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(54) **AN APPARATUS AND A METHOD FOR CUTTING A WEB OF WOVEN SHEET MATERIAL**

VORRICHTUNG UND VERFAHREN ZUM SCHNEIDEN EINER BAHN AUS GEWEBTEM BLATTMATERIAL

APPAREIL ET PROCÉDÉ POUR COUPER UNE BANDE DE MATIÈRE TISSÉE EN FEUILLE

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Description

Field Of Invention

[0001] This invention relates to apparatus for cutting a web of sheet material, and particularly a moving web in a processing line.

Background Of Invention

[0002] There are many processing lines and conversion lines wherein the web cutting systems are already in usage. The conventional knife arrangements of prior art patent have proved to be highly successful in the handling of sheet materials of the types listed therein, namely cardboard, plastics and like materials which are relatively thick or otherwise resistant to conventional cutting knives. However, these systems have not been satisfactory for use with webs of materials which have a high tendency to elongate under stress and/or a low coefficient of friction such for example as woven and nonwoven plastic fibre or filament webs.

[0003] The problem which arises in the cutting of such webs derives from the basic fact that with any knife which relies for the cutting action on its passage through an inadequately supported web, as distinguished from a guillotine type knife which cuts directly against an anvil, the tension in the web is an essential factor in the cutting action. In other words, the tension in that portion of the web which opposes the knife must be adequate to keep the web sufficiently taut for passage of the knife there-through, rather than merely stretching the web without the knife penetrating it. This problem is especially acute in connection with webs which have such a high tendency to elongation under stress that they must be handled in a processing line and rewind under very low tension to prevent permanent elongation in the wound roll. A typical example of such a web is a woven plastic of such high tendency to stretching. If it is attempted to cut such a web with the knife arrangement of, for example, U.S. Pat. No.3,794,255, the required elongation will occur between the knife and the winding roll causing excessive knife travel. In addition, some web materials, depending upon their coefficient of friction, will skid against the driving drum before enough tension can be developed to cut the web

[0004] Also as an example, US patent 3611856 ('856) discloses web cutter for cutting a web of material into web portions of a predetermined size. The '856 invention further discloses a cutter system which is placed perpendicular to the direction of the web. Such '856 invention does not disclose about the cross cutting method or technique of web cutting. Since the cross cutting method is advantageous during high speed cutting, so the '856 invention lacks the precise cutting of web with high speed moving web

[0005] A device for cutting polywoven bags is known from CN 209699974U, which includes a cutting bed and

rubber rollers. WO2013130045 A1 discloses an inkjet printer with diagonal media cutter with a cutting platform onto which the continuous moving media from an unwinder is conveyed and passes through a set of web guiding rollers, a pre-draw roller assembly and post-draw roller assembly, a cross cutter apparatus having moveable knife assembly, mounted for diagonal cut at an inclined angle between said roller assemblies, wherein said cross cutter apparatus is capable of cutting said media into pieces using said movable knife assembly in between of the rollers on the cutting platform.

[0006] Thus, there is a need for a more efficient cutting system for continuously moving web, particularly woven plastic fabric moving at higher speed and which overcomes the aforementioned drawbacks of the conventional systems.

Objects of Invention:

[0007] The main objective of the present invention is to provide a cutting apparatus or device or system to facilitate accurate cutting of a continuously moving web made of woven plastic.

[0008] A further objective of the present invention is to provide a cutting device or system which allows rapid cutting of a continuously moving web made of woven plastic with low maintenance cost.

[0009] Another objective of the present invention is to provide a cutting device or system which provides flexibility in handling of different specification webs without much alteration in the device or system.

Summary Of Invention:

[0010] The web or fabric cutting apparatus of the present invention comprises a transport table for the workpiece movement and a movable knife, the knife being preferably guided along an orbit. The web cutting apparatus disclosed herein enables highest throughput rates of workpieces and whereby the web cutting apparatus is advantageously used for the separation of workpieces from a woven plastic web. When the knife is in an orbit, it can be guided at a uniform speed, reducing power consumption for the gear motor or the drive, increasing life and reducing maintenance.

[0011] The knife, in the form of a blade, is mounted on a conveyance means, such as a belt. The conveyance means rotates in a direction that is nearly transverse to the direction of movement of the unrolling web or fabric.

[0012] The roll carrying a fabric that needs cutting into pieces is unwound from an unwinding unit. The fabric may be made of stretched plastic tape, which is optionally coated, or of plastic film, or of composite materials of fabric and plastic films.

[0013] The unwound fabric travels on a transportation means or a conveyance means onto a cutting platform. The conveyance means may be operated using driven rollers, for example. Adjacent to the worktable is provided

a transverse transport device which is in the form of a conveyor belt (not shown), and clamping means for workpieces, such as grippers or magnets.

[0014] The separation of a leading workpiece from the continuously arriving unrolled fabric takes place by means of the apparatus disclosed herein which essentially is a cutting device which comprises at least one movable knife, wherein the knife is guided along an orbit, which in the circumferential direction, substantially transversely to the longitudinal transport direction aligned endless belt to which at least one blade is fixed. The endless belt runs around two rollers, at least one of the two rollers is driven by a motor with speed controller, preferable a servomotor. The knife severed the incoming workpiece across the width by travelling at controlled speed based on incoming workpiece traverse rate.

[0015] The cut made using the device disclosed herein is of high quality, i.e. a smooth and precise cut is produced.

[0016] The transverse transport device conveys individual workpieces, away from the work area in a transverse transport direction which is oriented orthogonally to the longitudinal transport direction.

[0017] In a subsequent process step, once the knife has already completely cut off the single workpiece from the contiguous workpieces, it moves along its orbit to the top of the endless belt and thus out of contact with the workpieces. The individual workpiece is conveyed away from the working area by means of the transverse transport device in the transverse transport direction.

Brief Description Of Figures in the drawings:

[0018]

Figure 1 shows the perspective view of general arrangement of the web cutting apparatus of the invention.

Figure 1A shows the moving web gripped by pre draw roller assembly, post draw roller assembly, first tension roller assembly and second tension roller assembly.

Figure 2 shows the section view of cross cutting device which moves the blade in the orbit that is in the traverse direction to that of the moving web.

Figure 2A shows cross sectional view of the cross cutter apparatus.

Figure 3 shows perspective view of the cross cutter apparatus with protective covers and maintenance facility.

Figure 4 shows perspective view of the movable knife assembly.

Figure 4A shows perspective view of the connection of movable knife assembly with the cross cutter apparatus.

Figure 5 shows the top view of the cross-cutter apparatus.

Figure 5A shows the schematic view of cross cutting

operation.

List of Parts:

- | | | |
|----|---------------|---|
| 5 | [0019] | |
| 10 | | 1. Web cutting apparatus
2. Web
3. Base frame
4. First Side plate
5. Second Side plate
6. First Web guide roller
6A. Second Web guide roller
6B. Third Web guide roller
7. Cross cutter apparatus
8. Cutting platform
9. Pre-draw roller assembly
10. First motor
11. Post-draw roller assembly
12. Second motor
13. First Tension Roller assembly
14. Second Tension Roller assembly
15. Web cut piece
16. First Pneumatic cylinder
17. Second Pneumatic cylinder
18. Third Pneumatic cylinder
19. Fourth Pneumatic cylinder
20. First Lever
21. Second Lever
22. Third Lever
23. Fourth Lever
24. First Holding block
25. Second Holding block
26. Front plate
27. Rear plate
28. First pulley
29. Second pulley
30. Third pulley
31. Housing
32. First Shaft
33. Adjusting plate
34. Second Shaft
35. Fourth pulley
36. First Endless belt
37. Second Endless belt
38. Movable knife assembly
39. First Guide rail
40. Second Guide rail
41. Third Guide rail
42. Fourth Guide rail
43. Bottom cylindrical spacer
44. Top flat spacer
45. Front protection cover
46. Swivel cover
47. Third motor
48. Knife
49. Knife holding bracket
50. Knife holding plate |

51. First Guide pin
52. Second Guide pin
53. First Side sheet
54. Second Side sheet
55. Belt attachment
56. Knife movement axis
57. Web movement axis
58. Pulley cover
59. Position A
60. Position B
61. Position C
62. Position D
63. First Opening
64. Second opening
65. First rod
66. Second rod
67. Clamp
68. first longitudinal edge of fabric
69. Second longitudinal edge of fabric

Detail Description Of Invention with reference to drawings:

[0020] Figure 1 shows the apparatus of the present invention which is a web or fabric cutting apparatus (1) which facilitates accurate cutting of a continuously moving web (2) made of woven fabric such as plastic. The apparatus (1) comprises of a first side plate (4) and a second side plate (5) which are connected to and supported by a base frame structure (3) and cross cutting apparatus (7) with moving knife assembly (38). The base frame structure (3) is constructed of a plurality of the rectangular cross-sectional members which are jointed or welded together to form a sturdy base.

[0021] In one of the embodiments, the side plates (4, 5) are constructed in the form of a thick plates and are attached to the base frame structure (3) by any kind of joining means such as welding, bolting or screwing to form a rigid member.

[0022] The apparatus (1) further comprises a cutting platform (8) onto which the continuous moving web (2) from the unwinder (not shown) is conveyed in the direction shown by dotted arrow in Figure 1 by a pull-off driven roller (not shown) and passes through a set of web guiding rollers (6, 6A, and 6B) to maintain proper tension and avoiding shrinkage of the web (2).

[0023] The apparatus (1) also comprises of a pre-draw roller assembly (9) and post-draw roller assembly (11). Using a cross cutter apparatus (7), the cutting of the moving web (2) takes place in between of the rollers (9, 11) on the cutting platform (8), whereby the continuous web (2) is converted into the web cut pieces (15). The pre draw roller assembly (9) and post draw roller assembly (11) are individually constructed in such a way that they both have a plurality of rollers mounted on a single shaft.

[0024] As shown in figure 1A, the apparatus (1) further comprises of first tension rollers assembly (13) and second tension roller assembly (14) which are used for the

holding of the web (2) and also presses the web (2) from above onto the pre-draw roller assembly (9) and post-draw roller assembly (11) all over the traverse web length with the help of pneumatic cylinders such that web (2) lies between the roller assemblies (9, 11, 13, and 14). The first pneumatic cylinder (16) and second pneumatic cylinder (17) works together in the downwards direction and pushes the first tension roller assembly (13) at both ends. The first and second pneumatic cylinders (16, 17) are connected to the tension roller assembly (13) via a first lever (20) and second lever (21) respectively. The said connection can be obtained by any mechanical method of bolting, screwing or using bush or bearing arrangement such that the downwards movement of the cylinders (16, 17) facilitates the movement of the first tension roller assembly (13) to press the web (2) against the pre draw roller (9).

