

Sept. 25, 1956

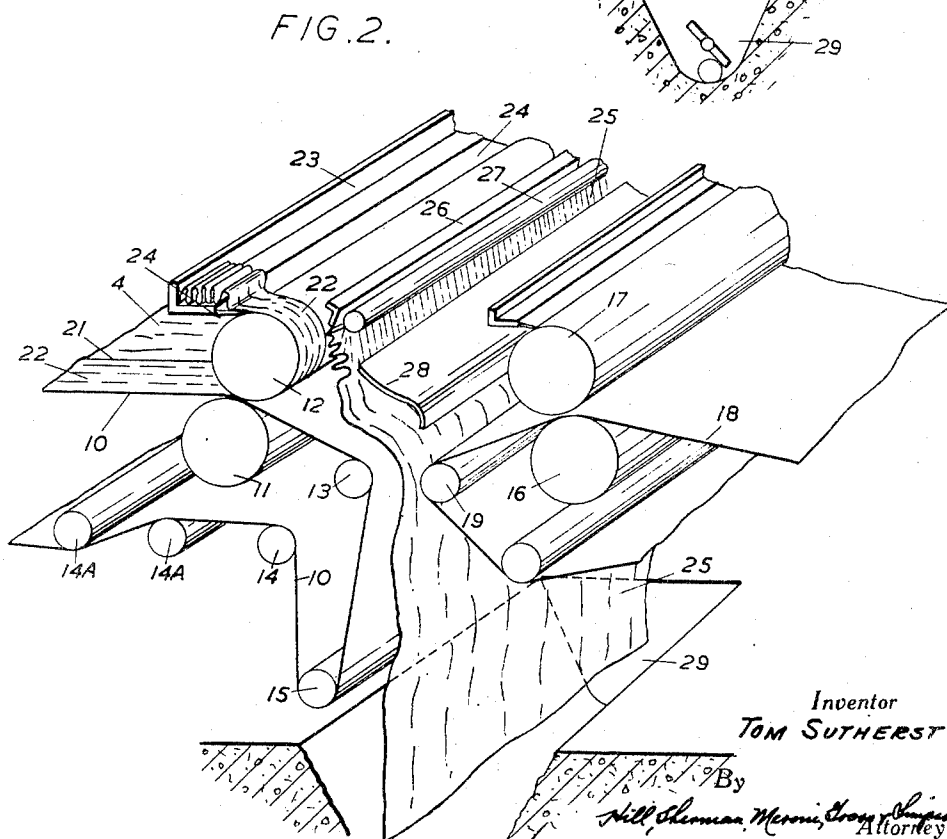
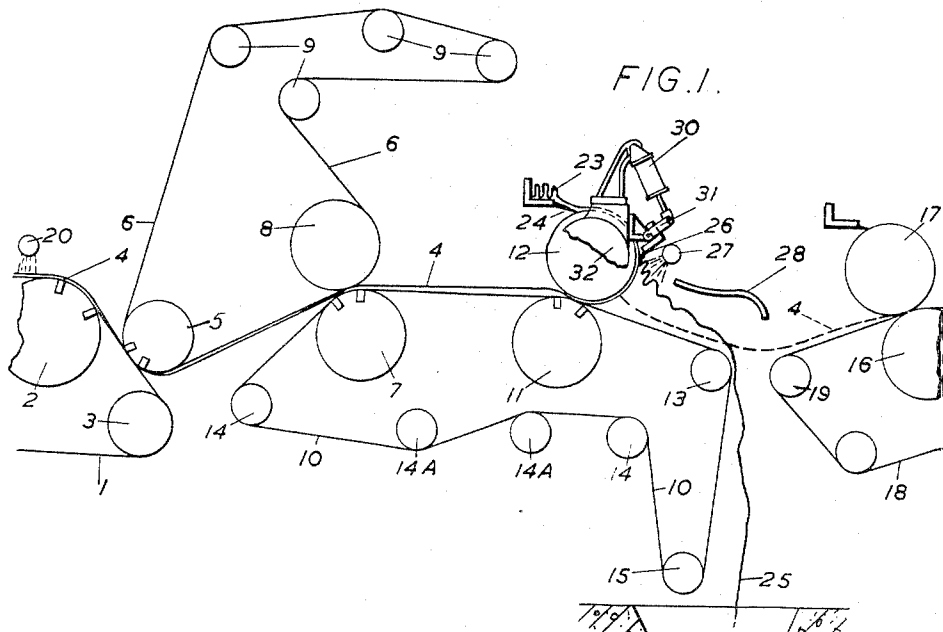
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2,764,068

PAPER-MAKING MACHINES

Filed Nov. 24, 1954

3 Sheets-Sheet 1



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FIG. 3.

