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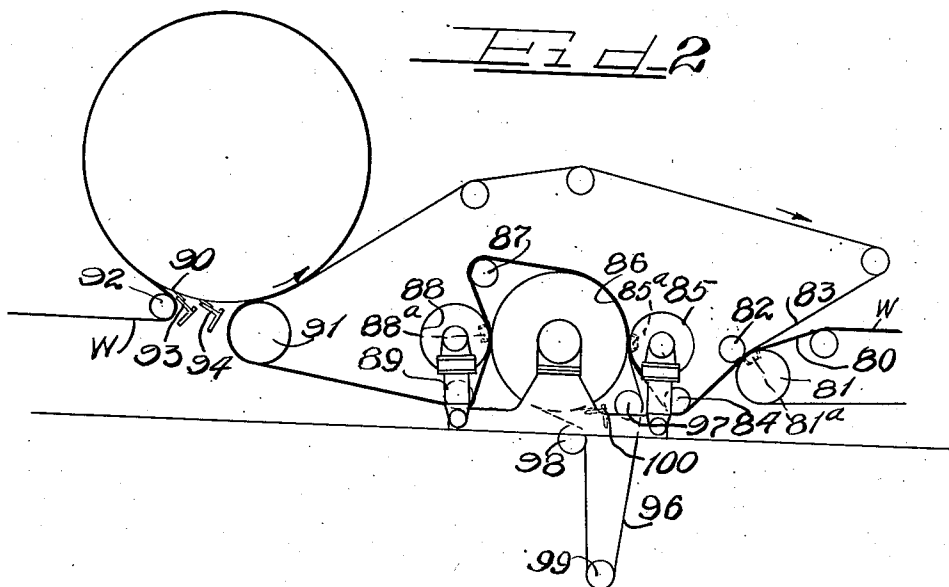
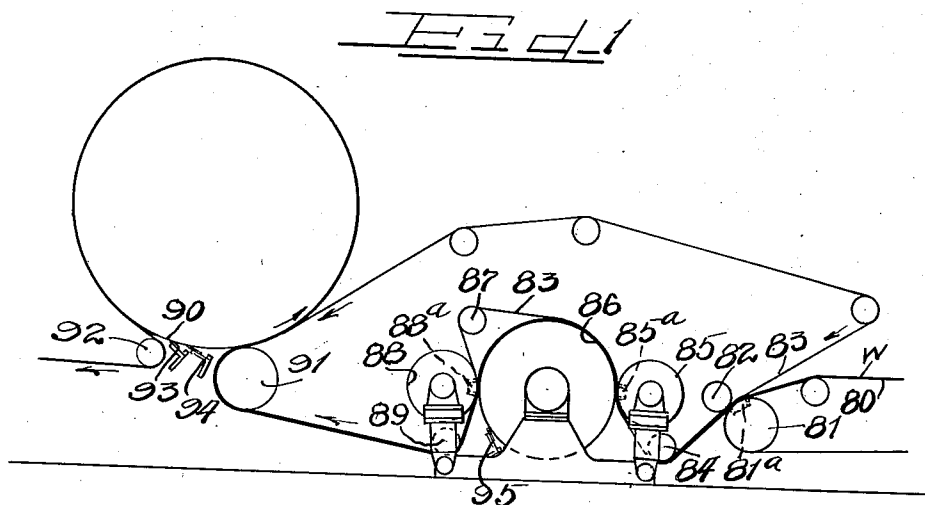
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2,209,758

