June 12, 1923. 1,458,558

L. M. START ET AL

FOURDRINIER PAPER MAKING MACHINE

Filed Dec. 6, 1920 2 Sheets-Sheet 1

Fig. 1.

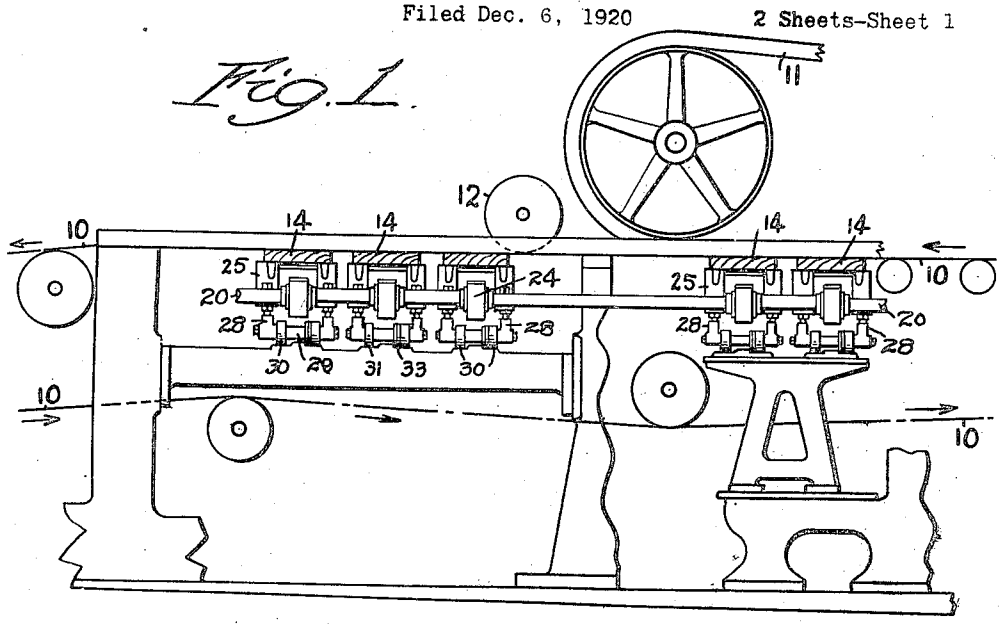

Fig. 2.

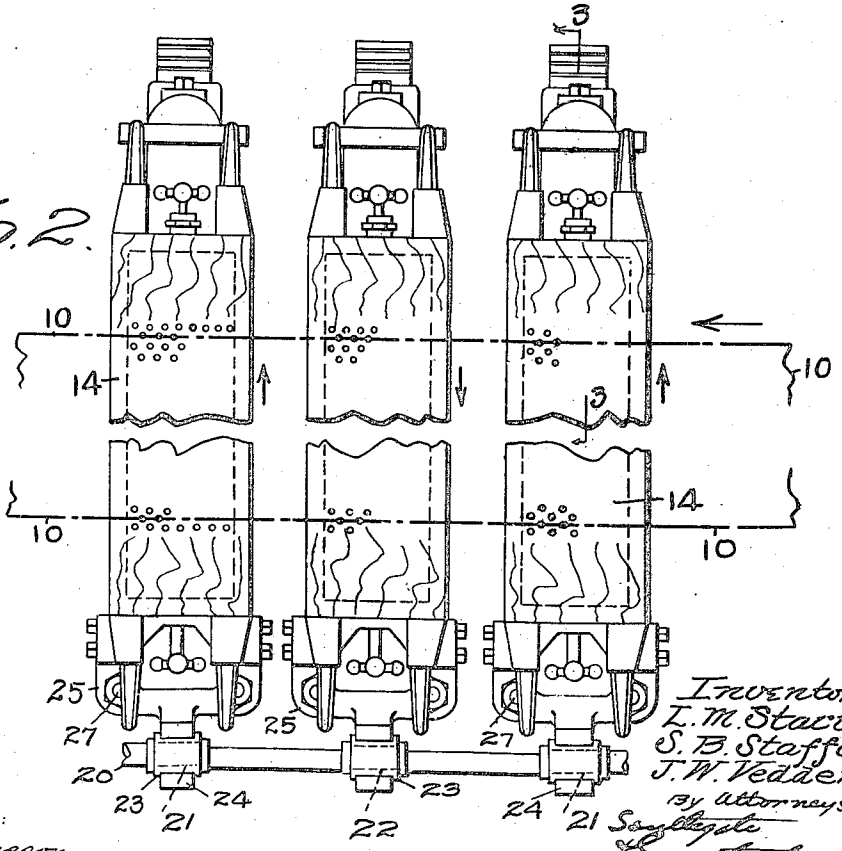

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Fig. 3.

