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(54) Trimmer and method of operating a trimmer

Trimmer und Verfahren zum Betreiben eines Trimmers

Massicot et procédé de fonctionnement d'un massicot

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(73) Proprietor: **manroland Goss web systems GmbH
86153 Augsburg (DE)**

(72) Inventors:
• **Doucet, Louis John
Salem, NH 03079 (US)**
• **Guaraldi, Glenn Alan
Kingston, NH 03848 (US)**

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Description

[0001] The present invention relates generally to a trimmer according to the preamble of claim 1 and a method of operating a trimmer according to the preamble of claim 8. Such a trimmer is known from US 2009/000440 A1.

BACKGROUND OF INVENTION

[0002] U.S. Patent No. 7,555,975 and U.S. Patent No. 8,186,252, disclose sheet material trimmers.

BRIEF SUMMARY OF THE INVENTION

[0003] A trimmer according to claim 1 is provided. The trimmer includes an infeed for transporting a sheet material article at a first speed, a trimming station transporter for decelerating the sheet material article for trimming by a trimmer, and a decelerator between the infeed and the trimming station transporter. The decelerator forms a deceleration nip for transferring the sheet material article from the infeed to the trimming station transporter.

[0004] A method of operating a trimmer according to claim 8 is also provided. The method includes transporting a sheet material article at an infeed at a first speed and receiving the sheet material article from the infeed at a deceleration nip. A surface speed of the deceleration nip is equal to the first speed as the deceleration nip receives the sheet material article from the infeed. The method also includes decelerating the sheet material using the deceleration nip and passing the sheet material article to a trimming station transporter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The present invention is described below by reference to the following drawings, in which:

Fig. 1 shows a trimmer according to an embodiment of the present invention;

Figs. 2a and 2b illustrate the transfer of a book from register belts to forwarding belts at an infeed of the trimmer;

Figs. 3a and 3b are cross-sectional views of the trimmer shown in Fig. 1 operating with a deceleration nip in a closed position;

Figs. 4a and 4b are cross-sectional views of the trimmer shown in Fig. 1 operating with the deceleration nip in an open position;

Fig. 5 shows a graph illustrating the speed of a book during one cycle of the trimmer;

Fig. 6 shows drive components of a decelerator of

the trimmer;

Fig. 7 shows a cross-sectional view of an upper decelerator section actuator of the decelerator;

Fig. 8 shows a detailed view of the upper decelerator section actuator in an open position;

Figs. 9 to 13 show deceleration nips in accordance with additional embodiments of the present invention; and

Figs. 14a and 14b show a decelerator according to another embodiment of the present invention.

DETAILED DESCRIPTION

[0006] Fig. 1 shows a trimmer 10 according to an embodiment of the present invention. Trimmer 10 includes an infeed 12, a decelerator 14 downstream of infeed 12 and a trimming station 18 downstream of decelerator 14. In this embodiment, trimming station 18 trims a front or face of sheet material articles (i.e., an edge opposite the spine) and trimmer 10 includes a side trimming station downstream of trimming station 18. Sheet material articles are sequentially fed from infeed 12 at a constant infeed speed to decelerator 14. At infeed 12, sheet material articles are registered with infeed register belts 20, 22 at register pins 24, 26 and passed to forwarding belts 28, 30. Infeed register belts 20, 22 and forwarding belts 28, 30 run at the same infeed speed. The sheet material articles leave infeed 12 at the outlet of forwarding belts 28, 30 and are received by decelerator 14 at a deceleration nip 32, which in this embodiment is formed by a lower decelerator section 34 of fixed position lower deceleration rollers 36, 38 and an upper decelerator section 40 of actuating upper deceleration belts 42, 44. In a closed position of deceleration nip 32, upper deceleration section 40 contacts an upper side of the sheet material article and lower deceleration section 34 contacts a lower side of the sheet material article. In an open position of deceleration nip 32, upper deceleration section 40 is spaced away from the sheet material article and does not contact the upper side of the sheet material article.

[0007] As deceleration nip 32 receives the sheet material article from infeed 12, a trailing edge of the sheet material article is still in contact with forwarding belts 28, 30 and a surface speed of the deceleration nip 32 is equal to the infeed speed (i.e., the surface speed of belts 20, 22, 28, 30). After the sheet material exits infeed 12, i.e., after a trailing edge of the sheet material article is no longer in contact with forwarding belts 28, 30, the surface speed of deceleration nip 32 is decreased, decelerating the sheet material article using deceleration nip 32. As sheet material enters into trimming station 18, i.e., when a leading edge of the sheet material articles contacts a trimming station transporter 46, which is formed by an upper transport conveyor 48 for contacting the upper side

of the sheet material article and a lower transport conveyor 50 for contacting the lower side of the sheet material article, the surface speed of deceleration nip 32 is equal to a surface speed of trimming station transporter 46. Deceleration nip 32 and trimming station transporter 46 then decelerate the sheet material article together until the sheet material article exits deceleration nip 32, i.e., when a trailing edge of the sheet material articles is no longer in contact with lower decelerator section 34 and upper decelerator section 40.

[0008] After the sheet material article exits deceleration nip 32, trimming station transporter 46 continues to decelerate the sheet material article until the sheet material article comes to a complete stop. Once the sheet material article is stopped, a trimming device 52 trims an edge of the sheet material article. In this embodiment, decelerator 14 and trimming station transporter 46 are driven by a common drive, such that the surface speed of trimming station transporter 46 is always equal to the surface speed of deceleration nip 32. In order to avoid problems for a following sheet material article entering deceleration nip 32 while the surface speed of deceleration nip 32 is lower than the infeed speed (i.e., the surface speed of the following sheet material article), deceleration nip 32 is opened after the sheet material article exits deceleration nip 32 (as shown with respect to book 58 in Fig. 4a). Accordingly, while lower decelerator section 34, upper decelerator section 40, upper transport conveyor 48 and lower transport conveyor 50 are driven to have a lower surface speed than the infeed speed and a following sheet material article has entered into deceleration nip 32, upper decelerator section 40 is actuated to be spaced away from lower decelerator section 34 such that upper decelerator section 40 does not contact the upper side of the following sheet material article and nip 32 is in the open position. Once the sheet material article is trimmed by trimming device 52, lower decelerator section 34, upper decelerator section 40, upper transport conveyor 48 and lower transport conveyor 50 are accelerated such that conveyors 48, 50 accelerate the trimmed sheet material article away from trimming device 52 and sections 34, 40 are accelerated to have a surface speed is again equal to the infeed speed. After the surface speed of deceleration nip 32 reaches the infeed speed, deceleration nip 32 is closed to grip the subsequent sheet material article, by actuating upper decelerator section 40 back toward lower decelerator section 34.

[0009] Fig. 1 shows three sheet material articles 54, 56, 58, which are for example books traveling in a direction 60, at their relative positions when infeed 12 and trimming station transporter 46 (along with decelerator 14) are running at matched speed. First book 54 is shown at infeed register belts 20, 22 with a leading edge spine 54a of book 54 against register pins 24, 26. Second book 56 is shown with its trailing edge 56b in a nip 70 formed by upper forwarding belt 28 and lower forwarding belt 30. Leading edge 56a of book 56 is shown in deceleration

nip 32 being gripped and transported by decelerator sections 34, 40. Third book 58 has already been trimmed by trimming device 52 and is shown between upper trimmer transport belts 62, 64 of upper transport conveyor 48 and lower trimmer transport belts 66, 68 of lower transport conveyor 50 being transported at the infeed speed. A lower knife 72 of trimming device 52, which made a face cut 74 at trailing edge 58b of book 58, is shown at the entrance to trimming station 18, just ahead of trimmer transport belts 62, 64, 66, 68.

[0010] Figs. 2a and 2b illustrate the transfer of book 56 from register belts 20, 22 to forwarding belts 28, 30. In Fig. 2a, pins 24, 26 register leading edge 56a, which in this embodiment is the spine, prior to entering forward belt nip 70. Forwarding belts 28, 30 run at the same speed as pins 24, 26. Once book 56 is under control of forwarding belts 28, 30, pins 24, 26 rotate away from leading edge 56a and travel in a return path 76. (similar to register and control disclosed in Fig. 4 of U.S. Patent 8,186,252).

[0011] Figs. 3a and 3b are cross-sectional views of Fig. 1. Instead of transporting books 54, 56, 58 as in Fig. 3a, trimmer 10 is transporting books 78, 80, 82, which are larger than books 54, 56, 58, in Fig. 3b. Books 78, 80, 82 are a little more than twice the length of books 54, 56, 58. Additionally, an upper knife 84 of trimming device 52, which was omitted from Fig. 1 for clarity, is in its raised position above lower knife 72. Both Figs. 3a and 3b show books at similar points in the transport cycle, when infeed 12 and trimming station transporter 46 (and thus also decelerator 14) are running at matched speed (zone A of Fig. 5). In this embodiment, trailing edge 56b of book 56 in Fig. 3a and trailing edge 80b of book 80 in Fig. 3b will be in the same position relative to front knives 72, 84 at any point in the cycle, regardless of the book length. As shown in Figs. 3a and 3b, longer books may be gripped by all of forwarding belts 28, 30, decelerator section 34, 40 and conveyors 48, 50 at the same time, while shorter books exit forwarding belts 28, 30 before being gripped by conveyors 48, 50. Similarly, in this embodiment, cut edge 58b of book 58 in Fig. 3a and cut edge 82b of book 82 in Fig. 3b will be at the same position (zone D of Fig. 5) relative to front knives 72, 84 at any point in the cycle, as well.

[0012] Figs. 4a and 4b are cross section views similar to Figs. 3a and 3b, but show books 54, 56, 58 and books 78, 80, 82, respectively, at an earlier point in the transport cycle. The face cut on trailing edges 58b, 82b have just been completed and books 58, 82 have started to move away from knives 72, 84 (zone D of Fig. 5). Upper knife 84 is starting to rise and transport conveyors 48, 50 have started to accelerate books 58, 82 from stationary state (zero speed), which existed when the front cut was made by trimming device 52. Books 54, 56 in Fig. 4a and books 78, 80 in Fig. 4b are traveling at a constant infeed speed (zone A of Fig. 5). Because fixed position lower deceleration rollers 36, 38 and actuating deceleration upper belts 42, 44 are running at the transport speed of trimming station 18, deceleration nip 32 is opened by raising belts

42, 44 to allow book 80, which is traveling at a faster speed than a surface speed of belts 42, 44, to pass through nip 32.

[0013] Fig. 5 shows a graph illustrating the speed E of a book during one cycle. In a zone A, the book is in forwarding belts 28, 30 and travels at an infeed speed F. Deceleration nip 32 begins gripping the book in zone A, when a surface speed of nip 32 matches the infeed speed F. In a zone B, the book is in deceleration nip 32 initially and is transferred at match speed to trimmer transport belts 62, 64, 66, 68 while being decelerated to zero speed. The book is released by deceleration nip 32 in zone B before the book reaches zero speed. In a zone C, the book is stopped and trimming by trimming device 52 occurs. In a zone D, the book is still captured by trimmer transport belts 62, 64, 66, 68 and accelerated back to infeed speed F. When the book is in forwarding belts 28, 30, its speed matches the infeed speed F, which is constant. After the book exits the forwarding belts 28, 30, it is decelerated to zero speed in zone B. When at zero speed in zone C, a trailing edge of the book is cut by trimming device 52. When the cut is completed the book is accelerated D back up to the infeed speed F.