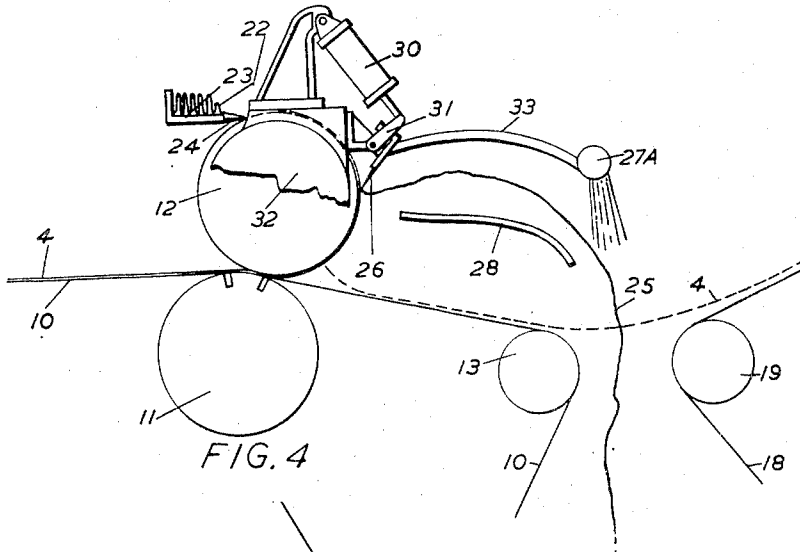
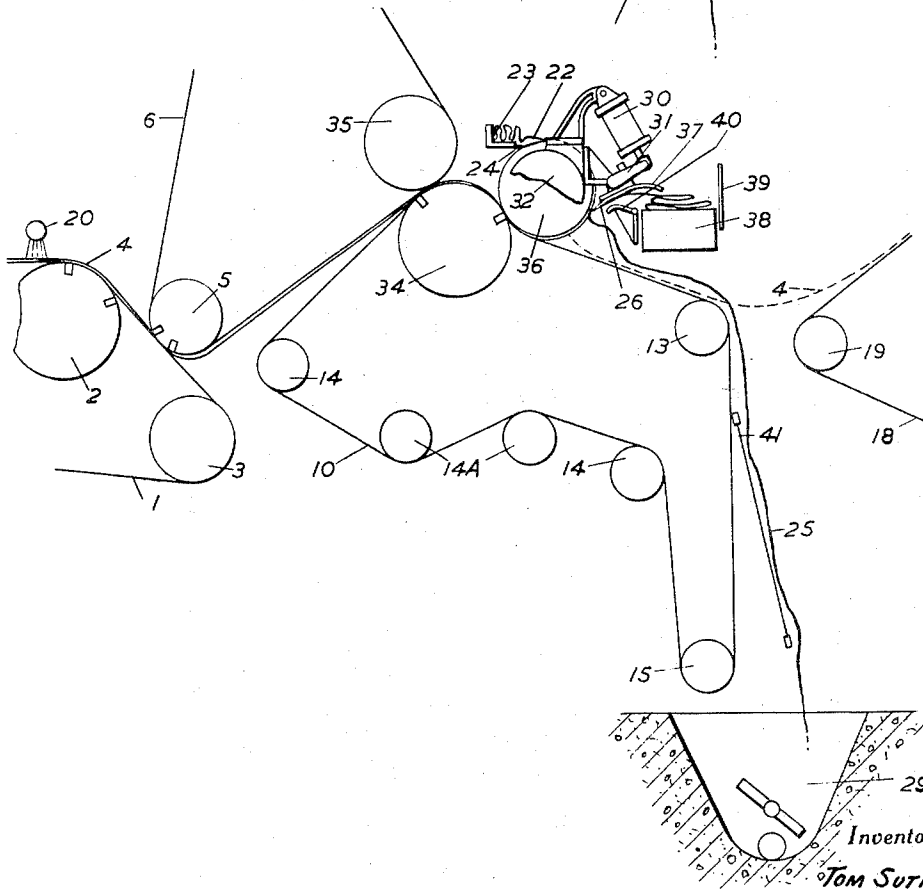


