Sept. 27, 1955

J. E. GOODWILLIE

SUCTION TRANSFER ROLL ASSEMBLY

Filed June 21, 1952

4 Sheets-Sheet 1

Inventor

John E. Goodwillie
This invention relates to paper making machines, and more particularly, to a suction transfer roll assembly for use therein in transferring a web from the forming wire to a felt leading to the press section. As is well known, the wet paper web on the forming wire of a paper machine is in a raw state of conditions and the handling thereof is accordingly complicated. Various devices have been suggested for accomplishing the transfer of such a wet web from the forming wire to the press section, but many of these devices leave much to be desired. In particular, it is important to provide a transfer arrangement wherein an open draw is completely or substantially completely avoided. By "open draw" is meant unsupported web travel or web travel past a point at which the web is not in contact with and supported by a suitable moving surface such as the forming wire, a roll surface or a felt. According to the instant invention, the web traveling on the forming wire is picked up at the suction area of a suction transfer roll, is carried a short distance on the roll surface and is then removed from the roll surface by means of a fluid blast urging the web onto a felt that is adjustably positioned closely adjacent to the transfer roll periphery, so that an open draw is reduced to a minimum or is avoided completely. As used herein, the term "fluid blast" means a gaseous fluid blast, preferably air under superatmospheric pressure. As will be appreciated, the weight and axial pressure of the wet web will determine the ease with which it may be removed from the transfer roll surface by means of the fluid blast. The instant invention provides adjustable mounting means for the transfer roll and for a guide roll for the press felt so that the felt may be positioned most advantageously with respect to the region of the transfer roll at which the fluid blast actually effects removal of the web. It is, therefore, one of the objects of the instant invention to provide an improved means and method for effects web transfer in a paper making machine between the forming wire and the press section. It is a further object of the instant invention to provide an improved means and method for conveying a wet web in a paper machine from a forming wire to the first press nip of a press section by means of a single press felt and without the necessity of an open draw. It is another object of the instant invention to provide a suction transfer roll for a paper making machine having a first compartment in said roll defining a suction area for picking up a web from a forming wire, a second compartment in said roll adjacent the first compartment defining a second suction area for retaining the web on the roll surface, a third compartment in said roll adjacent the second compartment, means for directing a fluid blast radially outward from the third compartment through surface perforations of the surface and onto a press felt, and a guide roll looped by the felt, and adjustabl means for positioning said guide roll near the periphery of said transfer roll adjacent the third compartment. It is still another object of the instant invention to provide, in a paper making machine, a suction transfer roll, a first compartment in said roll defining a suction area—for picking up a web from a forming wire, a second compartment in said roll adjacent the first compartment defining a second suction area for retaining the web on the roll surface, a third compartment in said roll adjacent the second compartment means for directing a fluid blast radially outward from the third compartment through surface perforations of the suction transfer roll to urge the web away from the surface and onto a press felt, a guide roll looped by the felt, adjustable means for positioning said guide roll near the periphery of said transfer roll adjacent the third compartment and a bearing means for said suction transfer roll pivotally mounted for swingable adjusting movement of said suction transfer roll.

It is another object of the instant invention to provide, in a paper making machine, a support frame, a transfer roll having a perforate peripheral shell, bearing means rotatably mounting said roll and pivotally mounted on said frame for swingable movement of said roll, adjustable jack means cooperating with said bearing means for effecting such swingable roll movement, a suction compartment in said roll defining a peripheral suction area for picking up a web from a forming wire, another compartment in said roll separate and distinct from the suction compartment, means for directing a fluid blast radially outwardly from said other compartment through the perforate roll shell to urge the web away from the roll surface, a press felt for receiving the web thus urged away from the roll surface, a guide roll looped by the felt, and adjustable means rotatably mounting said guide roll and mounted on said frame for adjusting the position of said guide roll relative to the position of said suction transfer roll.

It is yet another object of the instant invention to provide, in a paper making machine, a support frame, a transfer roll having a perforate peripheral shell, bearing means rotatably mounting said roll and pivotally mounted on said frame for swingable movement of said roll, adjustable jack means cooperating with said bearing means for effecting such swingable roll movement, means defining a suction area on said peripheral roll shell for picking up a web from a forming wire, fluid pressure reservoir means defining a slot longitudinal to said roll for delivering a fluid blast through the roll shell, compartment means within said transfer roll for diverting said fluid blast radially outwardly through said roll shell to urge the web away from the roll surface and onto a press felt, a guide roll looped by the felt and adapted to selectively position the same near said transfer roll for receiving the web, and bearing means mounting said guide roll for free rotation adjustably mounted on said frame.

