

(19)



(11)

EP 2 013 414 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
13.08.2014 Bulletin 2014/33

(51) Int Cl.:
D21G 9/00 (2006.01) **D21F 2/00** (2006.01)
D21F 7/00 (2006.01)

(21) Application number: **07748027.5**

(86) International application number:
PCT/SE2007/000362

(22) Date of filing: **18.04.2007**

(87) International publication number:
WO 2007/126353 (08.11.2007 Gazette 2007/45)

(54) **DEVICE FOR THREADING A PROCESSING INSTALLATION, SUCH AS A DRYER**

VORRICHTUNG ZUM AUFFÜHREN EINER VERARBEITUNGSANLAGE, WIE Z.B. TROCKNER

DISPOSITIF DE MISE EN PLACE D'UNE INSTALLATION DE TRAITEMENT, TEL QU'UN SECHOIR

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE
SI SK TR**

(30) Priority: **28.04.2006 SE 0600940**

(43) Date of publication of application:
14.01.2009 Bulletin 2009/03

(73) Proprietor: **Andritz Technology and Asset
Management GmbH
8045 Graz (AT)**

(72) Inventor: **PETERSSON, Rolf
343 72 Eneryda (SE)**

(74) Representative: **Simonsson, Erik
Awapatent AB
P.O. Box 5117
20071 Malmö (SE)**

(56) References cited:
**WO-A1-99/39049 DE-A1- 2 248 448
GB-A- 1 128 196 US-A- 3 759 434**

EP 2 013 414 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

Field of the invention

[0001] The present invention relates to a device for feeding web material through a processing installation, such as a pulp dryer, by means of a conveyor belt, which conveyor belt is divided, along its longitudinal direction, into an essentially flat first segment and an essentially flat second segment, the device comprising an opening member and a guiding surface, which is located downstream of the opening member as seen in the direction of the travel of the conveyor belt, the opening member and the guiding surface being adapted for unfolding the conveyor belt by separating the first and second segments, the device further being provided with a spreader roll, which is located downstream of the guiding surface and which is adapted to keep the conveyor belt unfolded while a tail of said web material is placed on said first segment, a folding member being located downstream of the spreader roll and being adapted for folding said second segment over said first segment for to enclose the tail in the conveyor belt.

Background of the invention

[0002] When forming and drying a web-formed material, such as a cellulose pulp web, the web-formed material is treated in different units. For instance a cellulose pulp production plant may include a wet forming station, in which a slurry comprising cellulose fibres is treated to form a wet cellulose based fibrous web, and a pulp dryer, in which the wet web is dried by means of blowing hot air towards the web. At start-ups, and when the web accidentally breaks, it is necessary to transfer the web from the wet forming station to the pulp dryer. When transferring a web it is common to first form a narrow tail, also called a leader, at the wet forming station. The tail is then transferred to the pulp dryer and passed into the pulp dryer. When the tail has been successfully transferred into the pulp dryer the tail may be gradually widened such that finally a web of full width is passed from the wet forming station to the pulp dryer.

[0003] US 3,759,434, in the name of Aktiebolaget Svenska Flaktfabriken, describes a device for feeding web material through a processing installation by means of a folded conveyor belt. The folded conveyor belt is unfolded and is led over a guide roller and another roller. Both the guide roller and said another roller are provided with outwardly tapering sections to ensure that the conveyor belt remains unfolded. After said another roller a tail is fed to one part of the unfolded conveyor belt. By means of a next roller, which is located downstream of said another roller, a second part of the conveyor belt is folded onto the tail, which is held on said first part by means of a further roller, thereby enclosing the tail between the first part and the second part of the conveyor belt.

[0004] It would be of interest to provide an automatic feeding of the tail to the device for feeding the processing installation. It has been found, however, that the tail tends to slip out of the conveyor belt of the device of US 3,759,434. Thus, an operator has to manually feed the tail into the conveyor belt, and the operator has to adjust the position of the tail in the horizontal plane during the tail feeding procedure, in order to have the tail correctly located in the folded conveyor belt.

[0005] A device for feeding web material through a processing installation according to the preamble of claim 1 is known from DE 22 48 448 A1.

Summary of the invention

[0006] An object of the present invention is to provide a device for feeding web material through a processing installation, such as a pulp dryer, said device having means making it possible to dispense of an operator, who manually adjusts the position, in the horizontal plane, of a tail of the web material during a tail feeding procedure.

[0007] This object is achieved by a device according to the preamble and characterised in that the spreader roll comprises a first roll portion, a second roll portion, and a circumferential guiding track separating the first roll portion from the second roll portion, said first roll portion being adapted for supporting said first segment, said second roll portion being adapted for supporting said second segment, the first roll portion having a cylindrical outer surface.

[0008] An advantage of the present invention is that, when the device is in operation, the tail rests steadily on the first segment of the conveyor belt, which first segment is supported on the first roll portion of the spreader roll, until the second segment is folded on top of the first segment to enclose the tail between the first segment and the second segment. Thus, the risk is decreased that the tail feeding procedure will fail. In relation to other possible solutions to the problem, such as the use of vertical guiding plates guiding the horizontal position of the tail, the present invention provides a solution which does not impose any additional wear on the tail or on the conveyor belt.

[0009] According to a preferred embodiment the device further comprises a holding belt, which is located adjacent to the spreader roll, is adapted to travel in parallel to the first segment of the conveyor belt, and which is adapted to hold the tail pressed against said first segment until said second segment is to be folded onto said first segment. An advantage of the holding belt is that it provides for an efficient way of holding the tail in place until the second segment is folded on top of the first segment. A further advantage is that the holding belt exposes the tail to a minimum of wear, thereby decreasing the risk that the tail is broken. The holding belt also has the ability of pressing the tail towards the conveyor belt for a comparably long distance, such that the tail is safely held

against the first segment of the conveyor belt up to the very moment the second segment is folded on top of the first segment for to enclose the tail between the first segment and the second segment.

[0010] Still more preferably said holding belt is adapted to travel over a first pulley and a second pulley, the second pulley being located downstream of the first pulley as seen in the direction of the travel of the conveyor belt, the first pulley having a cylindrical outer surface. An advantage of this embodiment is that the cylindrical outer surface of the first pulley, in combination with the cylindrical outer surface of the first roll portion of the spreader roll, forms a horizontal, flat nip between the first segment of the conveyor belt and the holding belt, adjacent to the first pulley. The horizontal, flat nip makes it easier to grip a tail and increases the chances that a tail fed to the nip is also forwarded into the processing installation by means of the conveyor belt. Further, the risk that the tail slips out of the nip, once the tail has been caught in the nip, is decreased.

[0011] Preferably the second pulley has a cambered outer surface. An advantage of this is that a second pulley having a cambered outer surface automatically keeps the holding belt in place such that it does not easily slip off the first and second pulleys.

[0012] According a preferred embodiment a driving mechanism is adapted for driving the holding belt. An advantage of this embodiment is that the driving mechanism, which could, e.g., be a motor, a driving chain or a drive shaft, driving one of the pulleys, decreases frictional forces on the tail and increases the chance that the tail is successfully caught in the nip.

[0013] According to a preferred embodiment the outer surface of said second roll portion is tapering outwardly from the guiding track. The second roll portion of the spreader roll supports the second segment of the conveyor belt, which second segment does not come into contact with the tail until the very moment the second segment is folded onto the first segment. Thus, there is no problem with the tail slipping off the second segment of the conveyor belt, and, thus, the outer surface of the second roll portion of the spreader roll need not be cylindrical. On the contrary, a second roll portion, which is provided with an outwardly tapering outer surface, decreases the risk that the second segment is folded onto the first segment, before the second segment is intended to do so. This lowered risk of a too early folding is believed to be due the fact that the first segment and the second segment are kept separated by more than 180° while passing over the spreader roll. Thus, the second roll portion, which has an outwardly tapering outer surface, provides for a more controlled operation.

[0014] Still more preferably the outer surface of said second roll portion is a conical outer surface or is a cambered outer surface. A second roll portion, which has a conical outer surface or a cambered outer surface, has proven to be the best manner of providing an outwardly tapering outer surface, of the second roll portion, as re-

gards safe and controlled operation, i.e., as regards control of the position of the conveyor belt and control of when the second segment of the conveyor belt is folded onto the first segment of the conveyor belt.

