



- (19) **B1 OCTROOI**
- (21) Aanvraagnummer: **2027175**
- (22) Aanvraag ingediend: **20 december 2020**
- (51) Int. Cl.:
B65B 5/06 (2021.01) **B65B 35/44** (2021.01) **B65B 35/56** (2021.01) **B65G 47/248** (2021.01) **B65G 47/31** (2021.01)

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(41) Aanvraag ingeschreven: 15 juli 2022	(72) Uitvinder(s): Lucas Leonard de Jager te Vianen Alexander van den Broek te Capelle aan den IJssel Hessel Michiel Koot te Vleuten Antonius Johannes Rootselaar te Wijk bij Duurstede Roeland Marcus Sturkenboom te Houten Elco Heijmink te Voorburg Sion Peter Verhoef te Bodegraven
(43) Aanvraag gepubliceerd: -	
(47) Octrooi verleend: 15 juli 2022	
(45) Octrooischrift uitgegeven: 15 juli 2022	(74) Gemachtigde: dr. R.C. van Duijvenbode c.s. te Den Haag

(54) **Article Packing Method and Apparatus**

(57) An article packing method and machine for packing articles into a packing container receive articles from a supply flow in a supply direction onto a portioning conveyor to provide portioned sets of a predetermined number of overlapping articles in a portioned flow. In each portioned set, each article overlaps a directly succeeding article and adjacent articles are separated by an intraset distance. Adjacent portioned sets are separated by an interset distance that is larger than the intraset distance. The intraset distance and the interset distance are provided by controlling the velocity of the portioning conveyor. A portioned set is discharged from the portioning conveyor onto an extraction conveyor while controlling a velocity of the extraction conveyor at a velocity associated with the velocity of the portioning conveyor. The portioned set is subsequently extracted from the portioned flow and discharged onto a formation surface by controlling a velocity of the extraction conveyor at a velocity that is sufficient to provide said portioned set onto the formation surface before a first article from a succeeding portioned set is discharged from the portioning conveyor onto the extraction conveyor. The portioned set is finally provided from the formation surface into the packing container.

Article Packing Method and Apparatus

FIELD OF THE INVENTION

[01] The invention relates to an article packing method and apparatus for packing articles into a packing container. The articles are provided in a supply flow of articles and sets of articles are provided into the packing container.

BACKGROUND OF THE INVENTION

[02] Such article packing methods and machines are very generally known. The articles can be any object or product to be packed, and may, for instance, be in the form of bags of crisps, sweets, etcetera. There are highly automated packing machines for packing high volumes of articles in a high volume of packing containers, such as packing boxes. These machines, and corresponding methods, are laid out for articles having specific dimensions to be packed into packing containers of specific dimensions for a specific configuration of articles packed in the packing containers. The degree of flexibility for packing another type of articles, or having another type of packing containers, or having another arrangement of articles in the packing boxes is very limited, and may require a large investment in time, tools and/or components to make the machine suited therefore. Such investment is quite often too high to do the effort.

[03] To allow for more flexibility and processing of lower volume articles, there are packing machines known that have a limited degree of automation. Some pre-arrangement of articles may be provided onto a conveyor, but subsequently it requires manual labor to provide the articles into packing containers and set the arrangement of the articles in the packing container by hand.

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SUMMARY OF THE INVENTION

[04] It is an objective of the invention to provide an article packing method and machine that provides an enhanced degree of process automation, while still allowing for process flexibility.

[05] It is another or alternative objective of the invention to provide an article packing method and machine that allows handling and packing various types of articles, in various types of packing containers, in various sorts of configurations.

[06] It is yet another or alternative objective of the invention to provide an article packing method and apparatus that allows for consecutively processing relatively small batches of products and/or packing containers.

[07] It is yet another or alternative objective of the invention to provide a method and machine that provide for a low cost automation of packing lines.

[08] In an aspect the invention provides for an article packing method for packing articles into a packing container, wherein the method comprises

40 - providing articles in a supply flow of articles in a supply direction to a portioning

conveyor such that the articles can be arranged in the supply direction on the portioning conveyor in a manner that an article overlaps a directly succeeding article by controlling a velocity of the portioning conveyor at an appropriate velocity in relation to the supply flow;

5 - receiving articles from the supply flow onto the portioning conveyor to provide portioned sets of a predetermined number of overlapping articles in a portioned flow of articles in the supply direction on the portioning conveyor, wherein, in each portioned set, each article overlaps a directly succeeding article and adjacent articles are separated by an intraset distance as measured between leading ends of adjacent articles, wherein adjacent portioned sets are separated by an interset distance as measured between leading ends of 10 a last article in a portioned set and a first article in a succeeding portioned set, and wherein the intraset distance and the interset distance are provided by controlling the velocity of the portioning conveyor to have the interset distance larger than the intraset distance;

15 - discharging a portioned set from the portioning conveyor onto an extraction conveyor and receiving said portioned set in the portioned flow from the portioning conveyor in the supply direction onto the extraction conveyor while controlling a velocity of the extraction conveyor at a velocity associated with the velocity of the portioning conveyor;

20 - extracting said portioned set received in the portioned flow on the extraction conveyor in the supply direction from the portioned flow and discharging said portioned set from the extraction conveyor onto a formation surface by controlling a velocity of the extraction conveyor at a velocity that is sufficient to provide said portioned set onto the formation surface before a first article from a succeeding portioned set in the portioned flow is discharged from the portioning conveyor onto the extraction conveyor;

 - receiving said portioned set from the extraction conveyor in the supply direction onto the formation surface; and

25 - providing said portioned set from the formation surface into the packing container.

[09] In another aspect the invention provides for an article packing apparatus for packing articles into a packing container, wherein the apparatus comprises a portioning conveyor configured to allow receiving articles provided in a supply flow of articles in a supply direction to the portioning conveyor such that the articles can be arranged in the supply direction on the portioning conveyor in a manner that an article overlaps a directly succeeding article by controlling a velocity of the portioning conveyor at an appropriate velocity in relation to the supply flow; an extraction conveyor; and a formation surface, wherein the article packing apparatus is configured for

35 - providing articles in a supply flow of articles in a supply direction to a portioning conveyor such that the articles can be arranged in the supply direction on the portioning conveyor in a manner that an article overlaps a directly succeeding article by controlling a velocity of the portioning conveyor at an appropriate velocity in relation to the supply flow;

40 - receiving articles from the supply flow onto the portioning conveyor to provide portioned sets of a predetermined number of overlapping articles in a portioned flow of articles in the supply direction on the portioning conveyor, wherein, in each portioned set,

each article overlaps a directly succeeding article and adjacent articles are separated by an intraset distance as measured between leading ends of adjacent articles, wherein adjacent portioned sets are separated by an interset distance as measured between leading ends of a last article in a portioned set and a first article in a succeeding portioned set, and wherein

5 the intraset distance and the interset distance are provided by controlling the velocity of the portioning conveyor to have the interset distance larger than the intraset distance;

- discharging a portioned set from the portioning conveyor onto an extraction conveyor and receiving said portioned set in the portioned flow from the portioning conveyor in the supply direction onto the extraction conveyor while controlling a velocity of the

10 extraction conveyor at a velocity associated with the velocity of the portioning conveyor;

- extracting said portioned set received in the portioned flow on the extraction conveyor in the supply direction from the portioned flow and discharging said portioned set from the extraction conveyor onto a formation surface by controlling a velocity of the extraction conveyor at a velocity that is sufficient to provide said portioned set onto the

15 formation surface before a first article from a succeeding portioned set in the portioned flow is discharged from the portioning conveyor onto the extraction conveyor; and

- receiving said portioned set from the extraction conveyor in the supply direction onto the formation surface; and to allow

- providing said portioned set from the formation surface into the packing container.

20 [10] The article packing method and apparatus according to the invention provide a portioned set of articles on the formation surface, which can then be easily handled further for packing into the packing container. It is only an easy adjustment in the method and machine to provide for a portioned set having a different number of articles. Further, it is very straightforward to design the packing machine such that articles of various size can be handled so that a very general purpose packing method and machine results.

[11] In an embodiment, the formation surface is provided by a formation conveyor and said portioned set is received from the extraction conveyor onto the formation conveyor while controlling a velocity of the formation conveyor at a velocity associated with the velocity of the extraction conveyor.

30 [12] In an embodiment, the intraset distance is provided by controlling the velocity of the portioning conveyor at a first velocity in relation to the supply flow, the interset distance is provided by controlling the velocity of the portioning conveyor at a second velocity in relation to the supply flow, and the second velocity is larger than first velocity.

35 [13] In an embodiment, the step of receiving a portioned set from the portioning conveyor onto the extraction conveyor comprises controlling the velocity of the extraction conveyor at a velocity equal to the velocity of the portioning conveyor.

[14] In an embodiment, the step of extracting said portioned set on the extraction conveyor from the portioned flow comprises controlling the velocity of the extraction conveyor at a third velocity larger than the second velocity.

40 [15] In an embodiment, the step of receiving said portioned set from the extraction

conveyor onto the formation conveyor comprises controlling the velocity of the formation conveyor at a velocity equal to the velocity of the extraction conveyor.

[16] In an embodiment, the step of providing said portioned set from the formation surface into the packing container comprises

5 - providing a back stop after said portioned set as seen in the supply direction and moving the back stop and said portioned set relatively towards one another for moving said portioned set and the back stop against one another to provide the articles in said portioned set in an upright orientation against one another.

[17] In an embodiment, the step of providing said portioned set from the formation 10 surface into the packing container comprises

- providing the back stop after said portioned set provided on the formation conveyor as seen in the supply direction;

- moving said portioned set on the formation conveyor in a formation direction oppositely directed to the supply direction against the back stop to provide the articles in 15 said portioned set in an upright orientation against one another; and

- providing said portioned set having the articles in the upright orientation against one another into the packing container.

[18] In an embodiment, the step of moving said portioned set on the formation conveyor in the formation direction against the back stop to provide the articles in said

20 portioned set in the upright orientation against one another comprises

- driving the formation conveyor to convey said portioned set in the formation direction against the back stop to provide the articles in said portioned set in the upright orientation against one another.