[0014] Fig. 6 shows drive components 86 of lower deceleration rollers 36, 38 and upper deceleration belts 42, 44. Also shown is a cam arrangement 88, which together with actuator 92 (Figs. 7 and 8) actuates upper deceleration belts 42, 44. Deceleration rollers 36, 38 and belts 42, 44 are driven by a common belt 90. This drive is connected to the same motor that drives the trimmer transport belts 62, 64, 66, 68, resulting in a speed match between trimmer transport belts 62, 64, 66, 68 and deceleration rollers 36, 38 and belts 42, 44. Upper decelerator section actuators 92, 94 and lower deceleration rollers 36, 38 are connected by mounting structures 96, 98. Drive shafts 100, 102 are splined so that upper decelerator section actuators 92, 94 and lower deceleration rollers 36, 38 can be moved in and out to accommodate different book widths. Upper drive shaft 102 passes through the upper belt pivot. This allows upper belts 42, 44 to rotate around the centerline of upper drive shaft 102 to open and close deceleration nip 32.

[0015] A cam 104 is driven by a chain 106 connected to the mechanism that also raises and lowers upper knife 84. Cam 104 rotates once per cycle just as upper knife 84 moves up and down once per cycle to cut each book. A cam follower bearing 108 rotates on cam 98 and is mounted to a lever 110, pivoting on a stud 112. Lever 110 is loaded against cam 104 by a spring 114. A connecting rod 116 connects cam lever 110 to a drive lever 118 mounted on the end of a belt actuating shaft 120. Belt actuating shaft 120 is also splined to allow adjustment of upper decelerator section actuators 92, 94 for different book width.

[0016] Fig. 7 shows a cross-section view of upper decelerator section actuator 92 and Fig. 8 shows a detailed view of upper decelerator section actuator 92 in an open position. Upper deceleration section actuator 92 moves

upper decelerator section 40 away from lower decelerator section 34 to open and close nip 32. Belt actuating shaft 120 pivots a splined sleeve 122 mounted in a housing 124. Connected to sleeve 122 is a lift lever 126. Lift lever 126 is connected to a deceleration belt lever 128 with a compression spring 130 and spring cups 132, 134. Deceleration belt lever 128 is mounted to a sleeve 136 which also pivots in housing 124. The arrangement of the levers 126, 128 results in a four bar mechanism. Spring 130 is a flexible connection between levers 126, 128, allowing deceleration nip 32 to self adjust for varying book thickness.

[0017] A timing belt pulley 138 is mounted on a splined bore sleeve 140 that is connected to deceleration belt lever 128 and sleeve 136 by a bearing 142 which allows deceleration belt lever 128 to pivot up and down while timing belt pulley 138 spins upper deceleration belt 42. Splined bore sleeve 140 is driven by splined upper drive shaft 102. Upper deceleration belt 42 wraps an idler pulley 144 mounted on bearings 146 to the end of deceleration belt lever 128. Upper deceleration belt 42 is positioned directly above lower deceleration roller 36 and deceleration nip 32 is created between belt 42 and roller 36 as deceleration belt lever 128 and belt 42 pivot downward.

[0018] Fig. 9 shows a deceleration nip 148 in accordance with another embodiment of the present invention. In contrast to deceleration nip 32, where upper deceleration belts 42, 44 form deceleration nip 32 with lower deceleration rollers 36, 38, deceleration nip 148 is formed by lower deceleration rollers 36, 38 and upper deceleration rollers 150, 151, which are mounted adjacent to respective upper deceleration belts 42, 44 and are driven by respective upper deceleration belts 42, 44.

[0019] Fig. 10 shows a deceleration nip 152 in accordance with another embodiment of the present invention. In contrast to deceleration nip 32, upper deceleration belts 42, 44 have been replaced by undriven idler rolls 154, 155, mounted to and actuated by levers 156, 157. Lever 156 is actuated by upper decelerator section actuators 92, 94 forming the previously described four bar mechanism. In another embodiment, upper decelerator section actuators 92, 94 may be eliminated and lever 156 may be actuated directly with an actuating shaft passing through a pivot center 158.

[0020] Fig. 11 shows a deceleration nip 160 in accordance with another embodiment of the present invention. In this embodiment, width-adjustable lower deceleration rolls 36, 38 have been replaced by a driven full width roll assembly 162.

[0021] Fig. 12 shows a deceleration nip 164 in accordance with another embodiment of the present invention. In this embodiment, upper deceleration belts 42, 44 have been replaced by a driven full width roll assembly 166, which forms deceleration nip 164 with driven full width roll assembly 162. Full width roll assembly 166 is driven by gears 168, connected to a belt 170 and is actuated by a cam mechanism 172.

[0022] Fig. 13 shows a deceleration nip 174 in accordance with another embodiment of the present invention. In this embodiment, upper deceleration belts 42, 44 have been replaced by axially-adjustable upper wheels 176, 177 which forms deceleration nip 174 with driven full width roll assembly 162.

[0023] Figs. 14a and 14b show a decelerator 178 according to another embodiment of the present invention. In this embodiment, a non-reciprocating segmented wheel 178 is provided for opening and closing a deceleration nip 180 formed by wheel 178 and a roller 182. Wheel 178 includes an outer circumferential surface of two different radial heights. A larger circumferential surface 184 having a greater radial height decreases the size of nip 180 and contacts a book 188 and a smaller circumferential surface 186 having a lesser radial height than larger circumferential surface 184 opens up nip 180 such that wheel 178 does not contact book 188 when the surface speed of wheel 178 (and the surface speed of trimmer station transporter 46) is less than the infeed speed. Wheel 178 and roller 182 may be connected to the same drive as trimmer station transport 46 so that the surface speed of larger circumferential surface 184 is equal to the surface speed of trimmer station transporter 46. Fig. 14a shows a book 188 traveling at infeed speed while wheel 178 has a surface speed less than the infeed speed. In Fig. 14b, book 188 has been transferred at matched speed from forwarding belts 28, 30 to wheel 178 and a roller 182 and deceleration nip 180 begins to decelerate book 188.

[0024] In the preceding specification, the invention has been described with reference to specific exemplary embodiments and examples thereof. It will, however, be evident that various modifications and changes may be made thereto without departing from the scope of invention as set forth in the claims that follow. The specification and drawings are accordingly to be regarded in an illustrative manner rather than a restrictive sense.

Claims

1. A trimmer (10) comprising:

an infeed (12) for transporting a sheet material article (54, 56, 58) at a first speed;
a trimming station transporter (46) for decelerating the sheet material article for trimming it by a trimming device (52); and
a decelerator (14) between the infeed (12) and the trimming station transporter (46), the decelerator (14) forming a deceleration nip (32) for transferring the sheet material article from the infeed (12) to the trimming station transporter (46), wherein the deceleration nip (32) receives the sheet material article from the infeed (12) at the first speed and decelerates the sheet material article with the trimming station transporter

(46), wherein the decelerator (14) includes a first decelerator section (40) contacting a first side of the sheet material article and a second decelerator section (34) contacting a second side of the sheet material article,

characterized in that

the first decelerator section (40) is movable away from the second decelerator section (34) such that the first decelerator section (40) does not contact the first side of the sheet material article, and **in that**

the decelerator (14) includes an actuator (92, 94) moving the first decelerator section (40) away from the second decelerator section after the sheet material article is released from the decelerator nip (32).

2. The trimmer (10) as recited in claim 1, wherein the first decelerator section (40) includes at least one belt (42, 44) or at least one roller (154, 155, 166, 176, 177) contacting the first side of the sheet material article.
3. The trimmer (10) as recited in any one of claims 1 or 2, wherein the infeed (12) includes a pair of forwarding belts (28, 30) for releasing the sheet material article to the decelerator (14).
4. The trimmer (10) as recited in any one of claims 1 to 3, wherein the trimming station transporter (46) includes a first transport conveyor (48) for contacting a first side of the sheet material article and a second transport conveyor (50) for contacting a second side of the sheet material article, the first transport conveyor (48) and the second transport conveyor (50) decelerating the sheet material article for trimming.
5. The trimmer (10) as recited in any one of claims 1 to 4, wherein the decelerator (14) contacts both sides of the sheet material article before the sheet material article is released from the infeed (12) and contacts both sides of the sheet material article after the sheet material article has been received by the trimming station transporter (46).
6. The trimmer (10) as recited in claim 5, wherein a surface speed of the decelerator (14) is equal to a surface speed of the infeed (12) while both the decelerator (14) and the infeed (12) contact the sheet material article and the surface speed of the decelerator (14) is equal to a surface speed of the trimming station transporter (46) while both the decelerator (14) and the trimming station transporter (46) contact the sheet material article.
7. The trimmer (10) as recited in claim 1 wherein the first decelerator section (40) includes an upper deceleration belt (42, 44), and the second decelerator

section (34) includes a lower deceleration roller (36, 38).

8. A method of operating a trimmer (10) comprising:

transporting a sheet material article (54, 56, 58; 78, 82) at an infeed (12) at a first speed; receiving the sheet material article from the infeed (12) at a deceleration nip (32), a surface speed of the deceleration nip (32) being equal to the first speed as the deceleration nip (32) receives the sheet material article from the infeed (12); and

decelerating the sheet material using the deceleration nip (32, 164, 174, 180) and passing the sheet material article to a trimming station transporter (46),

the method further comprising receiving the sheet material article from the deceleration nip (32) at the trimming station transporter (46), the trimming station transporter (46) including a first transport conveyor (48) for contacting a first side of the sheet material article and a second transport conveyor (50) for contacting a second side of the sheet material article,

the deceleration nip (32) being formed by a first decelerator section (40) contacting the first side of the sheet material article and a second decelerator section (34) contacting the second side of the sheet material article,

the first decelerator section (40) and the second decelerator section (34) transporting the sheet material article together with the first transport conveyor (48) and second transporter conveyor (50) after the infeed (12) releases the sheet material article,

characterized in that

a surface speed of the trimming station transporter (46) is equal to the surface speed of the deceleration nip (32) as the trimming station transporter (46) receives the sheet material article from the deceleration nip (32), and **in that** the receiving the sheet material article from the infeed (12) at a deceleration nip (32) includes moving the first decelerator section (40) toward the second decelerator section (34) to contact the first side of the sheet material article.

9. The method as recited in claim 8, wherein a surface speed of the deceleration nip (32) is varied during sequential cycles, each cycle including accelerating the deceleration nip (32) to match the first speed of the infeed (12) and decelerating the deceleration nip (32) to slow down a corresponding sheet material article for trimming.

10. The method as recited in claim 9, wherein the surface speed of the trimming station transporter (46) is

equal to the surface speed of the deceleration nip (32) throughout each cycle.

