

Jan. 19, 1932.

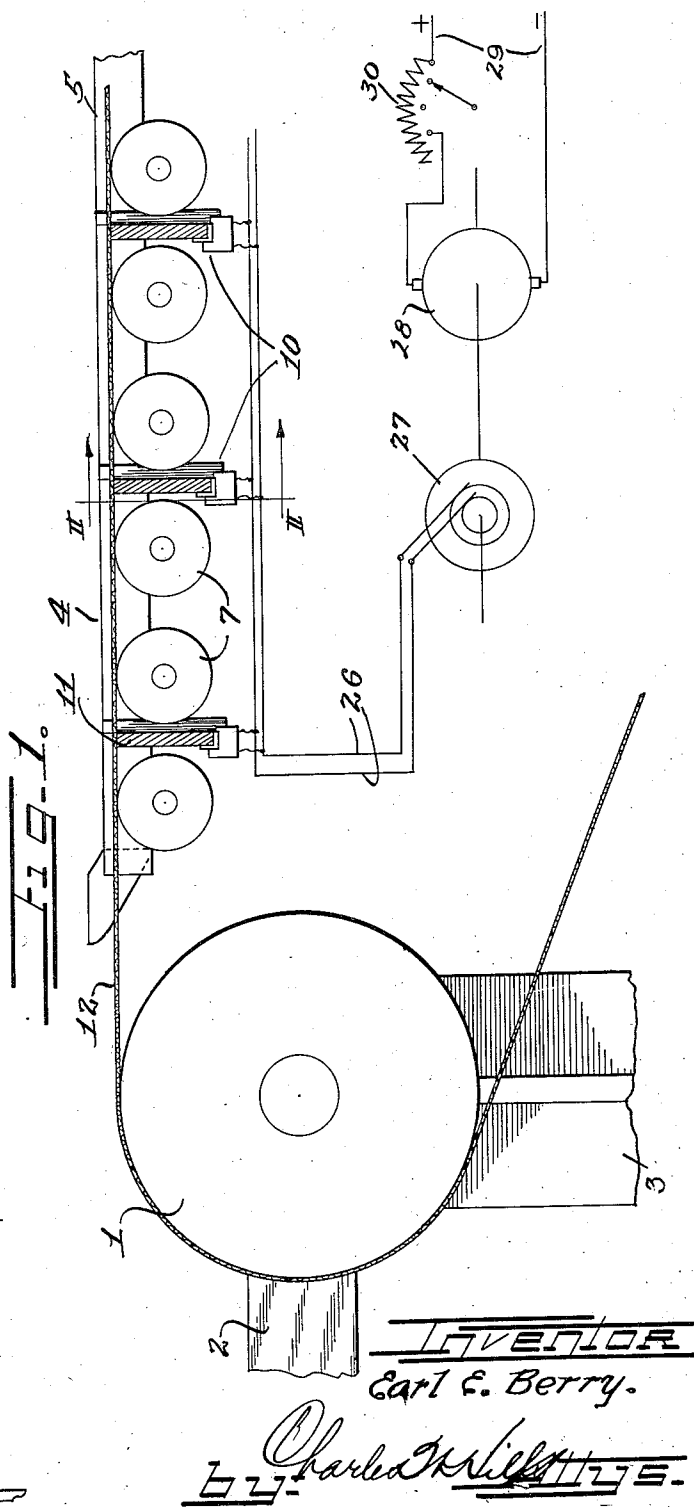
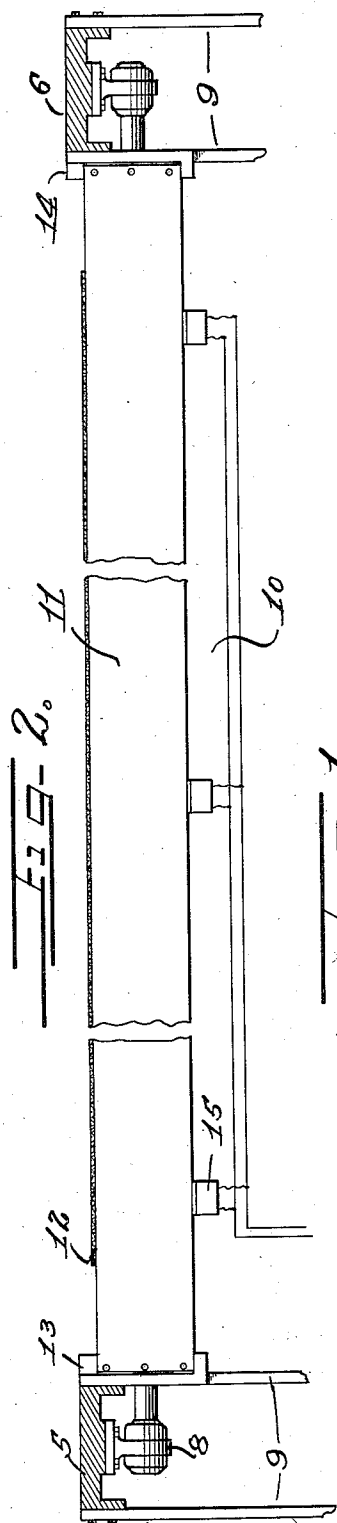
E. E. BERRY