[19] In an embodiment, the step of providing said portioned set from the formation 25 surface into the packing container comprises

- providing an end stop before said portioned set provided on the formation surface as seen in the supply direction and moving the back stop and the end stop relatively towards one another to provide the articles in said portioned set in an upright orientation against one another in between the end stop and the back stop.

30 [20] In an embodiment, the step of moving said portioned set on the formation surface in the formation direction against the back stop to provide the articles in said portioned set in the upright orientation against one another comprises

- moving the end stop against said portioned set in the formation direction.

[21] In an embodiment, the end stop is one of attached to the formation conveyor to 35 move together with the formation conveyor, and drivingly mounted alongside the formation conveyor to allow movement along the formation conveyor.

[22] Having the back stop and optionally the end stop as indicated allows to efficiently provide the articles in an upright orientation so that they can easily be placed in such upright vertical orientation into the packing box. Bringing the articles in the upright 40 orientation is efficiently carried out in the time interval that a next portioned set is provided

on the extraction conveyor.

[23] In an embodiment, the step of providing said portioned set from the formation surface into the packing container comprises moving said portioned set from the formation surface in a move-out direction transverse to the supply direction and along the formation surface.

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[24] In an embodiment, said portioned set is moved from the formation surface in the move-out direction using a pusher.

[25] Moving the portioned set from the formation surface in the defined move-out direction can be done very fast so that enough time is available for handling of the portioned set on the formation surface, and can be implemented in a straightforward manner.

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[26] In an embodiment, the step of providing said portioned set from the formation surface into the packing container comprises

- providing said portioned set from the formation surface onto a removable support surface;

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- providing the packing container below the removable support surface; and

- removing the removable support surface to allow providing said portioned set into the packing container.

[27] The removable support surface provides a very efficient way of providing the articles into the packing box, especially in combination with the move-out direction from the formation surface.

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[28] In an embodiment, more than one portioned set is provided from the formation surface onto the removable support before providing the portioned sets from the removable support into the packing container.

[29] In an embodiment, a confinement arrangement is provided around the removable support surface to keep the portioned set on the removable support surface in position. The confinement arrangement can also act a guiding wall when pushing portioned sets onto the removable support surface.

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[30] In an embodiment, the confinement arrangement comprises walls that allow clamping said portioned set there between and providing the clamped portioned set into the packing container.

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[31] In an embodiment, the removable support surface is removed to allow dropping said portioned set into the packing container.

[32] In an embodiment, the removable support surface is configured as two bottom slides that are movable in a horizontal direction into a closed position to allow supporting at least one portioned set thereon, and into an open position to allow said at least one portioned sets on the bottom slides to drop into the packing container.

[33] In an embodiment, the articles are bags filled with a product.

BRIEF DESCRIPTION OF THE DRAWINGS

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[34] Further features and advantages of the invention will become apparent from the

description of the invention by way of non-limiting and non-exclusive embodiments. These embodiments are not to be construed as limiting the scope of protection. The person skilled in the art will realize that other alternatives and equivalent embodiments of the invention can be conceived and reduced to practice without departing from the scope of the present 5 invention. Embodiments of the invention will be described with reference to the accompanying drawings, in which like or same reference symbols denote like, same or corresponding parts, and in which

Figures 1A to 1H schematically depict a side view of an apparatus according to the invention and show various subsequent stages of the method according to the invention; 10 Figures 2A and 2B schematically depict a top view of the apparatus of the above figures and show subsequent stages of the method according to the invention, with figure 2A showing the same stage as figure 1H;

Figures 3A and 3B schematically depict a cross-section of a part of the apparatus of the above figures and show final subsequent stages of the method according to the 15 invention, with figure 3A showing the same stage as figure 2B;

Figure 3C schematically depicts a cross-section like in figures 3A and 3B, but of an alternative embodiment of the method and apparatus according to the invention; and

Figure 4 shows a perspective view of an apparatus according to the invention.

20 DETAILED DESCRIPTION OF EMBODIMENTS

[35] Figures 1A to 1H schematically show an embodiment of the method and the apparatus according to the invention for packing articles A into a packing container C. The articles shown are bags filled with products like crisps, fried onion rings, sweets, etcetera. The articles are provided in a supply flow F0 of articles in a supply direction D1. In the 25 embodiment shown, the articles in the supply flow F0 are provided in an overlapping manner on a conveyor 10, but could be supplied in other ways as well. Another type of device 10 and method for providing a supply flow F0 of articles is, for instance, shown in figure 4, and described in WO 99/10261 A1. The supply flow F0 of articles is supplied to a portioning conveyor 110 of the packing machine 100 according to the invention. The articles are 30 provided such in the supply flow F0 in the supply direction D1 to the portioning conveyor 110 that the articles can be arranged in the supply direction on the portioning conveyor in a manner that an article overlaps a directly succeeding article (as seen with respect to the supply direction D1) by controlling a velocity of the portioning conveyor at an appropriate velocity in relation to the supply flow F0. By keeping the velocity of the portioning conveyor 35 at a same velocity of the articles in the supply flow F0, a spacing between the articles A is maintained, while the spacing can be increased or decreased by controlling the velocity of the portioning conveyor at a relatively higher or lower velocity, respectively.

[36] The articles are received from the supply flow F0 onto the portioning conveyor 110 to provide portioned sets S of a predetermined number of overlapping 40 articles A in a portioned flow F1 of articles in the supply direction D1 on the portioning

conveyor. In each portioned set S, each article A overlaps a directly succeeding article and adjacent articles A are separated by an intraset distance h as measured between leading ends of adjacent articles. Adjacent portioned sets S are separated by an interset distance H as measured between leading ends of a last article in a portioned set S and a first article in
5 a succeeding portioned set S. The intraset distance h and the interset distance H are provided by controlling the velocity of the portioning conveyor 110 to have the interset distance H larger than the intraset distance(h). The intraset distance h is provided by controlling the portioning conveyor 110 at a first velocity v1 in relation to the supply flow F0, and the interset distance H is provided by controlling the velocity of the portioning
10 conveyor 110 at a second velocity v2 in relation to the supply flow F0, wherein the second velocity v2 is larger than first velocity v1.

[37] Figure 1A shows that articles A are received on the positioning conveyor 110 for providing a first portioned set S while the portioning conveyor 110 is driven at velocity v1. Figure 1B shows that a predetermined number of four overlapping articles A with mutual
15 intraset distance h has been provided on the portioning conveyor 110 in a first portioned set. Figure 1B further shows that the portioning conveyor is now driven at the velocity v2 to provide for the interset distance H to the next, directly succeeding portioned set, which is the distance between leading ends of the last article in the first portioned set and the first article in the subsequent portioned set. The cycle of driving the portioning conveyor 110 at the first
20 velocity v1 and receive four overlapping articles A in a portioned set S and driving the portioning conveyor at the second velocity v2 to set the interset distance H to the next, directly succeeding portioned set is continuously repeated to provide a flow of portioned sets in the portioned flow F1 of articles.

[38] Figure 1C shows that two full portioned sets S have been provided on the portioning conveyor 110 from the supply flow F0, while a next portioned set is being provided onto the portioning conveyor at its receiving end by receiving articles from the supply flow F0 and the portioning conveyor is driven at the first velocity v1. Figure 1C further shows that, at a discharging end of the portioning conveyor 110, articles of a portioned set S are discharged from the portioning conveyor and received onto an extraction conveyor 120. The portioned set S is received in the portioned flow F0 from the portioning conveyor in the supply direction onto the extraction conveyor 120 by controlling a velocity of the extraction conveyor at a velocity associated with the portioning conveyor. The velocity of the extraction conveyor associated with the velocity of the portioning conveyor while receiving the portioned set onto the extraction conveyor maintains the integrity of the portioned set on the
30 extraction conveyor. In the embodiment shown, the velocity of the extraction conveyor 120 is controlled at a velocity equal to the velocity of the portioning conveyor 110, so that the portioning conveyor 110 and extraction conveyor 120 basically act as a single conveyor while a portioned set is received onto the extraction conveyor. The portioned flow F0 is continued onto the extraction conveyor 120 until a full portioned set S is received on the
35 extraction conveyor, as is shown in figure 1D.

[39] When the full portioned set S has been received on the extraction conveyor 120 in the portioned flow F1, the portioned set is extracted from the portioned flow and discharged from the extraction conveyor onto a formation surface 131 of a formation conveyor 130, as is shown in figure 1E. The extraction and discharge is done by controlling
5 a velocity of the extraction conveyor 120 at a velocity that is sufficient to provide the portioned set S onto the formation conveyor 130 before a first article from a next, directly succeeding portioned set S in the portioned flow F0 is discharged from the portioning conveyor 110 onto the extraction conveyor 120. In the embodiment shown, the extraction conveyor is driven at a third velocity v3 that is larger than the second velocity v2. The actual
10 velocity of the extraction conveyor which is required for the extraction is, inter alia, determined by the length of a portioned set, the interset distance H, and the actual velocity at which the portioning conveyor is driven while extracting the portioned set. The portioned set S received from the portioning conveyor 110 on the extraction conveyor 120 is separated and extracted from the portioned flow F0 in the supply direction D1 and is immediately
15 discharged from the extraction conveyor and received by the formation conveyor 130. A velocity of the formation conveyor 130 is controlled at a velocity associated with the velocity of the extraction conveyor 120 to maintain integrity of the extracted portioned set S. In the embodiment shown, the formation conveyor 130 is driven at the third velocity v3 as well when receiving the portioned set from the extraction conveyor 120 driven at the third
20 velocity v3 for a smooth transfer of the portioned set. The extraction conveyor 120 and the formation conveyor 130 basically act as a single conveyor when driven at equal velocity to extract a portioned set from the portioned flow F1. Figure 1F shows the portioned set provided on the formation conveyor 130.

