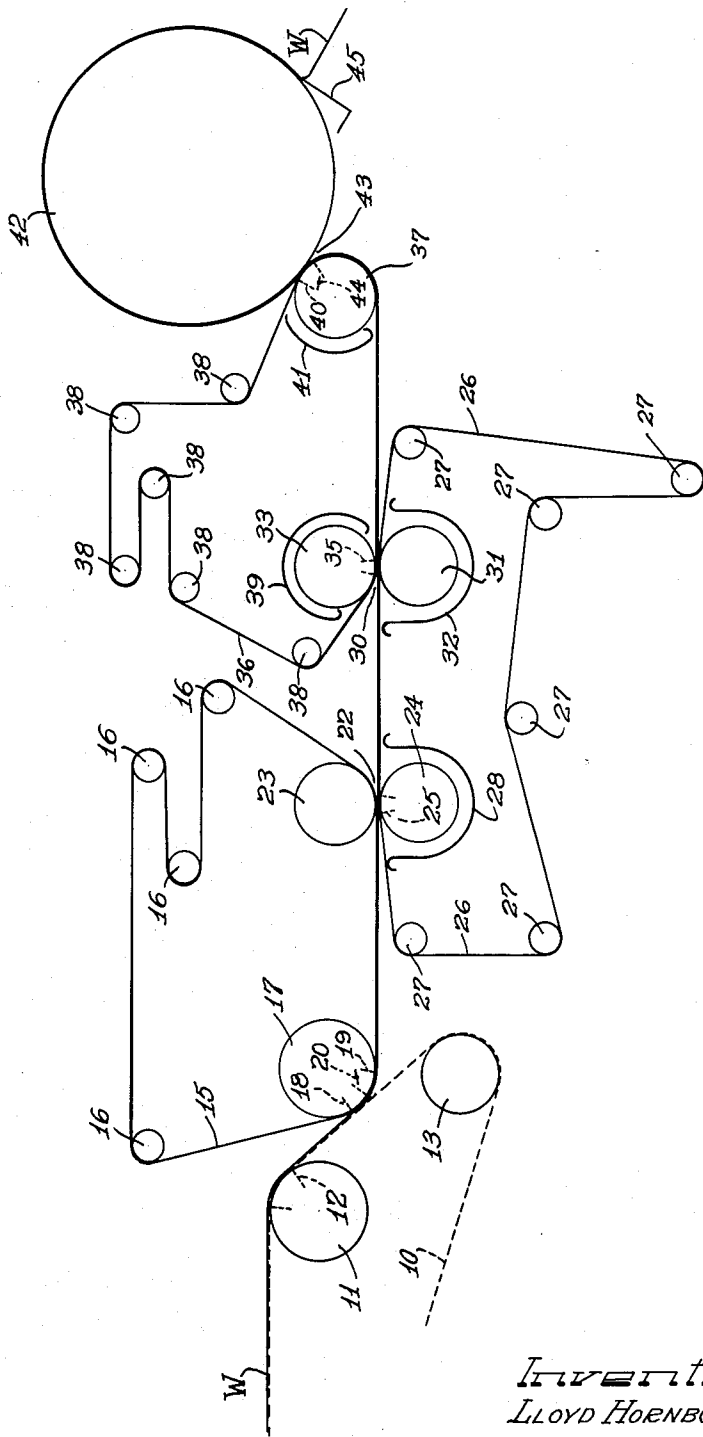


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REVERSE PRESS ASSEMBLY

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**REVERSE PRESS ASSEMBLY**

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**4 Claims. (Cl. 92-49)**

The present invention relates to a paper machine reverse press assembly and more particularly to a reverse press assembly for a paper making machine wherein a single press felt is trained through the consecutive reverse press nips of a suction press assembly to convey a moist paper web therethrough.

The press assembly of the present invention contemplates generally the utilization of a pick-up felt trained about a suction pick-up roll for removing a moist paper web from a foraminous forming surface of the paper making machine forming part, such as a Fourdrinier wire. The pick-up felt is next trained through the press nip of a suction press to convey the moist web therethrough. This first press assembly includes a plain press roll and a suction press roll, the suction press roll being positioned within the loop of a continuous press felt so that the press felt is also trained through the press nip with the suction area of the press roll being effective to transfer the moist paper web to the press felt at the nip. The press felt is next trained through the nip of a reverse suction press including a plain press roll positioned within the loop of the continuous press felt and a suction press roll positioned within the loop of a continuous second press felt. The suction press roll of the second press is effective to transfer the moist paper web from the first press felt to the second press felt, so that the second press felt conveys the web to an additional suction press roll positioned within the loop of the second press felt and cooperating with a dryer machine part, such as a Yankee dryer drum, to form an additional press nip.

At the additional press nip, the moist paper web is transferred to the Yankee dryer drum or like dryer part for conveyance about the periphery of the dryer drum.