It is yet another object of the instant invention to provide a paper making machine having a couch roll, a turning roll, a foraminous forming surface trained about said rolls for supporting therebetween a wet web, a tri-compartmented suction transfer roll having a first high-suction area defined by the first compartment facing said forming surface for removal of the web therefrom, a second low-suction area defined by the second compartment adjacent said first compartment for retaining the web upon the transfer roll surface and the third of the compartments being adjacent said second compartment for directing a fluid blast radially outwardly through the surface perforations of said transfer roll to urge the web away from the transfer roll surface, a press section having an upper press roll, a lower suction press roll defining a
press nip with said upper press roll, a felt trained about said suction press roll, a guide roll within the loop of said felt and adjustably mounted for positioning said felt adjacent to said third compartment. Said transfer roll to receive the web from the transfer roll surface.

Other and further important objects of this invention will become apparent from the disclosures in the specification and the accompanying drawings.

On the drawings:

Figure 1 is a schematic view of a paper machine forming wire, transfer assembly and press section embodying the instant invention;

Figure 2 is a sectional elevational view of a tricompartmented suction transfer roll adapted for use in the instant invention;

Figure 3 is a side elevational view of the transfer assembly of the instant invention;

Figure 4 is a top plan view taken substantially along the line IV—IV of Figure 3 (with certain parts omitted for the purpose of simplification); and

Figures 6 and 7 are essentially diagrammatical views of alternative suction transfer roll arrangements embodying the instant invention.

As shown on the drawings:

In Figure 1, the reference numeral 10 designates a couch roll of conventional design having lapped thereabout a forming wire 11 of a paper making machine. The transfer roll 12, also lapped by the wire 11, is positioned below and adjacent the couch roll 10 and permits the return of the forming wire 11 back to the breast roll (not shown) of the forming section.

The web, indicated generally by the reference letter W, travels upon the forming wire 11 over the couch roll 10 and approximately to the point 11a on the forming wire 11 between the couch roll 10 and the turning roll 12. At the point 11a a suction transfer roll, indicated generally by the reference numeral 13, removes the web from the forming wire 11, carrying the web on the transfer roll surface for a short distance and then depositing the web onto the press felt 14.

As will be seen, the felt 14 carries the web into and through the first press nip of the press section defined by a bare upper press roll 15 and a lower suction press roll 16. The travel of the web W is controlled by means of the guide rolls 17, 18, 19 and 20. The web in its travel from the press rolls 15 and 16 around to the suction transfer roll 13 and then back through the press nip defined by the rolls 15 and 16. In particular, it will be noted that the guide roll 20 positions the felt 14 closely adjacent to the suction transfer roll 13, so as to accomplish the transfer most effectively, and the manner in which the guide roll 20 is adjustably mounted will be described in detail hereinafter.

Referring now to Figure 2, it will be seen that the suction transfer roll 21 (corresponding to the roll 13 of Figure 1) is essentially a tri-compartmented roll having a perforate rotatable shell or peripheral portion 22, which is a conventional brass roll shell having a great number of closely spaced drillings therethrough, as at 22a, that are counterbored at the outside surface so as to afford a minimum amount of flat land surface on the face of the roll shell. Preferably, a supporting surface such as a 14-mesh facing wire 23 is securely fastened to the surface of the roll.

Positioned centrally in the roll 21 is a suction gland 24 which provides a suction area A defined by spaced sealing strips 25a and 25b which are mounted on longitudinally extending U-shaped brackets 26a and 26b carrying the strips 25a and 25b, respectively, and mounted by means of bolts 27 on the gland 24. The strips 25a and 25b serve to provide a first compartment X in the roll 13 which defines a high-suction area A at the roll nip. As can be seen from Figure 1, the high-suction area A faces the point 11a on the forming wire 11 so as to effect pick-up of the web at that point.

