(19) DANMARK

(10) **DK/EP 4179877 T3**

(12) Oversættelse af europæisk patentskrift

Patent- og Varemærkestyrelsen

(51) Int.Cl.: ***A 23 G 7/00 (2006.01)*** ***A 23 G 3/02 (2006.01)*** ***A 23 G 3/34 (2006.01)*** ***A 23 G 4/04 (2006.01)***

(45) Oversættelsen bekendtgjort den: **2024-11-04**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2024-10-09**

(86) Europæisk ansøgning nr.: **22210176.8**

(86) Europæisk indleveringsdag: **2014-12-05**

(87) Den europæiske ansøgnings publiceringsdag: **2023-05-17**

(30) Prioritet: **2013-12-06 US 201361913061 P**

(62) Stamansøgningsnr: **14821951.2**

(84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

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(54) Benævnelse: **System og fremgangsmåde til skæring af tyggegummi**

(56) Fremdragne publikationer:
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DESCRIPTION

Description

FIELD

[0001] The disclosure relates generally to a system and method for scoring and/or cutting chewing gum, and more particularly to a system and method for scoring and/or cutting chewing gum without the use of powder.

BACKGROUND

[0002] Conventional scoring and cutting systems and methods used for scoring and cutting chewing gum often require the application of powder to the chewing gum in order to sufficiently release the chewing gum from the cutting devices. Such application of powder to the chewing gum may cause a buildup of excess powder on process equipment, leading to greater maintenance requirements and lower operating efficiencies.

[0003] Accordingly, a system and method for efficiently and effectively scoring and/or cutting chewing gum without the application of powder would be desirable.

[0004] US-A-2006/0040041 describes methods and apparatus for producing alternatively shaped confectionary products using a set of rollers to define three dimensional shapes in a sheet of confectionary products.

[0005] US-A-2007/0104828 describes a center-filled confectionery product and a method for making such a product including filling a portion with liquid and an outer portion composed of a confectionery material.

[0006] US-B-1072316 describes a web cutting and folding machine.

[0007] WO-A-2012/125397 describes a system and method of forming multi-layer confectionary using at least two sets of forming drums that form and laminate confectionary sheets.

SUMMARY

[0008] Disclosed, as not part of the invention, is a method for cutting chewing gum, the method including providing a chewing gum sheet to at least one cutting device; applying oil to said at least one cutting device; and cutting said chewing gum sheet via said at least one cutting device.

[0009] Further disclosed is a method for cutting chewing gum, the method including providing a chewing gum sheet to at least one cutting device; cutting said chewing gum sheet via said at least one cutting device; and separating chewing gum from said at least one cutting device via a directing of compressed air onto said at least one cutting device.

[0010] Further disclosed, as not part of the invention, is a system for cutting chewing gum, the system including a conveyor configured to provide a chewing gum sheet to at least one cutting device; said at least one cutting device configured to cut said chewing gum sheet; and an oiling system configured to apply oil to said at least one cutting device.

[0011] Further disclosed is a system for cutting chewing gum, the system including a conveyor configured to provide a chewing gum sheet to at least one cutting device; said at least one cutting device configured to cut said chewing gum sheet; and a compressed air delivery system configured to direct a compressed air onto said at least one cutting device.

BRIEF DESCRIPTION OF THE FIGURES

[0012] The accompanying drawings incorporated in and forming a part of the specification embodies several aspects of the present invention and, together with the description, serve to explain the principles of the invention. In the drawings:

Figure 1 is a perspective view of a cutting system with the housing removed in accordance with an exemplary embodiment;

Figure 1A is a partial side elevation view of a cutting system shown in Figure 1;

Figure 2 is a perspective view of a cutting system in accordance with an exemplary embodiment; and

Figure 3 is a side elevation view of a cutting system in accordance with an alternative embodiment.

DETAILED DESCRIPTION

[0013] The invention is defined in the appended claims.

[0014] The present invention discloses a system (2) for cutting chewing gum (3), the system (2) comprising:

a conveyor (4) configured to provide a chewing gum sheet to at least one rotary type cutting device (6, 7, 8, 9);

said at least one rotary type cutting device (6, 7, 8, 9) including at least one cutting surface configured to score said chewing gum (3) sheet to a depth less than the entire height of the chewing gum (3) to form a gum (3) web of chewing gum (3) and/or to cut through the entire height of the chewing gum (3) sheet to form separate portions of chewing gum (3); and

a compressed air delivery unit (20) being located proximate to the said at least one rotary type cutting device (6, 7, 8, 9) to apply compressed air to the at least one cutting surface of said at least one rotary type cutting device (6, 7, 8, 9) in a direction that is opposite rotation of said rotary type cutting device (6, 7, 8, 9) to facilitate release of chewing gum (3) from said at least one rotary type cutting device (6, 7, 8, 9); and

an exit conveyor (5) configured to transport said chewing gum (3) from the system (2).

[0015] The present invention also discloses a method for cutting chewing gum (3), the method comprising:

providing a chewing gum (3) sheet to at least one rotary type cutting device (6, 7, 8, 9);

either cutting through the entire height of said chewing gum (3) sheet via said at least one rotary type cutting device (6, 7, 8, 9) to form separate portions of chewing gum (3) or scoring said chewing gum (3) sheet via said at least one rotary type cutting device (6, 7, 8, 9) to a depth less than the entire height of the chewing gum (3) to form a gum (3) web of chewing gum (3);

separating chewing gum (3) from said at least one rotary type cutting device (6, 7, 8, 9) by applying compressed air to a cutting surface of said at least one rotary type cutting device (6, 7, 8, 9) in a direction that is opposite rotation of said rotary type cutting device (6, 7, 8, 9); and

transporting said chewing gum (3) from the system (2) via an exit conveyor (5).

[0016] The following disclosure will detail particular embodiments according to the present invention, which provides systems and methods for scoring and/or cutting chewing gum, particularly systems and methods for scoring and/or cutting chewing gum without the use of powder. Reference is now made to the drawings, wherein like reference numerals are used to refer to like elements throughout the disclosure.

