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(54) Benævnelse: **System til fremstilling af chokolade-baserede artikler**

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WO-A1-2009/007801
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DESCRIPTION

Technical field

[0001] The present invention relates to a system for producing chocolate-based articles is solidifying form and to a method for producing chocolate-based articles in solidifying form.

Background art

[0002] Production of chocolate-based articles in solidifying form, such as chocolate chips or chocolate chunks, generally requires the execution of a series of processing steps under predetermined conditions to ensure that the final chocolate-based articles have a desired appearance and texture. It is well known in the art that chocolate contains solid particles dispersed throughout a fat matrix, wherein the term "fat" may include both cocoa butter and milk fat. The state of the chocolate fat can change depending on the temperature of the environment. For example, in room temperature, chocolate is in a solid state, while when heated above a certain temperature threshold point, it can be melted into a molten or liquid state so that it flows as a fluid. The liquid state of the chocolate is reversible and will return back to a solid state when cooled back below the threshold temperature point.

[0003] In view of the above, a typical production method for producing chocolate-based articles in solidifying form may start by completely melting the chocolate fat to a liquid state. Once the chocolate fat has been melted, the next step may involve the tempering of the chocolate, wherein small stable crystals are formed through the chocolate fat in the liquid state. The chocolate tempering step, although not always necessary, ensures that the chocolate solidifies with a desired shiny and smooth surface. After melting and tempering, the liquid chocolate mass may then be deposited into mould trays or directly onto another surface, which is typically cooled in a temperature and humidity-controlled environment, such as a cooling chamber. The cooling process may typically take anywhere between 10 minutes to 40 minutes depending on the type of chocolate-based articles produced and may require that the liquid chocolate mass is transported through a number of cooling zones to prevent sudden changes in temperature and humidity. Such changes may cause the destabilization of the chocolate butter crystals formed during the tempering process and may result in the chocolate-based article having an undesired appearance and texture. Typically the chocolate mass is transported through the cooling chamber by means of a conveyor belt, which transports the liquid chocolate mass along the different cooling zones in the cooling chamber before it is collected at an exit point. The dimensions and speed of the conveyor belt together with the cooling chamber conditions are adapted such that during transportation of the chocolate mass along the different cooling zones the liquid chocolate mass cools substantially uniformly throughout.

[0004] Conventional systems for producing chocolate-based articles are well known in the art. Such systems may comprise a transportation system arranged to carry the liquid chocolate mass onto a top load carrying side of a conveyor belt along the different cooling zones of the cooling chamber. Considering that a cooling process may take anywhere between 10 to 40 minutes, the conveyor belt of the conventional system needs to be dimensioned accordingly in order to ensure that the finished chocolate-based articles have the desired appearance and texture. Due to the considerably long cooling process, conventional systems for producing chocolate-based articles may require a conveyor belt having a large area overhead. As a result using a conventional system may limit the total number of systems that can work in parallel on a production facility of given dimensions, thereby negatively affecting the production throughput of this production facility. Furthermore, the size of the system would inevitably determine the size of the production facility needed, thus a larger system would require a larger facility that would incur a higher cost.

[0005] US2008/0274241 relates to a system for producing chocolate articles in a retail unit. The system uses a rapid cooling process for cooling the liquid chocolate mass faster, which has as an effect that the overall dimensions of the system can be reduced so that it fits in a retail unit space. However, cooling the liquid chocolate too rapidly, as previously discussed, may destabilise the crystal in the chocolate fat leading to a finished chocolate-based article that does not meet the production requirements.

[0006] EP 0 855 142 A2 discloses a system and a method for producing articles of fat-containing, chocolate-like mass in a continuous production-plant having throughgoing conveying means for mould elements with mould cavities. The system comprises means for initial filling of mould cavities with liquid mass, means for cooling the articles and means for releasing the articles from the mould cavities. After the cooling section, the articles are released in a demoulding section. A cooling section comprises six pairs of primary and secondary turning points. The throughgoing conveying means, arranged as a chain conveyor, is introduced in the cooling section at an inlet. Hereafter the chain conveyor is guided into the cooling section and subsequently guided horizontally forth and back between the primary and secondary turning points. At an outlet the chain conveyor leaves the cooling section and continues to the demoulding section.

[0007] EP 0 157 290 A1 discloses a system for producing moulded chocolate articles comprising a moulding station, a cooling station and a working station which comprises releasing means. The system comprises a transportation system having a conveyor belt being looped around a first and second axis.

Disclosure of the invention

[0008] It is an aim of the present invention to provide a system for producing chocolate based articles in solidifying form having a small area overhead while ensuring that the finished chocolate-based articles have a desired appearance and texture.

[0009] This aim is achieved according to the invention with the system showing the technical characteristics of the first claim.

[0010] More in particular, according to a first aspect of the present invention a system for producing chocolate-based articles in solidifying form is provided. The system comprises a transportation system comprising at least a first conveyor belt looped around at least a first and a second axis. The at least first conveyor belt comprises a substantially flat top load carrying side and a substantially flat bottom load carrying side, interconnected with one another via at least a first and second curved surfaces, formed respectively at the location of the at least first and second axes. The system comprises a dispensing unit positioned at an entry point of the transportation system and arranged for dispensing chocolate mass in liquid form along an outer surface of the top load carrying side of the at least first conveyor belt. For example, the dispensing unit may be suitable for dispensing chocolate mass in the form of continuous strips or individual droplets. The conveyor belt is arranged for transporting the chocolate mass through at least one cooling chamber at a predetermined speed along a first and a second cooling path. The cooling chamber is arranged for cooling the liquid chocolate mass under predetermined conditions before the chocolate mass is collected at an exit point of the transportation system.

[0011] The first and second cooling paths are positioned opposite one another and are connected via at least the first curved surface such that the direction in which the chocolate mass is transported in the second cooling path is opposite to that of the first cooling path. The first and second cooling paths are ocated respectively on the top load carrying side and bottom load carrying side of the conveyor belt. It has been found that by positioning the first and second cooling paths opposite one another, the area overhead of the system can be significantly reduced. By reducing the area overhead of the system, the problems related to the use of conventional systems with respect to the production facility space limitations and production throughput are overcome.

[0012] Furthermore, the system comprises a release mechanism positioned along the second cooling path and arranged for releasing the chocolate mass from an outer surface of the bottom load carrying side of the at least first conveyor belt. For example, the release mechanism may be provided with a cutting edge, such as in the form of a knife or scrapper, suitable for dislodging the chocolate mass from the outer surface of the bottom load carrying side of the conveyor belt. According to embodiments of the present invention, the release mechanism may alternatively or in combination comprise a sharp edge in the conveyor belt formed by an arrangement of axes positioned along the second cooling path and arranged to cooperate with the conveyor belt such that the chocolate mass at the location of the release mechanism is subjected to a sudden change in the inclination of the conveyor belt thereby causing the chocolate mass to be dislodged from the outer surface of the bottom load carrying side of the conveyor belt. According to further embodiments of the present invention, the sharp edge may be formed by using a second axis that has a substantially smaller diameter compared to the diameter of the first axis.