FELT ARRANGEMENT FOR HORIZONTAL PRESS ROLLS

Filed Jan. 15, 1937

2 Sheets-Sheet 1



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Fig. 3

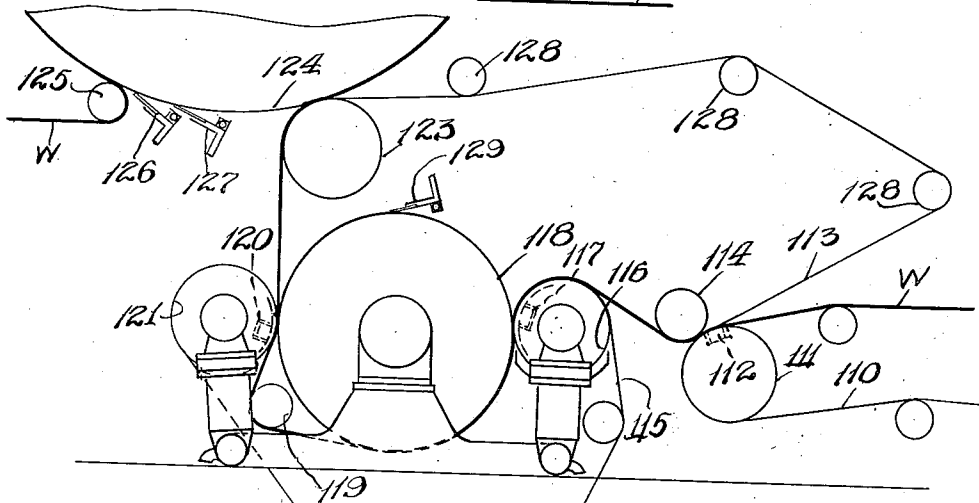
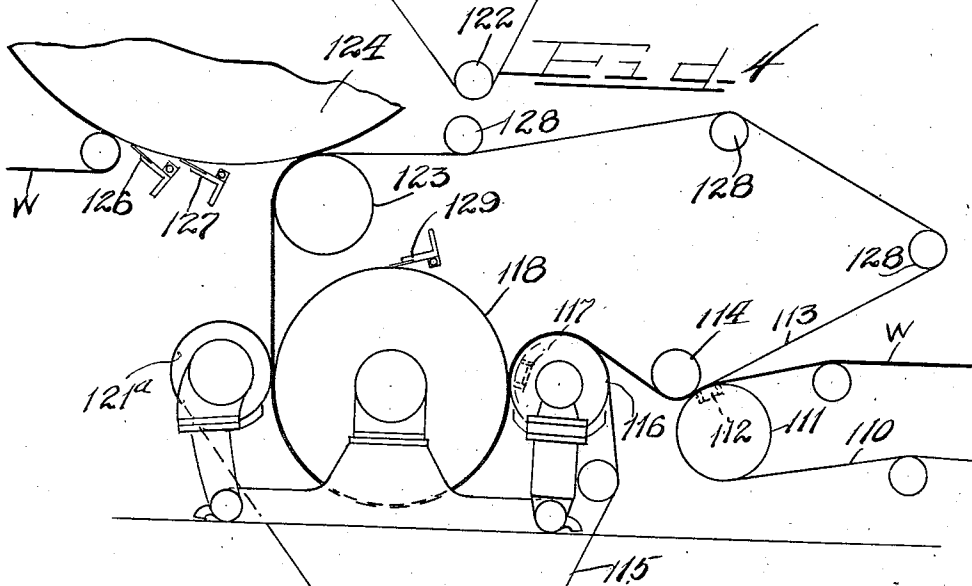


Fig. 4



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FELT ARRANGEMENT FOR HORIZONTAL
PRESS ROLLSEarl E. Berry, Beloit, Wis., assignor to Beloit Iron
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Application January 15, 1937, Serial No. 120,734

1 Claim. (Cl. 92—49)

This invention relates to carrier band arrange-
ments for press roll assemblies of paper machines
wherein an absorbent carrier band receives the
newly formed web of paper from the forming
surface of the machine, conveys the web through
a press roll assembly, and deposits the web onto
a drying roll.

More specifically the invention relates to a press
roll assembly for paper making machines having
the constituent rolls thereof in horizontal align-
ment with their axes lying in substantially the
same horizontal plane and includes a carrier band
for picking up the newly formed web of paper
from the forming surface of the machine to con-
vey the same in a serpentine path through the
press roll assembly for deposit onto a drying roll
of the drier section of the machine.