5 **Patentansprüche**

1. Schneidegerät (10), umfassend:

eine Zufuhr (12) zur Beförderung eines Artikels (54, 56, 58) aus Plattenmaterial bei einer ersten Geschwindigkeit,

einen Förderer (46) der Schneidstation zur Verzögerung des Artikels, um diesen mit einer Schneidvorrichtung (52) zu schneiden, und

einen Verzögerer (14) zwischen der Zufuhr (12) und dem Förderer (46), wobei der Verzögerer (14) einen Verzögerungsspalt (32) bildet, um

den Artikel von der Zufuhr (12) zum Förderer (46) zu befördern, wobei der Spalt (32) den Artikel von der Zufuhr (12) bei der ersten Geschwindigkeit empfängt und den Artikel mit dem

Förderer (46) verzögert, wobei der Verzögerer (14) einen ersten Verzögererabschnitt (40), der eine erste Seite des Artikels kontaktiert, und einen

zweiten Verzögererabschnitt (34), der eine zweite Seite des Artikels kontaktiert, umfasst

dadurch gekennzeichnet, dass

der erste Verzögererabschnitt (40) weg vom zweiten Verzögererabschnitt (34) bewegt werden kann, sodass der erste Abschnitt (40) die erste Seite des Artikels nicht kontaktiert, und dass

der Verzögerer (14) einen Aktuator (92, 94) umfasst, der den ersten Abschnitt (40) weg vom zweiten Verzögererabschnitt bewegt, nachdem der Artikel aus dem Spalt (32) freigegeben wird.

2. Schneidgerät (10) nach Anspruch 1, wobei der erste Abschnitt (40) mindestens einen Riemen (42, 44) oder mindestens eine Walze (154, 155, 166, 176, 177), die die erste Seite des Artikels kontaktieren.

3. Schneidgerät (10) nach einem der Ansprüche 1 oder 2, wobei die Zufuhr (12) ein Paar Förderriemen (28, 30) zur Freigabe des Artikels an den Verzögerer (14) umfasst.

4. Schneidgerät (10) nach einem der Ansprüche 1 - 3, wobei der Förderer (46) umfasst: ein erstes Transportband (48), um eine erste Seite des Artikels zu kontaktieren, und ein zweites Transportband (50), um eine zweite Seite des Artikels zu kontaktieren, wobei das erste Transportband (48) und das zweite Transportband (50) den Artikel verzögern, damit dieser geschnitten werden kann.

5. Schneidgerät (10) nach einem der Ansprüche 1 - 4, wobei der Verzögerer (14) beide Seiten des Artikels

kontaktiert, bevor der Artikel aus der Zufuhr (12) freigegeben wird, und beide Seiten des Artikels kontaktiert, nachdem der Artikel vom Förderer (46) empfangen worden ist.

6. Schneidgerät (10) nach Anspruch 5, wobei eine Oberflächengeschwindigkeit des Verzögerers (14) gleich einer Oberflächengeschwindigkeit der Zufuhr (12) ist, während sowohl der Verzögerer (14) als auch die Zufuhr den Artikel kontaktieren, und die Oberflächengeschwindigkeit des Verzögerers (14) gleich einer Oberflächengeschwindigkeit des Förderers (46) ist, während der Verzögerer (14) und der Förderer (46) beide den Artikel kontaktieren.
7. Schneidgerät (10) nach Anspruch 1, wobei der erste Abschnitt (40) einen oberen Verzögerungsriemen (42, 422) umfasst und der zweite Abschnitt (34) eine untere Verzögerungswalze (36, 38) umfasst.
8. Verfahren zur Bedienung eines Schneidgeräts (10), umfassend:

Befördern eines Artikels (54, 56, 58; 78,82) aus Plattenmaterial auf einer Zufuhr (12) bei einer ersten Geschwindigkeit, Empfangen des Artikels von der Zufuhr (12) an einem Verzögerungsspalt (32), wobei eine Oberflächengeschwindigkeit des Spalts (32) gleich der ersten Geschwindigkeit ist, während der Spalt (32) den Artikel von der Zufuhr (12) empfängt, und Verzögern des Plattenmaterials mithilfe des Verzögerungsspalts (32, 164, 174, 180) und Übergeben des Artikels an einen Förderer (46) der Schneidstation, wobei das Verfahren ferner umfasst: Empfangen des Artikels vom Spalt (32) am Förderer (46), wobei der Förderer (46) umfasst: ein erstes Transportband (48), um eine erste Seite des Artikels zu kontaktieren, und ein zweites Transportband (50), um eine zweite Seite des Artikels zu kontaktieren, wobei der Spalt (32) ausgebildet wird von einem ersten Verzögererabschnitt (40), der die erste Seite des Artikels kontaktiert, und einem zweiten Verzögererabschnitt (34), der die zweite Seite des Artikels kontaktiert, wobei der erste Abschnitt (40) und der zweite Abschnitt (34) den Artikel zusammen mit dem ersten Transportband (48) und dem zweiten Transportband (50) befördern, nachdem die Zufuhr (12) den Artikel freigibt, **dadurch gekennzeichnet, dass** eine Oberflächengeschwindigkeit des Förderers (46) gleich der Oberflächengeschwindigkeit des Spalts (32) ist, während der Förderer (46)

den Artikel vom Spalt (32) empfängt, und dass das Empfangen des Artikels von der Zufuhr (12) an einem Spalt (32) umfasst: Zubewegen des ersten Abschnitts (40) auf den zweiten Abschnitt (34), um die erste Seite des Artikels zu kontaktieren.

9. Verfahren nach Anspruch 8, wobei eine Oberflächengeschwindigkeit des Spalts (32) bei sequentiellen Zyklen variiert wird, wobei jeder Zyklus umfasst: Beschleunigen des Spalts (32) auf die erste Geschwindigkeit der Zufuhr (12) und Verzögern des Spalts (32), um einen entsprechenden Artikel zwecks Schneiden zu verlangsamen.
10. Verfahren nach Anspruch 9, wobei die Oberflächengeschwindigkeit des Förderers (46) während jedes Zyklus gleich der Oberflächengeschwindigkeit des Spalts (32) ist.

Revendications

1. Taille-bordure (10) comprenant :

une alimentation (12) pour le transport d'un article en matériau en feuille (54, 56, 58) à une première vitesse ;
un transporteur de station de taillage de bordures (46) pour la décélération de l'article en matériau en feuille pour de la taillage de la bordure de celui-ci par un dispositif de taillage de bordure (52) ; et
un décélérateur (14) entre l'alimentation (12) et le transporteur de station de taillage de bordures (46), le décélérateur (14) formant un pincement de décélération (32) pour le transfert de l'article en matériau en feuille de l'alimentation (12) vers le transporteur de station de taillage de bordures (46), le pincement de décélération (32) recevant l'article en matériau en feuille provenant de l'alimentation (12) à la première vitesse et décélérant l'article en matériau en feuille avec le transporteur de station de taillage de bordures (46), le décélérateur (14) comprenant une première section de décélérateur (40) entrant en contact avec un premier côté de l'article en matériau en feuille et une deuxième section de décélérateur (34) entrant en contact avec un deuxième côté de l'article en matériau en feuille,

caractérisé en ce que

la première section de décélérateur (40) peut être éloignée de la deuxième section de décélérateur (34) de façon à ce que la première section de décélérateur (40) n'entre pas en contact avec le premier côté de l'article en matériau en feuille et **en ce que** le décélérateur (14) comprend un actionneur

- (92, 94) éloignant la première section de décélérateur (40) de la deuxième section de décélérateur une fois l'article en matériau en feuille détaché du pincement du décélérateur (32).
2. Taille-bordure (10) selon la revendication 1, dans lequel la première section de décélérateur (40) comprend au moins une courroie (42, 44) ou au moins un galet (154, 155, 166, 176, 177) entrant en contact avec le premier côté de l'article en matériau en feuille. 5 10
 3. Taille-bordure (10) selon l'une des revendications 1 ou 2, dans lequel l'alimentation (12) comprend une paire de courroies de renvoi (28, 30) pour transférer l'article en matériau en feuille vers le décélérateur (14). 15
 4. Taille-bordure (10) selon l'une des revendications 1 à 3, dans lequel le transporteur de station de taillage de bordures (46) comprend un premier convoyeur de transport (48) pour le contact avec un premier côté de l'article en matériau en feuille et un deuxième convoyeur de transport (50) pour le contact avec un deuxième côté de l'article en matériau en feuille, le premier convoyeur de transport (48) et le deuxième convoyeur de transport (50) décélérant l'article en matériau en feuille pour le taillage des bordures. 20 25
 5. Taille-bordure (10) selon l'une des revendications 1 à 4, dans lequel le décélérateur (14) entre en contact avec les deux côtés de l'article en matériau en feuille avant que l'article en matériau en feuille soit libéré de l'alimentation (12) et entre en contact avec les deux côtés de l'article en matériau en feuille une fois l'article en matériau en feuille reçu par le transporteur de station de taillage de bordures (46). 30 35
 6. Taille-bordure (10) selon la revendication 5, dans lequel une vitesse de surface du décélérateur (14) est égale à une vitesse de surface de l'alimentation (12) tandis que le décélérateur (14) et l'alimentation entrent en contact avec l'article en matériau en feuille et la vitesse de surface du décélérateur (14) est égale à une vitesse de surface du transporteur de station de taillage de bordures (46) tandis que le décélérateur (14) et le transporteur de station de taillage de bordures (46) entrent en contact avec l'article en matériau en feuille. 40 45
 7. Taille-bordure (10) selon la revendication 1, dans lequel la première section de décélérateur (40) comprend une courroie de décélération supérieure (42, 44) et la deuxième section de décélérateur (34) comprend un galet de décélération inférieure (36, 38). 50 55
 8. Procédé de fonctionnement d'un taille-bordure (10) comprenant :

le transport d'un article en matériau en feuille (54, 56, 58, 78, 82) au niveau d'une alimentation (12) à une première vitesse ;
la réception de l'article en matériau en feuille de l'alimentation (12) au niveau d'un pincement de décélération (32), une vitesse de surface du pincement de décélération (32) étant égale à la première vitesse lorsque le pincement de décélération (32) reçoit l'article en matériau en feuille provenant de l'alimentation (12) ; et
la décélération du matériau en feuille à l'aide du pincement de décélération (32, 164, 174, 180) et le passage de l'article en matériau en feuille vers un transporteur de section de taillage de bordure (46),
ce procédé comprenant en outre la réception de l'article en matériau en feuille provenant du pincement de décélération (32) au niveau du transporteur de section de taillage de bordure (46), le transporteur de section de taillage de bordure (46) comprenant un premier convoyeur de transport (48) pour le contact avec un premier côté de l'article en matériau en feuille et un deuxième convoyeur de transport (50) pour le contact d'un deuxième côté de l'article en matériau en feuille,
le pincement de décélération (32) étant constitué d'une première section de décélérateur (40) entrant en contact avec le premier côté de l'article en matériau en feuille et d'une deuxième section de décélérateur (34) entrant en contact avec le deuxième côté de l'article en matériau en feuille,
la première section de décélérateur (40) et la deuxième section de décélérateur (34) transportant l'article en matériau en feuille conjointement avec le premier convoyeur de transport (48) et le deuxième convoyeur de transport (50) après que l'alimentation (12) a libéré l'article en matériau en feuille,
caractérisé en ce que
une vitesse de surface du transporteur de station de taillage de bordure (46) est égale à la vitesse de surface du pincement de décélération (32) lorsque le transporteur de station de taillage de bordure (46) reçoit l'article en matériau en feuille provenant du pincement de décélération (32) et **en ce que**
la réception de l'article en matériau en feuille provenant de l'alimentation (12) au niveau d'un pincement de décélération (32) comprend le déplacement de la première section de décélérateur (40) vers la deuxième section de décélérateur (34) afin d'entrer en contact avec le premier côté de l'article en matériau en feuille.

