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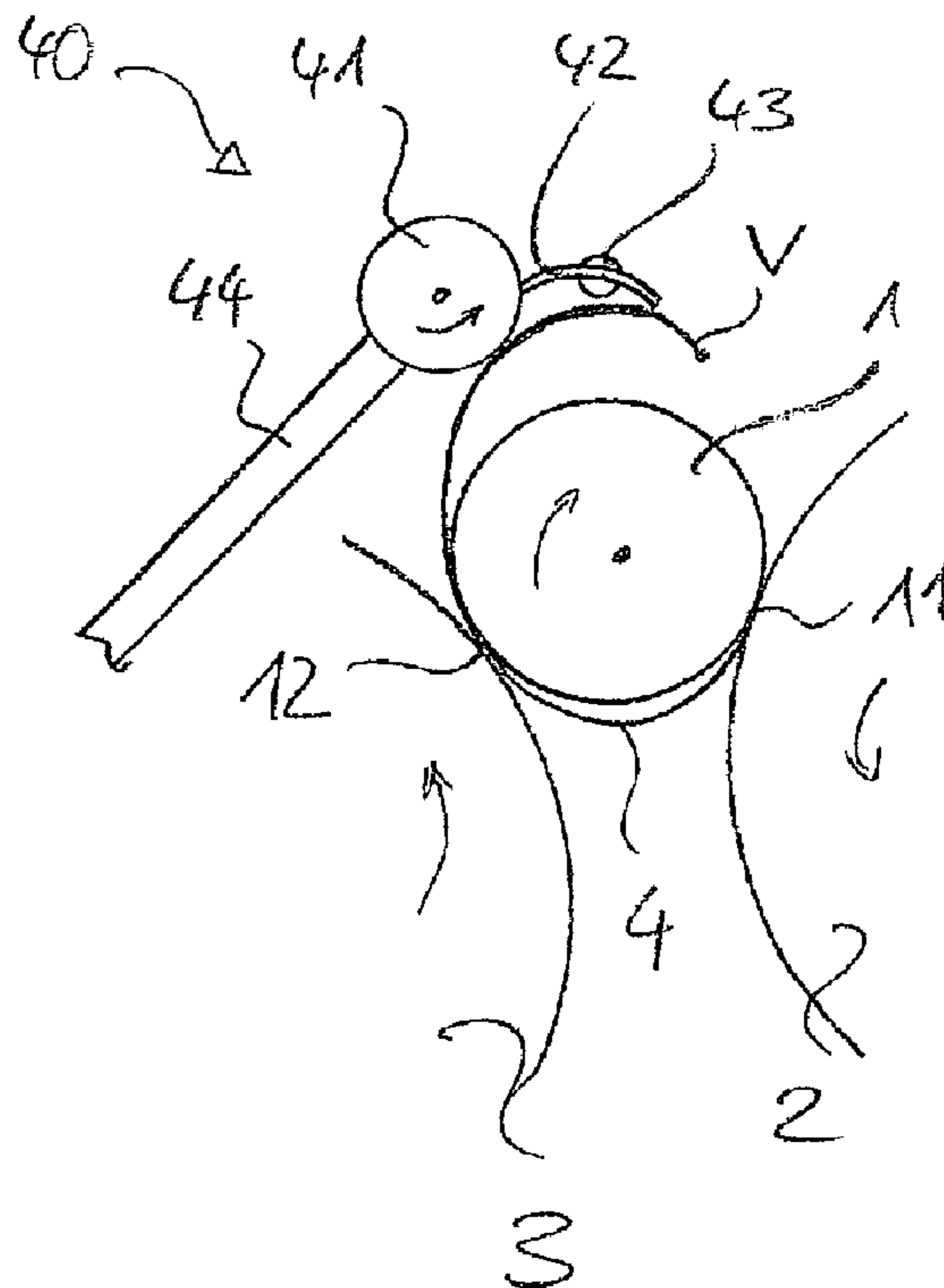
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(54) Titre : PROCEDE ET APPAREIL POUR PLACER UNE BANDE DE MATERIAU FIBREUX DANS UN ENROULEUR

(54) Title: METHOD AND APPARATUS FOR THREADING A FIBROUS MATERIAL WEB IN A WINDER



(57) **Abrégé/Abstract:**

The invention relates to a method of adhesive-free threading of a fibrous material web for winding around a winding body and comprises the following steps of diverting the fibrous material web in the circumferential direction of the winding body, guiding the fibrous material web with its unfolded leading edge ahead in the direction of a nip formed between the winding body and a drum and catching the leading edge of the fibrous material web by interaction with the fibrous material web and/or the winding body. An apparatus suggested by the invention for adhesive-free threading of a fibrous material web for winding around a winding body comprises a diverting means for diverting the fibrous material web in the circumferential direction of the winding body and a guiding means for guiding the fibrous material web with its unfolded leading edge ahead in the direction of a nip formed between the winding body and a drum.



Abstract

The invention relates to a method of adhesive-free
threading of a fibrous material web for winding around a
5 winding body and comprises the following steps of diverting
the fibrous material web in the circumferential direction
of the winding body, guiding the fibrous material web with
its unfolded leading edge ahead in the direction of a nip
formed between the winding body and a drum and catching the
10 leading edge of the fibrous material web by interaction
with the fibrous material web and/or the winding body. An
apparatus suggested by the invention for adhesive-free
threading of a fibrous material web for winding around a
winding body comprises a diverting means for diverting the
15 fibrous material web in the circumferential direction of
the winding body and a guiding means for guiding the
fibrous material web with its unfolded leading edge ahead
in the direction of a nip formed between the winding body
and a drum.

**Method and Apparatus for Threading
a Fibrous Material Web in a Winder**

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Description

The invention relates to a method and an apparatus by which a thick fibrous material web can be threaded into a winder.

10 The invention is especially directed to winding thick fibrous material webs, e.g. pulp webs. The thickness of said thick fibrous material webs amounts to more than 0.5 mm and especially more than 0.7 mm.

15 Winders or reels are used to wind a fibrous material web and to transport, store or supply it to further processing in said wound state. During winding the fibrous material web is wound around a core which is rotated and around which the fibrous material web is wound.

20

Such winder or reel is frequently employed together with a cutting device in which the fibrous material web is cut to the width to be supplied, wherein in this case usually cores cut to length corresponding to the web cuts' widths
25 are used onto which the web cuts simultaneously arriving from the cutting means are synchronously wound in the winder.

The cores are very quickly fully wound especially in the
30 case of thick fibrous material webs so that the cores have to be exchanged. After the exchange the web cuts or else the entire web has to be joined to the cores as winding start so that then winding can be performed in the usual way by rotating the core or the cores.

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From the state of the art according to US 7 458 539 B2 a winder is known in which a fibrous material web is to be wound around a core located on two bearer drums in a winding bed and forming respective nips with the two bearer
5 drums.

The web to be wound is guided with its leading edge ahead coming from below through one of the nips to the core and there the leading end of the web is bonded to the core by a
10 double-sided adhesive tape. To this end, a scraper scrapes the web leaving the nip from the bearer drum, the scraper element then making a tilting movement so as to press by a surface the leading end of the web against the core at the position where the adhesive tape is provided. For this
15 solution an adhesive tape is required, however.

Furthermore, a state of the art is known which does not require an adhesive bonding of the leading end. A core is supported on two bearer drums in a winding bed and forms
20 respective nips with the two rollers. The web to be wound is guided from above through the first one of the two nips, moves beneath the core and then passes the other nip. The leading end of the web leaving the nip is caught by a baffle plate and moves along the baffle plate until the
25 latter is covered by the leading end of the web on the side where the first nip is provided.

