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(54) **Article rotating and conveying assembly and method.**

(57) The invention relates to an article rotating and conveying assembly and method. The assembly comprises a first and a second conveyor belt, which first and second conveyor belts are arranged in a side-by-side, parallel orientation for simultaneously supporting an article. A drive mechanism is arranged for driving both conveyor belts in a conveying direction and for driving said first conveyor belt at a higher speed than said second conveyor belt. Furthermore a retarding device is arranged at a side of said second conveyor belt facing away from said first conveyor belt. The retarding device is movable, preferably in a reciprocating motion, in at least a direction substantially parallel to said conveying direction in order to assist the rotating of said article.

No. NLP194642A

5 Article rotating and conveying assembly and method

10 BACKGROUND

The invention relates to an assembly and method for rotating and conveying an article, in particular a carrier for dough products in a dough processing plant.

15 The United States Patent 4,085,839 describes an apparatus for conveying and rotating articles over an angle of 90 degrees while being conveyed along a predetermined path. The apparatus comprises a platform conveyor for receiving the articles and propelling each along a
20 predetermined path. The rotation is achieved by blocking the movement of a forward corner of the article using a bumper, while the conveyor is still active in propelling the article. Due to the obstruction of the forward corner of the article, said article will pivot around said bumper.
25 During said pivoting, the extending side will be grasped by a side-facing belt to complete rotation and propel the article forward. The platform conveyor comprises a first, a second and a third conveyor belt, which are positioned parallel to each other. The second and third conveyor belts
30 are driven at a faster linear speed than the first conveyor belt to pre-rotate the article prior to contacting the bumper so as to facilitate the turning action of the bumper.

Although the known apparatus is able to convey
35 and rotate articles in a highly controlled manner, it does so at a relatively low travel velocity of said articles.

It is an object of the present invention to

provide an alternative rotating and conveying assembly, suitable for handling articles using a higher travel velocity of said articles.

5 SUMMARY OF THE INVENTION

According to a first aspect, the present invention provides an article rotating and conveying assembly comprising:

10 a first and a second conveyor belt, which first and second conveyor belts are arranged in a side-by-side, parallel orientation for simultaneously supporting an article,

a drive mechanism arranged for driving said first
15 and second conveyor belts in at least a conveying direction and for driving said first conveyor belt at a higher speed than said second conveyor belt,

a retarding device arranged at a side of said second conveyor belt facing away from said first conveyor
20 belt for abutting against a leading edge of said article, wherein the retarding device is movable in at least a direction substantially parallel to said conveying direction and comprises a decelerating device for decelerating a movement of said retarding device in at
25 least said conveying direction.

In use, a leading edge of an article conveyed on both said first and second conveyor belts moves against said retarding device wherein a part of said article abutting said retarding device is retarded in order to
30 assist the rotating of said article. Due to the movable retarding device, which is movable in at least a direction substantially parallel to said conveying direction, and the decelerating device for decelerating a movement of said retarding device in at least said conveying direction, an
35 article arranged on said first and second conveyors can be conveyed at a high velocity and the part of said article abutting said retarding device is slowed down in a gentle

fashion to substantially prevent damaging the article. In addition, the high initial velocity of the article before it reaches said retarding device, can provide enough momentum to rotate the article over an angle of substantially 90 degrees. Thus in the assembly according to the invention there is, *inter alia*, no need to provide a side-facing belt for grasping the extending side to complete rotation and propel the article forward is in the apparatus according to US 4,085,839.

10 The assembly of the present invention comprises a first and a second conveyor belt, which first and second conveyor belts are arranged in a side-by-side, parallel orientation for simultaneously supporting an article. In addition, a drive mechanism is arranged for driving said first and second conveyor belts in at least a conveying direction, and for driving said first conveyor belt at a higher speed than said second conveyor belt. In use, this speed difference produces a pre-rotation of the article on said first and second conveyor belts prior to contacting the retarding device so as to facilitate the turning action of said article by said retarding device.

20 The retarding device is arranged for retarding the movement of a first forward corner of the article, in particular the forward corner of said article arranged at or facing the side of said second conveyor belt facing away from said first conveyor belt. In an embodiment, the part of the retarding device which is arranged for abutting against the first forward corner, is positioned above the second conveyor belt.

30 In an embodiment, said retarding device is movable in a reciprocating motion in at least a direction substantially parallel to said conveying direction. Because of the retarding device is arranged to be moveable in a reciprocating motion, the retarding device moves back in a direction substantially opposite to said conveying direction after having moved in the conveying direction to slowed down the part of said article abutting said

retarding device in order to assist the rotating of said article, to be ready for the subsequent article.

In an embodiment, said retarding device is arranged for pushing at least the part of said article abutting said retarding device in a direction opposite to the conveying direction, when said retarding device moves back in the direction opposite to the conveying direction. This additional push assist to speed up and/or assists to conclude at least the last part of the rotation of said article.

The movement in at least a direction substantially parallel to said conveying direction may be a linear movement, but also a curved movement. In an uncomplicated embodiment, said retarding device comprises a swiveling arm which is arranged on a swivel axle.

In an embodiment, the first and second conveyor belts define a conveying surface and wherein said swivel axle extends in a direction substantially perpendicular to said conveying surface. Thus the swiveling arm is movable in a plane which is substantially parallel to the conveying surface.

In an embodiment, the swivel axle is arranged at a distance from the second conveyor belt, in particular from the side of said second conveyor belt facing away from said first conveyor belt.

In an embodiment, the decelerating device comprising an elastic member which is arranged to provide a spring force to urge the retarding device in a direction substantially opposite to the conveying direction. In an embodiment, the elastic member comprises a spring. Using a spring force provides a convenient way for decelerating the retarding device in order to slow down the part of said article abutting said retarding device in order to assist the rotating of said article.