FIG. 4



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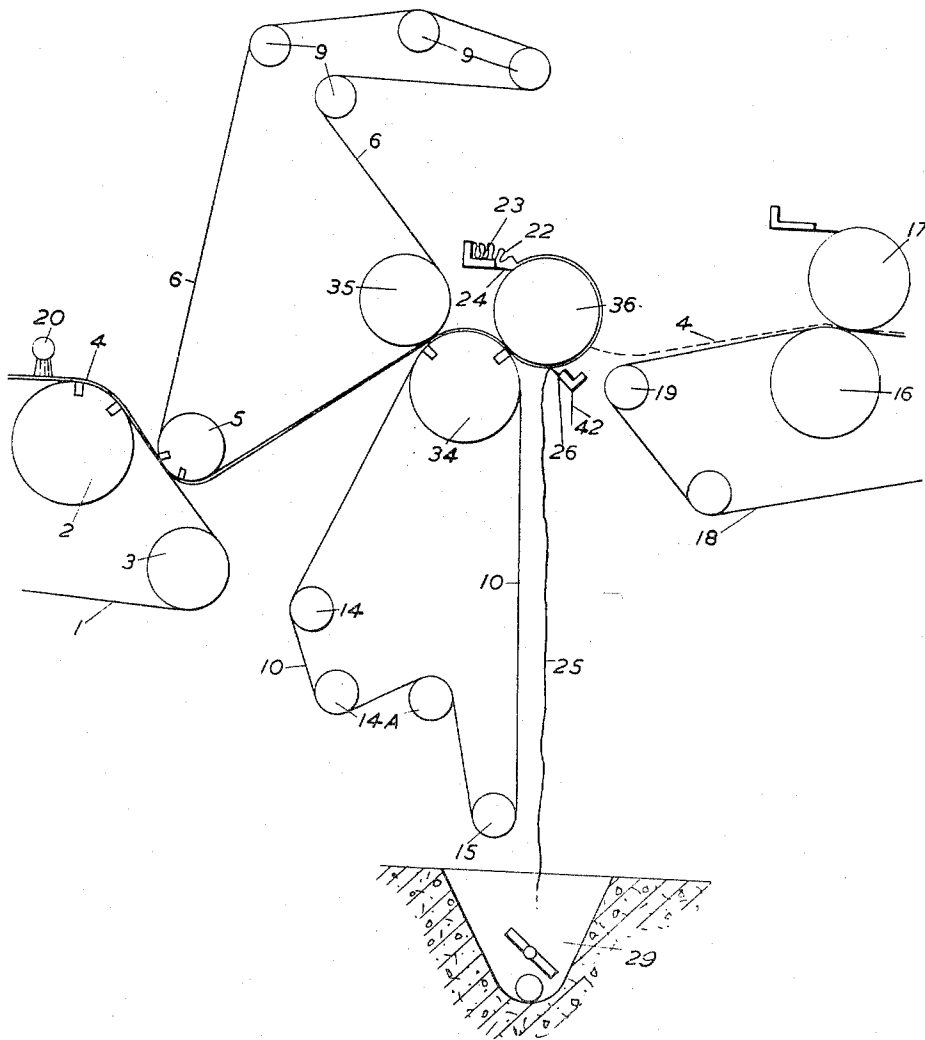
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PAPER-MAKING MACHINES

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FIG. 5.



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2,764,068

PAPER-MAKING MACHINES

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10 Claims. (Cl. 92-49)

This invention relates to paper-making machines, its object being to facilitate the starting of the paper web in its run through the press section and dryer section of a machine using automatic vacuum transfer to transfer the web of paper from the wire into the press section.