[0015] Preferably at least one of said first roll portion and said second roll portion is provided with a knurling on its outer surface. An advantage of this embodiment is that the knurling ensures that the circumferential velocity of the spreader roll will be the same as, or at least very close to, the travelling velocity of the conveyor belt. Thus, it can be ensured that the conveyor belt slides against the guiding surface and not against the spreader roll.

[0016] Further objects and features of the present invention will be apparent from the description and the claims.

Brief description of the drawings

[0017] The invention will now be described in more detail with reference to the appended drawings in which:

Fig. 1 a is a schematic side view and illustrates a tail conveyor device, as seen from the side.

Fig. 1b is an enlarged side view, and illustrates the position of two rolls in relation to each other.

Fig. 2 is a schematic top view and illustrates the tail conveyor device, as seen from above.

Fig. 3a is an enlarged cross-sectional view and illustrates a spreader roll according to the invention, as seen in the direction of the arrows III-III of Fig. 1a.

Fig. 3b is an enlarged cross-sectional view and illustrates a spreader roll designed in accordance to a prior art technique.

Fig. 4 is a schematic side view and illustrates the tail conveyor device while forwarding a tail.

Fig. 5 is a schematic top view and illustrates the tail conveyor device while forwarding the tail.

Fig. 6a is an enlarged cross-sectional view and illustrates a spreader roll according to a second embodiment of the present invention.

Fig. 6b is an enlarged cross-sectional view and illustrates a spreader roll according to a third embodiment of the present invention.

Description of preferred embodiments

[0018] Fig. 1 a illustrates, as seen from the side, a tail conveyor device 1 for feeding a tail of a web material through a processing installation, such as a dryer, which is not shown. Fig. 1b is an enlarged schematic side view and illustrates certain details of the tail conveyor device 1. Fig. 2 illustrates the tail conveyor device 1 as seen from above, i.e., as seen in the direction of the arrow II of Fig. 1a. The tail conveyor device 1 is useful for, e.g., feeding a tail of a cellulose pulp web through a pulp dryer of the type Andritz Pulp Dryer. The process of feeding a tail through a processing installation, such as a dryer, is

generally referred to as threading the processing installation. The tail conveyor device 1 comprises a tail conveyor bar 2, which is supported on a structure 4. As indicated in Fig. 1a the tail conveyor bar 2 is provided with a fixing element 6, which fixes the tail conveyor bar 2 to the structure 4. As an option the fixing element 6 could be provided with a hinge 7, such that the tail conveyor bar 2 would be turnable in the horizontal plane. The optional hinge 7 would make it possible to turn the tail conveyor bar 2 out of position when a threading procedure has been finalized. At an end 8 of the tail conveyor bar 2, said end 8 being opposite to the fixing element 6, a guiding surface in the form of a guiding roll 10 is rotatably mounted on the tail conveyor bar 2. The guiding roll 10 is provided with a central peripheral track and has outwardly tapering sections, which is per se known and which is not shown in detail in Fig. 1a. Further, a spreader roll 12 is rotatably mounted on the tail conveyor bar 2. The spreader roll 12 is preferably located directly after the guiding roll 10.

[0019] Fig. 1b illustrates how said "directly after" is to be interpreted with respect to the location of the spreader roll 12 in relation to the guiding roll 10. In the present context "directly after" means that a shortest distance SD, which is the shortest distance between an outer surface 14 of the guiding roll 10, and an outer surface 16 of the spreader roll 12, is less than the largest diameter D1 of the spreader roll 12. Still more preferably the shortest distance SD, depicted in Fig. 1b, is less than half of the largest diameter D1, which is depicted in Fig. 1b, of the spreader roll 12. Fig. 1b further illustrates that the largest diameter D1 of the spreader roll 12 is larger than the largest diameter D2 of the guiding roll 10.

[0020] Turning again to Fig. 1a, a driving chain 18 is arranged between a first gear 20, which is fixed to the guiding roll 10, and a second gear 22, which is fixed to the spreader roll 12. The first gear 20 and the second gear 22 have the same diameter and number of teeth. Thus, the guiding roll 10 and the spreader roll 12 will rotate by the same rpm.

[0021] An opening member in the form of a cambered opening roll 24 is located below the fixing element 6 and is supported on the structure 4. A folding member in the form of a cambered folding roll 26 is located above the fixing element 6 and is supported on the structure 4. The tail conveyor device 1 further comprises an endless foldable tail conveyor belt 28. The foldable tail conveyor belt 28 is divided, along the longitudinal direction of the tail conveyor belt 28, into an essentially flat first segment 30, and an essentially flat second segment 32. Fig. 2 illustrates a joint 34 in the form of a seam, which extends along the longitudinal direction of the tail conveyor belt 28. The seam divides the first segment 30 from the second segment 32. The conveyor belt 28 is foldable, by which is meant that the second segment 32 may be folded onto the first segment 30 in a folding procedure, and that the second segment 32 may then be unfolded from the first segment 30 in an unfolding procedure.

[0022] As is best illustrated in Fig. 1a the conveyor belt 28 travels from the dryer, not shown, in the direction of the arrow C. The conveyor belt 28 first reaches the opening roll 24. Upstream of the opening roll 24 the conveyor belt 28 is in a folded state, i.e., the first segment 30 is located on top of second segment 32, as is depicted in Fig. 1a. The opening roll 24 is that roll after which opening of the folded conveyor belt 28 can start. Between the opening roll 24 and the guiding roll 10 the conveyor belt 28 is "opened", by which is meant that the second segment 32 is unfolded from the first segment 30. Due to the fact that the guiding roll 10 is provided with two outwardly tapering surfaces, as will be described hereinafter in more detail and which is known in the art, the segments 30, 32 will gradually be separated by more than 180°. The opened conveyor belt 28 then runs over the guiding roll 10. Since the guiding roll 10 has outwardly tapering portions the opened conveyor belt 28 will remain "open" while passing the guiding roll 10. Downstream of the guiding roll 10 the conveyor belt 28 passes over the spreader roll 12, which spreader roll 12 preferably is, as described hereinbefore, located directly after the guiding roll 10, i.e., the spreader roll 12 is located downstream, with respect to the direction of travel of the conveyor belt 28, of the guiding roll 10 and preferably at a distance SD from the guiding roll 10, which distance SD is less than the largest diameter D1 of the spreader roll 12. Since the diameter D1 of the spreader roll 12 is larger than the diameter D2 of the guiding roll 10, and since the guiding roll 10 and the spreader roll 12 rotate at the same rpm, the circumferential velocity of the spreader roll 12 will be higher than the circumferential velocity of the guiding roll 10. This will cause a certain tension in the conveyor belt 28 at that section of the conveyor belt 28 which is located between the guiding roll 10 and the spreader roll 12. This tension ensures that the conveyor belt 28 is correctly opened. Downstream of the spreader roll 12 the conveyor belt 28 is again folded, as is best illustrated in Fig. 2. The folding is accomplished by the second segment 32 being folded onto the first segment 30 in that section of the conveyor belt 28 which is located between the spreader roll 12 and the folding roll 26.

[0023] A holding belt 36 is arranged for the purpose of holding a tail pressed against the first segment 30 of the conveyor belt 28 until the second segment 32 has been folded onto the first segment 30. The holding belt 36 runs over a cylindrical first pulley 38 and over a cambered second pulley 40. The holding belt 36 runs in a direction which is depicted by arrows in Fig. 1a. The second pulley 40 is located downstream of the first pulley 38, as seen in the direction of the travel of the conveyor belt 28. The first pulley 38 is located downstream of the spreader roll 12, as it is depicted in Fig. 1a. A nip 42 is formed between the conveyor belt 28 and the holding belt 36 adjacent to the first pulley 38.

