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(54) **CAROUSEL REEL FACILITY**

RUNDLÄUFERROLLENLANLAGE

INSTALLATION DE BOBINE À CARROUSEL

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(56) References cited:
WO-A1-99/03614
DE-A1- 2 037 869
JP-A- 6 328 129
JP-A- S63 188 425
JP-A- 2000 301 234
JP-A- 2004 114 110
JP-U- 58 051 817

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Description

TECHNICAL FIELD

[0001] The present invention relates to a carousel reel facility capable of continuously taking up a transported strip by alternately switching take-up positions of two rotatable take-up drums revolving with a carousel reel.

BACKGROUND ART

[0002] Generally, a cold-rolled strip of soft steel, high-tensile steel, or the like is rolled in a single pass by continuous tandem rolling in order to achieve high efficiency and high yield. In the continuous tandem rolling, a preceding strip and a following strip each unwound from a coil of a hot rolled strip are connected together to form a continuous strip. Then, this strip is continuously fed to a continuous tandem rolling mill to perform cold rolling. Thereafter, the strip is sequentially passed through rolling stands of the continuous tandem rolling mill to be rolled to a target thickness. Subsequently, the rolled strip is again taken up in a coil shape on the delivery side of the continuous tandem rolling mill, where the connecting portion of the preceding strip and the following strip is cut.

[0003] Accordingly, the continuous tandem rolling mill is provided, on the delivery side, with a take-up facility which is capable of continuously taking up the cut preceding strip and following strip in a coil shape. Of various take-up facilities, one in which two rotatable take-up drums revolve with a carousel reel (called a carousel reel facility below) is recently widely used from the viewpoint of productivity and reduction of facility cost.

[0004] As shown in Fig. 6, in such carousel reel facility, a first take-up drum 22 which is disposed at a take-up start position on an upstream side starts to take up a preceding strip Sf. Then, a carousel reel 21 is revolved during the taking-up to move the first take-up drum 22 to a take-up completion position on a downstream side and a second take-up drum 23 to the take-up start position. A trailing edge of the preceding strip Sf is cut by cutting blades 121a, 121b of respective drum shears 12a, 12b in this state. Then, a leading edge of a following strip Sb is taken-up by the second take-up drum 23. By thus switching the take-up positions of the two take-up drums 22, 23, the rolling process can be continuously performed without stopping.

[0005] Meanwhile, the carousel reel facility has been conventionally provided on a delivery side of a continuous finishing facility and of an acid pickling facility. For example, Patent Documents 1 and 2 each disclose a carousel reel facility applied to a continuous finishing facility. In these carousel reel facilities, a take-up start position where a take-up drum starts to take up a strip is set to be lower than an installed position of a deflector roller used to change a direction of the transported strip. In other words, the take-up start position is set to be lower than a pass line of the transported strip.

PRIOR ART DOCUMENTS

PATENT DOCUMENTS

[0006]

Patent Document 1: Japanese Examined Patent Application Publication No. Hei 7-8381
Patent Document 2: Japanese Examined Patent Application Publication No. Hei 7-106384

[0007] WO 99/03614 A1 discloses a carousel reel facility with the features in the pre-characterizing portion of Claim 1. Further carousel reel facilities related to the one of the present invention are disclosed in documents JP S63 188425 A, JP 58 051817 U, JP 2000 301234 A and JP 6 328129 A.

SUMMARY OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0008] On the other hand, in the carousel reel facility provided on the delivery side of the continuous tandem rolling mill for cold rolling as described above, as shown in Fig. 6, the take-up start position where the take-up drums 22, 23 start taking up the strip is set to substantially the same height as the installed position of the deflector roller 13 so that the carousel reel facility can handle high-speed, high-tensile, and hard materials. In other words, the take-up start position is set to substantially the same height as the pass line of the transported strip S. Accordingly, even if the strip S is transported fast, the strip S is taken up by the take-up drum 22, 23 disposed at the take-up start position without overshooting the take-up drum 22, 23 due to its own inertial force.

[0009] In other words, when the carousel reel facility applied to the continuous finishing facility or the like is used on the delivery side of the continuous tandem rolling mill for cold rolling, the following problem occurs. Since the take-up start position is set lower than the installed position of the deflector roller and the transport speed of the strip is high, the strip reaches the take-up start position by its own weight, but may overshoot the take-up drum and may not be taken up by the take-up drum properly.

[0010] Moreover, in the conventional carousel reel facility for cold rolling as shown in Fig. 6, when the strip S is cut by the drum shears 12a, 12b, a trailing edge of the strip S (strip Sf or Sb) taken up by the take-up drum 22, 23 disposed at the take-up completion position is released from tension to be in a non-restrained state. Thus, the strip S may flutter and come into contact with peripheral devices, or may be bent.

[0011] In order to solve such problems, the transport speed of the strip S during cutting has to be set to, for example, 250 m/min or lower in the conventional carousel reel facility for cold rolling. However, recently, faster high-

tensile cold rolling is to be achieved. Accordingly, with the configuration of the conventional carousel reel facility for cold rolling, it is difficult to restrain the behavior of the trailing edge of the cut strip S and appropriately guide it to the take-up drum 22, 23 disposed at the take-up completion position.

[0012] The present invention aims to solve the above problems, and has an object to provide a carousel reel facility capable of, even when a strip to be cut is transported at high speed, stably guiding a trailing edge of the cut strip to a take-up drum.

MEANS FOR SOLVING THE PROBLEMS

[0013] The present invention is defined in independent claim 1.

[0014] In the carousel reel facility of the invention, a transport speed of the strip during the cutting may be set to 250 m/min or higher.

[0015] In the carousel reel facility of the invention, the guiding means may include a magnet for attracting the strip by magnetic force and a roller protruding out relative to an attracting surface of the magnet, and attraction by the magnet may be performed when a transport speed of the strip during the cutting exceeds 300 m/min.

EFFECT OF THE INVENTION

[0016] According to the carousel reel facility of the present invention, even when the strip to be cut is transported at high speed, the trailing edge of the cut strip can be stably guided to the take-up drum. Accordingly, there is no need to reduce the transport speed of the strip more than necessary during the cutting. Thus, productivity and quality of the strip can be improved.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

[Fig. 1] Fig. 1 is a schematic configuration diagram of a carousel reel facility according to one embodiment of the present invention.

[Fig. 2] Fig. 2 is a diagram for explaining a take-up operation.

[Fig. 3] Fig. 3 is a diagram for explaining a take-up operation subsequent to Fig. 2.

[Fig. 4] Fig. 4 is a diagram for explaining a take-up operation subsequent to Fig. 3.

[Fig. 5] Fig. 5 is a diagram for explaining a take-up operation subsequent to Fig. 4.

[Fig. 6] Fig. 6 is a schematic configuration diagram of a conventional carousel reel facility.

EMBODIMENT MODE FOR CARRYING OUT THE INVENTION

[0018] A carousel reel facility according to the present invention will be described in detail by using the drawings.