[0017] Referring first to Figure 1, a cutting system 2 for chewing gum 3 is illustrated. The

chewing gum 3 to be scored or cut by the cutting system 2 is referred to as "chewing gum" or "gum" and includes, but is not limited to, compositions ranging from and inclusive of compounded elastomer to finished gum, which may include compounded elastomer in addition to some compounding aids, master batch gum base, compounded elastomer in addition to some subsequent gum ingredients, compounded elastomer in addition to some gum base ingredients and some subsequent gum ingredients, gum base, gum base in addition to some subsequent gum ingredients, master batch finished gum, and finished gum. The chewing gum 3 may be formed into and processed as a plurality of sheets of chewing gum 3 or fed as a continuous sheet of chewing gum 3.

[0018] Incoming sheet(s) of chewing gum 3 may enter cutting system 2 with a temperature ranging from 25 degrees Celsius to 45 degrees Celsius, while preferably ranging from 30 degrees Celsius to 40 degrees Celsius.

[0019] Further, incoming sheet(s) of chewing gum 3 may have varying thicknesses. Sheet(s) of chewing gum 3 used for slab gum may include single layer and multi-layer (2, 3, etc.) compositions. Single layer sheet(s) of chewing gum 3 used for slab gum may range in thickness from 3 millimeters to 4 millimeters. Multi-layer sheet(s) of chewing gum 3, particularly 3 layer sheet(s) may range from 4 millimeters to 5.5 millimeters. Sheet(s) of chewing gum 3 used for pellet gum may range in thickness from 4.5 millimeters to 5.5 millimeters. Pellet gum, as known in the art, may have a generally arcuate or pillow shape after scoring/cutting, with a varying thickness along the length of the pellet gum body.

[0020] As shown in the exemplary embodiment of Figure 1, the cutting system 2 includes cutting devices 6, 7, 8, and 9. As will be discussed below, these cutting devices 6, 7, 8, and 9 may be a combination of rollers including a plurality of ring knives and rollers including a plurality of lateral knives, 6, 7, 8, 9 used to score and/or cut chewing gum 3. The cutting system 2 also includes an oiling system 10 and/or a compressed air delivery units 20 (as shown in Figure 1A) to facilitate the release of chewing gum 3 from the cutting devices. Chewing gum 3 that has been cut and/or scored via the system 2 may later be conveyed from cutting system 2 for packaging or further processing. As will be discussed in conjunction with the system elements hereinbelow, the cutting system 2 is used to score or cut the chewing gum 3 after forming, cooling, or other processing steps without applying powder to chewing gum 3 (directly or via system elements) in order to release the chewing gum 3 from the cutting devices 6, 7, 8, and 9.

[0021] As shown schematically in the exemplary embodiment of Figure 1 and briefly mentioned above, the cutting system 2 includes a conveyor 4, upper and lower parallel cutting device 6, 7, upper and lower perpendicular cutting device 8, 9, the oiling system 10, and the compressed air delivery units 20. The upper and lower parallel cutting devices 6, 7, may be rollers including a plurality of ring knives that score and/or cut the chewing gum 3 parallel to the direction of the chewing gum flow 24. Alternatively, the upper and lower perpendicular cutting devices 8, 9, may be rollers including a plurality of lateral knives that may score and/or cut the chewing gum 3 perpendicular to the direction of the chewing gum flow 24. The oiling system 10

may include oil rollers 12, 16 that apply oil directly to the chewing gum 3 (and therefore indirectly to the cutting devices 6, 7, 8, 9) and oil sprayers 14 to apply oil directly to chewing gum 3 and/or to the cutting devices 6, 7, 8, 9. The compressed air delivery units 20 may operate in conjunction with or independently from oiling system 10 to assist in separating and releasing chewing gum 3 from the cutting devices by applying compressed air to the cutting surfaces of the cutting devices 6, 7, 8, 9.

[0022] When the system 2 is in use, the chewing gum 3 is transported to cutting system 2 by conveyor 4 from a cooling device, forming device, or any other process device. In an exemplary embodiment, the conveyor 4 includes belts, rollers, cutting devices, other suitable conveying devices, or any combination thereof. Further, downstream of a conveyor termination point the system 2 may include dead plates or plates (not shown), that allow chewing gum 3 to slide between elements of cutting system 2. In an exemplary embodiment, these plates may include a non-stick surface. Dead plates and other elements may be spaced apart to support the gum 3 within the system (downstream of the conveyor 4), while allowing elements located between these plates, such as the cutting devices 6, 7, 8, 9, oiling system 10, and compressed air delivery units 20, to interact with chewing gum 3 at upper and lower sides thereof. Actuation of chewing gum movement through the cutting system 2 from an entry point 26 of the cutting system 2 to an exit point 28 of the cutting system 2 is achieved via an exit conveyor 5 (which will be discussed in greater detail below) that pulls the chewing gum 3 through the system 2. A "pushing" by the conveyor 4 and the rotation of the cutting devices 6, 7, 8, 9 themselves also assists in this movement. In at least one embodiment of the system 2, chewing gum 3 may be conveyed at a line speed of 3 to 40 meters per minute, particularly, 15 meters per minute or 30 meters per minute.

[0023] Various types of oil may be applied within the system 2. For example, the various components of oiling system 10 may impart medium chain trigylceride oil, mineral oil, vegetable oil or any other suitable oil for maintaining separation and preventing adherence between chewing gum 3 and the cutting devices. Suitable oils may have a viscosity between 1 to 100 centipoise at 20 to 40 degrees Celsius, particularly 25 degrees Celsius. The total weight of oil applied to chewing gum 3 may be between 0.1% to 3.0% of the total weight of chewing gum 3.