The present invention thus utilizes a single press felt for conveying a moist paper web to a first suction press and through a second reverse suction press. The suction at the presses not only serves to de-water the moist paper web, but also to effectuate the transfer of the moist paper web through the entire press assembly, with the web being supported at all times during its passage therethrough to eliminate the possibilities of web breakage due to tension placed upon the web during the pressing operation.

It is, therefore, an important object of the present invention to provide an improved paper machine press section including a suction press, a reverse suction press, and a common felt trained through both the suction press and the reverse suction press nips in order that the moist paper web may be adequately supported by the felt throughout its entire travel through the press assembly.

Another important object of the present invention is to provide a press assembly for a paper making machine including a suction press and a reverse suction press together with felt carriers for conveying a moist paper web through each of the presses with the suction areas of the presses each being effective to transfer the paper web through the assembly.

It is a further important object of the present invention to provide a reverse press assembly for a paper making machine including a suction press and a reverse suction press, the first suction press being effective to transfer a moist paper web from a pick-up felt to a press felt common to each of the presses and the reverse press being effective to transfer the moist paper web from the

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common press felt to a transfer felt for conveyance to a paper making machine dryer part.

Still another important object of the present invention is to provide a reverse suction press assembly wherein each transfer of a moist paper web through the entire press assembly is made under the influence of vacuum and the paper web is supported by a felt carrier during its entire passage through the press assembly, the felt carriers including a single felt bridging the press nips of the reverse press assembly.

Other and further important objects of the invention will be apparent to those skilled in the art from the following detailed description of the annexed sheet of drawings which, by way of a preferred example only, illustrates one embodiment of the invention.

On the drawing:

The single figure of the drawing is a schematic representation of a paper making machine reverse press assembly of the present invention.

As shown on the drawing:

In Figure 1, reference numeral 10 refers generally to a foraminous forming wire surface, such as a Fourdrinier forming wire trained about a suction couch roll 11 having an arcuate suction area 12 and a wire turning roll 13.

A moist paper web W, previously deposited upon the wire 10 in the forming part of the machine, is removed from the wire 10 by means of a pick-up felt 15 guided by a plurality of guide rolls 16 into peripheral contact with a suction pick-up roll 17. Transfer of the web W to the felt 15 is accomplished by means of a high vacuum suction area 18 of the roll 17, and the web W is held upon the felt 15 after transfer has been effected by a relatively low vacuum suction area 19, in which the degree of vacuum is controlled by a butterfly control valve 20.

The pick-up felt 15 is next trained through a suction press nip 22 defined by an upper plain press roll 23 located within the loop of the continuous pick-up felt 15 and a lower suction press roll 24 having a suction area 25 located at the nip 22. The suction area 25 of the roll 24 is lapped by a lower first press felt 26 which is also trained through the nip 22 and which receives the web W from the pick-up felt 15. A clean transfer of the web W to the felt 26 is effected by the suction area 25 of the roll 24, which suction area also serves to remove residual moisture squeezed from the web by the mechanical and differential fluid pressure exerted at the press nip 22.

The press felt 26 is gathered into contact with the web and the roll 24 by means of a plurality of guide rolls 27 and a conventional arcuate save-all pan 28 is provided about the roll 24 to receive water centrifugally flung from the perforated periphery of a suction roll 24.

Following passage of the felt 26 through the nip 22 and the transfer of the web W to the felt 26, the felt and web are next trained through the nip 30 of a reverse suction press defined by a lower plain press roll 31 located within the loop of the endless press felt 26 in spaced relation to and in substantially horizontal alignment with the suction press roll 24. An arcuate save-all pan 32 is also provided for the roll 31.

The reverse suction nip 30 is defined by the roll 31 in cooperation with a superimposed suction press roll 33 having an arcuate suction area 35 at the nip 30. A transfer felt, or second press felt, 36 is lapped about the roll 33 for passage through the nip 30 in lapping relation with the suction area 35 of the suction roll 33. The transfer felt 36 receives the web W from the press felt 26, and the felt 36 is guided in a substantially horizontal plane from the nip 30 for passage about an additional suction roll 37. The return reach of the transfer felt 36 to the suction roll 33 is accomplished by passage of the felt about felt guide rolls 38 and an arcuate save-

all pan 39 is provided about the roll 33 within the loop of the felt 36.

The additional roll 37 is provided with an arcuate suction area 40 lapped by the felt 36, and a save-all pan 41 is provided for the roll 37. The roll 37 is mounted in press nip relation to an adjacent dryer drum 42, such as a Yankee dryer, forming a portion of the dryer part of the paper making machine. Transfer of the web W to the Yankee dryer drum 42 is accomplished at the nip 43 therebetween, and the suction area 40 of the roll 37 is provided with a butterfly vacuum control valve 44 for regulating the degree of vacuum within the suction area so as to prevent interference with web transfer while accommodating removal of residual moisture squeezed from the web W at the nip.