EMBODIMENT

[0019] Fig. 1 is a schematic configuration diagram of a carousel reel facility according to one embodiment of the present invention. Fig. 2 is a diagram for explaining a take-up operation. Fig. 3 is a diagram for explaining a take-up operation subsequent to Fig. 2. Fig. 4 is a diagram for explaining a take-up operation subsequent to Fig. 3. Fig. 5 is a diagram for explaining a take-up operation subsequent to Fig. 4.

[0020] The carousel reel facility 1 shown in Fig. 1 is, for example, provided on a delivery side of a continuous tandem rolling mill including multiple rolling mill stands, in an unillustrated cold rolling mill line for manufacturing a cold-rolled strip (hereinafter, referred to as strip S). The strip S is formed as follows. Preceding strip Sf and following strip Sb (see Figs. 2 to 5) which are hot milled and coiled are unwound on the entry side of the continuous tandem rolling mill. Then, a trailing edge of the preceding strip Sf and a leading edge of the following strip Sb are connected. The above processing is repeated. Thus formed strip S is continuously fed to the continuous tandem rolling mill.

[0021] As shown in Fig. 1, a pair of upper and lower entry-side rollers 11a, 11b is rotatably supported on the entry side of the carousel reel facility 1. These entry-side rollers 11a, 11b are disposed facing each other to hold the transported strip S in between.

[0022] A pair of upper and lower drum shears 12a, 12b is rotatably supported downstream of the entry-side rollers 11a, 11b. These drum shears 12a, 12b are disposed facing each other to hold the strip S transported from the entry-side rollers 11a, 11b in between. Cutting blades 121a, 121b are provided on the circumferential portions of the drum shears 12a, 12b, respectively, and are arranged to face each other when the drum shears are rotated. In other words, when the drum shears 12a, 12b make one revolution synchronously with the transport speed of the strip S and synchronously with each other in opposite directions, the protruding cutting blades 121a, 121b cut the strip S at a predetermined position.

[0023] A deflector roller 13 is rotatably supported downstream of the drum shears 12a, 12b. The deflector roller 13 changes the transport direction of the strip S by winding the strip S thereon.

[0024] Guide plates 14, 15 are provided below the deflector roller 13. The guide plate 14 extends in the transport direction of the strip S and is fixed. The guide plate 15, which will be described in detail later, is supported to be moveable between a guide position for guiding the strip S and a retracted position where the guide 15 is retracted from the guide position. Note that the guide plate 15 shown in Fig. 1 is disposed at the guide position.

[0025] Meanwhile, a disk shaped carousel reel 21 is provided on a delivery side of the carousel reel facility 1, and is rotationally driven about a substantially-horizontal

axis thereof. A first take-up drum 22 and a second take-up drum 23 are provided on a front surface of the carousel reel 21, and are supported in such a manner as to be rotatable about substantially-horizontal axes thereof, respectively. The first take-up drum 22 and the second take-up drum 23 are arranged to be symmetrical with respect to the rotation axis of the carousel reel 21. The first take-up drum 22 takes up the cut preceding strip Sf, and the second take-up drum 23 takes up the cut following strip Sb.

[0026] Note that, in the rotating state of the carousel reel 21 shown in Fig. 1, the first take-up drum 22 is disposed at a take-up start position on a reel upstream side, and the second take-up drum 23 is disposed at a take-up completion position on a reel downstream side. The take-up positions of the first take-up drum 22 and the second take-up drum 23 can be switched by revolving the carousel reel 21 180° clockwise. The take-up start position is set to be lower than the take-up completion position, and also the take-up drum 22, 23 disposed at the take-up start position is disposed at substantially the same height as the deflector roller 13. In other words, the take-up start position is set to be substantially the same height as the pass line of the strip S transported from the entry side of the carousel reel facility 1.

[0027] Here, a belt wrapper 24 is attachable and detachable to the first take-up drum 22 or the second take-up drum 23 disposed at the take-up start position. The belt wrapper 24 has a configuration in which a pressing belt is wound around multiple rollers. The belt wrapper 24 is wound around a circumferential surface of the take-up drum 22, 23, thereby assisting the leading edge of the cut strip Sf or Sb to be wrapped around the circumferential surface of the take-up drum 22, 23.

[0028] In addition, multiple rotatable snubber rollers 25 (three in the drawings) are attachable and detachable to the first take-up drum 22 or the second take-up drum 23 disposed at the take-up completion position. The snubber rollers 25 are swingably supported, and come into contact with the circumferential surface of the strip Sf or Sb taken up by the take-up drum 22, 23, while following an increase in the coil diameter of the strip. The snubber rollers 25 thus press the strip Sf or Sb taken up in a coil shape so that the strip does not spring back. In other words, as the coil diameter of the strip S increases along with progress in the taking-up of the strip S by the take-up drum 22, 23, the snubber rollers 25 swing outward in the coil diameter direction while pressing against the circumferential surface of the strip S.

[0029] The snubber roller (pressing means) 25 disposed at the highest position is rotatably supported by a tip of a swing arm 26. The swing arm 26 is swingably supported at its base end. A receiving pad 27 is provided at the tip of the swing arm 26 in such a manner as not to interfere with the rotation of the snubber roller 25.

[0030] Moreover, a base end of a guide frame 31 is swingably supported by a rotation shaft of the deflector roller 13. A guide roller 32 is rotatably supported by a tip of the guide frame 31. The guide roller 32 is disposed to face an upper surface of the receiving pad 27.

[0031] In addition, magnets 33 and support rollers 34 are alternately provided on a bottom surface of the guide frame 31 from the base end to the tip end thereof. The support rollers 34 are disposed so that circumferential surfaces thereof may protrude from attracting surfaces of the magnets 33. Meanwhile, a link member 35 is provided on an upper surface of the guide frame 31. One end of a link bar 36 is swingably supported by the link member 35. A rod 37a of an elevating/lowering cylinder 37 is swingably supported by the other end of the link bar 36. Further, the base end of the elevating/lowering cylinder 37 is also swingably supported.

[0032] Note that the guide frame 31, the guider roller 32, the magnets 33, and the support rollers 34 constitute guiding means, and that the link member 35, the link bar 36, and the elevating/lowering cylinder 37 constitute swinging means and swing allowing means.

[0033] Extension of the rod 37a of the elevating/lowering cylinder 37 brings the guide roller 32 of the guide frame 31 into contact with the receiving pad 27 of the swing arm 26. As a result, the guide frame 31 is swung to a guide position, and the strip S (strip Sf or Sb) to be taken up by the take-up roller 22, 23 disposed at the take-up completion position can be guided by the support rollers 34 while being attracted by the magnets 33 (see Fig. 1).

[0034] Meanwhile, contraction of the rod 37a of the elevating/lowering cylinder 37 brings the guide roller 32 of the guide frame 31 away from the receiving pad 27 of the swing arm 26. As a result, swung to a retracted position, the guide frame 31 can avoid interference with the take-up drums 22, 23 which are moved by the revolution of the carousel reel 21 (see Figs. 4 and 5).