9. Procédé selon la revendication 8, dans lequel une vitesse de surface du pincement de décélération (32)

varie pendant des cycles séquentiels, chaque cycle comprenant l'accélération du pincement de décélération (32) afin d'atteindre la première vitesse de l'alimentation (12) et la décélération du pincement de décélération (32) afin de ralentir un article en matériau en feuille correspondant pour le taillage des bordures.

10. Procédé selon la revendication 9, dans lequel la vitesse de surface du transporteur de station de taillage de bordure (46) est égale à la vitesse de surface du pincement décélération (32) pendant chaque cycle.

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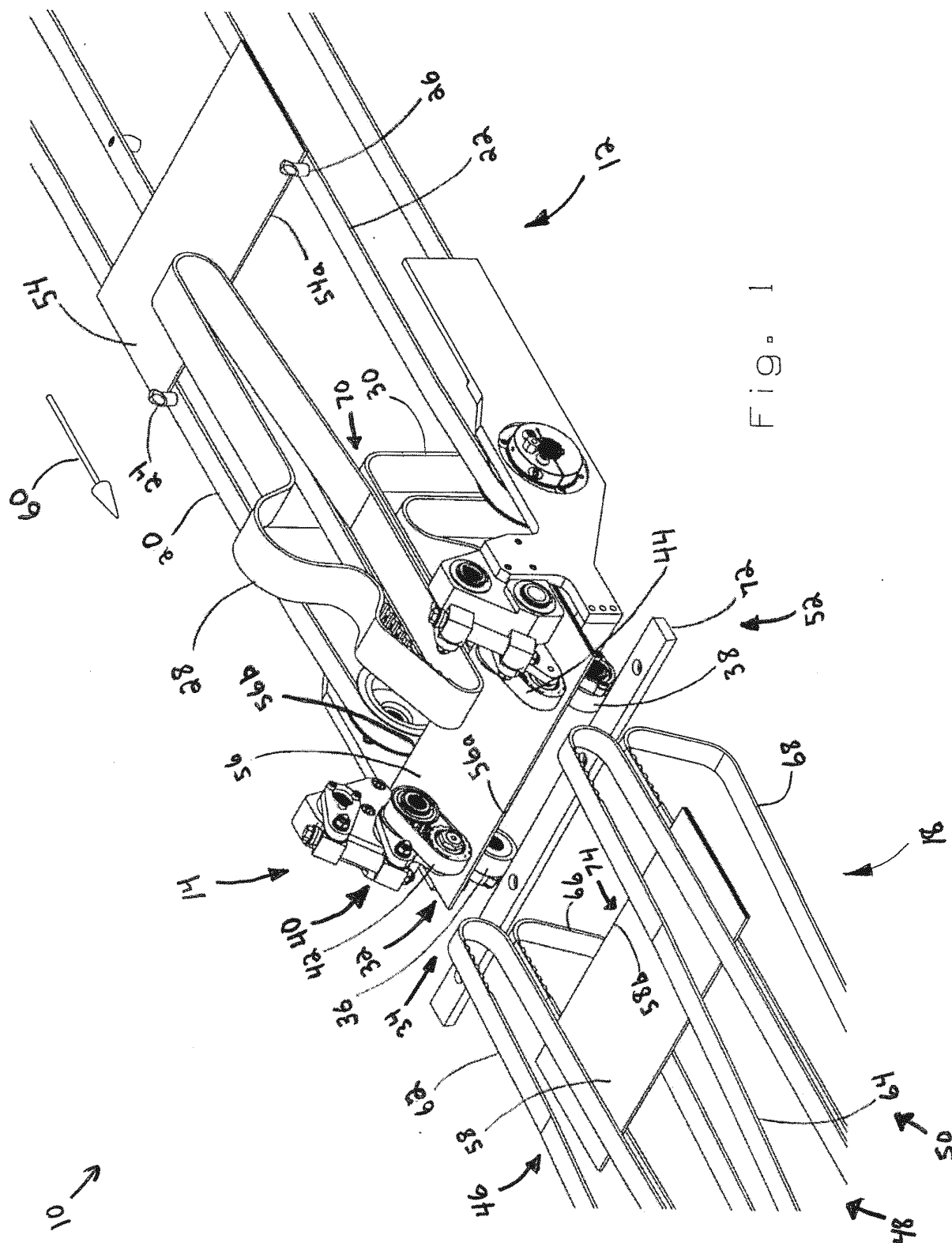
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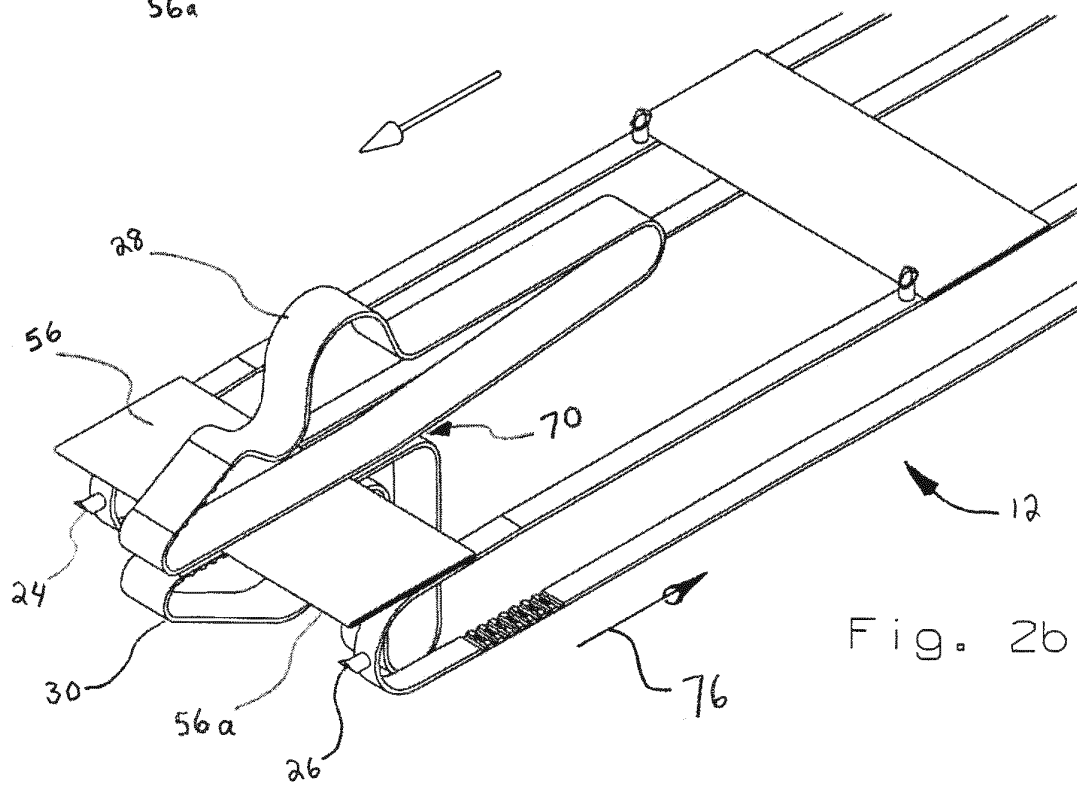
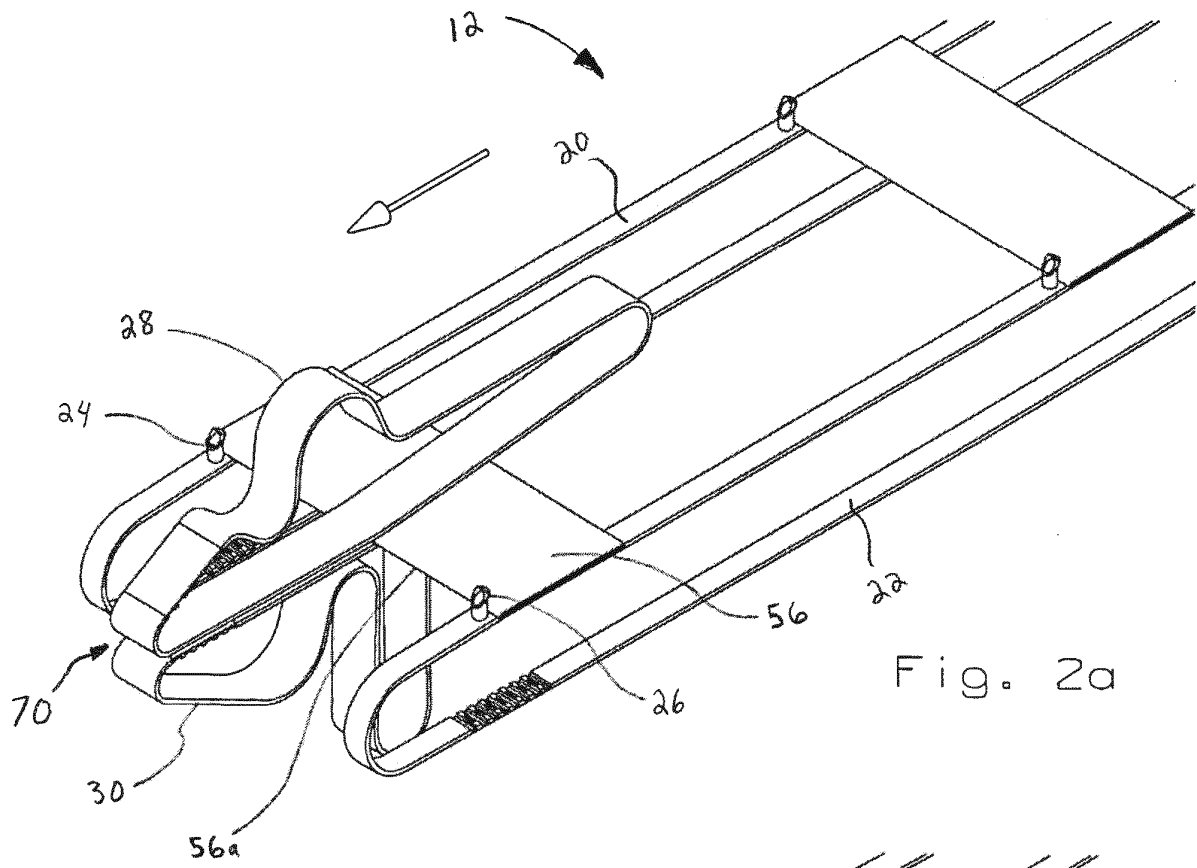
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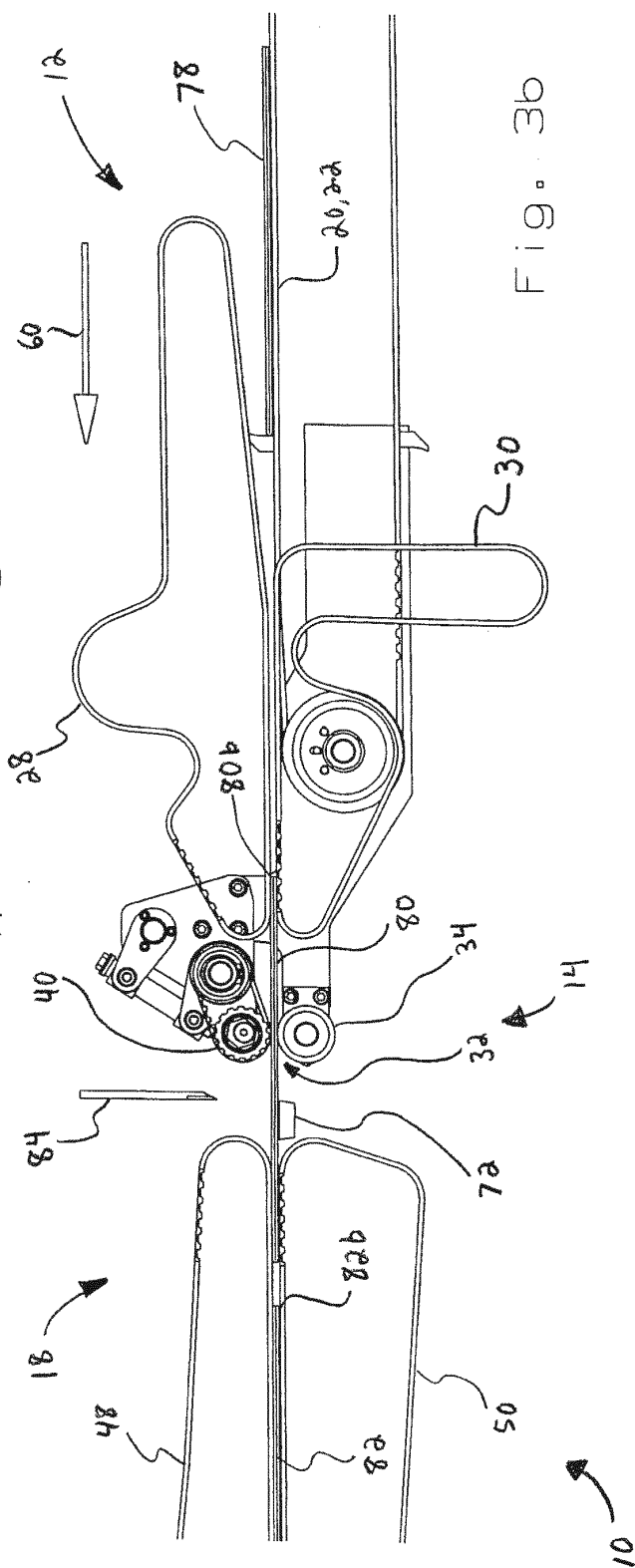
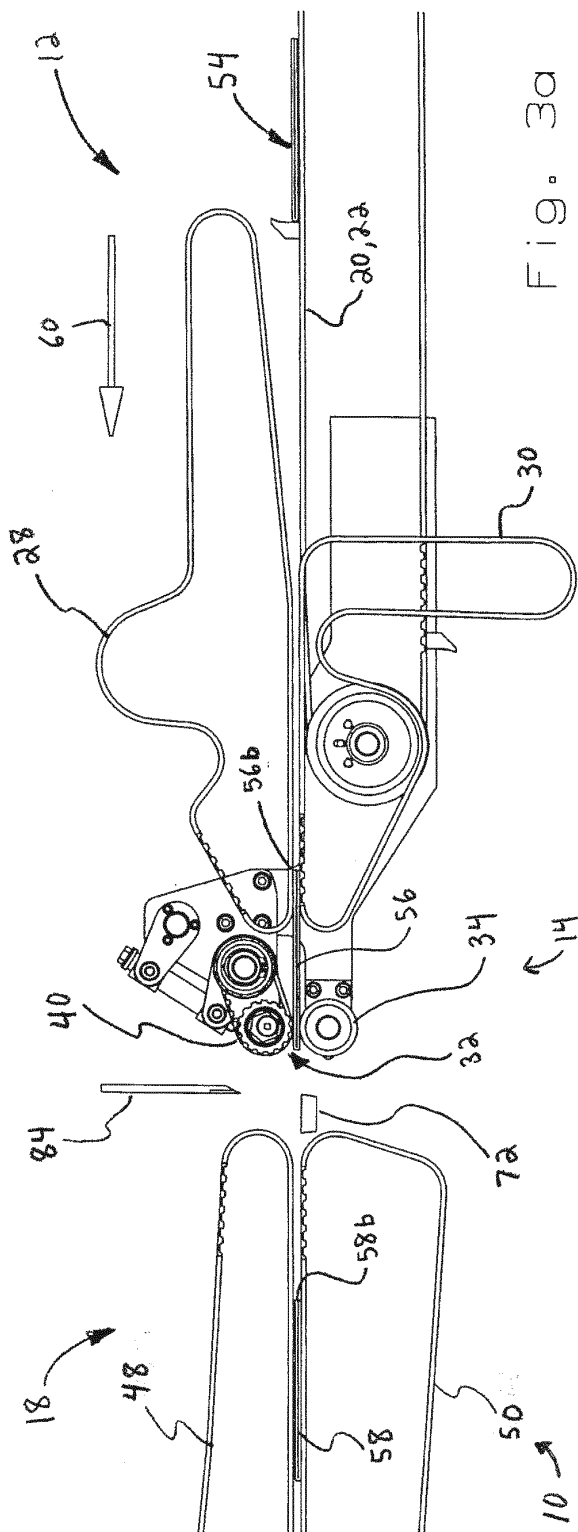
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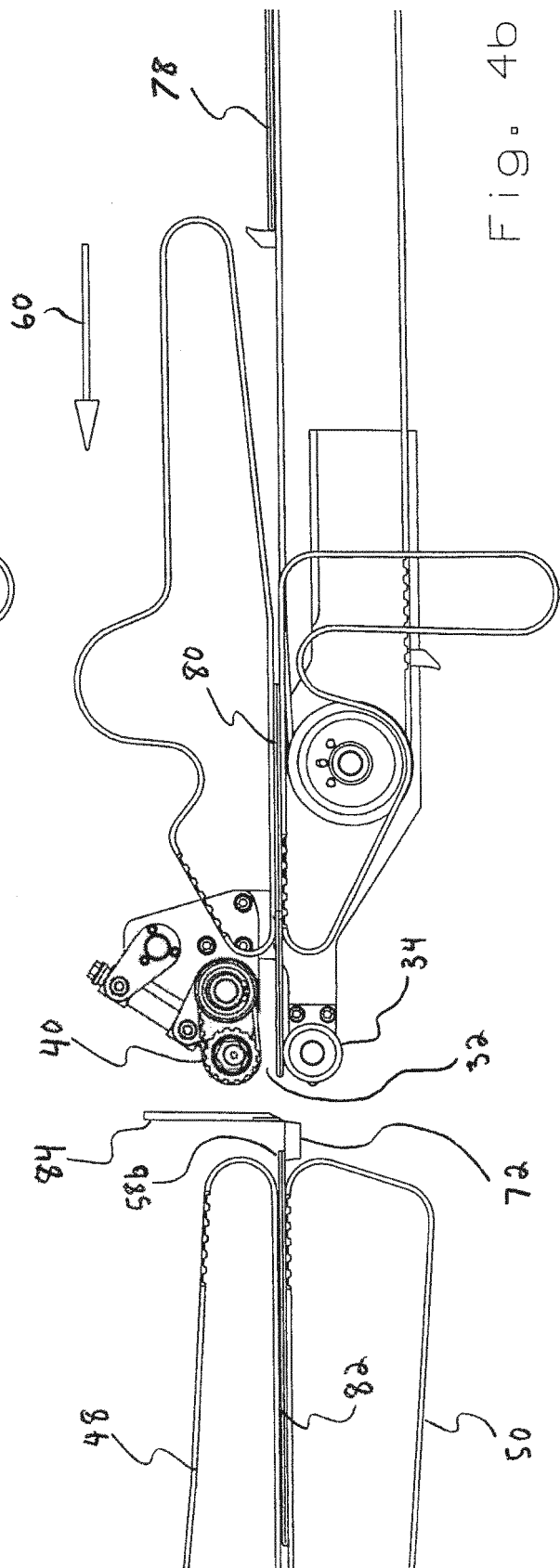
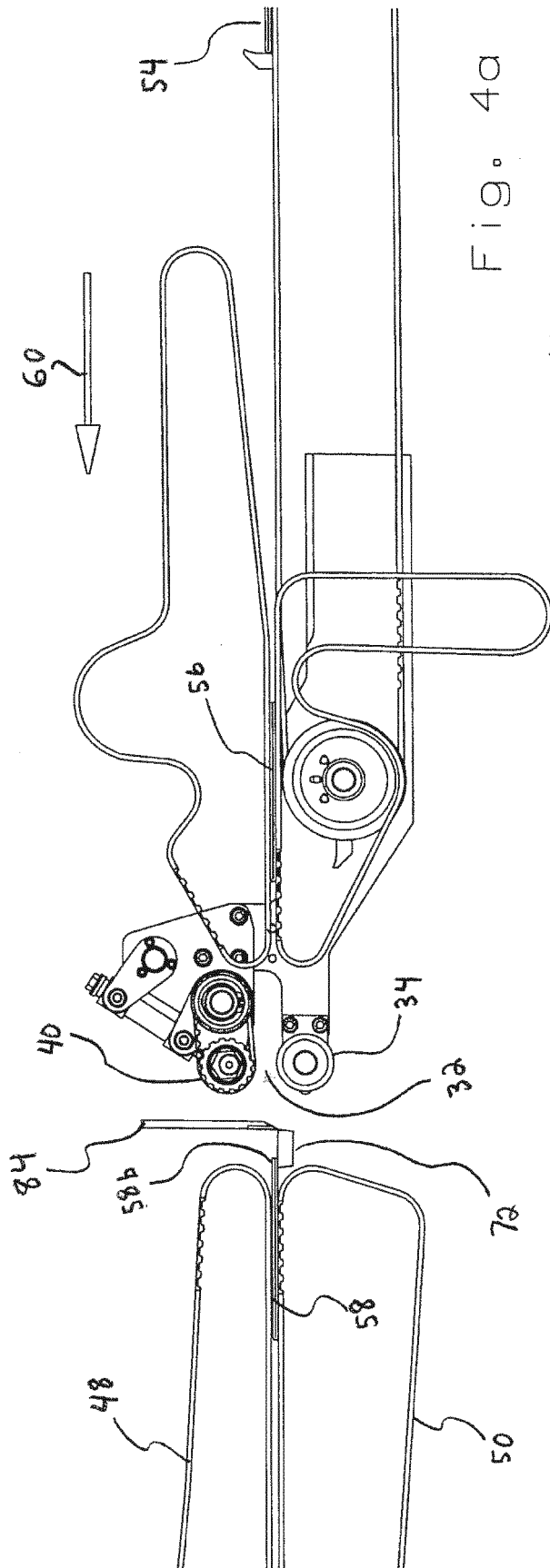
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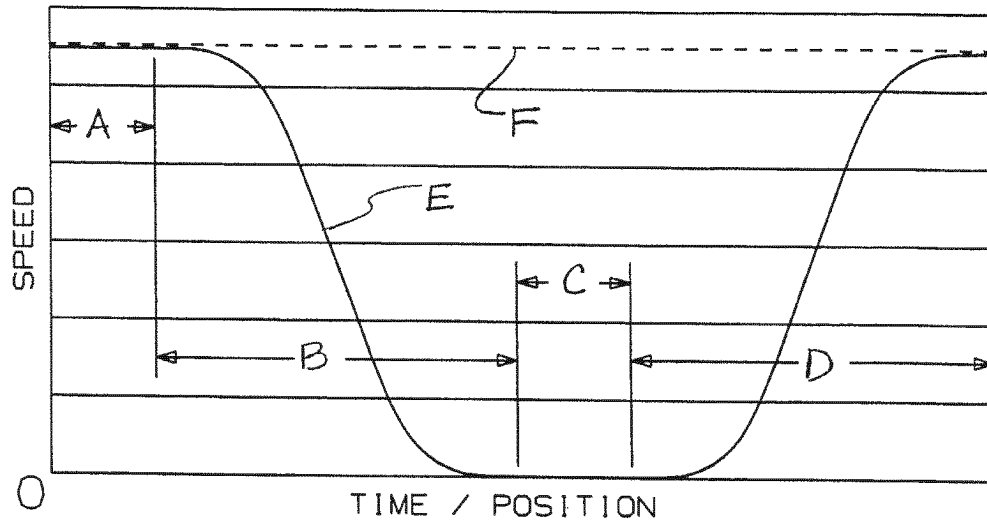