In an embodiment, the article rotating and conveying assembly comprises a frame for supporting the first and second conveyor belts, wherein the retarding

device is movably connected to said frame, and wherein the elastic member is at a first end thereof connected to said frame and at a second end thereof, facing away from said first end, connected to said retarding device.

5 In an embodiment, the elastic member is connected to said frame at a position, with respect to the conveying direction, upstream from the retarding device. In this embodiment, the elastic member is stretched out for decelerating the retarding device in order to slow down the
10 part of said article abutting said retarding device in order to assist the rotating of said article.

 In an embodiment, the article rotating and conveying assembly further comprising a first lateral guide which is arranged at a side of said second conveyor belt
15 facing away from said first conveyor belt for guiding the article, wherein the first lateral guide is arranged at a position, with respect to the conveying direction, downstream from the retarding device. The first lateral guide is arranged for guiding the article downstream from
20 the retarding device, in particular after the article has been rotated.

 In an embodiment, the first lateral guide is a substantially straight guide which extends substantially parallel to the side of said second conveyor belt.

25 In an embodiment, the first lateral guide is at least partially arranged above the second conveyor belt.

 In an embodiment, said article rotating and conveying assembly further comprising a second lateral guide which is arranged at a side of said first conveyor
30 belt facing away from said second conveyor belt for guiding the article, wherein the second lateral guide extends, with respect to the conveying direction, from a position upstream from the retarding device to a position downstream from the retarding device. The second lateral guide is
35 arranged at least partially opposite the retarding device, and is substantially arranged for guiding the movement of a second corner of the article, in particular the corner of

said article arranged at or facing the side of said first conveyor belt facing away from said second conveyor belt.

In an embodiment, the second lateral guide comprises a curved part, wherein the side of said second lateral guide facing said first conveyor belt is concave.

In an embodiment, an upstream end and/or a downstream end of said second lateral guide are arranged above said first conveyor belt.

In an embodiment, the retarding device comprises a cylinder or wheel which is freely rotatable around a rotation axle. In particular said freely rotatable cylinder or wheel is arranged for abutting against the leading edge of the article, in particular the first forward corner thereof, which is conveyed on said first and second conveyor belts. The use of a freely rotatable cylinder or wheel for abutting against the article reduces friction between the retarding device and the article, at least when the article slides along the retarding device.

In an embodiment, the first and second conveyor belts define a conveying surface and wherein said rotation axle extends in a direction substantially perpendicular to said conveying surface. This is especially advantageous when the retarding device comprises a swiveling arm which is movable in a plane which is substantially parallel to the conveying surface.

According to a second aspect, the present invention provides a method for rotating and conveying an article using an assembly as described above, wherein the first conveyor belt is driven at a higher speed with respect to the second conveyor belt, wherein a leading edge of said article conveyed on both said first and second conveyor belts moves against said retarding device wherein a part of said article abutting said retarding device is retarded in order to assist the rotating of said article, and wherein in a first part of a movement of said retarding device, when said article abutting said retarding device, said retarding device moves in the conveying direction and

slows down at least the part of said article abutting said retarding device.

In an embodiment, in a second part of the movement of said retarding device, said retarding device
5 moves opposite to the conveying direction and pushes at least the part of said article abutting said retarding device in a direction opposite to the conveying direction.

In an embodiment, the velocity of the first and second conveyor belts are substantially constant.

10 In an embodiment, the article is rotated by the device over an angle of substantially 90 degrees.

The various aspects and features described and shown in the specification can be applied, individually, wherever possible. These individual aspects, in particular
15 the aspects and features described in the attached dependent claims, can be made subject of divisional patent applications.

BRIEF DESCRIPTION OF THE DRAWINGS

20

The invention will be elucidated on the basis of an exemplary embodiment shown in the attached drawings, in which:

Figure 1 is a schematic top view of an article
25 rotating and conveying assembly of the present invention,

Figure 2 is a schematic top view of a part of the assembly of figure 1, showing an example of a retarding device in more detail, and

Figure 3 is a schematic top view of a part of the
30 assembly according to a second embodiment.

DETAILED DESCRIPTION OF THE INVENTION

Figure 1 shows a schematic example of an article
35 rotating and conveying assembly 1 of the present invention. The assembly comprises a first 2 and a second 3 conveyor belt. The first 2 and second 3 conveyor belts are arranged

in a side-by-side, parallel orientation for simultaneously supporting an article, such as carrier for dough products 4, 4', 4". Said carrier for dough products 4, 4', 4" comprises, for example, a frame which is provided with a series of elongated containers 44, in particular bread pans for baking bread, each one arranged for holding a dough portion.

The first 2 and second 3 conveyor belts are provided with a drive mechanism 5, 5' arranged for driving said first 2 and second 3 conveyor belts in at least a conveying direction A as indicated by the arrow in figure 1. In the example shown in figure 2, each one of the first 2 and second 3 conveyor belts comprises its own driving motor 5, 5' respectively.

As shown in figures 1 and 2, the assembly comprises a retarding device 6 arranged at a side 31 of said second conveyor belt 2 facing away from said first conveyor belt 2. The retarding device 6 comprises an abutting member 61, in particular a cylinder or wheel 61 which is freely rotatable around a rotation axle. In this example, said freely rotatable cylinder or wheel 61 is arranged for abutting against the leading edge 41 of the article, in particular the first forward corner 42 thereof, which is conveyed on said first 2 and second 3 conveyor belts.