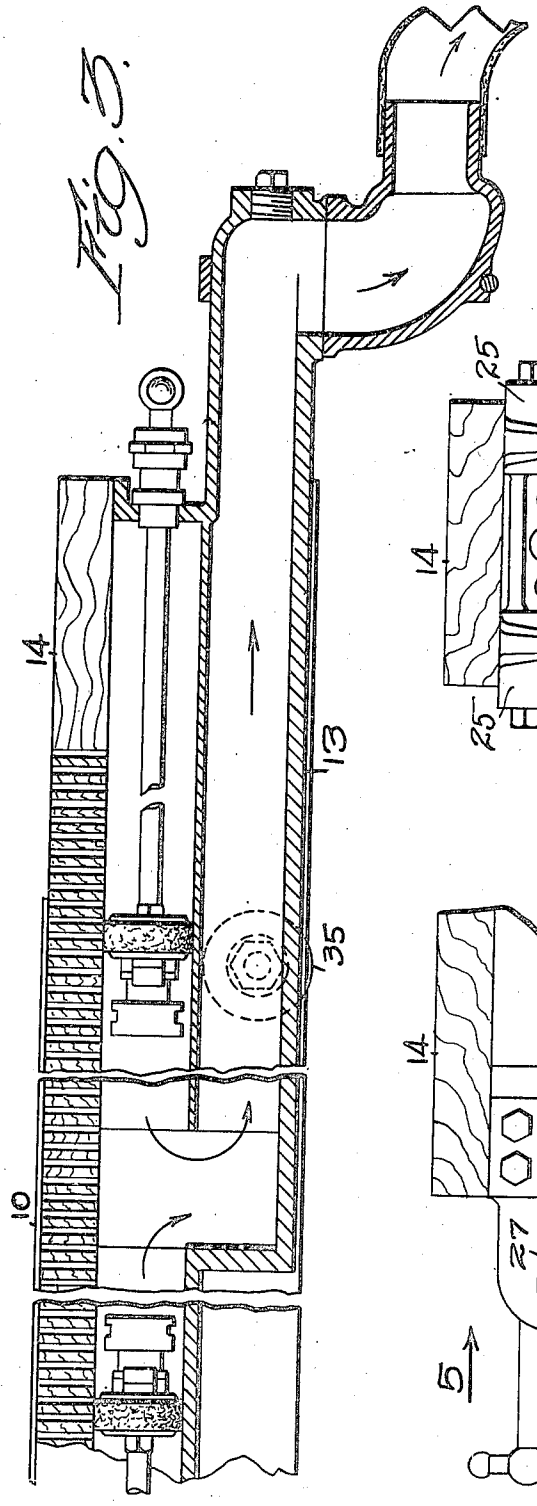


Fig. 5.

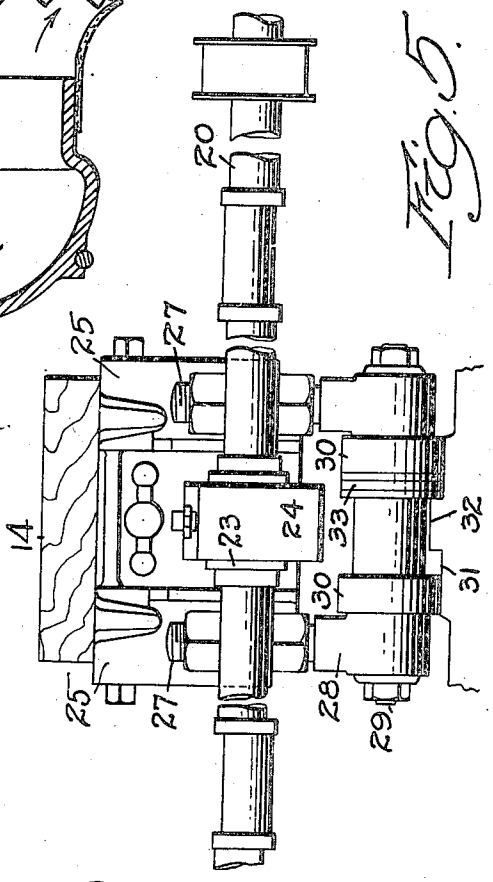
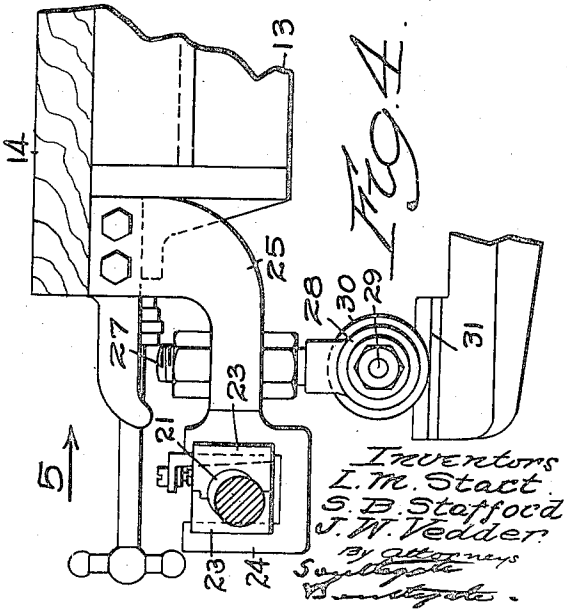