Fig. 5

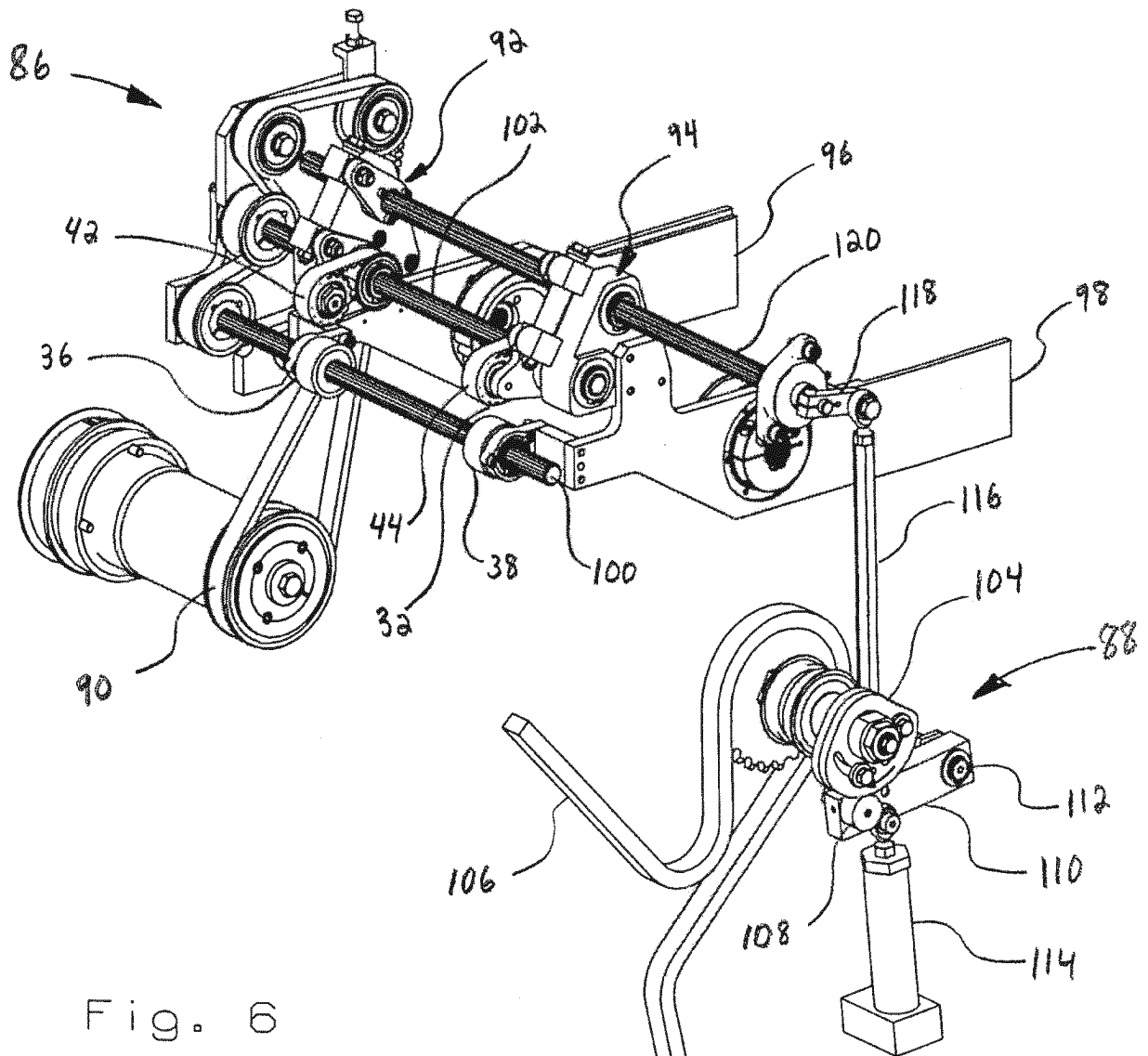
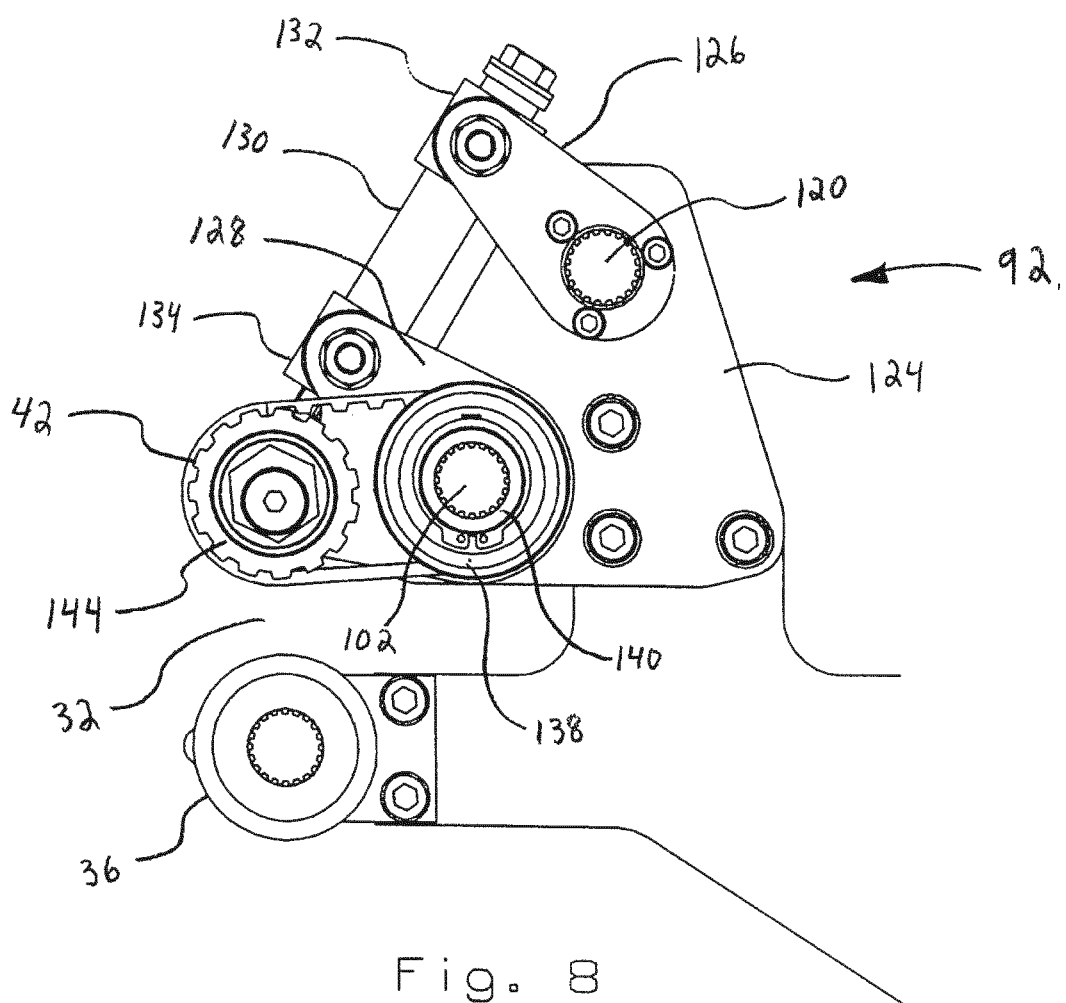
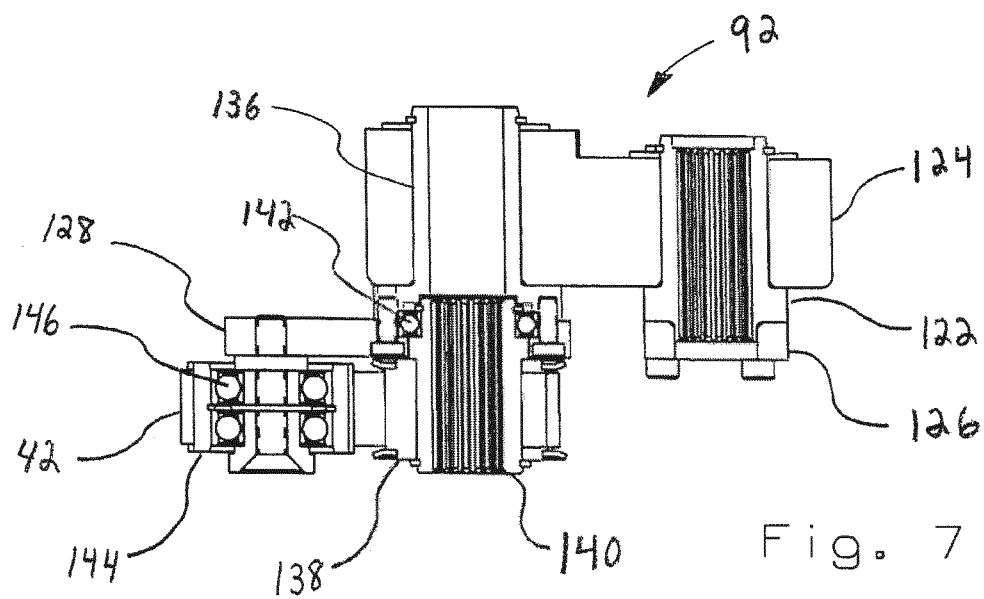


