

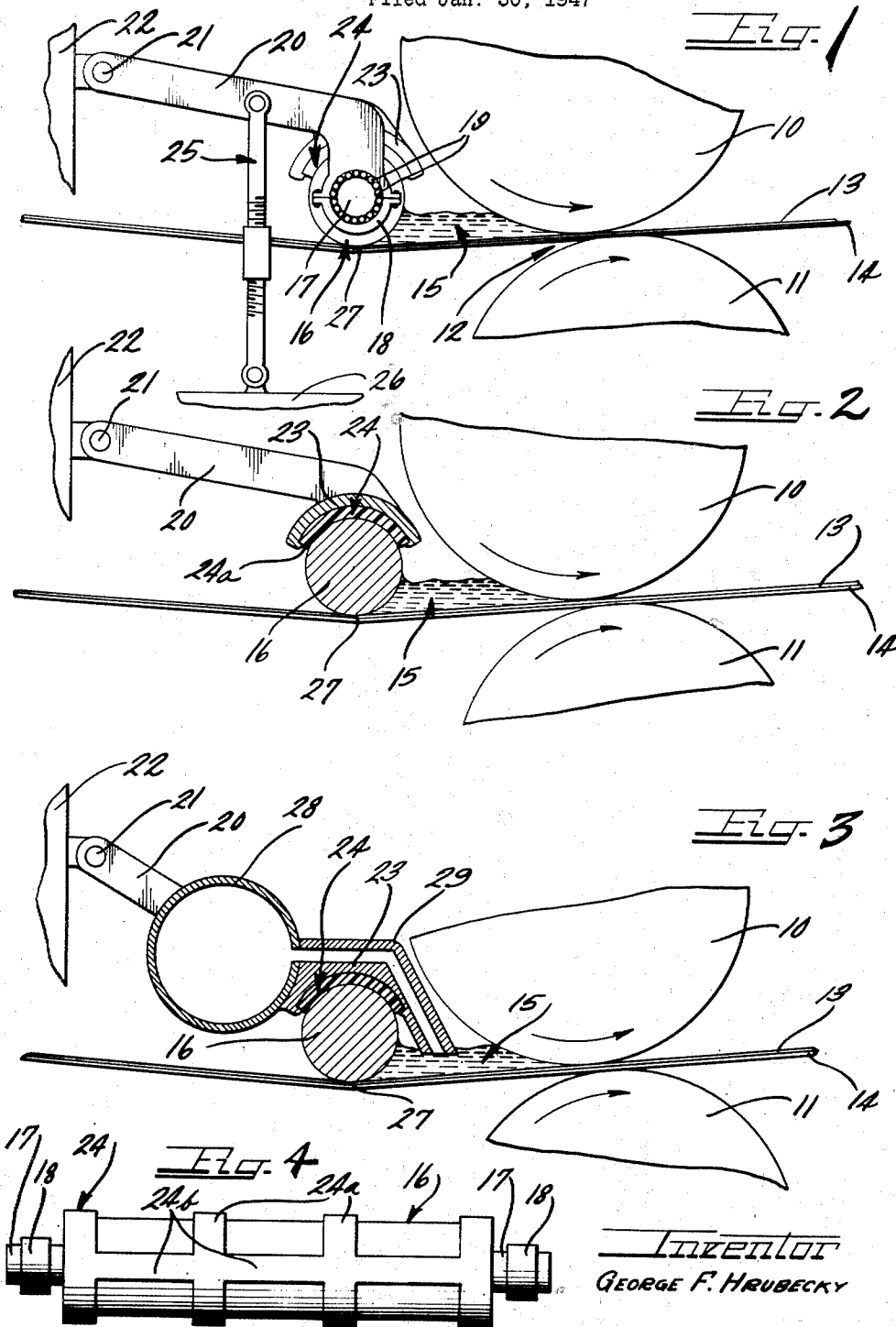
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SLICE ROLL ASSEMBLY FOR PAPER MACHINE PRESSES

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SLICE ROLL ASSEMBLY FOR PAPER
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This invention relates to a slice roller arrangement for paper machine presses to replace the heretofore used slice board.

Specifically the invention deals with a slice roller rotatably mounted immediately in advance of the nip of a press to prevent water extracted from the press from running back along the felt, and to press hard enough upon the felt for separating the felt fibers from the sheet fibers to eliminate "picking."

Heretofore slice boards have been pressed against web-conveying felts in advance of the nip of a press receiving the felt and web for damming off the flow of water from the nip so that this water would not run back along the felt to create water marks or streaks. The use of a slice board, however, has many disadvantages, including wearing action on the felt, embedding of fragments in the board to damage the felt, vibration of the board when pulled tightly against the felt, bacterial growths on the board, and the like.

