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54 **Wet cellulosic web transfer.**

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Description

Field and Background of the Invention

5 The present invention relates to the transfer and support of wet cellulosic webs between two moving elements in a paper machine. More specifically, the present invention relates to the detachment of moving wet cellulosic webs from a press roll or web supporting belt to another moving element in the press section or dryer section of a paper machine.

10 In the fabrication of paper, a suspension of cellulosic fibres, referred to as a furnish, is spread on one or more moving forming fabrics or carriers and the bulk of water drained away. This cellulosic web or sheet, which is initially weak and wet, is transferred onto a press felt which carries it into a press nip formed by two press rolls. The mechanical compression between the two press rolls compacts the web and eliminates part of the water from the wet web. The web usually leaves the press nip adhering to one of the press rolls, and must be peeled from the roll before it can be transferred to the next section of the paper machine.

15 Paper machines generally have one to four presses in the press section followed by a dryer section with heated dryer rolls, to evaporate most of the water remaining in the pressed web. In the fabrication of some paper grades, the dry web is moistened by the application of an aqueous suspension of sizing agents. This occurs in a size press after a first drying stage, and the moist sized paper is then again transferred to a second dryer section where it is dried for a second time.

20 While in the different sections of the paper machine, the wet cellulosic web is usually supported by a pervious belt such as forming fabric, press felts, or dryer fabric, or by other means such as a press roll. A mechanical support is often unavailable during web transfer between the individual moving elements of the machine. Thus during web transfer there is an increased danger of the web or sheet breaking, especially if it is moist and the machine operates at high speed. To reduce the danger of sheet breaks it is sometimes necessary to reduce the machine speed, even though this leads to a decrease in production. The danger of sheet breaks is sometimes reduced by the addition of chemicals or by increasing the proportion of a stronger, but more expensive, component such as chemical pump or long fibre pulp in the furnish or initial fibre mix.

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The most critical areas of sheet transfer are from the forming section to the press section, between the consecutive presses in the press section, and between the last press in the press section and the first roll in the dryer section. In all of these transfer areas, the web or sheet is still wet and thus is comparatively weak. Several methods have been used for transferring the sheet at these areas. In one method the sheet is pulled unsupported from one element to the next through a so-called "open draw". The wet sheet in the open draw is unstable at high speeds and reacts to small variations in the process, sometimes having a tendency to oscillate or flutter. An excessive sheet flutter can cause deformations and wrinkling of the web and reduce the product quality or completely break the sheet and interrupt production. Thus, paper machines with an open draw between the former and the first press rolls usually operate at speed below 750 metres per minute.

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All the machines operating at high speeds, that is to say, in excess of 1,000 metres per minute provide a continuous support of the web from the former to least the first nip in the press section. On machines with multiple roll press arrangement, the web is continuously supported up to the second or third press nip. However, on all present paper machines, the sheet passes through an open draw as it is peeled from the roll of the last press.

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In the open draw method of transfer, the reduction of excessive sheet flutter and stabilization of the web is sometimes achieved by increasing the tension in the web. The tension required to peel the web and to stabilize it in the open draw transfer may, in some instances, be sufficiently great to cause a break in the web and even if it does not break, a high tension can permanently stretch the web and, therefore, make it more susceptible to breaks during the subsequent operations on the paper machine. This reduced extensibility is preserved even in the finished product and can lead to an increased number of paper sheet breaks during converting or printing operations.

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Another method of transferring a web from a pervious carrier or belt such as a forming fabric to another pervious carrier such as a press felt is with the assistance of a drilled roll equipped with a vacuum chamber. Most high speed paper machines use such a vacuum pick-up system to transfer the web from the former to the first press roll. In a vacuum pick-up system, however, a suction roll can only efficiently transfer a web from a pervious carrier to another pervious carrier. Press rolls are generally solid rolls and thus a vacuum system such as a suction roll cannot by itself initiate peeling of a web from a solid press roll or even an impervious belt. In the case of a press roll, the web normally adheres better to the smoother and less pervious surface.

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Since separation of the leading edge of a wet web from a press roll or web supporting belt is difficult to achieve, paper machines are commonly initially threaded with only a narrow band of the web which is sometimes referred to as a "tail". When this narrow band has been successfully threaded through the length of the machine, it is gradually widened until the full width of the paper machine is achieved. This narrow band of paper is initially very weak because it is so narrow and air currents in fast running machines frequently cause the narrow strip to break, thus prolonging the start-up procedure. All the paper produced during machine start-up is unusable and must be recycled. If the machine threading time could be shortened and the machine threaded with the full width of the sheet or web, then production losses would be decreased and a higher efficiency achieved.

Undesirable materials, which generally represent fractions of cellulosic fibres, often adhere to various paper machine rolls such as press rolls, dryers or calender rolls, and are commonly removed by so-called "doctor blades" which have sharp edges positioned in close proximity to the surfaces of the machine rolls and scrape off the web and fibres adhering to the roll. The web removed in this manner is generally densely crimped or creped and cannot be converted into a smooth paper. Creping of a web by a doctor blade may be applied commercially to produce soft and bulky tissue paper used primarily for hygienic products. For high bulk and softness, it is desirable that the tissue paper has regularly and densely spaced creped ridges. Good creping requires a sharp doctor blade and an optimal contact angle between the blade and the impinging web. Canadian Patent no. 1,044,459 and Japanese Patent No. 43160 disclose methods of creping by using a hollow doctor blade from which a flat jet of compressed air is blown from a location adjacent the blade. Both of these patents have as a primary objective, the reduction of the wear of the roll through a reduction or elimination of blade contact with the roll. These hollow doctor blades were designed for production of creped paper rather than for initiation of the transfer of a wet cellulosic web in the press section or immediately prior to the dryer section. Because creping occurs when a web is removed from a smooth surface, such as a press roll by a blade, doctoring has not been used as a means of transfer for wet cellulosic webs to produce paper which requires a smooth surface.