Fig. 6



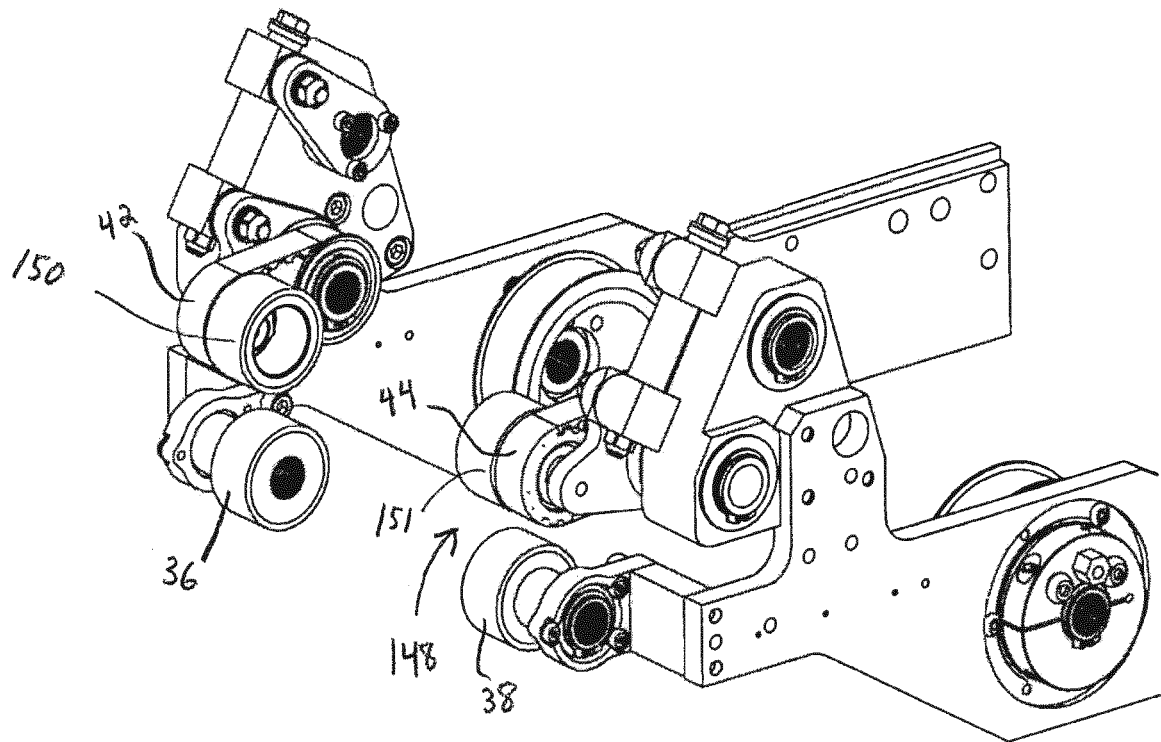


Fig. 9

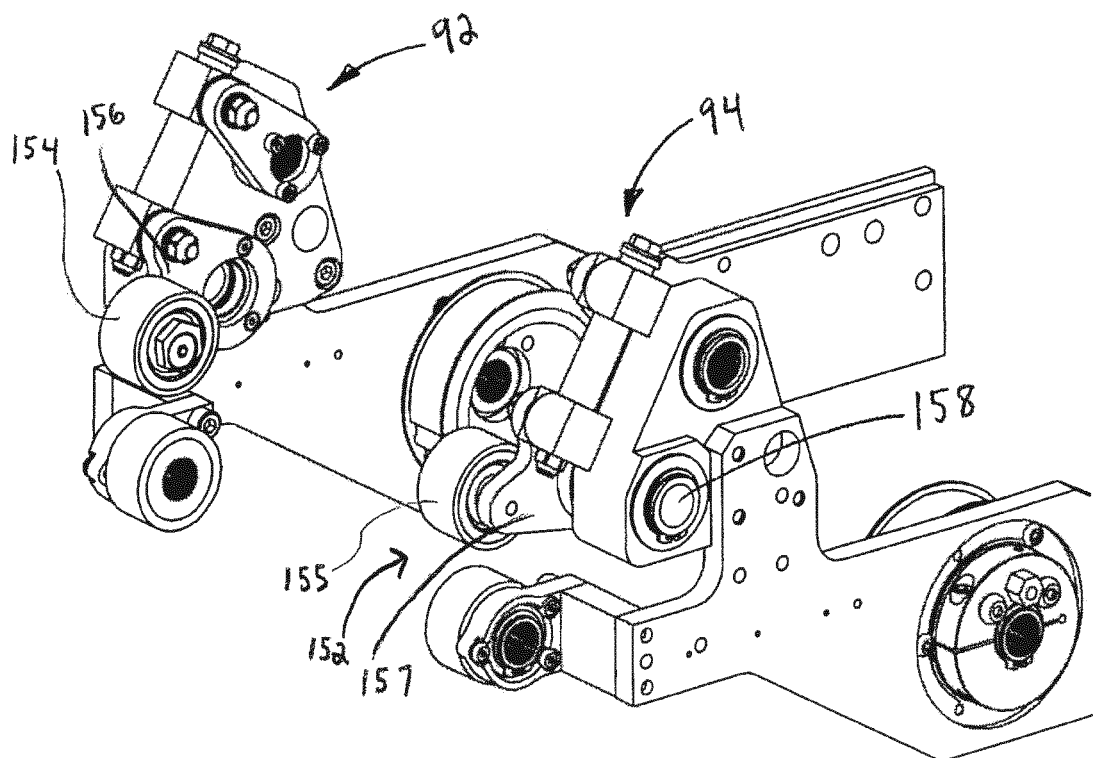


Fig. 10

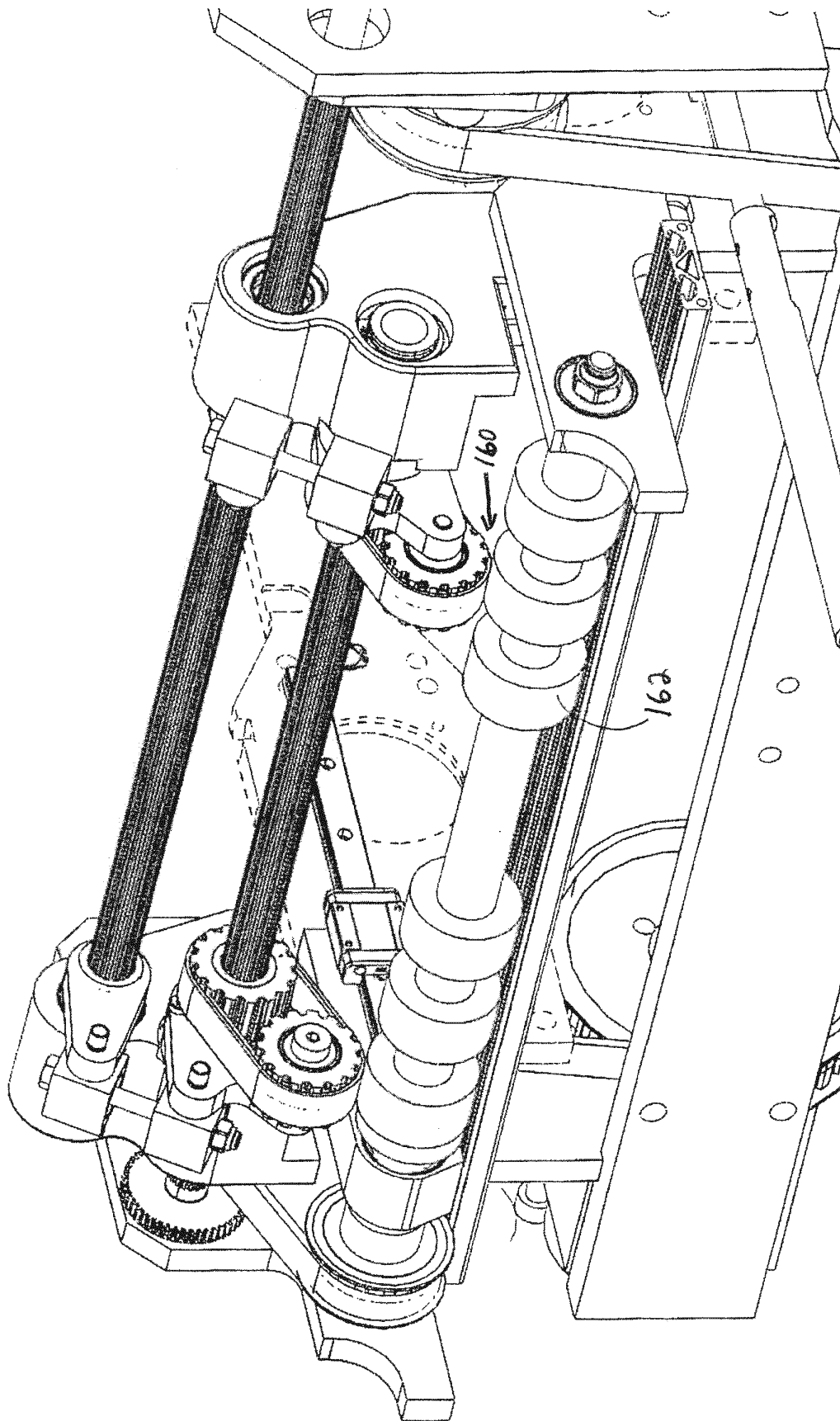


Fig. 11

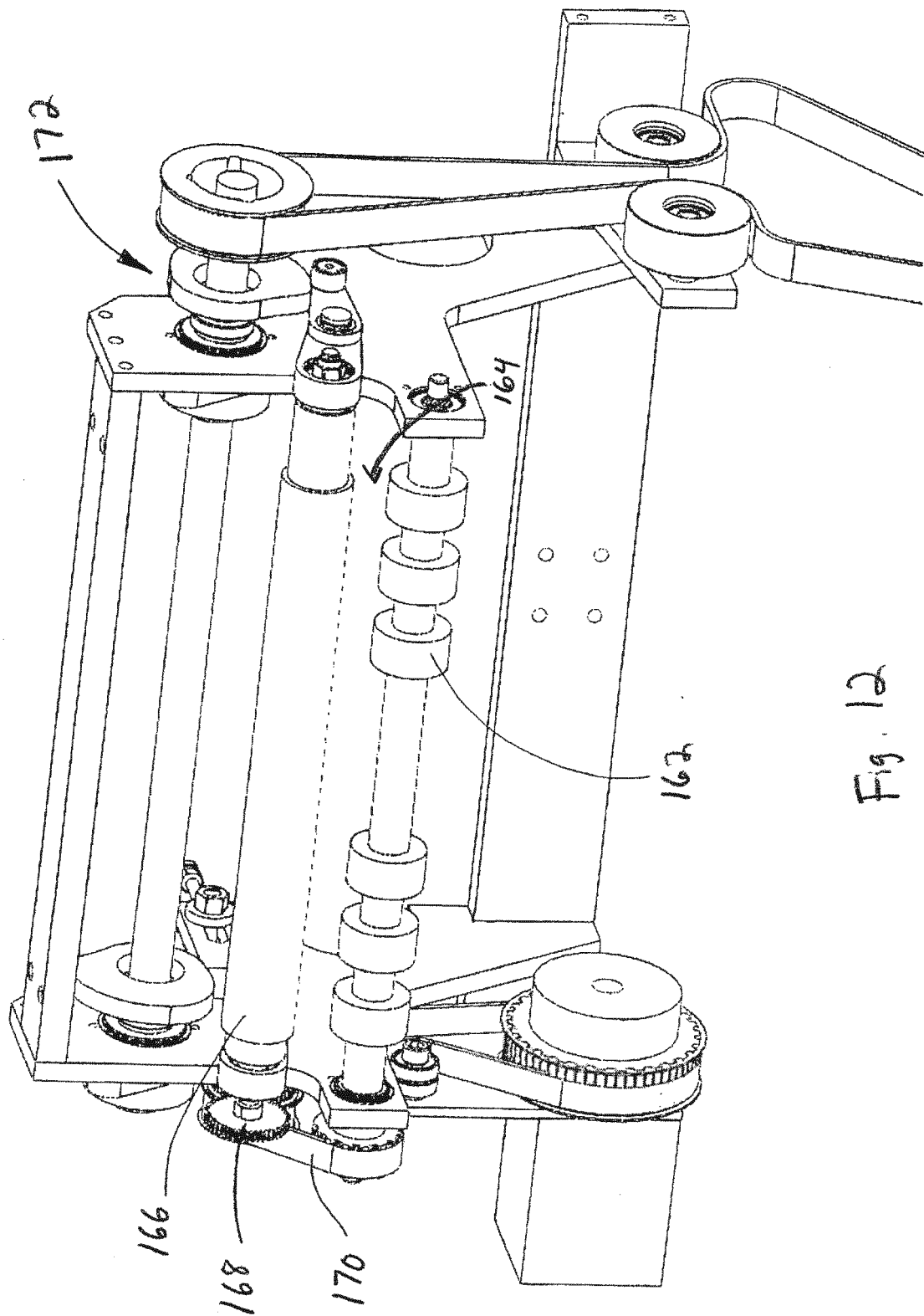


Fig. 12