This application is a continuation-in-part of
my copending application entitled: "Felt arrange-
ments for horizontal press roll assemblies," Serial
No. 80,763, filed May 20, 1936.

The present invention utilizes horizontal press
roll assemblies such as are disclosed in my copend-
ing application Serial No. 80,763. In such a press
roll assembly, the constituent rollers, instead of
being vertically mounted, are arranged in hori-
zontal alignment preferably with their axes lying
in the same horizontal plane with a single center
roll having diametrically opposed rollers in pres-
sure relation therewith on opposite lateral sides
thereof. In these constructions, a single center
roll takes the place of heretofore necessary two
separate top rollers. The side rollers can be plain
or suction rolls although it is preferred to have
the first side roll of the assembly a suction roll.

According to this invention a single looped ab-
sorbent carrier band such as a felt band is thread-
ed through the press roll assembly between the
nip of the rolls thereof and is trained around
guide rollers so as to pick up the freshly formed
web from the forming surface of the machine to
convey the same through the press roll assembly
for deposit onto a drier drum of the drier section
in the machine. In some modifications of this in-
vention a second absorbent carrier band or felt
can be used in conjunction with the main car-
rier band to cover the web as it passes through the
press roll assembly.

The invention is particularly adapted for use
in Yankee type Fourdrinier machines and will
be hereinafter specifically described in connec-
tion with such type of machine. It should be
understood, however, that the invention is not
limited to Yankee type machines but may be used

on all types of paper making machines wherein
press roll assemblies are needed or desired.

Another important feature of this invention is
the provision of a heated roll in the press roll
assembly which is adapted to heat the web passing
through the assembly for reducing the viscosity
of the water therein so that pressure and suction
extracting operations will remove greater amounts
of water from the web in less time.

It is then an object of this invention to provide
a press roll assembly for paper making machines
having an absorbent carrier band for receiving
the web from the forming section of the machine
to convey the web through the press roll assem-
bly for deposit on a drier drum in the drier sec-
tion of the machine.

A further object of this invention is to provide
a press roll assembly for paper making machines
in which the constituent rollers are mounted in
horizontal alignment having their axes lying sub-
stantially within the same horizontal plane and
having a looped absorbent carrier for receiving
the paper web from the forming section of the ma-
chine for passage through the press roll assembly
and deposit onto a drier drum of the drier section.

A specific object of this invention is to provide
in a horizontal press roll assembly felt arrange-
ment wherein a single looped absorbent carrier
receives the newly formed paper web directly
from the forming section of the machine, con-
veys the web through the press roll assembly and
deposits the web into the drier section of the
machine.

Another specific object of this invention is to
provide a horizontal press roll assembly having a
main looped absorbent carrier band for receiving
the newly formed web from the forming section
of the paper making machine to guide the web
through the press roll assembly and deposit the
same onto a drier drum and also having a sub-
sidiary absorbent looped band for covering the
web as it passes through the press roll assembly.

Other and further objects of this invention will
become apparent to those skilled in the art from
the following detailed description of the annexed
sheets of drawings which disclose preferred em-
bodiments of the invention.

On the drawings:

Figure 1 is a diagrammatic side elevational view
of a press roll assembly according to this inven-
tion shown in combination with the couch roll
end of the forming section and the drier drum of a
Yankee type Fourdrinier machine wherein a sin-
gle looped absorbent carrier band receives the
web from the couch roll end of the forming sec-

tion, conveys the web through the press roll assembly and deposits the web onto the drier drum.

Figure 2 is another diagrammatic side elevational view of a press roll assembly according to this invention shown in combination with the forming section and drier drum of a Yankee type Fourdrinier machine and having, in addition to the main carrier felt, an inner felt for covering and protecting the web as it passes through the press roll assembly.

