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(54) **SYSTEM FOR CONVEYING ROD-SHAPED CONSUMER GOODS**

(57) There is disclosed system for conveying rod-shaped consumer goods. The system comprises a conveyor band (2) having a direction of travel and a support surface (10) to support and transfer a plurality of the rod-shaped consumer goods (1) stacked on top of each other and generally aligned transverse to the direction of travel. The system further comprises at least one sidewall (3) aligned along the direction of travel and providing a surface against which end faces of the rod-shaped consumer goods may abut, and a roof portion (4) extending from the at least one sidewall over the support surface of the conveyor band. The support surface is disposed in a first plane (8) and the roof portion is disposed in a second plane (9). The first plane and the second plane are non-parallel.

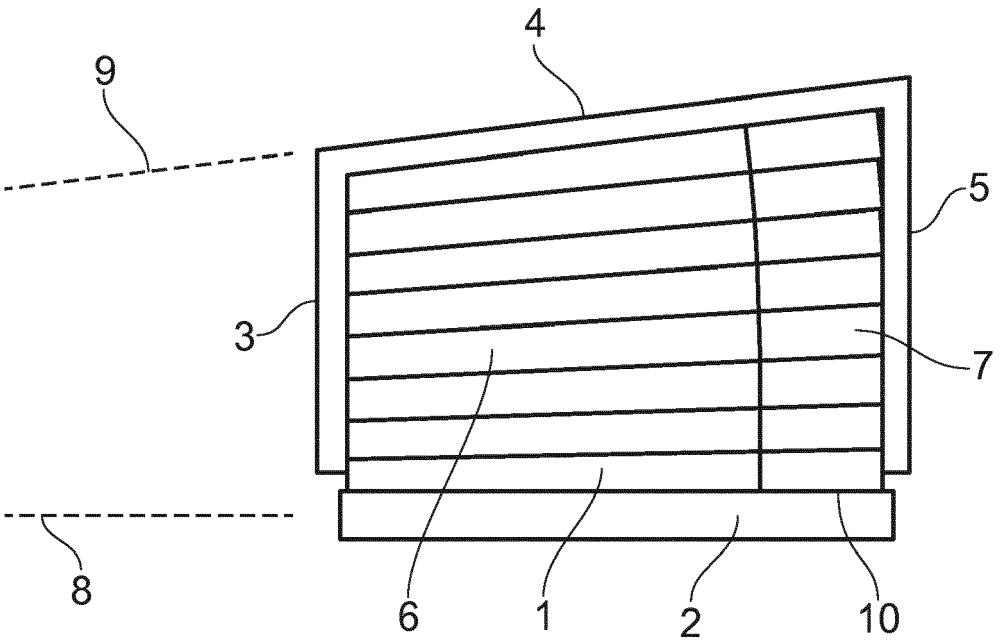

FIG. 2

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Description

[0001] The present disclosure relates to a system for conveying rod-shaped consumer goods, for example rod-shaped aerosol-generating articles.

[0002] The handling of rod-shaped consumer goods can present a number of challenges in a high-speed manufacturing process. For example, aerosol-generating articles, such as filter cigarettes, are typically made from at least two cylindrical objects, for example a tobacco rod and a filter. During the manufacture of aerosol-generating articles, such as filter cigarettes, the two cylindrical objects are joined during a rolling process with a tipping paper. The tipping paper covers a first of the two cylindrical objects and extends over the second cylindrical object and thus secures the two cylindrical objects to each other. The tipping paper creates a small step-change between the circumference of the first cylindrical object and the second cylindrical object. This step creates an angle between the edge of the tipping paper and the free edge of the second cylindrical object. While the angle is generally small, however, during production, many of the finished aerosol generating articles may be stacked up on top of each other in a mass-flow or a hopper and the cumulative effect of each small angle may create a significant total angle at the top of the stack. This may cause the aerosol generating articles to jam in the mass-flow or hopper, particularly since a mass-flow production process allows a certain degree of free movement of the aerosol-generating articles which is necessary to accommodate the high flow rate. The 'stacking angle' effect depends on the size of the step created by the tipping paper and the length of the product between the free edge of the second cylindrical object and the tipping paper. The risk of jams is further increased when the product has an uneven mass distribution, in particular where the centre of mass of the article is in the section of the article with the smaller diameter. The effect increases further where the section of the article with the smaller diameter is ductile and therefore, where articles are stacked onto each other, may sink into adjacent articles due to gravitational forces, thus increasing the nesting of the articles on one side and in turn adding to the stacking angle.

[0003] These challenges apply equally to aerosol-generating articles comprising a first rod in the form of an aerosol-generating substrate and a second rod in the form of a mouthpiece, the first and second rods joined by way of a tipping paper or the like.

[0004] During mass-flow transport, the rod-shaped aerosol-generating articles may be stacked on top of each other in layers on a conveyor band and aligned generally transverse to the direction of travel of the band, since this is a stable position for transport. A channel may be defined above the conveyor band, the channel having sidewalls and a roof, and the aerosol-generating articles will tend to fill the space defined by the channel. Aerosol-generating articles on the top of the stack can engage frictionally with the roof, and if the aerosol-generating articles are not perfectly aligned transverse to the direction of travel, they may twist or yaw relative to the direction of travel.

