April 21, 1925. 1,534,948

J. E. McLAUGHLIN ET AL

FOURDRINIER TYPE OF PAPER MAKING MACHINE

Original Filed Sept. 6, 1919 3 Sheets-Sheet 1

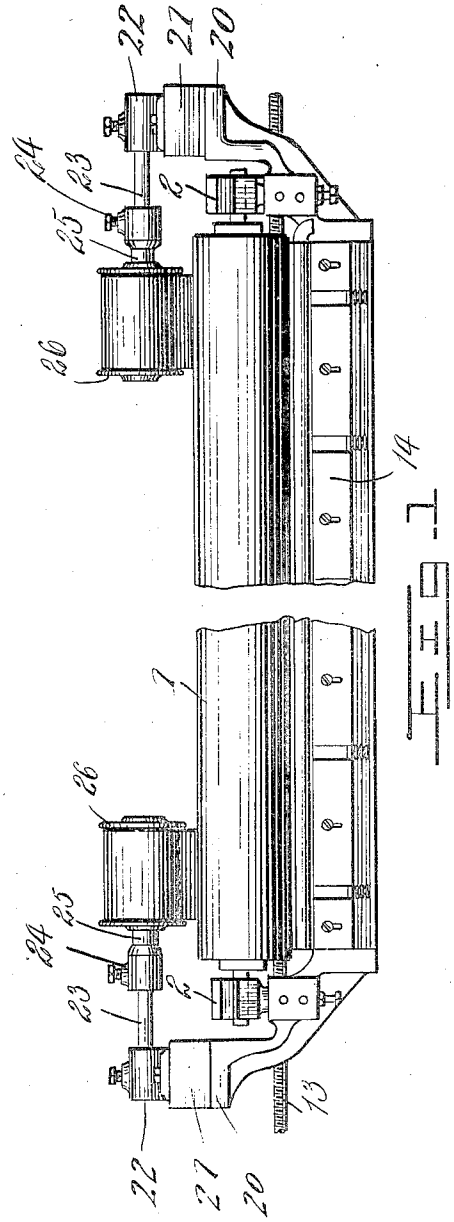


Fig. 1.

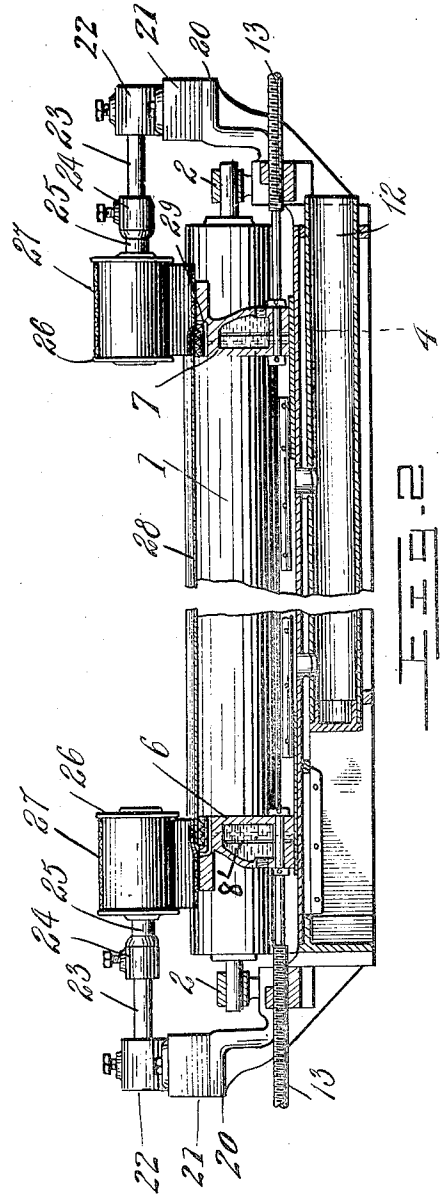


Fig. 2.