[0025] Further, the first tension roller assembly (13) and second tension roller assembly (14) are responsible for maintaining adequate tension in and holding of the web (2) during cutting so that clean and accurate cutting takes place. This web tension is created by the difference in speed between the pre-draw roller assembly (9) and post -draw roller assembly (11). The post-draw roller assembly (11) speed measured in rpm is slightly higher than the speed of pre-draw roller assembly (9), the rpm of pre draw roller assembly (9) is controlled by the first motor (10) and the rpm of post draw roller assembly (11) is controlled by second motor (12). Such difference in the rpm is also required to pull the web (2) in the direction of web movement axis (57).

[0026] In the same way, a third pneumatic cylinder (18) and fourth pneumatic cylinder (19) work together in the downward direction and push the second tension roller assembly (14) at both ends. The third and fourth pneumatic cylinders (18, 19) are connected to the second tension roller assembly (14) at the ends via a third lever (20) and fourth lever (23) respectively. The said connection can be obtained by any mechanical method of bolting, screwing or using bush or bearing arrangement such that the downward movement of the cylinders (18, 19) facilitates the movement of the second tension roller assembly (14) to press the web (2) against the post draw roller (11).

[0027] It is evident from the Figure 1A that, pre draw roller assembly (9) and post draw roller assembly (11) are identical in construction with plurality of rollers. These rollers can be chosen from the set of rolling members such that while drawing the web (2) in the direction of web movement axis (57) the rollers provide negligible friction to the surface of web (2) due to which the web (2) does not get damaged. The first tension roller assembly (13) and second tension roller assembly (14) also comprises of plurality of rollers mounted on a first and second rod (65, 66) respectively thereby connecting the rod (65, 66) individually with the at least two brackets (67).

[0028] Figure 2 shows the internal construction of the cross cutter apparatus (7), comprising of a moving cutting

assembly (38) mounted on endless belt (36), two parallel plates, a front plate (26) and a rear plate (27) which are mounted at a prescribed gap as shown in figure 2A that is maintained by a set of top flat spacer (44) and a set of bottom cylindrical spacers (43). The front and rear plates (26, 27) can be constructed from a metallic or non-metallic plate which can bear the load of the other supporting members. Cross cutter apparatus (7) is located on the cutting platform (8) at an inclined angle α as shown in figure 5 perpendicular in direction with respect to the web movement direction (56) and cross cutter apparatus (7) mounted on the first side plate (4) and second side plate (5) via first holding block (24) and second holding block (25). The said mounting can be achieved by any mechanical means such as bolting, screwing or welding.

[0029] The cross cutter apparatus further comprises of a rear plate (27) wherein at the ends of the said rear plate (27), a first pulley (28) and at the other end a second pulley (29) are mounted. The said first pulley (28) is connected to third pulley (30) via first stationary housing (31) and a first rotating shaft (32) and on the other end second pulley (29) mounted on the rear plate (27) is connected with the adjustment bracket (33) as shown in figure 5 and second rotating shaft (34).

[0030] By moving the adjustment bracket (33) as shown in figure 5, the second pulley (29) can be moved farther from the first pulley (28). Such movement is required to increase or decrease the tension in the first endless belt (36) which passes over the pulleys (28,29).

[0031] Further, the third pulley (30) is driven by fourth pulley (35) shown in figure 3 through endless second belt (37). Hence, the rotation is transmitting from third motor (47) as shown in Figure 3 which is mounted on first side plate (4) to fourth pulley (35) and from fourth pulley (35) to third pulley (30) which are connected through endless second belt (37) and then from third pulley (30) which are directly coupled to first pulley (28) and finally from first pulley (28) to second pulley (29) which are connected through endless first belt (36).

[0032] In one of the embodiments, the pulleys can be selected from the set of round grooved members having toothed or non-toothed profile, such that profile can be of any shape or size which can drive the belts along with it. Also, these pulleys are efficient enough to transmit the motor power and drive the belts smoothly.

[0033] In another embodiment, the belts can be selected from set of flexible members having toothed profile same as of pulleys and can withstand the wear and tear. The belts can be of any type such as flat belts, V belts, round belts, spring belts, multi groove belts, timing belts, speciality belts or of any kind known to person skilled in art.

[0034] Movable knife assembly (38) mounted on the first endless belt (36) which makes movable knife assembly (38) rotates in the orbit that is circumferential on the path of the first endless belt (36) which runs over the first pulley (28) and second pulley (29) to cut the web fabric in to workpiece smoothly.

[0035] As can be seen from Figure 4A, the said movable knife assembly (38) is further supported and guided by the guide rails in between first pulley (28) and second pulley (29) on top and bottom positions. The said guide rails are mounted on the front plate (26) and rear plate (27) in such a manner that opposite guide rails face each other. The first Guide rail (39) and the second guide rail (40) are mounted on the front plate (26) at top and bottom position where as the third guide rail (41) and fourth guide rail (42) are mounted on the rear plate (27) exactly opposite to the first guide rail (39) and second guide rail (40) as shown in Figure 2A.

[0036] In one of the embodiments, these guide rails (39, 40, 41, and 42) may be made of any shape such as u shape cross section or any other cross section such as v shape, curve shape such that the movable knife assembly moves freely through it.

[0037] Figure 3 shows perspective view of the cross cutter apparatus (7) comprises of front protective cover (45) and a swivel cover (46). Front protection cover (45) covers the knife (48) moving path to avoid any accident and pulley cover (58) is also provided to cover the rotating part to avoid any accident. At the top of the cross cutter apparatus (7) one swivel cover (46) is provided for the changing of the knife (48) when the knife (48) is worn-out so that there is no need to open the whole cross cutter apparatus (7) for changing the worn out knife which has to be done periodically. Further, the cross cutter apparatus (7) is driven by the third motor (47) which is coupled with the fourth pulley (35) and is connected to the third pulley (30) via endless belt (37).

[0038] In one of the embodiments, the front protective cover (45) may be constructed of a sheet metal or plate bend to form a rigid body which can withstand the external impact if occur during the cutting process.

[0039] In another embodiment, the swivel cover (46) can also be constructed of a sheet metal or plate bend to form a rigid surface. Also, the swivel cover (46) can be opened and closed whenever the blade (48) of the movable knife assembly (38) requires to be changed when it is worn out. Such change can take place by driving the movable knife assembly (38) to position D (62) and thereby opening the swivel cover (46). The position D (62) can be determined by set of sensors (not shown) which governed the stoppage of the movable knife assembly (38).

[0040] Figure 4 shows the movable knife assembly (38) which comprises of knife holding bracket (49) on which the knife (48) is located and mounted through the knife holding plate (50) such that knife (48) lies between the holding bracket (49) and holding plate (50). The knife (48) can be selected from set of any sharp object which is capable of cutting the web (2) perfectly and smoothly without any hindrance.

[0041] The movable knife assembly (38) further comprises of first guide pin (51) and a second guide pin (52) that are clamped between the first side sheet (53) and second side sheet (54) in such a way that it forms a rigid

body. First side sheet (53) and second side sheet (54) are mounted on the knife holding bracket (49) that creates the prescribed gap (not shown) between both the sheets so that the swivel action of guide pins can take place smoothly. First side sheet (53) and second side sheet (54) are constructed in arc-shaped form so that they are able to run on the circular periphery of the first pulley (28) and second pulley (29).

[0042] Further, the said movable knife assembly (38) also comprises of first opening (63) and second opening (64) for positioning of first endless belt (36) through which, the movement of the movable knife assembly (38) is driven.

[0043] Figure 4A, shows perspective view of movable knife assembly (38) wherein guide pin (52) moves along the profile of the fourth guide rail (42) and second guide rail (40). As mentioned earlier, the movable knife assembly (38) is connected to the first endless belt (36) such that the said movable knife assembly (38) is driven by the first endless belt (36) along the path as defined by the first endless belt (36).

[0044] Figures 5 and 5A show the top view of cross cutter apparatus (7) and schematic view of the cutting operation. As shown in the Figures 5 and 5A cross cutter apparatus (7) is mounted at an inclined angle α perpendicular in direction with respect to the web (2) movement direction axis (57).

[0045] Cutting speed of cross cutter is set in such a way so that time required by the knife (48) to travel from position A (59) to position B (60) is same as the time required taken by the fabric to move from position C (61) to position B (60).

[0046] Inclined mounting of cross cutter apparatus (7) provides the flexibility to the system to set the driving speed of the cutter knife (48) with respect to the continuous moving web (2).

[0047] The present invention also provides a method of cutting a moving web (2).. The said method uses the apparatus (1) for cutting a moving web (2) disclosed on the foregoing pages. The method of the cross-cutting of the moving web (2) according to the present invention comprises of following steps:

- Web (2) is pulled by the pull-off roller from the unwinder roll.
- Web (2) passes through the web guide rollers (6,6A,6B) to maintain proper tension and removing shrinkage of the web (2).
- Web (2) is further pulled through the post-draw roller assembly (11) and pre-draw roller assembly (9) where tension rollers assembly (13,14) provides proper holding during cutting of the web (2).
- Web (2) exit from the pre-draw roller assembly (9) and when it comes under the cross cutter apparatus (7) mounted at an inclined angle with respect to the web movement axis (57), movable knife assembly (38) which is mounted on the first endless belt (36) between the two pulleys (28,29) cuts the web (2)

simultaneously the post-draw roller assembly (11) and pre draw roller assembly (9) holds the web (2) during cutting to provide proper tension and holding. Movable knife assembly (38) moves and guided by the first endless belt (36) and the guiding rails (39, 40, 41, and 42) so that it can move in the required orbit.

- Required web cut piece is transferred for further processing as desired.

[0048] The method disclosed herein has further embodiments described as follows.

[0049] In one of the embodiments, the rotational speed of said post-draw roller assembly (11) is slightly higher than the rotational speed of the pre-draw roller assembly (11) and wherein the rotational speed of said pre draw roller (9) is controlled by a first motor (10) and the rotational speed of said post draw roller (11) is controlled by a second motor (12).

[0050] In another embodiment, the cutting speed of said cross cutter (7) is set in such a way that time required by said knife (48) to travel from a position A (59) on first longitudinal edge (68) of fabric (2) to a position B (60) on the second longitudinal edge (69) of said fabric (2) is same as the time required by the fabric (2) to travel the distance between the position on said second longitudinal edge (9) that corresponds to said position A to position B (60).