There is disclosed in EP-A-0 254 665 web transfer apparatus for transferring a narrow or tail portion of a web from a press section to a dryer section. It is mentioned that there are devices in use for blowing the tail off the press roll and for directing it towards the dryer section. Associated problems mentioned include the long open spans between the press roll and the nip of the dryer section, and the need to blow the tail off the press roll before it contacts a removing doctor blade, and the proposal is made for reducing the length of the span between the press and dryer sections (which may be in the range of 2.44 metres to 3.05 metres). For this purpose there is provided a transfer fabric which cooperates with the dryer fabric during the majority of the travel of the web between the press and the dryer section so that the web is supported simultaneously from both sides. A lead-in roll 40 is disposed adjacent to a first press roll 28. A doctor blade 38D is located after the press roll 28D and, in use, the tail TD of the web is detached by the doctor blade and moved by curtains of air 96, 98 (see Fig 7), which are located at some distance from the doctor blade, into a nip 104 of the dryer section, likewise at a relatively remote location from the doctor blade.

Prior documents FR-A-1 572 200 and DE- C-234 713 and GB-A-2 158 047 disclose various systems for employing air jets or air currents for transferring detached web ends between successive portions of web treatment apparatus.

We have identified a requirement for :-

- a) an apparatus and method for the detachment of a wet cellulosic web from a press roll or web supporting belt and continuously support this web during its transfer to a subsequent moving element; and/or
- b) a transfer system which permits safe transfer of a tail or a full width sheet or web during the start-up of a paper machine; and/or
- c) a transfer system to transfer a wet fibrous web at web speeds greater than 1,000 meters per minute; and/or
- d) to transfer webs which are weaker than those transferred on existing paper machines without the necessity of having to increase wet web strength and to reduce the number of breaks that occur in conventional paper machines; and/or improvements generally.

According to the invention there is provided a method of forming a web of sheet material as defined in the accompanying claims.

An embodiment can be used to transfer a tail or a full width strip between a press roll or a web supporting belt to a following moving element and comprises a doctor blade to initially separate the web from the roll or carrier, an air jet that blows air in a direction opposite to the movement of the web, between the web and the roll or carrier, and a vacuum or suction roll that may have a pervious belt thereon to retain the web as it is transferred from the press roll or carrier.

The embodiment provides a method and apparatus to transfer a fast moving web of flexible material from a surface of a first web supporting moving element to a second web supporting moving element while continuously supporting said web during the transfer thereof.

The apparatus comprises

5 firstly a first web supporting moving element, and
secondly a suction roll in contact with said web, defining a nip with said first moving element. The apparatus further comprises a doctor blade in contact with said surface immediately after said nip to cause separation of said web from said surface. Additionally, there is provided

10 means for producing an air jet adjacent said doctor blade, between said web and said surface and in a direction substantially opposite the direction of movement of said web, said air jets constituting means for supporting and guiding said web toward said suction roll.

In another embodiment, a pervious belt moves through the nip, around the suction roll and the web is transferred to this pervious belt.

15 In another embodiment, the doctor blade and air jet comprise a unitary assembly with an air plenum connected to a tapered air chamber culminating in two lips with a gap between the lips forming an air jet. One of the two lips forming the doctor blade is positioned in contact with the surface of the roll or web supporting belt.

20 In yet another embodiment, the air plenum and air chamber form a unitary assembly, said assembly being movable between first and second positions, in said first position said assembly contacts the surface of the roll or web supporting belt so that the air jet therefrom is directed towards the nip formed by the press roll and suction roll, in said second position said assembly being positioned so that it is out of contact with said surface.

25 In a still further embodiment, there is provided in a method of forming a web of fibrous sheet material, including the steps of forming a wet web of cellulosic fibres, moving the web through a press section having a plurality of press rolls to a dryer section, the improvement of transferring the moving web from a press roll to a following moving element, comprising the steps of: feeding the moving web around the press roll through a nip formed between the press roll and a suction roll, detaching the moving web from the press roll immediately after the nip by a combination of a doctor blade and blowing a jet of air in a direction counter to the moving web between the press roll and the web, and guiding and supporting the moving web
30 to the following moving element by a combination of the air jet and suction from the suction roll.

Brief Description of the Drawings

35 FIG 1 is a schematic side elevational view of a solid roll with a suction roll forming a nip and a conventional doctor as provided in the prior art;

FIG 2 is a partial side elevational view of a combined doctor blade and air jet according to one embodiment of the present invention;

FIGS 3 and 4 are partial side views showing different shapes of air chambers for the combined doctor blade and air jet;

40 FIGS 5, 6 and 7 are detailed side views showing different edges for doctor blades;

FIG 8 is a partial side elevational view showing a combined doctor blade and air jet positioned adjacent a solid roll forming a nip with a suction roll;

FIG 9 is a schematic side elevational view of a paper machine showing the transfer system of the present invention positioned to transfer a web from the last nip of the press section; and

45 FIG 10 is a schematic side elevational view of yet a further embodiment of a transfer system according to the present invention wherein the transfer occurs between an impervious web supporting belt and a pervious dryer fabric.

Description of the Preferred Embodiment

50 Referring now to the drawings, FIG 1 illustrates a solid roll 10, which is the last roll in a press section of a paper machine, with a web 12 of wet cellulosic fibres moving on the roll 10 from a nip 14 with the previous press roll 16. A suction roll 18 forms a nip 19 with the solid roll 10, and a pervious belt 20, in the form of fabric belt, moves around the suction roll 18 and through the nip 19. A second carrier belt 22, which is also pervious, is conveyed about a further roll 24 positioned beneath the suction roll 18 to provide a passage for the web 12 between the first carrier belt 20 and the second carrier belt 22. The suction roll 18 is to provide suction to separate the web 12 from the surface of the solid roll 10 and direct it between the carrier belts. However, because the solid roll 10 does not allow air to pass therethrough, the suction roll 18

has little effect in separating the web 12 from the solid roll 10. As can be seen in FIG 1, the web 12 passes down to a conventional doctor blade 26 which separates the web 12 and crimps or crepes the web as it is separated from the roll 10. FIG 1 illustrates a prior art arrangement which is not considered satisfactory.