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Original Filed Sept. 8, 1919 3 Sheets-Sheet 2

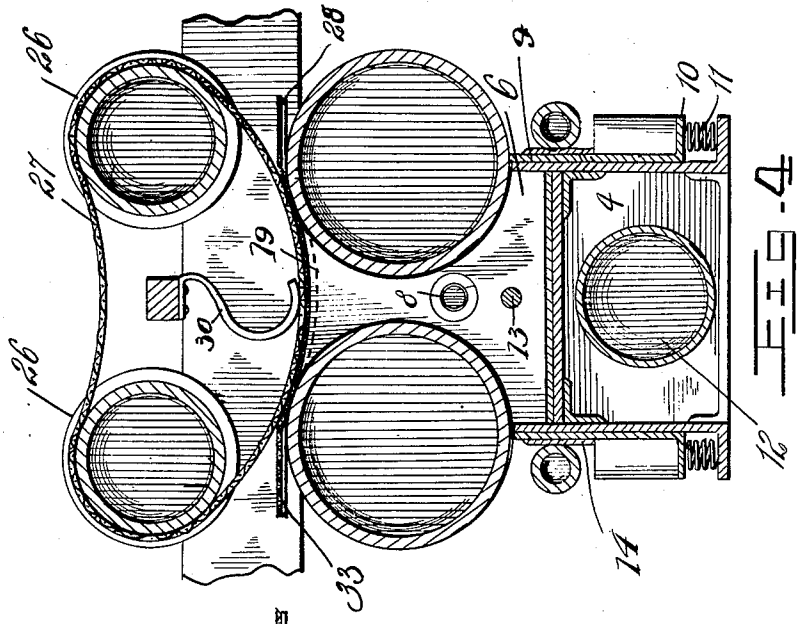


FIG. 4

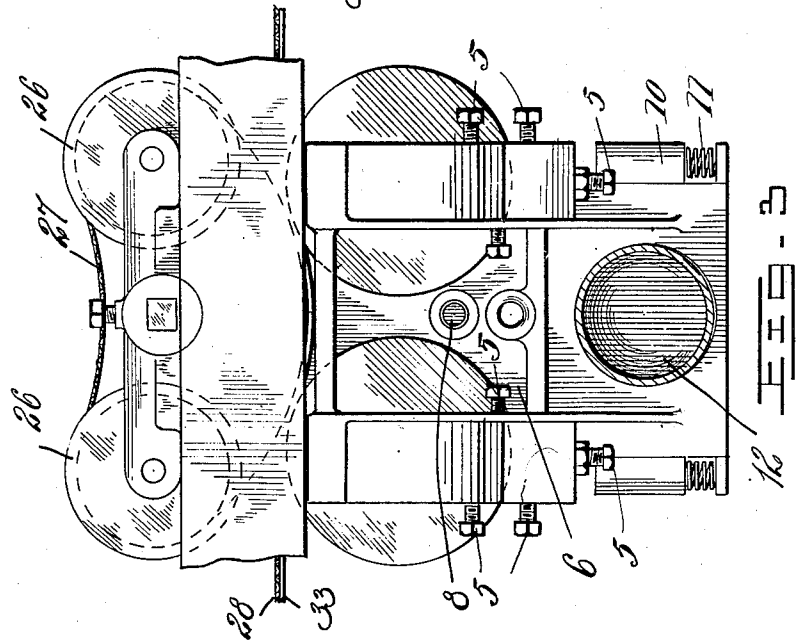


FIG. 5

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FOURDRINIER TYPE OF PAPER MAKING MACHINE