[0035] When disposed at the guide position, the guide frame 31 is made to swing by the snubber roller 25 and the guide roller 32 as the coil diameter of the strip S (strip Sf or Sb) taken up by the take-up drum 22, 23 disposed at the take-up completion position increases. When the guide frame 31 is made to swing as described above, the rod 37a of the elevating/lowering cylinder 37 is maintained in the extended state. Meanwhile, the link member 35, the link bar 36, and the elevating/lowering cylinder 37 swing to operate as a link mechanism which allows the guide frame 31 to swing.

[0036] A demagnetizing device 38 is provided in the guide frame 31 in such a manner as to face the magnets 33. The demagnetizing device 38 demagnetizes peripheral devices magnetized by the magnetic forces of the magnets 33 when the carousel reel facility 1 is shut down and the magnetic forces of the magnets 33 are being turned off.

[0037] Next, the take-up operations of the carousel reel facility 1 will be described in detail by using Figs. 2 to 5.

[0038] First, as shown in Fig. 2, the direction of the strip S (strip Sf) cold-rolled by the continuous tandem rolling mill is changed by the deflector roller 13, and the strip Sf

is then taken up by the first take-up drum 22 having moved to the take-up completion position.

[0039] At this time, the snubber rollers 25 are in contact with the circumferential surface of the preceding strip Sf taken up by the first take-up drum 22. The snubber rollers 25 thus press the preceding strip Sf so that the strip does not spring back. Meanwhile, the rod 37a of the elevating/lowering cylinder 37 is extended to bring the guide roller 32 in contact with the receiving pad 27, so that the guide frame 31 is disposed at the guide position. Accordingly, the preceding strip Sf is attracted to the magnets 33, and comes into contact with the support rollers 34. As a result, the preceding strip Sf is stably guided to the first take-up drum 22 by the rotation of the support rollers 34 without fluttering or springing back.

[0040] Note that the second take-up drum 23 having moved to the take-up start position is in a stand-by as a substitute while being rotationally driven. The belt wrapper 24 is wound around the circumferential surface of the second take-up drum 23.

[0041] Next, as shown in Fig. 3, the snubber rollers 25 swing outward in the coil diameter direction of the preceding strip Sf as the coil diameter of the preceding strip Sf taken up by the first take-up drum 22 increases. Along with this, the swing arm 26 also swings. Thereby, the guide roller 32 rolls on the receiving pad 27 of the swing arm 26, and consequently the guide frame 31 also swings.

[0042] As described, the snubber rollers 25 swing along with the increase in the coil diameter of the preceding strip Sf, and the link member 35, the link bar 36, and the elevating/lowering cylinder 37 in the extended state performs the link operation. This causes the guide frame 31 to swing at substantially the same angle as a take-up angel of the preceding strip S in accordance with the swinging of the snubber rollers 25. As a result, the attracting surfaces of the magnets 33 are always parallel to the surface of the preceding strip Sf. Thus, efficient attracting is performed, and the surface of the preceding strip Sf is securely in contact with the circumferential surfaces of the support rollers 34 to stably guide the preceding strip Sf. Moreover, since there is no need to operate the elevating/lowering cylinder 37, the guide frame 31 operates in accordance with the snubber rollers 25 through the guide roller 32 without any response delay to the swinging of the snubber rollers 25.

[0043] Thereafter, when the coil diameter of the preceding strip Sf taken up by the first take-up drum 22 reaches a certain size, the cutting blades 121a, 121b protrude from the drum shears 12a, 12b rotationally driven, thereby cutting the connecting portion between the preceding strip Sf and the following strip Sb. At this time, since the preceding strip Sf is attracted to the magnets 33 of the guide frame 31 before being cut and is therefore stably guided, the trailing edge of the preceding strip Sf is stably guided along the support rollers 34 to the first take-up drum 22 without fluttering or springing back even after the preceding strip Sf loses its tension by being cut.

[0044] Then, as shown in Fig. 4, a coil of the preceding strip Sf taken up by the first take-up drum 22 is pulled out by an unillustrated coil pulling-out device. At this time, the rod 37a of the elevating/lowering cylinder 37 contracts to move the guide frame 31 to the retracted position, and the snubber rollers 25 are also retracted outward from the carousel reel 21.

[0045] Meanwhile, the attraction of the lowermost (base end side of the guide frame 31) magnet 33 is turned off, and therefore the cut following strip Sb travels on the guide plate 15 having moved to the guide position and is taken up by the second take-up drum 23 disposed at the take-up start position. At this time, since the belt wrapper 24 is wound around the circumferential surface of the second take-up drum 23, the leading edge of the cut following strip Sb is securely wound around the circumferential surface of the second take-up drum 23.

[0046] Next, as shown in Fig. 5, the guide plate 15 is moved to the retracted position, and the belt wrapper 24 is released from the second take-up drum 23 and retracted downward. Then, the carousel reel 21 is revolved 180°. Thus, the second take-up drum 23 is moved to the take-up completion position while taking up the following strip Sb. On the other hand, the first take-up drum 22 is moved to the take-up start position to be in the stand-by state. Thereafter, similar take-up operations are repeated in sequence.

[0047] The carousel reel facility of the present invention achieves the following. The tip of the guide frame 31 is caused to be attachably and detachably in contact with the snubber roller 25 which is pressing against the circumferential surface of the strip S taken up at the take-up completion position, while following an increase in the coil diameter. This allows the guide frame 31 to swing in accordance with the coil diameter following operation of the snubber rollers 25. Thus, the strip S is attracted to the magnets 33 regardless of its coil diameter, and comes into contact with the support rollers 34. Accordingly, even when the strip S is cut and is released from tension, the trailing edge thereof is stably guided to the take-up drum 22, 23 disposed at the take-up completion position.

[0048] Moreover, when the snubber roller 25 performs the coil diameter following operation in accordance with an increase in the coil diameter, the rod 37a of the elevating/lowering cylinder 37 is maintained at the extended state, and the link member 35, the link bar 36, and the elevating/lowering cylinder 37 operate as the link mechanism. This allows the guide frame 31 to swing at substantially the same angle as the take-up angle of the strip S. Thus, the strip S is effectively attracted to the magnets 33, and is stably guided by the support rollers 34. In addition, the guide frame 31 can operate in accordance with the coil diameter following operation of the snubber rollers 25 without any response delay.

[0049] As a result, fluttering and moving around of the trailing edge of the strip S due to springback of the strip S toward the take-up completion position at the time of the cutting is prevented. This can prevent folding or dam-

aging of the trailing edge, and in turn, damaging of the peripheral devices. Accordingly, there is no need to reduce the transport speed of the strip S more than necessary when the cutting is performed. For example, the transport speed of the strip S when the cutting is performed can be set to 250 m/min to 350 m/min. This not only increases the productivity, but also eliminates the risk of adversely affecting a plate-shape control of the strips S during rolling. As a result, the strip S can be rolled highly accurately, and the quality thereof can be improved.

[0050] Furthermore, in the carousel reel facility according to the present invention, when the transport speed of the strip S is 250 m/min to 300 m/min during the cutting, the trailing edge of the strip S can be guided only by the support rollers 34 without the strip S being attracted to the magnets 33. Thus, the carousel reel facility is configured to perform the attraction of the magnets 33 only when the transport speed of the strip S is 300 m/min to 350 m/min during the cutting.