The web W travels about the periphery of the Yankee dryer drum 42 and is removed therefrom by a doctor blade 45.

The operation of the reverse press assembly of the present invention will be obvious to those skilled in the art. It will be seen that the web W is removed from the wire 10 by means of the pick-up felt 15 trained about the pick-up roll 17. The suction area 18 of the roll 17 will be effective to remove the web W from the wire, with the lesser degree of vacuum within the suction area 19, as controlled by the valve 20, retaining the web upon the pick-up felt after transfer has been effected.

The suction area 25 of the roll 24 causes transfer of the web W to the press felt 26, and at the same time this suction area 25 removes residual moisture squeezed from the web at the nip 22. The press felt 26 bridges the gap between the suction press nip 22 and the reverse suction press nip 30, so that the web is at all times supported by a felt.

Transfer of the web from the press felt 26 to the transfer felt 36 is caused by the suction area 35 of the roll 33, and the felt 36 serves to transfer the web to the dryer drum 42, while the additional suction roll 37 gives an additional pressing action at the drier drum.

It will be seen that the suction areas 25 and 35 exert differential fluid pressures upon opposing sides of the web W to yield most advantageous and efficient water removal from the web. The efficient utilization of the three felts 15, 26 and 36 results in a compact, inexpensive reverse press assembly wherein the web is transferred at all times under the influence of vacuum, the web is at all times supported by a felt carrier, and a single press felt is utilized for conveying the web through both the suction press nip 22 and the reverse suction press nip 30.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. In a paper machine, a press section for removing wet web from a paper machine forming wire and pressing the same, comprising a looped pick-up felt, a suction pick-up roll within the loop of said pick-up felt directing the felt against the web on top of the wire for transferring the web to the underface of the pick-up felt, a looped bottom felt, a first press having a horizontal nip defined by an upper press roll within said pick-up felt loop and a lower suction press roll within said bottom felt loop to transfer the web from said pick-up felt to said bottom felt at the press nip, a looped press felt, and a reverse press having a horizontal nip defined by an upper suction roll within said press felt loop and a lower press roll within said bottom felt loop to transfer the web from said bottom felt to said press felt at the reverse press nip, said felts being so positioned that the web is maintained in a substantially horizontal plane during its travel from the wire through said presses.

2. In a paper machine, a press section for removing wet web from a paper machine forming wire and pressing the same, comprising a looped pick-up felt, a suction

pick-up roll within the loop of said pick-up felt directing the felt against the web on top of the wire for transferring the web to the underface of the pick-up felt, a looped bottom felt, a first press having a horizontal nip, defined by a bare upper press roll within said pick-up felt loop and a lower suction press roll within said bottom felt loop to transfer the web from said pick-up felt to said bottom felt at the press nip, a looped press felt, a reverse press having a horizontal nip defined by an upper suction roll within said press felt loop and a bare lower press roll within said bottom felt loop to transfer the web from said bottom felt to said press felt at the reverse press nip, said felts being so positioned that the web is maintained in a substantially horizontal plane during its travel from the wire through said presses, a second suction roll disposed within the loop of said press felt separate and apart from said reverse press suction roll and having its suction area lapped by said press felt, and a dryer drum cooperating with said second suction roll to define a suction press nip receiving said press felt for transferring the web from the press felt to said dryer drum, said felts being so positioned that the web is maintained in a substantially horizontal plane during its travel from the wire to said second suction roll.

3. In a paper machine, a press section for removing a wet web from a paper machine forming wire and pressing the same, comprising a looped pick-up felt, means for transferring the web from the forming wire to said felt, an upper press roll and a suction roll therebeneath defining a suction press having a nip receiving said pick-up felt therethrough with a web conveyed thereby, said pick-up felt lapping the upper press roll, a press felt lapping the suction roll and trained through said suction press nip and receiving said web from said pick-up felt at said suction press nip, a reverse suction press separate and apart from said suction press and having a nip receiving the press felt therethrough with said web conveyed thereby, and a transfer felt also trained through the nip of said reverse press for receiving said web from said press felt and for conveying said web therefrom.

4. In a paper machine, a press section for removing a wet web from a paper machine forming wire and pressing the same, comprising a looped pick-up felt, a suction pick-up roll within the loop of said pick-up felt directing the felt against the web on top of the wire for transferring the web to the underface of the pick-up felt, a looped bottom felt, a first press having a horizontal nip defined by a plain upper press roll within said pick-up felt loop and a lower suction press roll within said bottom felt loop to transfer the web from said pick-up felt to said bottom felt at the press nip, a looped press felt, and a reverse press having a horizontal nip defined by an upper suction roll within said press felt loop and a plain lower press roll within said bottom felt loop to transfer the web from said bottom felt to said press felt at the reverse press nip, said felts being so positioned that the web is maintained in a substantially horizontal plane during its travel from the wire through said presses.

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