Original Filed Sept. 6, 1919 3 Sheets-Sheet 3

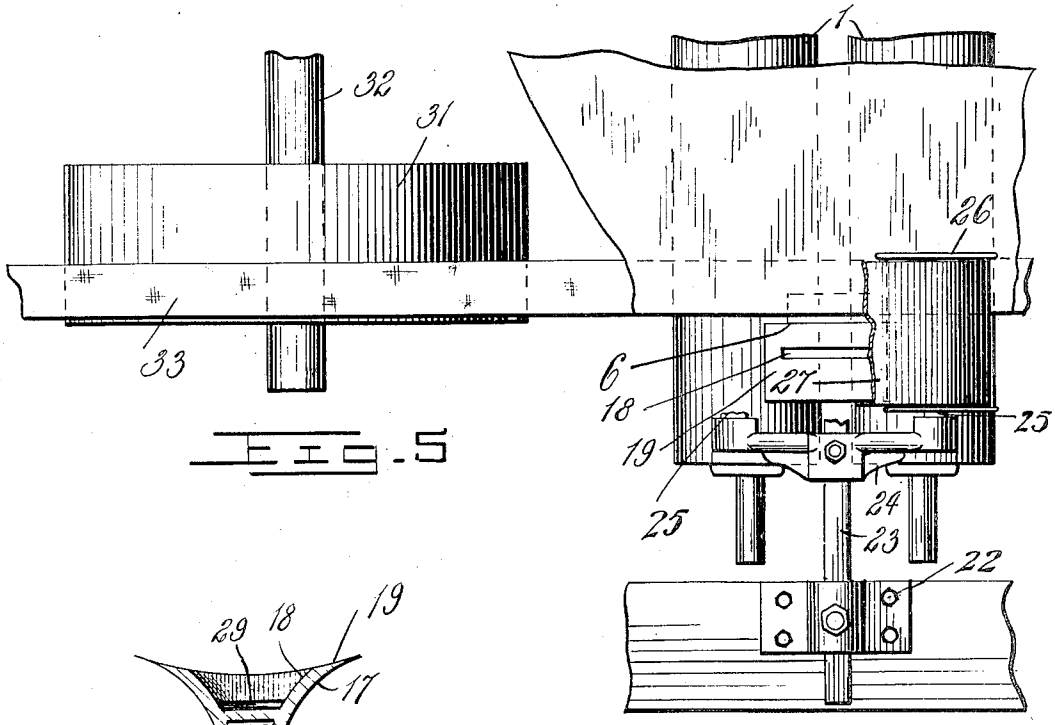


FIG. 5

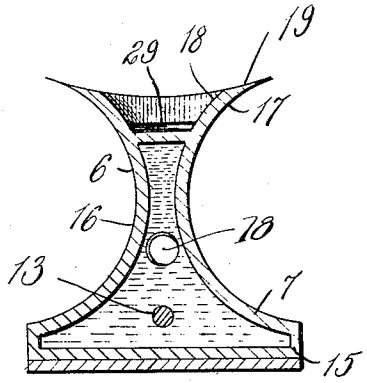


FIG. 6

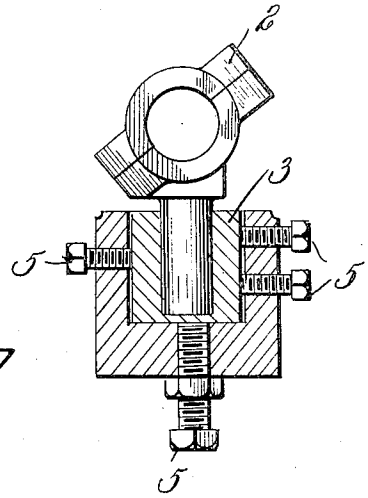


FIG. 7

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UNITED STATES PATENT OFFICE.

JAMES E. McLAUGHLIN AND JOSEPH OVIDE HAMEL, OF GRAND'MERE, QUEBEC, CANADA.

FOURDRINIER TYPE OF PAPER-MAKING MACHINE.

Application filed September 6, 1919, Serial No. 322,149. Renewed September 27, 1924.

To all whom it may concern:

Be it known that we, JAMES E. McLAUGHLIN and JOSEPH O. HAMEL, both subjects of the King of Great Britain, residing at Grand' Mere, Province of Quebec, Canada, have invented certain new and useful Improvements in Fourdrinier Type of Paper-Making Machines; and we do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention has relation to improvements in suction boxes for Fourdrinier-type of paper making machines and the principal object thereof embodies the provision of means for sealing the ends of the felting rollers, whereby a perfect hermetic joint is maintained at these points.

Another object of the invention is to provide a revolving type of suction box that will prolong the life of the Fourdrinier wire screen felting belts by the reduction of friction thereon.

Another object is to provide vacuum means for causing the felting screen to adhere to the tops of the suction box and for extracting the water from the pulp.

A further object of the invention contemplates the adjustment of the felting rollers with respect to each other and with the suction box.

A still further object of the invention is to provide adjustable jackets or packing strips.

In contrast to the well known type of suction boxes for paper making machines, the present apparatus possesses such characteristics that, although it is simple in its construction, it can be regulated to afford correct precision of the pulping rolls and reduce to a minimum the entrance of air at the ends of the rolls and, as is well known in the art, a perfect feed of the pulp is contingent upon the reduction of air at the roller ends which latter tends to retard the even accumulation of the pulp upon the screens.