INDUSTRIAL APPLICABILITY

[0051] The present invention is applicable to a highly productive carousel reel facility having excellent yield.

EXPLANATION OF REFERENCE NUMERALS

[0052]

1	Carousel reel facility
11a, 11b	Entry-side roller
12a, 12b	Drum shear
121a, 121b	Cutting blade
13	Deflector roller
14, 15	Guide plate
21	Carousel reel
22	First take-up drum
23	Second take-up drum
24	Belt wrapper
25	Snubber roller
26	Swing arm
27	Receiving pad
31	Guide frame
32	Guide roller
33	Magnet
34	Support roller
35	Link member
36	Link bar
37	Elevating/lowering cylinder
37a	Rod
38	Demagnetizing device

Claims

1. A carousel reel facility (1) in which
a disk-shaped revolvable carousel reel (21) is provided with two rotatable take-up drums (22, 23) disposed at respective positions symmetric to each other with respect to a rotation axis of the carousel reel (21),
one of the take-up drums (22) which is disposed on an upstream side starts to take up a preceding strip (S, Sf),
during the taking-up, the carousel reel (21) is revolved to move the one take-up drum (22) to a downstream side and the other take-up drum (3) to the upstream side, and
in this state, a trailing edge of the preceding strip (S, Sf) is cut, and a lead-ing edge of a following strip (S, Sb) is taken up by the other take-up drum, the carousel reel facility (1) comprising:

a deflector roller (13) provided on an entry side of the carousel reel (21) at a position almost as high as the take-up drum (22, 23) disposed on the upstream side, the deflector roller (13) guiding the transported strip (S, Sf, Sb) to any of the take-up drums (22, 23) disposed on the upstream side and the downstream side;
a snubber roller (25) rotatably supported by a tip of a swingably supported swing arm (26) and pressing against a circumferential surface of the strip (S, Sf, Sb) taken up by the take-up drum (22, 23) disposed on the downstream side, while following an increase in a coil diameter of the strip (S, Sf, Sb) and thus prevents fluttering of the trailing edge of the cut strip (S, Sf, Sb);
guiding means (31, 32, 33, 34) including a guide frame swingably supported at a base end thereof by the rotation shaft of the deflector roller (13) such that the guiding means (31, 32, 33, 34) are swingable about the rotation shaft of the deflector roller (13), the guiding means guiding the trailing edge of the cut strip (S, Sf, Sb) to the take-up drum (22, 23) disposed on the downstream side while having a tip of the guiding means (31, 32, 33, 34) work in accordance with a coil diameter following operation of the snubber roller (25);
swinging means (35, 36, 37) that causes the guiding to swing so that the guide means (31, 32, 33, 34) does not interfere with the take-up drums (22, 23) moved by the revolution of the carousel reel (21); and
swing allowing means (35, 36, 37) that allows the guiding means (31, 32, 33, 34) to swing in accordance with the coil diameter following operation of the snubber roller (25) without operating the swinging means (35, 36, 37);
characterized in that
a receiving pad (27) is provided at the tip end of the swing arm (26) in such a manner as not to interfere with a rotation of the snubber roller (25), and

the guiding means (31, 32, 33, 34) further includes a guide roller (32) rotatably supported by a tip end of the guide frame (31), the guide roller being attachable and detachable to a top surface of the receiving pad (27).

2. The carousel reel facility according to claim 1, wherein the guiding means (31, 32, 33, 34) are adapted to set a transport speed of the strip during the cutting to 250 m/min or higher.

Patentansprüche

1. Rundlaufaufrollanlage (1), in der
eine scheibenförmige drehbare Rundlaufrolle (21) mit zwei rotierbaren Aufnahmetrommeln (22, 23) versehen ist, die jeweils an bezüglich einer Rotationsachse der Rundlaufrolle (21) zueinander symmetrischen Positionen angeordnet sind,
eine der Aufnahmetrommeln (22), die an einer stromaufwärtigen Seite angeordnet ist, einen vorhergehenden Streifen (S, Sf) aufzunehmen beginnt, die Rundlaufrolle (21) während des Aufnehmens gedreht wird, um die eine Aufnahmetrommel (22) auf eine stromabwärtige Seite und die andere Aufnahmetrommel (3) auf die stromaufwärtige Seite zu bewegen, und
in diesem Zustand eine nachlaufende Kante des vorhergehenden Streifens (S, Sf) geschnitten wird und eine führende Kante eines folgenden Streifens (S, Sb) von der anderen Aufnahmetrommel aufgenommen wird, wobei die Rundlaufaufrollanlage (1) umfasst:

eine Ablenkrolle (13), die auf einer Eingangsseite der Rundlaufrolle (21) an einer fast so hohen Position wie die auf der stromaufwärtigen Seite angeordnete Aufnahmetrommel (22, 23) vorgesehen ist, wobei die Ablenkrolle (13) den geförderten Streifen (S, Sf, Sb) zu irgendeiner der auf der stromaufwärtigen und der stromabwärtigen Seite angeordneten Aufnahmetrommeln (22, 23) führt;
eine Dämpfungsrolle (25), die von einer Spitze eines schwenkbar gehaltenen Schwenkarms (26) rotierbar gehalten wird und gegen eine Umfangsoberfläche des Streifens (S, Sf, Sb), der von der auf der stromabwärtigen Seite angeordneten Aufnahmetrommel (22, 23) aufgenommen wird, drückt, während sie einer Erhöhung in einem Spuldurchmesser des Streifens (S, Sf, Sb) folgt, und damit das Flattern der nachfolgenden Kante des geschnittenen Streifens (S, Sf, Sb) verhindert;
eine Führungseinrichtung (31, 32, 33, 34), die einen Führungsrahmen enthält, der an seinem Basisende durch die Rotationswelle der Ablenkrolle (13) schwenkbar gehalten wird, sodass die Führungseinrichtung (31, 32, 33, 34) um die Rotationswelle der Ablenkrolle (13) schwenkbar ist, wobei die Führungseinrichtung die nachfolgende Kante des geschnittenen Streifens (S, Sf, Sb) zu der auf der stromabwärtigen Seite angeordneten Aufnahmetrommel (22, 23) führt, während eine Spitze der Führungseinrichtung (31, 32, 33, 34) gemäß einem Spuldurchmesserfolgevorgang der Dämpfungsrolle (25) arbeiten gelassen wird;
eine Schwenkeinrichtung (35, 36, 37), die die Führungseinrichtung schwingen lässt, sodass die Führungseinrichtung (31, 32, 33, 34) nicht die durch die Drehung der Rundlaufrollen (21) bewegten Aufnahmetrommeln (22, 23) stört; und
eine Schwingmöglichkeitseinrichtung (35, 36, 37), die der Führungseinrichtung (31, 32, 33, 34) das Schwingen gemäß dem Spuldurchmesserfolgevorgang der Dämpfungsrolle (25) ohne Betreiben der Schwenkeinrichtung (35, 36, 37) ermöglicht;
gekennzeichnet dadurch, dass
ein Empfangsblock (27) am spitzen Ende des Schwenkarms (26) so vorgesehen ist, dass er die Rotation der Dämpfungsrolle (25) nicht stört, und
die Führungseinrichtung, (31, 32, 33, 34) ferner eine Führungsrolle (32) enthält, die von einem spitzen Ende des Führungsrahmens (31) rotierbar gehalten wird, wobei die Führungsrolle an und von einer oberen Oberfläche des Empfangsblocks (27) anbringbar und abnehmbar ist.

