A. J. DAVIES.

FOURDRINIER MACHINE.

APPLICATION FILED DEC. 7, 1911.

1,090,974.

Patented Mar. 24, 1914.

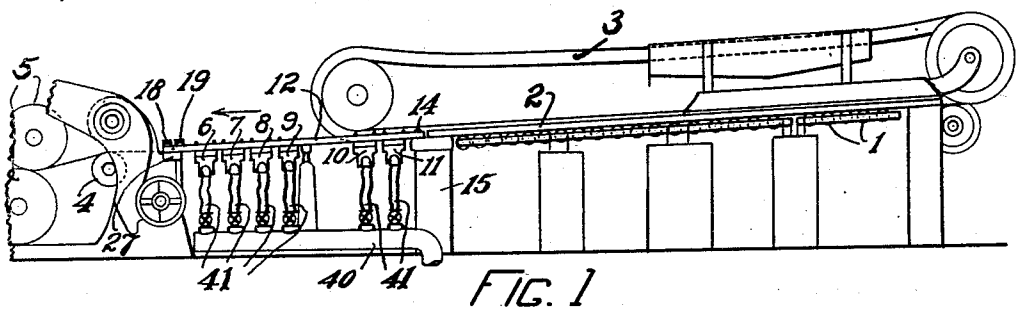


FIG. 1

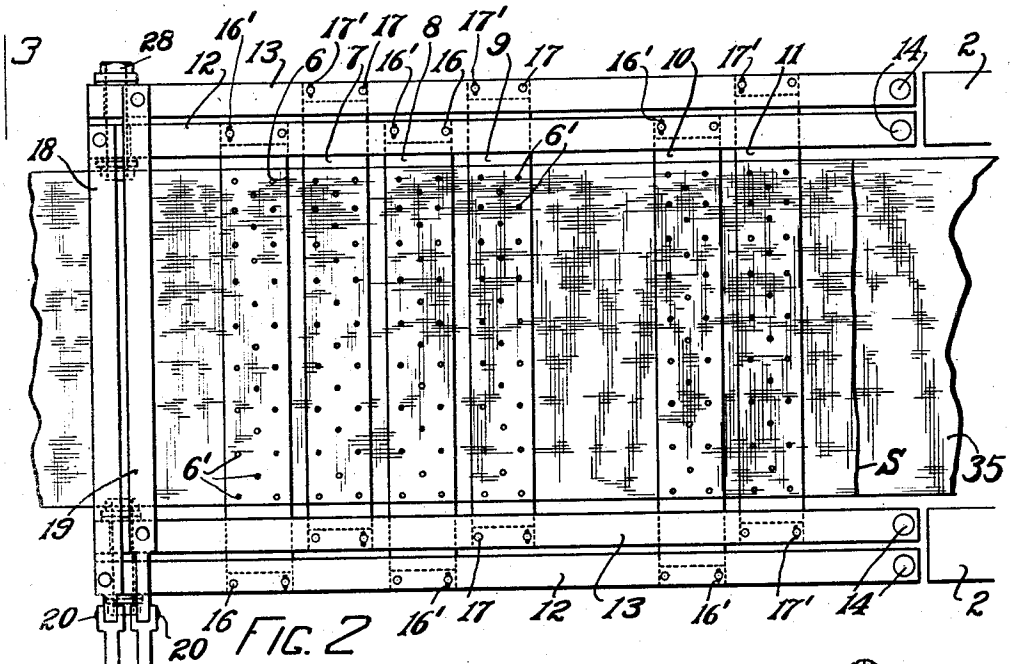


FIG. 2

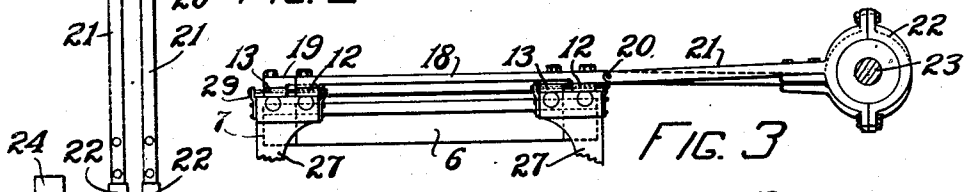
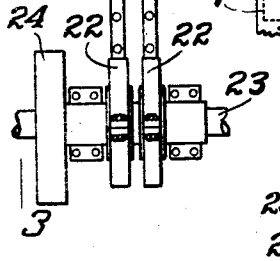