Figure 3 is a diagrammatic side elevational view of another modified form of felt arrangement for a horizontal press roll assembly in which a single looped felt conveys the web from the couch roll, through the assembly to a Yankee drier and a second looped felt is trained around the press rolls of the assembly so that the web will be between two felts as it passes through the assembly.

Figure 4 is another diagrammatic side elevational view of a further modified form of the felt and press roll assembly shown in Figure 3.

As shown on the drawings:

In Figure 1 the reference numeral 80 indicates a forming wire having a web W formed thereon. The wire 80 is trained around a suction couch roll 81 having a suction head 81a therein and a top roll 82 cooperating therewith for transferring the web W from the wire 80 to the main absorbent carrier felt 83.

The web W and felt 83 are then passed under a guide roll 84 and up over a suction roll 85 of the press roll assembly. The suction roll 85 has a suction head 85a therein for removing water from the web through the felt 83. The web and felt then pass through the nip of the suction press roll 85 and a heated center roll 86 of the assembly where additional water is removed from the web by pressure. The web and felt then follow around the periphery of the heated roll 86 with the web in contact with the periphery of the roll. The web and felt are thus heated to reduce the viscosity of the water entrained therein and make possible a freer extraction of water therefrom. The felt 83 is momentarily removed from the web W and passes over a guide roll 87 while the web hugs the heated roll 86.

The felt 83 is directed by the roll 87 against a second suction press roll 88 and over the suction head 88a of the roll where water is sucked from the felt to dry the same and open up the pores thereof. The felt then recontacts the web as the same passes through the nip of the rolls 86 and 88 and readily absorbs water squeezed from the web. The water absorbed into the felt is removed by suction through the suction head 88a.

The web and felt then pass under a guide roll 89 and travel toward a large Yankee drier drum 90. A transfer roll 91 is provided for receiving the web and felt to transfer the web from the felt onto the periphery of the drier 90. The felt then travels back to the forming wire and the web travels around the drier drum 90 where it is dried by contact with the heated drum. The web is pulled from the periphery of the drum around a roll 92 or it can be scraped from the drum by a creping doctor 93. A second doctor 94 may be provided for wiping clean the periphery of the drier drum.

If desired, a wiper 95 can be urged against the periphery of the heated roll 86 to clean the same. The suction rolls 85 and 88 are rotatably mounted on standards as shown which are pivoted to the main frame of the assembly. The center roll 86 is rotatably mounted on bearings from the

main frame of the assembly as shown. The suction rolls 85 and 88 can thus be moved into peripheral pressure engagement with the center roll by tilting these rolls about the pivot points of their supporting standards. Any desired amount of pressure in the nips of the rolls can be obtained.

The mechanical structure of the press roll assembly is more fully described and claimed in my copending application entitled: "Horizontal press roll assembly," Serial No. 80,253, filed May 18, 1936.

In the modification illustrated in Figure 2, the arrangement is substantially identical with that described in Figure 1 and identical parts have been marked with the same reference numeral.

However in Figure 2, the heated drum 86 is provided with a bottom felt or inner felt 96 which is trained around the periphery of the heated drum so that the web will be carried between two felts as it passes through the press roll assembly.

The felt 96 is directed into contact with the web W on the felt 83 by a guide roll 97 mounted under the suction roll 85. The felt 96 thereupon covers the web W on the felt 83 as the same passes through the nip of the rolls 85 and 86 and acts as a bottom or inner felt for the entire travel of the web around the periphery of the center roll 86. The felt 96 is removed from the center roll 86 over a guide roll 98 and under a tensioning roll 99. If desired a wiper or scraper 100 can act against the periphery of the heated center roll 86 after the felt 96 has been removed therefrom over the roll 98. The scraper or wiper will serve to clean the periphery of the roll 86.

The use of the felt 96 serves as an added protection for the web in its passage through the nips of the press rolls and around the periphery of the center roll.

