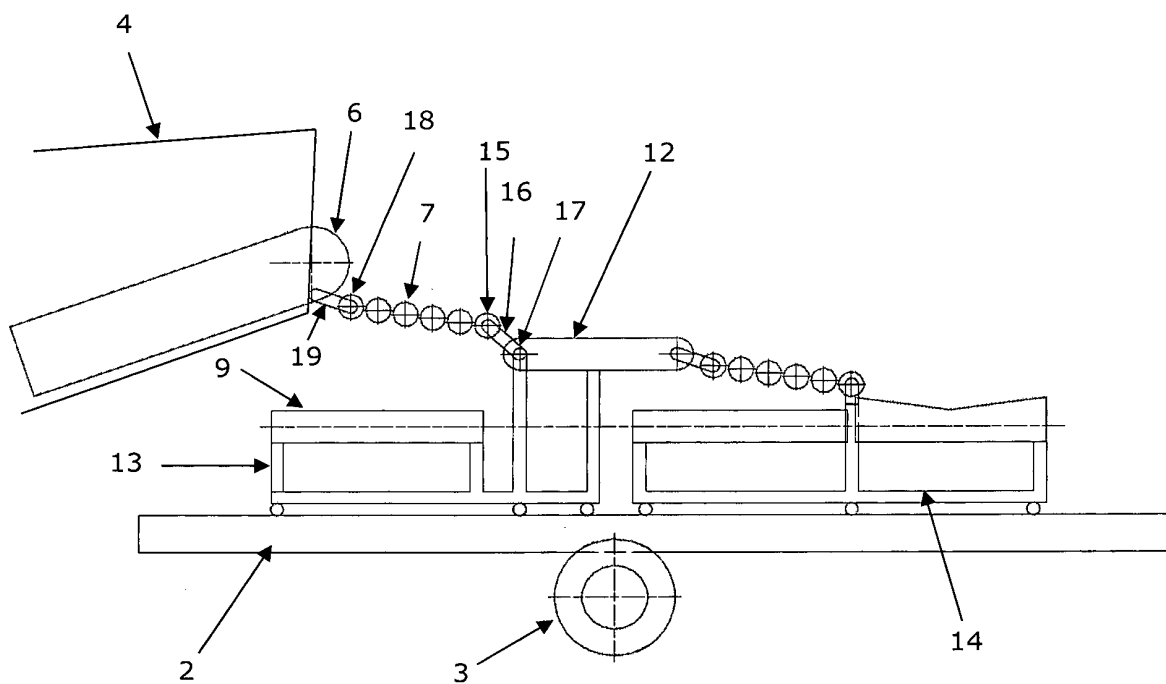


Fig. 2a

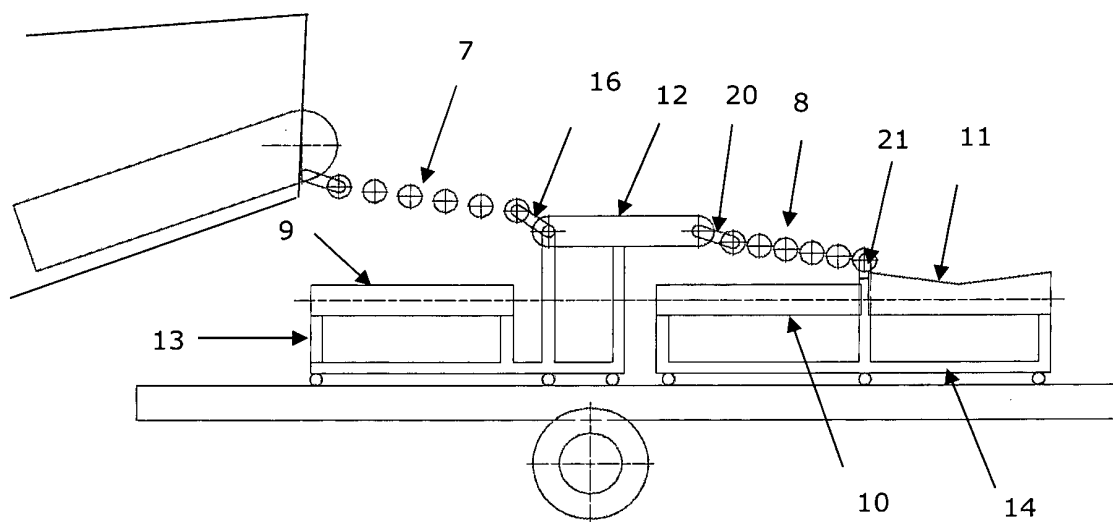


Fig. 2b

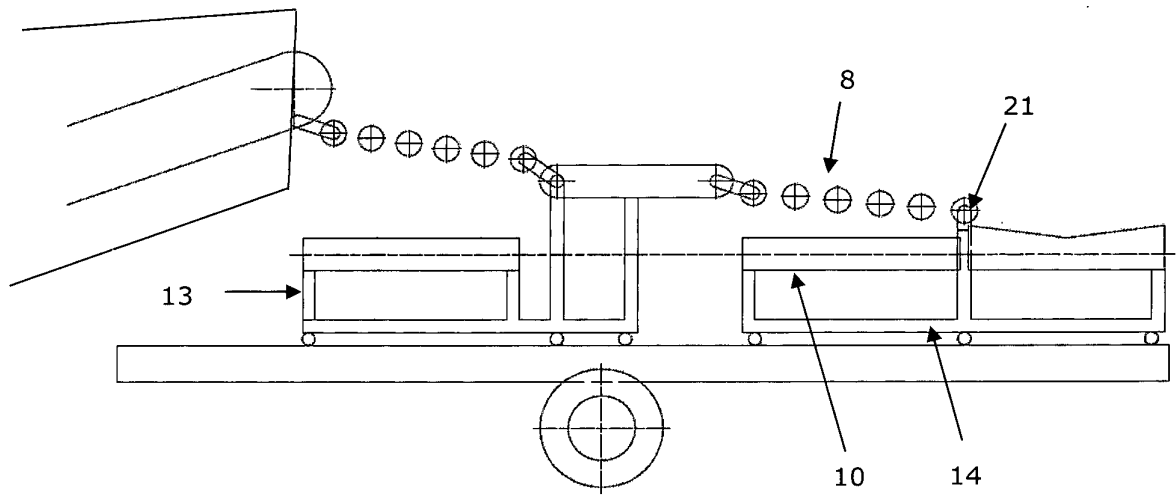