Adjacent the high-suction area A, and angularly positioned therefrom with respect to the roll 13 or 21 is a second or low-suction area B. As can be seen in Figure 1, the low-suction area B is afforded communication with the central portion of the gland 24 via a butterfly valve 28, so that a controlled, relatively lower vacuum may be maintained in the compartment Y and thus at the suction area B. The suction area B provides a roll surface to which the web is caused to adhere during its travel from its point of pick-up from the forming wire, 11, at the high-suction area A, to approximately the point at which it is deposited upon the press felt 14 looped about the guide roll 20.

As is shown in Figure 2, the low-suction area B is defined by the compartment Y comprising the pair of radially spaced sealing strips 25b and 25c (the sealing strip 25c being mounted by means of the bracket 26c in the manner described in connection with the mounting of the sealing strips 25a and 25b). Also, it will be noted that it is not necessary to employ the butterfly valve 28 in the structure shown in Figure 2, for the reason that the sealing strips 25b and 25c in cooperation with the suction gland lip portion 24b define a closed compartment Y and as the web passes from the peripheral area A to area B at least a portion of the vacuum originally maintained in each of the shell perforations 22a will be retained so that there is a general tendency to have a slight vacuum throughout the low vacuum area B.

Referring next to the third compartment Z in the roll 13, or 21, which is defined by the sealing strip 25c, the central suction gland wall portion designated 24c, and another radial sealing strip 25f which is angularly disposed a substantial distance from the sealing strip 25c, and is mounted in a conventional manner upon a longitudinally extending support 29a fastened to the central portion of the gland 24 by means of bolts 30a.

Actually the third compartment Z comprises a central compartment and two circumferentially spaced compartments Z-1 and Z-2, on opposite sides of the central compartment, which are being defined by the sealing strips 25f and 25e, the sealing strip 25e being mounted in a conventional manner upon a longitudinally extending support 29b fastened to the central portion of the gland 24 by means of bolts 30b.

The central portion of the compartment Z is, however, not open to the roll shell 22 so as to permit fluid flow therefrom through the drillings 22a. Instead, there is a false gland wall 24d in the form of an arcuate plate extending longitudinally of the roll 21 and spaced radially from the central suction gland wall portion 24c, so as to define an arcuate channel between the walls 24c and 24d which provides fluid communication between the end compartments Z-1 and Z-2.

The compartment Z-2 is defined by sealing strips 25d and 25e, the strip 25d being mounted in a conventional manner upon the longitudinally extending support 29b, which is apertured like the support 29b. The plate 24d extends between the supports 29b and 29e and is suitably mounted thereupon.

As is shown in Figure 1, and partially in Figure 2, an air reservoir means or tank 31, to be described in detail hereinafter, is positioned generally above the transfer roll 13 and is provided with a longitudinally extending slot-like nozzle 32 (preferably with longitudi-
nally extending guards 32a and 32b) for directing a blast of air against the roll shell 22 and through the perforations 22a therein, as is shown by means of the arrows. The blast of air passing out of the nozzle 32 and through the hole 22a in the shell 22 passes into the third compartment Z, wherein it is diverted radially outwardly again through the perforate shell 22 in the region of area C. It will thus be seen that the air blast at the area C urge the web away from the shell 22 (and the screen-like covering 23) and onto the press felt 14.

As shown in Figure 6, the means for introducing the air blast into the transfer roll, in this case designated generally as 79, may be constructed along the lines of a suction gland. In such a construction the central suction gland 80 is split by a central partition wall 81 which separates a suction gland S from a pressure gland P. Means for communicating air pressure to the gland P are thus provided in substantially the same way that means for providing vacuum for the suction gland S, as is well known to the detail hereinafter.

As shown in Figure 7, the means for urging a blast of air against the web is at the zone C so as to urge the same away from the suction transfer roll, here designated as 82, may also comprise an air blast projected from a reservoir 83 through an elongated longitudinally extending portion of the roll shell 22 and through a "sheet" of air tending to pry the web from the roll surface and urge it against the felt 14. Referring now to Figures 3, 4 and 5, it will be seen how each of the various rolls is adjustably mounted in the instant invention. The turning roll 12 is conventionally mounted for rotation between the turning roll bearing housings 12a and 12b. As will be seen, the turning roll bearing housing 12a (Figure 3) is suitably mounted on the bearing housing support 33, which in turn is suitably affixed to the floor F in the manner well known in the art. The other turning roll bearing housing 12b (Figure 5) is mounted in a similar manner and is operatively connected through the housing extension 12b to driving means (not shown) for the turning roll 12.