[0005] This problem is made worse if the aerosol-generating articles are not perfectly cylindrical. For example, some aerosol-generating articles comprise a tobacco rod at one end and a mouth piece filter at the other end, the mouth piece filter having a slightly greater diameter than the tobacco rod, or vice versa.

[0006] Another problem with aerosol-generating articles is that they can be made up of different rods of different densities and different resistances to compression. Moreover, such aerosol-generating articles are often not evenly weight balanced. Accordingly, when stacked in layers and all aligned the same way, the bottom layers may be compressed due to the weight of the overlying layers, and the compression may not be homogeneous along the lengths of the aerosol-generating articles. For instance, one end of the lower aerosol-generating articles may be compressed to a smaller diameter than the other end of the lower aerosol-generating articles. This imbalance can lead to twisting or yawing of aerosol-generating articles in the upper layer due to differential friction with the roof along the length of the aerosol-generating articles. In turn, this can lead to misalignment of the aerosol-generating articles and blockages in downstream machines or in the transportation path. It can also lead to damage to the aerosol-generating articles.

[0007] Embodiments of the present disclosure therefore seek to address at least some of these problems.

[0008] Viewed from one aspect, there is provided a system for conveying rod-shaped consumer goods, the system comprising:

a conveyor band having a direction of travel and a support surface to support and transfer a plurality of the rod-shaped consumer goods stacked on top of each other and generally aligned transverse to the direction of travel;
at least one sidewall aligned along the direction of travel and providing a surface against which end faces of the rod-shaped consumer goods may abut; and
a roof portion extending from the at least one sidewall over the support surface of the conveyor band;
wherein the support surface is disposed in a first plane and the roof portion is disposed in a second plane; and
wherein the first plane and the second plane are non-parallel.

[0009] Where the conveyor belt and hence the direction of travel extend along a straight line, the first and second planes preferably intersect at a line that is substantially parallel to the direction of travel. Where the conveyor belt and hence the direction of travel extend around a curve, the first and second planes preferably intersect at a line parallel to a tangent to the curve.

[0010] By configuring the support surface and roof portion so that the first and second planes are non-parallel, it is possible to accommodate stacking angle effects so that the rod-shaped consumer goods adjacent to the roof portion are substantially parallel thereto along their lengths. This may reduce the likelihood of twisting or yawing of the rod-shaped consumer goods in the upper layer, since any frictional forces due to contact between the rod-shaped consumer goods and the roof in the direction of travel may be substantially the same along the lengths of the rod-shaped consumer goods, which will generally be transverse to the direction of travel.

[0011] In some embodiments, the roof portion and the support surface may be adjustable relative to each other so that the angle between the first plane and the second plane can be changed. In other embodiments, the roof portion and the support surface may be configured so that the angle between the first plane and the second plane is fixed.

[0012] In some embodiments, the first plane and the second plane may be angled at up to 45° to each other. For example, defining the angle between the first plane and the second plane as a, in some embodiments $0° < \alpha \leq 45°$. In other embodiments, $1° \leq \alpha \leq 45°$; or $5° \leq \alpha \leq 45°$; or $10° \leq \alpha \leq 45°$. The angle α may be defined in a cross-sectional plane normal to the direction of travel.

[0013] The conveyor band, at least one sidewall and roof portion together define a transportation channel.

[0014] In some embodiments, a second sidewall, laterally disposed from the first sidewall on an opposed side of the conveyor band, is provided. In these embodiments, the roof portion may extend from a top of the first sidewall to a top of the second sidewall, with the support surface extending between a bottom of the first sidewall and a bottom of the second sidewall. The provision of first and second opposed sidewalls helps to keep the rod-shaped consumer goods neatly stacked during transportation.

[0015] In some embodiments, the support surface may be substantially horizontal and the roof portion may slope relative thereto. In other embodiments, the roof portion may be substantially horizontal and the support surface may slope relative thereto. In yet further embodiments, both the support surface and the roof portion may slope relative to the horizontal.

[0016] The at least one sidewall may be substantially vertical. In other embodiments, the at least one sidewall may be sloped relative to a vertical direction.

[0017] In yet further embodiments, the at least one sidewall, and (where provided) the second sidewall, may have a curved cross-section. This can be useful where a stack of rod-shaped consumer goods on the support surface has a pronounced stacking angle, with ends of the rod-shaped consumer goods in the stack defining a curve from the support surface towards the roof portion. This is advantageous because end faces of the rod-shaped consumer goods will then be substantially parallel with the sidewall over the entire height of the sidewall, thus avoiding friction differentials and reducing any tendency to twist, yaw and/or rotate.

[0018] In embodiments where the roof portion and the support surface are adjustable relative to each other so that the angle between the first plane and the second plane can be changed, either the support surface may be adjustable or the roof portion may be adjustable or both may be adjustable.

[0019] The adjustment between the roof portion and support surface may be effected manually, for example by adjusting bolt or screw mechanisms holding the roof portion and/or the support surface in their respective planes.

[0020] Alternatively, there may be provided an actuator to adjust the angle between the first and second planes by tilting the roof portion relative to the support surface or vice versa. The actuator may be a hydraulic actuator or an electric motor actuator.