5 A doctor blade and air jet assembly 30 are shown in FIG 2 which comprises an air plenum 32 in the form of a pipe with a slot or a series of holes 34. Air passes into an air chamber 36 formed by two tapered walls 38 which taper down to a first lip 40 and a second lip 42. FIG 2 shows the first lip 40 representing a doctor blade in contact with the surface of a press roll 10 so that the web 12 is shown to separate adjacent the doctor blade lip 40. The second lip 42 is shown to extend not so far as the first lip 40 and a gap 44 or slit between the two lips 40 and 42 provides a longitudinal air jet to eject a flat jet of air. Whereas the word
10 "jet" has been used throughout the specification, this terminology includes a longitudinal stream of air as would be ejected by a gap or slit 44.

FIG 3 shows one embodiment of an air chamber 36 wherein the tapered walls 38 join to a first lip 40 and a second lip 42 which converge inwards to the gap 44 at the ends of the lips 40 and 42. FIG 4 shows another embodiment wherein the two lips 40 and 42 are parallel to each other, thus the gap 44 represents a
15 parallel gap and provides a flat jet of air therefrom.

FIGS 5, 6 and 7 represent different tips of the doctor blade lip 40. The contact angle alpha as shown in FIG 5 being similar to that used on conventional blades wherein the edge of the blade scrapes the roll surface. One or both lips of the assembly may be replaced if the lip or lips are damaged or worn.

The optimum gap width depends on production parameters such as machine speed, product grade,
20 web adhesive force etc. The gap width between the two lips may be between 0.1 and 3.0 mm wide, and preferably is in the approximate range of 0.3 to 0.8 mm.

FIG 8 shows a suction roll 18 positioned above the doctor blade and air jet assembly 30. In the initial phase of the start-up procedure, the assembly 30 is in position A and the leading edge of the tail or full machine width of web 12 is detached from the roll 10 by impact with lip 40 of the doctor blade. The web 10
25 is then forced by the air jet towards the suction roll 18 and is attracted to the roll surface by the vacuum within the suction roll 18. The web 12 is thus transferred to the felt 20. Once the moving web 12 has been transferred to the felt 20, the assembly 30 is no longer required and is switched to position B and the air supply shut off. If a web break occurs, the web is rethreaded with the assembly 30 in position A. During an operating period of anticipated web breaks, the assembly is left in position A.

30 The suction roll 18 is shown having three zones. The first zone 50, located nearest to the nip 19, has a high vacuum level to assist in establishing the initial contact between the web 12 and the felt covered suction roll 18. The second zone 52 downstream from the first zone 50 is a larger zone and acts as a holding zone with a lower vacuum level. For example, the first zone 50 may have a vacuum level in the range of about 10 to 80 kPa and the second zone 52 has a vacuum level in the range of from 0 to 50 kPa.
35 The second zone 52 is sufficient to maintain and support the web 12 on the felt 20. The third zone 54 provides a small positive air pressure to ensure that the web 12 is easily parted from the felt 20 as the felt 20 separates from the suction roll 18.

The air pressure in the air plenum 32 depends on production variables such as doctor gap, width, machine speed, product grade and the web adhesion to the roll, but preferably ranges from about 14 kPa to
40 600 kPa. The most convenient air pressure for an air blade with a gap width of 0.5 mm was found to be between 34 kPa and 100 kPa.

FIG 9 illustrates the transfer system of the present invention used to transfer the web from the plain roll 10 of the last press which is the central roll of a three-roll inclined press. FIG 10 illustrates two transfer systems, the second of which transfers from a pervious or impermeable web supporting belt 60 onto a
45 dryer felt 70. The device could be used for the transfer of various flexible thin materials and is particularly suitable for the transfer of weak and extensible sheets such as wet paper or paperboard, dry creped hygienic paper or non-woven products.

EXAMPLE 1

50 A pilot paper machine was used to make paper in two different ways. Paper was first made with a direct transfer from the press section using the air doctor transfer roll arrangement of the present invention, and secondly, paper was transferred from the solid roll using the conventional open draw operation. The tensile properties of the paper so made were then compared.

55 The pilot machine consisted of a roll former with a suction pick-up, a three-roll inclined press and a sampler as illustrated in FIG 9. The transfer system was installed between the second press nip and the sampler as shown in FIG 9. The paper machine was producing a web 0.33 meters wide with a basis weight of about 50 grams per square meter at 800 meters per minute using a newsprint furnish. The first and

second press nip loads were 60 and 120 kN/m respectively, and the solid content of the paper after the second press was approximately 42%.

The wet paper used for the laboratory test was reeled with minimum draw (less than 1%) for the air doctor transfer roll experiments and at several draws between 2 and 4% for the open draw experiments.

5 The experimental results are shown in the following table.

TABLE
Paper Stretch
(Open draw versus air doctor - transfer roll arrangement)

	<u>STRETCH %</u>		
	<u>Wet Paper **</u>		<u>Dry Paper *</u>
<u>Draw</u>	<u>Stretch</u>		<u>Stretch</u>
%	%		%
2.1	3.1		1.4
20 2.1	3.6		1.4
2.2	3.0		1.2
2.4	3.9		1.2
25 3.2	3.7		1.2
4.0	2.7		1.2
1.0	4.4		1.5

* Sample size 1.5 x 10 cm

** Sample size 2.5 x 10 cm

Strain rate 100 mm/min

+ Using air doctor-transfer roll arrangement

$$\text{Draw} = \text{Speed of } \frac{(\text{Sampler}) - (\text{Second Press})}{(\text{Second Press})} \times 100\%$$

The wet stretch measurements were done on samples cut from the reel (2.5 x 10 centimetres) sealed in a bag, and handled in such a way to reduce moisture loss. Other samples were dried between blotters in a photographic dryer and cut in strips (1.5 x 10 centimetres). Both wet and dry samples were strained at 100 mm per minute in a laboratory tensile strength tester. The measurements on both the wet and dry paper demonstrate that the paper produced with a transfer arrangement according to the present invention had more stretch than that produced using the open draw system. These results indicate that the paper is less likely to break in subsequent open draws on the paper machine and in the converting or printing process.

Example 2

Using the arrangement shown in FIG 9, a 45 gram per square metre web was transferred to the sampler at 1,000 metres per minute ten times for ten attempts. After sheet transfer was initiated by the transfer system of the present invention, it was maintained even when the air supply to the air jet was interrupted. Without the application of the present transfer system, the transfer of a web having the full machine width could not be accomplished by experienced machine operators.