[40] When the portioned set S has been provided onto the formation conveyor 130,
25 a back stop 140 is provided after the portioned set, as is shown in figure 1G. In the embodiment shown, the back stop 140 is configured as a vertical wall that is projected upward in between the extraction conveyor 120 and the formation conveyor 130. An end stop 150 is present after the portioned set S that is provided on the formation conveyor. The end stop 150 is attached to the formation conveyor 130. After the back stop 140 has been
30 put in position after the portioned set on the formation conveyor, as seen in the supply direction D1, the portioned set S is moved in the formation direction D2 that is oppositely directed to the supply direction D1. This is achieved by driving the formation conveyor 130 together with the attached end stop 150 in the formation direction D2 to move the portioned set against the back stop 140 to provide the articles A in the portioned set S in an upright
35 orientation against one another. Since the articles in the portioned set are overlapping one another, they are in a slanted position, which results in bringing the articles in the upright orientation when the portioned set moves against the back stop 140. The last article in the portioned set as seen in the supply direction D1 is the first article as seen in the formation direction D2 and will move against the back stop 140 to put it in the upright orientation, while
40 the other articles are put in the upright orientation by moving against a preceding article as

seen in the formation direction D2. Figure 1H shows the articles in the portioned set in their upright vertical position in between the back stop 140 and the end stop 150.

[41] In a next step, the portioned set S with the articles A in the upright orientation is to be pushed sideward in a move-out direction D3 transverse to the supply direction D1, as is shown in figures 2A and 2B. Figure 2A shows the portioned set S still present on the formation conveyor 130, while figure 2B shows that the portioned set S has been pushed onto a removable surface 170. The portioned set S is pushed by a pusher 160 onto the removable support surface 170 formed by two bottom slides 171, 172. The portioned set S on the formation conveyor 130 is pushed in the move-out direction D3 on the removable support surface 170, while being guided by back stop 140 and end stop 150 and guide walls 181, 182. Guide wall 181 is provided in line with back stop 140 and guide wall 182 is provided in line with end stop 150. Figures 2A and 2B show that two other portioned sets S have already been provided earlier on the removable support surface 170. A next portioned set S is pushed up to a portioned set S provided earlier on the removable support surface 170. An end wall 183 is provided to confine the portioned sets S on the removable support surface 170 together with the guiding walls 181, 182. In the embodiment shown, the three portioned sets S provided on the removable support surface 170 will fill a packing container C.

[42] Empty packing containers C are provided along a container track 190 to below the removable surface 170 as is visible in figures 2A and 2B. Figures 3A and 3B show a cross section of the part of the packing machine along the container track 190 at the position of the removable support surface 170. Figure 3A shows the same stage as figure 2B with three portioned sets S provided on the removable support surface 170 to fill a packing container C that has been provided under the removable surface 170. As a next step the bottom slides 171, 172 of the removable support surface are moved sideward. The articles A of the portioned sets S will remain in position between the confining guide walls 181, 182 and drop downward into the packing box C. The bottom slides 171, 172 will close again to present a removable support surface 170 for a next series of portioned sets to be provided on the removable support surface. In an embodiment, each bottom slide is configured in two or more sections that slide into each other when opening the bottom slides to provide a very fast opening and closing action of the bottom slides, which can be driven by pneumatic action. A filled packing box C is moved further along the container track 190, as is visible in figures 2A and 2B as well. The container track 190 is a slide track in the embodiment shown to provide packing containers by manual sliding, but can be configured as a conveyor for packing containers as well.

[43] Figure 3C shows an alternative embodiment having movable guide walls 181, 182 that are first moved inward to clamp the portioned set S between the guide walls. Subsequently, the bottom slides 171, 172 are opened and the guide walls 181, 182 together with the portioned set S are moved downward to position the portioned set S of articles into the packing container C. The end wall 183 is provided in two parts, each part connected to

a movable guide wall 181, 182. After positioning the portioned set S into the packing container, the guide walls are moved outward to release the portioned set and moved upward. The bottom slides 171, 172 will then close to present a removable support surface 170 for a next series of portioned sets to be provided on the removable support surface. Figures 3A, 3B and 3C show that only a single layer of articles A is provided in the packing container C. In alternative containers and implementations of the method and apparatus, multiple layers of articles can be provided in the packing container.

[44] Figure 4 shows another embodiment of the apparatus 100 and method according to the invention, which generally corresponds to the apparatuses and methods as has been described with reference to the preceding figures. Similarities and differences are discussed below with reference to figure 4, while reference is made to the preceding figures as well.

[45] A supply flow of articles A is provided by device 10 for arranging articles A lying on entrance conveyor 11 into the supply flow F0 of overlapping articles to portioning conveyor 110. The articles A lying on entrance conveyor 11 are provided to rotor 12 having slots, each slot taking up a lying article from the entrance conveyor 10 to provide the article to an upright position towards portioning conveyor 110. Such a device is disclosed in WO 99/10261 A1. By presenting an obstruction by flap 13 to the top end of the articles in the upright position in a row of upright articles after rotor 12, the row of articles is provided into a supply flow F0 of overlapping articles on the portioning conveyor 110. Subsequently, the articles in the supply flow F0 are provided into portioned sets S of articles in a portioned flow F1 of articles, and the portioned flow F1 of articles is provided to extraction conveyor 120, as has been described with reference to figures 1A to 1H.

[46] The extraction conveyor 120 of the embodiment of the apparatus 100 shown in figure 4 comprises consecutive first and second extraction conveyors 120.1, 120.2. The first extraction conveyor 120.1 directly behind portioning conveyor 110, as seen in the supply direction D1, is moving synchronously ("in sync") with the portioning conveyor 110 when receiving a portioned set S of articles A from the portioning conveyor. The second extraction conveyor 120.2 directly behind the first extraction conveyor 120.1 moves in sync with the first extraction conveyor when articles of the portioned set S transfer from the first extraction conveyor 120.1 onto the second extraction conveyor 120.2. When the full portioned set S of articles has been provided onto the first and second extraction conveyors 120.1, 120.2 of extraction conveyor 120, the first and second extraction conveyors will be driven at the higher third velocity v3 in sync with the formation conveyor 130 to transfer the portioned set S of articles from the extraction conveyor 120 onto the formation conveyor 130. As soon as all articles A of the portioned set S have been transferred from the first extraction conveyor 120.1 to the second extraction conveyor 120.2, the first extraction conveyor 120.1 is put in sync again with the portioning conveyor 110 to allow receiving articles A from the portioning conveyor 110 onto the first extraction conveyor 120.1 for the next portioned set S. The extraction conveyor 120 is now discharging articles of a portioned set from the second

extraction conveyor 120.2 onto the formation conveyor 130, while at the same time receiving articles of a next portioned set from the portioning conveyor 110 onto the first extraction conveyor 120.1. At the moment that all articles A of the portioned set S have been transferred from the second extraction conveyor 120.2 onto the formation conveyor 130, the
5 second extraction conveyor 120.2 is put in sync with the first extraction conveyor 120.1 to allow receiving articles A in the next portioned set S from the first extraction conveyor 120.1 onto the second extraction conveyor 120.2. The second conveyor 120.2 is coupled by one-way type of bearings to the first extraction conveyor 120.1 and the formation conveyor 130 to be driven in sync with the one of those two conveyors having the highest velocity in the
10 supply direction D1.

15 [47] Receiving of a portioned set S of articles onto the formation conveyor 130, and providing the articles in the portioned set into the upright position is done in the same manner in the figure 4 embodiment as has been described with reference to figures 1E to 1H. The back stop 140 is provided upwards from in between the extraction conveyor 120 and the formation conveyor 130. However, the end stop 150 is not attached to the formation conveyor 130 but driven by a separate drive 155 alongside the formation conveyor. The end stop 150 can be rotated upwards away from the formation conveyor to allow passing and rejecting articles from the formation conveyor 130 by transferring those articles to the end of and off the formation conveyor 130. When the articles A of the portioned set have been
20 provided in the upright position in between back stop 140 and end stop 150, the portioned set S is pushed by pusher 160 onto a removable support surface 170 in between guide walls 181, 182. The pusher 160 is shown in a transparent fashion by dashed lining in order to allow a view on parts of the machine behind the pusher from the point of view of figure 4. This has only been done for illustration purposes.

25 [48] The position of the back stop 140 corresponds to the position of guide wall 181, and the position of the end stop 150 corresponds to the position of guide wall 182 when the articles of the portioned set have been put in the upright position in between the back stop 140 and the end stop 150 for transfer to the removable support surface 170. Guide wall extension 181A is an extension of the guide wall 181 and is positioned and shaped to
30 provide a continuous transition from back stop 140 to guide wall extension 181A. In the same manner, guide wall extension 182A is an extension of the guide wall 182 and is positioned and shaped to provide a continuous transition from end stop 150 to guide wall extension 182A. Guide wall 181 has a slideable part 181.1 to allow closing a gap between guide wall extension 181A and guide wall 181 to provide a continuous transition from guide
35 wall extension 181A to guide wall 181 including slideable part 181.1. The slideable part 181.1 is driven by a drive 181.2 along the guide wall 181. In the same manner, guide wall 182 has a slideable part 182.1 to allow closing a gap between guide wall extension 182A and guide wall 182 to provide a continuous transition from guide wall extension 182A to guide wall 182 including slideable part 182.1. This provides for
40 continuous composed guide walls 181/181.1/181A/140/181A and 182/182.1/182A/150,

which provide there between a guided transition path from formation conveyor 130 to removable support surface 170.

[49] The end position of the end stop 150 along the formation conveyor 130 in the formation direction D2 for providing the articles A of a portioned set S in the upright position
5 can be adjusted to a length L, as shown in figure 1H, of the portioned set in between the back stop 140 and the end stop 150 with its associated articles in the upright position. The length L corresponds to a dimension of the packing container C in which the portioned set of articles in the upright position is to be provided. The positions of the guide wall 182 with its slideable part 182.1 and the guide wall extension 182A can be set accordingly at a
10 position along the formation conveyor 130 to adjust to the corresponding dimension of the packing container C to be filled with articles.