[0051] While the above description contains much specificity, these should not be construed as limitation in the scope of the invention, but rather as an exemplification of the preferred embodiments thereof. It must be realized that modifications and variations are possible based on the disclosure given above without departing from the scope of the invention, as defined by the claims.

[0052] Accordingly, the scope of the invention should be determined not by the embodiments illustrated, but by claims and their legal equivalents.

Claims

1. An apparatus for cutting a web (2) of woven sheet material, **characterised in that** said apparatus comprises:
 - a first side plate (4) and a second side plate (5) connected to and supported by a base frame structure (3);
 - a cutting platform (8) onto which the continuous moving web (2) from an unwinder is conveyed and passes through a set of web guiding rollers (6, 6A, and 6B) so as to maintain proper tension and, thereby avoiding shrinkage of the web (2);
 - a pre-draw roller assembly (9) and post-draw roller assembly (11), both individually constructed to have a plurality of rollers mounted on a single shaft;
 - a cross cutter apparatus (7) having moveable

knife assembly (38), mounted at an inclined angle between said roller assemblies (9, 11),
 - a first tension rollers assembly (13) and second tension roller assembly (14) respectively mounted corresponding to said pre-draw assembly (9) and post-draw assembly (11);
 - a pair of pneumatic cylinders, namely a first pneumatic cylinder (16) and a second pneumatic cylinder (17) connected to said first tension roller assembly (13) using a first lever (20), and a second lever (21), respectively, and another pair of pneumatic cylinders, namely third pneumatic cylinder (18) and a fourth pneumatic cylinder (19) corresponding to said second tension roller assembly (14), connected to said second tension roller assembly (14) using a third lever (22), and a fourth lever (23), respectively,

wherein said cross cutter apparatus (7) is capable of cutting said web (2) using said movable knife assembly (38) in between of the rollers (9, 11) on the cutting platform (8), whereby the continuous web (2) is cut into the web cut pieces (15).

2. The apparatus as claimed in claim 1, wherein said connections to said first lever (20) and second lever (21) with said first tension roller assembly (13), and those of said third lever (23) and said fourth lever (24) with said second tension roller assembly (14) can be of a type selected from bolted, screwed, and bush or bearing arrangement whereby the downwards movement of the corresponding cylinders (16, 17, and 18, 19) facilitates the movement of the first tension roller assembly (13) to press the web (2) against the pre draw roller (9), and that of said second tension roller assembly (14) to press said web (2) against said post-draw roller (11).
3. The apparatus as claimed in one of the claims 1 and 2, wherein in use the rotational speed of said post-draw roller assembly (11) is slightly higher than the rotational speed of the pre-draw roller assembly (9), wherein the rotational speed of said pre draw roller assembly (9) is controlled by a first motor (10) and the rotational speed of said post draw roller assembly (11) is controlled by a second motor (12).
4. The apparatus as claimed in one of claims 1 to 3, wherein pre draw roller assembly (9) and post draw roller assembly (11) are identical in construction and have a plurality of rollers, and wherein said first tension roller assembly (13) and second tension roller assembly (14) are of identical construction each made of a plurality of rollers mounted on a set of first and second rod (65, 66) respectively, said first rods (65) connected to each other using a set of brackets (67).

5. The apparatus as claimed in one of claims 1 to 4, wherein said cross cutter device (7) comprises:

- two parallel plates, a front plate (26) and a rear plate (27) mounted at a predetermined gap maintained a set of top flat spacers (44) and a set of bottom cylindrical spacers (43),
- a first pulley (28) mounted at one end of said rear plate (27) is connected to a third pulley (30) via first stationary housing (31) and a first rotating shaft (32), and a second pulley (29) mounted at the other end of said rear plate (27) is connected with an adjustment bracket (33) and a second rotating shaft (34);
- a first endless belt (36) which passes over said pulleys (28, 29).
- a moveable knife assembly (38) connected to said endless belt (36)
- A fourth pulley (35) that drives said third pulley (30) using a second endless belt (37)
- a third motor (47) mounted on first side plate (4) transferring the rotation to fourth pulley (35), and ultimately to said second pulley (29) via third pulley (30) and first pulley (28) to second pulley (29) which are connected through endless first and second belts (36, 37);
- a first guide rail (39) and a second guide rail (40) mounted on said front plate (26) at its top and bottom position, respectively, and a third guide rail (41) and fourth guide rail (42) mounted on said rear plate (27), respectively exactly opposite to said first guide rail (39) and second guide rail (40);
- a front protective cover (45) with swivel that covers a knife (48), a pulley cover (58) to cover said first and second pulleys (28, 29),

wherein said cross cutter apparatus is mounted on a first side plate (4) and a second side plate (5) via a first holding block (24) and a second holding block (25) using mechanical means such as bolting, screwing or welding.

6. The apparatus according to claim 5, wherein said pulleys can be round grooved pulleys having toothed or non-toothed profile that accommodates respective belts (36, 37).
7. The apparatus as claimed in claim 5 or claim 6, wherein said belts (36, 37) are flexible members have toothed profile that match those of respective pulleys and they are selected from any of the types such as flat belts, V belts, round belts, spring belts, multi groove belts, and timing belts, etc.
8. The apparatus as claimed one of claims 5 to 7, wherein said movable knife assembly (38) rotates in the orbit that is circumferential on the path of the

first endless belt (36) which runs over the first pulley (28) and second pulley (29).

9. The apparatus as claimed in one of claims 5 to 8, wherein said guide rails (39, 40, 41, and 42) have u shape cross section or any other cross section such as v shape, curve shape such that the movable knife assembly (38) moves freely through it. 5
10. The apparatus as claimed in one of claims 5 to 9, wherein said front protective cover (45) and swivel cover (46) are made of a sheet metal or plate bend to form respective rigid bodies. 10
11. The apparatus as claimed one of claims 5 to 10, wherein said movable knife assembly (38) comprises: 15
- a knife (48) mounted on knife holding bracket (49) through a knife holding plate (50) to position said knife (48) between said holding bracket (49) and holding plate (50); 20
 - A first guide pin (51) and a second guide pin (52) that are clamped between a first side sheet (53) and a second side sheet (54) to form a rigid body, wherein said first side sheet (53) and second side sheet (54) are mounted on said knife holding bracket (49) that creates the desired gap between both the sheets (53, 54) so that the swivel action of guide pins (51, 52) occurs smoothly; 25
 - a first opening (63) and a second opening (64) through which first endless belt (36) is positioned such that the movement of the movable knife assembly (38) is driven by said first endless belt (36). 30
12. The apparatus as claimed in claim 11, wherein said first side sheet (53) and second side sheet (54) are constructed in the arc-shaped form so that they can run on the circular periphery of the first pulley (28) and second pulley (29). 35
13. The apparatus as claimed in one of claims 5 to 12, wherein in use the cutting speed of said cross cutter apparatus (7) is set in such a way that time required by said knife (48) to travel from a position A (59) on first longitudinal edge (68) of fabric (2) to a position B (60) on the second longitudinal edge (69) of said fabric (2) is same as the time required by the fabric (2) to travel the distance between the position on said second longitudinal edge (9) that corresponds to said position A to position B (60). 40
14. A method of cutting a moving web (2) of woven sheet material using the apparatus as claimed in claims 1 to 13, **characterised in that** said method comprises the following steps: 45

- a. passing said web (2) through said web guide rollers (6, 6A, and 6B) to maintain proper tension and removing shrinkage of the web (2);
- b. pulling said web (2) through the post-draw roller assembly (11), said pre-draw roller assembly (9), and said tension rollers assembly (13, 14) and holding it down on said cutting platform (8) ready for cutting;
- c. exiting said web (2) from said pre-draw roller assembly (9);
- d. cutting said moving web (2) using said movable knife assembly (38) having knife (48) held within said cross-cutter apparatus (7) when said moving web (2) comes under said cross cutter apparatus (7) mounted at an inclined angle with respect to the web movement axis (57), while said moving web (2) is still held down securely by said post-draw roller assembly (11) and pre draw roller assembly (9) to provide proper tension and holding;
- e. transferring the cut piece of said moving web (2) to a downstream station for further processing as desired.

15. The method as claimed in claim 14, wherein the rotational speed of said post-draw roller assembly (11) is slightly higher than the rotational speed of the pre-draw roller assembly (11) and wherein the rotational speed of said pre draw roller (9) is controlled by a first motor (10) and the rotational speed of said post draw roller (11) is controlled by a second motor (12); and/or 25
- wherein the cutting speed of said cross cutter apparatus (7) is set in such a way that time required by said knife (48) to travel from a position A (59) on first longitudinal edge (68) of fabric (2) to a position B (60) on the second longitudinal edge (69) of said fabric (2) is same as the time required by the fabric (2) to travel the distance between the position on said second longitudinal edge (9) that corresponds to said position A to position B (60). 30

Patentansprüche

1. Vorrichtung zum Schneiden einer Bahn (2) eines gewebten Schichtmaterials, **dadurch gekennzeichnet, dass** die Vorrichtung aufweist: 45
- eine erste Seitenplatte (4) und eine zweite Seitenplatte (5), die mit einer Bodenrahmenstruktur (3) verbunden sind und von dieser gestützt werden;
 - eine Schneideplattform (8), auf welche die sich kontinuierlich bewegende Bahn (2) von einem Abwickler befördert wird und durch einen Satz von Bahnführungsrollen (6, 6A und 6B) hindurch verläuft, um eine geeignete Spannung beizubehalten. 50

halten und dadurch ein Schrumpfen der Bahn (2) zu vermeiden;

- eine Vorzugrollenanordnung (9) und eine Nachzugrollenanordnung (11), die beide einzeln so konstruiert sind, dass sie eine Vielzahl von Rollen aufweisen, die auf einer einzelnen Welle montiert sind;

- eine Querschneidevorrichtung (7), die eine bewegliche Messeranordnung (38) aufweist, die in einem geneigten Winkel zwischen den Rollenordnungen (9, 11) montiert ist;

- eine erste Spannungsrollenanordnung (13) und eine zweite Spannungsrollenanordnung (14), die jeweils entsprechend der Vorzuganordnung (9) und der Nachzuganordnung (11) montiert sind;

- ein Paar pneumatischer Zylinder, nämlich ein erster pneumatischer Zylinder (16) und ein zweiter pneumatischer Zylinder (17), die jeweils mit der ersten Spannungsrollenanordnung (13) unter Verwendung eines ersten Hebels (20) und eines zweiten Hebels (21) verbunden sind, und ein weiteres Paar pneumatischer Zylinder, nämlich ein dritter pneumatischer Zylinder (18) und ein vierter pneumatischer Zylinder (19) entsprechend der zweiten Spannungsrollenanordnung (14), die jeweils mit der zweiten Spannungsrollenanordnung (14) unter Verwendung eines dritten Hebels (22) und eines vierten Hebels (23) verbunden sind,

wobei die Querschneidevorrichtung (7) in der Lage ist, die Bahn (2) unter Verwendung der beweglichen Messeranordnung (38) zwischen den Rollen (9, 11) der Schneideplattform (8) zu schneiden, wobei die kontinuierliche Bahn (2) in die Bahnschnitteile (15) geschnitten wird.