[0024] Fig. 3a illustrates, in more detail, the spreader roll 12 and the first pulley 38 as seen in the direction indicated by arrows III in Fig. 1a. The spreader roll 12

has a first roll portion 44 and a second roll portion 46. A circumferential guiding track 48, which has the shape of a groove as depicted in Fig. 3a, separates the first roll portion 44 from the second roll portion 46. The first roll portion 44 is adapted for supporting the first segment 30 of the unfolded conveyor belt 28. The first roll portion 44 is cylindrical and thus the outer surface 16 is a cylindrical outer surface. The second roll portion 46 is adapted for supporting the second segment 32 of the unfolded conveyor belt 28. The second roll portion 46 is conical and tapers outwardly from the circumferential guiding track 48. The second roll portion 46 thus has a conical outer surface 17.

[0025] Due to the fact that the outer surface 16 of the first roll portion 44 is cylindrical, whereas the outer surface 17 of the second roll portion 46 is conical, and tapers outwardly from the guiding track 48, the segments 30, 32 will remain separated by more than 180° while the conveyor belt 28 passes over the spreader roll 12, as is depicted in Fig. 3a. The result is that the segments 30, 32 will be prevented from folding onto each other at a too early stage.

[0026] The joint 34 of the conveyor belt 28 fits in the circumferential guiding track 48. The cylindrical outer surface 16 of the first roll portion 44, and the conical outer surface 17 of the second roll portion 46, are each provided with a knurling, as is depicted in Fig. 3a. The knurling on the respective outer surfaces 16, 17 ensures that the spreader roll 12 will roll against the conveyor belt 28 without slipping, thereby ensuring that the circumferential velocity of the spreader roll 12 will correspond to the travelling velocity of the conveyor belt 28. As is illustrated in Fig. 3a the guiding roll 10, which is located upstream of the spreader roll 12 with respect to the direction of travel of the conveyor belt 28, is symmetrical and is provided with two conical surfaces 50, 52 tapering outwardly from a guiding groove 54. The guiding roll 10 has a smooth surface 56. Due to the fact, that the circumferential velocity of the guiding roll 10 is lower than the circumferential velocity of the spreader roll 12, the conveyor belt 28 will slide on the smooth surface 56, thereby providing the tension, which has been described above, in that section of the conveyor belt 28 which is located between the guiding roll 10 and the spreader roll 12.

[0027] Between the first roll portion 44, which first roll portion 44 has the cylindrical outer surface 16, and the first pulley 38, which first pulley 38 has a cylindrical outer surface 37, the nip 42 is formed. The nip 42 has the form of a horizontally extending opening, or gap, which is located between the holding belt 36 and the first segment 30 of the conveyor belt 28. Thus, the nip 42 has the same horizontal level over its entire extension, from the left end to the right end of the nip 42, in accordance with the depiction in Fig. 3a.

[0028] Fig. 3b illustrates a spreader roll 80, which is designed in accordance with the prior art technique. The spreader roll 80 is symmetrical and is provided with two portions 82, 84, each of which portions 82, 84 tapers

outwardly from the centre of the spreader roll 80. The spreader roll 80 thus has the same principal shape as a guiding roll 86, which is located upstream, with respect to the direction of travel of a conveyor belt 88, of the spreader roll 80. A cambered holding pulley 90 is adapted for pressing a tail, which is not shown in Fig. 3b, towards the conveyor belt 88 until the latter has been folded to enclose the tail. The spreader roll 80, which is designed according to the prior art technique, is efficient as long as the tail is fed manually into a narrow nip 92. With automatic feeding of a tail to the nip 92 it is difficult to obtain the required adjustment precision for feeding the tail into the narrow nip 92. In addition the tail may, once the tail has been caught in the nip 92, quite easily slide out of the nip 92.

[0029] Fig. 4 and Fig. 5 illustrate the tail conveyor device 1 after a tail 58 of web material, such as cellulose pulp, has been caught in the nip 42. With the tail conveyor device 1 according to the present invention the tail 58 is efficiently caught in the nip 42. Further, the risk that the tail 58 may slide out of the nip 42 is minimal. Due to these facts, efficient threading of the processing installation is ensured, and successful automatic feeding of the tail into the nip 42 is made possible. By "automatic" is meant that an optional cutting device 59, which is schematically depicted in Fig. 4, automatically cuts the tail 58 and directs the cut end of the tail 58 towards the nip 42. Thus, by employing the tail conveyor device 1 in accordance with the present invention, and the cutting device 59, there is no need for manual interference in the threading procedure.

[0030] The tail 58 typically has a width W, which is depicted in Fig. 5, which width W is 80-250 mm. The tail 58 has a thickness of 1.5-2.5 mm. The holding belt 36 holds the tail 58 pressed against the first segment 30 of the conveyor belt 28, until the second segment 32 is folded over the first segment 30 to enclose the tail 58 between the two segments 30, 32, as is best depicted in Fig. 5. The tail 58, enclosed between the segments 30, 32 of the conveyor belt 28, is then forwarded past the folding roll 26 and further into the processing installation, which is not shown in Fig. 4 and Fig. 5.

[0031] In Fig. 5 an optional motor 41 is shown. The motor 41 is adapted to drive, by means of a shaft 43, the cambered second pulley 40, and, thus, the motor 41 is adapted to drive the holding belt 36. By means of a not shown control device the rpm of the motor 41 can be controlled so that the travelling velocity of the holding belt 36 is in the same range as the travelling velocity of the tail conveyor belt 28. Preferably the motor 41 is adjusted so as to provide a travelling velocity of the holding belt 36, which travelling velocity is within a range of -3% to +3% of the travelling velocity of the tail conveyor belt 28. Due to the motor 41 driving, via the second pulley 40, the holding belt 36, the frictional forces on the tail 58 are decreased. This results in a decreased risk that the tail 58 is broken. Further, the probability is increased that the tail 58 is successfully "gripped" between the holding belt

36 and the conveyor belt 28 at the nip 42, thereby increasing the chance of successfully having the tail 58 folded into the conveyor belt 28.

[0032] In Fig. 4 an optional driving chain 45 is shown. The driving chain 45 is adapted for driving the first pulley 38 from the spreader roll 12, which in turn is driven by the tail conveyor belt 28, in such a manner that the travelling velocity of the holding belt 36 is similar to the travelling velocity of the tail conveyor belt 28. Thus, the driving chain 45, which is depicted in Fig. 4, represents an alternative solution to the motor 41, which is depicted in Fig. 5.

[0033] Fig. 6a illustrates a further embodiment of the present invention in the form of a spreader roll 112. The spreader roll 112 has a first roll portion 144 and a second roll portion 146. A circumferential guiding track 148 separates the first roll portion 144 from the second roll portion 146. The first roll portion 144 is cylindrical and has a similar design and function as the first roll portion 44 of the spreader roll 12, hereinbefore described with reference to Fig. 3a. The second roll portion 146 is adapted for supporting the second segment 32 of the unfolded conveyor belt 28. The second roll portion 146 is cambered, and tapers outwardly from the circumferential guiding track 148. Thus, the second roll portion 146 has a cambered outer surface 117. The outer surfaces of the first and second roll portions 144, 146 are each provided with a knurling.

[0034] Fig. 6b illustrates yet another embodiment of the present invention in the form of a spreader roll 212. The spreader roll 212 has a first roll portion 244 and a second roll portion 246. A circumferential guiding track 248 separates the first roll portion 244 from the second roll portion 246. The first roll portion 244 is cylindrical and has a similar design and function as the first roll portion 44 of the spreader roll 12, hereinbefore described with reference to Fig. 3a. The second roll portion 246 is adapted for supporting the second segment 32 of the unfolded conveyor belt 28. The second roll portion 246 is cylindrical and thus has a cylindrical outer surface 217. Consequently the spreader roll 212 is symmetrical as regards the shape of the first and second roll portions 244, 246. The outer surfaces of the first and second roll portions 244, 246 are each provided with a knurling.

[0035] It will be appreciated that numerous variants of the above described embodiments are possible within the scope of the appended claims.