[50] The pusher 160 is driven by a corresponding drive 165 in the move-out direction D3 transverse to the longitudinal direction of the formation conveyor 130 and along the guide walls 181, 812 to transfer the portioned set S of upright articles A onto the
15 removable support surface 170. As soon as a portioned set is moved onto the removable support surface 170, a next portioned set of articles is being received onto the formation conveyor 130. To allow the pusher 160 to move back to the other side of the formation conveyor 130, the drive 165 can move the pusher 160 in the vertical direction as well so that the pusher can hop over the formation conveyor 130, the end stop 150 and the next
20 portioned set of articles on the formation conveyor, from the formation conveyor side associated with the removable support surface 170 to the opposing formation conveyer side that provides for the initial position of the pusher 160 for a pushing action against a portioned set of articles in the upright position. The pusher 160 is extendible along the formation conveyor 130 to allow adjusting to the length L of the portioned set of articles in the upright
25 position as well.

[51] When a number of portioned sets of upright articles have been provided on the removable support surface to fill a layer of an associated packing container C, as is shown in figure 2B, the slideable parts 181.1, 182.1 of the guide wall 181, 182 are retracted away from the guide wall extensions 181A, 182A and the guide walls 181, 182 are moved inward
30 to clamp the portioned sets of articles A on the removable support surface 170. Subsequently, bottom slides 171, 172 are opened to remove the removable support surface 170 from below the guide walls 181, 182 and the portioned article sets clamped between the guide walls 181, 182, and the clamped portioned sets are lowered into the packing container C below, as is shown in figure 3C by driving the guide wall 181, 182
35 downward. The guide walls 181, 182 will then release the portioned sets and move upwards again. Movement of the guide walls 181, 182 up and down and inward and outward is driven by drive 185. Drive 185 allows to lower portioned sets clamped between the guide wall 181, 182 to various height positions to allow filling of multiple layers into a packing container C. The length of the guide walls 181, 182 along the move-out direction D3 can be adjusted
40 through adjusting the position of the slideable parts 181.1, 182.1 to adjust to an associated

dimension of the packing container C to allow lowering the guide walls 181, 182 including the slideable parts 181.1, 182.1 into the packing container, and to close a gap to the guide wall extensions 181A, 182A.

- [52] Empty packing containers are to be provided at location E to the apparatus for
5 subsequent transfer on container track 190 to below the removable support surface 170 for
filling of the packing containers C as described.

CONCLUSIES

1. Een artikelinpakwerkwijze voor het inpakken van artikelen (A) in een verpakkingshouder (C), waarbij de werkwijze omvat:

- 5 - het verschaffen van artikelen in een toevoerstroom (F0) van artikelen in een toevoerrichting (D1) naar een portioneertransporteur (110) zodat de artikelen in de toevoerrichting op de portioneertransporteur kunnen worden opgesteld op een manier dat een artikel een direct daaropvolgend artikel overlapt door het regelen van een snelheid van de portioneertransporteur opeen geschikte snelheid in relatie tot de toevoerstroom;
- 10 - het ontvangen van artikelen van de toevoerstroom (F0) op de portioneertransporteur (110) om te verschaffen geportioneerde sets (S) van een vooraf bepaald aantal overlappende artikelen (A) in een geportioneerde stroom (F1) van artikelen in de toevoerrichting (D1) op de portioneertransporteur, waarbij, in elke geportioneerde set (S), elk artikel (A) een direct daaropvolgend artikel overlapt en aangrenzende artikelen 15 worden gescheiden door een intraset-afstand (h) zoals gemeten tussen de voorste uiteinden van aangrenzende artikelen, waarbij aangrenzende geportioneerde sets (S) worden gescheiden door een interset-afstand (H) zoals gemeten tussen de voorste uiteinden van een laatste artikel in een geportioneerde set en een eerste artikel in een daaropvolgende geportioneerde set, en waarbij de intraset-afstand (h) en de interset-afstand (H) zijn verschaft door het regelen van de snelheid van de portioneertransporteur om de interset-afstand (H) groter te hebben dan de intraset-afstand (h);
- 20 - het afvoeren van een geportioneerde set (S) van de portioneertransporteur (110) op een extractietransporteur (120) en het ontvangen van de geportioneerde set (S) in de geportioneerde stroom (F1) van de portioneertransporteur (110) in de toevoerrichting (D1) 25 op de extractietransporteur (120) terwijl een snelheid van de extractietransporteur wordt geregeld op een snelheid geassocieerd met de snelheid van de portioneertransporteur;
- 30 - het extraheren van de geportioneerde set (S) ontvangen in de geportioneerde stroom (F1) op de extractietransporteur (120) in de toevoerrichting (D1) uit de geportioneerde stroom en het afvoeren van de geportioneerde set (S) van de extractietransporteur op een formatieoppervlak (131) door een snelheid van de extractietransporteur te regelen op een snelheid die voldoende is om genoemde geportioneerde set op het formatieoppervlak te brengen voordat een eerste artikel van een daaropvolgende geportioneerde set (S) in de geportioneerde stroom (F0) wordt afgevoerd van de portioneertransporteur (110) op de extractietransporteur (120);
- 35 - het ontvangen van genoemde geportioneerde set (S) van de extractietransporteur (120) in de toevoerrichting (D1) op het formatieoppervlak (131); en
 - het verschaffen van genoemde geportioneerde set (S) van het formatieoppervlak (130) in de verpakkingshouder (C).

40 2. Een artikelinpakinrichting (100) voor het inpakken van artikelen (A) in een

verpakkingshouder (C), waarbij het apparaat omvat een portioneertransporteur (110) geconfigureerd om het mogelijk te maken om te ontvangen artikelen verschaft in een toevoerstroom (F0) van artikelen in een toevoerrichting (D1) naar de portioneertransporteur (110) zodanig dat de artikelen kunnen worden geplaatst in de toevoerrichting op de portioneertransporteur op een manier dat een artikel een direct daaropvolgend artikel overlapt door een snelheid van de portioneertransporteur te regelen op een geschikte snelheid in relatie tot de toevoerstroom; een extractietransporteur (120); en een formatieoppervlak (131), waarbij het artikelverpakningsapparaat is geconfigureerd voor

10 - het ontvangen van artikelen van de toevoerstroom (F0) op de portioneertransporteur (110) om te verschaffen geportioneerde sets (S) van een vooraf bepaald aantal overlappende artikelen (A) in een geportioneerde stroom (F1) van artikelen in de toevoerrichting (D1) op de portioneertransporteur, waarbij, in elke geportioneerde set (S), elk artikel (A) een direct daaropvolgend artikel overlapt en aangrenzende artikelen worden gescheiden door een intraset-afstand (h) zoals gemeten tussen de voorste uiteinden van aangrenzende artikelen, waarbij aangrenzende geportioneerde sets (S) worden gescheiden door een interset-afstand (H) zoals gemeten tussen de voorste uiteinden van een laatste artikel in een geportioneerde set en een eerste artikel in een daaropvolgende geportioneerde set, en waarbij de intraset-afstand (h) en de interset-afstand (H) worden verschaft door het regelen van de snelheid van de portioneertransporteur om de interset-afstand (H) groter te hebben dan de intraset-afstand (h);

15 - het afvoeren van een geportioneerde set (S) van de portioneertransporteur (110) op de extractietransporteur (120) en het ontvangen van genoemde geportioneerde set (S) in de geportioneerde stroom (F1) van de portioneertransporteur (110) in de toevoerrichting (D1) op de extractietransporteur (120) terwijl een snelheid van de extractietransporteur wordt geregeld op een snelheid geassocieerd met de snelheid van de portioneertransporteur;

20 - het extraheren van genoemde geportioneerde set (S) ontvangen in de geportioneerde stroom (F1) op de extractietransporteur (120) in de toevoerrichting (D1) uit de geportioneerde stroom en het afvoeren van de geportioneerde set (S) van de extractietransporteur op het formatieoppervlak (131) door een snelheid van de extractietransporteur te regelen op een snelheid die voldoende is om genoemde geportioneerde set op het formatieoppervlak te brengen voordat een eerste artikel uit een daaropvolgende geportioneerde set (S) in de geportioneerde stroom (F0) wordt afgevoerd van de portioneertransporteur (110) op de extractietransporteur (120); en

25 - het ontvangen van de geportioneerde set (S) van de extractietransporteur (120) in de toevoerrichting (D1) op het formatieoppervlak (131); en toe te staan

30 - het verschaffen van de geportioneerde set (S) vanaf het formatieoppervlak (130) in de verpakkingshouder (C).

3. De artikelinpakwerkwijze of -inrichting volgens een van de voorgaande conclusies, waarbij het formatieoppervlak (131) wordt verschaft door een formatietransporteur (130) en de geportioneererde set (S) wordt ontvangen van de extractietransporteur (120) op de formatietransporteur (130) terwijl een snelheid van de formatietransporteur wordt geregeld op een snelheid geassocieerd met de snelheid van de extractietransporteur.

4. De artikelinpakwerkwijze of -inrichting volgens een van de voorgaande conclusies, waarbij de intraset-afstand (h) wordt verschaft door het regelen van de snelheid van de portioneertransporteur (110) op een eerste snelheid (v1) in relatie tot de toevoerstroom (F0), de interset-afstand (H) wordt verschaft door het regelen van de snelheid van de portioneertransporteur op een tweede snelheid (v2) in relatie tot de toevoerstroom, en de tweede snelheid (v2) groter is dan de eerste snelheid (v1).

15

5. De artikelinpakwerkwijze of -inrichting volgens een van de voorgaande conclusies, waarbij de stap van het ontvangen van een geportioneererde set (S) van de portioneertransporteur (110) op de extractietransporteur (120) omvat het regelen van de snelheid van de extractietransporteur (120) op een snelheid gelijk aan de snelheid van de portioneertransporteur.

20

6. De artikelinpakwerkwijze of -inrichting volgens een van de voorgaande conclusies, waarbij de stap van het extraheren van genoemde geportioneererde set (S) op de extractietransporteur (120) uit de geportioneererde stroom (F1) omvat het regelen van de snelheid van de extractietransporteur (120) op een derde snelheid (v3) groter dan de tweede snelheid (v2).