[0021] There may further be provided a sensor to detect a plane of an upper surface of the plurality of rod-shaped consumer goods. The plane of the upper surface may be defined as a plane substantially tangential to an uppermost part of a circumference of the rod-shaped consumer goods at the top of the stack. The sensor may be an optical sensor, for example a laser sensor (or a plurality of laser sensors) above the transportation channel and pointing downwardly towards the rod-shaped consumer goods. The optical sensor may be positioned above a window or transparent part of the roof portion. Alternatively, the sensor may be a mechanical sensor. The sensor may be configured to evaluate a height of the stack of rod-shaped consumer goods at different points across the width of the transportation channel transverse to the direction of travel and thus to determine a slope of the upper surface of the plurality of rod-shaped consumer goods. The actuator may then be controlled to adjust the angle between the first plane and the second plane so that the second plane (of the roof portion) is substantially coincident with or parallel to the plane of the upper surface of the plurality of rod-shaped consumer goods.

[0022] In some embodiments, the sensor may continuously monitor the angle of the plane of the upper surface of the plurality of rod-shaped consumer goods, and the actuator may dynamically adjust the angle between the first and second planes in response to detected changes in the angle of the plane of the upper surface of the plurality of rod-shaped consumer goods.

[0023] The transportation channel may be substantially linear along the entire length between its upstream and downstream ends. That is, the transportation channel may comprise a single linear segment extending between its upstream and downstream ends.

[0024] Alternatively, the transportation channel may comprise multiple linear segments.

[0025] In a further alternative, at least a portion of the transportation channel may be curved. In some embodiments, the transportation channel may be curved along substantially its entire length.

[0026] In any of the embodiments described above, moving the plurality of rod-shaped consumer goods along the transportation channel may comprise moving the plurality of rod-shaped consumer goods on at least one conveyor along at least a portion of the stacking channel in the downstream direction. For example, the transportation channel may comprise at least one conveyor extending along a bottom side of the transportation channel along substantially the entire length of the transportation channel.

[0027] Alternatively, the transportation channel may comprise one or more conveyors provided along only a portion of the transportation channel.

[0028] In any of the embodiments described above in which the rod-shaped consumer goods are moved along at least a portion of the transportation channel by at least one conveyor, the at least one conveyor may comprise at least one of a mechanically driven belt, such as a toothed belt, or a directed airflow.

[0029] In any of the embodiments described above, the plurality of rod-shaped consumer goods may be agitated as they move along the transportation channel. For example, the transportation channel may comprise a mechanical means for vibrating or otherwise agitating the plurality of rod-shaped consumer goods. In those embodiments comprising one or more conveyors, at least one of the conveyors may be configured to vibrate. Additionally, or alternatively, the transportation channel may comprise an airflow or multiple airflows that can create an air cushion in the mass flow of consumer goods. Such an air cushion can reduce friction between the consumer goods and facilitate a smooth product flow. The one or multiple airflows may be directed against the flow of consumer goods, so that the airflow is directed in the upstream direction.

[0030] In any of the embodiments described above, the transportation channel may have a length of between about 30 centimetres and about 300 centimetres between the upstream and downstream ends, preferably between about 50 centimetres and about 300 centimetres, more preferably between about 100 centimetres and about 300 centimetres. Using a transportation channel having a length within one of these ranges allows the transportation channel to function effectively as a buffer between an upstream manufacturing process and a downstream packing process.

[0031] As used herein, the term 'rod-shaped consumer goods' refers to elongate consumer goods each having an approximately circular or elliptical cross-sectional shape.

[0032] In some embodiments, the rod-shaped consumer goods comprise aerosol-generating articles. Aerosol-generating articles may comprise a generally cylindrical mouthpiece joined to a generally cylindrical aerosol-generating substrate.

[0033] Aerosol-generating substrates comprising gathered sheets of homogenised tobacco for use in aerosol-generating articles may be made by methods known in the art, for example the methods disclosed in WO 2012/164009 A2. Preferably, the aerosol-generating substrate has an external diameter of at least 5 millimetres. The aerosol-generating substrate may have an external diameter of between approximately 5 millimetres and approximately 12 millimetres, for example of between approximately 5 millimetres and approximately 10 millimetres or of between approximately 6 millimetres and approximately 8 millimetres. In a preferred embodiment, the aerosol-generating substrate has an external diameter of 7.2 millimetres plus or minus 10 percent.

[0034] The aerosol-generating substrate may have a length of between approximately 5 millimetres and approximately 15 millimetres, for example between about 8 millimetres and about 12 millimetres. In one embodiment, the aerosol-generating substrate may have a length of approximately 10 millimetres. In a preferred embodiment, the aerosol-generating substrate has a length of approximately 12 millimetres.

[0035] Preferably, the aerosol-generating substrate is substantially cylindrical.

[0036] A support element may be located immediately downstream of the aerosol-generating substrate and may abut the aerosol-generating substrate.

[0037] The support element may be formed from any suitable material or combination of materials. For example, the support element may be formed from one or more materials selected from the group consisting of: cellulose acetate; cardboard; crimped paper, such as crimped heat resistant paper or crimped parchment paper; and polymeric materials, such as low density polyethylene (LDPE). In a preferred embodiment, the support element is formed from cellulose acetate.

[0038] The support element may comprise a hollow tubular element. In a preferred embodiment, the support element comprises a hollow cellulose acetate tube.

[0039] The support element preferably has an external diameter that is approximately equal to the external diameter of the aerosol-generating substrate.