The baffle plate is now swiveled in the direction of the first nip so that a longitudinal edge of the baffle plate
30 is moved toward the first nip. The projecting leading end of the web is folded or bent about the longitudinal edge of the plate so that the web is adjacent to both sides of the baffle plate, a web tail being formed which extends away from the longitudinal edge of the baffle plate. The baffle
35 plate now introduces the portion of the web folded around

the longitudinal edge into the nip. A suitably shaped guide member may assist this insertion. Upon further rotation the web end is pressed against the core by the following web so that the first winding is completed. After several
5 revolutions the web end is sufficiently secured to the core so that the winding operation is performed in the usual way, e.g. with the aid of a press roll biasing the core against the bearer drums.

10 The threading technology according to this state of the art forms a thickness step of three layers of fibrous material web where the web for the first time overlaps its end inserted in the nip. It has turned out that especially in the case of thicker fibrous material webs at a position
15 corresponding to this point breaks in the web can occur even later in the wound product. Hereinafter the terms of fibrous material web and web will be used synonymously for the fibrous material web.

20 It is the object of the invention to suggest a method of threading a thick fibrous material web into a winder as well as an apparatus for threading a thick fibrous material web into a winder by which the afore-mentioned drawbacks are avoided. The thickness of the thick fibrous material
25 webs is more than 0.5 mm.

This object is achieved, as regards the method, by a method according to claim 1. As regards the apparatus, the solution is described in claim 13.

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In accordance with the invention, the method of adhesive-free threading of a thick fibrous material web for winding onto a winding body comprises the following steps of:
diverting the fibrous material web in the circumferential
35 direction of the winding body, guiding the fibrous material

web with its unfolded leading edge ahead in the direction of a nip formed between the winding body and a roll, and catching the leading edge of the fibrous material web by interaction with the fibrous material web and/or the
5 winding body.

By the method according to the invention, the web is introduced with the leading edge ahead or first guided to the nip in which the fibrous material web is already
10 provided. The arriving web assists catching the leading edge of the web into the nip and then clamps the foremost end of the web to the core. The interaction may consist in the fact that the arriving web gets into frictional engagement with the winding body and/or with the arriving
15 web; it may also consist in the fact that the web end is clamped or pinched in the vicinity of the nip between the web and the winding body. If the web is held at the core, the web can be wound.

20 Since no fold is formed, the afore-described step of thickness only has the height of two web layers when the leading edge of the web is superimposed on the core by the following web. The risk of web breaks is reduced. Therefore no adhesive tape is required.

25 The invention can be used in winders making use of winding cores. The method can also be applied when a winding shaft is used (i.e. no winding core being retained in the wound product is provided) onto which the fibrous material web is
30 wound. In order to cover these two forms, a winding body which explicitly includes both winding cores and winding shafts is defined in the claims. In the following description the terms of winding body, winding core and core are used synonymously.

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The method according to the invention can be applied to an apparatus where the winding body forms a single nip with a roll.

- 5 Preferably the winding apparatus can form two nips with the winding body, wherein then in the method preferably the fibrous material web is deflected after leaving a further nip formed between the winding body and a further roller.
- 10 Preferably the fibrous material web first passes through the nip and then through the further nip; i.e. the leading edge of the web is supplied to the nip mentioned first here.
- 15 Preferably, upon diverting, the leading edge of the fibrous material web is pushed toward the nip in one direction.

During diverting, preferably a tensile strength is applied to the fibrous material web in the circumferential
20 direction of the winding body. By this course of action, the fibrous web is tightened around the core and thus smoothly contacts the core.

Furthermore, diverting the fibrous material web in the
25 direction of the nip is preferably assisted by an auxiliary nip. The auxiliary nip can be generated by an auxiliary pressing means which presses the unfolded leading edge of the fibrous material web toward the nip until the leading edge is caught, wherein the auxiliary pressing means is
30 adapted to hold the fibrous material web tightly around the winding body.

Preferably, to this end the auxiliary pressing means can advance or decelerate the fibrous material web.

35 Alternatively or in addition the rotation of the winding

body can be accelerated or decelerated in order to stretch the fibrous material web tight.

Preferably the winding body can be rotated in a winding bed
5 formed by two bearer drums, a nip being formed between the winding body and each bearer drum, the fibrous material web passing through both nips and the auxiliary pressing means being adapted to act upon the fibrous material web above the two nips and between two vertical planes each of which
10 includes a nip. It is described here that the auxiliary pressing means by which the diversion and the guiding to the nip are assisted can be arranged in the intermediate space between the two bearer drums. The auxiliary pressing means is preferably movable. It is of advantage when the
15 auxiliary pressing means can be moved out of the intermediate space.

The fibrous material web can preferably be inserted, after passing the two nips with its unfolded leading edge ahead,
20 by means of the auxiliary pressing means between the subsequent fibrous material web and the winding body so as to be caught by the nips.

After the fibrous material web has been guided for several
25 revolutions of the winding body during the threading operation, upon winding the fibrous material web can be pressed against the winding body by a press roll different from the auxiliary pressing means. In winding operations such press rolls are used to control the winding hardness
30 and/or to ensure a safe catching of the winding body for its rotation along with a rotating drum, which can also be two rotating bearer drums.

There is a plurality of techniques and means for guiding a
35 fibrous material web. As regards the present method,

preferably the following options for guiding the fibrous material web are applicable. The leading edge of the fibrous material web can be caught by means of sliding contact with a mechanical guide and/or by means of one or more air jets. The fibrous material web can be diverted by means of rolling contact with one or more rolls, by means of sliding contact with a mechanical guide, by means of an auxiliary nip and/or by means of one or more air jets and the fibrous material web can be bent into a shape approached to the circumference of the core by means of rolling contact with one of more rolls, by means of sliding contact with a mechanical guide, by means of an auxiliary nip and/or by means of one or more air jets.

15 In the afore-mentioned techniques especially the rolling contact between the roll or rolls and the web can be brought about by adjustable pressure. Such a solution can be realized, for instance, by the adjustable auxiliary pressing means.

20 Preferably it can be provided that the threaded fibrous material web is tightened by increasing the diameter of the winding body. To this end, the winding body can be equipped, for instance, with hydraulic or pneumatic means so that the diameter of the winding body is adjustable. Mechanical constructions by which this can be achieved are equally possible.

30 An apparatus according to the invention for adhesive-free threading of a thick fibrous material web for winding onto a winding body includes a diverting means for diverting the fibrous material web in the circumferential direction of the winding body and a guide means for guiding the fibrous material web with its unfolded leading edge ahead in the direction of a nip formed between the winding body and a

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roll, wherein the leading edge of the fibrous material web is caught when an interaction with the fibrous material web and/or the winding body takes place.

5 As explained in the beginning, in the apparatus according to the invention the method according to the invention is realized by a diverting means and a guide means. The diverting means and the guide means are configured to lead the unfolded leading end of the fibrous material web in the
10 direction of the nip between a drum and the winding body. The fibrous material web has a particular stiffness which is sufficient to guide the unfolded end freely over a certain distance so that it is not necessary to stiffen the leading end by folding. The distance over which the
15 unfolded leading end is guided is preferably adjusted to the stiffness of the web.

Preferably the diverting means includes drive means so as to push the leading edge of the fibrous material web toward
20 the nip. Preferably the drive means of the diverting means are designed so that during diverting they can apply a tensile strength to the fibrous material web in the circumferential direction of the winding body.

25 It is a possible configuration that the diverting means includes an auxiliary pressing means forming an auxiliary nip at the winding body. The auxiliary pressing means preferably comprises a drive and/or a brake so as to press the unfolded leading edge of the fibrous material web in
30 the direction of the nip and/or to keep the fibrous material web tight around the winding body.