2. Vorrichtung nach Anspruch 1, wobei die Verbindungen mit dem ersten Hebel (20) und dem zweiten Hebel (21) mit der ersten Spannungsrollenanordnung (13) und jene des dritten Hebels (23) und des vierten Hebels (24) mit der zweiten Spannungsrollenanordnung (14) von einem Typ sein können, der aus einer verriegelten, verschraubten und Buchsen- oder Lageranordnung ausgewählt wird, wobei die Abwärtsbewegung der entsprechenden Zylinder (16, 17 und 18, 19) die Bewegung der ersten Spannungsrollenanordnung (13) zum Drücken der Bahn (2) gegen die Vorzugrolle (9) und jene der zweiten Spannungsrollenanordnung (14) zum Drücken der Bahn (2) gegen die Nachzugrolle (11) erleichtert.
3. Vorrichtung nach einem der Ansprüche 1 und 2, wobei bei der Verwendung die Drehzahl der Nachzugrollenanordnung (11) leicht höher als die Drehzahl der Vorzugrollenanordnung (9) ist, wobei die Drehzahl der Vorzugrollenanordnung (9) durch ei-

nen ersten Motor (10) gesteuert wird und die Drehzahl der Nachzugrollenanordnung (11) durch einen zweiten Motor (12) gesteuert wird.

4. Vorrichtung nach einem der Ansprüche 1 bis 3, wobei die Vorzugrollenanordnung (9) und die Nachzugrollenanordnung (11) hinsichtlich der Konstruktion identisch sind und eine Vielzahl von Rollen aufweisen, und wobei die erste Spannungsrollenanordnung (13) und die zweite Spannungsrollenanordnung (14) eine identische Konstruktion aufweisen, die jeweils aus einer Vielzahl von Rollen hergestellt ist, die jeweils auf einem Satz einer ersten und einer zweiten Stange (65, 66) montiert sind, wobei die ersten Stangen (65) unter Verwendung eines Satzes von Halterungen (67) miteinander verbunden sind.

5. Vorrichtung nach einem der Ansprüche 1 bis 4, wobei die Querschneidevorrichtung (7) aufweist:

- zwei parallele Platten, eine vordere Platte (26) und eine hintere Platte (27), die in einem vorbestimmten Spalt montiert sind, der durch einen Satz von oberen flachen Abstandshaltern (44) und einen Satz von unteren zylinderförmigen Abstandshaltern (43) beibehalten wird;

- ein erstes Riemenrad (28), das an einem Ende der hinteren Platte (27) montiert ist, ist mit einem dritten Riemenrad (30) über ein erstes feststehendes Gehäuse (31) und eine erste Rotationswelle (32) verbunden, und ein zweites Riemenrad (29), das an dem anderen Ende der hinteren Platte (27) montiert ist, ist mit einer Einstellhalterung (33) und einer zweiten Rotationswelle (34) verbunden;

- ein erster Endlosriemen (36), welcher über die Riemenscheiben (28, 29) verläuft;

- eine bewegliche Messeranordnung (38), die mit dem Endlosriemen (36) verbunden ist;

- eine vierte Riemenscheibe (35), die die dritte Riemenscheibe (30) unter Verwendung eines zweiten Endlosriemens (37) antreibt;

- einen dritten Motor (47), der auf der ersten Seitenplatte (4) montiert ist, der die Rotation auf die vierte Riemenscheibe (35) und letztendlich auf die zweite Riemenscheibe (29) über die dritte Riemenscheibe (30) und die erste Riemenscheibe (28) auf die zweite Riemenscheibe (29) überträgt, welche durch den ersten und den zweiten Endlosriemen (36, 37) verbunden sind;

- eine erste Führungsschiene (39) und eine zweite Führungsschiene (40), die jeweils auf der vorderen Platte (26) in ihrer oberen und unteren Position montiert sind, und eine dritte Führungsschiene (41) und eine vierte Führungsschiene (42), die jeweils genau entgegengesetzt zu der ersten Führungsschiene (39) und der zweiten Führungsschiene (40) auf der hint-

eren Platte (27) montiert sind;
 - eine vordere Schutzabdeckung (45) mit einem Drehgelenk, die ein Messer (48) abdeckt, eine Riemenradabdeckung (58) zum Abdecken des ersten und des zweiten Riemenrads (28, 29);

wobei die Querschneidevorrichtung auf einer ersten Seitenplatte (4) und einer zweiten Seitenplatte (5) über einen ersten Halteblock (24) und einen zweiten Halteblock (25) unter Verwendung mechanischer Mittel, wie etwa Verriegeln, Verschrauben oder Schweißen, montiert ist.

6. Vorrichtung nach Anspruch 5, wobei die Riemenräder runde genutete Riemenräder sein können, die ein gezahntes oder nicht-gezahntes Profil aufweisen, das jeweilige Riemen (36, 37) aufnimmt.
7. Vorrichtung nach Anspruch 5 oder 6, wobei die Riemen (36, 37) biegsame Elemente mit einem gezahnten Profil sind, die mit jenen von jeweiligen Riemenrädern übereinstimmen, und die aus einem der Typen, wie etwa Flachriemen, V-Riemen, Rundriemen, Federriemen, Mehrriemen und Zahnriemen usw., ausgewählt sind.
8. Vorrichtung nach einem der Ansprüche 5 bis 7, wobei die bewegliche Messeranordnung (38) in der Umlaufbahn rotiert, die auf der Strecke des ersten Endlosriemens (36) umläuft, welche über das erste Riemenrad (28) und das zweite Riemenrad (29) läuft.
9. Vorrichtung nach einem der Ansprüche 5 bis 8, wobei die Führungsschienen (39, 40, 41 und 42) einen U-förmigen Querschnitt oder einen beliebigen sonstigen Querschnitt, wie etwa eine v-Form, eine Kurvenform, aufweisen, so dass sich die bewegliche Messeranordnung (38) frei durch diese hindurch bewegt.
10. Vorrichtung nach einem der Ansprüche 5 bis 9, wobei die vordere Schutzabdeckung (45) und die Drehgelenkabdeckung (46) aus einem Metallblech oder einer Platte hergestellt sind, die gebogen sind, um jeweilige starre Körper zu bilden.
11. Vorrichtung nach einem der Ansprüche 5 bis 10, wobei die bewegliche Messeranordnung (38) aufweist:
- ein Messer (48), das auf einer Messerhalteklammer (49) durch eine Messerhalteplatte (50) montiert ist, um das Messer (48) zwischen der Halteklammer (49) und der Halteplatte (50) zu positionieren;
 - einen ersten Führungsstift (51) und einen zweiten Führungsstift (52), die zwischen einem ers-

ten Seitenblech (53) und einem zweiten Seitenblech (54) eingeklemmt sind, um einen starren Körper zu bilden, wobei das erste Seitenblech (53) und das zweite Seitenblech (54) auf der Messerhalteklammer (49) montiert sind, die den gewünschten Spalt zwischen beiden Blechen (53, 54) erzeugt, so dass die Schwingwirkung der Führungsstifte (51, 52) sanft erfolgt;

- eine erste Öffnung (63) und eine zweite Öffnung (64), durch welche der erste Endlosriemen (36) positioniert ist, so dass die Bewegung der beweglichen Messeranordnung (38) durch den ersten Endlosriemen (36) angetrieben wird.

12. Vorrichtung nach Anspruch 11, wobei das erste Seitenblech (53) und das zweite Seitenblech (54) in der Bogenform konstruiert sind, so dass sie auf dem kreisförmigen Umfang der ersten Riemenscheibe (28) und der zweiten Riemenscheibe (29) laufen können.
13. Vorrichtung nach einem der Ansprüche 5 bis 12, wobei bei der Verwendung die Schneidegeschwindigkeit der Querschneidevorrichtung (7) derart festgelegt wird, dass die Zeit, die das Messer (48) benötigt, um sich von einer Position A (59) auf dem ersten Längsrand (68) des Stoffes (2) in eine Position B (60) auf dem zweiten Längsrand (69) des Stoffes (2) zu bewegen, dieselbe ist wie die Zeit, die der Stoff (2) benötigt, um sich über die Distanz zwischen der Position auf dem zweiten Längsrand (9), die der Position A entspricht, und der Position B (60) zu bewegen.
14. Verfahren zum Schneiden einer sich bewegenden Bahn (2) von gewebtem Schichtmaterial unter Verwendung der Vorrichtung nach Anspruch 1 bis 13, **dadurch gekennzeichnet, dass** das Verfahren die folgenden Schritte umfasst:
- a. Führen der Bahn (2) durch die Bahnführungsrollen (6, 6A und 6B), um eine geeignete Spannung beizubehalten und ein Schrumpfen der Bahn (2) zu beseitigen;
 - b. Ziehen der Bahn (2) durch die Nachzugrollenanordnung (11), die Vorzugrollenanordnung (9) und die Spannungsrollenanordnung (13, 14) und Herunterhalten von dieser auf der Schneideplattform (8), die bereit zum Schneiden ist;
 - c. Austreten der Bahn (2) aus der Vorzugrollenanordnung (9);
 - d. Schneiden der sich bewegenden Bahn (2) unter Verwendung der beweglichen Messeranordnung (38), bei der ein Messer (48) innerhalb der Querschneidevorrichtung (7) gehalten wird, wenn die sich bewegende Bahn (2) unter die Querschneidevorrichtung (7) gerät, die in einem geneigten Winkel bezüglich der Bahnbewe-

gungsachse (57) montiert ist, wobei die sich bewegende Bahn (2) immer noch durch die Nachzugrollenanordnung (11) und die Vorzugrollenanordnung (9) sicher heruntergehalten wird, um eine geeignete Spannung und ein geeignetes Halten bereitzustellen;

e. Übertragen des geschnittenen Teils der sich bewegenden Bahn (2) zu einer stromabwärts liegenden Station zur weiteren Verarbeitung, falls gewünscht.