2. Rundlaufaufrollanlage nach Anspruch 1, wobei die Führungseinrichtung (31, 32, 33, 34) dazu ausgelegt ist, eine Fördergeschwindigkeit des Streifens während des Schneidens auf 250 m/min oder höher einzustellen.

Revendications

1. Installation de bobine à carrousel (1) dans laquelle :

une bobine à carrousel rotative en forme de disque (21) est prévue avec deux tambours d'enroulement rotatifs (22, 23) disposés dans des positions respectives symétriques entre elles par rapport à un axe de rotation de la bobine à carrousel (21),
l'un des tambours d'enroulement (22) qui est disposé sur un côté en amont, commence à enrouler une bande précédente (S, Sf),
pendant l'enroulement, la bobine à carrousel (21) est entraînée en rotation pour déplacer le un tambour d'enroulement (22) vers un côté en

aval et l'autre tambour d'enroulement (3) vers le côté en amont, et
dans cet état, un bord de fuite de la bande précédente (S, Sf) est coupé, et un bord d'attaque d'une bande suivante (S, Sb) est pris par l'autre tambour d'enroulement, l'installation de bobine à carrousel (1) comprenant :

un rouleau déflecteur (13) prévu sur un côté d'entrée de la bobine à carrousel (21) dans une position presque aussi haute que le tambour d'enroulement (22, 23) disposé du côté en amont, le rouleau déflecteur (13) guidant la bande transportée (S, Sf, Sb) vers l'un quelconque des tambours d'enroulement (22, 23) disposés du côté en amont et du côté en aval ;
un rouleau tracteur (25) supporté en rotation par une pointe d'un bras oscillant (26) supporté de manière oscillante, et appuyant contre une surface circonférentielle de la bande (S, Sf, Sb) prise par le tambour d'enroulement (22, 23) disposé du côté en aval, tout en suivant une augmentation d'un diamètre de bobine de la bande (S, Sf, Sb) et empêche ainsi le flottement du bord de fuite de la bande coupée (S, Sf, Sb) ;
des moyens de guidage (31, 32, 33, 34) comprenant un bâti de guidage supporté de manière oscillante au niveau de son extrémité de base par l'arbre de rotation du rouleau déflecteur (13) de sorte que les moyens de guidage (31, 32, 33, 34) peuvent osciller autour de l'arbre de rotation du rouleau déflecteur (13), les moyens de guidage guidant le bord de fuite de la bande coupée (S, Sf, Sb) vers le tambour d'enroulement (22, 23) disposé du côté en aval tout en ayant une pointe des moyens de guidage (31, 32, 33, 34) qui fonctionne selon un diamètre de bobine suite au fonctionnement du rouleau tracteur (25) ;
les moyens d'oscillation (35, 36, 37) qui amènent le guidage à osciller de sorte que les moyens de guidage (31, 32, 33, 34) n'interfèrent pas avec les tambours d'enroulement (22, 23) déplacés par la révolution de la bobine à carrousel (21) ; et
des moyens d'autorisation d'oscillation (35, 36, 37) qui permettent aux moyens de guidage (31, 32, 33, 34) d'osciller selon le diamètre de bobine suite au fonctionnement du rouleau tracteur (25) sans actionner les moyens d'oscillation (35, 36, 37) ;
caractérisée en ce que :

un patin de réception (27) est prévu au niveau de l'extrémité de pointe du bras oscillant (26) de sorte à ne pas interférer avec une rotation du rouleau tracteur (25), et
les moyens de guidage (31, 32, 33, 34) comprennent en outre un rouleau de guidage (32) supporté en rotation par une extrémité de pointe du bâti de guidage (31), le rouleau de guidage pouvant être fixé à et détaché d'une surface supérieure du patin de réception (27).

2. Installation de bobine à carrousel selon la revendication 1, dans laquelle les moyens de guidage (31, 32, 33, 34) sont adaptés à régler une vitesse de transport de la bande pendant la coupe à 250 m/min ou supérieure.