FIG. 3



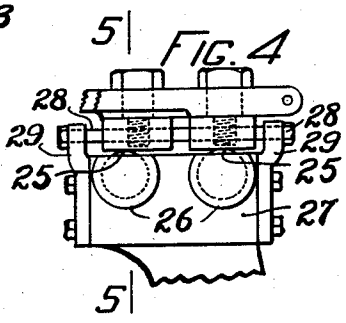


FIG. 4

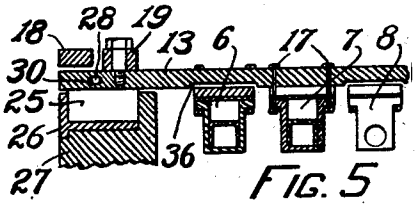


FIG. 5

WITNESSES

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FOURDRINIER MACHINE.

1,090,974. Specification of Letters Patent. Patented Mar. 24, 1914.

Application filed December 7, 1911. Serial No. 664,416.

To all whom it may concern:

Be it known that I, ALBERT J. DAVIES, a citizen of the United States, residing at Woodland, county of Washington, State of Maine, have invented certain new and useful Improvements in Fourdrinier Machines, of which the following is a specification.

This invention relates to improvements in paper making machine of the Fourdrinier type and has for its main object the oscillating of the vacuum boxes beneath the wire cloth which carries the paper pulp.

Heretofore these boxes have been held stationary and a slight vibratory effect, under certain conditions which will be explained, is obtained from the vibration of the wire cloth at the entering end of the machine. This vibratory motion, the object of which is to "form the sheet", has for its theoretical pivot point the feed roll beyond the vacuum boxes; consequently the radius of vibration over said boxes must be small and, under the most favoring conditions, insufficient to overcome certain hindering effects. For instance, when the wire cloth is new the longitudinal wires of the mesh are apt to wear grooves in the tops of the boxes and in this way shorten the radius of vibration so as to practically eliminate all effect at this point. Were it not for the interfering effect of the seams or joinings of this cloth, one of which is represented at S in Fig. 2 of the accompanying drawings, the only ill effect of this state of affairs would be that the continual wearing of the wire cloth in these grooves considerably lessens its life and necessitates more frequent renewals than are required when my improvement is added. In practice, it is customary to frequently plane out these grooves, and when the cloth becomes smooth and worn the grooving effect is less noticeable and a small portion of the vibratory movement is noticed at these points. The seam S, however, completely nullifies whatever of good there may have been, as before described, unless the cloth has been perfectly joined, a very unusual circumstance, for when this seam comes in contact with the box it is snapped over its top in such a way as to lift the longitudinal wires out of their grooves and when the seam has passed on there is great probability that these wires do not drop back into their original grooves but into the ones adjacent. This movement causes a continual creeping of the wire cloth toward one side of the machine and if not watched and corrected will in time buckle and break the cloth. Careful study of these conditions has led me to devise means to cause rapid but slight oscillations of the vacuum boxes, and by causing alternating boxes to move in opposite directions simultaneously, I break up this grooving tendency, prolong the life of the wire cloth and prevent creeping, and also eliminate the necessity for frequent planing of the boxes.

In the accompanying drawings which form part of this specification,—Figure 1 shows, in diagram, part of a paper making machine embodying my invention, Fig. 2 is a plan view of the portion of Fig. 1 to which my invention is applied, Fig. 3 is a cross sectional elevation on line 3—3 of Fig. 2, Fig. 4 is an enlarged detail viewed as in Fig. 3, and Fig. 5 is a partial section along line 5—5 of Fig. 4.