[0024] In at least one embodiment, oil may be applied by oiling system 10 to the chewing gum 3 before chewing gum 3 is conveyed or provided to the cutting devices 6, 7, 8, 9 via rollers 12. Oil may be applied externally to oil rollers 12 (via a sprayer, etc.) or oil may be fed internally and flow outward to surface of oil rollers 12. In at least one embodiment, oil rollers 12 may be disposed above and/or below chewing gum 3. Further, chewing gum 3 may be conveyed by the rolling motion of oil rollers 12. The oil rollers 12 may be made of rubber or any other suitable material. Of course, oil sprayers (such as ultrasonic or high pressure sprayers) may also be used.

[0025] Downstream of the rollers 12, the chewing gum 3 is conveyed to the cutting devices 6 and 7. First cutting devices 6, 7 are shown to be disposed both above and below chewing gum

3. However in alternative embodiments, first cutting devices 6, 7 may be disposed only above or only below chewing gum 3 as first upper cutting device 6 or as first lower cutting device 7. In further alternative embodiments, a single first cutting device 6, 7 may be used in conjunction with a cutting surface to support and limit deflection of chewing gum 3 disposed opposite the single first cutting device 6, 7 on the opposite surface (e.g. bottom surface) of chewing gum 3. Cutting surfaces may include cylindrical rollers with smooth knifeless walls or flat plates or anvils.

[0026] In at least one embodiment, first cutting devices 6, 7 may be configured to make one or more cuts in a parallel direction relative to chewing gum flow direction 24 at a predetermined spacing. Further, first cutting devices 6, 7 may be rollers including a plurality of ring knives spaced apart at a predetermined spacing in order to make one or more cuts in a parallel direction relative to the chewing gum flow direction 24. The upper roller 6 may rotate in a generally counter clockwise direction while the lower roller 7 may rotate in a generally clockwise direction. These rollers may also oscillate to reduce wear. As will be discussed below, the cutting depth of the first cutting devices 6, 7 may vary.

[0027] Downstream of the first cutting devices 6 and 7, the chewing gum 3 is conveyed to second cutting devices 8 and 9. Second cutting devices 8, 9 are shown to be disposed both above and below chewing gum 3. However in alternative embodiments, second cutting devices 8, 9 may be disposed only above or only below chewing gum 3 as second upper cutting device 8 or as second lower cutting device 9. In further alternative embodiments, a single second cutting device 8, 9 may be used in conjunction with a cutting surface to support and limit deflection of chewing gum 3 disposed opposite the single second cutting device 8, 9 on the opposite surface (e.g. bottom surface) of chewing gum 3. Cutting surfaces may include cylindrical rollers with smooth knifeless walls or flat plates or anvils.

[0028] In at least one embodiment, second cutting devices 8, 9 may be configured to make cuts in a perpendicular direction relative to chewing gum flow direction 24 at predetermined intervals or spacing. Further, second cutting devices 8, 9 may be rollers including a plurality of lateral knives. The upper roller 8 may rotate in a generally counter clockwise direction while the lower roller 9 may rotate in a generally clockwise direction. Hereagain, these rollers may also oscillate to reduce wear. As will be discussed below, the cutting depth of the second cutting devices 8, 9 may vary.

[0029] In order to effectively reduce presence of residual chewing gum 3 and promote separation of chewing gum 3 from the cutting devices oil may be applied to cutting devices 6, 7, 8, 9 by oil sprayers 14. Oil sprayers 14 may be desirable for oil application in that they evenly distribute oil onto the cutting devices and may be disposed above and/or below the cutting devices. Oil sprayers may be ultrasonic sprayers and/or high pressure sprayers. Ultrasonic sprayers utilize a low pressure oil delivery system with a corresponding low velocity spray to control oil application. Similarly, atomized oil delivered by high pressure sprayers is also delivered with a low velocity spray to control oil application.

[0030] Oil may be applied directly to the interface or cutting surfaces (e.g. cutting blades) of the cutting devices. Further, rotary type cutting devices, such as rollers including a plurality of ring knives 6, 7, and rollers including a plurality of lateral knives 8, 9 may receive oil directly from oil rollers 16 disposed to be in rotational contact with the cutting or gum interface surfaces of cutting devices 6, 7, 8, 9. Of course, oil applied to the chewing gum 3 itself will ultimately be indirectly applied to the cutting devices 6, 7, 8, 9.

[0031] In embodiments with a single first cutting device 6 or 7 or a single second cutting device 8 or 9, it should be appreciated that the cutting depth may be the entire height of the chewing gum 3, or any depth less than the entire height of the chewing gum 3. In embodiments with an upper first cutting device 6 and a lower first cutting device 7 and/or an upper second cutting device 8 and a lower second cutting device 9, the cutting depth or combined cutting depth of cutting devices 6, 7 and cutting devices 8, 9 may be less than an entire height of the gum 3.

[0032] In accordance with the above and for the purposes of this disclosure, the term "cutting" as achieved via the above or other cutting devices may be defined as cutting through the entire height of the sheet of chewing gum 3, wherein separate portions of chewing gum 3 that are independently conveyable are created, or as a scoring the chewing gum 3 to a depth less than the entire height of the chewing gum 3, wherein separate portions of chewing gum 3 are not created. Specifically, when the chewing gum 3 is cut or scored through to a depth less than the entire height of the chewing gum 3, the forward motion of the gum web of chewing gum 3 may still convey the remainder of chewing gum 3 as the entire (continuous or non-continuous) sheet of chewing gum 3. Accordingly, chewing gum 3 may move as a single unit and not be considered separate portions, though the unit may easily be separated into portions (along the scores) later.

[0033] Further, cutting devices 6, 7, 8, 9 in addition to cutting and/or scoring chewing gum 3 may perform a trimming operation. Trimming as achieved via the above or other cutting devices may be defined as cutting through the entire height of the sheet of chewing gum 3 along the edges of the sheet of chewing gum 3. Portions removed by trimming may fall below conveyor 4 to a separate trim conveyor. The trim conveyor may move in the same direction as conveyor 4 and gum flow 24.