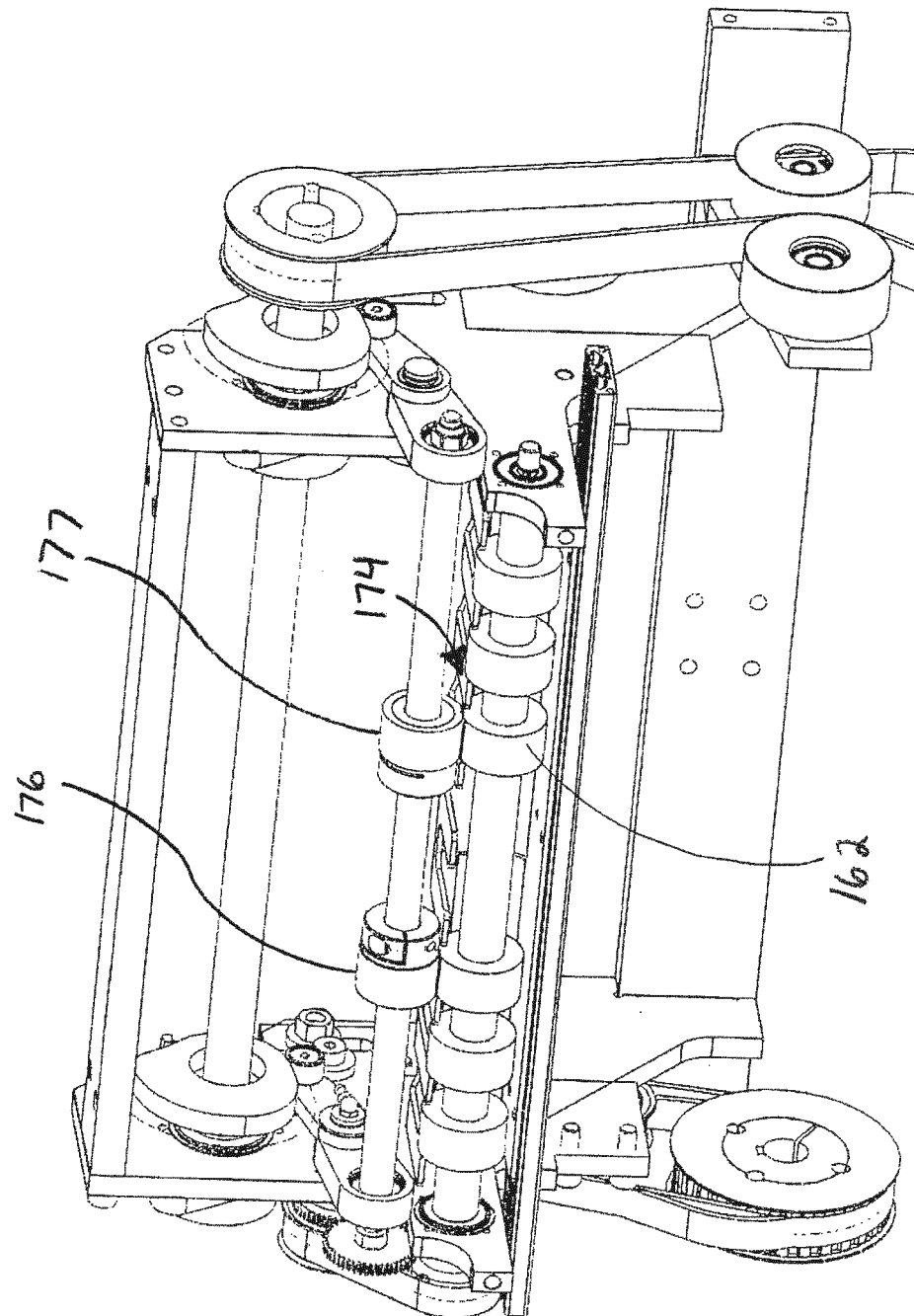
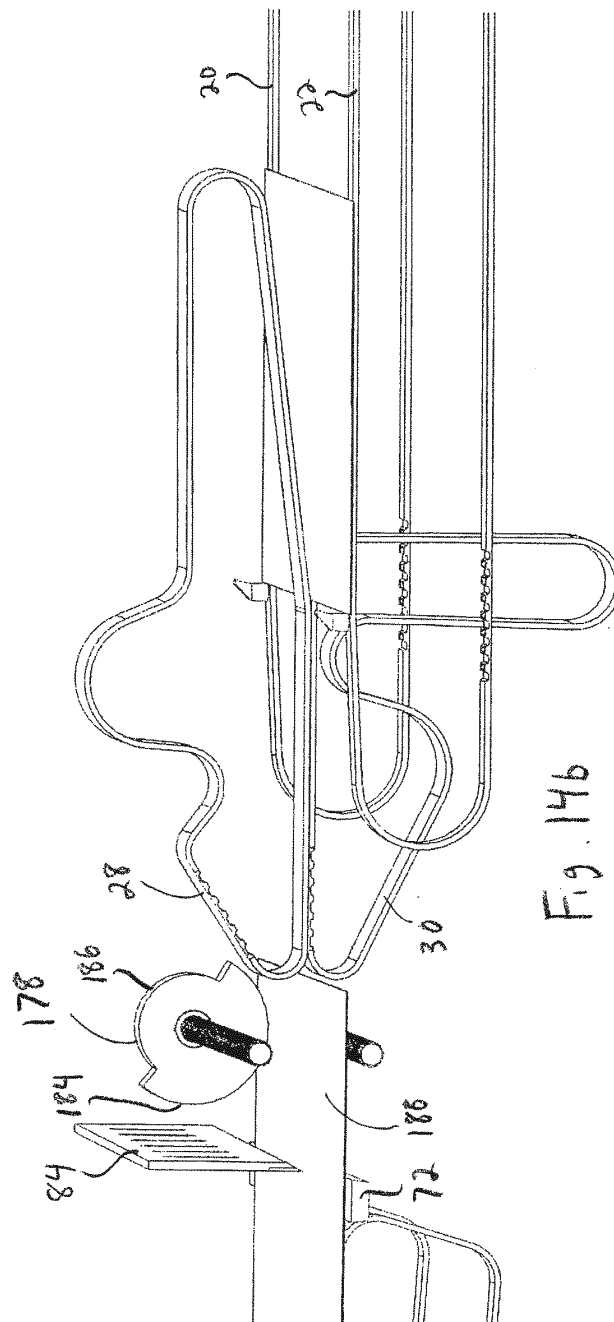
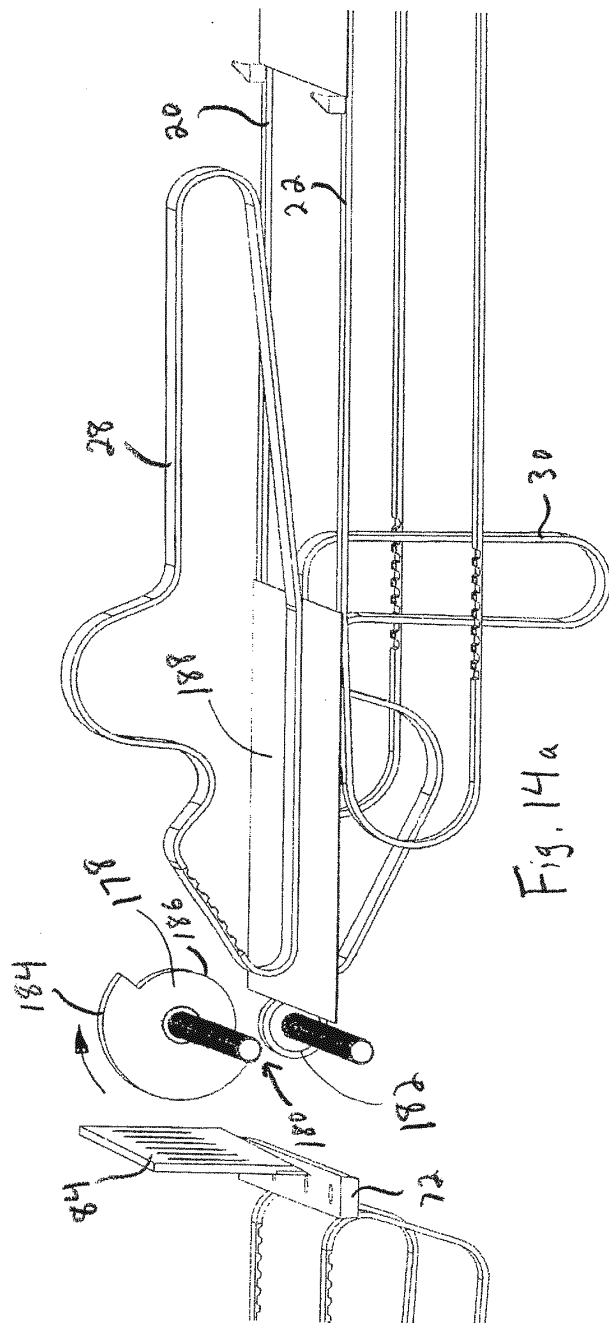


Fig. 13



REFERENCES CITED IN THE DESCRIPTION

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