[0040] The support element may have an external diameter of between approximately 5 millimetres and approximately 12 millimetres, for example of between approximately 5 millimetres and approximately 10 millimetres or of between approximately 6 millimetres and approximately 8 millimetres. In a preferred embodiment, the support element has an external diameter of 7.2 millimetres plus or minus 10 percent.

[0041] The support element may have a length of between approximately 5 millimetres and approximately 15 millimetres. In a preferred embodiment, the support element has a length of approximately 8 millimetres.

[0042] An aerosol-cooling element may be located downstream of the aerosol-generating substrate, for example an aerosol-cooling element may be located immediately downstream of a support element, and may abut the support element.

[0043] The aerosol-cooling element may be located between the support element and the mouthpiece locat-

ed at the extreme downstream end of the aerosol-generating article.

[0044] The mouthpiece may have an external diameter of a diameter of between approximately 5 millimetres and approximately 10 millimetres, for example of between approximately 6 millimetres and approximately 8 millimetres. In a preferred embodiment, the mouthpiece has an external diameter of 7.2 millimetres plus or minus 10 percent.

[0045] The mouthpiece may have a length of between approximately 5 millimetres and approximately 20 millimetres. In a preferred embodiment, the mouthpiece has a length of approximately 14 millimetres.

[0046] The mouthpiece may have a length of between approximately 5 millimetres and approximately 14 millimetres. In a preferred embodiment, the mouthpiece has a length of approximately 7 millimetres.

[0047] The aerosol-generating substrate and any other elements upstream of the mouthpiece, such as a support element and an aerosol-cooling element, are circumscribed by an outer wrapper. The outer wrapper may be formed from any suitable material or combination of materials. Preferably, the outer wrapper is a cigarette paper.

[0048] The aerosol-generating article may have a total length of between about 40 millimetres and about 50 millimetres, for example approximately 45 millimetres.

[0049] As used herein, the terms 'upstream' and 'downstream' when used to describe the relative positions of elements, or portions of elements, of the stacking channel or other apparatus refer to the direction in which the plurality of consumer goods moves during the manufacturing or packing process. That is, the consumer goods move in a downstream direction from an upstream end to a downstream end.

[0050] As used herein, the term "mass-flow" indicates the flow of multiple products along a general transport direction wherein the exact position of the product within the mass-flow is not known. Typically, in a mass-flow a single product has some degree of freedom for random movement relative to the general transport direction, for example upwards or downwards where the general transport direction is horizontal. Additionally, the individual velocity of a product along the general transport direction does not have to be equal to the average transport speed of products within the mass-flow.

[0051] Embodiments of the invention are further described hereinafter with reference to the accompanying drawings, in which:

Figure 1 shows a prior art transportation channel for rod-shaped consumer goods;

Figure 2 is a schematic cross-section of a transportation channel of a first embodiment of the present disclosure;

Figure 3 is a schematic cross-section of a transportation channel of a second embodiment of the present disclosure;

Figure 4 is a schematic cross-section of a transportation channel of a third embodiment of the present disclosure;

Figure 5 is a schematic cross-section of a transportation channel of a fourth embodiment of the present disclosure; and

Figure 6 is a schematic cross-section of a transportation channel of a fifth embodiment of the present disclosure.

[0052] Figure 1 shows a portion of a prior art transportation channel for rod-shaped consumer goods 1. The transportation channel includes a conveyor band 2 for moving a stack of rod-shaped consumer goods 1 from upstream to downstream. A first sidewall 3 (in this case, made of a transparent material) helps to keep the rod-shaped consumer goods 1 in place on the conveyor band 2. A roof portion 4 extends over the conveyor band 2 from the first sidewall 3 to a second sidewall (not shown) on the other side of the conveyor band 2. The roof portion 4 is substantially parallel to the conveyor band 2. In Figure 1, the transportation channel has a curved configuration, but it will be appreciated that the transportation channel may alternatively be substantially straight or linear.

[0053] While the prior art transportation channel of Figure 1 may be effective when the rod-shaped consumer goods 1 are of uniform cylindrical shape, problems will arise if the rod-shaped consumer goods 1 do not form a stack with parallel top and bottom planes. This is often the case when the rod-shaped consumer goods 1 are do not have a uniform cylindrical shape (for example, are tapered, or have one end with a slightly larger diameter than the other end), or if a mass profile of the rod-shaped consumer goods 1 is not uniform along their lengths. In these circumstances, the roof portion 4 may contact the top of the stack adjacent to the first sidewall 3, but not contact the top of the stack adjacent to the second sidewall, thus leading to non-uniform friction between the roof portion 4 and the rod-shaped consumer goods 1 along their lengths. In turn, this can lead to twisting or yawing of the rod-shaped consumer goods 1, especially at the top of the stack.