Fig. 1

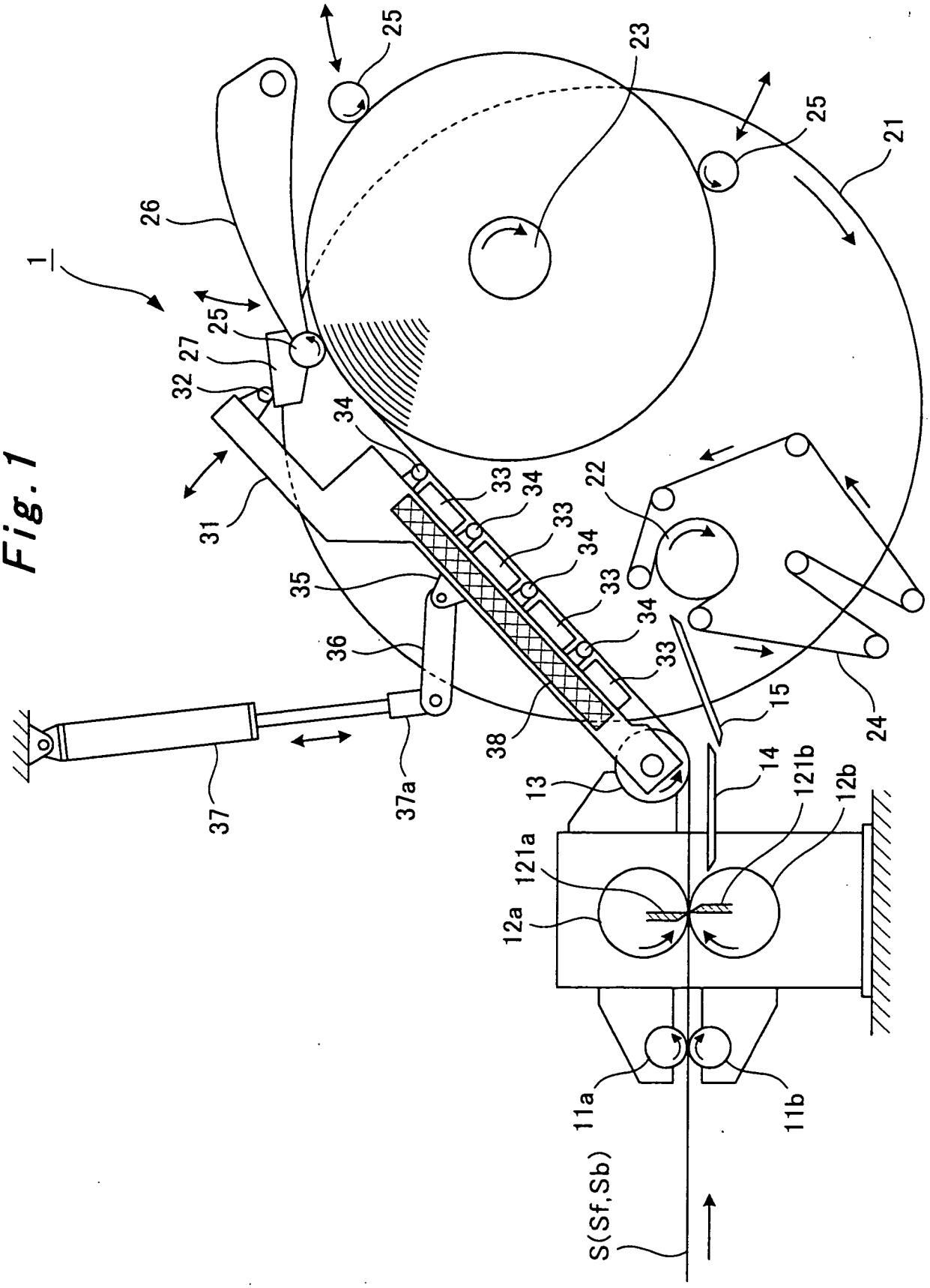

1
11a
11b
12a
12b
13
14
15
21
22
23
24
25
26
27
31
32
33
34
35
36
37
37a
38
121a
121b
S(Sf,Sb)

Fig. 2

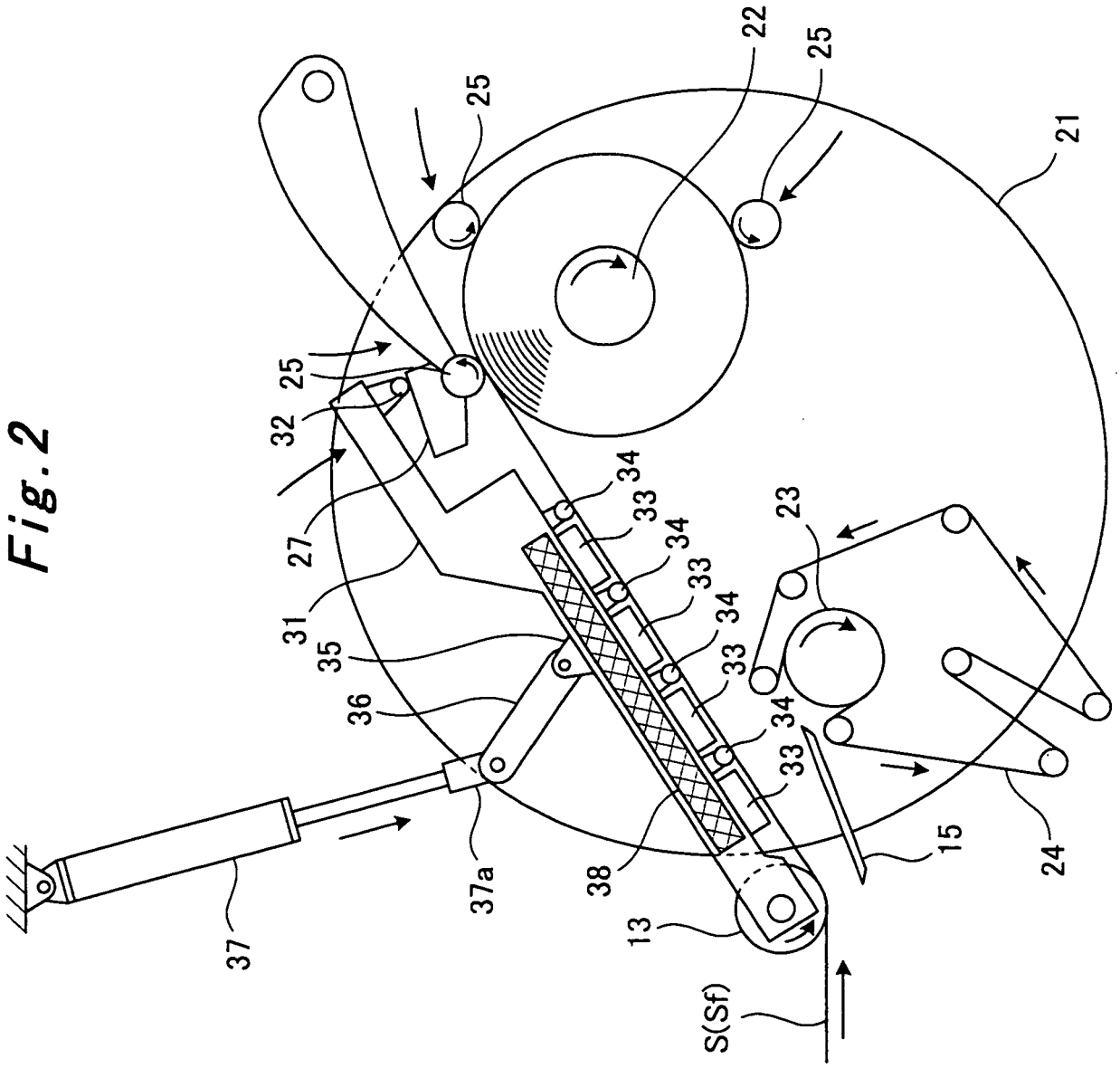
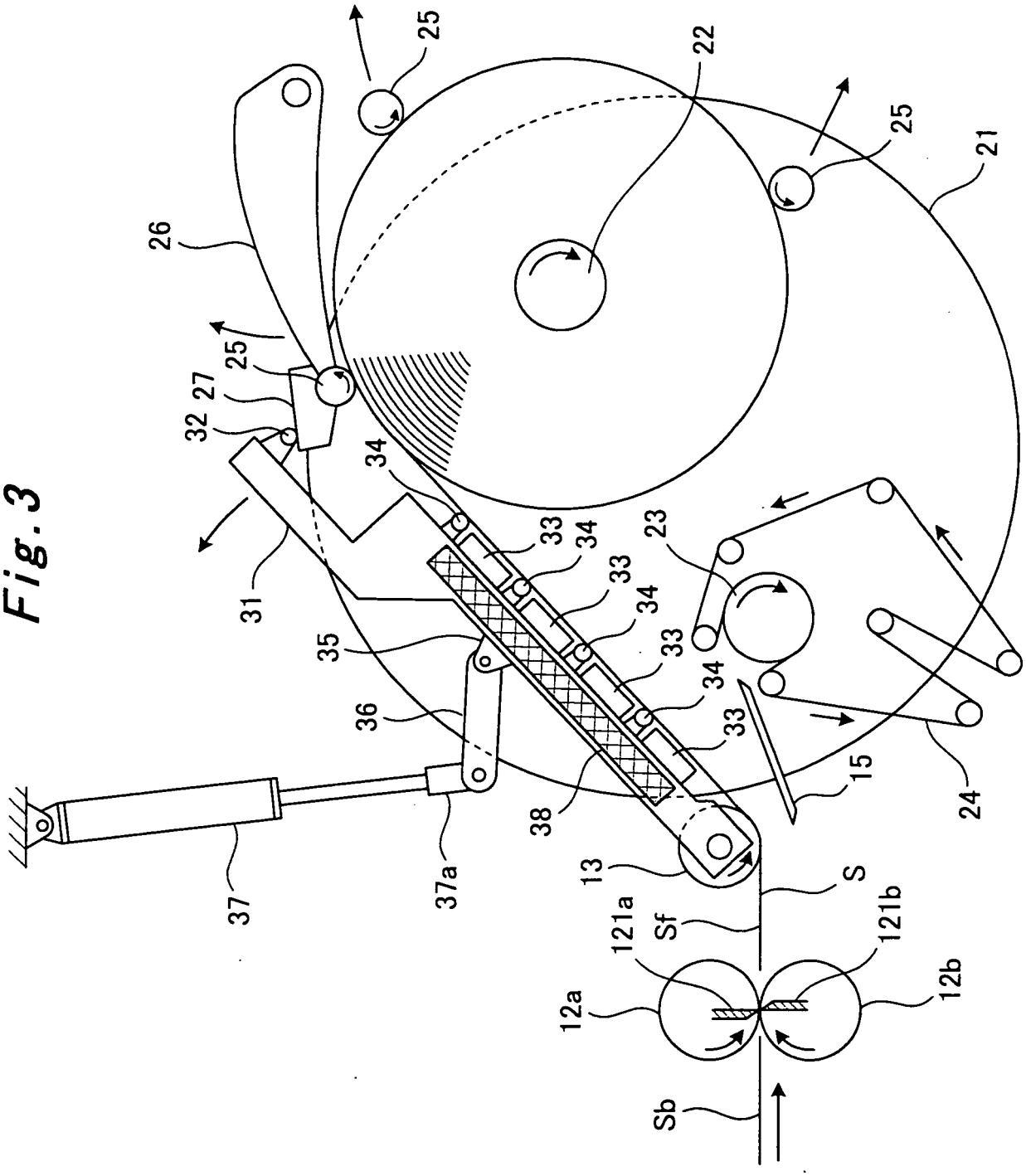