[0013] According to embodiments of the present invention, the adherence properties of the liquid mass may be significantly enhanced by adapting the cooling conditions of the cooling chamber and speed of the at least first conveyor belt such that the chocolate mass is arranged to adhere to the outer surfaces of the top and bottom load carrying sides of the at least first conveyor belt. The adherence of the chocolate mass to the outer surfaces of the conveyor belt may enable the transportation of the liquid chocolate mass along the first and second cooling paths via at least the first curved surface, thereby contributing to the reduction of the area overhead of the system. The transportation of the chocolate mass along the second cooling path may be performed by ensuring that the chocolate mass sufficiently adheres to the outer surface of the top and bottom load carrying side of the at least first conveyor belt. The adherence of the chocolate mass may for example be enhanced by adapting the speed and cooling conditions of the cooling chamber such that during transportation of the chocolate mass along the first and second cooling path, a part of the chocolate mass in contact with the outer surface of the top and bottom load carrying sides of the conveyor belt remains in liquid form.

[0014] According to embodiments of the present invention, the adherence properties of the liquid chocolate mass may further be enhanced by choosing a suitable material for the outer surface of the top and bottom load carrying side of the at least first conveyor belt. For example, the outer surfaces of the at least first conveyor belt may be made from a polymer-based material, such as plastic or rubber. Furthermore, the outer surface of the at least first conveyor belt may be made from a metal-based material such aluminium.

[0015] According to embodiments of the present invention, the diameter of at least the first axis may be at least 100.0 mm, at most 1000.0 mm, preferably at most 800.0 mm, more preferably at most 500.0 mm, and even more preferably at most 400.0 mm. The diameter of the at least the first axis may be chosen such that the inclination experienced by the chocolate mass at the location of the curved surfaces when transported between the top and bottom flat load carrying sides is as gradual as possible, thereby ensuring that the chocolate mass may remain adhered to the outer surface at the location of the curved surfaces.

[0016] According to embodiments of the present invention, the at least first conveyor belt may be arranged to have a wrap angle at the location of the curved surfaces which may be in the range of 120.0 to 180.0 degrees.

[0017] According to embodiments of the present invention, the at least first and second axes may be pulleys, at least one of which may be arranged as a drive pulley.

[0018] According to embodiments of the present invention, the system of the present invention may comprise a cutting mechanism positioned at the location of the first curved surface, which may be used for cutting the chocolate mass into predetermined sized pieces.

[0019] According to embodiments of the present invention, the transportation system may

comprise at least a second conveyor belt arranged for collecting the chocolate mass released by the release mechanism. The at least second conveyor belt may be arranged for transporting the chocolate mass through the cooling mechanism along a third cooling path before the chocolate mass is collected at the exit point of the transportation system. The at least third cooling path may be positioned opposite the second cooling path and arranged such that the chocolate articles are transported along the third cooling path in the opposite transport direction to that of the second cooling path. It has been found that the use of at least a second conveyor belt may further reduce the total area overhead of the system while at the same time ensuring that the chocolate mass cools uniformly under the right conditions in the cooling chamber.

[0020] According to a second aspect of the invention, a method for producing chocolate-based articles in solidifying form having the features of claim 20 is provided. The method comprises the step of providing a transportation system having at least a first conveyor belt looped around at least a first and a second axis, wherein the at least first conveyor belt comprises a substantially flat top load carrying side and a substantially flat bottom load carrying side interconnected with one another via at least first and second curved surfaces formed respectively at the location of the at least first and second axes. The method comprises the step of dispensing chocolate mass in liquid form along the top load carrying side of the at least first conveyor belt by means of a dispensing unit positioned at an entry point of the transportation system. The liquid chocolate mass is then transported at a predetermined speed through at least one cooling chamber by means of the at least first conveyor belt, the cooling chamber being arranged for cooling the liquid chocolate mass under predetermined conditions before the chocolate mass is collected at an exit point of the transportation system. The method further comprises the steps arranging the first and second cooling paths such that they are positioned opposite one another and are connected via at least the first curved surface so that the direction in which the chocolate mass is transported in the second cooling path is opposite to that of the first cooling path. Furthermore, the method comprises the step of providing a release mechanism along the second cooling path, which is arranged for releasing the solidified chocolate articles from an outer surface of the bottom load carrying side of the at least first conveyor belt.

Brief description of the drawings

[0021] The invention will be further elucidated by means of the following description and the appended figures.

Figures 1 to 3 show cross-sectional views of a system for producing chocolate-based articles in solidifying form according to embodiments of the present invention.

Figure 4 to 6 show cross-sectional views of a system for producing chocolate-based articles in solidifying form according to other embodiments of the present invention.

Modes for carrying out the invention

[0022] The present invention will be described with respect to particular embodiments and with reference to certain drawings but the invention is not limited thereto but only by the claims. The drawings described are only schematic and are non-limiting. In the drawings, the size of some of the elements may be exaggerated and not drawn on scale for illustrative purposes. The dimensions and the relative dimensions do not necessarily correspond to actual reductions to practice of the invention.

[0023] Furthermore, the terms first, second, third and the like in the description and in the claims, are used for distinguishing between similar elements and not necessarily for describing a sequential or chronological order. The terms are interchangeable under appropriate circumstances and the embodiments of the invention can operate in other sequences than described or illustrated herein.

[0024] Moreover, the terms top, bottom, over, under and the like in the description and the claims are used for descriptive purposes and not necessarily for describing relative positions. The terms so used are interchangeable under appropriate circumstances and the embodiments of the invention described herein can operate in other orientations than described or illustrated herein.

[0025] The term "comprising", used in the claims, should not be interpreted as being restricted to the means listed thereafter; it does not exclude other elements or steps. It needs to be interpreted as specifying the presence of the stated features, integers, steps or components as referred to, but does not preclude the presence or addition of one or more other features, integers, steps or components, or groups thereof. Thus, the scope of the expression "a device comprising means A and B" should not be limited to devices consisting only of components A and B. It means that with respect to the present invention, the only relevant components of the device are A and B.

[0026] The term "chocolate-based articles" refers to chocolate products that are stable at ambient temperatures and may take the form of solid pieces of chlorate, such as chocolate bars, chocolate chunks, or chocolate droplets, or other products incorporating chocolate as a component, for example for coating other food products, such as nuts, fruits and the like.

[0027] The term "chocolate-based articles in solidifying form" refers to melted chocolate which has been cooled to produce a solid chocolate wherein at least a portion, preferably a substantial part, of the fat of the chocolate is in solid state.