[0054] Figure 2 shows a schematic cross-section through a transportation channel of a first embodiment of the present disclosure. There is shown a conveyor band 2 with a substantially horizontal support surface 10, a first sidewall 3, a second sidewall 5 and a sloped roof portion 4. The transportation channel is filled with rod-shaped consumer goods 1 generally aligned transverse to a direction of travel of the conveyor band 2 (out of the page in the Figure). Each rod-shaped consumer good 1 comprises a generally cylindrical aerosol-generating element 6 joined to a generally cylindrical mouthpiece 7, the mouthpiece 7 having a slightly greater diameter than

the aerosol-generating element 6. This causes the top of the stack to be angled relative to the bottom of the stack as shown. The support surface 10 has a first plane 8 and the roof portion 4 has a second plane 9. The first plane 8 and the second plane 9 are angled relative to each other by an angle a, where $\alpha > 0°$. In other words, the first plane 8 and the second plane 9 are non-parallel. By selecting α so that the second plane 9 is substantially parallel to a plane of the top of the stack, as shown in Figure 2, it can be seen that any friction between rod-shaped consumer goods 1 at the top of the stack and the roof portion 4 will be substantially constant along the length of the rod-shaped consumer goods 1 at the top of the stack during transportation of the goods along the channel. This helps to prevent twisting or yawing of the rod-shaped consumer goods 1 at the top of the stack.

[0055] Figure 3 shows a schematic cross-section through a transportation channel of a second embodiment of the present disclosure, with parts being labelled as in Figure 2. No rod-shaped consumer goods are shown in Figure 3 for clarity. In the Figure 3 embodiment, the roof portion 4 is substantially horizontal, while the support surface 10 is sloped, thus leading to the same relative angle α between the first plane 8 and the second plane 9 as in Figure 2. It will be understood that both the roof portion 4 and the support surface 10 may be sloped relative to the horizontal.

[0056] Figure 4 shows a schematic cross-section through a transportation channel of a third embodiment of the present disclosure, with parts being labelled as in Figure 2. The third embodiment is similar to the first embodiment of Figure 2, except that only one sidewall 3 is provided.

[0057] Figure 5 shows a schematic cross-section through a transportation channel of a fourth embodiment of the present disclosure, with parts being labelled as in Figure 4. The fourth embodiment is similar to the third embodiment of Figure 4, except that the angle between the first plane 8 and the second plane 9 is adjustable. This can be achieved by way of a mechanical, hydraulic or motorised actuator 11, shown here is being configured to adjust the slope of the roof portion 4 relative to the support surface 10. This arrangement may also be used with the embodiments of Figures 2 and 3. Although it may usually be easier to configure the roof portion 4 with an actuator 11 to adjust its angle relative to the support surface 10, the same effect may be obtained by providing an actuator to adjust the angle of the support surface 10. Indeed, the slope of either one or other or both of the first and second planes 8, 9 may be adjusted as required. The angle between the first and second planes 8, 9 may be adjusted to any desired angle, for example $0° < \alpha \leq 45°$.

[0058] Figure 6 shows a schematic cross-section through a transportation channel of a fifth embodiment of the present disclosure, with parts being labelled as in Figure 5. The fifth embodiment is similar to the fourth embodiment of Figure 5, except that optical sensors 12 are provided above the roof portion 4 to sense a position of the plane of the top of the stack of rod-shaped consumer goods 1 (not shown in Figure 6). In this embodiment, the roof portion 4 is transparent to allow the optical sensors 12 to detect the top of the stack. The optical sensors 12 are operatively connected to the actuator 11, and control circuitry (not shown) allows the actuator 11 dynamically to adjust the angle α between the first and second planes 8, 9 in response to the detected orientation of the plane of the top of the stack.

[0059] Throughout the description and claims of this specification, the words "comprise" and "contain" and variations of them mean "including but not limited to", and they are not intended to (and do not) exclude other moieties, additives, components, integers or steps. Throughout the description and claims of this specification, the singular encompasses the plural unless the context otherwise requires. In particular, where the indefinite article is used, the specification is to be understood as contemplating plurality as well as singularity, unless the context requires otherwise.

[0060] Features, integers, characteristics, compounds, chemical moieties or groups described in conjunction with a particular aspect, embodiment or example of the invention are to be understood to be applicable to any other aspect, embodiment or example described herein unless incompatible therewith. All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive. The invention is not restricted to the details of any foregoing embodiments. The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

[0061] The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

Claims

1. A system for conveying rod-shaped consumer goods, the system comprising:

   a conveyor band having a direction of travel and a support surface to support and transfer a plurality of the rod-shaped consumer goods stacked on top of each other and generally aligned transverse to the direction of travel;
   at least one sidewall aligned along the direction

of travel and providing a surface against which end faces of the rod-shaped consumer goods may abut; and
a roof portion extending from the at least one sidewall over the support surface of the conveyor band;
wherein the support surface is disposed in a first plane and the roof portion is disposed in a second plane; and
wherein the first plane and the second plane are non-parallel.

2. The system of claim 1, wherein the first plane and the second plane are angled relative to each other at an angle a, where $0° < \alpha \leq 45°$.

3. The system of claim 1 or 2, wherein the first plane and the second plane are angled relative to each other such that the second plane is substantially coincident with a plane of an upper surface of the plurality of rod-shaped articles.

4. The system of any preceding claim, wherein the roof portion and the support surface are adjustable relative to each other so that an angle between the first plane and the second plane can be changed.

5. The system of claim 4, further comprising an actuator to adjust the angle between the first plane and the second plane.

6. The system of claim 5, wherein the actuator is to adjust the angle between the first plane and the second plane such that the second plane is substantially coincident with a plane of an upper surface of the plurality of rod-shaped articles.

7. The system of claim 6, further comprising a sensor to detect the plane of the upper surface of the plurality of rod-shaped articles.