Directly above the turning roll 12 there is positioned the suction transfer roll 21, which is suitably mounted for rotation between the transfer roll bearing housings 21a and 21b, respectively. The transfer roll bearing housings 21a and 21b have different structures and functions. Referring first to the transfer roll bearing housing 21a, which is best seen in Figures 3 and 5, it will be seen that the housing 21a has a depending stop block 34 suitably affixed thereto and extending downwardly to operatively engage a stop screw 35, which in turn extends downwardly to operatively engage a stop bracket 36 having an associated shoulder 36a fitting upon the top of the turning roll bearing housing 12a and furnishing vertical support thereby. A pair of lock nuts 37, 37 cooperate with stop screw 35 and the stop block 34 and the stop bracket 36 to permit adjustment of the distance between means will be 34 and the stop bracket 36, in the manner well known in the art. The transfer roll bearing housing 21a is thus furnished adjustable vertical support by means of the stop assembly 34, 35, 36 and 37 mounted upon the turning roll bearing housing 12a.

The suction transfer roll bearing housing 21a is suitably designed to house bearings (not shown) for permitting free rotation of the roll 21 and also to afford communication with the suction gland 24 of the roll 21, so as to provide means for maintaining the desired degree of vacuum in the suction gland 24, in the manner well known in the art. Communication with the suction gland 24, for the purpose of maintaining the desired vacuum therein, is afforded through the bearing housing 21a, from there through an integral expanding mouth 39, a pipe section 39a flangedly connected to the mouth 39, a pipe elbow 40 flangedly connected to the pipe section 39a, a hose coupling flangedly connected to the pipe elbow 41, a hose 43 affixed by the clamp 44 to the hose coupling 42 and thence to an air pressure reducing or suction producing means, such as a pump (not shown). The means in which such suction producing or reducing means is connected to a suction roll bearing housing is, of course, well understood in the art; and the instant vacuum connection is afforded with a hose portion 42 which is sufficiently flexible to permit adjustable movement of the transfer roll assembly.

Swingable movement for the transfer roll 21 is provided on the side of the bearing housing 21a by means of the pivotal mounting of the pipe section 39. The pipe section 39 has a generally horizontally extending integral arm 39a, extending radially away from the roll 21 and terminating with two horizontally spaced ears 39b, 39c. The ears 39b, 39c are suitably apertured, parallel to the axis of the roll 21, so as to receive the pivot pin 44, which in turn is mounted in a stationary pivot bracket 45.

The stationary pivot bracket 45 is fixedly mounted on one of a pair of upright frame members 46 and 47, respectively, which, as will be shown hereinafter, furnish the stationary support means for the various pivotal and adjustable mounting means for the suction transfer roll 21, the air reservoir 31 and the felt guide roll 20. The upright frame members 46 and 47 are supported by the floor F and extend parallelly upwardly therefrom, affording each other mutual horizontal support by means of a top cross shaft 48 (Fig. 4) and being additionally supported at their bases by means of the table support 49 and the angle brackets 50, as will be readily understood.

Referring now to the transfer roll bearing housing 21b opposite the bearing housing 21a just described, it will be seen that vertical support for the bearing housing 21b is furnished by means of a stop block 51 integral therewith and extending tangentially downwardly to operatively engage the stop screw 52 which in turn engages the stop stand 53 and has mounted thereon lock nuts 54, 55 for effecting adjustment of the stop assembly. The stop stand 53 is suitably mounted on the floor F and extends upwardly therefrom, as shown in Figure 3, to a short distance below the stop block 51 mounted on the bearing housing 21b. The function of the stop assembly 51, 52, 53 and 54 is thus substantially the same as the function of the stop assembly 34, 35, 36 and 37, hereinbefore described.