Fig. 4.



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UNITED STATES PATENT OFFICE.

LESTER M. START, OF WORCESTER, STEPHEN B. STAFFORD, OF OXFORD, AND JOHN WARREN VEDDER, OF WORCESTER, MASSACHUSETTS.

FOURDRINIER PAPER-MAKING MACHINE.

Application filed December 6, 1920. Serial No. 428,475.

To all whom it may concern:

Be it known that LESTER M. START, STEPHEN B. STAFFORD, and JOHN WARREN VEDDER, citizens of the United States, respectively residing at Worcester, Oxford, and Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Fourdrinier Paper-Making Machine, of which the following is a specification.

This invention relates to the operation of the suction boxes of a Fourdrinier machine.

It has been proposed heretofore to move these suction boxes alternately in a transverse direction, but this motion has been oscillatory. An oscillatory motion has a tendency to interrupt the contact between the suction boxes and the wire screen on which the pulp is carried and thus break the suction.

The principal object of this invention is to provide for operating the suction boxes in an accurate and positive manner and in such a way as to prevent the breaking of the suction in the manner described above. The invention also involves improvements in other features as will appear to secure a smooth and accurate operation as well as durability.

Reference is to be had to the accompanying drawings in which

Fig. 1 is a side view of a portion of a Fourdrinier machine showing a preferred embodiment of this invention applied thereto;

Fig. 2 is a plan of part of the machine on enlarged scale;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2 of one of said suction boxes;

Fig. 4 is an edge view of a portion of one of the suction boxes showing its supporting means, and

Fig. 5 is a side view of the same.

It has been the practice to carry the pulp on a traveling woven wire screen apron or conveyor 10 under the deckle strap 11 and to and from the dandy roll 12 over a series of suction boxes 13. Each of these suction boxes is provided at the top with a perforated board 14 over which the woven wire conveyor 10 passes. It has been the custom also to oscillate these suction boxes under the wire conveyor alternately with a comparatively slight motion.

According to the present invention an eccentric shaft 20 is kept in constant rotation. It is provided with eccentrics 21 and 22 arranged alternately, the eccentrics 21 being all set at the same point so that each alternate suction box will move in the same way and simultaneously. The other eccentrics 22 are set at 180° from the eccentrics 21.

Each eccentric is located to bear in the two halves of a pair of blocks 23 capable of sliding up and down in an eccentric strap 24. This strap is connected directly to the proper suction box by an arm 25 which is bolted thereto or otherwise secured in position. This sliding block 23 is provided so that the vertical motion of the eccentric will not be transmitted in any degree to the suction box. Means is provided whereby horizontal motion will be transmitted to the box and its motion will be confined to movement in a horizontal plane. For this purpose we provide each of the arms 25 with a pair of vertical bolts 27 secured to the arms by nuts or in any other desired way. These bolts are shown as passing through the arms 25 which are bifurcated for that purpose. Each of these bolts has on the bottom a head or enlargement 28 into which passes a shaft or stud 29. A single shaft passes through a pair of these heads for operation on a single suction box. Any desired kind of bearings can be employed for the shaft 29 in these heads.