15. Verfahren nach Anspruch 14, wobei die Drehzahl der Nachzugrollenanordnung (11) leicht höher als die Drehzahl der Vorzugsrollenanordnung (11) ist, und wobei die Drehzahl der Vorzugrolle (9) durch einen ersten Motor (10) gesteuert wird und die Drehzahl der Nachzugrolle (11) durch einen zweiten Motor (12) gesteuert wird; und/oder

wobei die Schneidegeschwindigkeit der Querschneidevorrichtung (7) derart festgelegt wird, dass die Zeit, die das Messer (48) benötigt, um sich von einer Position A (59) auf dem ersten Längsrand (68) des Stoffes (2) in eine Position B (60) auf dem zweiten Längsrand (69) des Stoffes (2) zu bewegen, dieselbe ist wie die Zeit, die der Stoff (2) benötigt, um sich über die Distanz zwischen der Position auf dem zweiten Längsrand (69), die der Position A entspricht, und der Position B (60) zu bewegen.

Revendications

1. Appareil pour couper une bande (2) de matériau en feuille tissé, **caractérisé en ce que** ledit appareil comprend :

- une première plaque latérale (4) et une deuxième plaque latérale (5) reliées à une structure de cadre de base (3) et supportées par celle-ci ;
- une plateforme de coupe (8), sur laquelle la bande en déplacement continu (2) provenant d'un dérouleur est transportée et passe à travers un jeu de rouleaux de guidage de bande (6, 6A et 6B) de manière à maintenir une tension appropriée et à éviter ainsi un rétrécissement de la bande (2) ;
- un ensemble formant rouleau de pré-étirage (9) et un ensemble formant rouleau d'étirage ultérieur (11), tous deux élaborés individuellement pour présenter une pluralité de rouleaux montés sur un arbre unique ;
- un appareil de coupe transversale (7) présentant un ensemble formant couteau mobile (38), monté à un angle incliné entre lesdits ensembles formant rouleaux (9, 11),
- un premier ensemble formant rouleaux tendeurs (13) et un deuxième ensemble formant rouleaux tendeurs (14) montés respectivement

de manière à correspondre audit ensemble de pré-étirage (9) et audit ensemble d'étirage ultérieur (11) ;

- une paire de cylindres pneumatiques, à savoir un premier cylindre pneumatique (16) et un deuxième cylindre pneumatique (17) reliés audit premier ensemble formant rouleau tendeur (13) utilisant un premier levier (20) et un deuxième levier (21) respectivement, et une autre paire de cylindres pneumatiques, à savoir un troisième cylindre pneumatique (18) et un quatrième cylindre pneumatique (19) correspondant audit deuxième ensemble formant rouleau tendeur (14), reliés audit deuxième ensemble formant rouleau tendeur (14) en utilisant un troisième levier (22) et un quatrième levier (23) respectivement ;

dans lequel ledit appareil de coupe transversale (7) est en mesure de couper ladite bande (2) en utilisant ledit ensemble formant couteau mobile (38) entre les rouleaux (9, 11) sur la plateforme de coupe (8), dans lequel la bande continue (2) est coupée en morceaux de bande coupés (15).

2. Appareil selon la revendication 1, dans lequel lesdites liaisons du premier levier (20) et du deuxième levier (21) audit premier ensemble formant rouleau tendeur (13), et celles dudit troisième levier (23) et dudit quatrième levier (24) audit deuxième ensemble formant rouleau tendeur (14) peuvent être d'un type choisi parmi un système boulonné, vissé et un système à coussinet ou à palier lisse, où les mouvements vers le bas des cylindres (16, 17 et 18, 19) correspondants facilitent le mouvement du premier ensemble formant rouleau tendeur (13) pour presser la bande (2) contre le rouleau de pré-étirage (9), et celui dudit deuxième ensemble formant rouleau tendeur (14) pour presser ladite bande (2) contre ledit rouleau d'étirage ultérieur (11).
3. Appareil selon l'une quelconque des revendications 1 et 2, dans lequel, en utilisation, la vitesse de rotation dudit ensemble formant rouleau d'étirage ultérieur (11) est légèrement supérieure à la vitesse de rotation de l'ensemble formant rouleau de pré-étirage (9), dans lequel la vitesse de rotation dudit ensemble formant rouleau de pré-étirage (9) est commandée par un premier moteur (10) et la vitesse de rotation dudit ensemble formant rouleau d'étirage ultérieur (11) est commandée par un deuxième moteur (12).
4. Appareil selon l'une quelconque des revendications 1 à 3, dans lequel l'ensemble formant rouleau de pré-étirage (9) et l'ensemble formant rouleau d'étirage ultérieur (11) sont identiques en termes de structure et présentent une pluralité de rouleaux, et dans

lequel ledit premier ensemble formant rouleau tendeur (13) et ledit deuxième ensemble formant rouleau tendeur (14) sont de structure identique faite chacune d'une pluralité de rouleaux montés sur un jeu de première et de deuxième tige (65, 66) respectivement, lesdites premières tiges (65) étant reliées l'une à l'autre en utilisant un jeu de supports (67).

5. Appareil selon l'une quelconque des revendications 1 à 4, dans lequel ledit dispositif de coupe transversale (7) comprend :

- deux plaques parallèles, une plaque avant (26) et une plaque arrière (27) montées à un espace prédéterminé maintenu par un jeu d'écarteurs plats supérieurs (44) et un jeu d'écarteurs cylindriques inférieurs (43),

- une première poulie (28) montée sur une extrémité de ladite plaque arrière (27) est reliée à une troisième poulie (30) par l'intermédiaire d'un premier boîtier stationnaire (31) et d'un premier arbre de rotation (32), et une deuxième poulie (29) montée sur l'autre extrémité de ladite plaque arrière (27) est reliée à un support d'ajustement (33) et à un deuxième arbre de rotation (34) ;

- une première courroie sans fin (36), qui passe au-dessus desdites poulies (28, 29),

- un ensemble formant couteau mobile (38) relié à ladite courroie sans fin (36),

- une quatrième poulie (35) qui entraîne ladite troisième poulie (30) en utilisant une deuxième courroie sans fin (37),

- un troisième moteur (47) monté sur une première plaque latérale (4) transférant la rotation à la quatrième poulie (35), et pour finir à ladite deuxième poulie (29) par l'intermédiaire de la troisième poulie (30) et de la première poulie (28) à la deuxième poulie (29) qui sont reliées par l'intermédiaire de première et deuxième courroies sans fin (36, 37) ;

- un premier rail de guidage (39) et un deuxième rail de guidage (40) montés sur ladite plaque avant (26) sur sa position supérieure et inférieure respectivement, et un troisième rail de guidage (41) et un quatrième rail de guidage (42) montés sur ladite plaque arrière (27) respectivement à l'opposé exactement dudit premier rail de guidage (39) et du deuxième rail de guidage (40) ;

- un couvercle protecteur avant (45) avec un pivot qui recouvre un couteau (48), un couvercle de poulie (58) pour recouvrir lesdites première et deuxième poulies (28, 29)

dans lequel ledit appareil de coupe transversale est monté sur une première plaque latérale (4) et une

deuxième plaque latérale (5) par l'intermédiaire d'un premier bloc de maintien (24) et d'un deuxième bloc de maintien (25) en utilisant des moyens mécaniques comme le boulonnage, le vissage ou le soudage.

6. Appareil selon la revendication 5, dans lequel lesdites poulies peuvent être des poulies rainurées rondes présentant un profil denté ou non denté qui loge des courroies (36, 37) respectives.

7. Appareil selon la revendication 5 ou la revendication 6, dans lequel lesdites courroies (36, 37) sont des éléments flexibles qui présentent un profil denté qui correspond à celui de poulies respectives et qui sont choisis parmi l'un quelconque des types tels que des courroies plates, des courroies en V, des courroies rondes, des courroies à ressort, des courroies à rainures multiples et des courroies de temporisation, etc.

8. Appareil selon l'une quelconque des revendications 5 à 7, dans lequel ledit ensemble formant couteau mobile (38) tourne sur son orbite qui est circonferentielle sur le trajet de la première courroie sans fin (36) qui se déplacent au-dessus de la première poulie (28) et de la deuxième poulie (29).

9. Appareil selon l'une quelconque des revendications 5 à 8, dans lequel lesdits rails de guidage (39, 40, 41 et 42) présentent une section transversale en forme de U et une autre section transversale quelconque comme une forme en V, une forme courbée telle que l'ensemble formant couteau mobile (38) se déplace librement à travers celle-ci.

10. Appareil selon l'une quelconque des revendications 5 à 9, dans lequel ledit couvercle protecteur avant (45) et le couvercle à pivot (46) sont faits d'une feuille métallique ou d'une plaque cintrée pour former des corps rigides respectifs.

11. Appareil selon l'une quelconque des revendications 5 à 10, dans lequel ledit ensemble formant couteau mobile (38) comprend :

- un couteau (48) monté sur un support de maintien de couteau (49) par l'intermédiaire d'une plaque de maintien de couteau (50) pour positionner ledit couteau (48) entre ledit support de maintien (49) et ladite plaque de maintien (50) ;

- une première broche de guidage (51) et une deuxième broche de guidage (52) qui sont serrées entre une première feuille latérale (53) et une deuxième feuille latérale (54) pour former un corps rigide, dans lequel ladite première feuille latérale (53) et ladite deuxième feuille