The retarding device 6, in particular the abutting member 61, is movable in at least a direction substantially parallel to said conveying direction A. Said retarding device 6 comprises a swiveling arm 63 which is arranged on a swivel axle 64. Said swivel axle 64 extends in a direction substantially perpendicular to a conveying surface provided by the first 2 and second 3 conveyor belts. In particular, the swivel axle 64 extend substantially perpendicular to the upper surface of the first 2 and/or second 3 conveyor belts. Thus the swiveling arm 63 can perform a swivel motion, in particular a reciprocating swivel motion as indicated by the arrow B in

figure 2, is a plane substantially parallel to the upper surface of the first 2 and/or second 3 conveyor belts.

The swivel axle 64 is arranged at a distance d from the side 31 of said second conveyor belt 3 facing away from said first conveyor belt 2. Positioning said swivel axle 64 at a distance d from the side 31 of the second conveyor belt 3, provides space for allowing the first corner 42 of the article to pass said retarding device 6 substantially without hindrance by other parts of the retarding device 6. Only the abutting member 61 of the retarding device 6 interacts with the article 4' and assists in rotating the article 4'.

As shown in detail in figure 2, the abutting member 61 is arranged above the second conveyor belt 3 and is attached to an end of the swiveling arm 63 facing away from the swivel axle 64. The movement of the swiveling arm 63 around the swivel axle 64 provides a curved movement of the abutting member in the reciprocating movement. Preferably the length of the swiveling arm 63 between the abutting member 61 and the swivel axle 64, and the swiveling angle α are arranged to provide a movement of the abutting member 61 which is substantially parallel to the conveying direction A. In particular the length of the swiveling arm 63 is relatively large, for example 0,5 meter or larger, and the swiveling angle α is relatively small, for example smaller than 45 degrees, preferably smaller than 30 degrees.

In the example shown in figure 2, the retarding device 6 comprises a first 65 and second 66 bumper, which bumpers 65, 66 limit the maximum extend of the swiveling angle α . In addition the first bumper 65 also defines the position of the abutting member 61 before an article 4, 4', 4'' contacts the abutting member 61, as will be explained below.

As already indicated above, the abutting member 61 comprises a cylinder or a wheel which is freely rotatable around a rotation axle 62. Said rotation axle 62

extends in a direction substantially perpendicular to the conveying surface of the first 2 and/or second 3 conveyor belts. Thus the circumferential surface of the cylinder or wheel can roll along the edge of the article 4', in particular the leading edge 41 which, after the 90 degrees rotation, becomes a side edge of the article.

In use, when a leading edge of said article conveyed on both said first and second conveyor belts moves against said retarding device 6, in particular against the abutting member 61 thereof, said retarding device 6 moves in the conveying direction A. In order to slow down at least the part of said article abutting said retarding device 6, the retarding device 6 comprises a decelerating device for decelerating a movement of said retarding device 6 in at least said conveying direction A. In the example shown in figures 1 and 2, the decelerating device comprises an elastic member 68, in particular a pair of springs, which is arranged to provide a spring force to urge the retarding device 6, in particular the swiveling arm 63 thereof, in a direction substantially opposite to the conveying direction A.

As shown in the detail in figure 2, the assembly comprises a frame 9 for supporting the first 2 and second 3 conveyor belts. The retarding device, in particular the swiveling arm 63 and the abutting member 61 thereof, is movably connected to said frame 9. The elastic member 68 is at a first end 96 thereof connected to said frame 9 and at a second end 97 thereof, facing away from said first end 96, connected to the swiveling arm 63. The elastic member 68 is connected to said frame 9 at a position, with respect to the conveying direction A, upstream from the retarding device 6.

The assembly 1 as shown in figure 1 further comprising a first lateral guide 7 which is arranged at a side 31 of said second conveyor belt 3 facing away from said first conveyor belt 2 for guiding the article 4, wherein the first lateral guide 7 is arranged at a

position, with respect to the conveying direction A, downstream from the retarding device 6. The first lateral guide 7 is a substantially straight guide which extends substantially parallel to the side 31 of said second conveyor belt 3. The first lateral guide 7 is at least partially arranged above the second conveyor belt 3.

The assembly 1 as shown in figure 1 further comprising a second lateral guide 8 which is arranged at a side 21 of said first conveyor belt 2 facing away from said second conveyor belt 3 for guiding the article 4, 4', wherein the second lateral guide 8 extends, with respect to the conveying direction A, from a position upstream from the retarding device 6 to a position downstream from the retarding device 6. The second lateral guide 8 comprises a curved part, wherein the side 81 of said second lateral guide facing 8 said first conveyor belt 2 is concave. The upstream end 82 and the downstream end 83 of said second lateral guide 8 are arranged above said first conveyor belt 2. The second lateral guide 8 is arranged at least partially opposite the retarding device 6, and is arranged for guiding the movement of a second corner 43 of the article 4', in particular the corner 43 of said article 4' arranged at or facing the side 21 of said first conveyor belt 2 facing away from said second conveyor belt 3.

In use, the first conveyor belt 2 is driven at a higher speed with respect to the second conveyor belt 3. The article 4, 4', 4'' conveyed on said conveyor belts 2, 3 is slowly rotated because of the speed difference of said conveyor belts 2, 3. This speed difference produces a pre-rotation of the article 4' on said first 2 and second 3 conveyor belts prior to contacting the retarding device 6 so as to facilitate the turning action by said retarding device 6.

A leading edge 41 of said article 4', at or near a corner 42 facing the side 31 of the second conveyor belt 3, moves against the abutting member 61 of said retarding device 6, and the part of said article 4' abutting said

abutting member 61 is slowed down in order to assist the rotating of said article 4'. In a first part of a movement of the abutting member 61 of said retarding device 6, when said article 4' abutting said abutting member 61, said
5 abutting member 61 on the swiveling arm 63 moves substantially in the conveying direction A and slows down at least the corner 42 of said article 4'. Because the first 2 and second 3 conveyor belts are still moving at the same speed, at least the part of the article 4' facing away
10 from the retarded corner 42 is conveyed in the conveying direction A, and the article 4' will rotate in clock-wise direction.