[0036] Above it has been described that a guiding surface has the form of a guiding roll 10, the circumferential velocity of which is lower than the travelling velocity of the conveyor belt 28, making the conveyor belt 28 slide over the smooth surface 56 of the guiding roll 10. As an alternative to the guiding roll 10, a guiding surface could be provided in the form of a smooth steel plate, having a guiding track and two outwardly tapering portions. The smooth steel plate would not rotate at all, making the conveyor belt slide over its smooth surface, thereby providing the desired tension in that section of the conveyor

belt 28 which is located between the smooth steel plate and the spreader roll 12, which is located downstream of the smooth steel plate.

[0037] With reference to Fig. 5 it has been described that a motor 41 is used for driving the second pulley 40. It will be appreciated that a motor could, as alternative to the motor 41, be adapted for driving the first pulley 38. A further alternative is to provide a driving chain, for instance the driving chain 45 depicted in Fig. 4, or a driving shaft for driving any one of the pulleys 38, 40 from the spreader roll 12. Thus, there are many alternatives for how to provide a driving mechanism, such as a motor 41, a driving chain 45 or a driving shaft, which driving mechanism is adapted for driving the holding belt 36, with the purpose of having the holding belt 36 travelling at a travelling velocity which is similar to the travelling velocity of the tail conveyor belt 28.

[0038] Above it has been described that the opening member is provided in the form of the opening roll 24, and that the folding member is provided in the form of the folding roll 26. It will be appreciated that other types of opening members and folding members could be used, such as steel plates over which the conveyor belt 28 may slide. To employ the opening roll 24 as the opening member, and to employ the folding roll 26 as the folding member is usually preferred for reasons of low friction and effective unfolding and folding, respectively.

[0039] It has been hereinbefore described, with reference to Fig. 4, that a cutting device 59 is used for cutting the tail and forwarding the end of the cut tail to the nip 42. It is, as alternative, possible to employ the tail conveyor device 1 of the present invention in connection to manual cutting of the tail. In the latter case, an operator may cut the tail 58 and forward the end of the cut tail 58 to the nip 42. The operator need not, however, continuously adjust the position of the tail 58 in the nip 42 during the further threading procedure.

Claims

1. A device for feeding web material through a processing installation, such as a pulp dryer, by means of a foldable conveyor belt (28), which conveyor belt (28) is divided, along its longitudinal direction, into an essentially flat first segment (30) and an essentially flat second segment (32), the device comprising an opening member (24) and a guiding surface (10), which is located downstream of the opening member (24) as seen in the direction of the travel of the conveyor belt (28), the opening member (24) and the guiding surface (10) being adapted for unfolding the conveyor belt (28) by separating the first and second segments (30, 32), the device further being provided with a spreader roll (12), which is located downstream of the guiding surface (10) and which is adapted to keep the conveyor belt (28) unfolded while a tail (58) of said web material is placed on

said first segment (30), a folding member (26) being located downstream of the spreader roll (12) and being adapted for folding said second segment (32) over said first segment (30) for to enclose the tail (58) in the conveyor belt (28),

characterised in that the spreader roll (12) comprises a first roll portion (44), a second roll portion (46), and a circumferential guiding track (48) separating the first roll portion (44) from the second roll portion (46), said first roll portion (44) being adapted for supporting said first segment (30), said second roll portion (46) being adapted for supporting said second segment (32), the first roll portion (44) having a cylindrical outer surface (16).

2. A device according to claim 1, the device (1) further comprising a holding belt (36), which is located adjacent to the spreader roll (12), is adapted to travel in parallel to the first segment (30) of the conveyor belt (28), and which is adapted to hold the tail (58) pressed against said first segment (30) until said second segment (32) is to be folded onto said first segment (30).
3. A device according to claim 2, wherein said holding belt (36) is adapted to travel over a first pulley (38) and a second pulley (40), the second pulley (40) being located downstream of the first pulley (38) as seen in the direction of the travel of the conveyor belt (28), the first pulley (38) having a cylindrical outer surface (37).
4. A device according to claim 3, wherein the second pulley (40) has a cambered outer surface.
5. A device according to any one of claims 2-4, wherein a driving mechanism (41, 43; 45) is adapted for driving the holding belt (36).
6. A device according to any one of the preceding claims, wherein the outer surface (17; 117) of said second roll portion (46; 146) is tapering outwardly from the guiding track (48).
7. A device according to claim 6, wherein the outer surface of said second roll portion (46; 146) is a conical outer surface (17) or is a cambered outer surface (117).
8. A device according to any one of the preceding claims, wherein at least one of said first roll portion (44; 144; 244) and said second roll portion (46; 146; 246) is provided with a knurling on its outer surface (16, 17; 117; 217).

Patentansprüche

1. Vorrichtung zum Zuführen von Bahnmaterial durch eine Verarbeitungsanlage, wie beispielsweise ein Zellstofftrockner, mittels eines faltbaren Förderbandes (28), wobei das Förderband (28) entlang seiner Längsrichtung in ein im Wesentlichen flaches erstes Segment (30) und ein im Wesentlichen flaches zweites Segment (32) unterteilt ist, wobei die Vorrichtung ein Öffnungselement (24) und eine Führungsfläche (10) umfasst, die sich, in der Richtung der Bewegung des Förderbandes (28) betrachtet, dem Öffnungselement (24) nachgelagert befindet, wobei das Öffnungselement (24) und die Führungsfläche (10) angepasst sind, um das Förderband (28) durch Trennen des ersten und des zweiten Segments (30, 32) auseinanderzufalten, wobei die Vorrichtung ferner mit einer Breits Streckwalze (12) versehen ist, die sich der Führungsfläche (10) nachgelagert befindet und die angepasst ist, um das Förderband (28) auseinandergefaltet zu halten, während ein Ende (58) des Bahnmaterials auf dem ersten Segment (30) untergebracht ist, wobei ein Faltelement (26) sich der Breits Streckwalze (12) nachgelagert befindet und angepasst ist, um das zweite Segment (32) über das erste Segment (30) zu falten, um das Ende (58) im Förderband (28) einzuschließen,
dadurch gekennzeichnet, dass die Breits Streckwalze (12) einen ersten Walzenabschnitt (44), einen zweiten Walzenabschnitt (46) und eine Umfangsführungsbahn (48) umfasst, die den ersten Walzenabschnitt (44) vom zweiten Walzenabschnitt (46) trennt, wobei der erste Walzenabschnitt (44) angepasst ist, um das erste Segment (30) zu stützen, wobei der zweite Walzenabschnitt (46) angepasst ist, um das zweite Segment (32) zu stützen, wobei der erste Walzenabschnitt (44) eine zylindrische Außenfläche (16) aufweist.
2. Vorrichtung nach Anspruch 1, wobei die Vorrichtung (1) ferner ein Halteband (36) umfasst, das sich der Breits Streckwalze (12) benachbart befindet, angepasst ist, um sich parallel zum ersten Segment (30) des Förderbandes (28) zu bewegen, und das angepasst ist, um das Ende (58) zu halten, das gegen das erste Segment (30) gedrückt wird, bis das zweite Segment (32) auf das erste Segment (30) zu falten ist.
3. Vorrichtung nach Anspruch 2, wobei das Halteband (36) angepasst ist, um sich über eine erste Rolle (38) und eine zweite Rolle (40) zu bewegen, wobei die zweite Rolle (40) sich, in der Richtung der Bewegung des Förderbandes (28) betrachtet, der ersten Rolle (38) nachgelagert befindet, wobei die erste Rolle (38) eine zylindrische Außenfläche (37) aufweist.
4. Vorrichtung nach Anspruch 3, wobei die zweite Rolle

(40) eine gewölbte Außenfläche aufweist.

5. Vorrichtung nach einem der Ansprüche 2 bis 4, wobei ein Antriebsmechanismus (41, 43; 45) angepasst ist, um das Halteband (36) anzutreiben.
6. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Außenfläche (17; 117) des zweiten Walzenabschnitts (46; 146) von der Führungsbahn (48) nach außen verjüngt ist.
7. Vorrichtung nach Anspruch 6, wobei die Außenfläche des zweiten Walzenabschnitts (46; 146) eine konische Außenfläche (17) ist oder eine gewölbte Außenfläche (117) ist.
8. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei mindestens einer von dem ersten Walzenabschnitt (44; 144; 244) und dem zweiten Walzenabschnitt (46; 146; 246) mit einer Rändelung auf seiner Außenfläche (16, 17; 117; 217) versehen ist.

