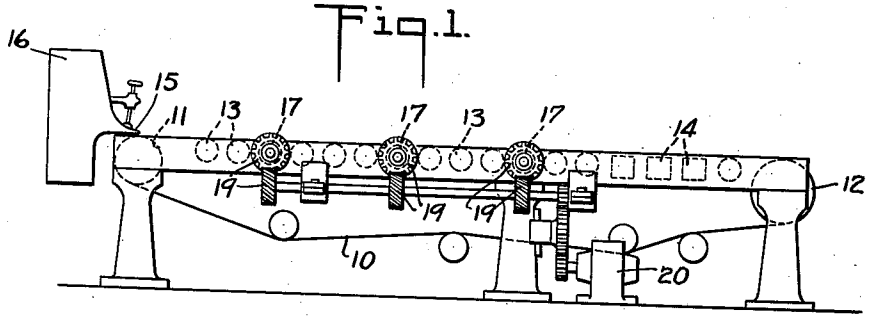
Sept. 14, 1937. E. A. CHARLTON 2,092,798

PROCESS AND APPARATUS FOR THE MANUFACTURE OF PAPER

Filed Dec. 17, 1934

Fig. 1.



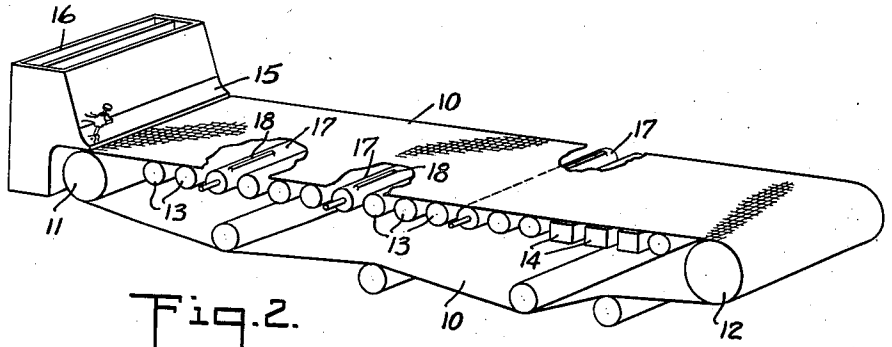
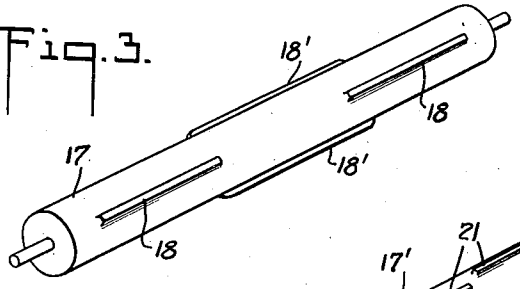


Fig. 2.

Fig. 3.



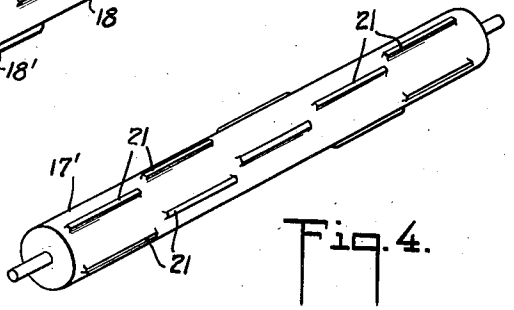


Fig. 4.

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PROCESS AND APPARATUS FOR THE MANUFACTURE OF PAPER

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5 Claims. (Cl. 92—45)

This invention relates to improvements in the manufacture of paper and more particularly to an improved apparatus for imparting to the paper forming screen or wire a shaking or vibration to the end that a more even distribution of the fibres on the wire or screen will take place.

In the manufacture of paper wherein use is made of the Fourdrinier wire machine a suitably prepared fibre stock is deposited on a moving screen or wire and there subjected to suction or other means to drain the water in the stock from the wire, leaving the fibres of the stock on the wire in the form of a web.

Various mechanisms have been devised to impart to the wire a shaking or vibratory action to the end that a more even distribution of the fibres will take place. However, all of the known devices are costly to make and are somewhat complicated in their structure. When paper is to be produced at high speeds it has been found inadvisable to use a shake or vibration action, not because such action is undesirable, but because of frequent mechanical break-downs of the conventional shake mechanisms.

It is accordingly an object of this invention to provide a device for imparting a shaking motion to the wire which requires little change to existing paper making machinery and which is simple in construction and operation.

Another object of this invention resides in the provision of a rotatable member having raised portions which contact with the undersurface of the wire. Rotation of this device either by positively driving the same or by driving it through the medium of the wire will cause a rapid, vertical vibration or shake to the wire. The stock on the wire when subjected to this action will be given a settling action to the end that the fibres of the stock will be evenly distributed throughout the forming web and an improved felting or interlacing of the fibres with one another will take place.