Example 3

Using the transfer system described herein, a web of full machine width was transferred from the press to the sampler of a pilot paper machine at its maximum speed of 1,200 metres per minute. Without this transfer system, this could not be accomplished.

The transfer system described and claimed herein is capable of transferring weak wet webs, such as those made from 100% mechanical pulps. In the past, this has not been possible without forfeiting speed or having to add a percentage of chemical pulps. Thus the present invention permits the manufacture of paper from weaker and less expensive starting materials.

When practising the transfer system described herein, the number of web breaks is reduced and the speed of the paper machine can be increased above the highest speeds of conventional machines, in the order of about 1,400 metres per minute.

Whereas FIG 9 shows only a single transfer system, multiple transfer assemblies may be provided at different locations on the machine.

Various changes may be made to the embodiments described herein without departing from the scope of the present invention which is limited only by the following claims.

Claims

1. A method of forming a web (12) of fibrous sheet material, including the steps of forming a wet web of cellulosic fibres, moving the web through a press section having a plurality of press rolls to a dryer section, the method comprising transferring the moving web from a press roll in (10) to a following moving element, the method further comprising the steps of :-
 - a) feeding the moving web (12) between said press roll (10) and a suction roll (18);
 - b) detaching the moving web from said press roll employing a doctor blade (40);
 - characterised by
 - c) said suction roll (18) cooperating with said press roll to define a nip (19), said nip being defined on one side by a solid surface of said press roll (10) and on the other side by said suction roll (18);
 - d) said doctor blade (40) being located close to said nip (19) and air jet means (30) delivering air directly onto the leading edge of said blade and in a direction directly into said nip (19) and substantially opposite to the direction of movement of said web towards said leading edge from said nip, and said air jet serving in combination with said suction roller to transfer said web within said nip (19) from said press roll to said suction roll.
2. A method according to claim 1 characterised by causing said suction roll (18) to apply maximum suction to said web (12) in a region (50) of said roll at the apex of said nip (19).
3. Apparatus for transferring a wet web (12) of cellulosic fibres from a press roll (10) to a suction roll (18), the apparatus comprising :-
 - a) said press roll (10) and said suction roll (18) being mounted so that said web (12) can be fed therebetween;
 - b) a doctor blade (40, 42) for detaching said web (12) from said press roll (10)
 - characterised by
 - c) said suction roll (18) cooperating with said press roll (10) to define a nip (19) having on one side a solid surface of said press roll and on the other side said suction roll;
 - d) said doctor blade (40, 42) being located close to said nip (19) and air jet means (30) being provided to deliver air directly onto the leading edge of said doctor blade and in a direction directly into said nip (19) and substantially opposite to the direction of movement of said web towards said leading edge, from said nip, and said air jet means serving in combination with said suction roll to transfer said web within said nip from said press roll to said suction roll.
4. Apparatus according to claim 3 characterised by said suction roll (18) having a region 50 located at the apex of said nip (19) at which maximum suction is applied, and a region (52) spaced therefrom in which reduced suction is applied.
5. Apparatus according to claim 3 or 4 characterised by said air jet means (30) comprising an air plenum (32) coupled to a tapered air chamber leading to two lips (40, 42) with a gap (44) between said lips forming said air jet, one of said lips forming said doctor blade.

6. Apparatus according to claim 5 characterised by said two lips (40, 42) having the same length.
7. Apparatus according to claim 5 characterised by one of said two lips being longer than the other lip.
- 5 8. Apparatus according to claim 5 characterised by adjacent walls of said two lips (40, 42) converging towards said gap (44).
9. Apparatus according to claim 5 characterised by adjacent walls of said two lips (40, 42) being parallel prior to said gap (44).
- 10 10. Apparatus according to claim 5 characterised by the width of said gap forming said air jet is in the approximate range of from 0.1 to 3.0 millimetres.
11. Apparatus according to claim 10 characterised by said air jet means (30) comprising means to
15 establish a pressure in said air plenum in the approximate range from 14 to 600 kPa.
12. Apparatus according to any one of the preceding claims characterised in that said air jet means (30) is movable between first and second positions in which it respectively contacts and is spaced from the surface of said press roll (10).
- 20

Patentansprüche

1. Verfahren, eine Bahn (12) aus faserigem Papierbogenmaterial zu formen, welche die Schritte einschließt, eine nasse Bahn von Zellulosefasern zu formen, die Bahn durch einen Preßabschnitt mit einer
25 Vielzahl von Preßwalzen zu einem Trocknerabschnitt zu bewegen, wobei das Verfahren umfaßt die Überleitung der sich bewegenden Bahn von einer Preßwalze (10) zu einem nachfolgenden sich bewegenden Element, das Verfahren weiterhin die Schritte umfaßt:
- a) Beschicken der sich bewegenden Bahn (12) zwischen die Preßwalze (10) und eine Saugwalze (18);
- 30 b) Ablösen der sich bewegenden Bahn von der Preßwalze unter Einsatz einer Schaber Klinge (18);
dadurch gekennzeichnet, daß
- c) die Saugwalze (18) mit der Preßwalze zusammenwirkt, um einen Spalt (19) zu umgrenzen, wobei der Spalt auf einer Seite durch eine feste Oberfläche der Preßwalze (10) und auf der anderen Seite durch die Saugwalze (18) begrenzt wird;
- 35 d) die Schaber Klinge (40) dicht an den Spalt (19) gesetzt wird, und eine Luftstromvorrichtung (30) Luft direkt an die Führungskante der Klinge leitet und in einer Richtung direkt in den Spalt (19) und im wesentlichen entgegengesetzt zu der Bewegungsrichtung der Bahn auf die Führungskante zu von dem Spalt her, und der Luftstrom dazu dient, in Kombination mit der Saugwalze die Bahn in dem Spalt (19) von der Preßwalze zur Saugwalze überzuleiten.
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2. Verfahren nach Anspruch 1, gekennzeichnet durch Veranlassen der Saugwalze (18), ein Maximum an Saugkraft an die Bahn (12) anzulegen in einem Gebiet (50) der Walze am Scheitel des Spaltes (19).
3. Vorrichtung für den Transfer einer nassen Bahn (12) von Zellulosefasern von einer Preßwalze (10) zu
45 einer Saugwalze (18), wobei die Vorrichtung umfaßt:
- a) die Preßwalze (10) und die Saugwalze (18), die so montiert sind, daß die Bahn (12) dazwischen beschickt werden kann;
- b) eine Schaber Klinge (40, 42), um die Bahn (12) von der Preßwalze (10) zu lösen
dadurch gekennzeichnet, daß
- 50 c) die Saugwalze (18) mit der Preßwalze (10) zusammenwirkt, um einen Spalt (19) zu begrenzen, der an der einen Seite eine feste Oberfläche der Preßwalze hat und an der anderen Seite die Saugwalze;
- d) die Schaber Klinge (40, 42) dicht an dem Spalt (19) angebracht ist, und eine Luftstromvorrichtung vorgesehen ist, um Luft direkt auf die Führungskante der Schaber Klinge zu liefern und in einer
55 Richtung direkt in den Spalt (19) und im wesentlichen entgegengesetzt zu der Bewegungsrichtung der Bahn zu der Führungskante, von dem Spalt, und die Luftstromvorrichtung in Verbindung mit der Saugwalze dazu dient, die Bahn in dem Spalt von der Preßwalze zu der Saugwalze überzuleiten.