[0028] Figure 1 shows an example of a system 100 for producing chocolate-based articles in solidifying form according to an embodiment of the present invention. The system 100 comprises a chocolate dispensing unit 103 arranged for dispensing chocolate mass 106 in

liquid form along an outer surface of a top load carrying side 108 of at least a first conveyor belt 101, which is part of a transportation system. The at least first conveyor belt 101 is ooped around at least a first and second axe 102 and 113, thereby forming substantially flat top and bottom load carrying sides 108 and 109 interconnected with one another via at least a first and second curved surface 110 and 114 formed respectively at the location of the at least first and second axes 102, 113. For example, the first and second axes 102 and 113 may be provided in the form of pulleys at least one of which may be configured as a drive pulley. The at least first conveyor belt 101 is arranged for transporting the chocolate mass 106 through a cooling chamber 103 along a first and a second cooling path such that the liquid chocolate mass 106 solidifies under predetermined conditions before the chocolate mass 106 is collected at an exit point 104 of the transportation system. As previously discussed, the temperature and humidity of the cooling chamber 105 may play an important role in the appearance and texture of the final chocolate-based article. For this reason, the cooling chamber 105 may comprise a number of cooling zones (not shown) in order to prevent sudden changes of temperature and humidity. The cooling chamber 105 is provided for circulating cooling air by a ventilation system, for example provided with at least one ventilator in the system 100, the ventilator for example being provided with a cooling unit at the air intake of the at least one ventilator so that air sucked into the ventilator is first cooled by the cooling unit. Although the ventilating system is not shown in the figures, the ventilation system is provided for providing and circulating cooled air through the cooling chamber 105.

[0029] According to the present invention the first and second cooling paths are positioned opposite one another and are connected via at least the first curved surface 110 such that the direction in which the chocolate mass 106 is transported along the second cooling path is opposite to that of the first cooling path. The first and second cooling paths are located respectively on the top load carrying side 108 and bottom load carrying side 109 of the conveyor belt 101. Positioning the first and second cooling paths opposite one another results in a reduction of the area overhead of the system 100 since the transportation of the chocolate mass 106 along the second cooling path reuses the area taken by the first cooling path. A reduction of the area overhead of the system 100 contributes to overcome the problems related to the use of conventional systems with respect to the production facility space limitations and production throughput. The transportation of the chocolate mass 106 along the second cooling path may be performed by ensuring that the chocolate mass 106 sufficiently adheres to the outer surface of the top and bottom load carrying side 108 and 109 of the at least first conveyor belt 101. The adherence of the chocolate mass 106 may be enhanced by adapting the speed and cooling conditions of the cooling chamber 105 such that during transportation of the chocolate mass 106 along the first and second cooling path, a part of the chocolate mass 106 in contact with the outer surface of the top and bottom load carrying sides 108 and 109 of the conveyor belt 101 remains in liquid form. Furthermore, the material of the outer surface of the top and bottom load carrying sides 108 and 109 of the at least first conveyor belt 101 may further be chosen such that the chocolate mass adheres to the outer surfaces of the conveyor belt 101. For example, the outer surfaces of the at least first conveyor belt 101 may be made from a polymer based material such as plastic or rubber. In another example, the outer surfaces of the at least first conveyor belt 101 may be made from a metal-

based material, such as aluminium.

[0030] According to an embodiment of the present invention the system 100 further comprises a release mechanism 107 positioned at a location along the second cooling path, which is arranged for releasing the chocolate mass 106 from the outer surface of the bottom load carrying side 109 of the at least first conveyor belt 101. For example, the release mechanism 107 may be provided with a cutting edge, such as in the form of a knife or scrapper, suitable for dislodging the chocolate mass 106 from the outer surface of the bottom load carrying side 109 of the at least first conveyor belt 101 as shown in figure 1. The released chocolate mass 106 may be collected at an exit point 104 of the conveyor system.

[0031] Figure 2 show a further example of a system 200 according to embodiments of the present invention. The main difference of this example with the system 100 of figure 1 is that the release mechanism 207 comprises a sharp edge in the conveyor belt 101 formed by an arrangement of axes 207 , 207b positioned along the second cooling path 109 and arranged to cooperate with the conveyor belt 101 such that the chocolate mass at the location of the release mechanism 207 may be subjected to a sudden change in the inclination of the conveyor belt 101 thereby causing the chocolate mass to be dislodged from the outer surface of the bottom load carrying side of the conveyor belt. According to further embodiments, not shown in the figures, the sharp edge may also be formed by using a second axis 113 with a substantially smaller diameter compared to the diameter of the first axis 110.

[0032] According to an embodiment of the present invention the system may further comprise a cutting mechanism 111 positioned at the location of at least the first curved surface 110, as shown in the example of figure 3. The function of the cutting mechanism would be further described with reference to the system 100. However, it should be noted that the use of the cutting mechanism 111 is not limited to the system 100 and that it can also be combined with the system 200, The use of a cutting mechanism 111 may be used for cutting the chocolate mass 106 into smaller pieces having a predetermined size. For example, the cutting mechanism 11 may be arranged as a servo chunks cutter mechanism having a cutting edge arranged to move at predetermined time internals in the direction of the arrow, as shown in the figure 3. Cutting the chocolate mass 106 into smaller pieces may prevent the chocolate mass 106 from being dislodged from the outer surface of the conveyor belt 101 during transportation along the curved surfaces 110 and 114.

[0033] According to an embodiment of the present invention, at least the first axis 102 may be designed to have a sufficient diameter so as to prevent the chocolate mass 106 from being dislodged from the outer surface of the conveyor belt 101 during transportation along the curved surfaces 110 and 114. For example, the first and second axes 102 and 113 may have a diameter of at least 100.0 mm, at most 1000.0 mm, preferably at most 800.0 mm, more preferably at most 500.0 mm, and even more preferably at most 400.0 mm.

[0034] According to embodiments of the present invention, in order to maintain sufficient tension of conveyor belt 101 around the first and second axes 102 and 113 the wrap angle α at

least at the location of the first curved surface 102 may be in the range 120.0 to 180.0 degrees.

[0035] Figure 4 shows a further example of a system 300 according to an embodiment of the present invention. The main difference with the systems shown in figures 1 to 3 is that the transportation system of the system 300 may comprise at least a second conveyor belt 301 arranged for collecting the chocolate mass 106 released by the release mechanism 107. The at least second conveyor belt 301 may be arranged for transporting the chocolate mass 106 through the cooling chamber 105 along a third cooling path before the chocolate mass 106 is collected at the exit point 104 of the transportation system. In order to further reduce the area overhead of the system 300, the at least second conveyor belt may be positioned opposite the at least first conveyor belt 101 such that the third cooling path is positioned opposite the second cooling path, which second cooling path may be arranged along the bottom load carrying side 109 of the at least first conveyor belt 101. Furthermore, the transport direction of the chocolate mass 106 along the third cooling path may be opposite to that of the second cooling path. The third cooling path may be arranged on the top load carrying side 308 of the at least second conveyor belt 301.