25

7. De artikelinpakwerkwijze of -inrichting volgens een van de voorgaande conclusies zoals afhankelijk van conclusie 3, waarbij de stap van het ontvangen van genoemde geportioneererde set (S) van de extractietransporteur (120) op de formatietransporteur (130) omvat het regelen van de snelheid van de formatietransporteur op een snelheid gelijk aan de snelheid van de extractietransporteur.

30

8. De artikelinpakwerkwijze of -inrichting volgens een van de voorgaande conclusies, waarbij de stap van het verschaffen van de geportioneererde set (S) van het formatieoppervlak (131) in de verpakkingshouder (C) omvat

40 - het verschaffen van een achteraanslag (140) na de geportioneererde set (S) zoals gezien in de toevoerrichting (D1) en het bewegen van de achteraanslag en genoemde geportioneererde set relatief naar elkaar toe om genoemde geportioneererde set en de achteraanslag tegen elkaar te bewegen om de artikelen in genoemde geportioneererd set in

een rechtopstaande oriëntatie tegen elkaar te verschaffen.

9. De artikelinpakwerkwijze of -inrichting volgens de voorgaande conclusie zoals afhankelijk van conclusie 3, waarbij de stap van het verschaffen van de geportioneererde set (S) van het formatieoppervlak (131) in de verpakkingshouder (C) omvat
- 5 - het verschaffen van de achteraanslag (140) achter genoemde geportioneererde set (S) verschaft op de formatietransporteur (130) zoals gezien in de toevoerrichting (D1);
 - het bewegen van genoemde geportioneererde set (S) op de formatietransporteur (130) in een formatierichting (D2) tegengesteld gericht aan de toevoerrichting (D1) tegen de achteraanslag (140) om de artikelen in genoemde geportioneererde set in een rechtopstaande oriëntatie tegen elkaar te verschaffen; en
 - 10 - het verschaffen van genoemde geportioneererde set (S) met de artikelen in de rechtopstaande oriëntatie tegen elkaar in de verpakkingshouder (C).

- 15 10. De werkwijze voor het verpakken van artikelen volgens de voorgaande conclusie, waarbij de stap van het bewegen van genoemde geportioneererde set (S) op de formatietransporteur (130) in de formatierichting (D2) tegen de achteraanslag (140) voor het verschaffen van de artikelen in genoemde geportioneererde set in de rechtopstaande oriëntatie tegen elkaar omvat
- 20 - het aandrijven van de formatietransporteur (130) om de geportioneererde set in de formatierichting (D2) tegen de achteraanslag (140) te transporteren om de artikelen in de geportioneererde set in de rechtopstaande oriëntatie tegen elkaar te verschaffen.

- 25 11. De artikelinpakwerkwijze of -inrichting volgens een van de voorgaande drie conclusies, waarbij de stap van het verschaffen van de geportioneererde set (S) van het formatieoppervlak (131) in de verpakkingshouder (C) omvat
- 30 - het verschaffen van een eindstop (150) voor de geportioneererde set (S) verschaft op het formatieoppervlak (131) zoals gezien in de toevoerrichting (D1) en het bewegen van de achteraanslag en de eindstop relatief naar elkaar toe om de artikelen in genoemde geportioneererde set in een rechtopstaande oriëntatie tegen elkaar te plaatsen tussen de eindaanslag en de achteraanslag.

- 35 12. De artikelinpakwerkwijze of -inrichting volgens de voorgaande conclusie en conclusie 9, waarbij de stap van het bewegen van genoemde geportioneererde set (S) op het formatieoppervlak (131) in de formatierichting (D2) tegen de achteraanslag (140) om de artikelen in genoemde geportioneererde set in de rechtopstaande oriëntatie tegen elkaar verschaffen omvat
- 40 - het bewegen van de eindstop (150) tegen genoemde geportioneererde stel (S) in de formatierichting (D2).

13. De artikelinpakwerkwijze of -inrichting volgens conclusie 10 en 12, waarbij de eindstop (150) is bevestigd aan de formatietransporteur (130) om samen met de formatietransporteur te bewegen, of aandrijfbaar langs de formatietransporteur is gemonteerd om beweging langs de formatietransporteur mogelijk te maken.

5

14. De artikelinpakwerkwijze of -inrichting volgens een van de voorgaande conclusies, waarbij de stap van het verschaffen van genoemde geportioneererde set (S) van het formatieoppervlak (131) in de verpakkingshouder (C) omvat het bewegen van genoemde geportioneererde set van de formatieoppervlak in een uitplaatsrichting (D3) dwars op de toevoerrichting en langs het formatieoppervlak.

10

15. De artikelinpakwerkwijze of -inrichting volgens de voorgaande conclusie, waarbij genoemde geportioneererde set (S) wordt bewogen van het formatieoppervlak (130) in de uitplaatsrichting (D3) met behulp van een duwer (160).

15

16. De artikelinpakwerkwijze of -inrichting volgens een van de voorgaande conclusies, waarbij de stap van het verschaffen van genoemde geportioneererde set (S) van het formatieoppervlak (131) in de verpakkingshouder (C) omvat

20

- het verschaffen van genoemde geportioneererde set (C) van het formatieoppervlak (131) op een verwijderbaar steunoppervlak (170);
- het verschaffen van de verpakkingshouder (C) onder het verwijderbare steunoppervlak (170); en
- het verwijderen van het verwijderbare steunoppervlak (170) om het mogelijk te maken genoemde geportioneererde set (S) in de verpakkingshouder (C) te verschaffen.

25

17. De artikelinpakwerkwijze of -inrichting volgens de voorgaande conclusie, waarbij meer dan één geportioneererde set (S) wordt verschafft van het formatieoppervlak (131) op de verwijderbare ondersteuning (170) voor verschaffen van de geportioneererde sets van de verwijderbare ondersteuning in de verpakkingshouder (C).

30

18. De artikelinpakwerkwijze of -inrichting volgens een van de voorgaande twee conclusies, waarbij een opluitinrichting (181, 182, 182) is verschafft rond het verwijderbare steunoppervlak (170) om de geportioneererde set op het verwijderbare steunoppervlak in positie te houden.

35

19. De artikelinpakwerkwijze of -inrichting volgens de voorgaande conclusie, waarbij de opluitinrichting omvat wanden (181, 182) die het mogelijk maken genoemde geportioneererde set daar tussen te klemmen en de ingeklemde geportioneererde set in de verpakkingshouder te verschaffen.

40

20. De artikelinpakwerkwijze of -inrichting volgens een van de conclusies 16-18, waarbij het verwijderbare steunoppervlak (170) wordt verwijderd om het laten vallen van genoemde geportioneererde set (S) in de verpakkingshouder mogelijk te maken.

5

21. De werkwijze of inrichting voor het inpakken van artikelen volgens een van de conclusies 16-20, waarbij het verwijderbare steunoppervlak (170) is geconfigureerd als twee bodemschuiven (171, 172) die in horizontale richting beweegbaar zijn in een gesloten positie om ondersteuning mogelijk te maken van ten minste één geportioneererde set (S) daarop, en in een open positie om de genoemde ten minste één geportioneererde set (S) op de bodemschuiven in de verpakkingshouder (C) te laten vallen.

22. De werkwijze of inrichting volgens een van de voorgaande conclusies, waarbij de artikelen (A) zakken zijn die gevuld zijn met een product.