In a second part of the movement of the abutting member 61 on the swiveling arm 63, said abutting member 61
15 is pulled back by the elastic member 68 moves in a direction opposite to the conveying direction A and pushes at least the part of said article 4' abutting said abutting member 61 in a direction opposite to the conveying direction A. This additional push assist to speed up and/or
20 assists to conclude at least the last part of the rotation of said article 4'.

After the article 4' has been rotated over 90 degrees, the article 4 is conveyed to the end of the assembly by the first 2 and second 3 conveyor belts and is
25 substantially held in the required rotated position by the first lateral guide 7. It is preferred that the first 2 and second 3 conveyor belts are driven at a substantially constant velocity, and that therefor also the speed difference of the first 2 and second 3 conveyor belts are
30 constant. At least this first lateral guide 7 substantially prevents a further rotation of the article 4 because of the speed difference between the first 2 and second 3 conveyor belts.

It is noted that the example of the assembly of
35 the invention shown in figures 1 and 2 provides a simple and reliable apparatus for conveying and rotating article, in particular at high speed.

A more elaborate example of an assembly of the present invention is shown in figure 3. Figure 3 shows a top view of a part of an assembly of the invention. This embodiment is provided with a linear actuator 16, instead
5 of the pair of springs 68 in the embodiment of figures 1 and 2. The linear actuator 16 is driven and/or controlled by a controller 17, which is arranged for providing a controlled reciprocating movement of the abutting member 61. In a first part of the reciprocating movement, when
10 said article 4' abutting said abutting member 61, the linear actuator 16 is arranged or driven to move the swiveling arm 63 in the conveying direction A and to slow down at least the part of said article 4' abutting said abutting member 61. In a second part of the reciprocating
15 movement, said linear actuator 16 is driven to move opposite to the conveying direction A and is arranged to actively push at least the part of said article 4' abutting said abutting member 61 in a direction opposite to the conveying direction A.

20 Said linear actuator 16 comprises, for example, a pneumatic cylinder and a compression of the air in the cylinder when said cylinder is expanded in the first part of the reciprocating movement can be used as a brake for slowing down the movement of the swiveling arm 63.
25 Subsequently the pneumatic cylinder is controlled by the pneumatic controller 17 to actively pull the swiveling arm 63 back in the direction opposite to the conveying direction A in the second part of the reciprocating movement.

30 Alternatively or in addition, said retarding device 6 may also comprise a decelerating device, such as said elastic member 68 or said linear actuator 16, which is connected to said frame 9 at a position, with respect to the conveying direction A, downstream from the retarding
35 device 6. In case of an elastic member 68, the decelerating action is provided by compressing said elastic member 68. In case of a linear actuator 16, in particular a pneumatic

cylinder, the decelerating action is provided by a compression of the air in the cylinder when said cylinder is contracted or compressed in the first part of the reciprocating movement.

5 It is to be understood that the above description is included to illustrate the operation of the preferred embodiments and is not meant to limit the scope of the invention. From the above discussion, many variations will be apparent to one skilled in the art that would yet be
10 encompassed by the spirit and scope of the present invention.

 In summary, the present invention relates to an article rotating and conveying assembly and method. The assembly comprises a first and a second conveyor belt,
15 which first and second conveyor belts are arranged in a side-by-side, parallel orientation for simultaneously supporting an article. A drive mechanism is arranged for driving both conveyor belts in a conveying direction and for driving said first conveyor belt at a higher speed than
20 said second conveyor belt. Furthermore a retarding device is arranged at a side of said second conveyor belt facing away from said first conveyor belt. The retarding device is movable, preferably in a reciprocating motion, in at least a direction substantially parallel to said conveying
25 direction in order to assist the rotating of said article.

C O N C L U S I E S

1. Samenstel voor het draaien en transporteren van een product, omvattende:

een eerste en tweede transportband, welke eerste en tweede transportbanden in een parallelle oriëntatie
5 naast elkaar geplaatst zijn voor het simultaan ondersteunen van een product,

een aandrijfmechanisme ingericht voor het aandrijven van de eerste en tweede transportbanden in tenminste een transportrichting en voor het aandrijven van
10 de eerste transportband met een hogere snelheid dan de tweede transportband,

een vertragingsinrichting die aan een van de eerste transportband afgekeerde zijde van de tweede transportband geplaatst is voor het hiertegen aanliggen van
15 een voorlopende rand van het product, waarbij de vertragingsinrichting verplaatsbaar is in ten minste een richting in hoofdzaak parallel aan de transportrichting en een afremminrichting omvat voor het afremmen van een beweging van de vertragingsinrichting in ten minste de
20 transportrichting.

2. Samenstel voor het draaien en transporteren van een product volgens conclusie 1, waarbij de vertragingsinrichting verplaatsbaar is in een heen-en-weer gaande beweging in ten minste een richting in hoofdzaak
25 parallel aan de transportrichting.

3. Samenstel voor het draaien en transporteren van een product volgens conclusie 2, waarbij de vertragingsinrichting een zwenk-arm omvat die op een zwenkas geplaatst is.

30 4. Samenstel voor het draaien en transporteren van een product volgens conclusie 3, waarbij de eerste en tweede transportbanden een transportoppervlak bepalen en waarbij de zwenkas zich in een richting in hoofdzaak loodrecht op het transportoppervlak uitstrekt.