8. The system of claim 7, wherein the actuator is to adjust the angle between the first plane and the second plane in response to the sensor so that the second plane is substantially coincident with the plane of the upper surface of the plurality of rod-shaped articles.

9. The system of claim 8, wherein the actuator is dynamically to adjust the angle between the first plane and the second plane in response to detected changes in an angle of the plane of the upper surface of the plurality of rod-shaped articles.

10. The system of any one of claims 7 to 9, wherein the sensor is an optical sensor.

11. The system of any one of claims 5 to 10, wherein the actuator is a hydraulic actuator.

12. The system of any one of claims 5 to 10, wherein the actuator is a motor.

13. The system of any preceding claim, wherein the at least one sidewall extends in a substantially straight line between the support surface and the roof portion.

14. The system of any preceding claim, further comprising a second sidewall substantially parallel to the first sidewall, and laterally disposed therefrom with the support surface located between the first and second sidewalls.

15. The system of any preceding claim, configured to convey rod-shaped consumer goods in the form of aerosol-generating articles.

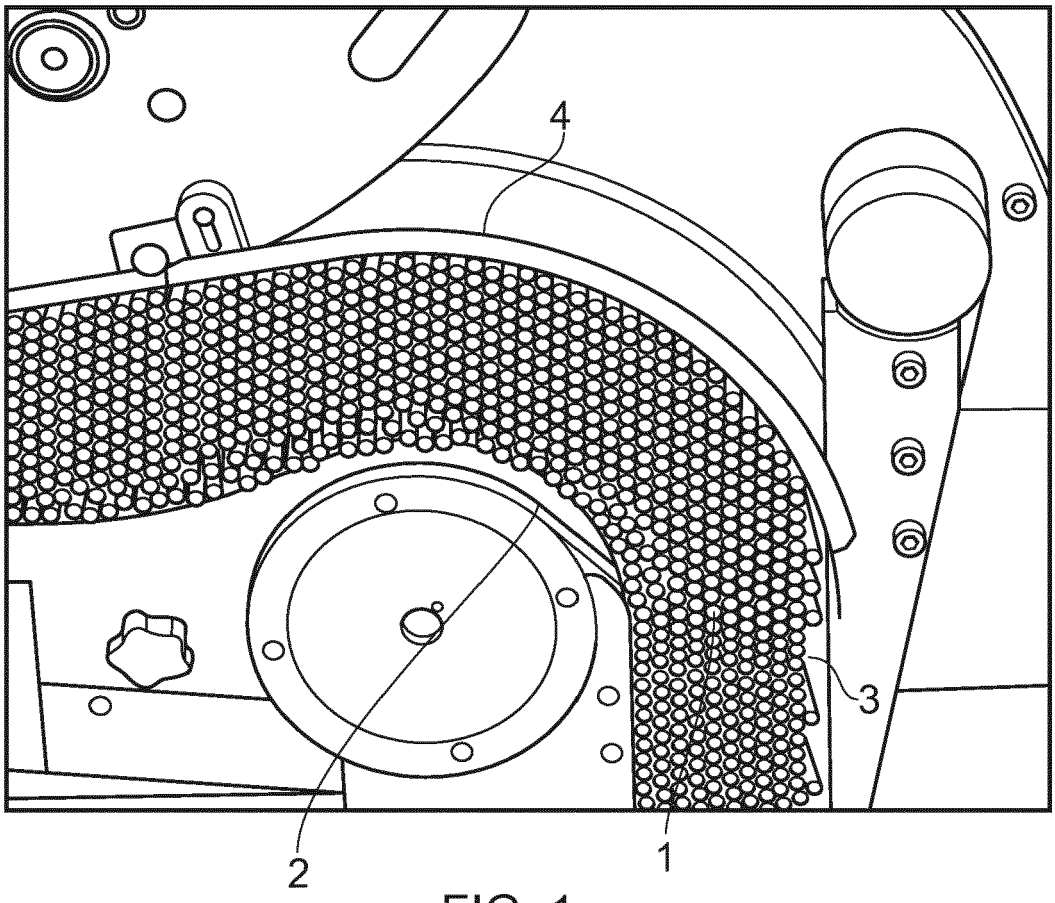

FIG. 1

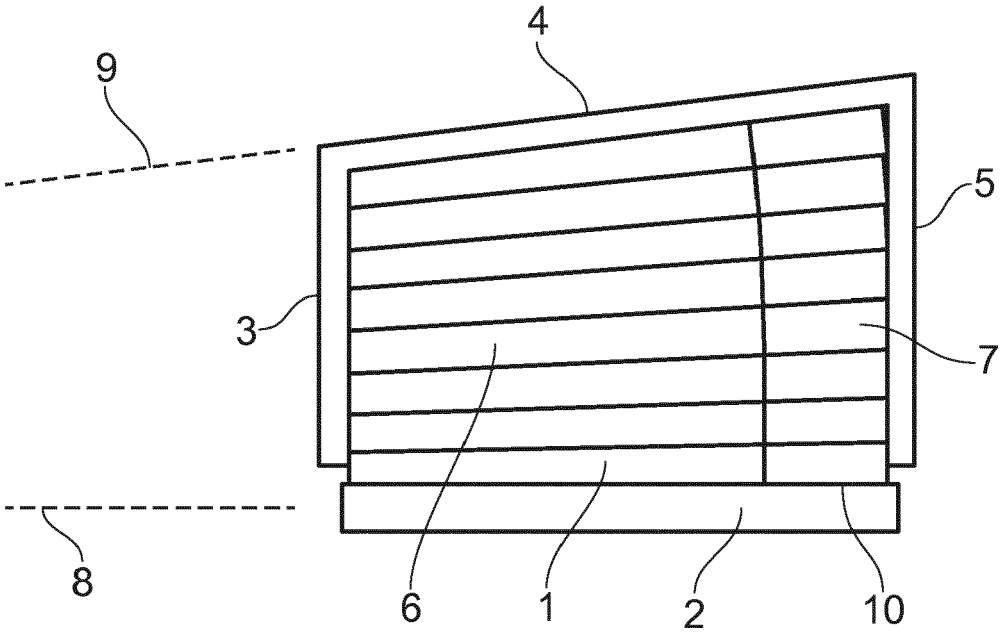

FIG. 2

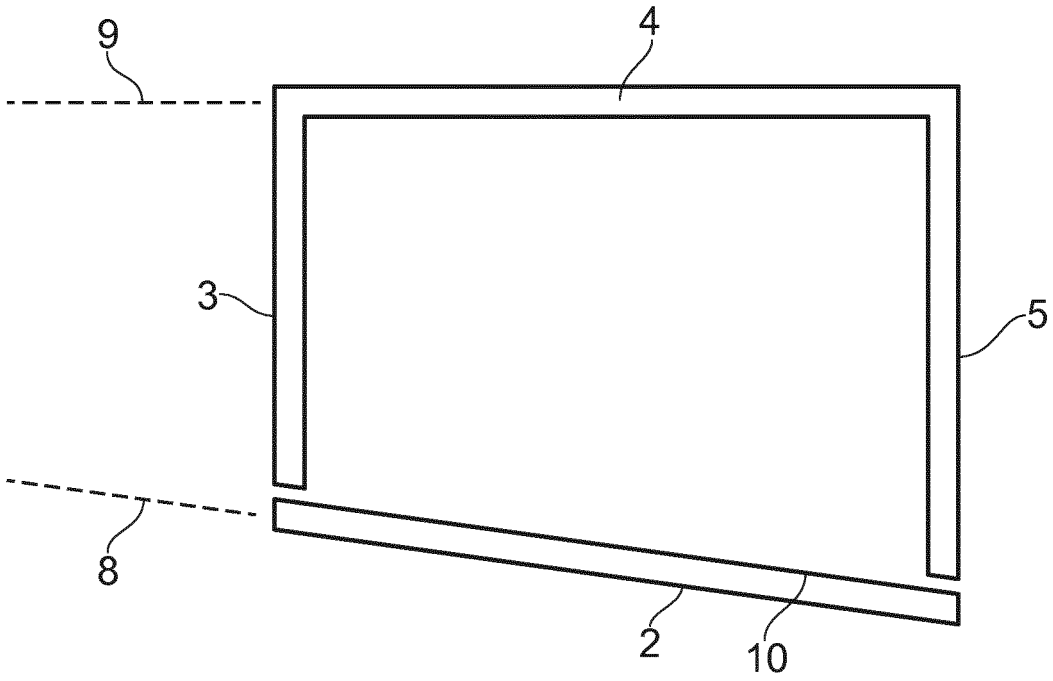

FIG. 3