4. Vorrichtung nach Anspruch 3, gekennzeichnet durch die Saugwalze (18) mit einer Region (50), die am Scheitel des Spalts (19) liegt, an dem ein Maximum an Saugkraft angelegt wird, und einer Region (52) in Abstand davon, an die eine verminderte Saugkraft angelegt wird.
- 5 5. Vorrichtung nach Anspruch 3 oder 4, gekennzeichnet durch die Luftstromvorrichtung (30), welche ein Luftverteilergehäuse (32) enthält, das mit einer sich verjüngenden Luftspeicherkammer verbunden ist, die zu zwei Lippen (40, 42) führt mit einer Öffnung (44) zwischen den Lippen, die die Luftdüse bilden, wobei eine der Lippen die Schaber Klinge bildet.
- 10 6. Vorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß die zwei Lippen (40, 42) dieselbe Länge haben.
7. Vorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß eine der zwei Lippen länger ist als die andere Lippe.
- 15 8. Vorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß benachbarte Wände der zwei Lippen (40, 42) zu der Öffnung (44) konvergieren.
- 20 9. Vorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß benachbarte Wände der zwei Lippen (40, 42) vor der Öffnung (44) parallel sind.
10. Vorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß die Breite der Öffnung, die die Luftdüse bildet, in dem annähernden Bereich von 0.1 bis 3.0 mm ist.
- 25 11. Vorrichtung nach Anspruch 10, dadurch gekennzeichnet, daß die Luftstromvorrichtung (30) ein Mittel umfaßt, um in dem Luftverteilergehäuse einen Druck in dem annähernden Bereich von 14 bis 600 kPa aufzubauen.
- 30 12. Vorrichtung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Luftstromvorrichtung (30) zwischen einer ersten und zweiten Position beweglich ist, in der sie die Oberfläche der Preßwalze berührt bzw. Abstand von ihr hat.

Revendications

- 35 1. Procédé de formation d'une bande (12) de matière fibreuse en feuille, comprenant les étapes de formation d'une bande humide de fibres cellulosiques, et de déplacement de la bande à travers une zone de presse ayant une pluralité de rouleaux de presse jusqu'à une zone de séchage, le procédé comprenant le transfert de la bande en déplacement d'un rouleau de presse (10) à un élément mobile suivant, le procédé comprenant en outre les étapes de :
- 40 (a) avance de la bande en déplacement (12) entre ledit rouleau de presse (10) et un rouleau d'aspiration (18) ;
 (b) détachement de la bande en déplacement dudit rouleau de presse, au moyen d'une lame de raclage (40) ;
 caractérisé en ce que :
- 45 (c) ledit rouleau d'aspiration (18) coopère avec ledit rouleau de presse pour définir un pincement (19), ledit pincement étant défini d'un côté par une surface unie dudit rouleau de presse (10) et de l'autre côté par ledit rouleau d'aspiration (18), et
 (d) ladite lame de raclage (40) est placée près dudit pincement (19) et des moyens à jet d'air (30) envoient de l'air directement sur le bord avant de ladite lame et dans une direction d'admission
- 50 directe dans ledit pincement (19) sensiblement opposée à la direction de déplacement de ladite bande vers ledit bord avant à partir du dit pincement, lesdits moyens à jet d'air servant en combinaison avec ledit rouleau d'aspiration à transférer ladite bande passant dans ledit pincement (19), dudit rouleau de presse audit rouleau d'aspiration.
- 55 2. Procédé suivant la revendication 1, caractérisé en ce qu'on agence ledit rouleau d'aspiration (18) de manière à appliquer une aspiration maximale à la dite bande (12) dans une région (50) dudit rouleau située au sommet dudit pincement (19).