The bearing housing 21b has an integral arm member 58 extending horizontally and radially from the roll 21 in generally parallel relationship with the arm 39a pivotally mounting the opposite bearing housing 21a. The arm 58 is suitably apertured at its extremity to receive the pivot pin 59 which is axially aligned with the pivot pin 21a, hereinbefore described. The pivot pin 59 is, likewise, supported by a fixed mounting, in this case a pair of pivot brackets 60, 60, each of which is suitably fixed to the upright frame member 47, which is opposite the frame member 46 mounting the pivot bracket 45. It will thus be seen that the suction transfer roll 21 is mounted, via its bearing housings 21a and 21b for swingable or pivotal movement about the pivot line defined by the aligned pivot pins 44 and 59, which in turn are mounted in stationary pivot brackets mounted on the upright frame members 46 and 47.

In the instant apparatus, means are provided for adjustably effecting swingable movement of the transfer roll 21, pivotally mounted as just described. The bearing housing 21b for the transfer roll 21 has a pair of ears 51, 51 integrally mounted on the top thereof and extend-
ing upwardly. As is best seen in Figure 4, the ears 61, 61 are suitably apertured to receive therethrough a shaft 62 and are suitably spaced to receive therebetween an eye-bolt 63 pivotally mounted on the shaft 62. The eye-bolt 63 extends upwardly to an adjustable jack means which is not shown in Figure 4 to prevent untidily complicating that drawing, but which is the same as the adjustable jack arrangement designated by the reference numeral 64 in Figure 3, and which is mounted in the top twin-pivot bracket, designated by the reference numeral 65, and fastened at the top of the upright frame 47, as shown in Figure 4.

Referring now to the transfer roll bearing housing 24a, it will be seen that the bearing housing 24a has an integral upwardly extending portion which presents a flat mounting surface 66 (Figures 3 and 5). A lift bracket 67 is suitably affixed to the surface 66 and extends upwardly therefrom to define a pair of spaced upwardly extending ear members 68, 68 which in turn are apertured to receive the shaft 69 axially aligned with the shaft 62. An eye-bolt 63' (which functions in the same manner that the eye-bolt 63 functions) is engaged by the shaft 69 and extends from between the ears 68, 68 upwardly to the adjustable jack arrangement 64, likewise, not shown in Figure 4 to avoid undue complications. As will be seen from Figure 3, however, the adjustable jack arrangement 64 is mounted on the twin-pivot bracket 65' which is suitably affixed to the top of the upright frame member 46. The jack 64 may have any suitable arrangement for carrying out the particular function of moving the transfer roll 21 by axial movement of the eye-bolts 63 and 63'. As shown in Figure 3, the jack 64 is pivotally mounted at 70 on the twin-pivot bracket 65' and comprises a rack and pinion-type gear arrangement, which is well known to those skilled in the art and need not be described herein in detail. Means for coordinating the operation of the two jacks 64, 64 may be provided, as by means of a cross shaft in the general location of the cross shaft 48 extending between the pinion gears 71, 71, so as to coordinate rotation thereof, or the jacks 64, 64 may be operated separately.

Referring now to the air reservoir or tank 31, it will be seen from Figures 3 and 4 that the generally cylindrical tank 31 is rotatable mounted (about the axis defined by the shafts 62 and 69) and is also pivotally mounted at the pivot pin brackets 72, 72, alignedly mounted on the periphery at opposite ends of the tank 31, each of which is cooperatively engaged by a pin and eye-bolt member 73. As is shown in Figure 3, each pin and eye-bolt member 73 is operatively connected to a threaded sleeve or turnbuckle 74, 74 which in turn is connected to a second pin and eye-bolt member 75, 75 and cooperates with the pin and eye-bolt members to form an adjustable turnbuckle assembly. As is shown in Figure 3, each of the second mentioned pin and eye-bolt members 75, 75 extends downwardly from its respective adjustable sleeve 74, 74 and is mounted on the inward end of the pins 44 and 59, respectively, for pivotal cooperation therewith.

It will thus be seen that during movement of the transfer roll 21 about the pivotal axis defined by the pivot pins 44 and 59, the air blast nozzle 32 of the tank 31 will remain properly aligned with the transfer roll 21, because of the pivotal arrangement of the turnbuckle assemblies (73, 74 and 75) which are also pivotally mounted about the pivot axis defined by the pivot pins 44 and 59. The slotted nozzle 32 extends substantially the full axial length of the tank 31 and may be aligned by adjustment of the sleeves 74, 74 so that it is aimed in substantially radial direction with respect to the transfer roll 21. Consequently, the air blast source (not shown) may be fed by means of a hose or other flexible conduit (not shown) connected by suitable means to the coupling pipe 76 extending outwardly from the end of the tank 31, as shown in Figures 3 and 4.