- latérale (54) sont montées sur ledit support de maintien de couteau (49) qui crée l'espace souhaité entre les deux feuilles (53, 54) de telle sorte que l'action de pivotement de broches de guidage (51, 52) se produit en douceur ;
- une première ouverture (63) et une deuxième ouverture (64) par lesquelles une première courroie sans fin (36) est positionnée de telle sorte que le déplacement de l'ensemble formant couteau mobile (38) est entraîné par ladite première courroie sans fin (36).
12. Appareil selon la revendication 11, dans lequel ladite première feuille latérale (53) et ladite deuxième feuille latérale (54) sont élaborées avec une forme d'arc de telle sorte qu'elles peuvent se déplacer sur la périphérie circulaire de la première poulie (28) et de la deuxième poulie (29).
13. Appareil selon l'une quelconque des revendications 5 à 12, dans lequel, en utilisation, la vitesse de coupe dudit appareil de coupe transversale (7) est définie de telle manière que le temps requis par ledit couteau (48) pour se déplacer depuis une position A (59) sur le premier bord longitudinal (68) du tissu (2) à une position B (60) sur le deuxième bord longitudinal (69) dudit tissu (2) est le même que le temps requis par le tissu (2) pour parcourir la distance entre la position sur ledit deuxième bord longitudinal (9) qui correspond à ladite position A à la position B (60).
14. Procédé de coupe d'une bande (2) mobile d'un matériau en feuille tissé en utilisant l'appareil selon l'une quelconque des revendications 1 à 13, **caractérisé en ce que** ledit procédé comprend les étapes suivantes :
- de passage de ladite bande (2) à travers lesdits rouleaux de guidage de bande (6, 6A et 6B) pour maintenir une tension appropriée et pour éliminer un rétrécissement de la bande (2) ;
 - de poussée de ladite bande (2) par l'ensemble formant rouleau d'étirage ultérieur (11), ledit ensemble formant rouleau de pré-étirage (9), et ledit ensemble de rouleaux tendeurs (13, 14) et son maintien en bas sur ladite plateforme de coupe (8) prête pour la coupe ;
 - de sortie de ladite bande (2) dudit ensemble formant rouleau de pré-étirage (9) ;
 - de coupe de ladite bande mobile (2) en utilisant ledit ensemble formant couteau mobile (38) présentant un couteau (48) maintenu à l'intérieur dudit couteau de coupe transversale (7) lorsque ladite bande mobile (2) arrive sous ledit appareil de coupe transversale (7) monté à un angle incliné par rapport à l'axe de déplacement de bande (57), tandis que ladite bande mobile (2) est toujours maintenue en bas fermement par ledit ensemble formant rouleau d'étirage ultérieur (11) et ledit ensemble formant rouleau de pré-étirage (9) pour fournir une tension appropriée et un maintien ;
 - le transfert du morceau coupé de ladite bande mobile (2) à une station en aval pour traitement ultérieur tel que souhaité.
15. Procédé selon la revendication 14, dans lequel la vitesse de rotation dudit ensemble formant rouleau d'étirage ultérieur (11) est légèrement plus élevée que la vitesse de rotation de l'ensemble formant rouleau de pré-étirage (11) et dans lequel la vitesse de rotation dudit rouleau de pré-étirage (9) est commandée par un premier moteur (10) et la vitesse de rotation dudit rouleau d'étirage ultérieur (11) est commandée par un deuxième moteur (12) ; et/ou dans lequel la vitesse de coupe dudit appareil de coupe transversale (7) est définie de telle sorte que le temps requis par ledit couteau (48) pour se déplacer depuis une position A (59) sur le premier bord longitudinal (68) du tissu (2) à une position B (60) sur le deuxième bord longitudinal (69) dudit tissu (2) est le même que le temps requis par le tissu (2) pour parcourir la distance entre la position sur ledit deuxième bord longitudinal (9) qui correspond à ladite position A à la position B (60).