5. Samenstel voor het draaien en transporteren van een product volgens conclusie 3 of 4, waarbij de zwenkas op een afstand geplaatst is van de zijde van de tweede transportband die van de eerste transportband afgekeerd is.

6. Samenstel voor het draaien en transporteren van een product volgens één van de conclusies 2 - 5, waarbij de afreminrichting een elastisch orgaan omvat dat is ingericht voor het verschaffen van een veerkracht om de vertragingsinrichting in een richting in hoofdzaak tegengesteld aan de transportrichting te drijven.

7. Samenstel voor het draaien en transporteren van een product volgens conclusie 6, waarbij het elastisch orgaan een veer omvat.

8. Samenstel voor het draaien en transporteren van een product volgens conclusie 6 of 7, waarbij het samenstel een frame voor het ondersteunen van de eerste en tweede transportbanden omvat, waarbij de vertragingsinrichting beweegbaar verbonden is met het frame, en waarbij het elastisch orgaan met een eerste uiteinde daarvan verbonden is met het frame en met een, van het eerste uiteinde afgekeerd, tweede uiteinde daarvan verbonden is met de vertragingsinrichting.

9. Samenstel voor het draaien en transporteren van een product volgens conclusie 8, waarbij het elastisch orgaan verbonden is met het frame op een, ten opzichte van de transportrichting, bovenstrooms van de vertragingsinrichting gelegen positie.

10. Samenstel voor het draaien en transporteren van een product volgens één van de conclusies 1 - 9, verder omvattende een eerste laterale geleiding die aan een van de eerste transportband afgekeerde zijde van de tweede transportband geplaatst is voor het geleiden van het product, waarbij de eerste laterale geleiding ten opzichte van de transportrichting op een positie benedenstrooms van de vertragingsinrichting geplaatst is.

11. Samenstel voor het draaien en transporteren

van een product volgens conclusie 10, waarbij de eerste laterale geleiding een in hoofdzaak rechte geleiding is die zich in hoofdzaak parallel aan de zijde van de tweede transportband uitstrekt.

5 12. Samenstel voor het draaien en transporteren van een product volgens conclusie 10 of 11, waarbij de eerste laterale geleiding althans ten dele boven de tweede transportband geplaatst is.

10 13. Samenstel voor het draaien en transporteren van een product volgens één van de conclusies 1 - 12, verder omvattende een tweede laterale geleiding die aan een van de tweede transportband afgekeerde zijde van de eerste transportband geplaatst is voor het geleiden van het product, waarbij de tweede laterale geleiding zich
15 uitstrekt, ten opzichte van de transportrichting, van een positie bovenstrooms van de vertragingsinrichting naar een positie benedenstrooms van de vertragingsinrichting.

 14. Samenstel voor het draaien en transporteren van een product volgens conclusie 13, waarbij de tweede
20 laterale geleiding een gebogen deel omvat, waarbij de naar de eerste transportband gekeerde zijde van de tweede laterale geleiding concaaf is.

 15. Samenstel voor het draaien en transporteren van een product volgens conclusie 13 of 14, waarbij een
25 bovenstrooms uiteinde en/of een benedenstrooms uiteinde van de tweede laterale geleiding boven de eerste transportband geplaatst zijn.

 16. Samenstel voor het draaien en transporteren van een product volgens één van de voorgaande conclusies,
30 waarbij de vertragingsinrichting een cilinder of een wiel omvat die/dat vrij draaibaar is rond een rotatie-as.

 17. Samenstel voor het draaien en transporteren van een product volgens conclusie 16, waarbij de eerste en tweede transportbanden een transportoppervlak bepalen en
35 waarbij de rotatie-as zich in hoofdzaak loodrecht op het transportoppervlak uitstrekt.

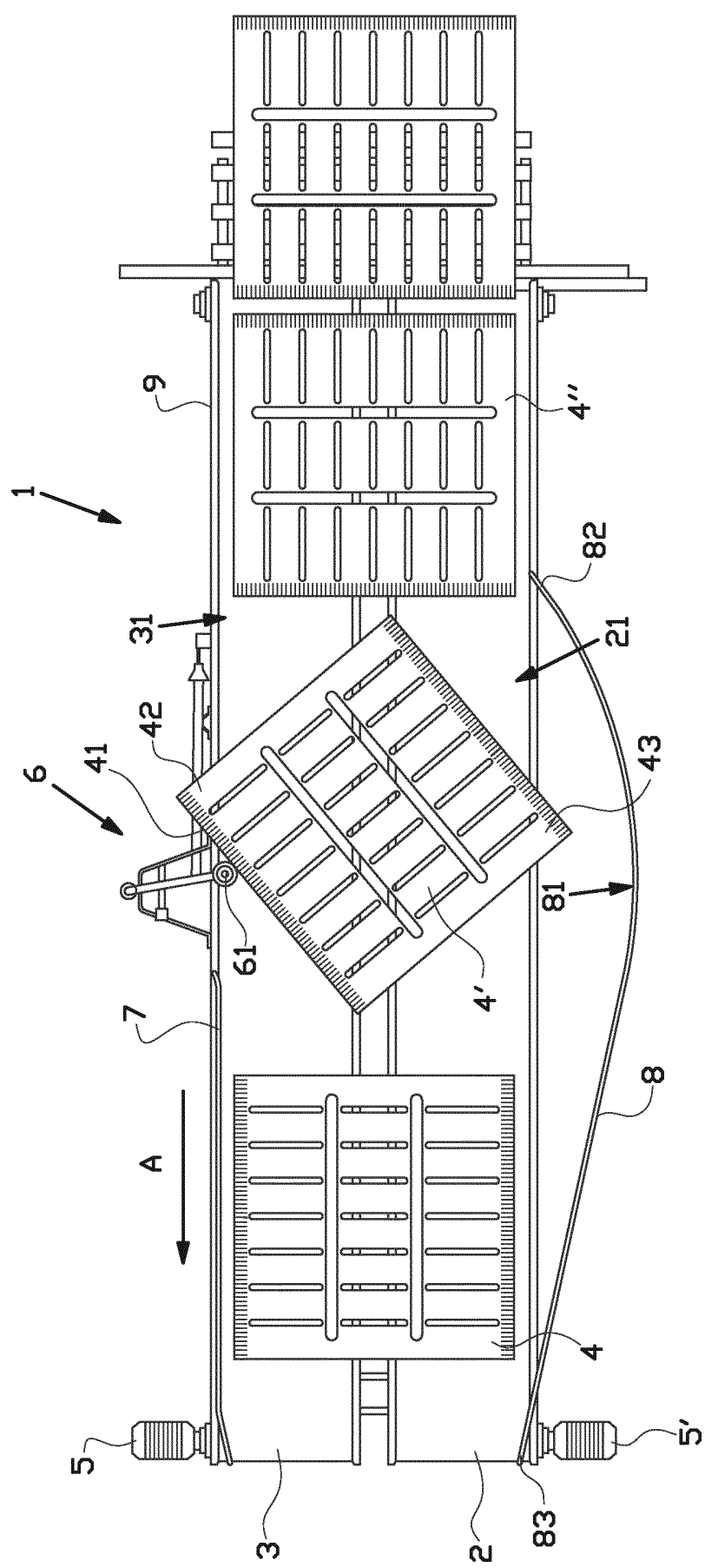
 18. Werkwijze voor het draaien en transporteren