In another direction applicant by the use of flexible head elements, provides for the even adjustment of the felting screens, so that the friction encountered is reduced to a minimum and the said screens are given a certain degree of flexibility, not embodied in any of the screens heretofore used in the prior art.

In the accompanying drawings:

Figure 1 is a fragmental side elevational view of a portion of my invention illustrating a suction box and one of the pulp accumulating rollers;

Figure 2 is a longitudinal sectional view of same;

Figure 3 is an end view of the complete embodiment of my invention;

Figure 4 is a vertical sectional view on line 4—4 of Figure 2.

Figure 5 is a partial plan view;

Figure 6 is a vertical section of the water seal head; and,

Figure 7 is a detail sectional view of the roller bearings.

As is well known in the Fourdrinier type of paper making machines, the pulp is deposited upon a continuously actuated screen of fine gauge and the said screen passes over two or more brass rollers as are illustrated in the drawing by the numeral 1. These rollers 1 are suitably mounted in bearing standards 2 adjustably mounted in blocks 3 at each end of the suction box 4. Adjustment of said rollers in a horizontal and vertical plane is afforded by means of a plurality of set screws 5 to bring the said rollers in contiguous relation with each other.

Adjacent the bearing ends of the rollers, I provide water head sealing heads 6 comprising casings 7, which are hollow and adapted to hold a quantity of water, the same being introduced to the said heads through a water supply pipe 8 and emitted through slots 8′ formed in the concave walls 16. This arrangement later prevents air from entering the suction box at the ends thereof, and such sealing heads pass half way around the rolls and down the sides of the box, so that the water contained therein will form a perfect seal and replace any air that would tend to enter by the ends.

The lower part of the rolls 1 are likewise sealed by the slidable packing jackets 9 carried by the holders 10 and they are pressed against the rolls by springs 11. These jackets may be replaced when worn out by new ones by simply removing the bolts of holders 10.

A suction tube 12 extends longitudinally

along the base of the box and as the admixture of water and pulp is introduced upon the screen the water gravitates to the said screen.

The rollers 1 are adjustable in a vertical plane by means of the screws or bolts 5, while the adjustment of the water sealing casings 6 is accomplished by means of the threaded screws 13 passing through the opposite ends of the suction box, so that the said casings may be advanced or retracted longitudinally upon the roller 1.

The packing jackets 9 are adjustable through the sliding guides 14, whereby the same are in constant contraction union with the rollers 1 to afford a perfect sealing union.

It will be readily perceived that in my improved device, provision is made for excluding the air from the screen during the pulp accumulation period and means are provided for regulating the travel of the said screen and the adjustment of the rollers and packing jackets.

The water sealing heads 6 as has been stated, comprise hollow casings 7 having enlarged bases 15, arcuate walls 16 and outwardly flared top portions 17.

The top portions 17 are formed with vacuum recesses 18 and are of arcuate configuration as indicated at 19.

Mounted upon the brackets 20, at the opposite ends of the suction box 4 are the Fourdrinier frames 21, which carry bearing blocks 22 in which are adjustably mounted the square rods 23. Brackets 24 are slidably mounted on said rods 23 and carry the shafts 25 on which are mounted the flanged pulleys 26.

The pulleys 26 are spaced apart in sets of two and occupy portions immediately over the rollers 1 and are adapted to carry the jacket sealing straps 27.

A continuously actuated pulp accumulating screen 28 of very fine gauge, passes over the arcuate shaped top portions 19 of the water sealing heads 6 and rollers 1, and due to the vacuum induced in the vacuum recesses 18 of the heads 6, by the suction of air through the ports 29 in the head portions 17, for the suction pipe 8; the sealing straps 27 are drawn downwardly into contact with the pulp accumulating screen 28 and a perfect seal at this point is effected.

By this novel type of suction box the life of the wire pulp screens is prolonged, as the friction ordinarily encountered quickly wears the same out.

In the present type of suction boxes, the same are flat on top and when a vacuum is induced to 12 to 15 inches, this vacuum causes the screen to adhere to the top of the suction box, thereby causing a very great amount of friction and wears out the delicate meshes of the screen.