In the usual method of starting the run by jet-cutting a narrow "tail" at the forming end of the machine, the disposal of the remaining major web offers considerable difficulty because of the large accumulation of "broke" that results at the press section while the tail is being forwarded through the machine. Removed at the press, or at one of the presses, the broke has to be pulled to the front side of the machine by hand or by a broke conveyor, and the subsequent removal from the aisle of a large amount of broke calls for further handling.

According to the present invention, a paper-making machine press-section has a bottom felt for its press (or for one of the presses) guided downwardly after it has passed through the press, and is spaced from the subsequent bottom felt serving to lead the web to the remainder of the machine, and a top press roll is provided on the exit side of the press nip with a doctor movable into engagement with its surface beyond the point at which the web leaves the surface of the roll, the doctor extending across a width less than the total width of the press roll to leave an undoctored width corresponding to the width of the desired tail, and the space between the bottom felts providing for the downward discharge of the doctored width. The doctor is moved into position when required, being held clear of the roll during normal operation of the machine, when the normal doctor and collecting tray extending across the whole face of the top press roll keep the roll surface clear of fibre, fluff, and the like.

The bottom felt of the press may extend beyond the press below the path normally followed by the web to the subsequent bottom felt, and a roll then guides it downwardly, this roll being sufficiently spaced from the guide roll of the subsequent bottom felt for the broke doctored from the top press roll to pass freely through the space.

The web reaches the press with a longitudinal cut to form the tail, and the doctor removes the remainder of the web as broke for downward discharge, preferably to a hog-pit below the machine level, where it may be beaten up with water and returned for re-use as stock.

Preferably, a creping doctor is used, to compact the broke to greater bulk and to bring it to a more suitable condition for beating into stock. Advantageously, an air-jet (e. g., a perforated pipe) extends parallel to the doctor to assist in directing the broke towards the felt.

Until the broke is being satisfactorily removed from the vicinity of the press, the corresponding length of tail may be collected as waste in the tray behind the normal doctor above the press. Severing the waste enables the tail to be handled forward, to a subsequent press or to the dryer section.

Where the bottom felt extends beyond the press to a

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guide roll before being directed downwardly, a guard may be mounted above the path normally followed by the web on leaving the press, to counteract any tendency for the broke to be blown away from or beyond the felt extension. The guard leaves a gap between itself and the top press roll for the doctored broke to fall towards the felt (assisted by the air jet) and at its other end may have a downward curve more or less concentric with the roll that guides the felt downwardly. Alternatively, the guard itself may receive the broke from the doctor, the air jet being positioned beyond and above the far end of the guard to direct the broke downwards where the felt is guided downwards by the guide roll. In this case, a deflector guard may be disposed between the doctor and the air jet, more or less parallel to the main guard.

The broke doctor is preferably mounted so as to be quickly moved into and out of contact with the press roll, e. g. by having a pivotal mounting, with an air cylinder to effect rocking. When a break occurs in the machine, and broke removed by the full-width doctor begins to collect in the trough above the press, the air cylinder may be quickly operated for the part-width doctor to bring the broke down for discharge to the hog-pit; and the doctor may be quickly removed when the tail has again been passed through the machine thus allowing the gradual feeding of the full width of the web through the machine by means of the tail.

A guide may be provided to ensure that the broke does not adhere to the downward run of the bottom felt, but is thrown clear into the hog-pit.

By way of example, several forms of installation according to the invention will now be described in greater detail with reference to the accompanying drawings, in which:

Figure 1 is a diagrammatic side elevation of the press section of a paper-making machine provided with one form of installation;

Figure 2 is a perspective view of a part of Figure 1;

Figure 3 is a diagrammatic side elevation, showing a modification of the installation shown in Figure 1;

Figure 4 is a diagrammatic side elevation of another type of press section provided with a further form of installation; and

Figure 5 is a diagrammatic side elevation of a modification of Figure 4.