In the apparatus the diverting means and the guide means are preferably arranged in the moving direction of the
35 fibrous material web behind another nip so as to divert the

fibrous material web when it leaves the further nip formed between the winding body and a further drum.

Preferably the winding body is arranged in a winding bed
5 formed of two bearer drums and is rotated there, wherein a nip is formed between the winding body and each bearer drum, the fibrous material web being adapted to pass both nips and the auxiliary pressing means being adapted to be arranged movably above the two nips and between two
10 vertical planes each including a nip.

The auxiliary pressing means preferably includes an adjustable friction means so as to apply tensile strength in the circumferential direction of the winding body to the
15 fibrous material web upon diverting.

The friction means preferably includes one or more optionally resilient roll or rolls the axis or axes of which are aligned in parallel to the axis of rotation of
20 the winding body. An adjusting means can be operatively connected to the friction means so as to adjust the pressure of the friction means against the fibrous material web or else to vary the same during the threading operation.

25

In an advantageous configuration the guide means comprises at least one guide plate disposed in the direction of move of the fibrous material web behind the diverting means and is gradually bent in parallel to the circumferential shape
30 of the winding body.

Preferably the guide means is movable and the trailing edge of the at least one guide plate of the guide means can be brought closely to the nip. Closely in this context means a
35 value dependent on the type of fibrous material web or on

the characteristics thereof which at any rate has to be dimensioned such that a web portion freely projecting from the guide plate in the direction of the nip is stiff enough to be inserted into the nip or to be guided so closely to the web that it is caught by the nip. The value preferably
5 lies within the range of from 1 mm to 20 mm.

Preferably the at least one guide plate exhibits a comb-like configuration having teeth extending in the moving direction of the web. The guide means furthermore can include rolls which are or can be arranged between the
5 teeth of the comb-like guide plate. In order to reduce the weight and possibly to arrange additional sliding elements the at least one guide plate can have a comb-like configuration having tines extending in the moving direction of the web. It is possible that the guide means
10 further includes rolls that are or can be arranged between the teeth of the comb-like guide plate.

Preferably a catching means in the form of one or more plates and/or air jets is associated with the diverting
15 means so as to guide the leading edge of the fibrous material web into the sphere of influence of the diverting means which includes e.g. the auxiliary pressing means.

It can preferably be provided that the winding body is
20 equipped, for instance, with hydraulic or pneumatic means by which the diameter of the winding body is adjustable. Especially hoses that can be filled or pumped up can be provided. Only minor increases in the diameter are required to tighten the threaded fibrous material web over the
25 circumference of the winding body. Equally mechanical designs, especially including meshing cones or the like, are possible in order to achieve this target.

Of preference, the device has a press roll movable
30 independently of the diverting means and/or the guide means by which the fibrous material web can be pressed against the core during the winding operation. Such press roll is adapted to assist both the power transmission for rotating the core and to control the winding tightness.

Hereinafter the invention will be described in detail by way of a strongly schematized embodiment. For this purpose, the enclosed figures are referred to in which:

Fig. 1 shows in a strongly schematized manner a winding apparatus in which the threading operation of a fibrous material web has started;

Fig. 2 shows the continued threading operation in the winding apparatus according to Fig. 1;

Fig. 3 shows a state in the threading operation in a winding apparatus according to Fig. 1 shortly before threading is completed;

Fig. 4 shows the start of winding after threading in the winding apparatus according to Fig. 1; and

Fig. 5 schematically shows several details of the threading operation in the winding apparatus according to Fig. 1;

Fig. 6 schematically shows an example of press roll for the threading operation;

Fig. 7 schematically shows an example for the threading operation using a press roll according to figure 6.

Fig. 1 illustrates two bearer drums 2 and 3 on which a winding body, in this case a winding core 1 forming the later center of a wound fibrous material web 4, is supported. The bearing points of the core 1 on the bearer drums 2 and 3 are linear contacts which are to be referred to as nip in the following. The nip formed between the core 1 and the bearer drum 2 is denoted with 11 while the nip between the core 1 and the bearer drum 3 is denoted with 12. Furthermore, Fig. 1 shows a fibrous material web 4 guided around the bearer drum 2 coming from the right bottom and the leading edge V of which is guided through the nip 11.

Fig. 1 further shows a press roll 5 above the core 1 to be used for the later winding operation and a threading device 40 in a strongly schematized representation above the nip 12.

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The bearer drums 2 and 3 shown in Fig. 1 rotate anti-clockwise, the core 1 being rotated clockwise by the bearer drums 2 and 3. By this rotation also the fibrous material web 4 is conveyed through the nip 11.

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Fig. 2 shows the continued threading operation started in Fig. 1. The same reference numerals denote also the same elements in this figure. The fibrous material web 4 has passed the nip 11, has been collected by a device not shown in detail and diverted so that the leading edge V of the fibrous material web 4 has been inserted in the nip 12 formed between the core 1 and the bearer drum 3. The diverting operation below the core 1 in Fig. 2 can be effectuated by a device not shown which may be, for instance, a doctor blade, a deflector plate or else an air jet device.

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Above the bearer drum 3 there is shown a threading device 40, wherein the arrows P indicate it to be movable. The threading device 40 is shown only very schematically and is illustrated in more detail with reference to Fig. 5.

25

When the fibrous material web 4 has passed the nip 12 with its leading edge, the leading edge V contacts the threading device 40. By this threading device the leading end of the fibrous material web 4 is guided with the leading edge V ahead in the circumferential direction of the core 1 so that the position of the fibrous material web 4 shown in Fig. 3 is brought about.

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As is visible from Fig. 3, the threading device 40 has been clearly moved to the center of the winding apparatus and has approached the core 1. In this way the fibrous material web 3 is controlled or guided with its leading edge V ahead in the direction of the nip 11. Being further advanced by the rotation of the bearer drums, the leading edge V of the fibrous material web 4 is moved even more closely to the nip 11. If the leading edge V is inserted into the nip 11 so far that an interaction (for instance an entraining frictional contact) is reached with the trailing fibrous material web 4, the leading edge V of the fibrous material web 4 is pulled into the nip 11. At this moment the subsequent fibrous material web 4 pinches the leading edge V to the core 1 so that the fibrous material web 4 is fixedly held on the winding core 1 and the winding operation can start.

Preferably the core is further rotated for several times during threading so that the beginning of the fibrous material web 4 is wound around the core 1 for several times, before, as illustrated in Fig. 4, the press roll 5 urges the fibrous material web 4 from above, presses against the core 1 and thus fixedly presses the core toward the bearer drums 2 and 3. By this press roll 5 the winding tightness of the wound product being formed around the core 1 can be systematically influenced.

Fig. 5 is a somewhat enlarged schematized representation of the elements which can be found in a threading device 40. Fig. 5 only indicates the bearer drums 2 and 3 between which the core 1 is held and is adjacent to the nips 11 and 12 at the two bearer drums 2 and 3. The fibrous material web 4 is guided with its leading edge V through the two nips 11 and 12. The threading device 40 includes a diverting roll 41 as auxiliary pressing means for forming

an auxiliary nip, a guide plate 42 and guide rolls 43. These elements are held at rods 44 only symbolically reproduced by a simple bar, the rods 44 being designed to bring about the position of both the diverting roll 41 and the other guiding elements 42 and 43 with respect to the core 1 and with respect to the bearer drums 2, 3 in a desired and possibly independent manner. This means that it is not only a simple reciprocating or swivel movement which is meant but the rods 44 are adapted to carry out also more complicated moving operations.