Referring now the guide roll 20, which is looped by the press felt 14, it will be seen from Figure 3 that the guide roll 20 is mounted between a pair of adjustable bearing housings 77, 77. In Figure 4, only the roll 20 and bearing trunnions 78, 78 are shown; and in Figure 5, the roll 20 is pivotally mounted in brackets 79, 79 and a portion of the bearing housings 77, 77 are shown.

As can be seen from Figure 3, the bearing housings 77, 77 are suitably mounted in brackets 79, 79, each of which is mounted pivotally at 80 on a pivot bracket 81 which slidably engages a track 82 fixed to an upright frame member (46 and 47). The entire guide roll assembly is movable vertically on the tracks 82, 82 by means of worm gear assemblies 83 which engage the pivot brackets 81, 81 mounted on the tracks 82, 82 and cooperate therewith to effect vertical movement thereof. Also, each of the bearing housing brackets 79 is connected for horizontal adjustment to its respective pivot bracket 81 by means of a turnbuckle assembly 84.

It will thus be seen that the guide roll 20 is mounted for swingable pivot movement on a vertically movable carriage (i.e. the pivot bracket 81) and such swingable movement is adjustably controlled by means of the turnbuckle arrangement 84.

It will, of course, be understood that various details of construction have been shown in a particular way without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. In a paper making machine, a support frame, a transfer roll having a perforate peripheral shell, bearing means rotatably mounting said roll and pivotally mounted on said frame for swingable movement of said roll, adjustable jack means cooperating with said bearing means for effecting such swingable roll movement, means defining a first suction area on said peripheral roll shell for picking up a web from a forming wire, means defining a second suction area adjacent the first suction area, gaseous fluid pressure reservoir means defining a slot longitudinal to said roll for delivering a gaseous fluid blast inwardly through the roll shell, compartment means adjacent the second suction area within said transfer roll for diverting said gaseous fluid blast radially outwardly through said roll shell to urge the web away from the roll surface and onto a press felt, a guide roll having by the felt and adapted to selectively position the same near said transfer roll for receiving the web, and bearing means mounting said guide roll for free rotation adjustably mounted on said frame.

2. In a paper making machine, a foraminous forming surface trained about a couch roll and a turning roll to support a wet web therebetweeen, a tricompartamental suction transfer roll for picking up the web from said forming surface and depositing it upon a press felt, said tricompartamental suction transfer roll having a first high-suction area defined by the first compartment facing said forming surface for removal of the web therefrom, a second low-suction area defined by the second compartment adjacent said first compartment and spaced from said forming surface for retaining the web upon the transfer roll surface, and a third compartment adjacent the second compartment and also spaced from said forming surface, and gaseous fluid pressure reservoir means defining a slot longitudinal to said roll for delivering a fluid blast through the surface perforations of said suction roll and into said third compartment, said third compartment being adapted to divert said fluid blast radially outwardly through said transfer roll to urge the web away from the transfer roll surface and onto the felt.

3. In a paper making machine, a support frame, a transfer roll having perforate peripheral shell, bearing means rotatably mounting said roll and pivotally mounted
on said frame for swingable movement of said roll, adjustable jack means cooperating with said bearing means for effecting such swingable movement, means defining a first suction area in said perforate peripheral shell for picking up a web from a forming wire, means defining a second suction area adjacent the first suction area, gaseous fluid pressure reservoir means defining a slot longitudinal to said roll for delivering a gaseous fluid blast inwardly through the roll shell, compartment means within said transfer roll adjacent said second suction area for diverting said gaseous fluid blast radially outward through said roll shell to urge the web away from the roll surface and onto a felt, a guide roll looped by the felt and adapted to selectively position the same near said transfer roll for receiving the web, a carriage slidably mounted on said support frame, bearing means rotatably mounting said guide roll and pivotally mounted on said carriage and turnbuckle means operatively connecting said bearing means and said carriage for effecting swingable movement of said guide roll to adjust the position of the same relative to said transfer roll.