In the present device the suction box 4 employs two rollers 1, which are revolved by the screen 28 and therefore friction of the screen is reduced to a minimum and likewise the screen will take less power to operate it on account of the absence of friction. It is obvious that the rollers 1 may be operated by suitable gears not illustrated, to correspond with the speed required to run the pulp screen.

The screen 28 does not touch any part of the machine that would cause friction as there is a space of three quarters of an inch to one inch between the sealing heads 6 and the screen.

The water sealing recess 18 will cause the screen 28 due to vacuum induced there to adhere. The jacket sealing strap 27 will revolve with the screen 28 and close the opening between the water seal head 18 and said screen, as the strap 27 will have a width of from four to five inches.

The water sealing heads 1 are designed to close the space between the two rollers 1 at each end and the jacket packing 9, will cause the air openings or spaces beneath the roller 1 to be blocked tight and no air can enter at this point.

It is obvious that with the water sealing head 7 the jacket packing 9 under the rollers and the jacket sealing strap 27 to cover the opening between the heads 7 and pulp screen, there will be no chance for the air to enter.

When the screen 28 is running light, or if there is no pulp on the same, the screen will run on a horizontal line, as there will be no vacuum created for the water seal head recess 18, through port 29 and out through air suction pipe 12. Slurring the jacket sealing strap 27, will run on a slant.

A spring 30 serves to compress the jacket sealing strap 27, against the arcuate portion 19 of the water sealing head and pulp screen, so that no air will enter the screen.

After the stock or pulp is thrown on the moving screen to form a sheet, when it strikes the suction boxes 4 the vacuum will not penetrate through the fine mesh and pulp but it will seek an opening that will have the least resistance, namely the space between the water seal heads 7 and the screen. As before stated the recess portion 18 of the heads have the openings 29 cut therein, and when the vacuum drawn through the space between the screen and heads 7, it will only be a moment before the jacket sealing strap 27, will be sucked tight to the screen and will cause the openings 29 to be blocked, therefore the vacuum will seek the openings that will have the least resistance, namely through the meshes of the screen wire and pulp fibre and will extract the excess water from the sheet, before it passes between the top and bottom couch

rolls, not illustrated. If the water was not extracted from the pulp sheet, when it came to the couch rolls, the water would not pass between the rolls, but would back up on the screen and drop off on both sides and ruin the sheet. In Figure 5, a pulley 31, is mounted on shaft 32 leading from the power supply and a narrow deckle strap 33 passes over said idle pulley to the opposite end of the frame.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent is;—

1. The combination with a Fourdrinier type of paper making machines having rollers and pulp screen, of a suction box, water sealing heads arranged adjacent the ends of said rollers, means for causing the screen to adhere to the top of the sealing heads for the extraction of water from the pulp and said heads adapted for hermetically sealing the spaces between said rollers.

2. In combination with a suction box for paper making machines, a sealing head supported thereon and adapted for insertion between a pair of rollers of the machine, a pair of sealing jackets slidably mounted at the sides of the box and adjustably engaging the sides of the head.

3. In combination with a suction box for paper making machines, a sealing head supported thereon and adapted for insertion between a pair of rollers of the machine, flanges extending downwardly from the sides of the box, springs mounted on said flanges, sealing jackets yieldingly supported on said springs and slidably engaging the sides of the box, and partially engaging the sides of the head.

4. A Fourdrinier type of paper making machines comprising a frame, a suction box arranged in said frame, rollers mounted on said frame and adjustably associated with said suction box, sealing heads associated with said suction box and engaging said rollers, a pulp carrying screen operable over said rollers, pulleys mounted on said frame above said rollers, straps carried by said pulleys means associated with said straps for hermetically sealing the spaces between the rollers, means for adjusting the rollers with respect to each other and with the suction box, and means for flexibly supporting said screen.

5. A sealing head adapted to be placed between the rollers of a paper making machine, comprising a hollow casing having an open top and concave side walls, said walls each having a hole therethrough, means for admitting water to the casing, a partition provided within the casing beneath the top thereof whereby a water compartment is formed, said partition having a port cut therethrough, said port communicating with the space above the partition.

In witness whereof we have hereunto set our hands.

J. OVIDE HAMEL.
JAMES E. McLAUGHLIN.