[0034] As the chewing gum 3 passes through the cutting devices 6, 7, 8, 9, and in order to further promote separation of chewing gum 3 from cutting devices 6, 7, 8, 9, compressed air may be applied by compressed air delivery units 20. As shown in Figure 1, compressed air delivery units 20 is positioned proximate each of the cutting devices 6, 7, 8, 9. Though these units 20 are shown to be used in conjunction with the oiling system 10 in Figure 1, it should of course be appreciated that these units 20 may operate with or without the oiling system 10 or components thereof. That is, compressed air may be applied to cutting devices 6, 7, 8, 9 without being oiled.

[0035] The compressed air may be applied to the cutting devices in a direction that is opposite rotation of the cutting devices 6, 7, 8, 9, perhaps in a direction opposite of flow of the gum 3.

The compressed air is employed to sufficiently separate or at least assist to separate the chewing gum 3 from the cutting devices 6, 7, 8, 9, with this separation being optionally assisted by including non-stick surfaces on the cutting devices 6, 7, 8, 9 (via a non-stick coating applied to the cutting devices 6, 7, 8, 9). Separation of the chewing gum may include removing residual chewing gum 3 from the cutting device 6, 7, 8, 9, reducing or eliminating the adherence between the chewing gum 3 sheet(s) and the cutting devices 6, 7, 8, 9, and/or reducing or eliminating the adherence between trimmed portions of chewing gum 3 and the trim cutting devices (which are often ring knives at the end of cutting devices 6,7 that cut completely through the gum sheet 3 along trim end(s) thereof) and directing the trimmed portions from the remainder of the sheet 3 onto a trim conveyor.

[0036] In addition, excess oil that may have accumulated on the cutting devices and chewing gum 3, which may be undesirably transferred to other portions of cutting system 2 and to other processes downstream of cutting system 2, may be addressed via scrapers 18. Scrapers 18 may be disposed to remove excess oil and residual chewing gum 3 from the cutting devices 6, 7, 8, 9. For rollers including a plurality of ring knives 8,9 these scrapers 18 may be in interference contact with the ring knives 8,9 to be scraped, wherein a blade portion of scraper 18 is disposed at an obtuse angle relative to the motion of the ring knives 8,9 to be scraped in order to remove any residual chewing gum 3 or excess oil.

[0037] After all cutting and separation operations, the chewing gum 3 may be conveyed from conveyor 4 to exit conveyor 5, which transports the chewing gum 3 from the system 2. Exit conveyor 5 may transport the chewing gum 3 to downstream processes such as cooling, packaging or any other suitable process. Further, exit conveyor 5 may receive residual chewing gum 3 and excess oil from cutting and separation processes. A scraper 19 may be disposed on the return side of the exit conveyor 5 to scrape chewing gum 3 and excess oil.

[0038] Referring now to Figure 2, it should be noted that the chewing gum 3 may be sensitive to environmental factors such as temperature and humidity. In order to control such environmental factors, the cutting devices may be disposed in a housing 30 as shown in Figure 2. Within housing 30, dehumidified and cooled air may be forced and circulated. The relative humidity within the housing may be between 10% to 40% to eliminate condensation on cutting devices 6, 7, 8, 9, and rollers 16. Further, the temperature within the housing 30 may be maintained between 18 degrees Celsius and 25 degrees Celsius.

[0039] Referring now to Figure 3, an alternative embodiment of the system 2 is illustrated, wherein the second cutting devices 8, 9 are replaced with a reciprocating cutting system 21. In this embodiment, the chewing gum 3 is cut into pellet shaped gum.

[0040] The reciprocating cutting system 21 shown in Figure 3 includes a reciprocating knife 22 and cutting surface 23. This system 21 is configured to cut the chewing gum 3 in a direction perpendicular to flow 24. Reciprocating knife 22 reciprocates in a vertical cutting motion, and may additionally move horizontally to compensate for speed of gum flow 24 while cutting chewing gum 3. Cutting surface 23 is a relatively fixed surface configured to facilitate the

cutting operation of reciprocating knife 22 by limiting the downward travel of gum 3 as reciprocating knife 22 moves downward. Similarly and accordingly, the cutting depth of reciprocating knife 22 may be the entire height of chewing gum 3 to create separate portions in a perpendicular direction relative to gum flow direction 24 or may alternatively cut to a depth less than the entire height of chewing gum 3 to allow for a score that allows chewing gum 3 to be conveyed as a single unit.

[0041] Similarly to that which was discussed with regards to cutting devices 6, 7, 8, 9, in order to effectively reduce presence of residual chewing gum 3 and promote separation of chewing gum 3 from the reciprocating knife 22 and cutting surface 23 oil may be applied to one or both of the reciprocating knife 22 and cutting surface 23 by oil sprayers 14. Hereagain, oil sprayers may be ultrasonic sprayers and/or high pressure sprayers. Oil sprayers 14 may be desirable for oil application in that they evenly distribute oil onto the reciprocating knife 22 and cutting surface 23. Of course, oil applied to the chewing gum 3 itself at roller 12 will ultimately be indirectly applied to the reciprocating knife 22 and cutting surface 23.

[0042] Via the above discussed system embodiments, non-powdered chewing gum compositions may be cut without the adhering to cutting elements. This desirably reduces the need for preventative maintenance associated with powder use, increases equipment uptime, increases air quality by removing airborne particulates, removes the need for dust collection, and eliminates the need to change-over between fruit and mint dusting systems.

[0043] The use of the terms "a" and "an" and "the" and similar referents in the context of describing the invention (especially in the context of the following claims) is to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are to be construed as open-ended terms (i.e., meaning "including, but not limited to,") unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., "such as") provided herein, is intended merely to better illuminate the invention and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the invention.