5. In a paper making machine, a support frame, a transfer roll having a perforate peripheral shell, bearing means rotatably mounting said roll and pivotally mounted on said frame for swingable movement of said roll, adjustable jack means cooperating with said bearing means for effecting such swingable movement, means defining a first suction area in said peripheral shell for picking up a web from a forming wire, means defining a second suction area adjacent the first suction area, gaseous fluid pressure reservoir means outside said transfer roll defining a slot longitudinal to said roll for delivering a gaseous fluid blast inwardly through the roll shell, compartment means within said transfer roll adjacent the second suction area for diverting said gaseous fluid blast radially outwardly through said roll shell to urge the web away from the roll surface and onto a felt, a guide roll below and closely adjacent to said transfer roll and looped by the felt and adapted to selectively position the same near said transfer roll for receiving the web, and a movable carriage on said support frame for pivotally mounting said guide roll for adjusting the position thereof relative to said transfer roll.

6. In a paper making machine, a foraminous forming surface trained about a couch roll and a turning roll for supporting a wet web therebetweeen, a tri-compartmented suction transfer roll for picking up the web from said forming surface and depositing it upon a felt, said tri-compartmented suction transfer roll having a first high suction area defined by the first compartment facing said forming surface for removal of the web therefrom, a second low suction area defined by the second compartment adjacent said first compartment for retaining the web upon the transfer roll surface, and a third compartment adjacent the second compartment, gaseous fluid pressure reservoir means defining a slot longitudinal to said roll for delivering a gaseous fluid blast through the surface perforations of said suction roll and into said third compartment, said third compartment being adapted to divert said gaseous fluid blast radially outwardly through surface perforations of said transfer roll to urge the web away from the transfer roll surface and onto the felt, a support frame, bearing means rotatably mounting said suction roll and pivotally mounted on said frame, adjustable jack means mounted on said frame and cooperatively engaging said bearing means for effecting pivotal movement of said suction roll, and means mounting said gaseous fluid pressure reservoir means for pivotal movement with said transfer roll.

7. In a paper making machine, a foraminous forming surface trained about a couch roll and a turning roll to supply a web therebetweeen, a poly-compartmented suction transfer roll for picking up the web from said forming surface and depositing it upon a press felt, said poly-compartmented suction transfer roll having a suction area defined by a first compartment facing said forming surface for removal of the web therefrom and a second compartment adjacent said first compartment and spaced from said forming surface, and gaseous fluid pressure reservoir means defining a slot longitudinal of said roll for delivering a gaseous fluid blast through the surface perforations of said suction roll and into said other compartment, said other compartment being adapted to divert said gaseous fluid blast radially outwardly through surface perforations of said transfer roll to urge the web away from the transfer roll and onto the felt.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Inventor</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>689,400</td>
<td>Keeney</td>
<td>Dec. 24, 1901</td>
</tr>
<tr>
<td>1,163,254</td>
<td>Millsapgh</td>
<td>Dec. 7, 1915</td>
</tr>
<tr>
<td>1,504,727</td>
<td>Sheahan</td>
<td>Aug. 12, 1924</td>
</tr>
<tr>
<td>1,701,226</td>
<td>Collins</td>
<td>Feb. 5, 1929</td>
</tr>
<tr>
<td>1,914,742</td>
<td>Hillier</td>
<td>June 20, 1933</td>
</tr>
<tr>
<td>1,925,949</td>
<td>Case</td>
<td>Sept. 5, 1933</td>
</tr>
<tr>
<td>2,364,443</td>
<td>Hornbostel</td>
<td>Dec. 5, 1944</td>
</tr>
<tr>
<td>2,386,584</td>
<td>Berry</td>
<td>Oct. 9, 1945</td>
</tr>
<tr>
<td>2,415,351</td>
<td>Hornbostel et al.</td>
<td>Feb. 4, 1947</td>
</tr>
<tr>
<td>2,618,205</td>
<td>Heys</td>
<td>Nov. 18, 1952</td>
</tr>
</tbody>
</table>

FOREIGN PATENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>201,776</td>
<td>France</td>
<td>Nov. 7, 1889</td>
</tr>
<tr>
<td>436,959</td>
<td>Germany</td>
<td>Nov. 10, 1926</td>
</tr>
<tr>
<td>633,324</td>
<td>Germany</td>
<td>July 24, 1936</td>
</tr>
</tbody>
</table>