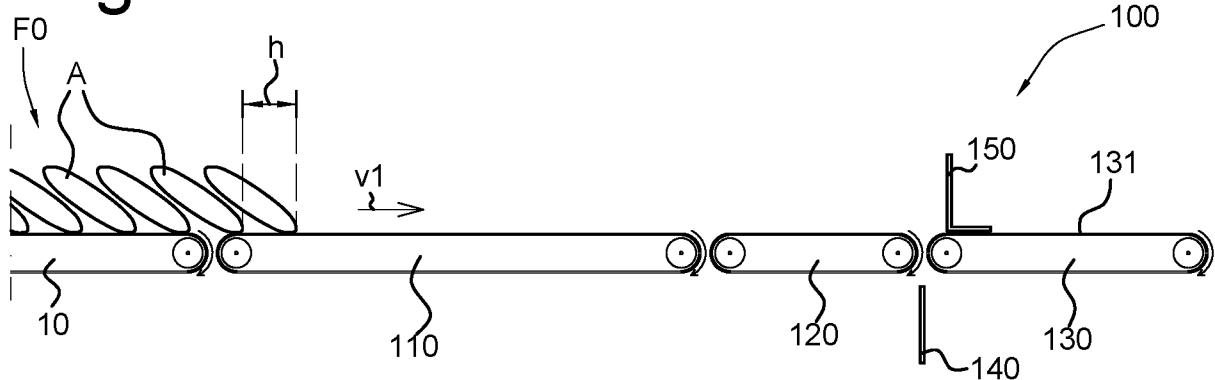
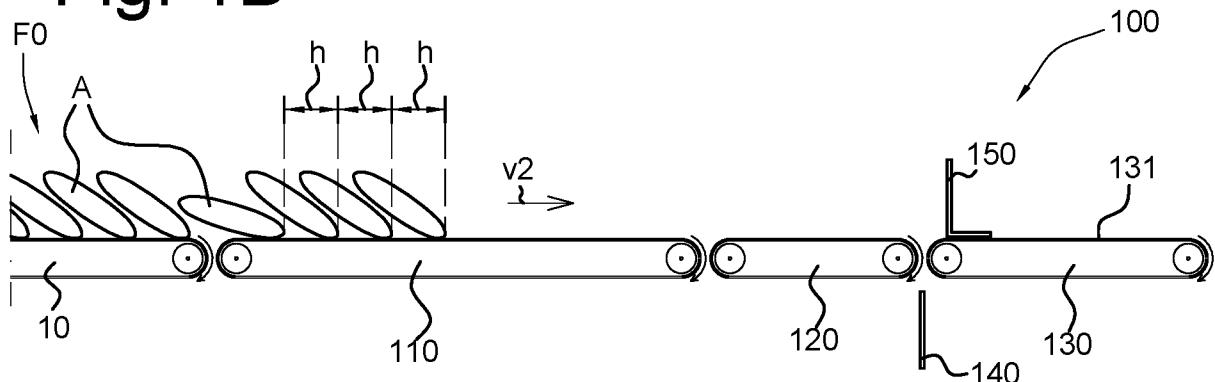
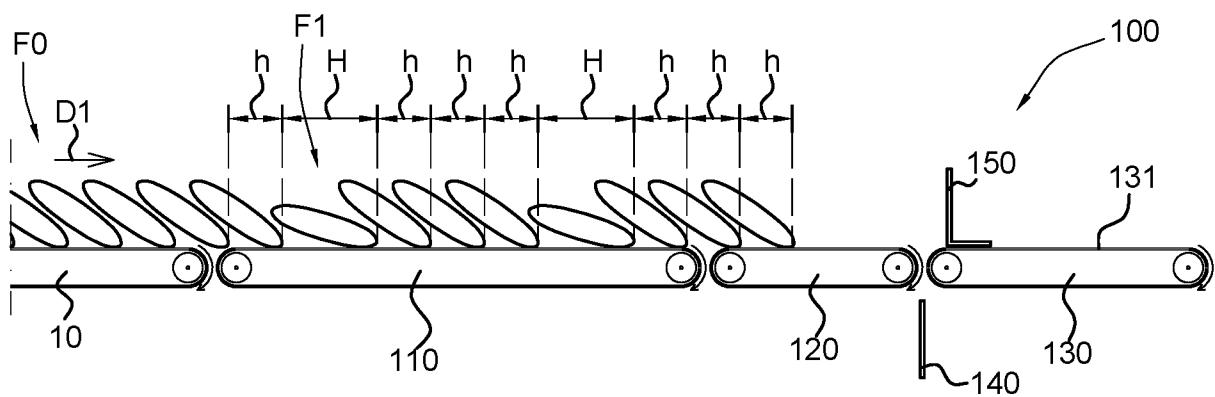
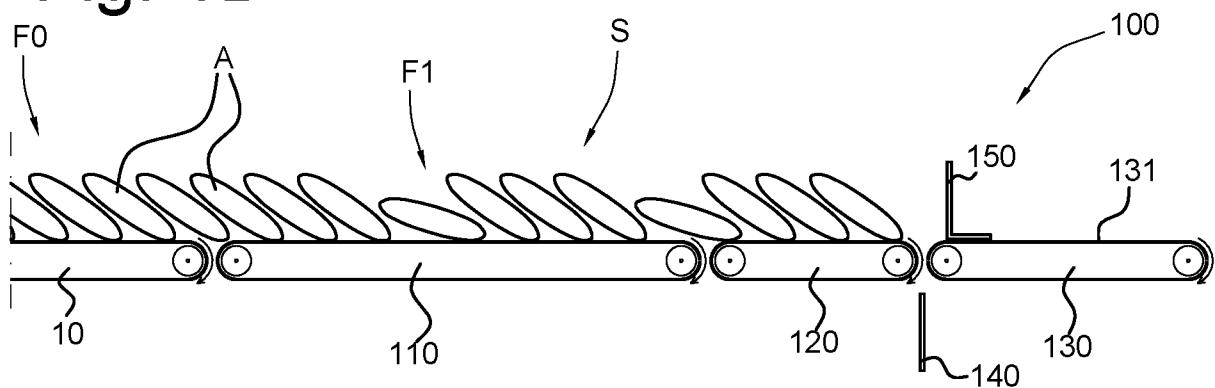
Fig. 1A**Fig. 1B****Fig. 1C****Fig. 1D**

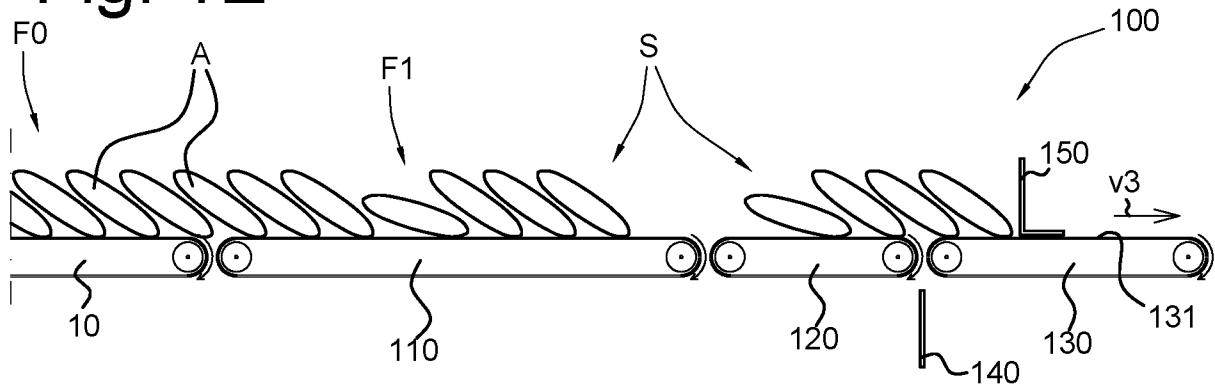
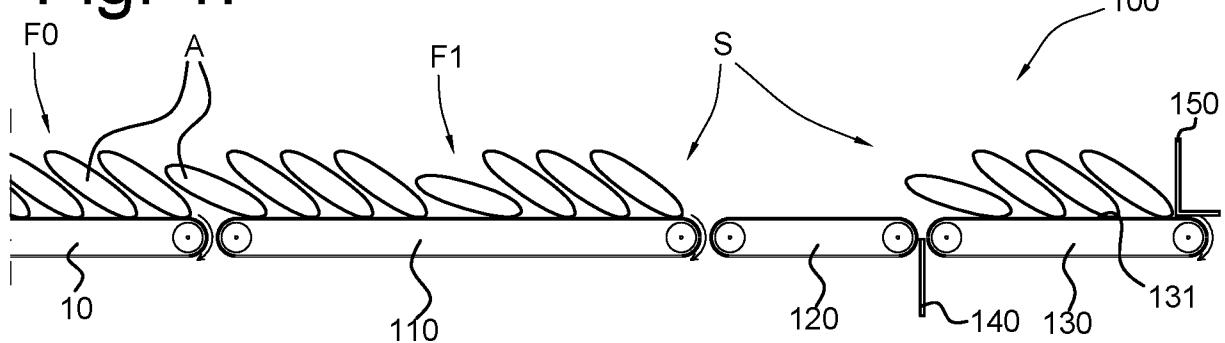
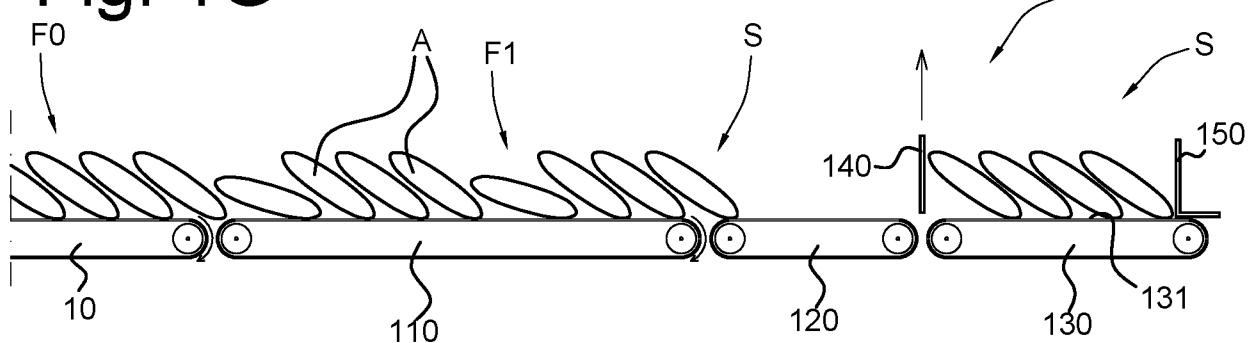
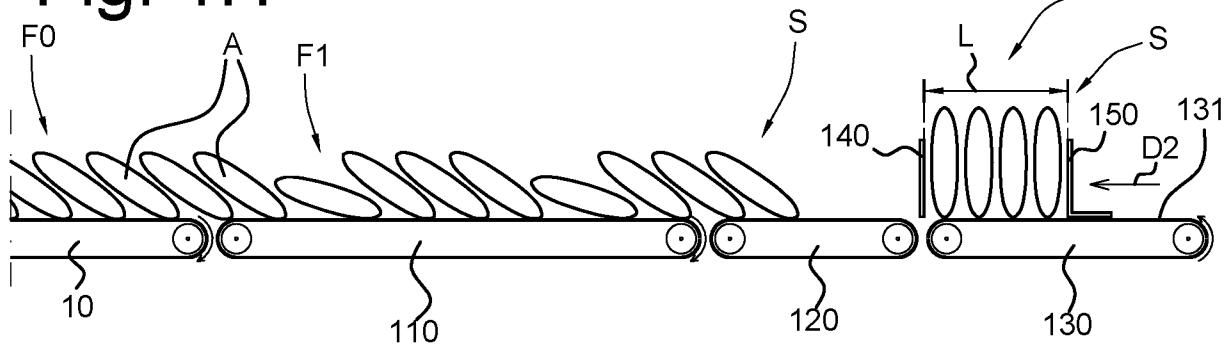
Fig. 1E**Fig. 1F****Fig. 1G****Fig. 1H**