van een product met een samenstel volgens één van de voorgaande conclusies, waarbij de eerste transportband wordt aangedreven met een hogere snelheid ten opzichte van de tweede transportband, waarbij een voorlopende rand van het product dat op beide eerste en tweede transportbanden wordt getransporteerd tegen de vertragingsinrichting beweegt waarbij een deel van het product dat aanligt tegen de vertragingsinrichting wordt vertraagd ter ondersteuning van het draaien van het product, en waarbij in een eerste deel van een beweging van de vertragingsinrichting, wanneer het product aanligt tegen de vertragingsinrichting, de vertragingsinrichting in de transportrichting beweegt en althans het deel van het product dat tegen de vertragingsinrichting aanligt afremt.

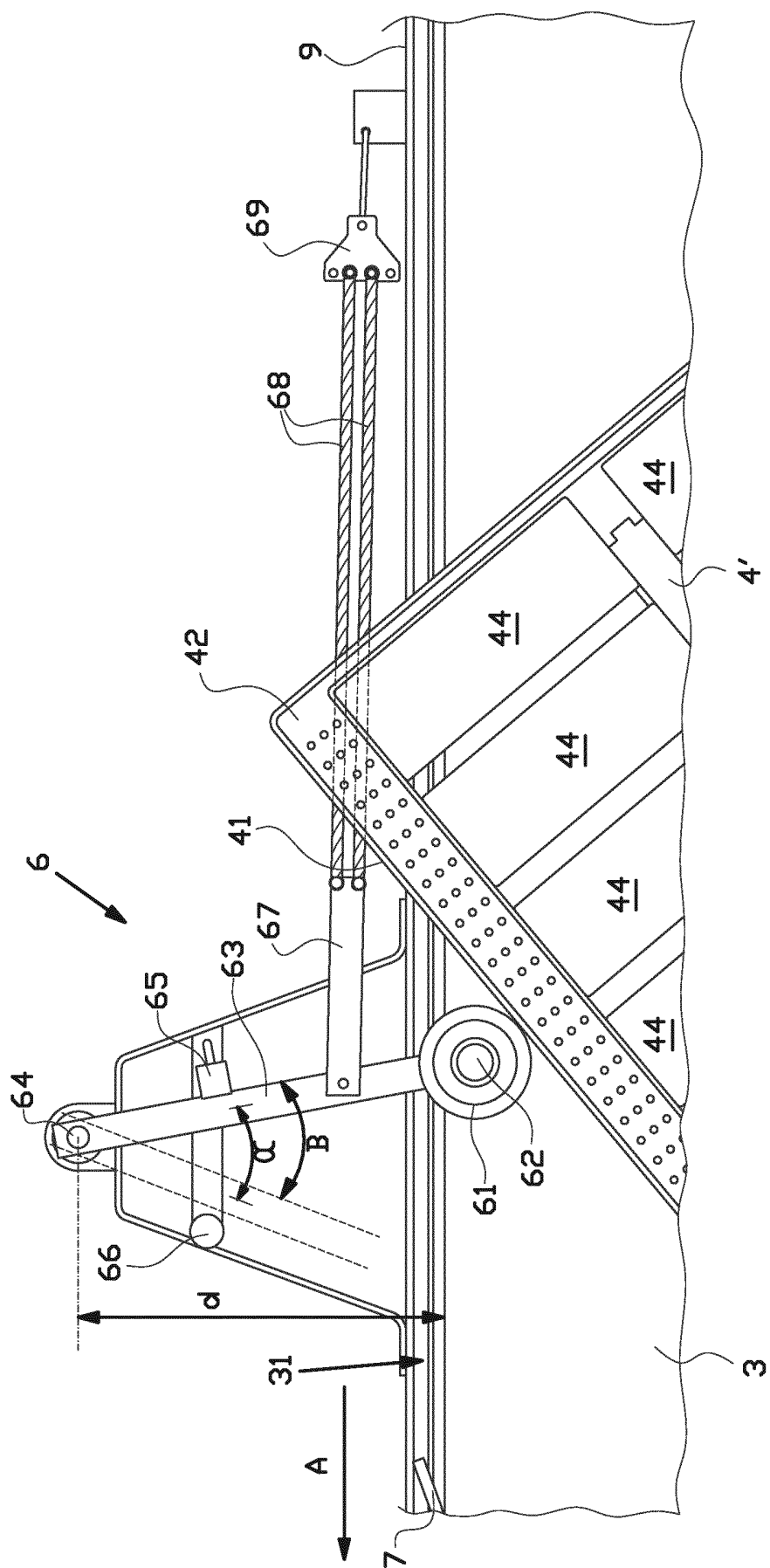
19. Werkwijze voor het draaien en transporteren van een product volgens conclusie 18, waarbij in een tweede deel van de beweging van de vertragingsinrichting, de vertragingsinrichting in een richting tegengesteld aan de transportrichting beweegt en althans het deel van het product dat tegen de vertragingsinrichting aanligt in een richting tegengesteld aan de transportrichting duwt.