These and other objects of this invention will become more apparent from a study of the following description taken with reference to the accompanying drawing in which

Fig. 1 is a side elevational view showing so much of a conventional Fourdrinier wire machine as is necessary to a complete understanding of this invention;

Fig. 2 is a diagrammatic perspective view of a Fourdrinier wire showing the various agencies normally employed in supporting and assisting in the proper drainage of the water from the said wire;

Fig. 3 is an enlarged perspective view of the vibrating device forming the subject matter of this invention; and

Fig. 4 is a view similar to Fig. 3 but showing a modification thereof.

Referring now to the drawing in which like numerals indicate like parts and more specifically to Fig. 2, the numeral 10 represents a Fourdrinier wire or paper making wire which at one end of the machine is passed around a breast roll 11 and at the other end a couch roll 12 by means of which the wire is normally driven. The driving parts of the couch roll are not shown inasmuch as they form no part of this invention. The wire is supported at intervals on table or tube rolls 13 and there is provided at the couch end of the wire the usual suction boxes 14. Stretch and guide rolls for the wire during its return travel are also provided.

The invention, as will now be explained, pertains to means for imparting a "shake" or vibratory movement to the stock deposited on the paper making wire in such a manner that the fibres making up the stock are evenly deposited across the wire in web form. The stock containing a very high proportion of water and of the desired consistency flows through the slice 15 from a head or flow box 16 and onto the wire. If desired, use may be made of the conventional apron and the upper lip of the slice may be made adjustable. The agitating or shake devices 17 are positioned at intervals under the wire, preferably to a distance about two-thirds along the wire. Each shake device comprises a roll made of any suitable material and having on its periphery a plurality of ribs 18 and 18'. The number of ribs may vary, depending on the frequency of shake desired, and it is to be noted that although the ribs are arranged in rows, the ribs of each row are staggered with respect to the ribs of adjacent rows. Thus the ribs 18' are staggered with respect to the ribs 18. The length of each rib may vary, but should be limited to that length which will prevent undue flexure of the wire as the ribs are brought into contact with the under surface thereof.

Each shake roll may be mounted in any suitable manner and driven independently of each other. However, in the form shown the shake rolls are connected together by a train of gearing 19 which in turn is driven by the prime mover 20. Thus the peripheral speeds of the several rolls may be maintained constant. In some instances it may be further desirable to arrange the shake rolls so that their peripheral speed in-

creases or decreases progressively from the breast roll toward the couch roll and to impart to said shake rolls a peripheral speed equal to greater than or less than the speed of the wire. In some instances the shake rolls can be driven in a reverse direction to the movement of the paper making wire.

It has also been found desirable not to drive the shake rolls positively but to have them driven through contact with the wire. If such be the method of operation desired it will be appreciated that driving mechanism for the rolls will not be used.

In the modification disclosed in Fig. 4, the ribs 21 of the shake roll 17' are staggered or arranged in echelon on the periphery of the roll. This type of arrangement not only imparts to the wire a vertical reciprocatory movement but will tend to distribute the fibres of the stock evenly across the wire and will also assist in interlacing the fibres to the end that a web having uniform "formation" qualities will be produced.

It will be understood by those skilled in the art that, while my invention has been described and set forth hereinabove by way of exemplification, with reference to a particular embodiment thereof, my invention is not limited to the specific details of such embodiment or exemplification, but may variously be embodied within the scope of the claims hereinafter made.

What is claimed as new is:

1. In a paper making machine, a paper making wire, rolls provided with vibratory devices located at spaced intervals under said wire and in contact therewith, and means to drive said rolls at differential speeds with respect to the speed of said wire.

2. In a paper making machine, a paper making wire, rolls provided with vibratory devices located at spaced intervals under said wire and in contact therewith, and means to drive each of said rolls at progressively increasing speeds.

3. In a paper making machine, a paper making wire, rolls provided with vibratory devices located at spaced intervals under said wire and in contact therewith, and means to drive each of said rolls at progressively decreasing speeds.

4. In a paper making machine, a paper making wire, table rolls for supporting said wire, rolls interposed at spaced intervals between said table rolls and provided with rows of ribs, the ribs in adjacent rows being staggered and contacting with the inner surface of said wire, and means to drive said rolls at differential speeds with respect to the speed of said wire.

5. In an apparatus of the class described, a paper making wire, table rolls for supporting said wire, rolls interposed at spaced intervals between said table rolls and provided with ribs arranged in echelon contacting with the under surface of said wire, and means to drive said rolls at differential speeds with respect to the speed of said wire.

EDGAR ALEXANDER CHARLTON.