Fig. 3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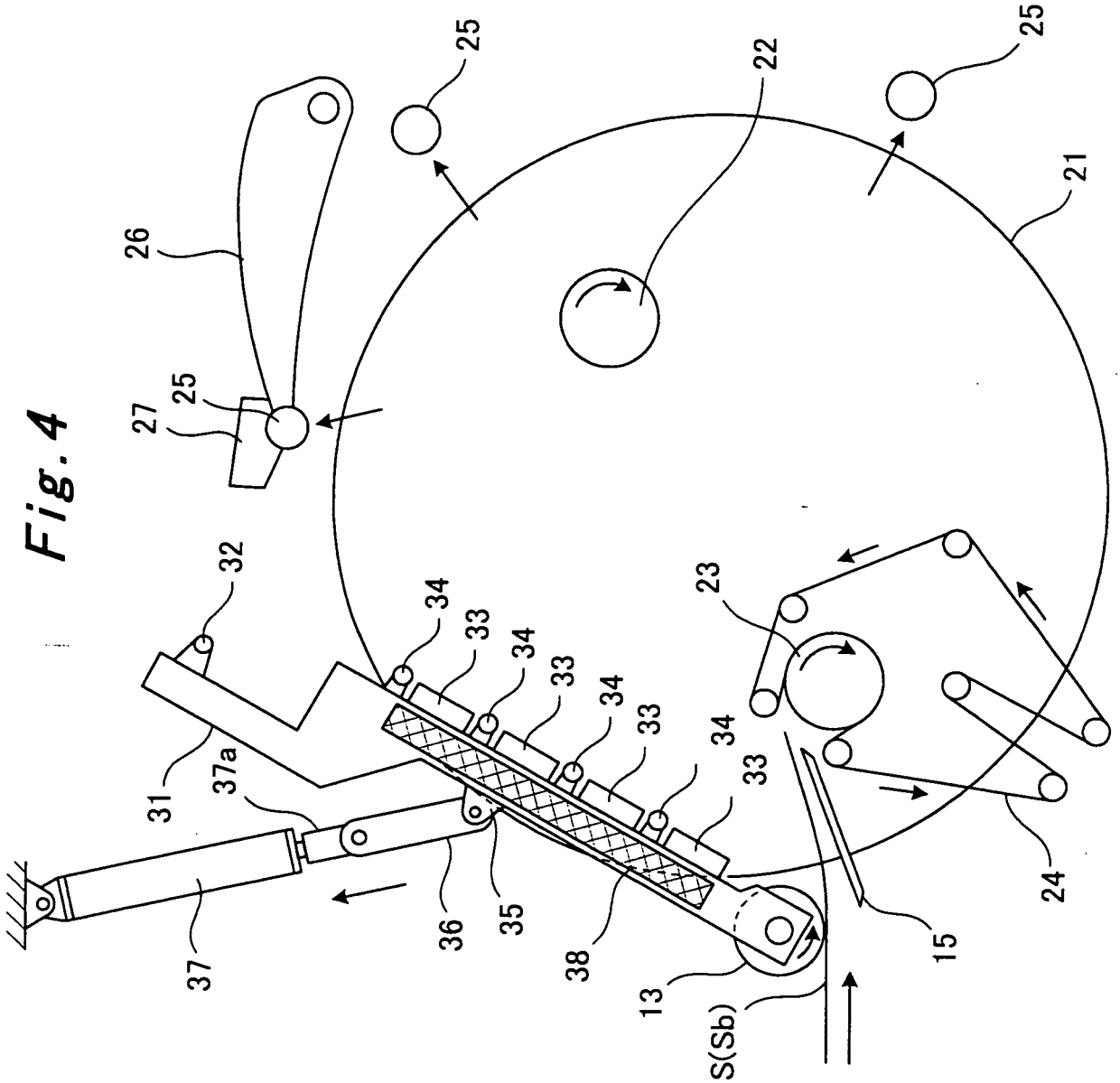
37a
13
S
121a
Sf
121b
12a
12b
Sb

Fig. 4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32
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33
34
33
23
31
37a
37
36
35
38
13
S(Sb)
15
24