[0036] Figure 5 shows a further example of the system 300 according to an embodiment of the present invention. The main difference with the system of figure 4 is that the at least second conveyor belt is combined with at least a first conveyor belt 101 having a release mechanism 207 according to the system 200 shown in figure 2.

[0037] Figure 6 shows yet a further example of the system 300 according to an embodiment of the present disclosure. The main difference with the systems shown in figures 4 and 5 is that the at least first conveyor belt 101 comprises release mechanisms 207 and 107 according to the systems 100 and 200.

[0038] According to embodiments of the present invention, a method for producing chocolate-based articles in solidifying form is provided. The method comprises the steps of providing a transportation system having at least a first conveyor belt 101 looped around at least a first and a second axis 102 and 113. The at least first conveyor belt 101 comprises a substantial flat top load carrying side 108 and a substantially flat bottom load carrying side 109 interconnected with one another via at least a first and second curved surfaces 110 and 114 formed respectively at the location of the at least first and second axes 102 and 113. At a next step chocolate mass 106 is dispensed in liquid form along the top load carrying side 108 of the at least first conveyor belt 101 by means of a dispensing unit 103 positioned at an entry point of the transportation system. The liquid chocolate mass 106 is arranged to be transported at predetermined speed through at least one cooling chamber 105 by means of the at least first conveyor belt 101 along a first and a second cooling paths. The cooling chamber 105 2. is arranged for cooling the liquid chocolate mass 106 under predetermined conditions before the solidified chocolate articles 106 are collected at an exit point 104 of the transportation system. According to an embodiment of the present invention, the method further comprises the step of arranging the first and second cooling paths such that they are positioned opposite one

another and connected via at least the first curved surface 110 so that the direction in which the chocolate mass 106 is transported in the second cooling path is opposite to that of the first cooling path. Furthermore, the method comprises the step of providing a release mechanism 107 along the second cooling path. The release mechanism 107 is arranged for releasing the chocolate mass 106 from an outer surface of the bottom load carrying side 109 of the at least first conveyor belt 101.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US20080274241A [0005]
- EP0855142A2 [0006]
- EP0157290A1 [0007]

PATENTKRAV

1. System (100, 200, 300) til fremstilling af chokolade-baserede artikler i størkningsform, hvilket system omfatter:

Et transportsystem, omfattende mindst et første transportbånd (101), som er sløjfet rundt om mindst første og anden aksel (102, 113);
en dispenserenhed (103), der er arrangeret til at afgive chokolademasse (106) i flydende form langs en ydre overflade af den øverste lastbærende side (108) på det mindst første transportbånd (101) i et indgangspunkt for transportsystemet;
mindst et kølekammer (105), indrettet til afkøling af chokolademassen (106) under forudbestemte betingelser, før chokolademassen (106) opsamles i et udgangspunkt (104) for transportsystemet;
hvorved det mindst ene transportbånd (101) er indrettet til transport af chokolademassen (106) gennem det mindst ene kølekammer (105) med en forudbestemt hastighed langs en første og en anden kølestrækning, hvilken første og anden kølestrækning er positioneret over for hinanden og er forbundet via mindst den første overflade (110), således at retningen, i hvilken chokolademassen (106) transporteres i den anden kølestrækning, er modsat retningen for den første kølestrækning,
kendetegnet ved, at det mindst første transportbånd (101) omfatter en i hovedsagen flad øverste lastbærende side (108) samt en i hovedsagen flad nederste lastbærende side (109), der er forbundet med hinanden via mindst første og anden krumme overflade (110, 114), dannet henholdsvis på stedet for den mindst første og anden aksel (102, 113);
ved, at den første og anden kølestrækning er beliggende på henholdsvis den øverste lastbærende side (108) og den nederste lastbærende side (109) af transportbåndet (101);
og **ved, at** systemet (100, 200) endvidere omfatter en udløsemekanisme (107, 207), som er positioneret langs den anden kølestrækning, hvilken udløsemekanisme (107, 207) er arrangeret til at frigive chokola-

demassen (106) fra en ydre overflade af den nederste lastbærende side (109) på det mindst første transportbånd (101).

2. System (100, 200, 300) ifølge krav 1, hvorved kølebetingelserne for kølekammeret (105) og hastigheden for det mindst første transportbånd (101) er indrettet således, at chokolademassen (106) er indrettet til at hæfte til de ydre overflader på den øverste lastbærende side (108, 109) på det mindst første transportbånd (101), således at chokolademassen kan transporteres fra den første kølestrækning til den anden kølestrækning via mindst den første krumme overflade (110).

3. System (100, 200, 300) ifølge krav 2, hvorved materialet for den ydre overflade af den øverste lastbærende side og den nederste lastbærende side (108, 109) på det mindst første transportbånd (101) ydermere er valgt således, at chokolademassen (106) hæfter til de ydre overflader på det mindst første transportbånd (101).

4. System (100, 200, 300) ifølge krav 3, hvorved mindst de ydre overflader på det mindst første transportbånd (101) er dannet af et polymer-baseret materiale.

5. System (100, 200, 300) ifølge krav 4, hvorved mindst de ydre overflader på det mindst første transportbånd (101) er dannet af plast.

6. System (100, 200, 300) ifølge et hvilket som helst af kravene 1 til 5, hvorved mindst de ydre overflader på det mindst første transportbånd (101) er dannet af gummi.

7. System (100, 200, 300) ifølge et hvilket som helst af de foregående krav, hvorved diameteren af mindst den første aksel (102) er mindst 100,0 mm, højst 1000,0 mm, fortrinsvist højst 800,0 mm, men fortrinsvist højst 500,0 mm og endnu mere foretrukket højst 400,0 mm.

8. System (100, 200, 300) ifølge et hvilket som helst af de foregående krav, hvorved omslyngningsvinklen (α) for det mindst første transportbånd (101) på stedet for den mindst første aksel (102) ligger i intervallet mellem 120,0 og 180,0 grader.

9. System (100, 200, 300) ifølge et hvilket som helst af de foregående krav, hvorved den mindst første og anden aksel (102, 113) er snorskiver, af hvilke mindst én er arrangeret som drivskive.

10. System (100, 200, 300) ifølge et hvilket som helst af de foregående krav, hvorved dispenserenheden (103) er arrangeret til at udgive chokolademasse (106) i form af kontinuerlige striber.

11. System (100, 200, 300) ifølge krav 1 til 9, hvorved dispenserenheden (103) er arrangeret til at udgive chokolademasse (106) i form af individuelle smådråber.