Revendications

1. Dispositif pour l'alimentation d'un matériau en bande à travers une installation de traitement, telle qu'un sécheur de pâte, au moyen d'un convoyeur à bande pliable (28), lequel convoyeur à bande (28) est divisé, le long de son sens longitudinal, en un premier segment (30) essentiellement plat et en un deuxième segment (32) essentiellement plat, le dispositif comprenant un élément d'ouverture (24) et une surface de guidage (10) située en aval de l'élément d'ouverture (24) vu dans la direction de déplacement du convoyeur à bande (28), l'élément d'ouverture (24) et la surface de guidage (10) étant adaptés pour déplier le convoyeur à bande (28) en séparant les premier et deuxième segments (30, 32), le dispositif étant en outre pourvu d'un rouleau déplisseur (12) situé en aval de la surface de guidage (10) et adapté pour maintenir le convoyeur à bande (28) déplié tandis qu'une queue (58) dudit matériau en bande est placée sur ledit premier segment (30), un élément de pliage (26) étant situé en aval du rouleau déplisseur (12) et adapté pour plier ledit deuxième segment (32) par-dessus ledit premier segment (30) pour enfermer la queue (58) dans le convoyeur à bande (28),
caractérisé en ce que le rouleau déplisseur (12) comprend une première partie de rouleau (44), une deuxième partie de rouleau (46) et une piste de guidage circonférentielle (48) séparant la première partie de rouleau (44) d'avec la deuxième partie de rouleau (46), ladite première partie de rouleau (44) étant adaptée pour supporter ledit premier segment (30), ladite deuxième partie de rouleau (46) étant adaptée

pour supporter ledit deuxième segment (32), la première partie de rouleau (44) présentant une surface extérieure cylindrique (16).

2. Dispositif selon la revendication 1, le dispositif (1) comprenant en outre une courroie de maintien (36) située à côté du rouleau déplisseur (12), adaptée pour se déplacer parallèlement au premier segment (30) du convoyeur à bande (28) et adaptée pour maintenir la queue (58) serrée contre ledit premier segment (30) jusqu'au pliage dudit deuxième segment (32) par-dessus ledit premier segment (30).
3. Dispositif selon la revendication 2, dans lequel ladite courroie de maintien (36) est adaptée pour se déplacer par-dessus une première poulie (38) et une deuxième poulie (40), la deuxième poulie (40) étant située en aval de la première poulie (38) vue dans la direction de déplacement du convoyeur à bande (28), la première poulie (38) présentant une surface extérieure cylindrique (37).
4. Dispositif selon la revendication 3, dans lequel la deuxième poulie (40) présente une surface extérieure bombée.
5. Dispositif selon l'une quelconque des revendications 2-4, dans lequel un mécanisme d'entraînement (41, 43 ; 45) est adapté pour entraîner la courroie de maintien (36).
6. Dispositif selon l'une quelconque des revendications précédentes, dans lequel la surface extérieure (17 ; 117) de ladite deuxième partie de rouleau (46 ; 146) se rétrécit vers l'extérieur à partir de la piste de guidage (48).
7. Dispositif selon la revendication 6, dans lequel la surface extérieure de ladite deuxième partie de rouleau (46 ; 146) est une surface extérieure conique (17) ou une surface extérieure bombée (117).
8. Dispositif selon l'une quelconque des revendications précédentes, dans lequel au moins l'une parmi ladite première partie de rouleau (44 ; 144; 244) et ladite deuxième partie de rouleau (46 ; 146 ; 246) est pourvue d'un moletage sur sa surface extérieure (16, 17 ; 117 ; 217).