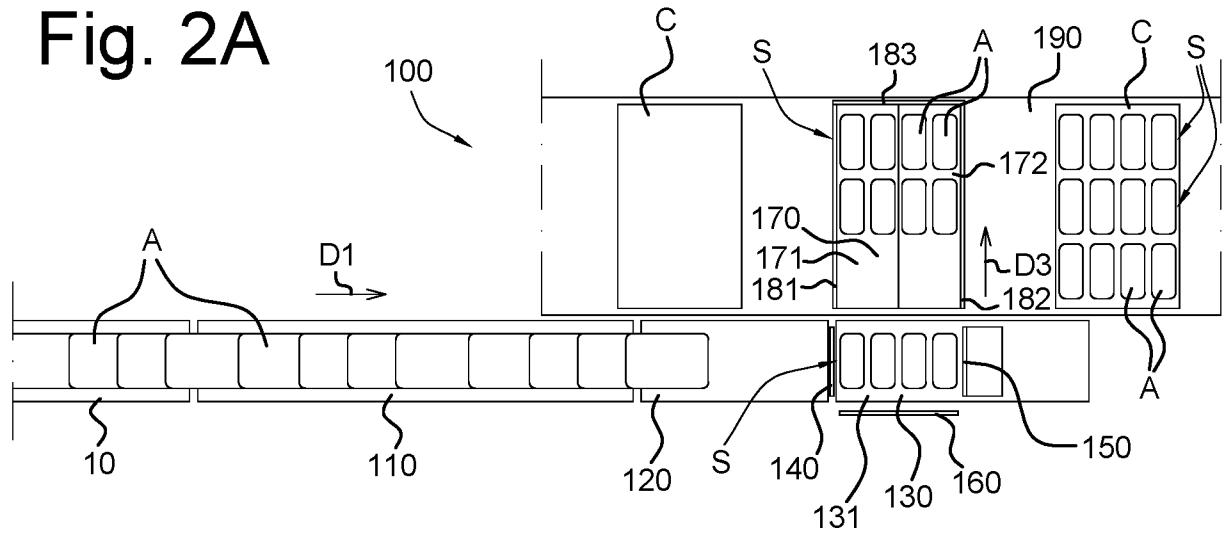
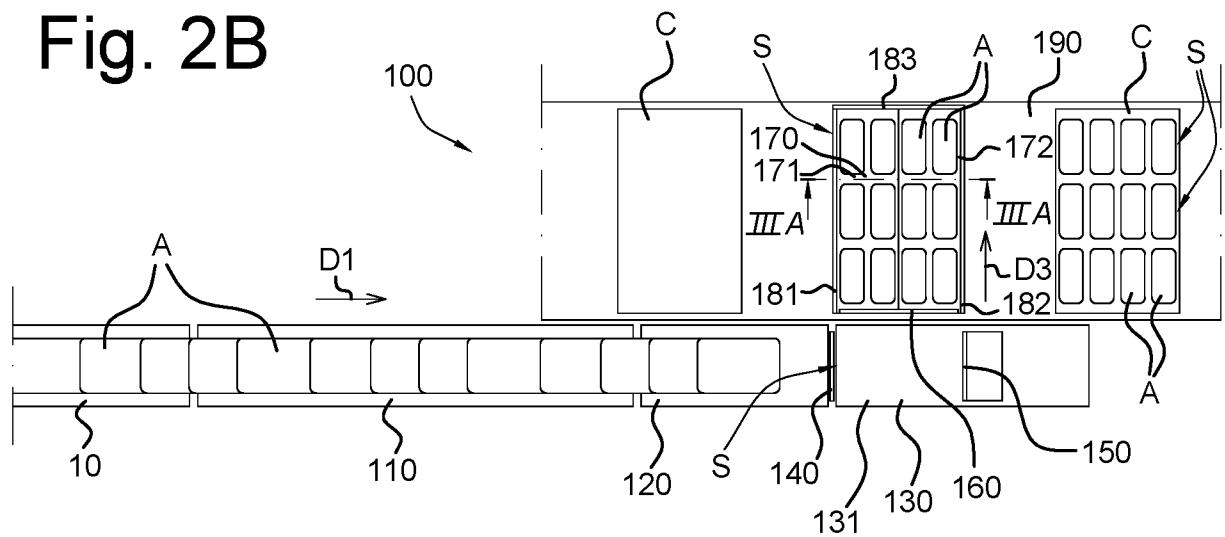
Fig. 2A**Fig. 2B**

Fig. 3A

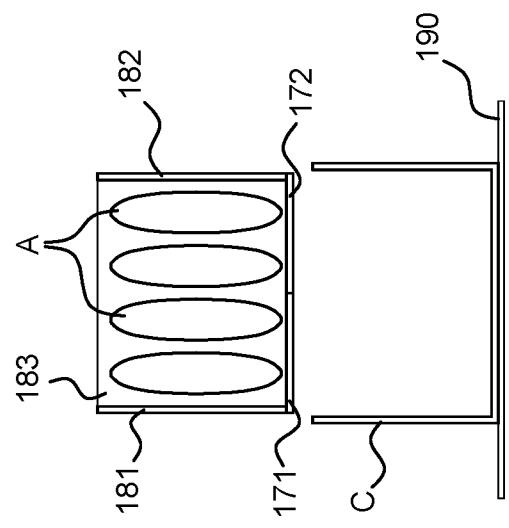


Fig. 3B

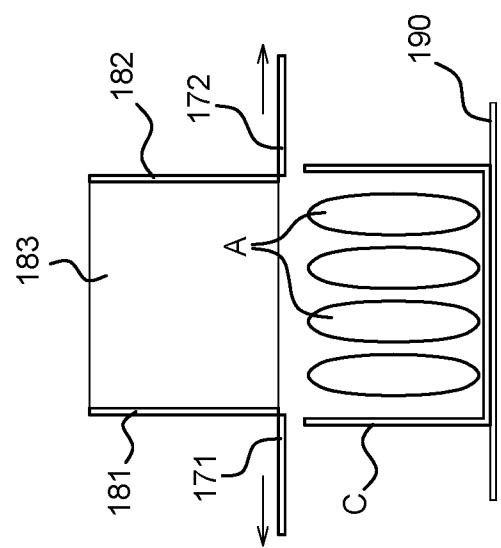
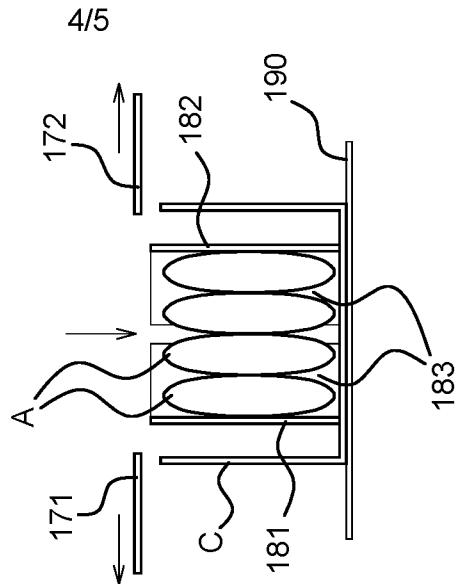
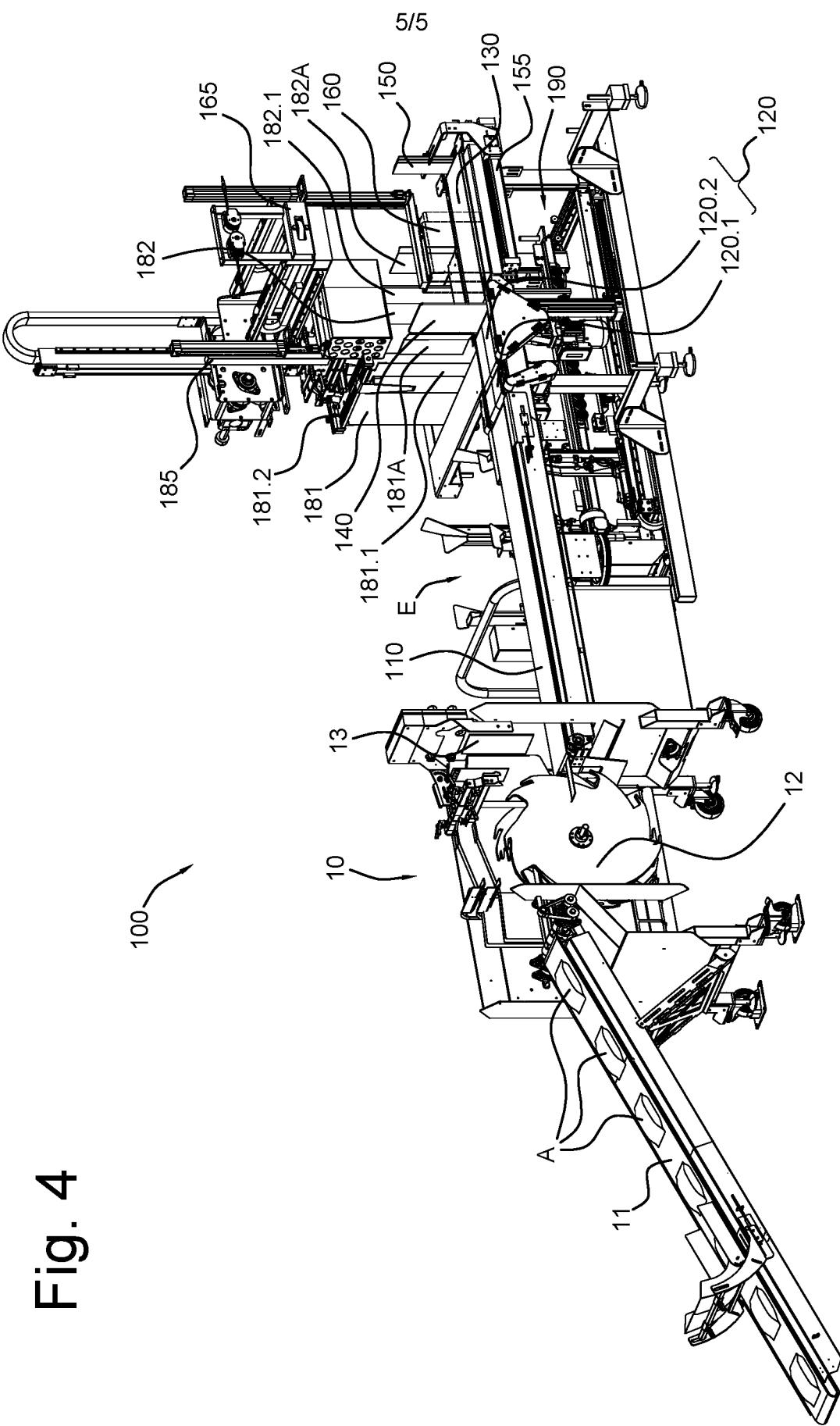


