Jan. 4, 1944. E. T. STREET 2,338,465

SUCTION ROLL

Original Filed May 19, 1938 2 Sheets-Sheet 1

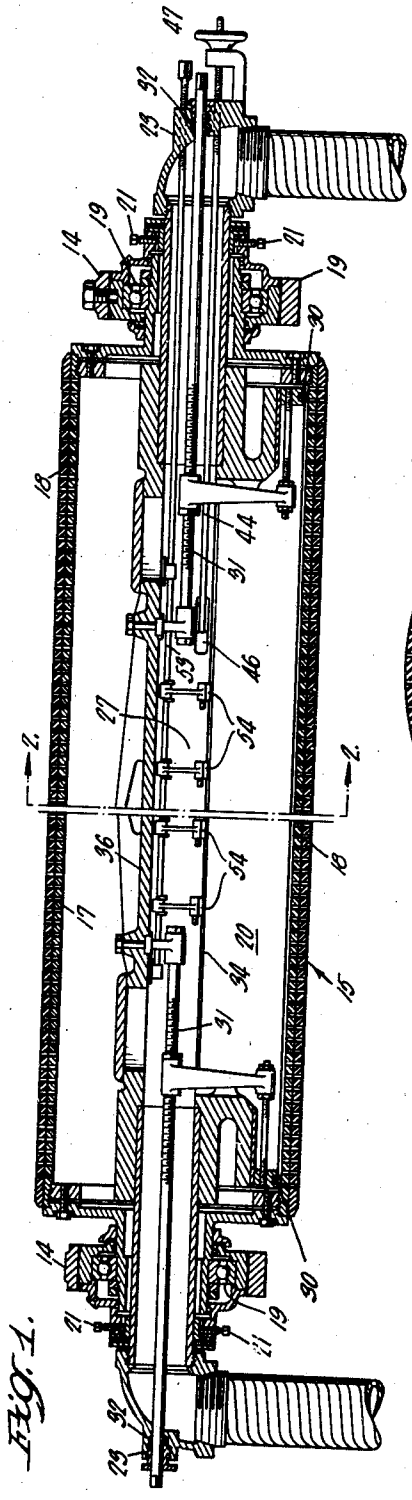


Fig. 1.

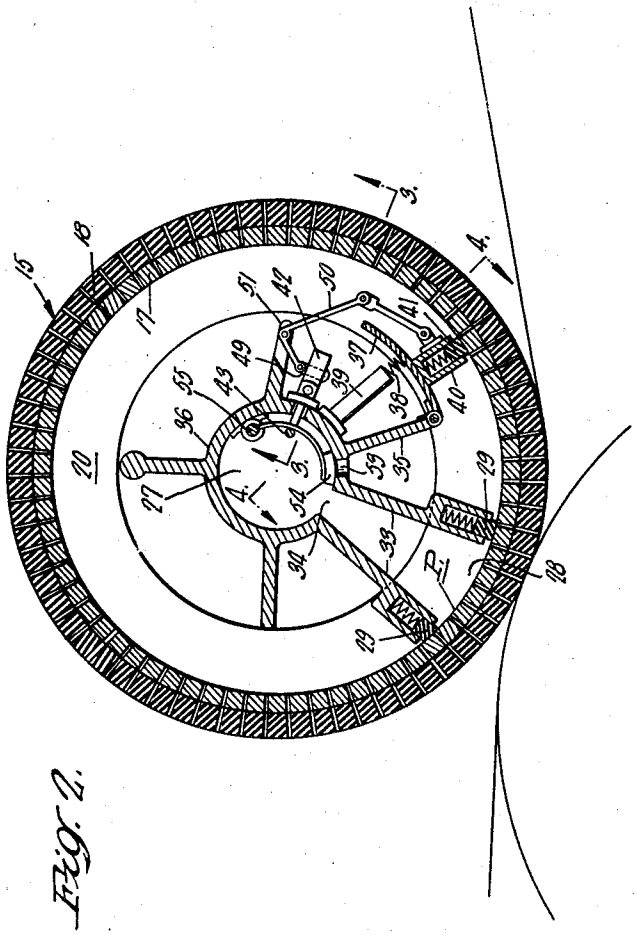


Fig. 2.