In Figure 1, a forming wire 1 is trained around a suction couch roll 2 and a return roll 3, the paper web 4 being taken from the wire between the couch roll and the return roll by a suction transfer roll 5 and an endless pick-up felt 6 passing between the transfer roll and the forming wire. The endless felt 6 leads from the transfer roll 5 to a first press consisting of a suction roll 7 and a top press roll 8, the felt 6 returning to the transfer roll 5 around felt-, guide-, and stretch-rolls 9. An endless bottom felt 10 serves both the first press and a second press comprising a suction roll 11 and a top press roll 12, the felt extending beyond the second press to a felt-roll 13 and returning to the first press around felt- and guide-rolls 14, 14A, and stretch-roll 15, being directed downwardly from the roll 13 to the roll 15.

For normal continuous running of the machine, the web 4 passes from the second press to a further section of the machine such as a third press as shown in Figure 1, comprising bottom roll 16 and a top press roll 17, served by an endless bottom felt 18 which approaches the third press after turning around felt roll 19, the web 4 bridging the space between the felt roll 13 and the felt roll 19. This space is made wide enough for the mass of broke to pass, such space normally being made narrow, in fact only of a width to ensure that an operative cannot trap his hands between the rolls.

In forming a tail for starting-up, a water jet 20, fixed at a point just prior to the point of contact of the forming wire 1 with the suction couch roll 2, cuts the web along a line 21 (Figure 2). Temporary collection of the tail 22 thus formed takes place in a tray 23 behind the normal full-width doctor 24 of the plain top roll of the second press. The broke 25 is removed from the top roll by a doctor 26 extending across a width less than the total width of the top roll 12 by a width of the tail. An air jet 27 directs the broke 25 between a guard 28 and the top roll 12 on to the bottom felt 10, to be carried over the felt roll 13, and fall for collection into a hog-pit 29, lying below the space between the felt rolls 13, 19.

The doctor 26 can quickly be brought into contact with the top roll 12, and as quickly be drawn out of contact with the top roll by air cylinders 30 and levers 31 (Figure 1) mounted on each end frame 32 carrying the top roll 12.

Alternatively, the guard 28 itself may receive the broke from the doctor 26, as in Figure 3. An air jet 27A may then be positioned at the edge of a deflector guard 33, beyond and above the far end of the main guard 28 to direct the broke downwards into the space between the felt rolls 13, 19.

In Figure 4, the transfer felt 6 leads from the transfer roll 5 to a "Simplex Press," passing through the bite between the suction roll 34 and the first top plain press roll 35, and returning via the roll 35 and felt-, guide-, and stretch-rolls (not shown) to the transfer roll 5. An endless bottom felt 10 serves the bites of both the first top roll 35 and the second top plain roll 36 with the suction roll 34 extending to a felt roll 13, and returning around felt- and guide-rolls 14, 14A, and stretch-roll 15 to the bite of the first top roll. The felt roll 13 is spaced from the first felt roll 19 of a second bottom felt 13 leading to a second press (not shown).

The temporary collection of the tail 22 takes place in the tray 23 behind the normal doctor 24 of the second top roll 36. The broke 25 is removed by a wide doctor 26 as described previously, which may be provided with a deflector plate 37 in continuation of the doctor blade to throw the broke 25 in its initial stage of formation into a broke conveyor 38 above the extension of the bottom felt 10. A back plate 39 and a hinged front plate 40 limit the spread of the broke 25 across the conveyor. The conveyor 38 serves to lead the broke to the side of the machine. When the broke is to be directed to the hog-pit 29, the hinged front plate 40 is swung upwards until vertical to prevent the broke passing into the conveyor, and directs it down on to the extension of the bottom felt 10, which carries the broke 25 over the felt roll 13. A guide 41 directs the falling broke clear of the downward run of the bottom felt 10 into the hog-pit 29.

A broke conveyor such as 38 is advantageous on wide high-speed machines, such as newsprint machines, since it enables the broke to be satisfactorily disposed of until it proves convenient to carry it via the bottom felt to the hog pit.

In Figure 5, the transfer felt 6 leads from the transfer roll 5 to a "Simplex Press" as in the installation shown in Figure 4, but the endless bottom felt 10, which serves the bites of both the first top roll 35 and the second top roll 36 with the suction roll 34, is guided vertically downwards directly from the suction roll 34, and returns around felt- and guide-rolls 14, 14A, and stretch-roll 15 to the bite of the first top roll.