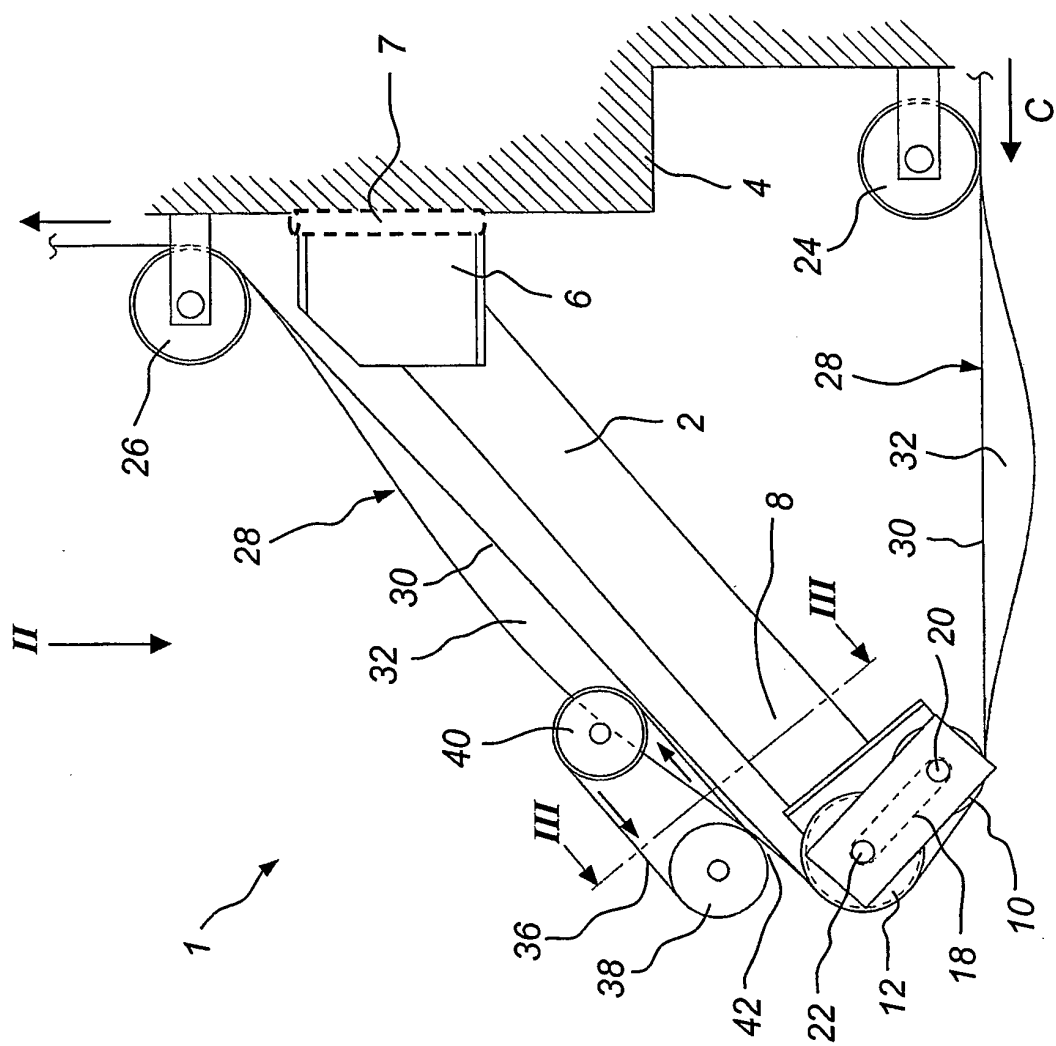


Fig. 1a

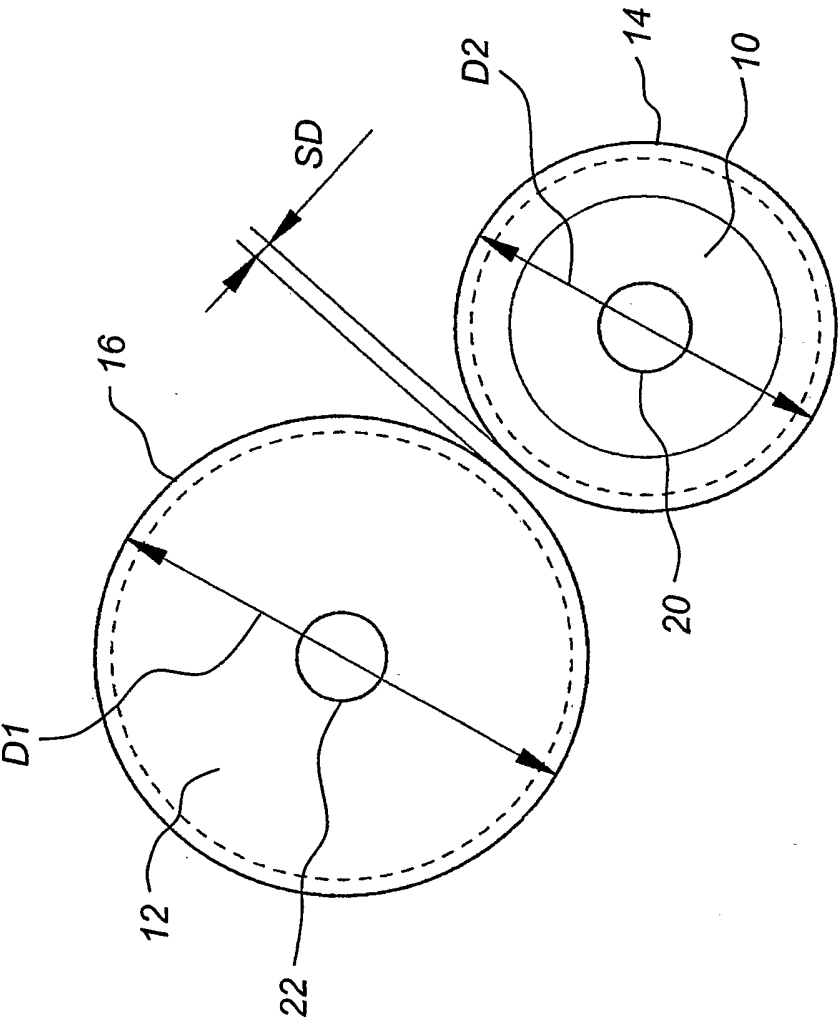
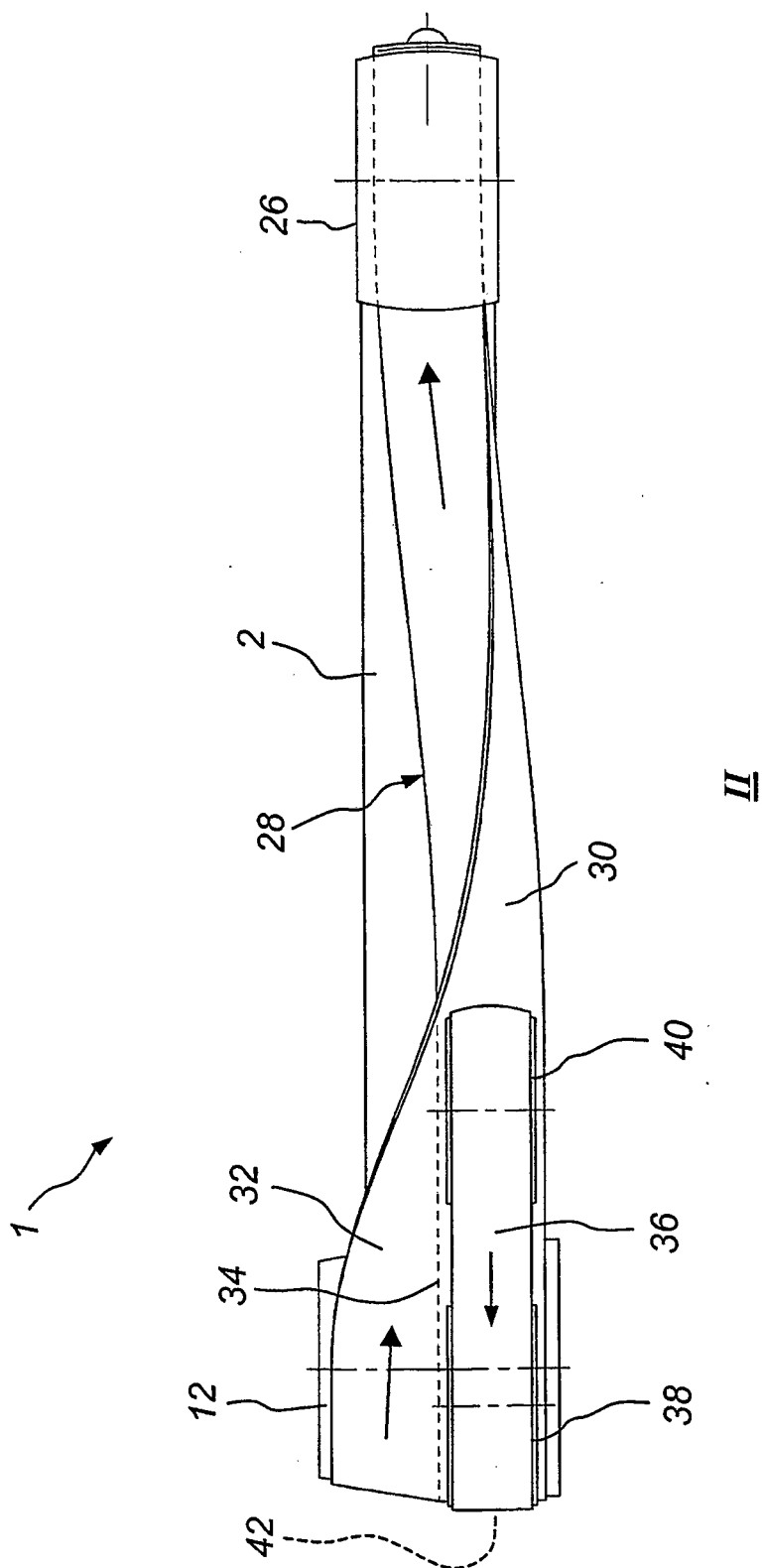
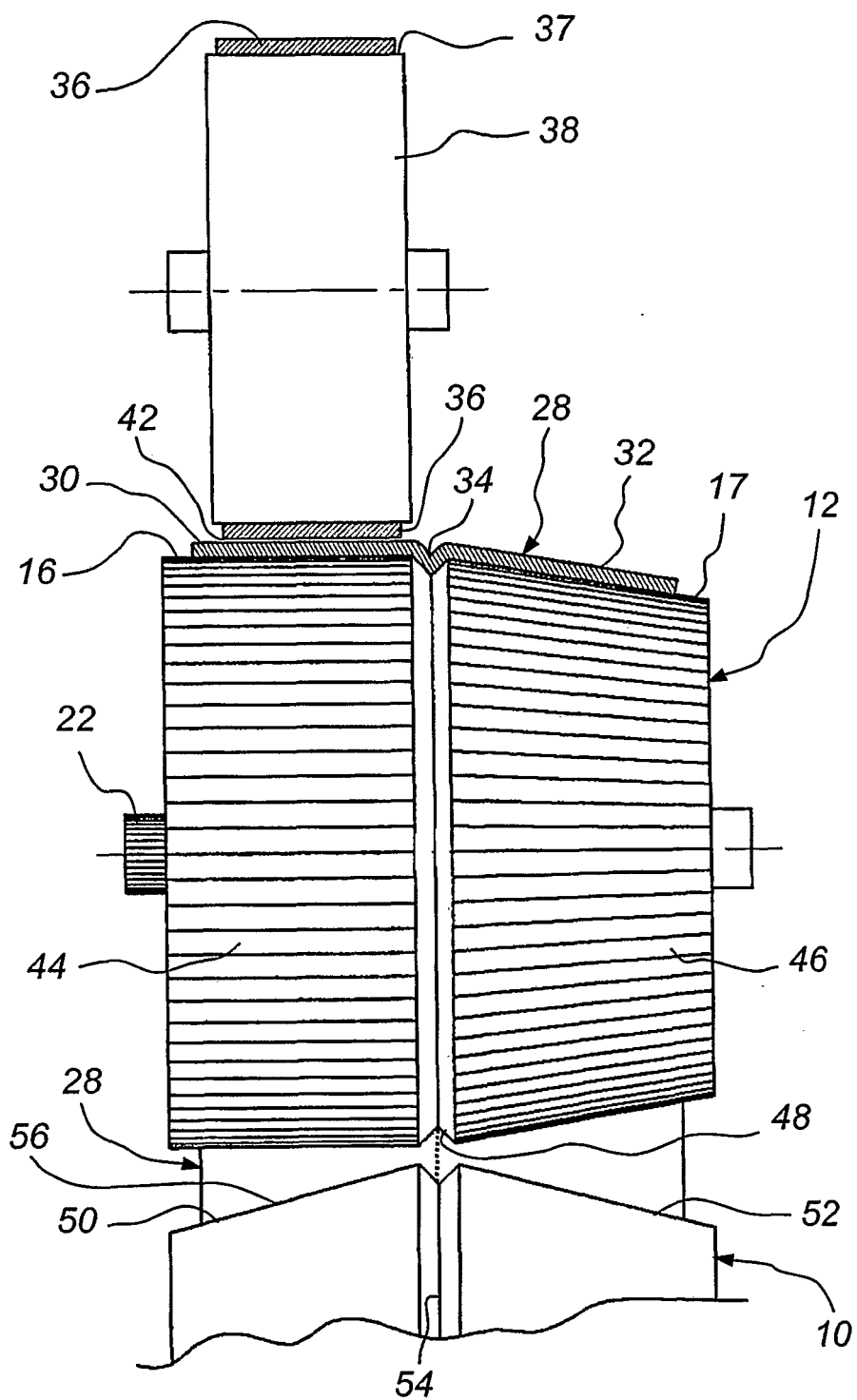