So, although this is not shown here, the diverting roll 41 can form, with the fibrous material web 4 in between, an auxiliary nip vis-à-vis the core 1. In this auxiliary nip the web can be accelerated or delayed so that, on the one hand, the web is laid tightly around the winding core and, on the other hand, is moved or pushed toward the nip 11 by a forced movement.

Fig. 5 shows that the fibrous material web 4 meshes with the diverting roll 41 and that the fibrous material web 4 is further guided by the guide plate 42. The guiding is aimed at guiding the leading edge V, as explained above, that far into the nip 11 until the leading edge is also pulled into the nip 11 by the subsequent fibrous material web. In order to assist this and to permit smooth sliding of the leading end of the fibrous material web 4 past the guiding elements 42 and 43, the guide plate 42 may have a comb-like shape, the guiding rolls 43 being arranged between the comb teeth formed in this way. It is also possible to arrange or form the guiding rolls 43 to be movable or adjustable vis-à-vis the guide plate 42.

The diverting roll 41 usually can be driven, namely anti-clockwise in Fig. 5. Hence by the diverting roll 41 not

only the caught leading edge V of the fibrous material web 4 can be diverted toward the guide plate 42, but the diverting roll 41 is also configured such that the rotating diverting roll 41 can catch the fibrous material web 4 by frictional contact. In the position shown in Fig. 5 this is possible to a limited extent only, but it is obvious that as stated already before the diverting roll 41, when further approached to the core 1, can form an additional nip with the core 1 in which the fibrous material web 4 can be conveyed.

Preferably the number of revolutions of the diverting roll 41 is selected such that the circumferential speed thereof is slightly higher than that of the core 1 so that the fibrous material web 4 leaving the nip 12 is tightened on the core 1 (this is not shown in Fig. 5). The fibrous material web 4 tightly placed on the core 1 moves to the nip 11 in the described manner and is conveyed there together with the subsequent fibrous material web through the nip 11 and the leading edge of the fibrous material web 4 is thus safely held.

In the described method of the apparatus a lot of configurations can be made. For instance, the diverting roll 41 can be spring-biased so as to exert a defined force onto the fibrous material web 4 in the contacting position against the core 1. The diverting roll 41 can also have a soft surface so that the spring action of this elastically deformable surface corresponds to a resilient suspension of the diverting roll 41. There can also be used a type of foamed rubber roller.

The guide plate 42 can be designed to be comb-like, but is it also possible to make use of a simple plate or a multi-split plate extending in the transverse direction of the

machine. The plate need not be made of sheet metal, of course, but can be made of any type of suitable material. The guide plate must not be thin but it can be in the form of a suitably configured body having extensions by which the guiding rolls 42 are held. The guide plate 42 can also be in the form of a guiding body including the diverting roll as well as a guiding face and guiding rolls, where appropriate.

10 In figure 6 is schematically shown a pressure roll 5 provided with means 95 to create the holding nip for the leading edge i.e. tail beginning of the fiber web when threading for winding. The pressure roll 5 is provided with for example grooves 95 that provide for holding the the
15 tail of the web.

As shown in figure 7 the pressure roll 5 provides for the holding nip on the top of the core 1 when the tail beginning is directed around the core 1 in the beginning of winding of the fiber web 4 in a two drum 2, 3, winder. Thus the holding means 95 in the pressure roll 5 accomplish catching the leading edge of the fibrous material web by interaction with the fibrous material web and/or the winding body 1.

25 Although not shown here, such winding apparatus as described in the foregoing is frequently used in connection with a cutting device or a longitudinal cutter. In such longitudinal cutter large rolls of a wide web are cut into individual webs, and these webs are then wound in the shown winding apparatus, for instance. In such apparatus the web is usually processed having a leading edge extending in the transverse machine direction and extending over the entire web width. But it is also possible that the leading edge of
30 the web is cut to be slanted or pointed so that the
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threading is to start with the tip of the web ahead. In this case, too, the method described here and the apparatus described here are applicable.

5 When the method described here and the apparatus described here are used in connection with a longitudinal cutter, then threading by a leading edge extending in the transverse direction of the web over the entire web width is advantageous, because the longitudinal cutter can supply
10 right away pre-cut webs to the winder so that the individual wound products are formed in axial direction completely separately from each other and later no wearisome separation of the individual wound products is required.

15 Since in the method described here no folded leading edge is covered in the nip by another web layer so that three webs are stacked at this position, this method is especially suited for the winding of thick fibrous material
20 webs; but it can also be used for fibrous material webs of conventional thickness. There is no adhesive tape or other adhesive required, either.

In this application everything is understood to be a thick
25 fibrous material web which is covered by the terms of paper, paperboard, cardboard etc. so that no restrictions are made in this respect. Preferably, the fibrous material web can also be a pulp web. The thickness of the web can be more than 0.5 mm, it can especially also be more than 0.7
30 mm.

Claims

1. A method of adhesive-free threading of a thick fibrous material web, especially a pulp web, for winding around a winding body, comprising the steps of:
- 5 diverting the fibrous material web in the circumferential direction of the winding body,
- guiding the fibrous material web with its unfolded leading edge ahead in the direction of a nip formed between
- 10 the winding body and a drum, and
- catching the leading edge of the fibrous material web by interaction with the fibrous material web and/or the winding body.
- 15 2. The method according to claim 1, characterized in that during diverting the leading edge of the fibrous material web is pushed in a direction toward the nip.
3. The method according to claim 1 or 2, characterized in
- 20 that during diverting a tensile strength is applied to the fibrous material web in the circumferential direction of the winding body.
4. The method according to one or more of the claims 1, 2
- 25 or 3, characterized in that diverting of the fibrous material web in the direction of the nip is assisted by an auxiliary nip.
5. The method according to one or more of the preceding
- 30 claims, characterized in that the auxiliary nip is produced by an auxiliary pressing means which presses the unfolded leading edge of the fibrous material web in the direction of the nip until the leading edge is caught, the auxiliary pressing means holding the fibrous material web tightly
- 35 around the winding body.

6. The method according to claim 5, characterized in that the auxiliary pressing means advances or decelerates the fibrous material web and/or the rotation of the winding body is accelerated or decelerated so as to stretch the fibrous material web tight.

7. The method according to one or more of the preceding claims, characterized in that the winding body is rotated in a winding bed formed by two bearer drums, wherein a nip is formed between the winding body and each bearer drum, wherein the fibrous material web passes through both nips and wherein the auxiliary pressing means acts upon the fibrous web above the two nips and between two vertical planes each comprising a nip.

8. The method according to claim 7, characterized in that after passing through both nips the fibrous material web is inserted with its unfolded leading edge ahead, by means of the auxiliary pressing means, between the subsequent fibrous material web and the winding body for being caught by the nips.

9. The method according to one or more of the claims 1 to 8, characterized in that during the threading operation the fibrous material web is guided for several revolutions of the winding body before the fibrous material web is pressed against the winding body during winding by a press roll different from the auxiliary pressing means.

10. The method according to one or more of the preceding claims, characterized in that diverting the fibrous material web comprises at least one of the following measures: Catching the leading edge of the fibrous material web by means of sliding contact with a mechanical guide and/or by means of one or more air jets; diverting the

fibrous material web by means of rolling contact with one or more rolls, by means of sliding contact with a mechanical guide, by means of an auxiliary nip and/or by means of one or more air jets; and bending the fibrous material web into a shape approached to the circumference of the winding body by means of rolling contact with one or more rolls, by means of sliding contact with a mechanical guide, by means of an auxiliary nip and/or by means of one or more air jets.

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11. The method according to claim 10, characterized in that the rolling contact pressure between the roll or rolls and the web and/or the pressure prevailing in the auxiliary nip is adjustable.