Fig. 3C



4/5



SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE
Nederlands aanvraag nr. 2027175	Indieningsdatum 20-12-2020
	Ingeroepen voorrangsdatum
Aanvrager (Naam) BluePrint Holding B.V.	
Datum van het verzoek voor een onderzoek van internationaal type 27-03-2021	Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr. SN78398
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven) Volgens de internationale classificatie (IPC) Zie onderzoeksrapport	
II. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK Onderzochte minimumdocumentatie	
Classificatiesysteem IPC	Classificatiesymbolen Zie onderzoeksrapport
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 2027175

A. CLASSIFICATIE VAN HET ONDERWERP INV. B65B5/06	B65B35/44	B65B35/56	B65G47/248	B65G47/31
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)

B65B 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	US 2003/123968 A1 (DERENTHAL JEROME W [US] ET AL) 3 juli 2003 (2003-07-03) * alineaas [0003], [0060]; figuren 1-2 *	1-7
Y	EP 2 204 343 A1 (ISHIDA SEISAKUSHO [JP]) 7 juli 2010 (2010-07-07) * figuren 1-46 *	8,9, 11-15,22
Y	US 2014/083062 A1 (ARIMATSU TATSUYA [JP] ET AL) 27 maart 2014 (2014-03-27) * figuren 1-14 *	8-22
Y	US 2018/016043 A1 (YOKOTA YUJI [JP] ET AL) 18 januari 2018 (2018-01-18) * figuren 1-2 *	8,11,14, 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" eerder 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 "&" lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

"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

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

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

2 september 2021

Naam en adres van de instantie

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De bevoegde ambtenaar

Garlati, Timea

**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 2027175

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)			Datum van publicatie
US 2003123968	A1 03-07-2003	US 6543989	B1	08-04-2003	
		US 2003123968	A1	03-07-2003	
EP 2204343	A1 07-07-2010	CN 101817407	A	01-09-2010	
		EP 2204343	A1	07-07-2010	
		JP 5514524	B2	04-06-2014	
		JP 2011111313	A	09-06-2011	
		US 2010170196	A1	08-07-2010	
US 2014083062	A1 27-03-2014	CN 103547510	A	29-01-2014	
		EP 2716550	A1	09-04-2014	
		JP 6038784	B2	07-12-2016	
		JP WO2012165632	A1	23-02-2015	
		US 2014083062	A1	27-03-2014	
		WO 2012165632	A1	06-12-2012	
US 2018016043	A1 18-01-2018	CN 107108055	A	29-08-2017	
		EP 3248892	A1	29-11-2017	
		JP 6534820	B2	26-06-2019	
		JP 2016135679	A	28-07-2016	
		US 2018016043	A1	18-01-2018	
		WO 2016117178	A1	28-07-2016	

WRITTEN OPINION

File No. SN78398	Filing date (<i>day/month/year</i>) 20.12.2020	Priority date (<i>day/month/year</i>)	Application No. NL2027175
International Patent Classification (IPC) INV. B65B5/06 B65B35/44 B65B35/56 B65G47/248 B65G47/31			
Applicant BluePrint Holding B.V.			

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 Garlati, Timea
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WRITTEN OPINION**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	8-22
	No: Claims	1-7
Inventive step	Yes: Claims	
	No: Claims	1-22
Industrial applicability	Yes: Claims	1-22
	No: Claims	

2. Citations and explanations

see separate sheet

WRITTEN OPINION

Box No. VII Certain defects in the application

see separate sheet

Box No. VIII Certain observations on the application

see separate sheet

Reference is made to the following documents:

- D1 US 2003/123968 A1 (DERENTHAL JEROME W [US] ET AL) 3 juli 2003 (2003-07-03)
- D2 EP 2 204 343 A1 (ISHIDA SEISAKUSHO [JP]) 7 juli 2010 (2010-07-07)
- D3 US 2014/083062 A1 (ARIMATSU TATSUYA [JP] ET AL) 27 maart 2014 (2014-03-27)
- D4 US 2018/016043 A1 (YOKOTA YUJI [JP] ET AL) 18 januari 2018 (2018-01-18)

Point VIII

The subject-matter of claim 2 is not clear as it attempts to define an apparatus in terms of the method steps it performs. Apparatus claims provide protection to an apparatus also when not in use, hence the definition of apparatus claims in terms of method steps does not provide a clear definition of the subject-matter to be protected.

The above reasoning also applies to dependent claims 2-22, which not only relate to the method of claim 1 but also to the apparatus of claim 2. It is thus furthermore not clear what category the dependent claims belong to.

Point VII

Claim 6 refers back to the second velocity which has however only been defined in claim 4. For the below reasoning it is thus presumed that claim 6 is dependent on claim 4.

Point V

- 1 Notwithstanding the above clarity objection, the subject-matter of **claim 1** is not considered to be novel. Document D1 discloses:

Een artikelinpakwerkwijze voor het inpakken van artikelen ([0060]:items) in een verpakkingshouder ([0003]:"into larger trays or containers"), waarbij de werkwijze omvat:
- het verschaffen van artikelen in een toevoerstroom (Fig 2, on conveyor

49) van artikelen in een toevoerrichting naar een portioneertransporteur (Fig 2, 52) zodat de artikelen in de toevoerrichting op de portioneertransporteur kunnen worden opgesteld op een manier dat een artikel een direct daaropvolgend artikel overlapt door het regelen van een snelheid van de portioneertransporteur opeen geschikte snelheid in relatie tot de toevoerstroom;

- het ontvangen van artikelen van de toevoerstroom op de portioneertransporteur (Fig 2, 52) om te verschaffen geportioneerde sets van een vooraf bepaald aantal overlappende artikelen in een geportioneerde stroom van artikelen in de toevoerrichting op de portioneertransporteur, waarbij, in elke geportioneerde set, elk artikel een direct daaropvolgend artikel overlapt en aangrenzende artikelen worden gescheiden door een intraset-afstand zoals gemeten tussen de voorste uiteinden van aangrenzende artikelen, waarbij aangrenzende geportioneerde sets worden gescheiden door een interset-afstand zoals gemeten tussen de voorste uiteinden van een laatste artikel in een geportioneerde set en een eerste artikel in een daaropvolgende geportioneerde set, en waarbij de intraset-afstand en de interset-afstand zijn verschaft door het regelen van de snelheid van de portioneertransporteur om de interset-afstand groter te hebben dan de intraset-afstand (*[0060]: The flat items are counted by an overhead sensor or counter (not shown) and enter the next conveyor belt 52 in counted groups. Conveyor belt 52 moves with a speed slower than the speed of the conveyor belt 49, so that the items enter conveyor belt 52 slightly overlapped with each other and form groups of shingled items. When the desired count or number of items has been detected, the noser 50 extends momentarily preventing additional items from entering conveyor 52. At the same time, conveyor 52 increases its speed for a moment to move the formed group of shingled items forward thus forming a gap between the group of shingled items and the next incoming group.*) ;

- het afvoeren van een geportioneerde set van de portioneertransporteur (Fig 2, 52) op een extractietransporteur (Fig 2, 54) en het ontvangen van de geportioneerde set in de geportioneerde stroom van de portioneertransporteur (Fig 2, 52) in de toevoerrichting op de extractietransporteur (Fig 2, 54) terwijl een snelheid van de extractietransporteur wordt geregeld op een snelheid geassocieerd met de snelheid van de portioneertransporteur;

- het extraheren van de geportioneerde set ontvangen in de geportioneerde stroom op de extractietransporteur (Fig 2, 54) in de

toevoerrichting uit de geportioneererde stroom en het afvoeren van de geportioneererde set van de extractietransporteur op een formatieoppervlak (Fig 2, 58) door een snelheid van de extractietransporteur te regelen op een snelheid die voldoende is om genoemde geportioneererde set op het formatieoppervlak te brengen voordat een eerste artikel van een daaropvolgende geportioneererde set in de geportioneererde stroom wordt afgevoerd van de portioneertransporteur (Fig 2, 52) op de extractietransporteur (Fig 2, 54);
- het ontvangen van genoemde geportioneererde set van de extractietransporteur (Fig 2, 54) in de toevoerrichting op het formatieoppervlak (Fig 2, 58); en
- het verschaffen van genoemde geportioneererde set van het formatieoppervlak (Fig 2, 58) in de verpakkingshouder ([0003]:"into larger trays or containers").

It is stressed, that the conveyor 52 of D1 is by all means in position to take up more than one set of products and to provide a somewhat larger gap between the products of adjacent sets. As such, document D1 discloses all the features of **claim 1**.

- 2 The above reasoning applies mutatis mutandis to corresponding apparatus **claim 2**.
- 3 Dependent claims
 - 3.1 The additional features of dependent **claims 3-7** are also known from document D1, Fig 2, [0060].
 - 3.2 The addition features of dependent **claims 8-13** relate to the problem of erecting the shingled set of articles. It is well known from the prior art, see for example document D3. The skilled person seeking to erect the products of D1 onto their edge would not hesitate to provide the conveyor 58 of D1 with a back stop instead of the stacker 22.
 - 3.3 The addition features of dependent **claims 14-15** relate to the removal of a set of articles from the formation surface. Such a removal is also suggested by document D3 (Figures 12-14).

- 3.4 The additional features of dependent **claims 16-21** relate to the packaging of the set of articles into boxes using a removable support surface. It is known from D3, figures 1-6 to allow removal by using a removable support surface in the form of belts that can be pivoted downwards. It is not considered to require any inventive step to replace such belts with a commonly known sliding plate as claimed in dependent claim 21.
- 3.5 The additional feature of dependent **claim 22** relates to the package being a filled bag. It is obvious that the apparatus of D1 is also suitable to transport a filled bag. Filled bags transported in the way claimed are furthermore also known from D2 and D3.