20. Werkwijze voor het draaien en transporteren van een product volgens conclusie 18 of 19, waarbij de snelheid van de eerste en tweede transportbanden in hoofdzaak constant zijn.

-O-O-O-O-O-O-O-O-



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2517

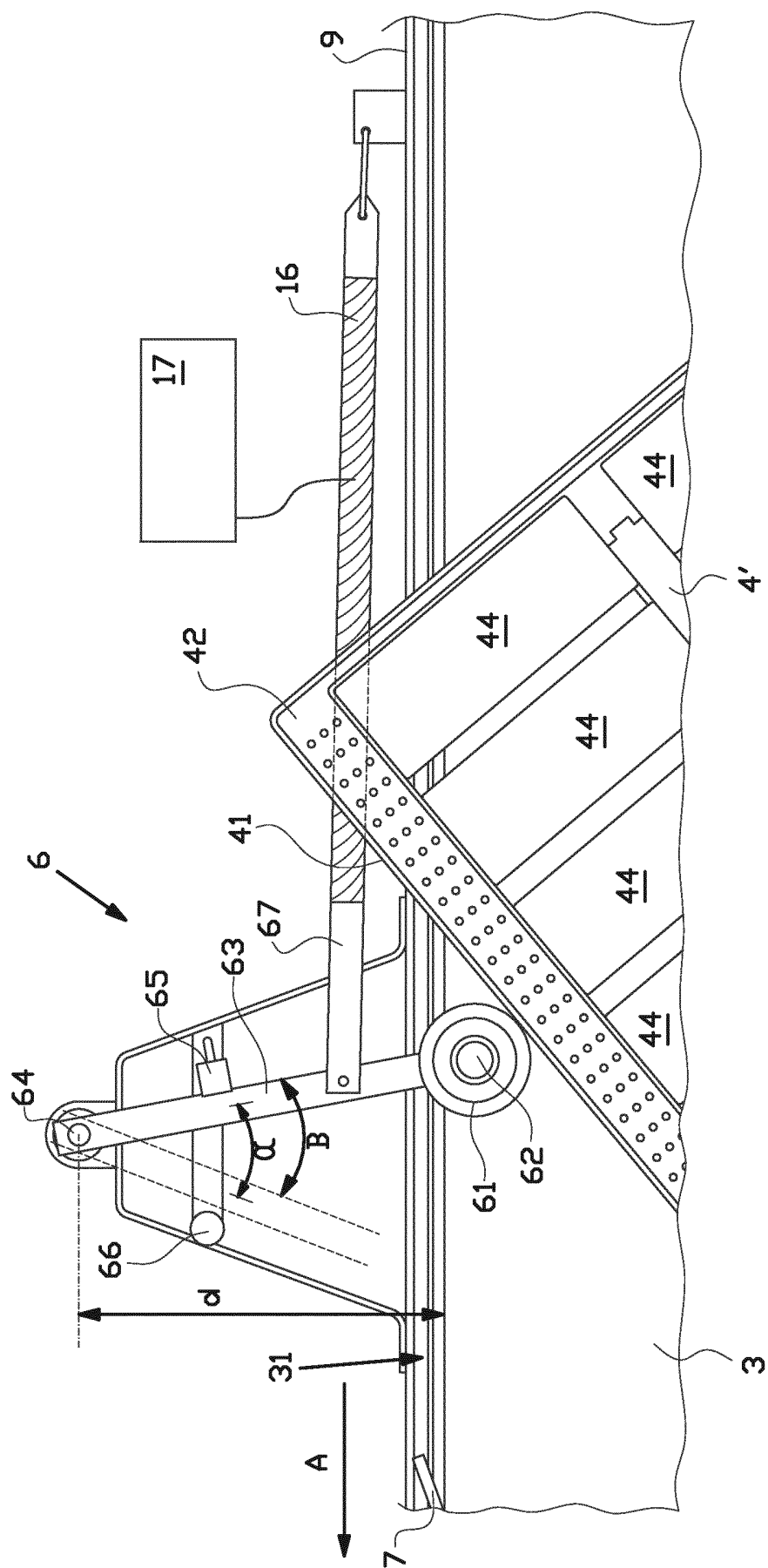


FIG. 3

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE		KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE	
		NLP194642A	
Nederlands aanvraag nr.		Indieningsdatum	
2012148		27-01-2014	
		Ingeroepen voorrangsdatum	
Aanvrager (Naam)			
Kaak			
Datum van het verzoek voor een onderzoek van internationaal type		Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr.	
05-04-2014		SN 61757	
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)			
Volgens de internationale classificatie (IPC)			
B65G47/244			
II. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK			
Onderzochte minimumdocumentatie			
Classificatiesysteem		Classificatiesymbolen	
IPC		B65G	
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen			
III.	☐	GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvullingsblad)	
IV.	☐	GEBREK AAN EENHEID VAN UITVINDING (opmerkingen op aanvullingsblad)	