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12. The method according to one or more of the preceding claims, characterized in that the threaded fibrous material web is tightened by increasing the diameter of the winding body.

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13. An apparatus for adhesive-free threading of a thick fibrous material web, especially a pulp web, for winding around a winding body, comprising

a diverting means for diverting the fibrous material web in the circumferential direction of the winding body, and

a guiding means for guiding the fibrous material web with its unfolded leading edge ahead in the direction of a nip formed between the winding body and a drum, wherein the leading edge of the fibrous material web is caught when an interaction with the fibrous material web and/or the winding body takes place.

14. The apparatus according to claim 13, characterized in that the diverting means includes drive means so as to push

the leading edge of the fibrous material web in a direction toward the nip.

15. The apparatus according to claim 13 or 14,
5 characterized in that during diverting the drive means of the diverting means can apply a tensile strength in the circumferential direction of the winding body to the fibrous material web.

10 16. The apparatus according to one or more of the claims 13 to 15, characterized in that the diverting means includes an auxiliary pressing means forming an auxiliary nip at the winding body.

15 17. The apparatus according to claim 16, characterized in that the auxiliary pressing means includes a drive and/or a brake so as to press the unfolded leading edge of the fibrous material web in the direction of the nip or to hold the fibrous material web tightly around the winding body.

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18. The apparatus according to one or more of the preceding claims 13 to 17, characterized in that the winding body is arranged and rotated in a winding bed formed by two bearer drums, wherein a nip is formed between
25 the winding body and each bearer drum, wherein the fibrous material web can pass through both nips and wherein the auxiliary pressing means is movably arranged above the two nips and between two vertical planes each including a nip.

30 19. The apparatus according to claims 13 to 18, characterized in that the auxiliary pressing means comprises an adjustable friction means so as to apply, during diverting, a tensile strength in circumferential direction of the winding body to the fibrous material web.

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20. The apparatus according to claim 19, characterized in that the friction means includes one or more optionally elastic roll or rolls the axis or axes of which is/are aligned in parallel to the axis of rotation of the winding
5 body.

21. The apparatus according to one or more of the preceding claims 13 to 20, characterized in that the guiding means includes at least one guide plate disposed in
10 the running direction of the fibrous material web behind the diverting means and is gradually bent in parallel to the circumferential shape of the winding body.

22. The apparatus according to claim 21, characterized in
15 that the guiding means is movable and the trailing edge of the at least one guide plate of the guiding means can be brought closely to the nip.

23. The apparatus according to claim 21 or 22,
20 characterized in that the at least one guide plate has a comb-like shape including teeth extending in the running direction of the web.

24. The apparatus according to claim 23, characterized in
25 that the guiding means furthermore includes rolls which are arranged or are adapted to be arranged between the teeth of the comb-like guide plate.

25. The apparatus according to one or more of the
30 preceding claims 13 to 24, characterized in that a catching means in the form of one or more plates and/or air jets is provided to guide the leading edge of the fibrous material web into the sphere of influence of the diverting means.

26. The apparatus according to one or more of the preceding claims, characterized in that the winding body includes expandable hoses so as to tighten the threaded fibrous material web by increasing the diameter of the winding body.

27. The apparatus according to any one or more of the claims 13 to 26, characterized in that the apparatus comprises a press roll movable independently of the diverting means and/or the guiding means and/or the guide member by which during the winding operation the fibrous material web can be pressed in the direction against the winding body.