12. System (100, 200, 300) ifølge et hvilket som helst af de foregående krav, hvorved systemet ydermere omfatter en skæremekanisme (111), som er positioneret på stedet for den første krumme overflade (110) og indrettet til at skære chokolademassen (106) i stykker med forudbestemt størrelse.

13. System (100, 200, 300) ifølge et hvilket som helst af de foregående krav, hvorved udløsemekanismen (107) omfatter en skærekant.

14. System (100, 200, 300) ifølge krav 13, hvorved udløsemekanismen (107) er en afstryger.

15. System (100, 200, 300) ifølge krav 12, hvorved udløsemekanismen omfatter en skarp kant i transportbåndet (101), dannet ved et arrangement af aksler (207a, 207b), indrettet til at virke sammen med det mindst første transportbånd (101), således at chokolademassen på stedet for udløsemekanismen udsættes for en pludselig ændring af transportbåndets hældning.

16. System (100, 200, 300) ifølge et hvilket som helst af de foregående krav, hvorved transportsystemet omfatter mindst et andet transportbånd (301), der er indrettet til at opsamle chokolademassen (106), som frigives ved hjælp af udløsemekanismen.

17. System (300) ifølge krav 16, hvorved det mindst andet transportbånd (301) er udformet til at transportere chokolademassen (106) gennem kølekammeret (105) langs en tredje kølestrækning.

18. System (300) ifølge krav 17, hvorved den tredje kølestrækning er positioneret som beliggende over for den anden kølestrækning.

19. System (300) ifølge et hvilket som helst af kravene 17 eller 18, hvorved transportretningen for chokolademassen (106) langs den tredje kølestrækning er modsat retningen for den anden kølestrækning.

20. Fremgangsmåde til fremstilling af chokolade-baserede artikler i størkningsform, hvilken fremgangsmåde omfatter trinene:

Tilvejebringe et transportsystem med mindst et første transportbånd (101), sløjfet rundt om mindst en første og en anden aksel (102, 103), hvorved det mindst første transportbånd (101) omfatter en i det væsentlige flad øverste lastbærende side (108) og en i det væsentlige flad nederste lastbærende side (109), der er forbundet med hinanden via mindst en første og en anden krum overflade (110, 114), der er dannet henholdsvis på stedet for den mindst første og anden aksel;

udgive chokolademasse (106) i flydende form langs den øverste lastbærende side (108) for det mindst første transportbånd (101) ved hjælp af en dispenser-enhed (103), der er positioneret i et indgangspunkt for transportsystemet;

transportere chokolademassen (106) med forudbestemt hastighed gennem mindst eet kølekammer (105) ved hjælp af det mindst første transportbånd (101) langs en første og en anden kølestrækning, hvilket kø-

lekammer (105) er indrettet til køling af chokolademassen (106) under forudbestemte kølebetingelser, før chokolademassen (106) opsamles i et udgangspunkt (104) for transportsystemet;

kendetegnet ved, at fremgangsmåden omfatter trinnet at arrangere henholdsvis den første og den anden kølestrækning på den øverste lastbærende side (108) og den nederste lastbærende side (109) for transportbåndet (101), således at de er positioneret over for hinanden og er forbundet via mindst den første krumme overflade (110), således at den retning, i hvilken chokolademassen (106) transporteres langs den anden kølestrækning, er modsat retningen for den første kølestrækning; og

ved, at fremgangsmåden ydermere omfatter trinnet at tilvejebringe en udløsemekanisme (107) langs den anden kølestrækning, og som er arrangeret til at frigive chokolademassen (106) fra den ydre overflade af den nederste lastbærende side (109) for det mindst første transportbånd (101).