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Fig. 3.

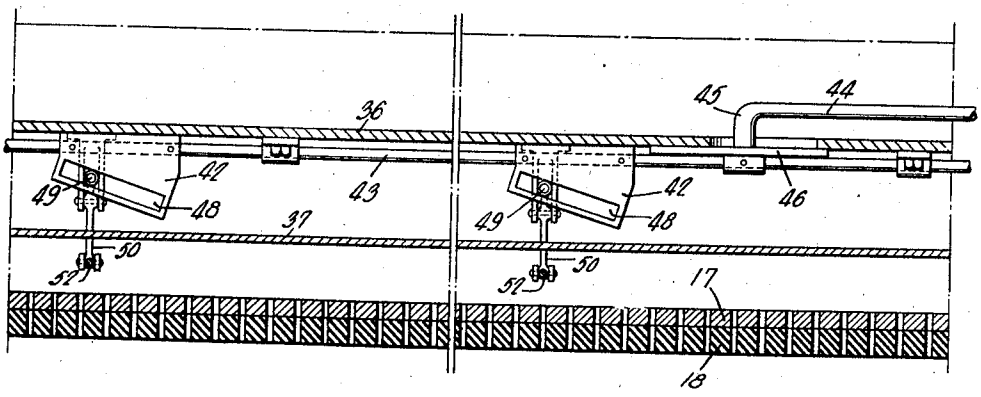
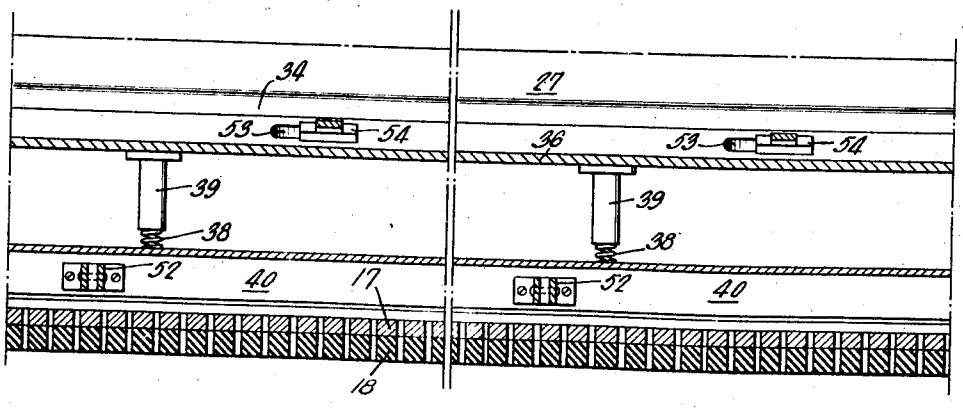


Fig. 4.



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Patented Jan. 4, 1944 2,338,465

UNITED STATES PATENT OFFICE

2,338,465

SUCTION ROLL

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Original application May 19, 1938, Serial No. 208,887. Divided and this application June 9, 1939, Serial No. 278,335

4 Claims. (Cl. 92—53)

This invention relates to suction rolls and, more particularly, to a suction roll especially adapted for use as a suction couch for the cylinder molds of board machines, and is a division of my copending application Serial No. 208,887, filed May 19, 1938, for Suction couch for cylinder molds.

An important object of the invention is to provide a suction roll having a suction box so constructed that the suction in the roll may act to actually lift the water drawn from the paper web or felt with which the suction roll is engaged through a considerable distance and at a high vertical angle.

Another object of the invention is the provision of a suction roll having a suction box the effective width of which may be altered during operation of the roll.

Another object of the invention is the provision of a suction roll having primary and secondary suction boxes in which the suction exerted in the secondary suction box may be controlled.

These and other objects I attain by the construction shown in the accompanying drawings wherein, for the purpose of illustration, I have shown a preferred embodiment of my invention and wherein:

Fig. 1 is a longitudinal sectional view through a suction roll constructed in accordance with my invention;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 2; and

Fig. 4 is a section on line 4—4 of Fig. 2.

The suction roll 15 is of relatively light construction, being preferably about 18 inches in diameter, and has the usual drilled shell 17 which is preferably provided with a correspondingly drilled rubber facing 18. This roll is mounted in suitable journals 19 supported by the arms 14, of which there is, of course, one at each end of the roll, and has arranged therein a suction box 20 held in rotatably adjusted positions through set screws 21.