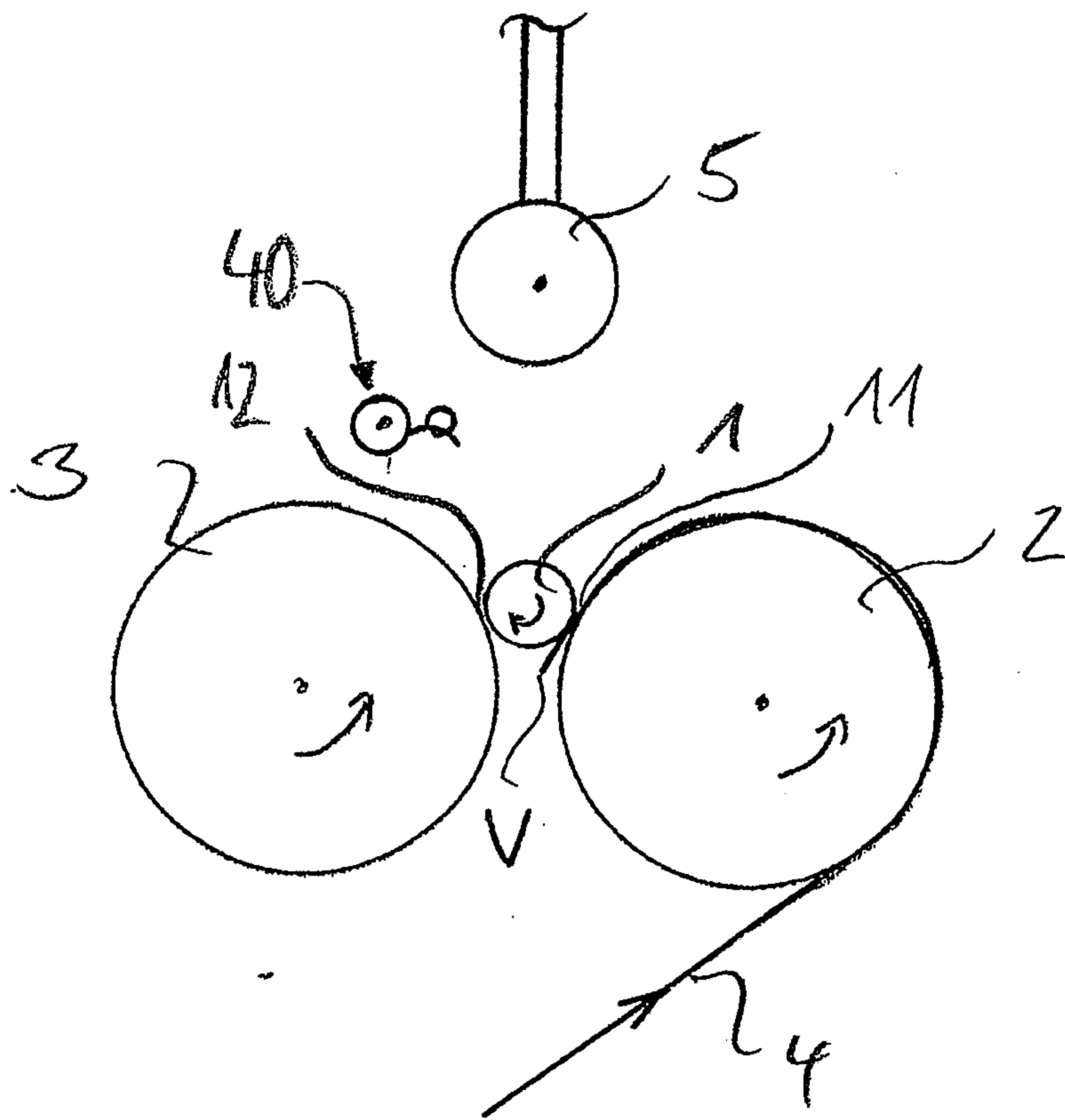


Fig. 1

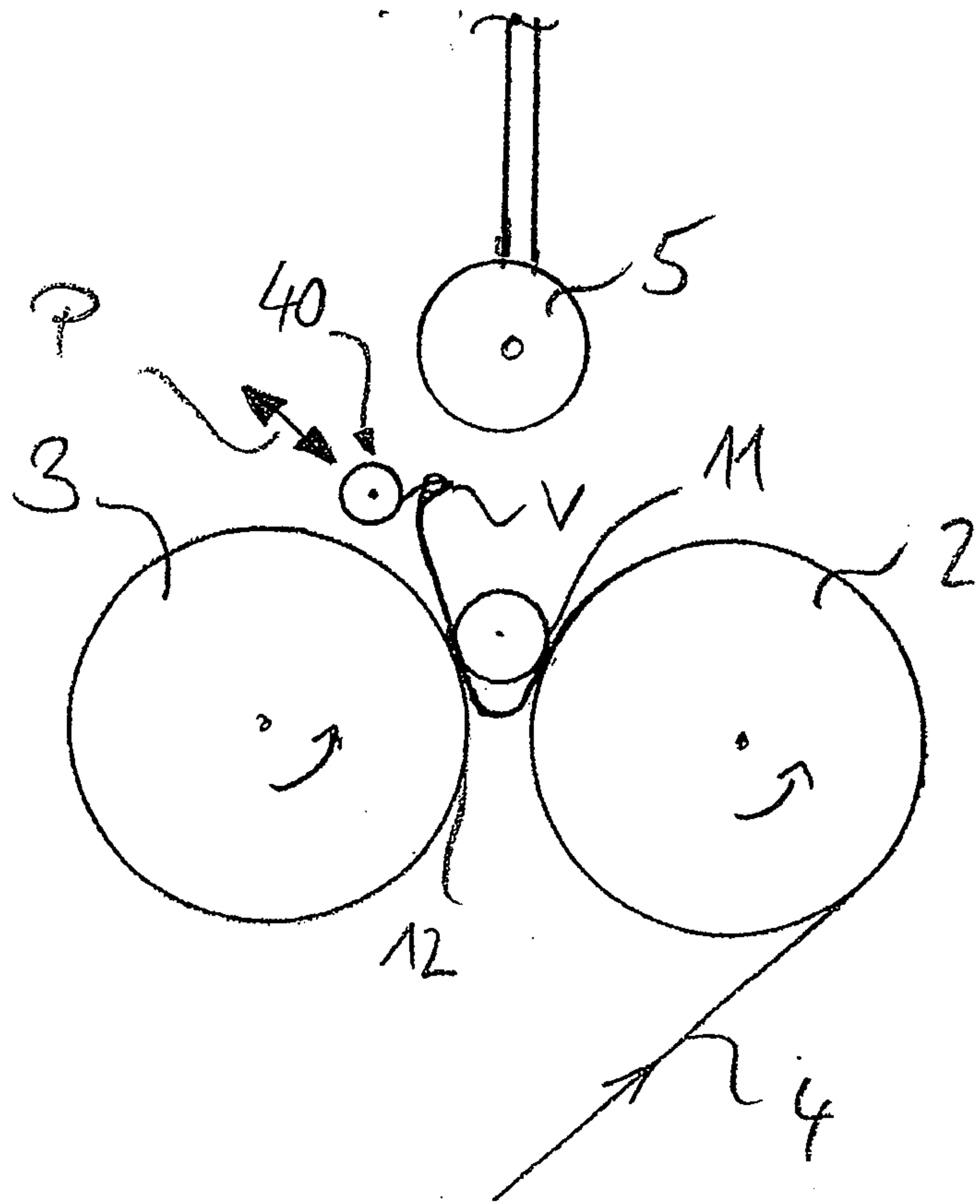


Fig. 2