DRAWINGS

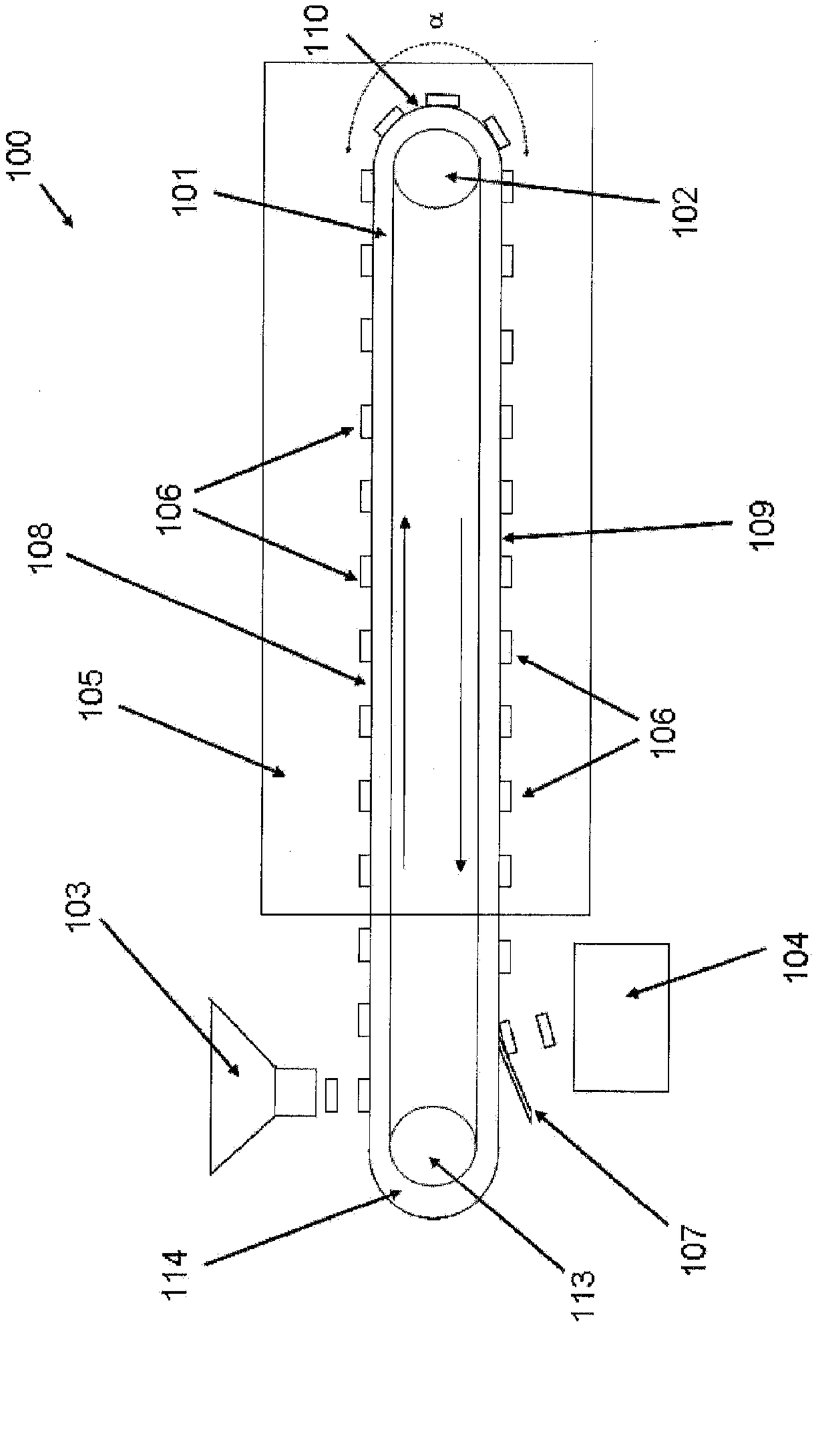
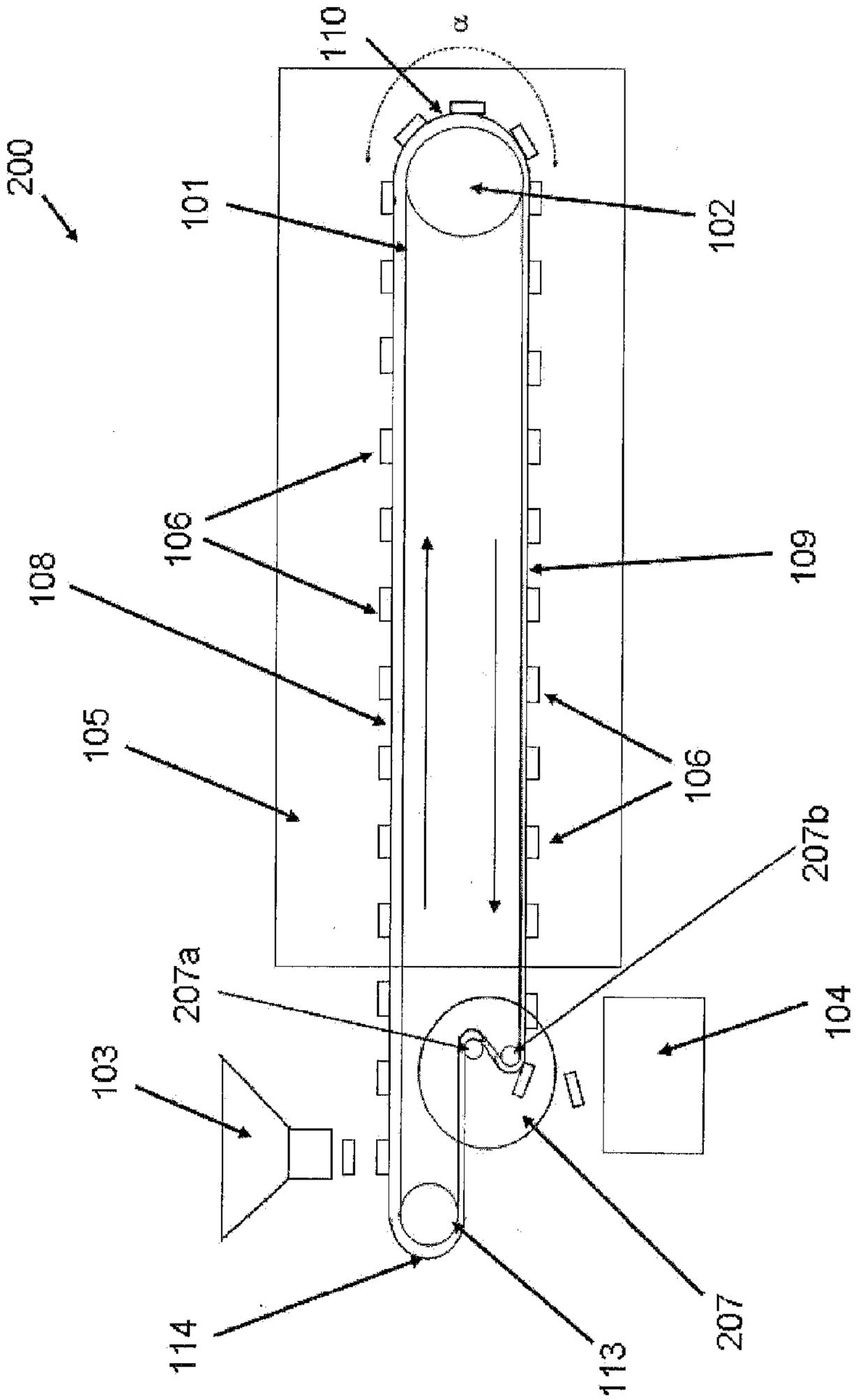


Figure 1


200
110
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207b
207a
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103
114
113
207