Fig. 5

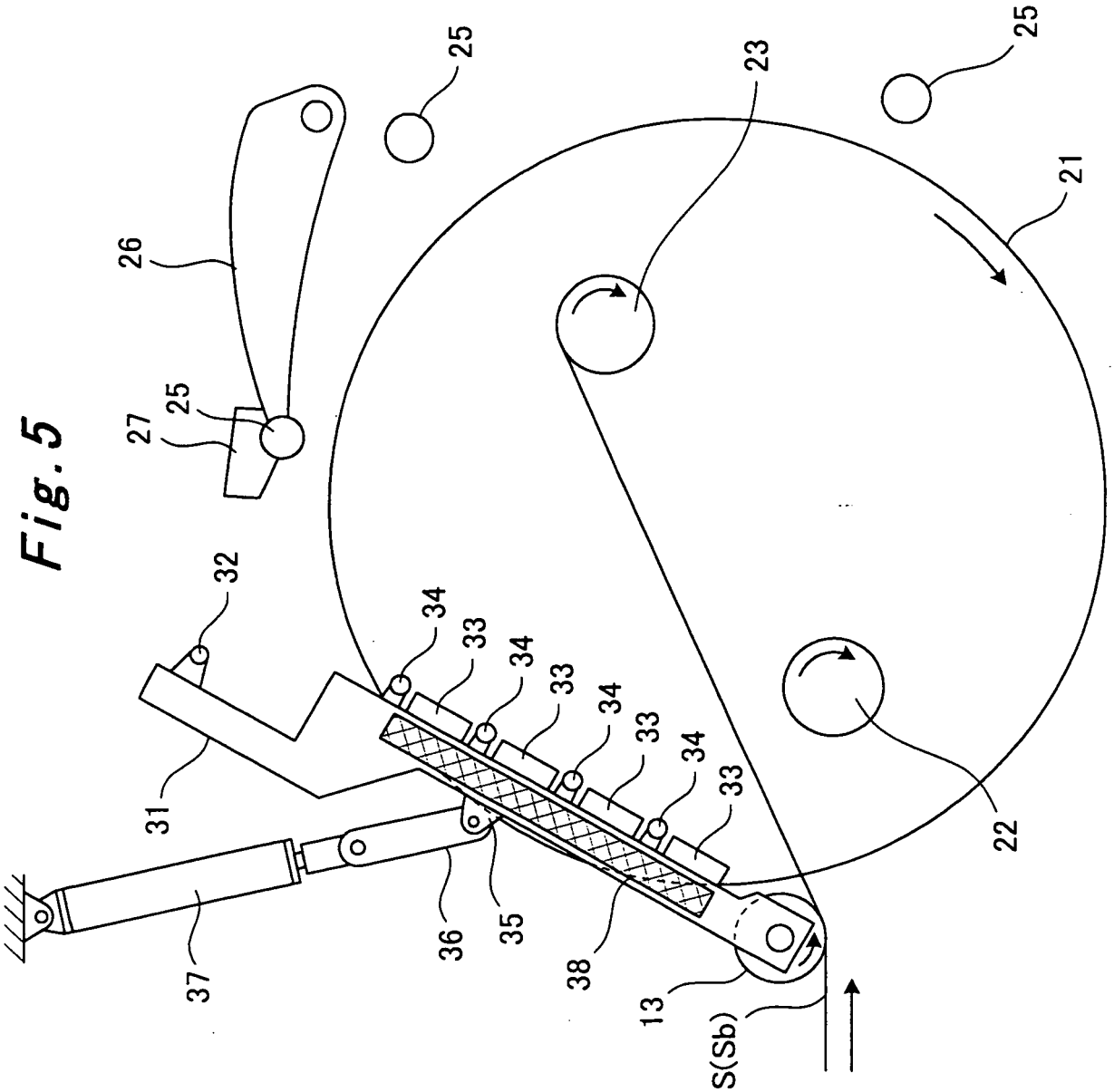
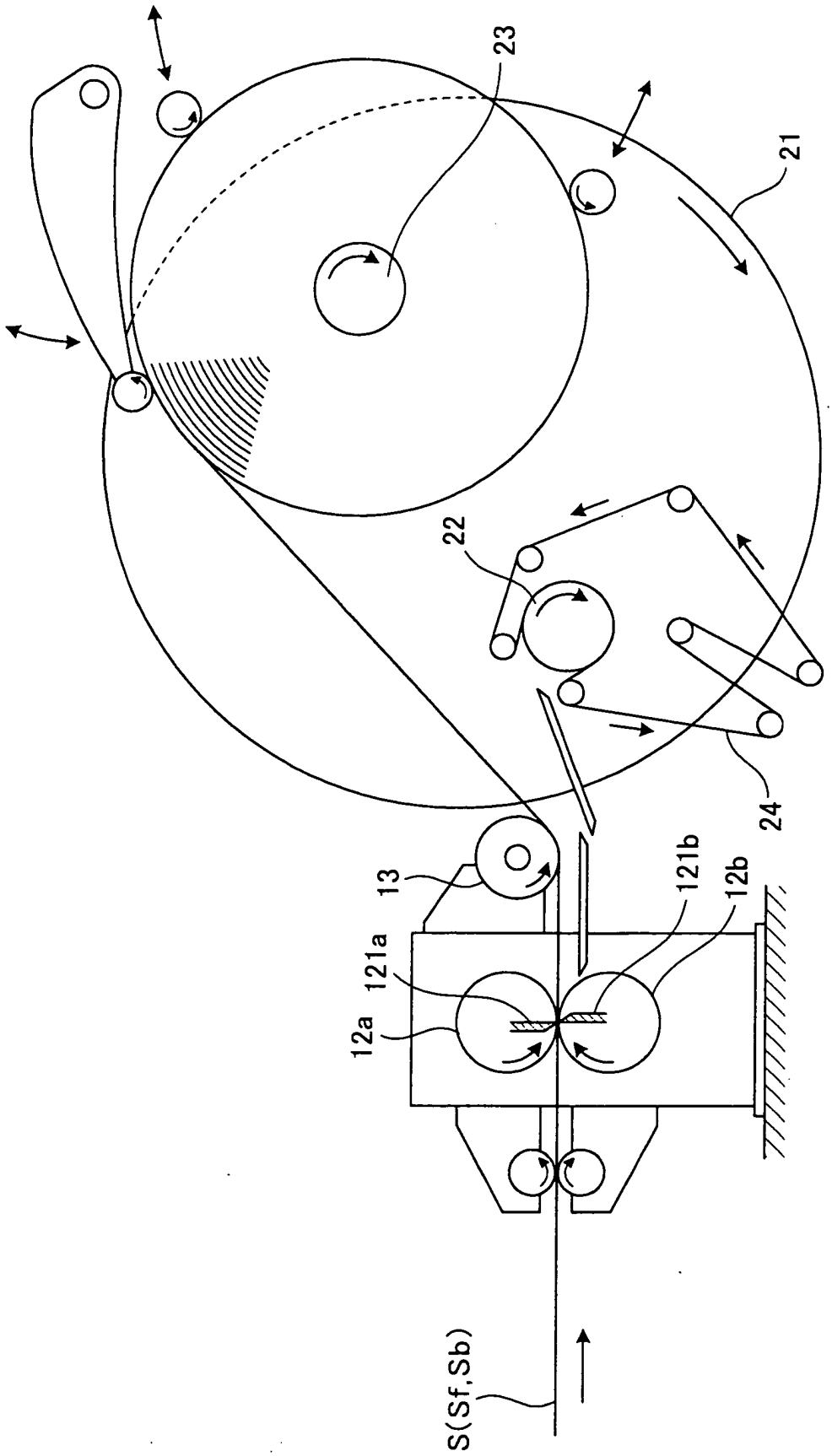


Fig. 6



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP HEI7106384 B **[0006]**
- WO 9903614 A1 **[0007]**
- JP 63188425 A **[0007]**
- JP 58051817 U **[0007]**
- JP 2000301234 A **[0007]**
- JP 6328129 A **[0007]**