Fig. 1b





III-III

Fig. 3a

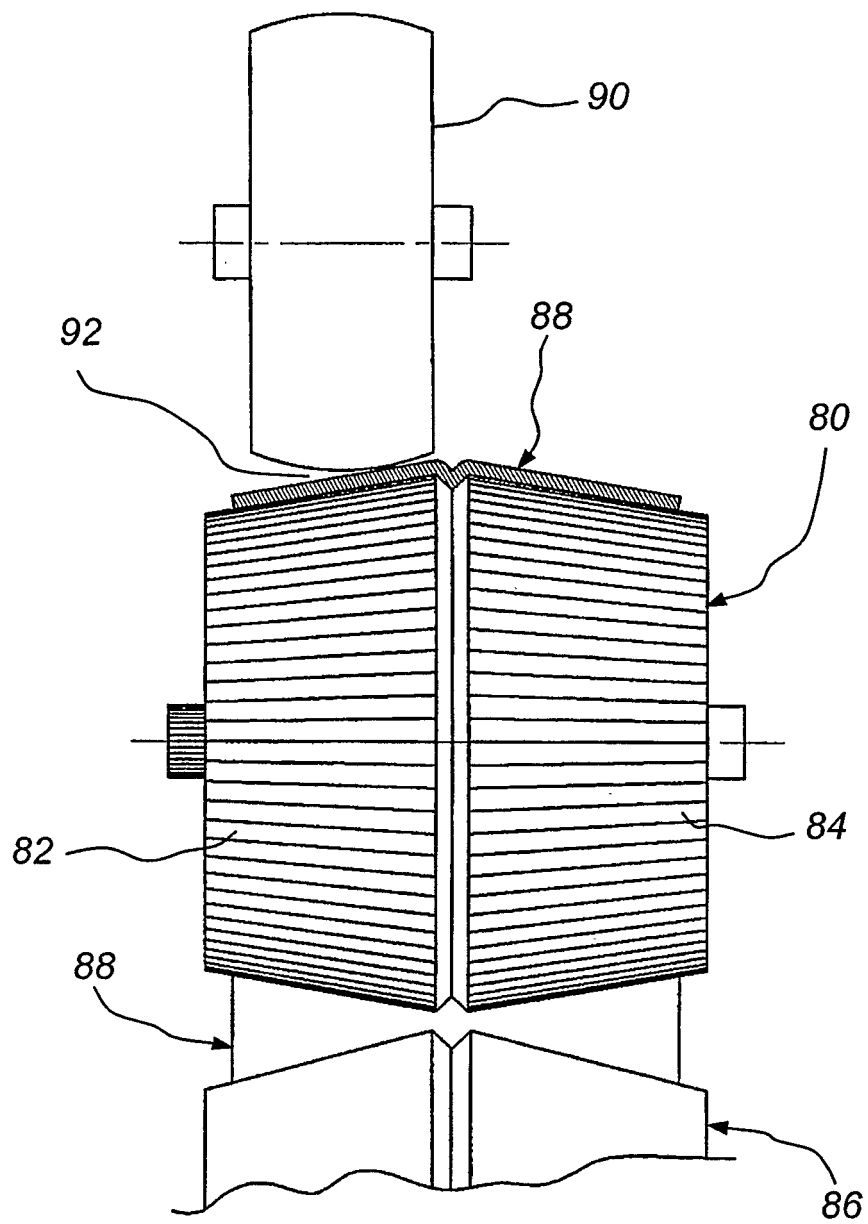


Fig. 3b

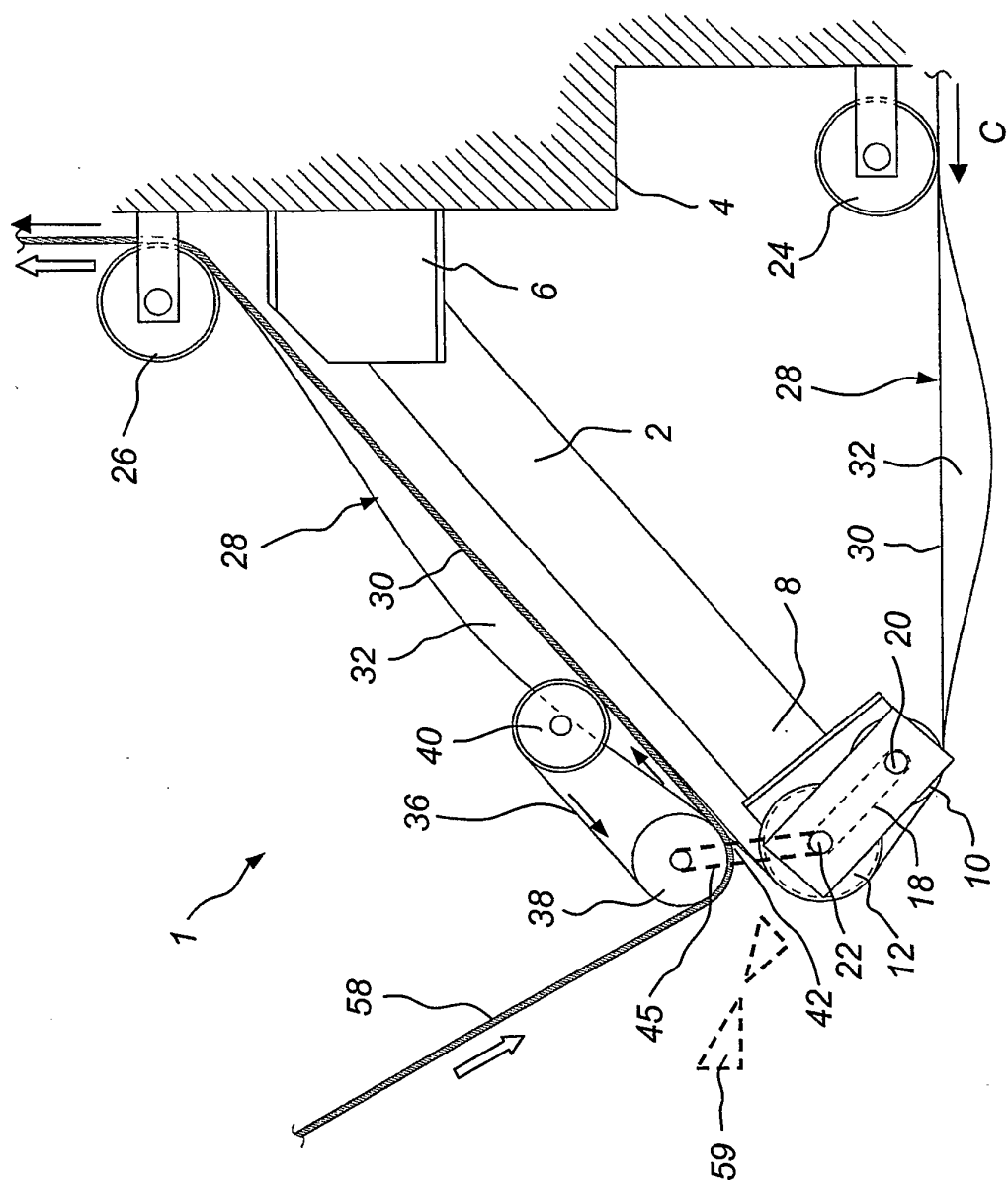


Fig. 4

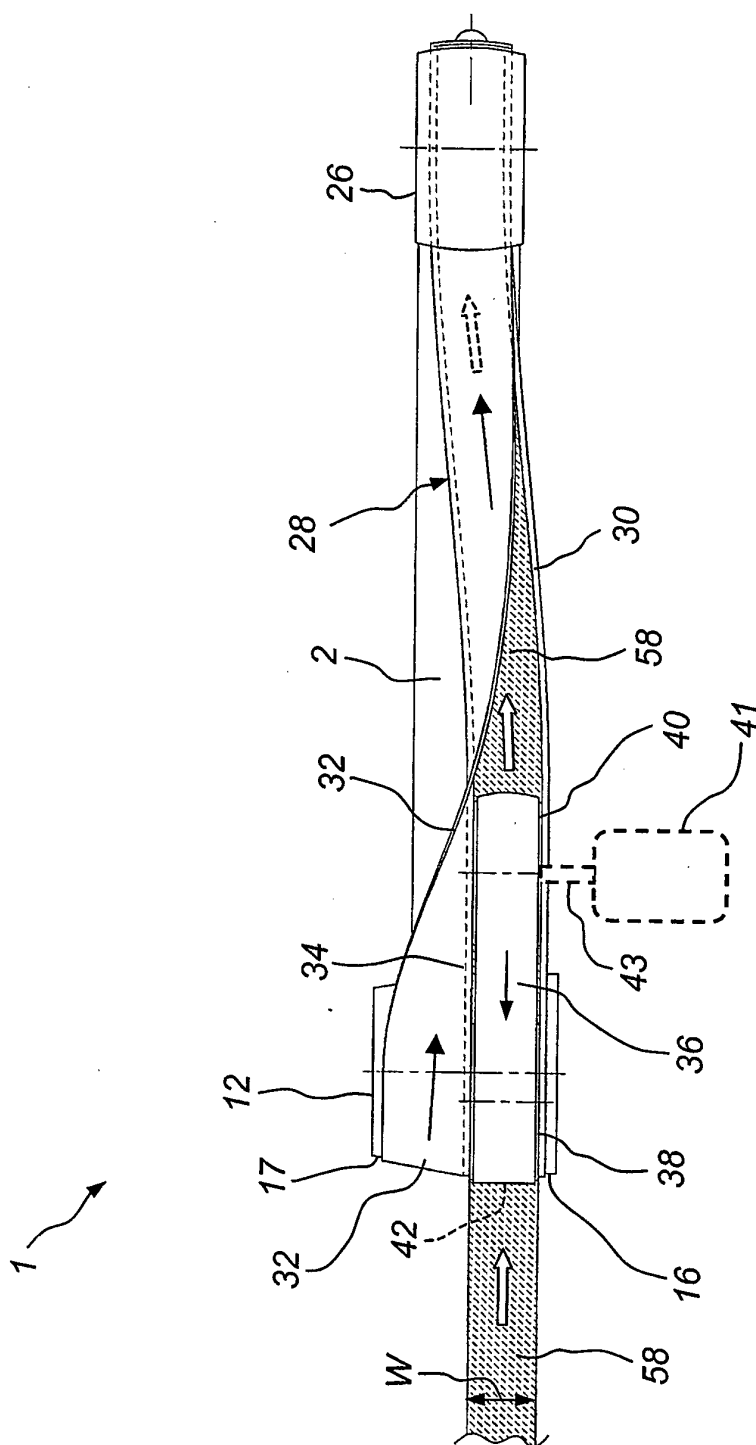


Fig. 5