According to the present invention the slice board is replaced with a roller and the web-conveying felt is partially lapped around the roller to loosen the felt fibers from the sheet and to eliminate "picking" of the sheet by the felt when the sheet is separated from the felt. The roll has a relatively small diameter, in the nature of two to three inches, and is backed up by a continuous bearing which prevents bowing of the roll. The moving felt drives the roll and the continuous bearing serves as a wiper to prevent flow of liquid past the roll. The liquid piled up in front of the roll can either drain off the sides of the felt or, in accordance with a modified structure of this invention, be removed by a suction drain.

It is, then, an object of this invention to provide a slice roller for paper machine presses in place of heretofore-used slice boards.

Another object of the invention is to provide a small diameter roller immediately in advance of the nip of a press for acting on a felt carrying a web through the press to flex the felt fibers relative to the web fibers thereby loosening the web from the felt and to dam off flow of water from the nip of the press back along the felt.

Another object of the invention is to provide a slice roller for paper machine presses wherein a small diameter roller is pressed against a felt about to enter the press and is held against deflection by a continuous bearing which also serves as a wiper.

A still further object of the invention is to provide a synthetic resin-type bearing for a slice roller with alternate wide and narrow portions

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so that the wide portions will prevent chattering of the roller, and the narrow portions will cooperate with the wide portions to form a continuous wiper.

A still further object of the invention is to provide a slice roller for paper machine presses equipped with a suction drain.

Other and further 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 drawings:

Figure 1 is a fragmentary, somewhat diagrammatic side elevational view of a paper machine press equipped with a slice roller according to this invention.

Figure 2 is a view similar to Figure 1 but illustrating the slice roller in vertical cross section.

Figure 3 is a view similar to Figure 2 but illustrating the slice roller equipped with a suction drain.

Figure 4 is a plan view of the slice roller illustrating the wide and narrow sections of the bearing backing up the roll to prevent roll deflection, roll chattering, and to serve as a wiper for the roll.

As shown on the drawings:

In Figure 1, top and bottom press rolls 10 and 11 coact to define a pressure nip 12 receiving therethrough a felt 13 carrying a sheet of paper 14 on its under face. As is customary in paper machine presses, a pool of water 15 squeezed from the web and felt forms on the felt in advance of the nip 12.

In accordance with this invention a slice roller 16 is rotatably mounted immediately in advance of the nip 12 to press against the felt 13 and dam off the pool of water 15 so that it cannot flow back along the felt to form streaks and water marks in the web on the under face of the felt. The dammed-off pool of water 15 flows off of the side edges of the felt immediately adjacent the nip 12 where it cannot damage the sheet 14.

The slice roll 16, as best shown in Figure 4, has end axles 17, 17 projecting therefrom and rotatably mounted in bearings 18, 18 which, as shown in Figure 1, can contain anti-friction elements such as rollers 19. Each bearing 18 is carried on an arm 20 (Figure 1). The arms 20 are pivoted at 21 on a support 22 above the felt 13.

The arms 20 are connected above the bearings 18 by an arcuate pad 23 overlying the roll 16 and extending along the full length thereof. This pad

23 carries a plain bearing 24 preferably composed of non-metallic plastic material such as Micarta or the like. The bearing 24, as best shown in Figure 4, is composed of a series of spaced arcuate bands or wide portions 24a extending around the upper half of the roll 16 and connected through narrow portions 24b. The portions 24a and 24b have good bearing engagement with the roll 16 and prevent deflection of the roll between the bearings 18. In addition the wide bearing portions 24a prevent chattering of the roll and coast with the narrow bearing portions 24b to form a continuous wiper or dam which prevents films of water from riding around the roll to drain back along the felt.

As shown in Figure 1, the arms such as 20 can be pulled down by means of a turnbuckle-type screw arrangement 25 pivotally anchored on a base 26. This screw arrangement 25 can be adjusted to press the roll 16 against the felt with any desired force irrespective of the weight of the roller. Alternatively, of course, if only light contact of the roll with the felt is desired, the screw arrangement 25 can be used to relieve the weight of the roll on the felt.

Alternatively, as indicated in Figure 2, the screw arrangement 25 can be disposed of and the weight of the roller alone relied upon for loading the felt.

As shown in Figures 1 and 2, the felt slightly laps at 27 around the bottom of the roll 16 so that it is flexed as it passes the roll. This flexing loosens the felt fibers from the sheet and thus assists clean removal of the sheet from the felt.

The felt drives the roll 16 and the bearings 18 preferably equipped with anti-friction elements, provide a free-rotating roll thereby eliminating scraping action on the felt and increasing the wear life of the felt.

The roll 16 is preferably composed of non-corroding metal such as stainless steel, brass, bronze, or the like, and being relatively hard and dense, it cannot pick up fragments of metal, glass, and the like such as were heretofore picked up by the conventional slice board with a resulting damaging of the felt.

Since the bearing 24 effectively holds the roll 16 against chattering and deflection, it can be pulled down very tightly on the felt without creating a vibration. In addition, the roll can remain in contact with the felt even when the machine is shut down since it is composed of non-corrodible material.