3. Appareil pour transférer une bande humide (12) de fibres cellulosiques d'un rouleau de presse (10) à un rouleau d'aspiration (18), l'appareil comprenant en outre :
- (a) ledit rouleau de presse (10) et ledit rouleau d'aspiration (18) montés de sorte qu'on peut faire avancer ladite bande (12) entre eux ;
- 5 (b) une lame de raclage (40,42) pour détacher ladite bande (12) dudit rouleau de presse (10) ; caractérisé en ce que
- (c) ledit rouleau d'aspiration (18) coopère avec ledit rouleau de presse (10) pour définir un pincement (19) ayant d'un côté une surface unie dudit rouleau de presse et de l'autre côté ledit
- 10 rouleau d'aspiration ;
- (d) ladite lame de raclage (40,42) est située près dudit pincement (19) et des moyens à jet d'air (30) sont prévus pour envoyer de l'air directement sur le bord avant de ladite lame de raclage et dans une direction d'introduction directe dans ledit pincement (19) sensiblement opposée à la direction de déplacement de ladite bande vers ledit bord avant, à partir dudit pincement, lesdits moyens à jet d'air servant en combinaison avec ledit rouleau d'aspiration à transférer ladite bande passant dans
- 15 ledit pincement, dudit rouleau de presse audit rouleau d'aspiration.
4. Appareil suivant la revendication 3, caractérisé en ce que ledit rouleau d'aspiration (18) présente une région (50) située au sommet dudit pincement (19), à laquelle l'aspiration maximale est appliquée, et une région (52) espacée de ce sommet, à laquelle une aspiration réduite est appliquée .
- 20