1,841,702

WIRE VIBRATOR

Filed Jan. 2, 1931

2 Sheets-Sheet 1



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FIG. 4. FIG. 3.

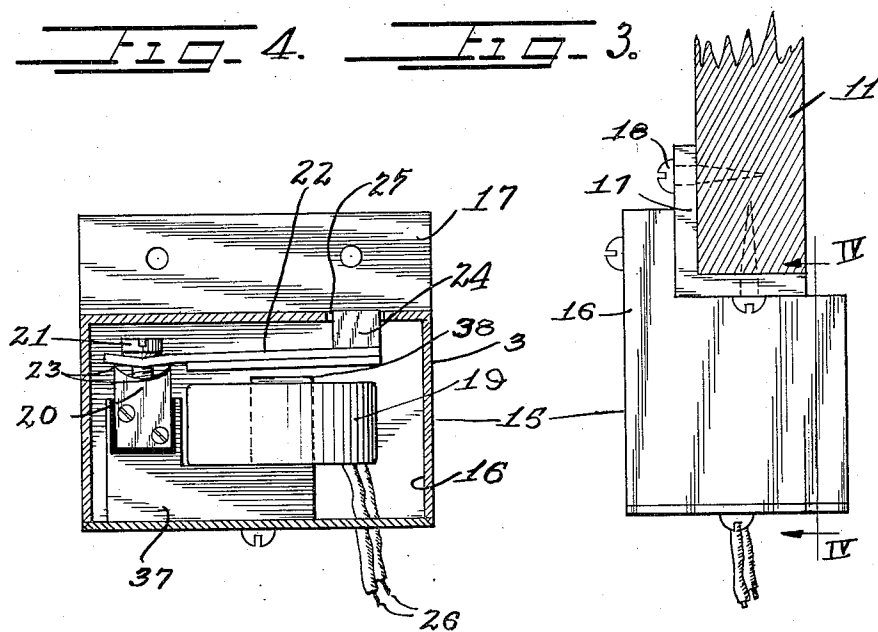
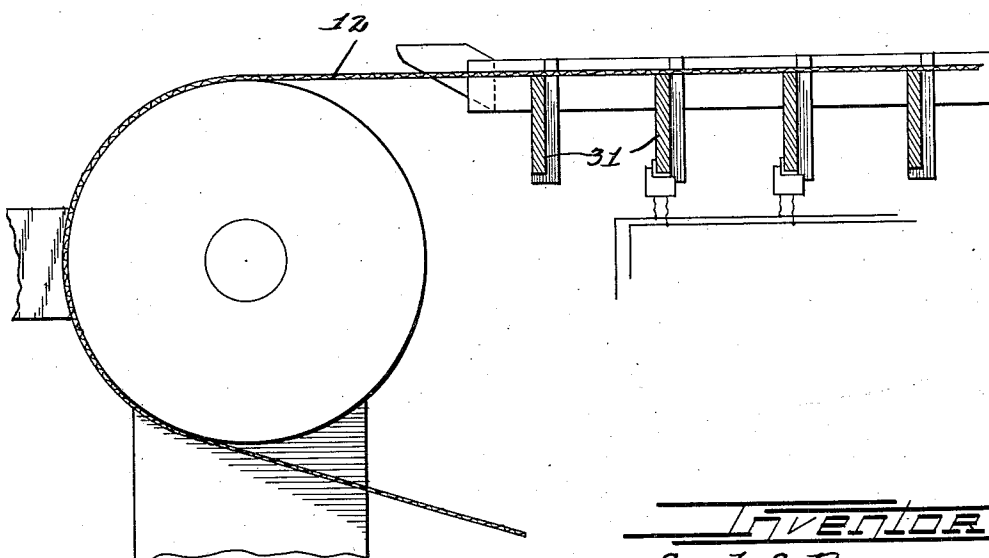


FIG. 5.