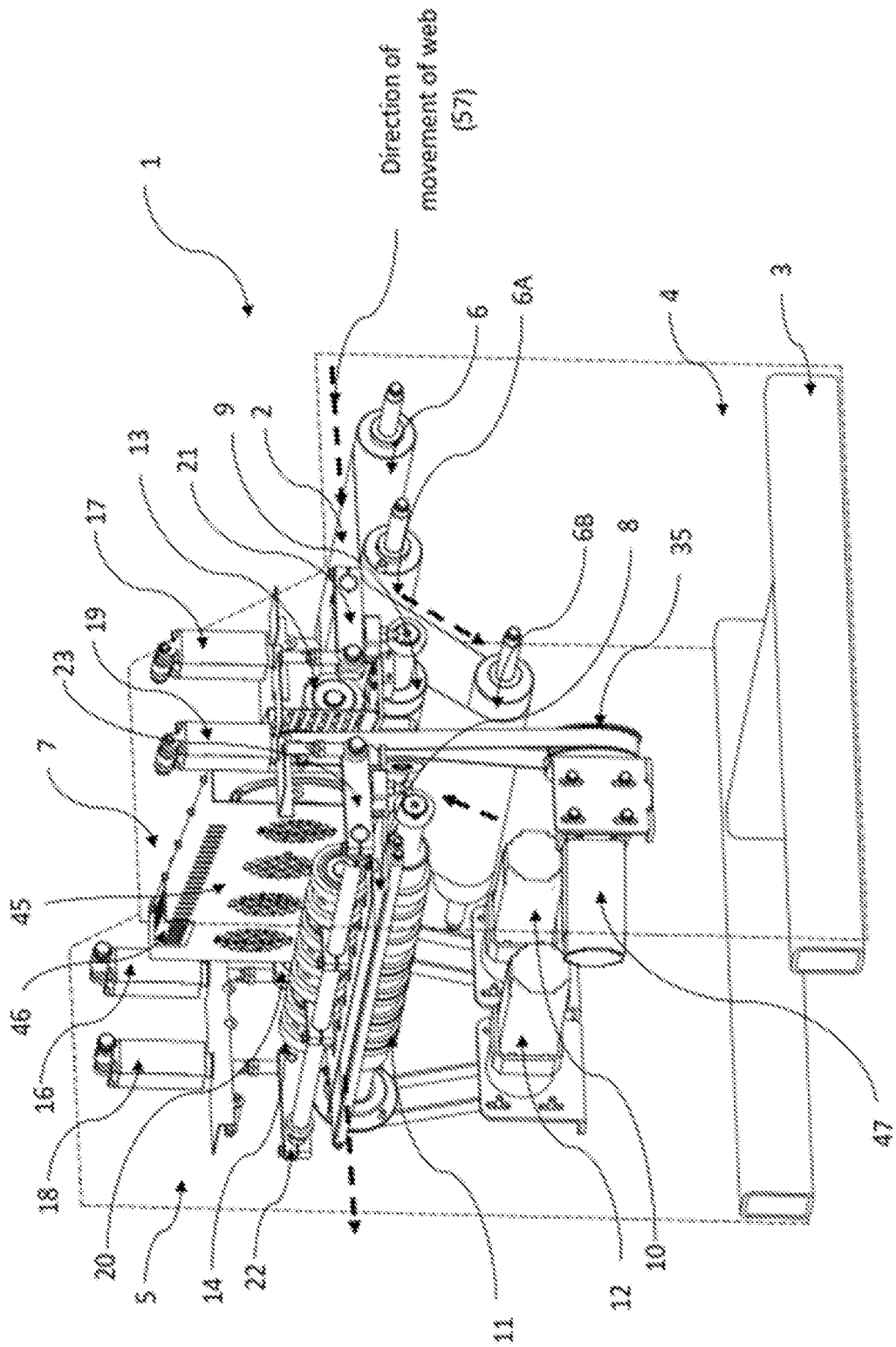


Figure 1

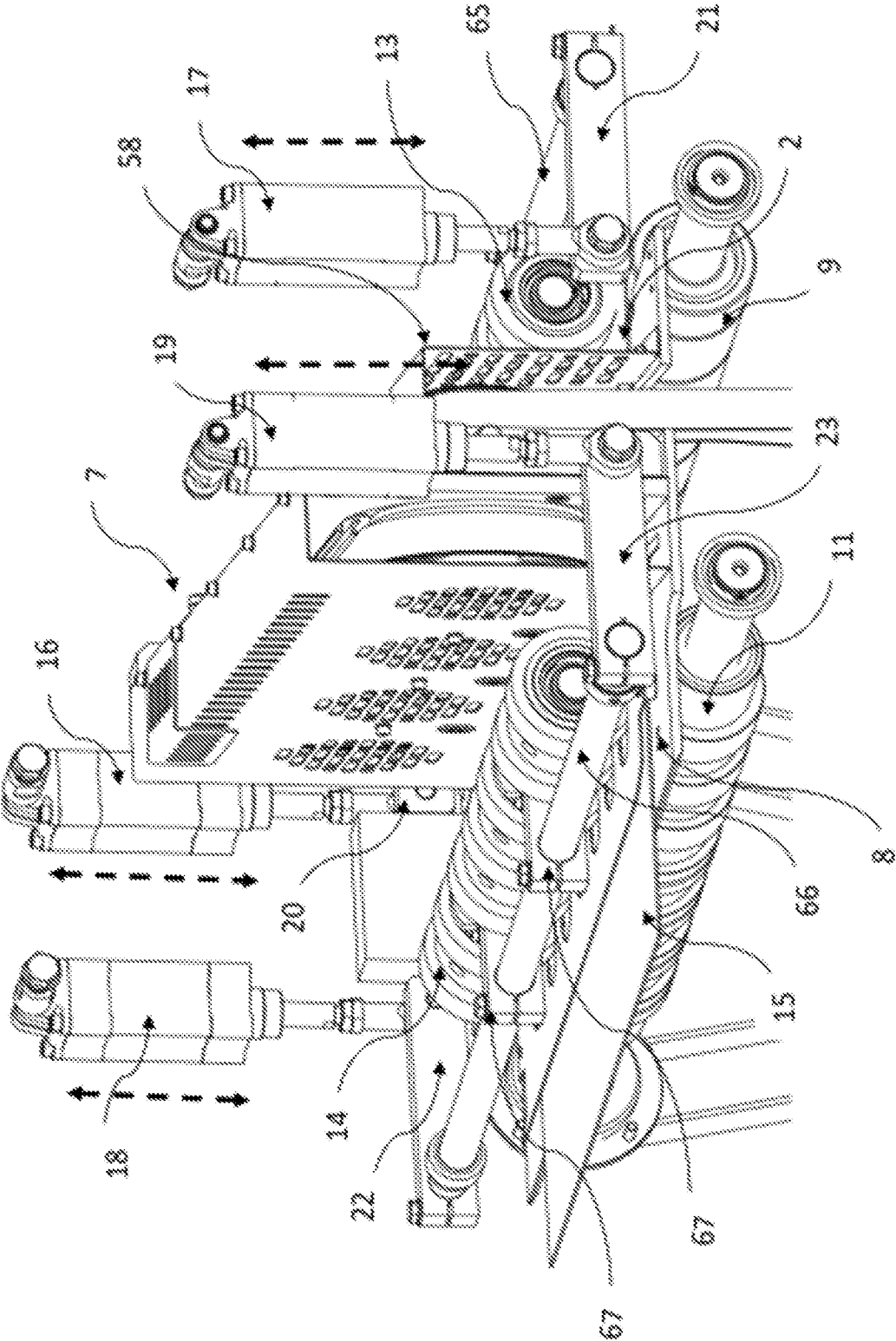


Figure 1A

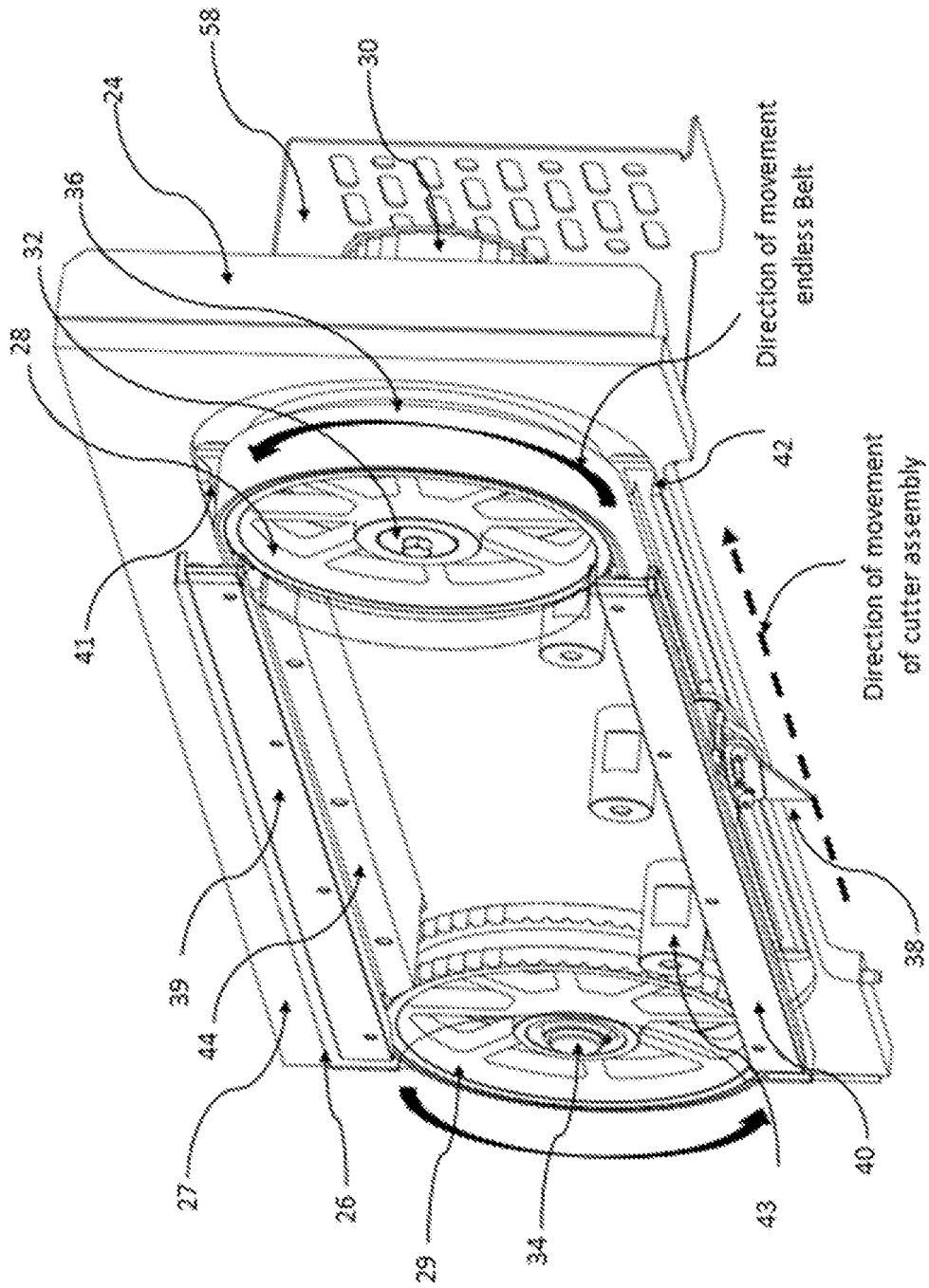


Figure 2

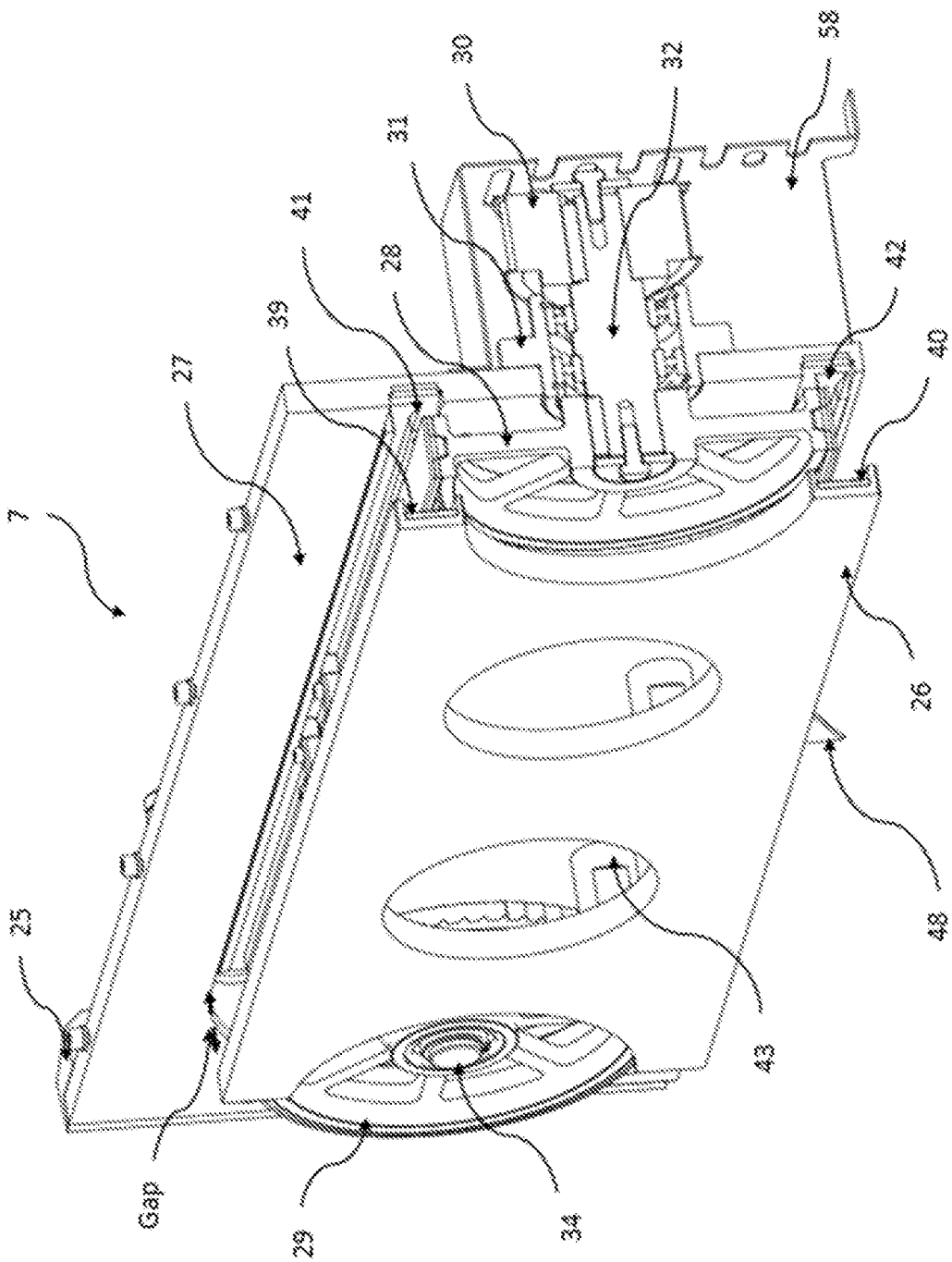


Figure 2A

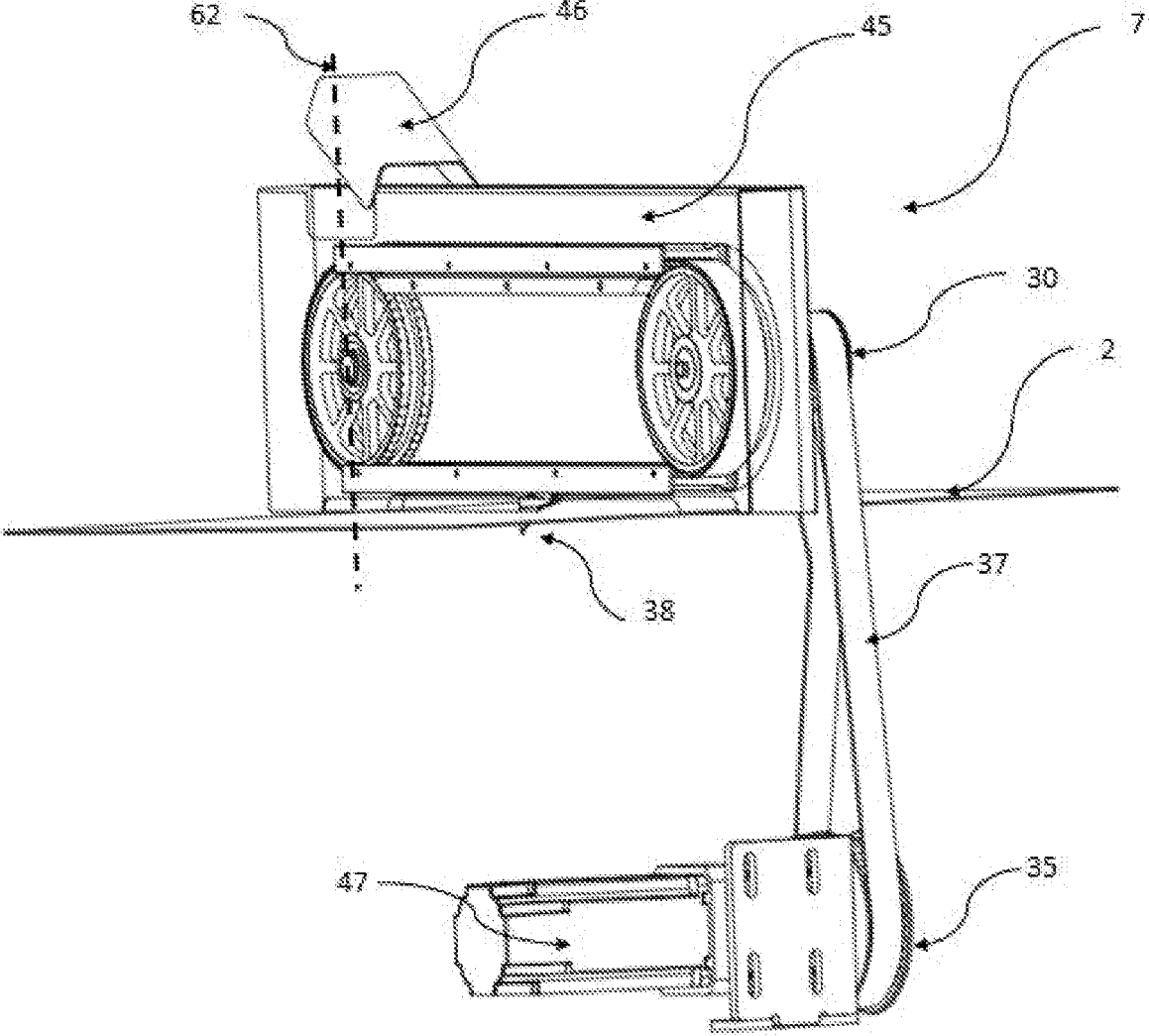