The suction box has a suction chamber 27 which is disposed centrally of the shell and preferably in alignment with the tubular extensions and has a mouth 28 defining a primary section area P controlled by side deckles 29 and end deckles 30 the latter being adjustable through rotatably threaded shafts 31 extending through packing boxes 32 in the fittings 23. The mouth 28 of the suction box is connected with the chamber 27 by inwardly converging walls 33 so that the suction effort exerted in chamber 27 will cause a constantly increasing velocity in the throat 34 of the box and thus prevent moisture contained in the air drawn through the openings of the shell from dropping back upon the surface of the shell.

Slightly spaced from the rear face of the trailing wall 33 of the main suction box is an abbreviated radial wall 35 extending outwardly from the wall 36 of the suction chamber. Pivoted to the outer end of the wall 35 is an arcuate plate 37 the curvature of which is substantially concentric with the axis of the suction chamber and with the wall of the shell. This plate is constantly urged toward the inner wall of the shell through springs 38 mounted on supports 39 carried by the suction chamber and between the plate and the shell is arranged a deckle carrier 40 which slidably engages the plate and which has a deckle 41 engaging the inner wall of the shell. The deckle carrier may be adjusted circumferentially of the shell and to this end I provide a plurality of cams 42 at present shown as mounted on a common rod 43 operated by a rod 44 extending through the suction chamber and having an angular end 45 projecting through a slot in the wall 36 and provided at the outer surface of this wall with a sealing means 46 for the slot. Rod 44 may be adjusted in any suitable manner, as by means of a threaded hand nut 47. The cams 42 have slots 48 receiving arms 49 carried by one end of bell crank levers 50 pivotally mounted upon supports 51 extending outwardly from the suction box. The opposite ends of the bell crank levers are linked to the deckle carrier 40 as at 52.

It will be seen that this deckle carrier together with the trailing wall 33 of the primary suction area defines a secondary suction area, and this suction area may be evacuated from any suitable source. At present I have disclosed openings 53 in the wall 36 communicating with this suction area and controlled by valves 54 which are, in turn, controlled by a longitudinally extending rod 55 leading out from the end of the suction chamber. Through these valves the extent of the suction created in the secondary area may be determined.

Since the construction illustrated is obviously capable of considerable modification without departing from the spirit of my invention, I do not wish to be understood as limiting myself thereto except as hereinafter claimed.

I claim:

1. In a suction roll and in combination with the rotating shell of the roll, a suction chamber, suction area defining means comprising a sta-

tionary wall, a circumferentially shiftable wall section, a circumferentially extending plate pivoted at one end to said suction chamber and abutting the inner face of said circumferentially movable wall section, and spring means for maintaining said plate in engagement with said circumferentially movable wall.

2. In a suction roll and in combination with the rotating shell of the roll, a suction chamber, suction area defining means comprising a stationary wall, a circumferentially shiftable wall section, a circumferentially extending plate pivoted at one end to said suction chamber and abutting the inner face of said circumferentially movable wall section, spring means for maintaining said plate in engagement with said circumferentially movable wall, and means operable during rotation of the shell for circumferentially shifting said wall.

3. In a suction roll and in combination with the rotating shell of the roll, a suction chamber, suction area defining means comprising a stationary wall, a circumferentially shiftable wall section, a circumferentially extending plate pivoted at one end to said suction chamber and abutting the inner face of said circumferentially movable wall section, and spring means for maintaining said plate in engagement with said circumferentially movable wall, said stationary wall having valve controlled openings placing the space between said walls in communication with the suction chamber.

4. In a suction roll and in combination with the rotating shell of the roll, a suction chamber, suction area defining means comprising a stationary wall, a circumferentially shiftable wall section, a circumferentially extending plate pivoted at one end to said suction chamber and abutting the inner face of said circumferentially movable wall section, spring means for maintaining said plate in engagement with said circumferentially movable wall, and means operable during rotation of the shell for circumferentially shifting said wall, said stationary wall having valve controlled openings placing the space between said walls in communication with the suction chamber.

EDWARD T. STREET.