On this shaft are located two rollers 30. These rollers rest on a pair of horizontal tracks 31 mounted on the floor or on the frame of the machine as may be desired. Between these two tracks is located an upward projection 32 extending longitudinally with respect to the tracks or transversely with respect to the direction of feed of the Fourdrinier machine itself. Against the edge of this projection bears a thrust bearing 33 of any ordinary or desired construction mounted on the shaft 29, adjacent to

one of the rollers 30 and in contact therewith. This thrust bearing takes the thrust caused by the passage of the wire 10 across the suction box and prevents undue wear and displacement of the suction box by the action of the traveling wire conveyor. The suction boxes rest on rollers 35 at their opposite ends. If the ends supported by the tracks 31 were capable of any vertical motion the suction boxes would swing up and come down about the centers of the rollers 35 as pivots, but this is prevented by our invention.

It will be seen that the movement of the suction boxes can be regulated to any desired degree of nicety by this means and that the wear on the bearing parts is reduced materially so that a machine should run a long time without adjustment, and on account of eliminating the oscillating motion and substituting a true rectilinear and reciprocating motion the trouble that has been experienced by the breaking of the suction is avoided.

Although we have illustrated and described only a single form of the invention we are aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, we do not wish to be limited to all the details of construction herein shown and described but what we do claim is:—

1. In a Fourdrinier machine, the combination with the pulp supporting and feeding wire cloth conveyor, of a series of suction boxes over the surface of which said wire cloth is adapted to move constantly in one direction, means for imparting to said suction boxes a reciprocating motion in a straight line transverse to the direction of motion of the wire cloth, a roller located beyond the end of each suction box, and means for supporting each suction box from one of the rollers.

2. In a Fourdrinier machine, the combination with the pulp supporting and feeding wire cloth conveyor, of a series of suction boxes over the surface of which said conveyor is adapted to move, a shaft, eccentrics arranged thereon, a pair of blocks for each eccentric, and an arm connected with each suction box and having ways thereon in which said blocks are mounted to slide freely up and down for transmitting only their horizontal motion to the respective suction boxes.

3. In a Fourdrinier machine, the combination with the pulp supporting and feeding wire cloth conveyor, of a series of suction boxes over the surface of which said conveyor is adapted to move constantly in one direction, a shaft, eccentrics arranged thereon in two series, those of each series being set oppositely to those of the other series and arranged alternately with respect thereto, a pair of blocks for each eccentric, and an arm rigidly connected with each suction box and having vertical ways thereon in which said blocks are mounted to slide freely in a vertical direction for transmitting their horizontal motion to the respective suction boxes.

4. In a Fourdrinier machine, the combination with the pulp supporting and feeding wire cloth conveyor, of a series of suction boxes over the surface of which said wire cloth is adapted to move constantly in one direction, means for imparting to said suction boxes a reciprocating motion in a straight line transverse to the direction of motion of the wire cloth, an arm extending beyond the end of each suction box and having an eccentric strap connected with one of said eccentrics, a horizontal track below said arm, a roller on the track, and means for supporting said arm from the roller at a point beyond the end of the suction box.

5. In a Fourdrinier machine, the combination with a movable wire cloth conveyor, of suction boxes under the surface of said wire cloth conveyor, means for imparting to said suction boxes a reciprocating motion in a straight line in a plane parallel to the plane of said conveyor, eccentric straps connected with each of said suction boxes and with said eccentrics, a horizontal track below the end of each suction box, a roller on the track, and vertically adjustable means for supporting the end of said suction box from the roller.

6. In a Fourdrinier machine, the combination with the pulp supporting and feeding wire cloth conveyor, of a series of suction boxes over the surface of which said wire cloth is adapted to move constantly in one direction, a shaft having eccentrics thereon for imparting to said suction boxes a reciprocating motion in a straight line transverse to the direction of motion of the wire cloth and in a plane parallel to the plane thereof, an arm projecting from one end of each suction box rigidly connected therewith and having a vertical sliding connection with its respective eccentric, a pair of rods extending downwardly from said arm, a horizontal shaft or stud carried by said rods, a pair of rollers on said shaft or stud, a pair of horizontal tracks for said rollers having a projection between them, and a thrust bearing on the shaft or stud engaging said projection and one of said rollers.

7. In a Fourdrinier machine, the combination with the wire cloth conveyor, of suction boxes, a shaft having eccentrics thereon for imparting to said suction boxes a re-

ciprocating motion, one end of each suction box having a vertical sliding connection with its respective eccentric, rods extending from said arm, a shaft or stud carried by said rods, rollers on said shaft or stud, tracks for said rollers having a projection, and a thrust bearing on the shaft or stud engaging said projection and one of said rollers.

In testimony whereof we have hereunto affixed our signatures.

LESTER M. START.
STEPHEN B. STAFFORD.
JOHN WARREN VEDDER.