Figure 3

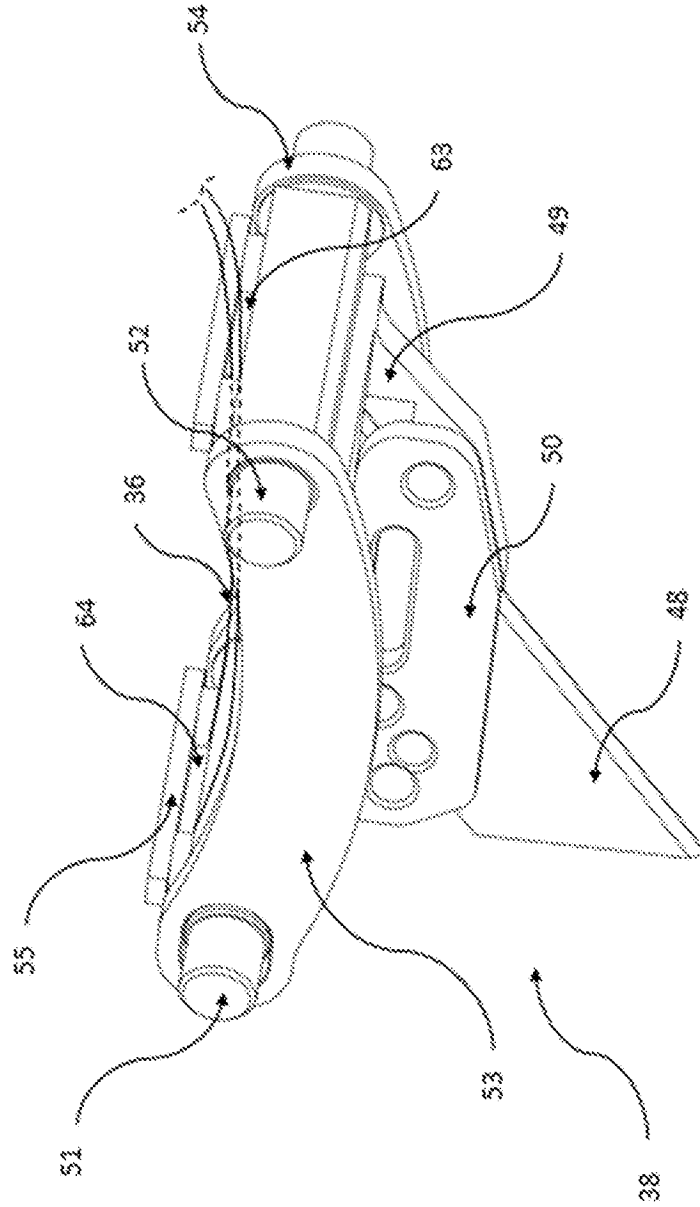


Figure 4

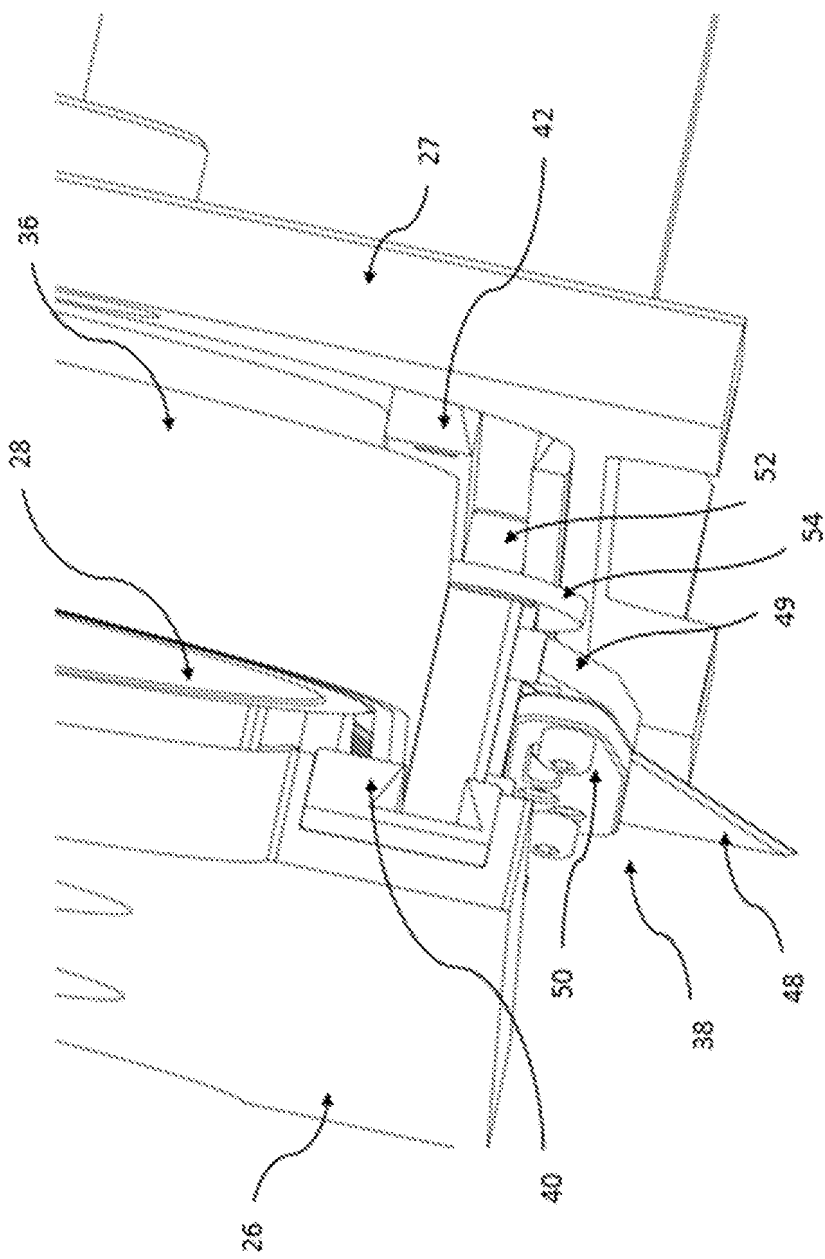


Figure 4A

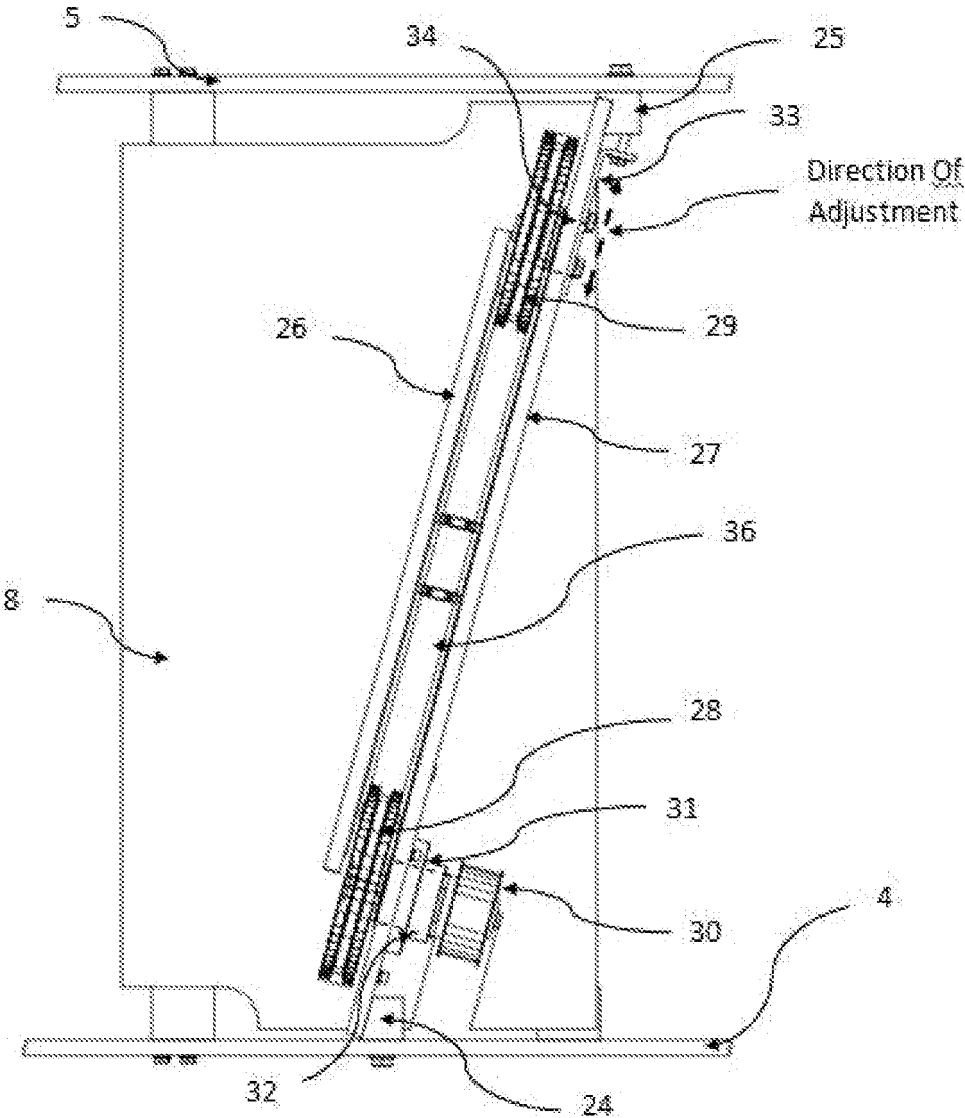


Figure 5

REFERENCES CITED IN THE DESCRIPTION

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