REFERENCES CITED IN THE DESCRIPTION

Cited references

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Patentkrav

1. System (2) til skæring af tyggegummi (3), hvor systemet (2) omfatter:
en transportør (4), der er konfigureret til at tilvejebringe et tyggegummiark til mindst én skæreindretning (6, 7, 8, 9) af roterende type;
hvor den mindst ene skæreindretning (6, 7, 8, 9) af roterende type omfatter mindst en skæreflade, der er konfigureret til at skære tyggegummiarket (3) til en dybde, der er mindre end den fulde højde af tyggegummiarket (3), for at danne en bane af tyggegummi (3) og/eller til at skære gennem den fulde højde af tyggegummiarket (3) for at danne separate dele af tyggegummi (3); og
en tryklufttilførselsenhed (20), der er placeret nær den mindst ene skæreindretning (6, 7, 8, 9) af roterende type for at påføre trykluft til den mindst ene skæreflade af den mindst ene skæreindretning (6, 7, 8, 9) af roterende type i en retning, der er modsat rotation af skæreindretningen (6, 7, 8, 9) af roterende type for at lette frigivelse af tyggegummi (3) fra den mindst ene skæreindretning (6, 7, 8, 9) af roterende type; og
en udgangstransportør (5), der er konfigureret til at transportere tyggegummiet (3) fra systemet (2).

2. System (2) ifølge krav 1, hvor den mindst ene skæreindretning (6, 7, 8, 9) af roterende type er en øvre skæreindretning (6, 8), der er anbragt på en relativt øvre overflade af tyggegummiarket (3), og en nedre skæreindretning (7, 9), der er anbragt på en relativt anden overflade af tyggegummiarket (3), hvor trykluften påføres både den øvre skæreindretning (6, 8) og den nedre skæreindretning (7, 9).

3. System (2) ifølge krav 1, hvor den mindst ene skæreindretning (6, 7, 8, 9) af roterende type er mindst en rulle, der omfatter en flerhed af ringknive (6, 7), der er konfigureret til at skære tyggegummiarket (3) i en retning parallelt med tyggegummistrømmens (3) retning mod den mindst ene skæreindretning af roterende type (6, 7, 8, 9), eller hvor den mindst ene skæreindretning (6, 7, 8,

9) af roterende type er i det mindste en rulle, der omfatter en flerhed af sideknive (8, 9), der er konfigureret til at skære tyggegummiarket (3) i en retning vinkelret på tyggegummistrømmens (3) retning mod den mindst ene skæreindretning (6, 7, 8, 9) af roterende type.

4. System (2) ifølge krav 1, hvor den mindst ene skæreindretning (6, 7, 8, 9) af roterende type er mindst en rulle, der omfatter en flerhed af ringknive (6, 7), der er konfigureret til at skære tyggegummiarket (3) i en retning parallelt med tyggegummistrømmens (3) retning mod den mindst ene skæreindretning (6, 7, 8, 9) af roterende type, og mindst en rulle, der omfatter en flerhed af sideknive (8, 9), der er konfigureret til at skære tyggegummiarket (3) i en retning vinkelret på tyggegummistrømmens (3) retning mod den mindst ene skæreindretning (6, 7, 8, 9) af roterende type, hvor den komprimerede luft ledes ind på både den mindst ene rulle, der omfatter flerheden af ringknive (6, 7), og den mindst ene rulle, der omfatter flerheden af sideknive (8, 9).

5. System (2) ifølge krav 4, hvor den mindst ene rulle, der omfatter flerheden af ringknive (6, 7), er mindst en øvre rulle (6) indbefattende en flerhed af ringknive, der er anbragt på en relativt øvre overflade af tyggegummiarket (3), og mindst én nedre rulle (7) indbefattende en flerhed af ringknive, der er anbragt på en relativt nedre overflade af tyggegummiarket (3), hvor den komprimerede luft ledes ind på både den øvre rulle (6), der omfatter flerheden af ringknive, og den nedre rulle (7), der omfatter flerheden af ringknive.

6. System (2) ifølge krav 4, hvor den mindst ene rulle, der omfatter flerheden af sideknive (6, 7), er mindst en øvre rulle (6) indbefattende en flerhed af sideknive, der er anbragt på en relativt øvre overflade af tyggegummiarket (3), og mindst én nedre rulle (7) indbefattende en flerhed af sideknive, der er anbragt på en relativt nedre overflade af tyggegummiarket (3), hvor den komprimerede luft ledes ind på både den øvre rulle (6), der omfatter flerheden af sideknive,

og den nedre rulle (7), der omfatter flerheden af sideknive.

7. Fremgangsmåde til skæring af tyggegummi (3), hvor fremgangsmåden omfatter:

tilvejebringelse af et tyggegummiark (3) til mindst én skæreindretning (6, 7, 8, 9) af roterende type;

enten at skære gennem den fulde højde af tyggegummiarket (3) via den mindst ene skæreindretning (6, 7, 8, 9) af roterende type for at danne separate dele af tyggegummi (3) eller at skære tyggegummiarket (3) via den mindst ene skæreindretning (6, 7, 8, 9) af roterende type til en dybde, der er mindre end den fulde højde af tyggegummiet (3) for at danne en tyggegummibane (3) af tyggegummi (3);

at adskille tyggegummi (3) fra den mindst ene skæreindretning (6, 7, 8, 9) af roterende type ved at påføre trykluft på en skæreflade af den mindst ene skæreindretning (6, 7, 8, 9) af roterende type i en retning, der er modsat rotation af skæreindretningen (6, 7, 8, 9) af roterende type; og

transport af tyggegummiet (3) fra systemet (2) via en udgangstransportør (5).

8. Fremgangsmåde ifølge krav 7, hvor den mindst ene skæreindretning (6, 7, 8, 9) af roterende type er en øvre skæreindretning (6, 8), der er anbragt på en relativt øvre overflade af tyggegummiarket (3), og en nedre skæreindretning (7, 9), der er anbragt på en relativt anden overflade af tyggegummiarket (3), hvor trykluften påføres både den øvre skæreindretning (6, 8) og den nedre skæreindretning (7, 9).