Fig. 2c

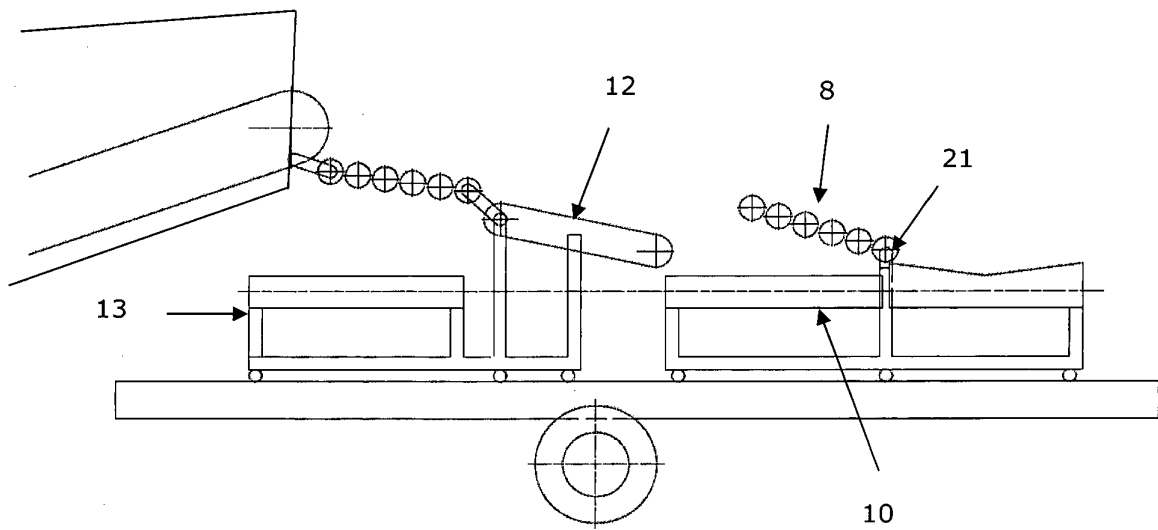


Fig. 2d

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- NL 9100377 A [0001]
- NL 8602843 [0006]