The temporary collection of the tail 22 takes place in the tray 23 behind the normal doctor 24 of the second top roll 36. The broke 25 is removed by a wide doctor 26 adapted to contact the surface of the second top roll 36 close to the second nip to allow the broke 25 to drop straight into the hog-pit 29. A deflector 42 may be provided in conjunction with the doctor 26 to guide the broke vertically downwards. The doctor 26 (which may be a creping doctor) can quickly be brought into or out

of contact with the top roll 36 by the cylinder and lever arrangement mentioned previously. A guide such as the guide 41 of Figure 4 may be used if required.

What I claim is:

1. A paper-making machine press-section having a bottom press roll, a top press roll, a bottom felt passing through the nip of the rolls, guide means to lead that felt downwardly after its passage through the nip, a subsequent bottom felt spaced from the first bottom felt to lead the paper web to the remainder of the machine, and a doctor movable into engagement with the surface of the top press roll on the exit side of the nip beyond the point at which the paper leaves the surface of the roll, the doctor extending across a width less than the total width of the press roll to leave an undoctored width corresponding to the width of the desired tail, and the space between the bottom felts providing for the downward discharge of the doctored width.

2. A paper-making machine press-section as in claim 1, wherein the doctor is a creping doctor, to compact the broke to greater bulk and to bring it to a more suitable condition for beating into stock.

3. A paper-making machine press-section as in claim 2, comprising an air-jet extending parallel to the doctor to assist in directing the broke downwardly.

4. A paper-making machine press-section having a bottom press roll, a top press roll, a bottom felt passing through the nip of the rolls, a guide roller beyond the press to lead that felt downwardly after its passage through the nip, a subsequent bottom felt spaced from the first bottom felt at the guide roller to lead the paper web to the remainder of the machine, and a doctor movable into engagement with the surface of the top press roll on the exit side of the nip beyond the point at which the paper leaves the surface of the roll, the doctor extending across a width less than the total width of the press roll to leave an undoctored width corresponding to the width of the desired tail, and the space between the bottom felts providing for the downward discharge of the doctored width deposited on the part of the first bottom felt extending from the nip to the guide roller.

5. A paper-making machine press-section as in claim 4, comprising a guard mounted above the path normally followed by the web on leaving the press, to counteract any tendency for the broke to be blown away from or beyond the felt extension, with a gap between itself and the contacting point of the doctor with the roll and an air-jet which directs the doctored broke through said gap.

6. A paper-making machine press-section as in claim 5, comprising a guard to receive the broke from the doctor, and an air-jet positioned beyond and above the rear end of the guard to direct the broke downwards towards the position where the felt is guided downwards by the guide roller.

7. A paper-making machine press-section as in claim 6, comprising a deflector disposed between the doctor and the air-jet, parallel to the main guard.

8. A paper-making machine press-section as in claim 4, comprising a deflector plate in continuation of the doctor, and a conveyor above the extension of the first bottom felt into which the doctor throws broke in the initial stage of formation of broke.

9. A paper-making machine press-section having a bottom press roll, a top press roll, a bottom felt passing through the nip of the rolls, guide means to lead that felt downwardly direct from the bottom press roll after its passage through the nip, a subsequent bottom felt spaced from the first bottom felt to lead the paper web to the remainder of the machine, and a doctor movable into engagement with the surface of the top press roll on the exit side of the nip beyond the point at which the paper leaves the surface of the roll, the doctor extending across a width less than the total width of the press roll to leave an undoctored width corresponding to the width of the desired tail, and the space between the bot-

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tom felt providing for the downward discharge of the doctored width.

10. A paper-making machine press-section having a bottom press roll, a top press roll, a bottom felt passing through the nip of the rolls, guide means to lead that felt downwardly after its passage through the nip, a subsequent bottom felt spaced from the first bottom felt to lead the paper web to the remainder of the machine, a doctor movable into engagement with the surface of the top press roll on the exit side of the nip beyond the point at which the paper leaves the surface of the roll, the doctor extending across a width less than the total width of the press roll to leave an undoctored width

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corresponding to the width of the desired tail, and the space between the bottom felts providing for the downward discharge of the doctored width, and a guide to direct broke away from the downward run of the first bottom felt.

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