9. Fremgangsmåde ifølge krav 7, hvor den mindst ene skæreindretning (6, 7, 8, 9) af roterende type er mindst en rulle, der omfatter en flerhed af ringknive (6, 7), der er konfigureret til at skære tyggegummiarket (3) i en retning parallelt med tyggegummistrømmens (3) retning mod den mindst ene skæreindretning (6, 7, 8, 9) af roterende type, eller hvor den mindst ene skæreindretning (6, 7, 8, 9) af roterende type er mindst én rulle, der omfatter en flerhed af sideknive

(8, 9), der er konfigureret til at skære tyggegummiarket (3) i en retning vinkelret på tyggegummistrømmens (3) retning mod den mindst ene skæreindretning (6, 7, 8, 9) af roterende type.

10. Fremgangsmåde ifølge krav 7, hvor den mindst ene skæreindretning (6, 7, 8, 9) af roterende type er mindst en rulle, der omfatter en flerhed af ringknive (6, 7), der er konfigureret til at skære tyggegummiarket (3) i en retning parallelt med tyggegummistrømmens (3) retning mod den mindst ene skæreindretning (6, 7, 8, 9) af roterende type, og mindst en rulle, der omfatter en flerhed af sideknive (8, 9), der er konfigureret til at skære tyggegummiarket (3) i en retning vinkelret på tyggegummistrømmens (3) retning mod den mindst ene skæreindretning (6, 7, 8, 9) af roterende type, hvor den komprimerede luft ledes ind mod både den mindst en rulle, der omfatter flerheden af ringknive (6, 7), og den mindst ene rulle, der omfatter flerheden af sideknive (8, 9).

11. Fremgangsmåde ifølge krav 10, hvor den mindst ene rulle, der omfatter flerheden af ringknive (6, 7), er mindst en øvre rulle (6) indbefattende en flerhed af ringknive, der er anbragt på en relativt øvre overflade af tyggegummiarket (3), og mindst én nedre rulle (7) indbefattende en flerhed af ringknive, der er anbragt på en relativt nedre overflade af tyggegummiarket (3), hvor den komprimerede luft ledes ind på både den øvre rulle (6), der omfatter flerheden af ringknive, og den nedre rulle (7), der omfatter flerheden af ringknive.

12. Fremgangsmåde ifølge krav 10, hvor den mindst ene rulle, der omfatter flerheden af sideknive (6, 7), er mindst en øvre rulle (6) indbefattende en flerhed af sideknive, der er anbragt på en relativt øvre overflade af tyggegummiarket (3), og mindst én nedre rulle (7) indbefattende en flerhed af sideknive, der er anbragt på en relativt nedre overflade af tyggegummiarket (3), hvor trykluften ledes ind på både den øvre rulle (6), der omfatter flerheden af sideknive, og den nedre rulle (7), der omfatter flerheden af sideknive.