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek
NL 2012148

A. CLASSIFICATIE VAN HET ONDERWERP
INV. B65G47/244
ADD.

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)
B65G

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)

EPO-Internal, WPI Data

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	DE 296 02 103 U1 (KRONSEDER MASCHF KRONES [DE]) 28 maart 1996 (1996-03-28) * bladzijde 8, alinea 2; figuur 1 * * bladzijde 9, alinea 1 * -----	1-20
X	JP S55 120616 U (-) 27 augustus 1980 (1980-08-27) * figuren * -----	1,18
X	DE 17 56 233 A1 (ENZINGER UNION WERKE AG) 2 april 1970 (1970-04-02) * conclusies 1,8; figuur 2 * -----	1,18
A	DE 203 19 973 U1 (SSI SCHAEFER PEEM GMBH GRAZ [AT]) 4 maart 2004 (2004-03-04) * figuur 1 * ----- -/-	14,15

☒ Verdere documenten worden vermeld in het vervolg van vak C.

☒ Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

° Speciale categorieën van aangehaalde documenten

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"D" in de octrooiaanvraag vermeld

"E" eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermelde literatuur

"O" niet-schriftelijke stand van de techniek

"P" tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"&" lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

31 oktober 2014

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

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De bevoegde ambtenaar

Schneider, Marc

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek
NL 2012148

C. (Vervolg). VAN BELANG GEACHTE DOCUMENTEN		
Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
A	US 2 805 753 A (PALMER ROBERT E) 10 september 1957 (1957-09-10) * figuur 1 *	14,15
A	----- GB 1 473 376 A (BRITISH LELY [GB]) 11 mei 1977 (1977-05-11) * figuur 2 *	8,9

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2012148

In het rapport genoemd octrooi geschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
DE 29602103	U1	28-03-1996	GEEN
JP S55120616	U	27-08-1980	JP S5844098 Y2 06-10-1983 JP S55120616 U 27-08-1980
DE 1756233	A1	02-04-1970	GEEN
DE 20319973	U1	04-03-2004	GEEN
US 2805753	A	10-09-1957	GEEN
GB 1473376	A	11-05-1977	GEEN

WRITTEN OPINION

File No. SN61757	Filing date (<i>day/month/year</i>) 27.01.2014	Priority date (<i>day/month/year</i>)	Application No. NL2012148
International Patent Classification (IPC) INV. B65G47/244			
Applicant Kaak			

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the application
- ☐ Box No. VIII Certain observations on the application

	Examiner Schneider, Marc
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WRITTEN OPINION

Application number
NL2012148

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the application as filed.
 - ☐ filed together with the application in electronic form.
 - ☐ furnished subsequently for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes: Claims	8, 9, 14, 15
	No: Claims	1-7, 10-13, 16-20
Inventive step	Yes: Claims	
	No: Claims	1-20
Industrial applicability	Yes: Claims	1-20
	No: Claims	

2. Citations and explanations

see separate sheet

WRITTEN OPINION

Application number

NL2012148

Box No. VII Certain defects in the application

see separate sheet

Reference is made to the following documents:

- D1 DE 296 02 103 U1 (KRONES) 28 maart 1996 (1996-03-28);
- D2 JP S55 120616 U (-) 27 augustus 1980 (1980-08-27);
- D3 DE 17 56 233 A1 (ENZINGER) 2 april 1970 (1970-04-02);
- D4 DE 203 19 973 U1 (SSI) 4 maart 2004 (2004-03-04);
- D5 US 2 805 753 A (PALMER) 10 september 1957 (1957-09-10).

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 1 The present application does not meet the criteria of patentability, because the subject-matter of claim 1 is not new.

The document D1 discloses indeed

*een samenstel (3) voor het draaien en transporteren van een product (1),
omvattende:*

- een eerste en tweede transportband (6; 5), welke eerste en tweede transportbanden (6; 5) in een parallelle oriëntatie naast elkaar geplaatst zijn voor het simultaan ondersteunen van een product (1),*
- een aandrijfmechanisme (22-25) ingericht voor het aandrijven van de eerste en tweede transportbanden (6; 5) in tenminste een transportrichting en voor het aandrijven van de eerste transportband (6) met een hogere snelheid (V2) dan de tweede transportband (5),*
- een vertragingsinrichting (9) die aan een van de eerste transportband (6) afgekeerde zijde van de tweede transportband (5) geplaatst is voor het hiertegen aanliggen van een voorlopende rand van het product (1), waarbij de vertragingsinrichting (9) verplaatsbaar is in ten minste een richting in hoofdzaak parallel aan de transportrichting en een afreminrichting omvat voor het afremmen van een beweging van de vertragingsinrichting in ten minste de transportrichting [see page 7, paragraph 2].*

- 2 The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claim 18 which therefore is also considered not new.

- 3 The dependent claims 2-17, 19 and 20 do not meet the requirements of novelty or inventive step:
- the features of claims 2-7, 10-13, 16, 17, 19 and 20 are also known from D1;
 - the features of claims 8 and 9 represent obvious arrangements of the biasing means of the retarding device;
 - the features of claims 14 and 15 are suggested by D1 (see page 9, first paragraph) and well-known from the prior art (see e.g. D4 and D5) in similar situations.

Re Item VII

Certain defects in the application

- 4 The independent claim are not in the two-part form.
- 5 The features of the claims are not provided with reference signs placed in parentheses.
- 6 The relevant background art disclosed in D1 is not mentioned in the description, nor is this document identified therein.