In Fig. 1, the table rolls are represented by the numeral 1, and the "shaker rail" by the numeral 2. 3 is the "deckel strap", 4 the feed roll and 5, 5 the "couch rolls" of the usual type of machine.

Heretofore the boxes 6, 7, 8, 9, 10 and 11 have been rigidly secured to stationary bars similar in width to the shaker rail 2, as seen in Fig. 2; but I prefer to replace these stationary bars each with two narrower ones 12 and 13, all being pivotally mounted at 14 on the standard 15. To these bars 12 are secured, by means of bolts 16, the boxes 6, 8 and 10; and to bars 13, the boxes 7, 9 and 11 are secured by means of bolts 17. At the outer end, bars 12 are banded together by the brace 18 and bars 13 by brace 19, both braces being pivotally connected, each to each, at 20, 20 to eccentric rods 21, 21, each connecting with its own eccentric 22 on a shaft 23. The shaft 23 may be continuously driven by means of a pulley 24 and the effect of this driving is to give alternate oscillatory motion of bars 12 and 13 with their depending boxes, about pivots 14. It will be understood that the boxes might be all oscillated in the same direction without departing from the spirit of my invention; but I prefer to alternate them, as described.

In securing the various boxes to their respective bars 12 and 13, I prefer to slot the two diagonally opposite bolt holes over each box, as indicated at 16^1 and 17^1 so as to allow some latitude for the twisting effect of the radial movement.

In practice, a clearance of a few hun-

dredths of an inch will give the necessary play, as the total amplitude of each oscillation will not be over one eighth of an inch and may even be as small as one sixteenth of an inch.

In Figs. 3, 4 and 5 are most clearly illustrated a few minor features of my invention. Under the free ends of bars 12 and 13 are placed rolls 25, 25 each pocketed in steel bushings 26, 26 in the standards 27. Bolts 28 secured by means of straps 29 to standards 27 are adapted to pass through slightly elongated holes 30 in bars 12 and 13 for the purpose of holding said bars down against the rolls 25. This is necessary in order that bars 12 and 13 may form gages to limit the upward adjustment of the boxes 6, 7, etc., against the under side of wire cloth 35. The boxes 6, 7, etc., are of ordinary construction and need no detailed description, except that attention may be called to the scarf or groove 36 which is cut in the under side of either of the bars 12 or 13 where necessary to avoid any frictional contact with such boxes which are secured to the opposite pair of bars. A few perforations 5' only are shown in the top of each box, 6, 7, 8, 9, 10 and 11, it being understood that their number has no bearing on the features of my invention.

40 represents the air tube for maintaining the vacuum in the various boxes and 41, 41, etc., the individual branch tubes, one to each box. These latter are made with a flexible section, to permit the necessary movement of the boxes.

It will be understood that I do not limit myself to pivoted bars 13 13 as means to oscillate them bodily are included within the scope of my invention.

These and various other modifications of my device are intended to be included as part of my invention within the limits of the appended claims.

What I therefore claim and desire to secure by Letters Patent is:

1. In a Fourdrinier machine, a pair of rails on each side of the paper making wire, a pair of suction boxes, one attached to one and the other to the other member of each pair of rails on each side, and means for imparting to said rail members opposite transverse movement to cause the opposite lateral movement of said suction boxes.

2. In a Fourdrinier machine a plurality of closely adjacent suction boxes and means for imparting to each of said boxes a reciprocating motion opposite at all times to the motion of the box next adjacent.

3. In a Fourdrinier machine, a pair of rails on each side of the paper making wire, a pair of suction boxes, one attached to one and the other to the other member of each pair of rails on each side, a pair of links connecting corresponding members on each of the rail pairs, a pair of oppositely phased cams operatively associated with said links and means for rotating said cams.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT J. DAVIES.

Witnesses:
R. B. ELLMS,
ETHEL F. YATES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."