5. Appareil suivant la revendication 3 ou 4, caractérisé en ce que lesdits moyens à jet d'air (30) comprennent un collecteur d'air (32) en communication avec une chambre d'air convergente aboutissant à deux lèvres (40, 52), un intervalle (44) entre lesdites lèvres engendrant le dit jet d'air, une desdites lèvres constituant ladite lame de raclage.
- 25
6. Appareil suivant la revendication 5, caractérisé en ce que lesdites deux lèvres (40, 42) ont la même longueur.
7. Appareil suivant la revendication 5, caractérisé en ce qu'une desdites deux lèvres est plus longue que
- 30 l'autre lèvre.
8. Appareil suivant la revendication 5, caractérisé en ce que les parois adjacentes desdites deux lèvres (40,42) convergent vers ledit intervalle(44).
- 35
9. Appareil suivant la revendication 5, caractérisé en ce que les parois adjacentes desdites deux lèvres (40,42) sont parallèles avant ledit intervalle (44).
10. Appareil suivant la revendication 5, caractérisé en ce que la largeur dudit intervalle engendrant ledit jet d'air est comprise entre 0,1 et 3,0 mm environ
- 40
11. Appareil suivant la revendication 10, caractérisé en ce que lesdits moyens à jet d'air (30) comprennent des moyens pour établir une pression, dans le dit collecteur d'air, dans la plage de 14 à 600 kPa environ.
- 45
12. Appareil suivant l'une quelconque des revendications précédentes, caractérisé en ce que lesdits moyens à jet d'air (30) sont déplaçables entre une première et une deuxième positions dans lesquelles ils sont respectivement en contact avec la surface dudit rouleau de presse (10) et espacés de cette surface.
- 50

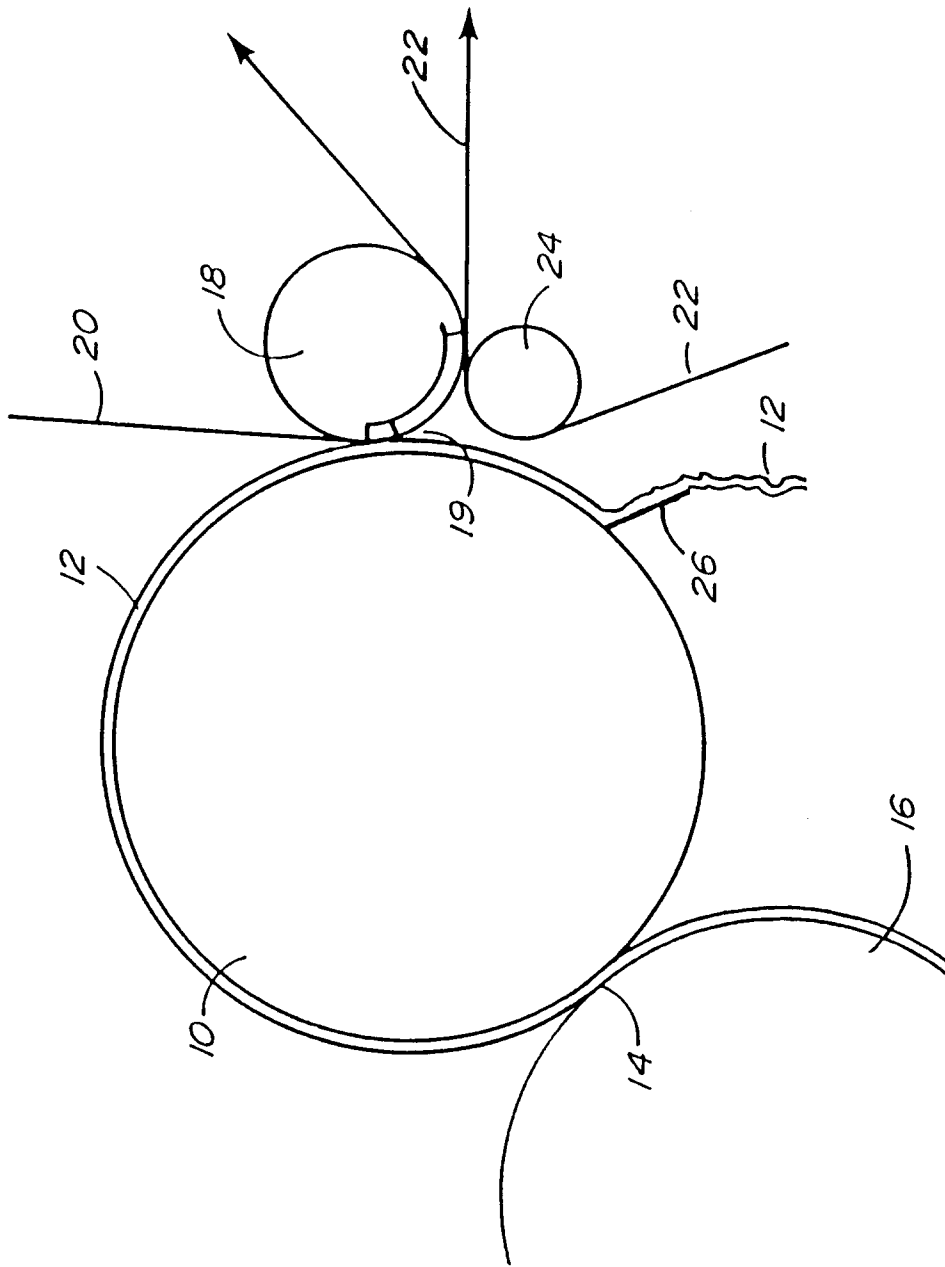
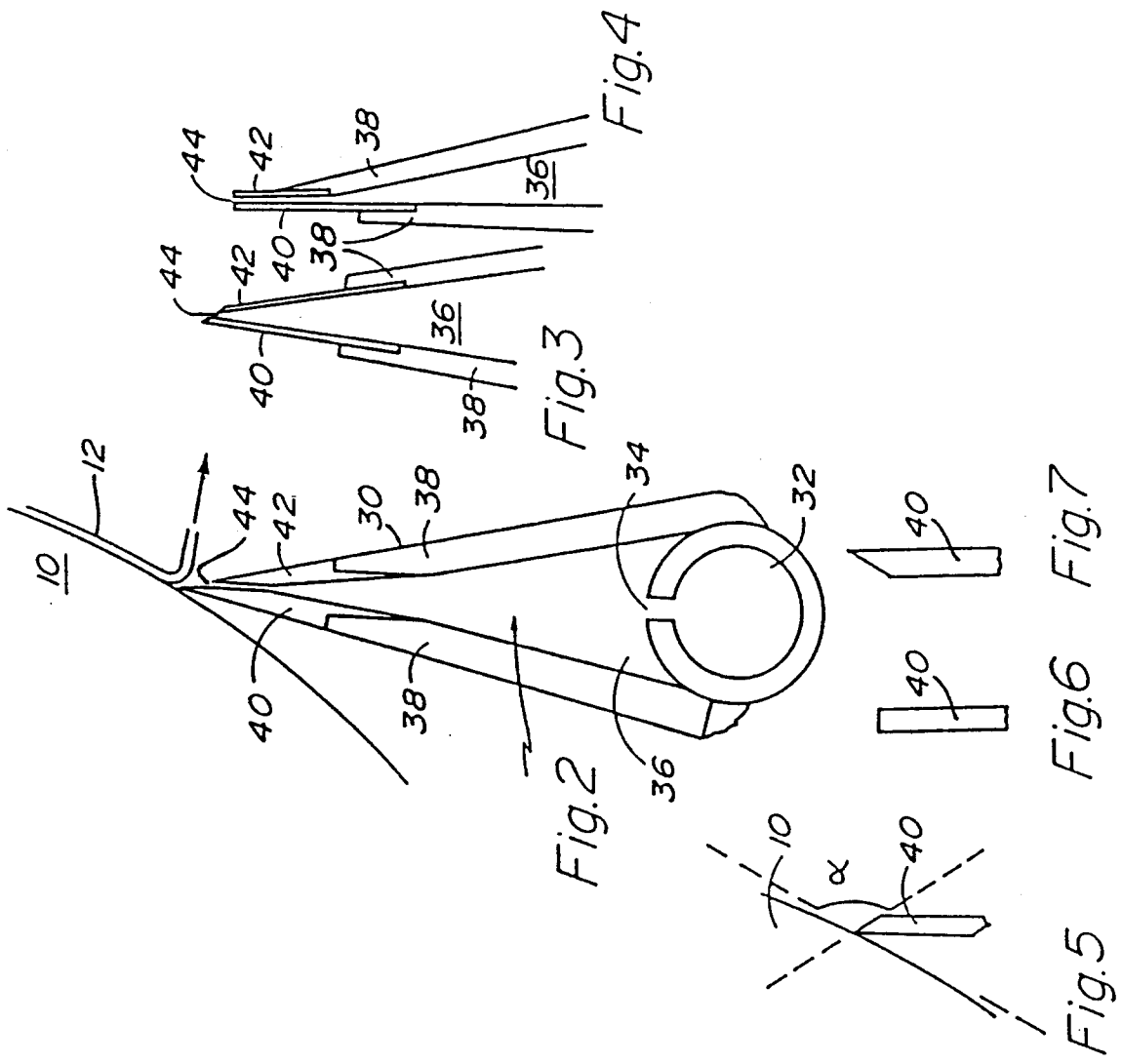