DRAWINGS

Drawing

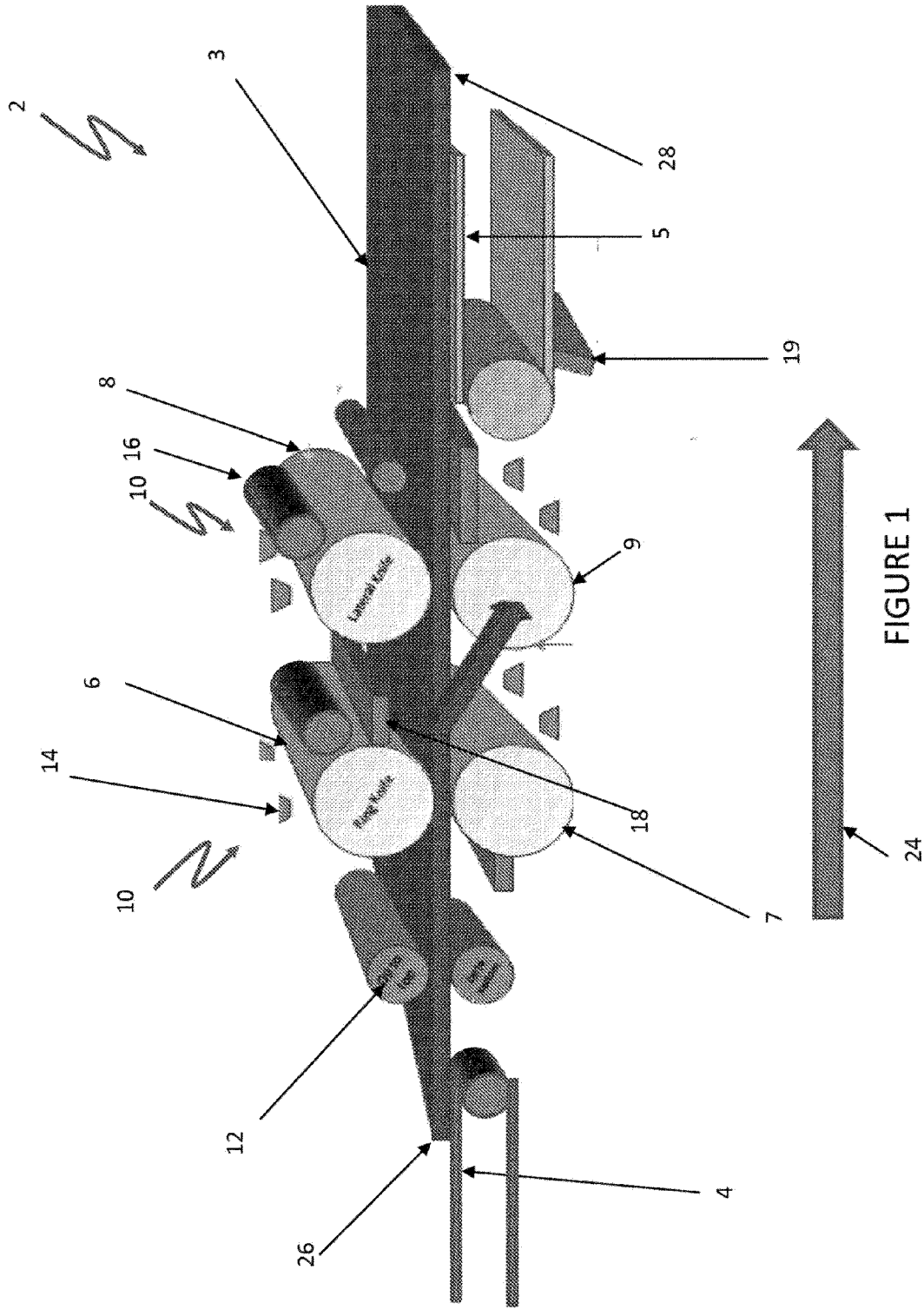

FIGURE 1

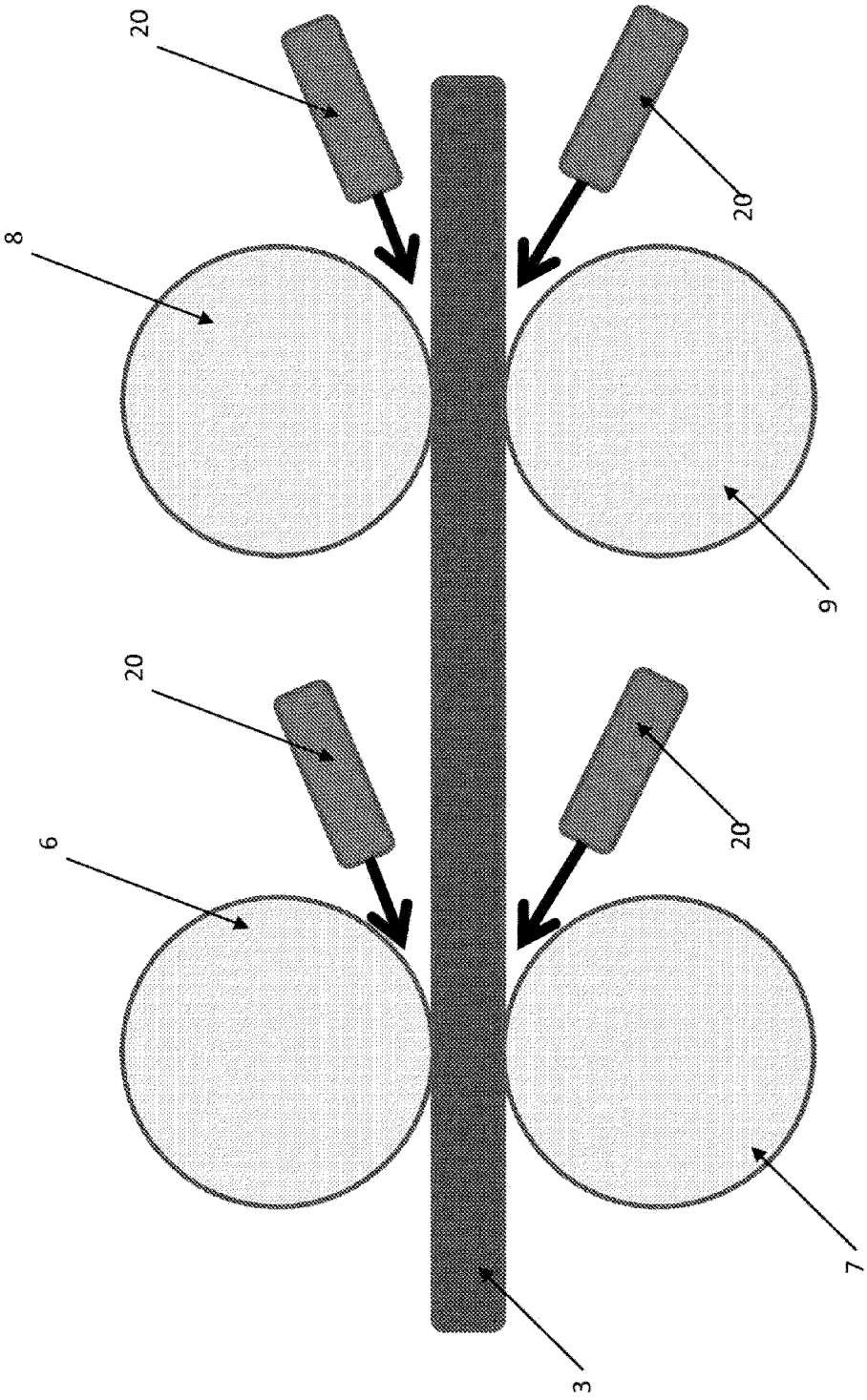