Figure 2

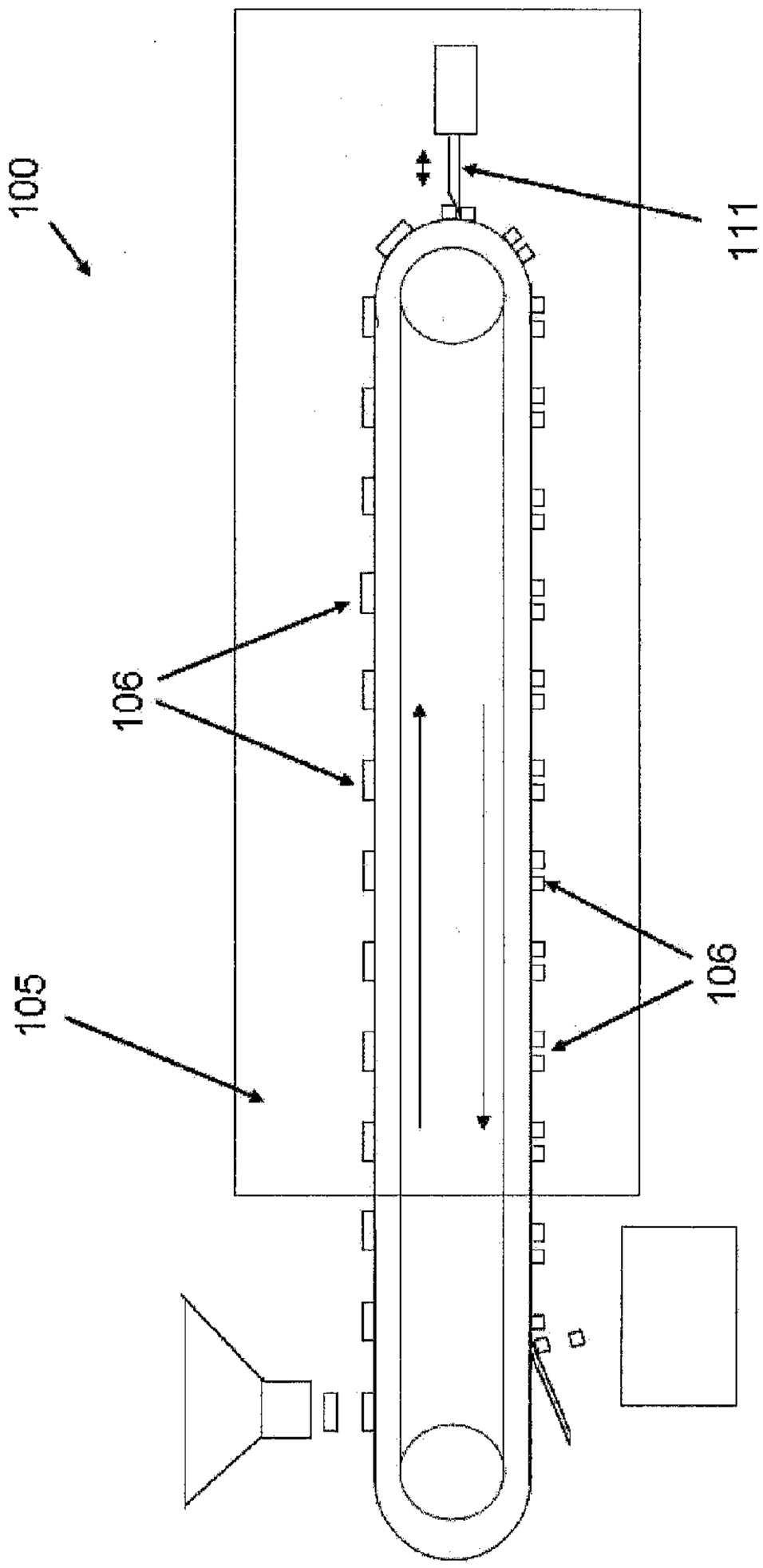

Figure 3

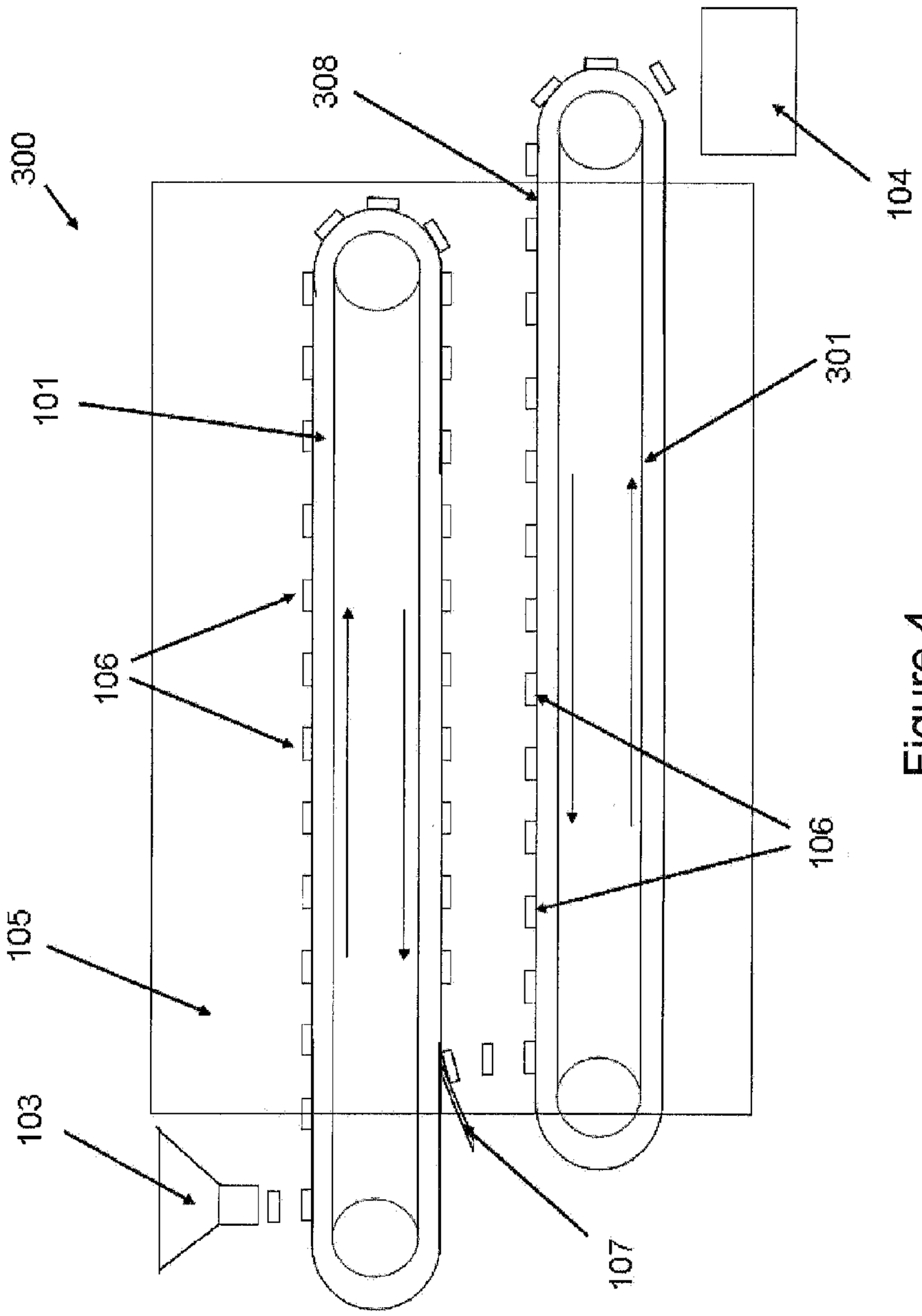