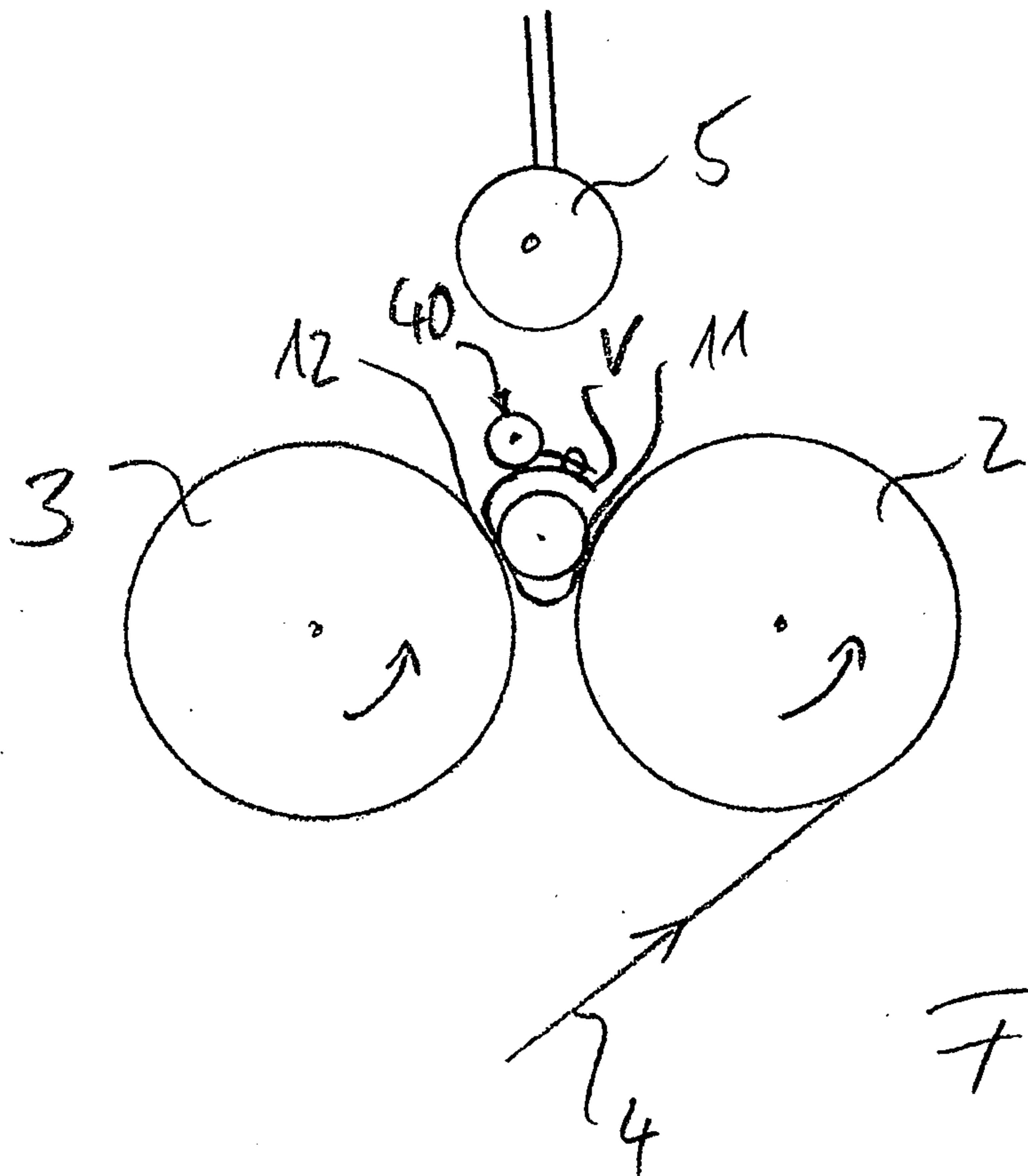


Fig. 3

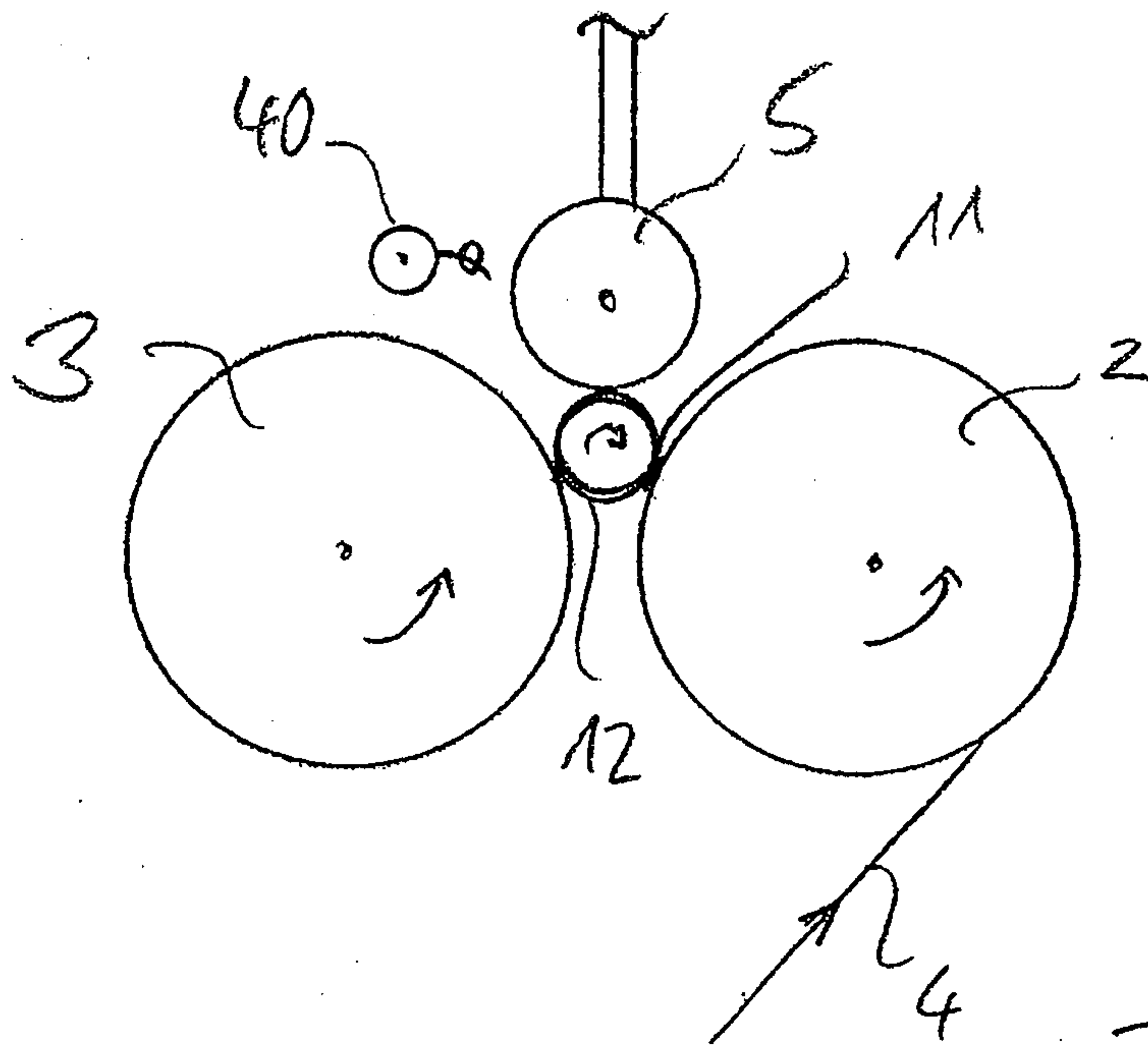


Fig. 4

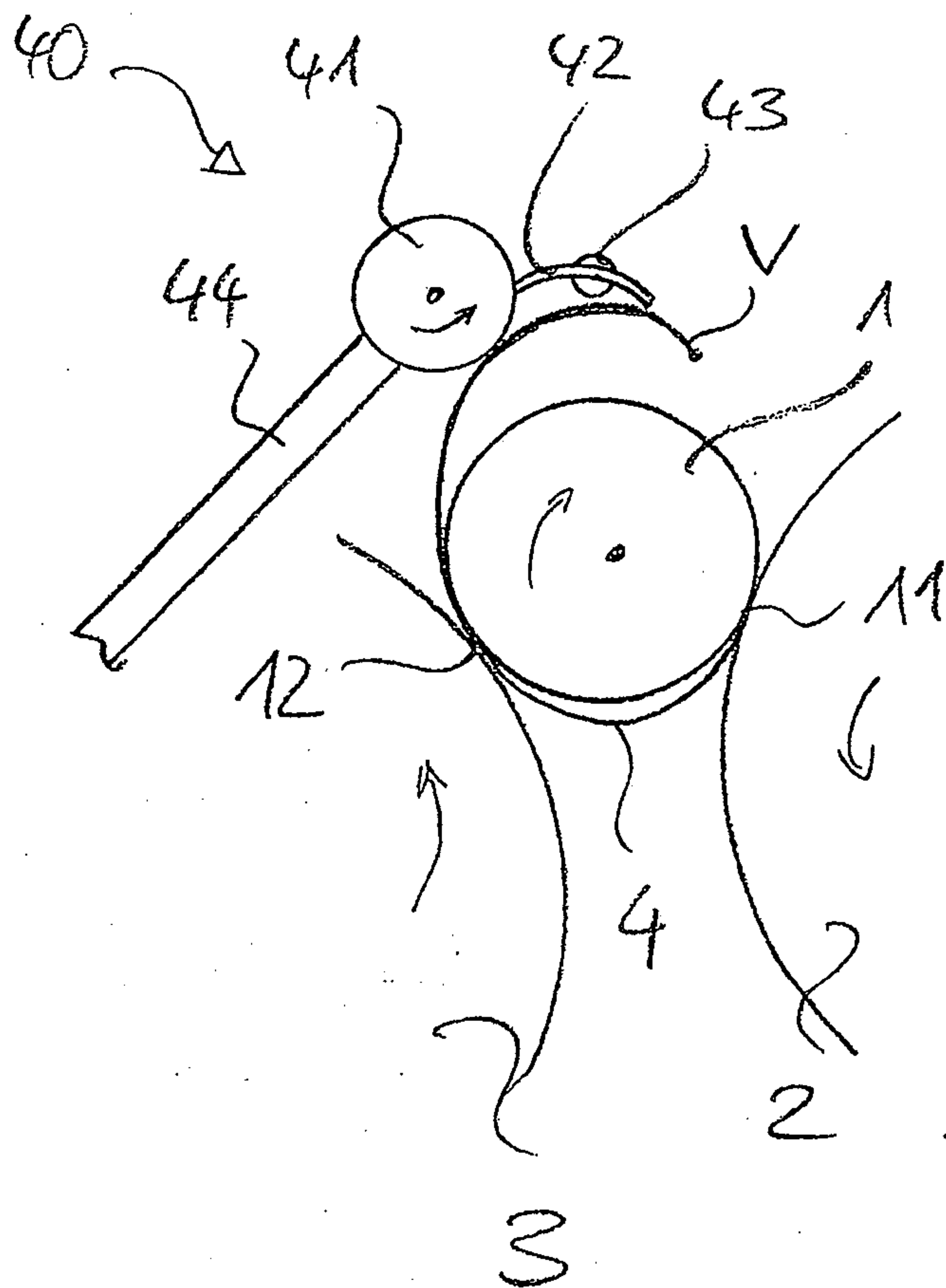