FIGURE 1A

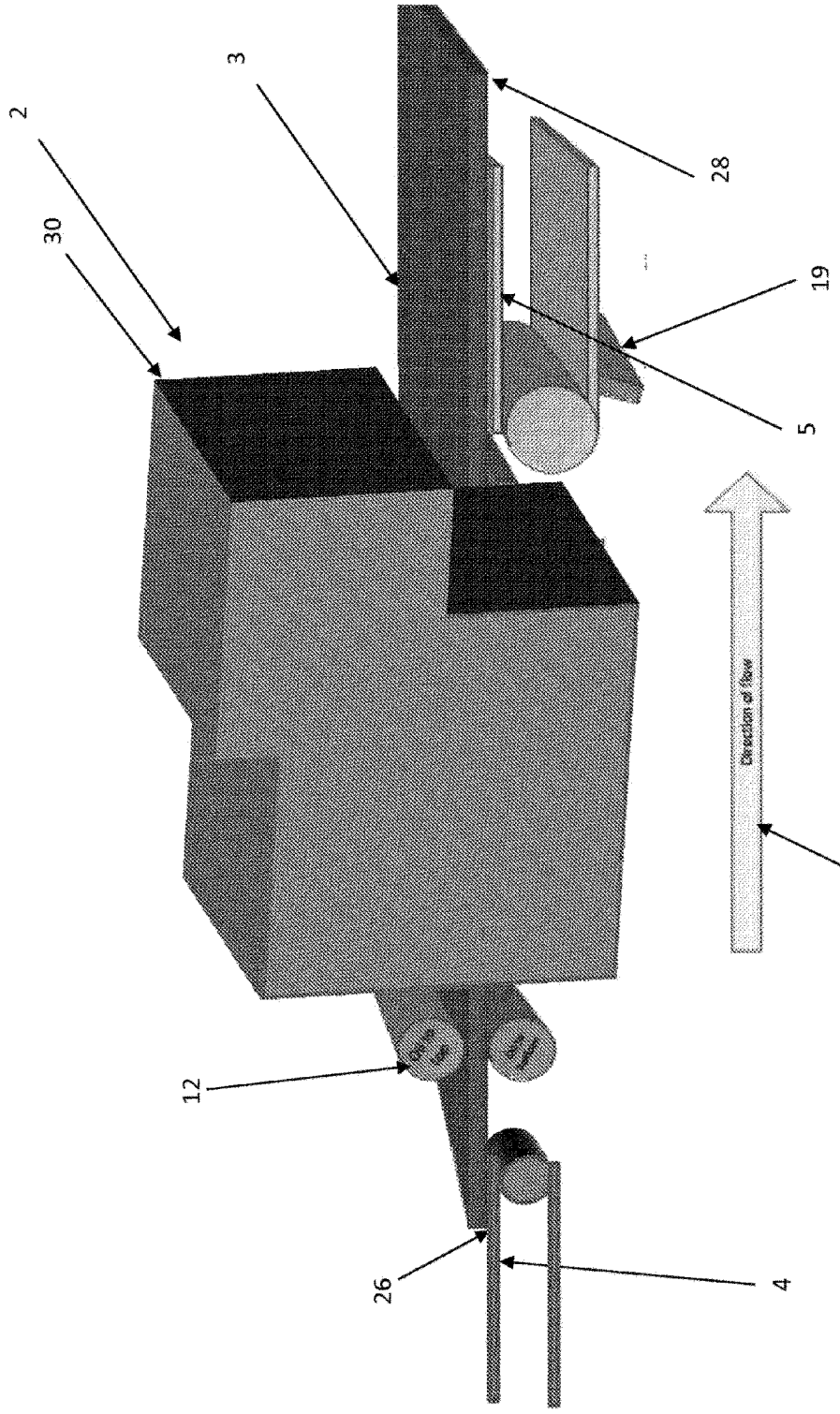

FIGURE 2

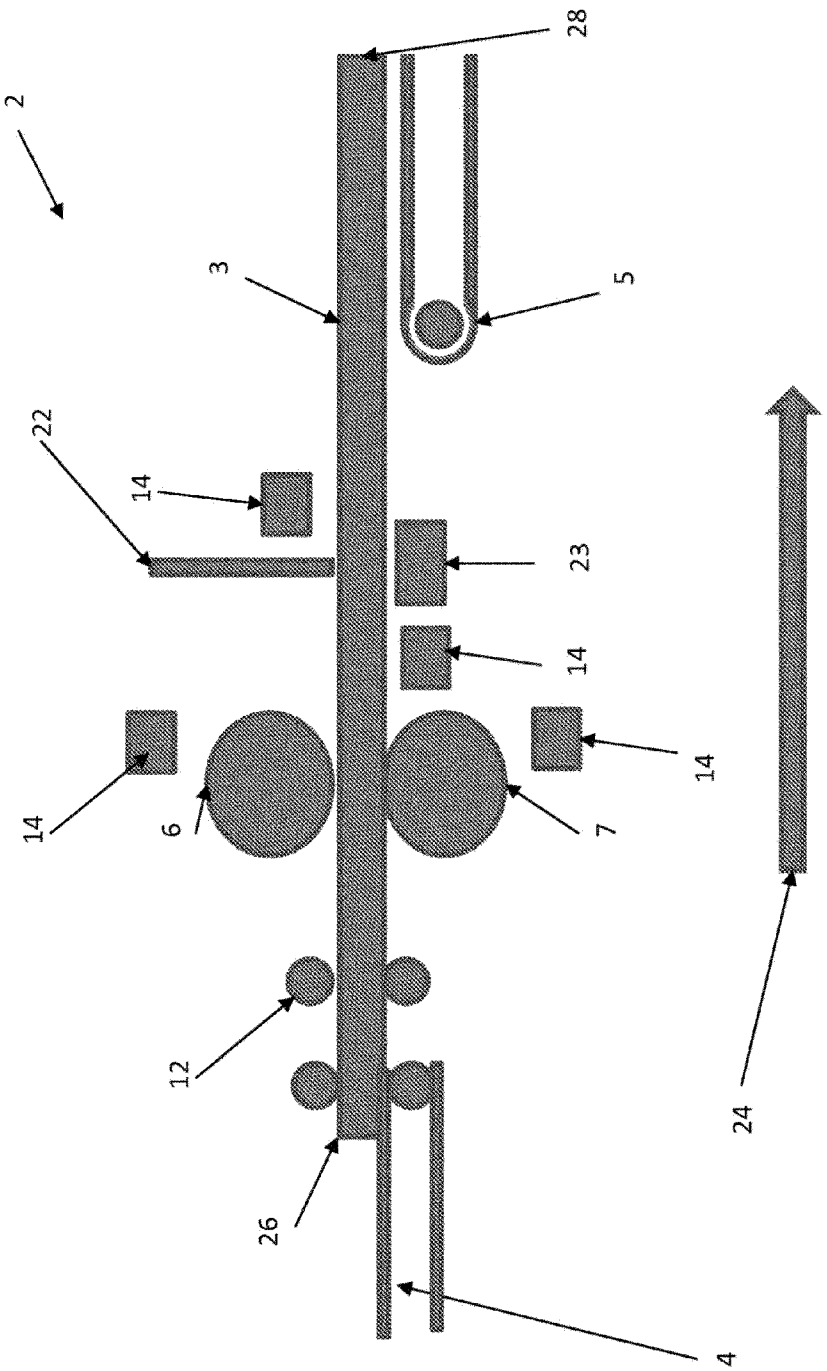

FIGURE 3