Figure 4

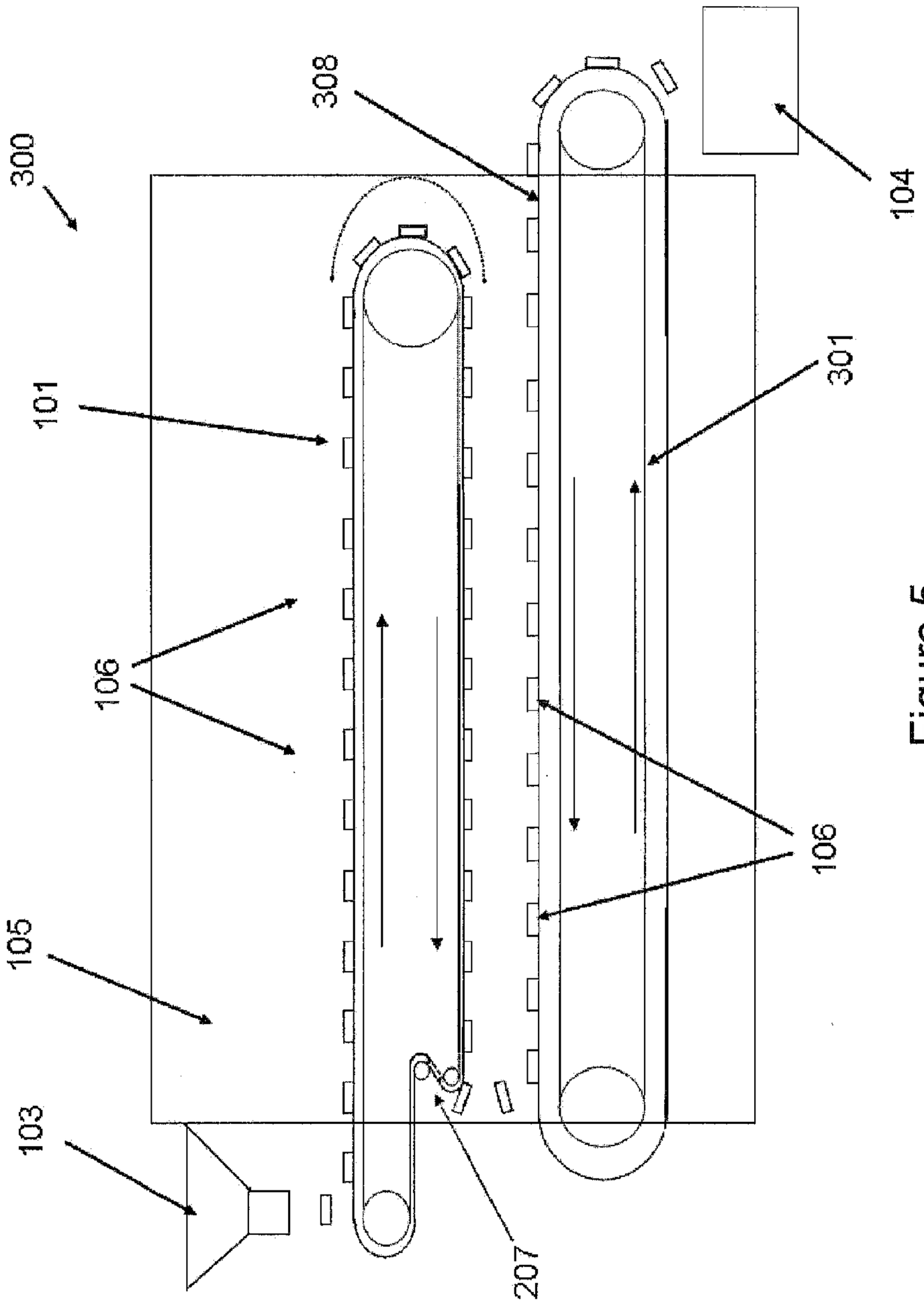

Figure 5

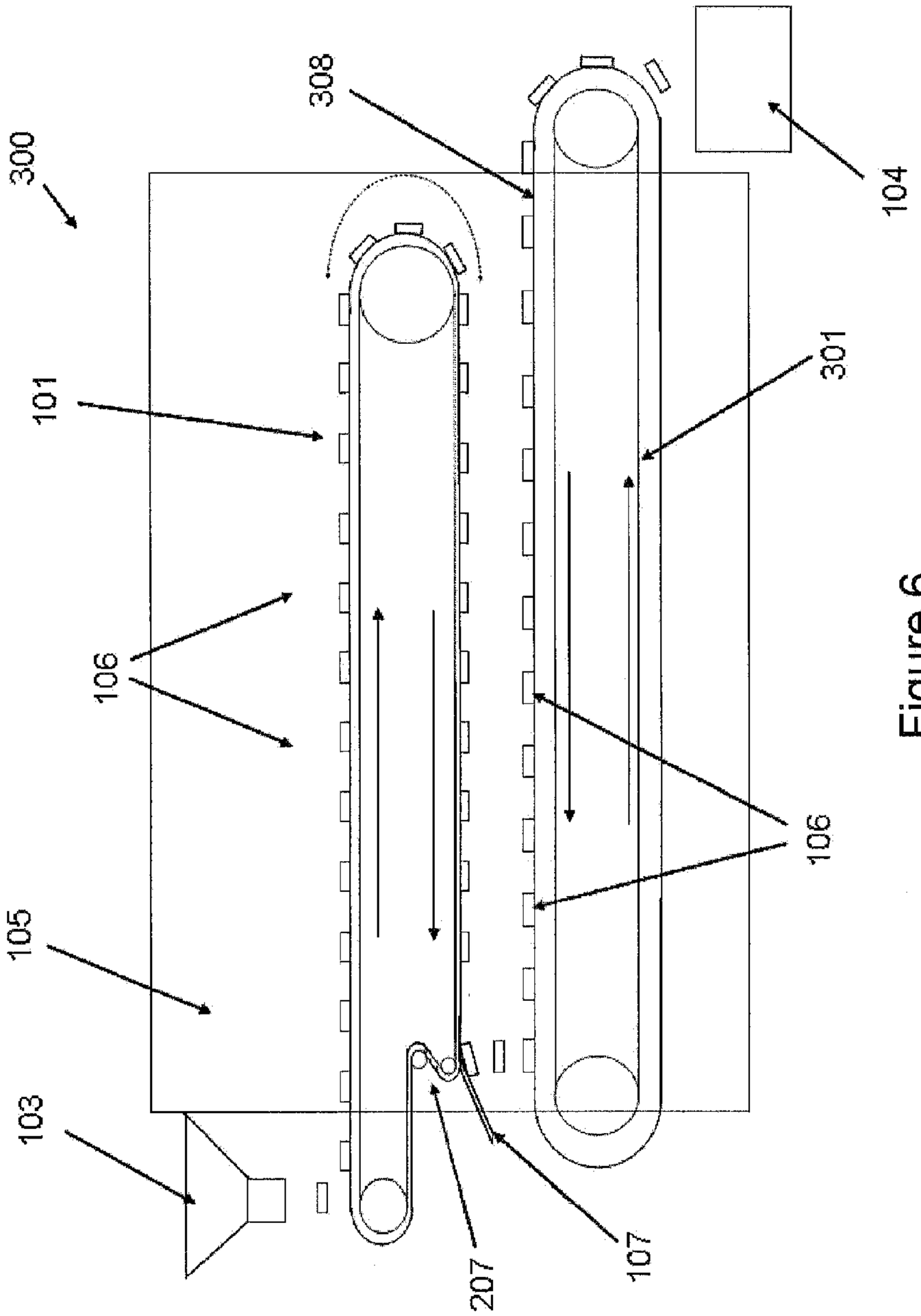

Figure 6