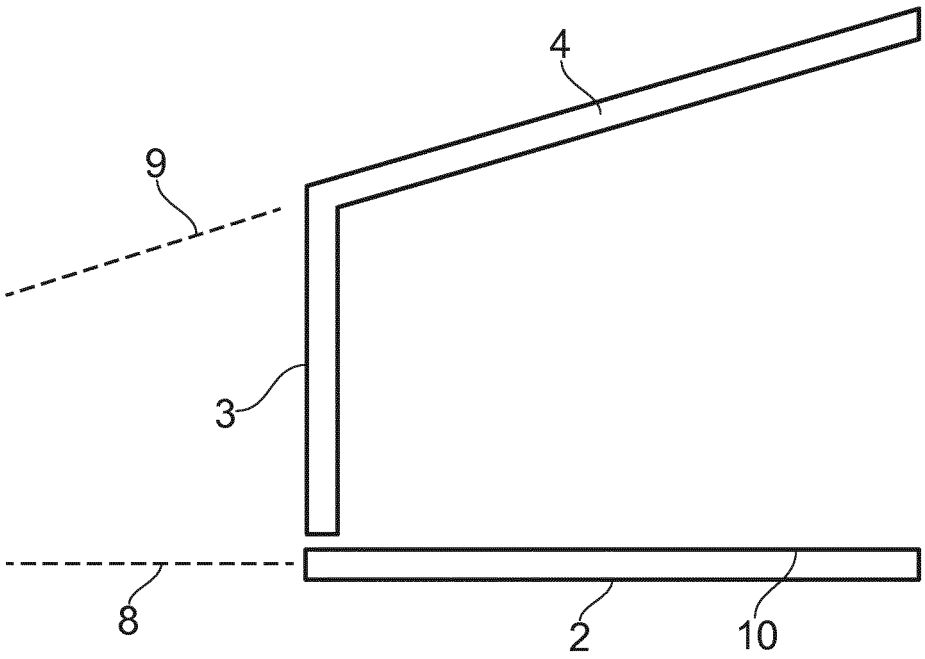

FIG. 4

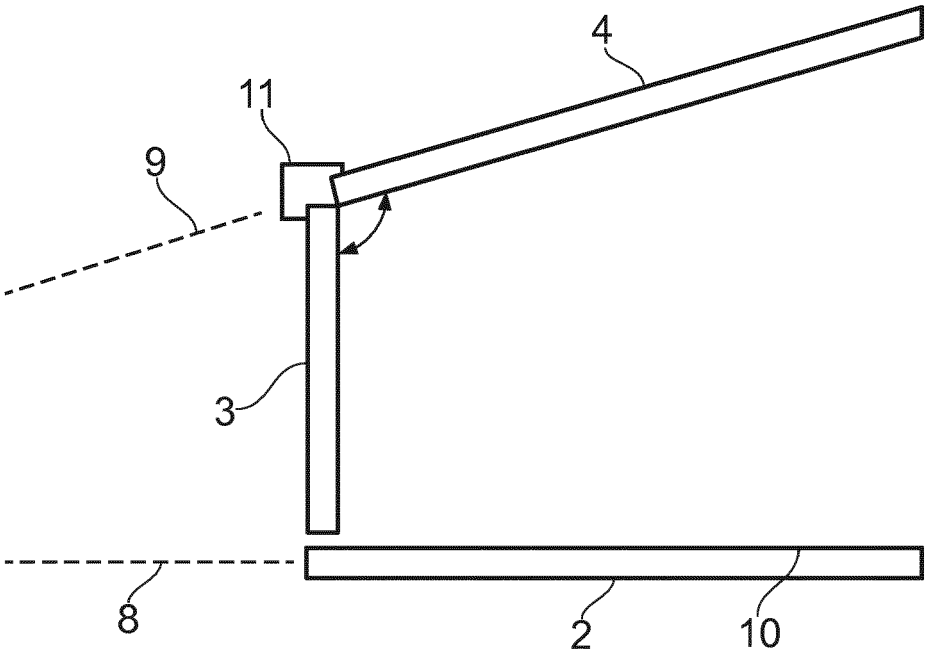

FIG. 5

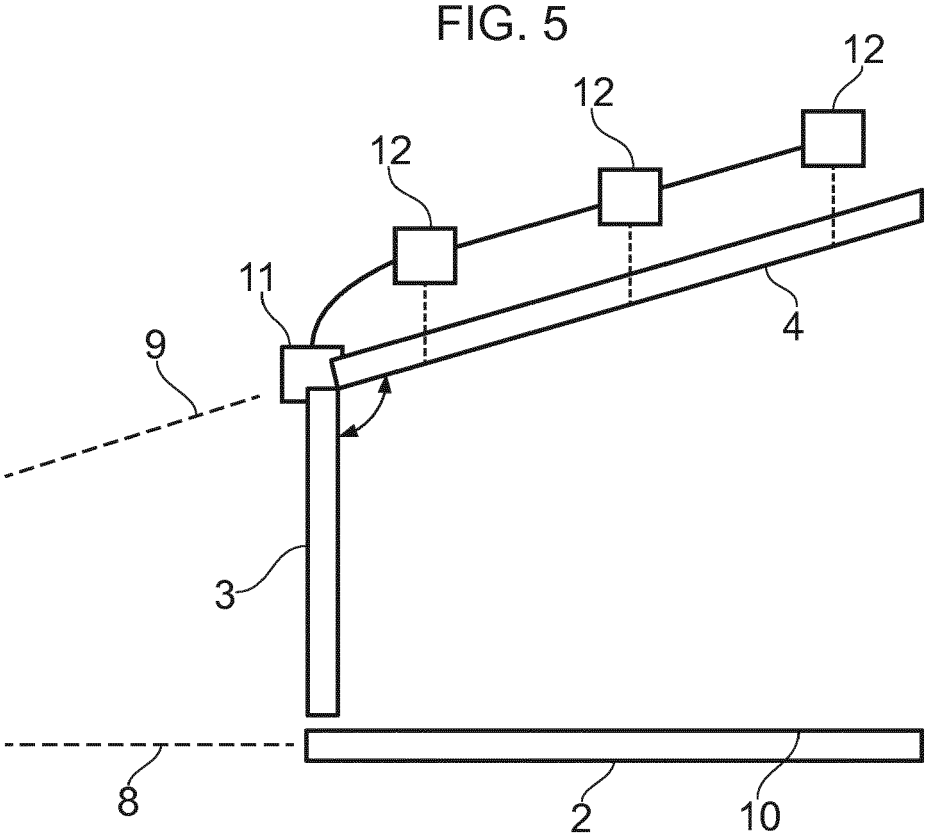

FIG. 6

Europäisches Patentamt
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EUROPEAN SEARCH REPORT

Application Number
EP 18 15 5179

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y A	EP 2 995 207 A1 (INT TOBACCO MACHINERY POLAND [PL]) 16 March 2016 (2016-03-16) * figures * * paragraphs [0012] - [0018] *	1-3, 11-15 4-6 7-10	INV. A24C5/32 A24C5/35
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Place of search	Date of completion of the search	Examiner
Munich	26 July 2018	Kirchmayr, Katrin

CATEGORY OF CITED DOCUMENTS

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