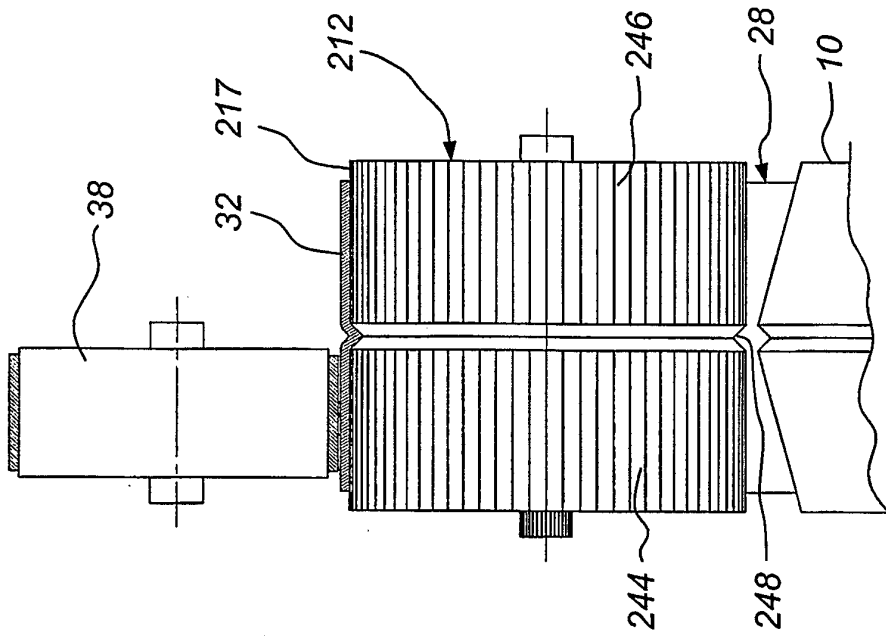


Fig. 6b

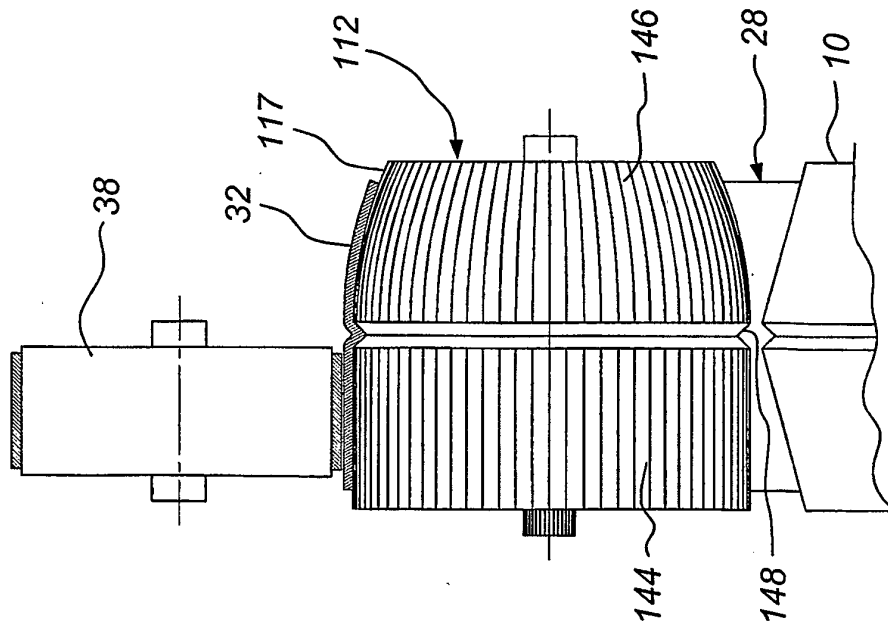


Fig. 6a

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 3759434 A [0003] [0004]
- DE 2248448 A1 [0005]