In the modification illustrated in Figure 3 the web W on the forming wire 110 passes over the couch roll 111 which may be provided with a suction head 112. A looped transfer or conveyor felt 113 is disposed over the web W on the forming wire 110 and is guided under a transfer roll 114 cooperating with the couch roll 111 so that the web W is transferred to the conveyor felt 113. The felt 113 carries the web W into contact with a second looped felt 115. The web W while between the two felts 113 and 115 travels around the suction roll 116 of a horizontal press roll assembly, over the suction area 117 of said suction roll and between the nip of the roll 116 and a heated center roll 118 of the assembly. The web and felts then travel with the roll 118 around the lower segment of its periphery. The felt 115 is next momentarily removed from the web and travels around a guide roll 119 and upward over the suction area 120 of a second suction roll 121 in the assembly. In this manner, water absorbed by the felt 115 from the web W is extracted from the felt before it recontacts the web W passing through the nip of the rolls 121 and 118. The felt 115 then travels around the roll 121 and over a tensioning roll 122 while the felt 113 conveys the web upward over a transfer roll 123 where the web is transferred onto a Yankee drier drum 124, travels around the periphery of the drum and is removed around a guide roller 125. A creping or plain doctor 126 can be used to loosen the web from the drum 124 and the periphery of the drum can be wiped clean by a second doctor 127 before it recontacts the web W. The felt 113 is then directed back over the forming wire

110 by guide rolls 128 one of which may be a tensioning roll.

5 In Figure 4 substantially the same felt arrangements as disclosed in Figure 3, are used, and identical parts bear the same reference numerals. In Figure 4, however, the second press roll 121a is a plain press roll whereas in Figure 3 the roll 121 is a suction press roll. Also in Figure 4 the felt 115 is not separated from the web as at 10 119 in Figure 3 but travels therewith through the entire horizontal press roll assembly.

In Figures 3 and 4 the center roll may be cleaned by a wiper 129 rubbing against the periphery of this roll and this roll may be heated if desired.

15 The felt arrangements illustrated in Figures 3 and 4 provide for a single looped felt to convey the web from its forming surface through a horizontal press roll assembly onto a drier drum with a second looped felt to cover the web as it passes through the assembly. These arrangements are particularly useful for handling light weight webs.

20 In the arrangements disclosed in Figures 3 and 4 the second press rolls of the horizontal press roll assembly can be plain presses since the direction of the nip of these rolls is upward and the water pressed from the sheet itself can drain downwardly without crushing the sheet in the nip of the rolls.

30 From the above description it should be understood that this invention provides novel felt arrangements for horizontal press roll assemblies wherein a main conveyor felt receives the web from its forming surface, conveys the web through the press roll assemblies and deposits the web 35 onto a drier drum in the drier section of the machine. Secondary conveyor felts may be utilized to cover the web as it passes through the press roll assembly.

I am aware that many changes may be made

and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim as my invention:

5 In a paper making machine including a web forming section, a drier drum spaced longitudinally therefrom, and a horizontal press roll assembly between said forming section and said 10 drier drum not requiring crowning of the rolls thereof to offset against vertical deflection for maintaining uniform nip pressures throughout the lengths of the nips therebetween, said press roll assembly having a center roll and rolls on 15 each side of said center roll in horizontal alignment therewith to define a pair of substantially vertical pressure nips, at least one of said rolls being a suction roll having a suction area at the nip partially defined thereby, the improvements 20 which comprise an endless open looped felt extending from the forming section to the drier drum trained through both nips of the press roll assembly and around the press rolls to lap portions of the peripheries of each roll, a roller within 25 the loop of the felt to direct the felt into contact with a web on the forming surface for picking up the web on the felt, a second roller within the loop of the felt to direct the web thereon against the drier drum, and a third roller outside of the 30 loop of the felt adjacent said suction roll receiving the felt from the center roll to direct the felt alone over the suction area before recontacting the web, whereby a single looped felt conveys the web from the forming surface to the drier drum 35 through the press roll assembly and is dewatered at the suction area of said assembly.

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