Fig.1



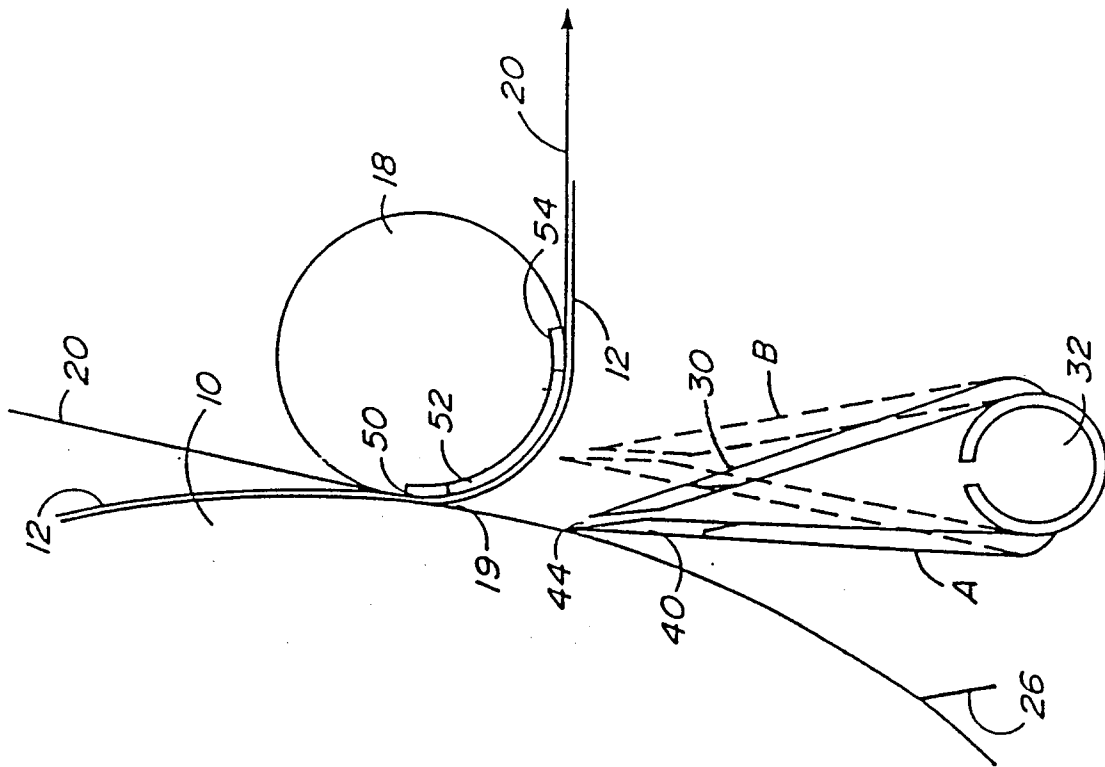


Fig.8

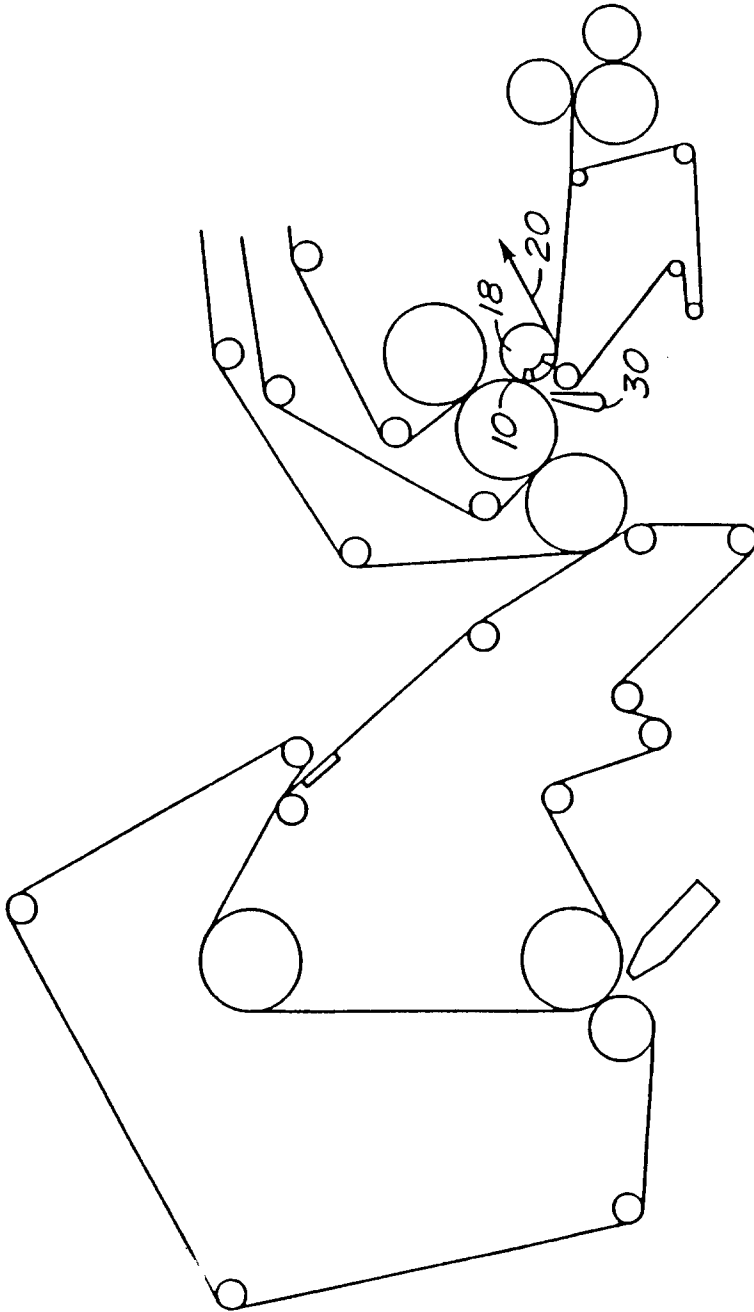


Fig.9

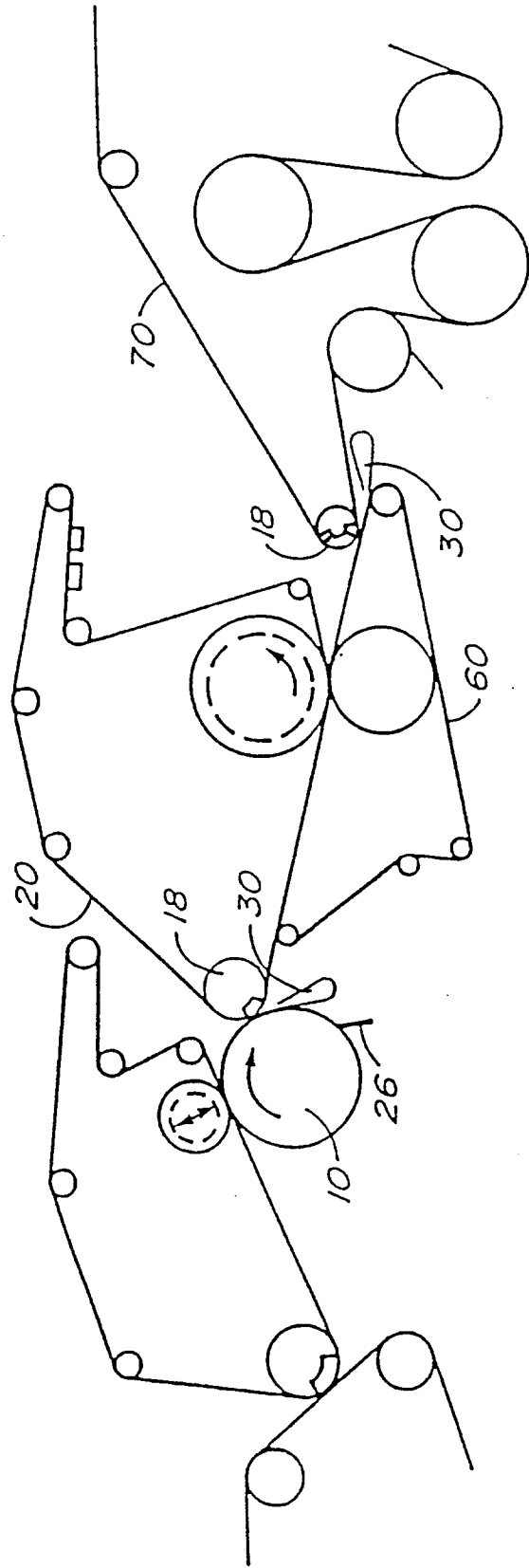


Fig.10