Fig. 5

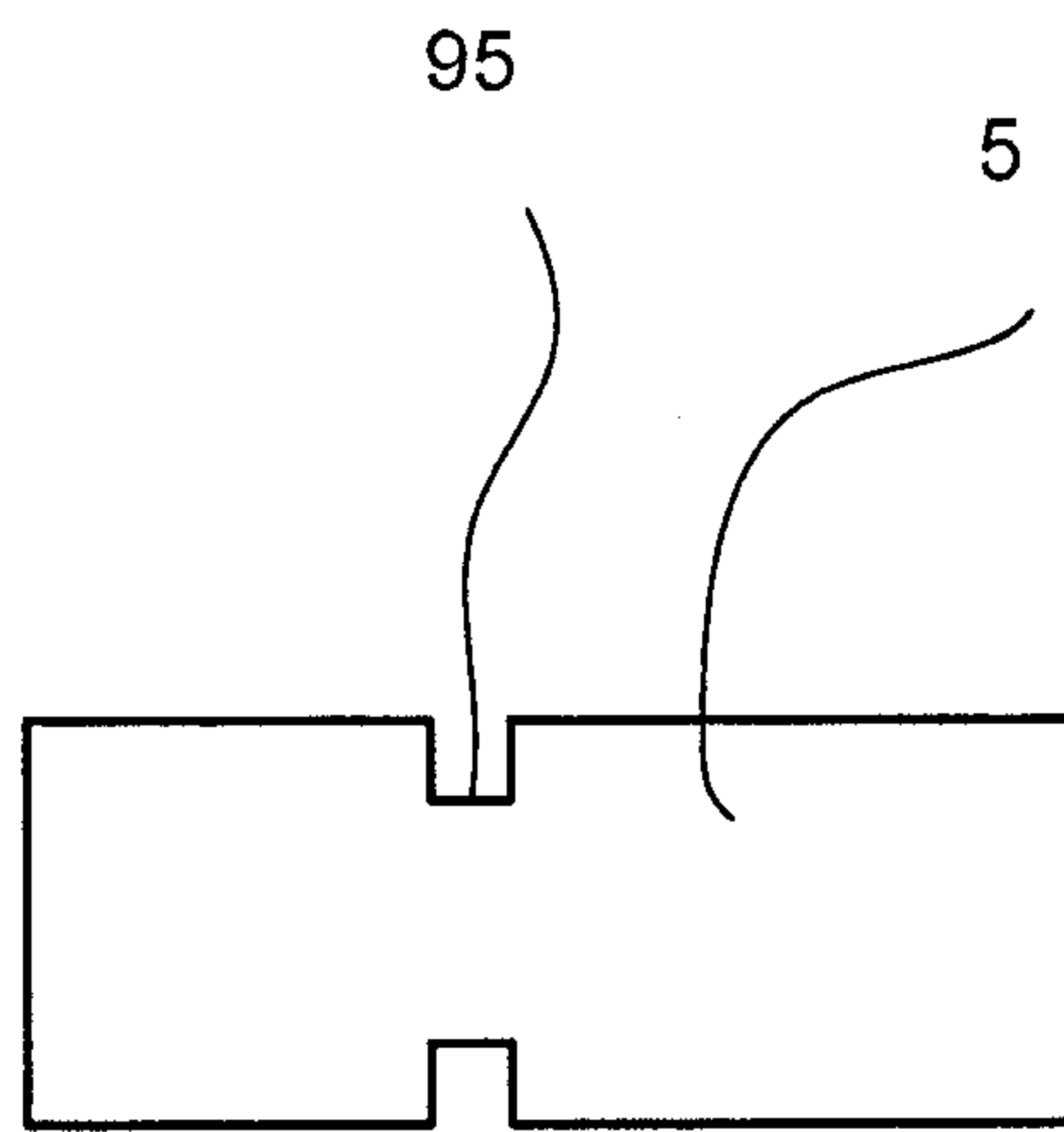


Fig. 6

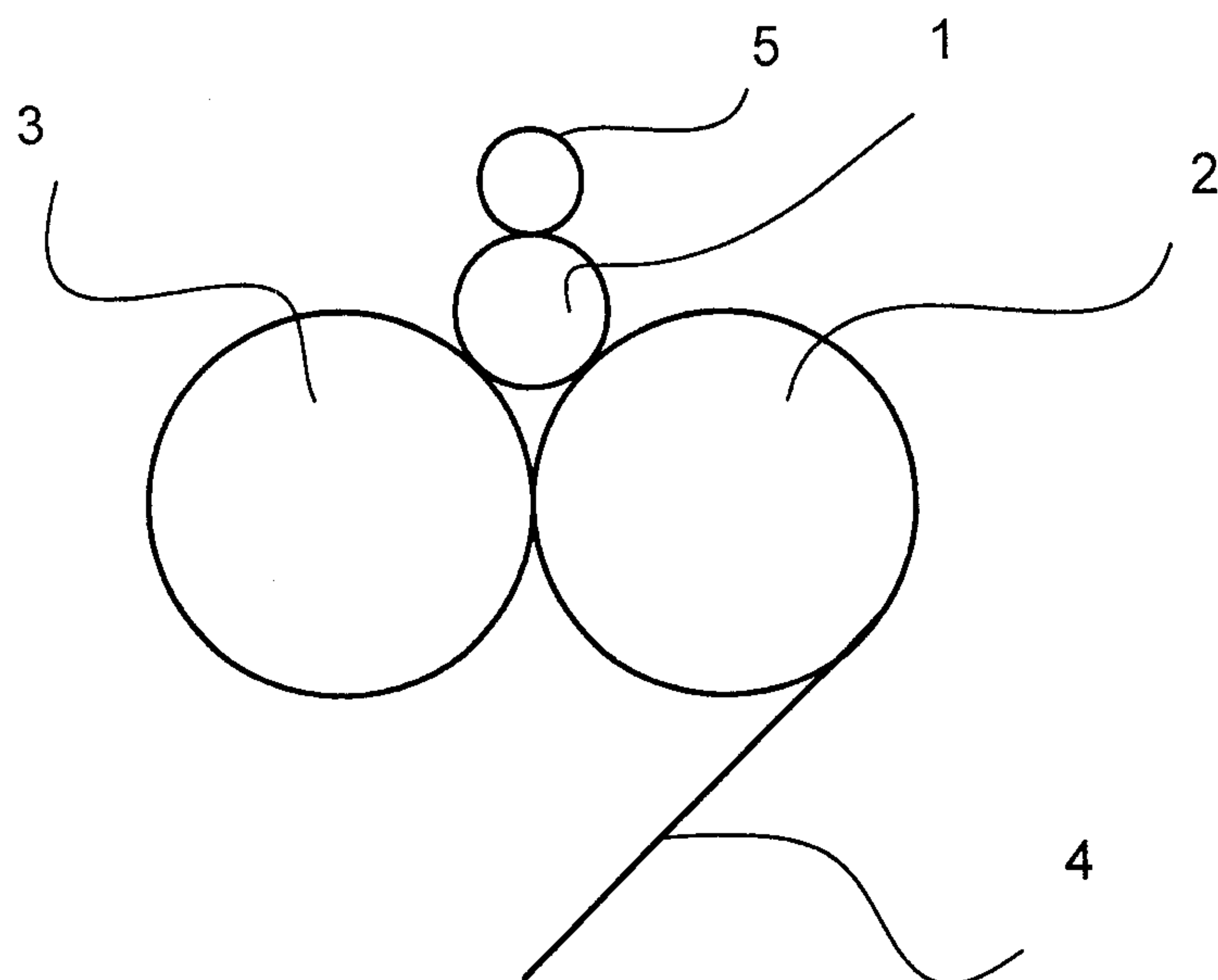


Fig. 7