The bearing 24 is preferably composed of a plastic which is lubricated with water from the pond 15.

In the embodiment of Figure 3 the arms 20 carry a suction pipe 28 immediately adjacent the arcuate pad portion 23 and this suction pipe is connected through a conduit 29 extending down in front of the roll 16 to dip into the pool of water 15. The pipe 28 is connected to a suction pump and water from the pool is drawn up through the passageway in the conduit 29 into the pipe so that the pond 15 is equipped with a suction drain thereby eliminating drainage of water over the side edges of the felt. In this arrangement wetting of the press roll bearings or the like is eliminated.

In view of the above illustrations and descriptions it should be understood that the invention provides a rotating slice roll for paper machine presses in place of the heretofore-used stationary slice board and provides a bearing mounting for the slice roll that not only insures free rotation

of the roll by the press felt but also prevents deflection and chattering of the roll while wiping off films of water that tend to cling to the roll.

It will, of course, be understood that various details of construction may be varied through a wide range 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 combination with a paper machine press including nip-defining cooperating press rolls receiving a press felt through the nip thereof, a slice roll in closely spaced relation in advance of said nip, means rotatably mounting said slice roll for rotation on said press felt, and wiper means coacting with said slice roll along the length thereof for confining liquid on the felt between the nip and slice roll.

2. In combination with a paper machine press including top and bottom coacting press rolls defining a pressure nip and a press felt trained through said nip in a substantially horizontal direction, the improvement of a slice roll rotatably mounted immediately in advance of said nip and extending completely thereacross for rotation on said press felt to dam off flow of water along the length of the felt and confine the water thereon between the nip and roll.

3. A slice roller assembly adapted for a paper machine press comprising an elongated roll of circular cross section, bearings surrounding end portions of the roll to rotatably mount the roll, and a water-lubricated plain bearing having an arcuate wiping surface contacting a portion only of the roll periphery and extending along the length of said roll between said end portions for continuously backing up the roll against deflection and for wiping off films of fluid picked up by the roll.

4. A slice roll assembly adapted for a paper machine press comprising an elongated roller, means rotatably mounting said roller at the ends of the roller, and a plain bearing engaging the roller along the length thereof, said plain bearing having longitudinally spaced arcuate finger portions partially lapping the roller periphery transversely to hold the roller against chattering together with intermediate narrow band portions also engaging a portion of the roller periphery and connecting the fingers to cooperate therewith for forming a continuous wiper along the length of the roller.

5. A slice roll assembly for the press felt of a paper machine roll press which comprises a small diameter roll, means rotatably mounting the roll to ride on and be driven by the press felt immediately in advance of the press nip, an elongated bearing extending along the axial length of the roll and cooperating therewith to dam off flow of water on the felt, and means extending between said roll and said lip for sucking said water off of the felt.

6. In combination, a paper machine press having a pair of cooperating press rolls defining a nip for receiving a press felt, a small diameter elongated roll extending across said felt in advance of said nip, means rotatably mounting said roll in contact with said press felt, arcuate wiper means in contact with a portion only of the periphery of said roll and coacting therewith to dam off water squeezed from said press felt by said press rolls, means defining a suction chamber carried by said mounting means and a con-

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duit connected to said suction chamber and extending between said slice roll and said nip to remove water from said felt.

7. In combination with a paper machine press having a press felt trained through a pressure nip, the improvements of a small diameter elongated roll adapted to overlie the press felt, bearings rotatably mounting the ends of the roll, a movable support for said bearings, means for loading said support to thrust the slice roll against said press felt, and a wiper having an arcuate wiping surface in partial peripheral contact with said roll and extending along the length of the roll.

8. In combination with a paper machine press having a press felt trained through a pressure nip, the improvements of a small-diameter elongated roll of circular cross-section, a plain bearing overlying the roll along the length thereof and in less than full peripheral contact therewith, bearings surrounding the end portions of the roll, supports for said last mentioned bearings, and means for shifting said supports to load the roll against said press felt, said means including a turnbuckle-type screw arrangement for pulling said supports vertically toward said press felt.

9. A slide roll assembly adapted for a paper machine press having a press felt trained through a pressure nip comprising an elongated small-diameter roller and a plain bearing engaging the roller along the length thereof, said bearing having longitudinally spaced arcuate fingers partial-

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ly lapping the roller periphery transversely to hold the roller against chattering together with narrow finger-connecting portions also partially lapping the roller periphery and coacting with said fingers to form a continuous wiper along the length of the roller, bearing means for rotatably receiving the ends of said roller, and means for loading said bearing means to urge said roller against the felt.

10. A slice roll assembly adapted for a paper machine press comprising a small-diameter roller, means rotatably mounting said roller and adapted to carry the roller close to the nip of a press roll assembly, said means including an arcuate bearing surface extending along the length of said roller in partial peripheral contact therewith, and a suction drain on said mounting means having an inlet opening immediately in advance of the roller.

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