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WIRE VIBRATOR

Application filed January 2, 1931. Serial No. 506,013.

This invention relates to a wire vibrator and more particularly to means for vibrating the forming wire of a Fourdrinier paper machine.

5 The standard type of Fourdrinier table structure includes a plurality of spaced table rolls over which the forming wire travels carrying the stock from which the web of paper is formed. The purpose of the table
10 rolls is not only to support the forming wire in its travel but also by contacting the underside of the forming wire to increase the tendency of the water to drain through the wire. While this function is performed to
15 some extent by the table rolls, the rapid revolutions of the rolls also has a tendency to throw water by centrifugal force back against the underside of the traveling wire, with the result that the efficiency of the table
20 rolls, so far as causing the removal of water from the stock carried by the forming wire is concerned, is not very great.

It is therefore an object of this invention to provide a wire vibrator for assisting in
25 the draining of water through the forming wire and also for assisting in the formation of the sheet on the wire.

It is a further important object of this invention to provide an attachment for the
30 table section of a Fourdrinier paper machine by means of which the wire may be vibrated through impulses acting in a vertical plane and transmitted through a vibrating member to the underside of the forming wire.

35 Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in a preferred form) is
40 illustrated in the drawings and hereinafter more fully described.

On the drawings:

45 Figure 1 is a side elevational view, more or less diagrammatic, of the breast roll end of a table structure, showing a wiring diagram and the connections of a wire vibrator embodying the principles of my invention.

50 Figure 2 is a broken transverse sectional view taken substantially on line II—II of Figure 1.

Figure 3 is an enlarged fragmentary view of an electrical vibrator showing its method of attachment.

Figure 4 is a sectional view taken substantially on line IV—IV of Figure 3.

Figure 5 is a fragmentary view of the breast roll end of a modified form of table structure with vibrating mechanism of my invention.

As shown on the drawings:

60 The reference numeral 1 indicates a breast roll suitably supported by means of spring members 2 and 3 in a well known manner. A table structure 4, associated with said breast roll 1, comprises the usual table rails 5 and 6 and table rolls 7 supported therefrom in bearings 8. Said table rails 5 and 6 are suitably mounted upon spring members 9 to permit the table structure to be shaken, all in accordance with standard practice.

70 My invention comprises a vibrating device, indicated generally by the reference numeral 10, and comprising a board 11 extending transversely of the forming wire 12 and secured at its respective ends in brackets 13 and 14 attached to the side rails 5 and 6, respectively, the board 11 being suitably formed of hard wood and being so mounted as to present a narrow edge for contact with the underside of the forming wire 12. The upper contacting edge of the board 11 may be rounded slightly to prevent unnecessary wear upon the forming wire. One or more of said boards 11 is positioned between adjacent table rolls 7 at the breast roll end of the machine, 85 as indicated in Figure 1.

To each of the transverse boards 11 is attached one or more electrical vibrators 15 of standard or other suitable construction. As best indicated in Figures 3 and 4, the 90 electrical vibrator comprises a casing 16 secured by means of an angle piece 17 and screws 18 to the underside of a board 11. Inside of the casing 16 is mounted a soft iron member 37 providing a core 38 around which 95 is positioned a coil 19. Insulated from the member 37 but secured thereto, as by means of a block 20 and screw 21 is a metallic spring member 22. Said member 22 is secured at one end by the head of the screw 21 against 100

base points 23 of the block 20 and extends over and adjacent to the core 18. At its free end, the spring member 22 carries a weight or hammer 24 that projects through an opening 25 in the upper wall of the casing 16 for contact with the under edge of a board 11. The coil 19 is connected by means of wires 26 to an alternating current generator 27, which in turn is driven from a variable speed direct current motor 28. In the leads 29 to said motor 28 is connected a rheostat 30, by means of which the speed of the motor 28 may be varied and consequently the frequency or cycle of the alternating current generator 27 likewise varied.

It will be obvious that as the cycle of the alternating current generator 27 is varied, the frequency of the vibratory impulse imparted by the hammer 24 to the board 11 is likewise varied.

Preferably, a plurality of vibrating mechanisms are secured at spaced intervals along the vibrating board 11. The result is that very rapid vibratory impulses are imparted to the board 11 and transmitted through the board to the forming wire 12. The actual amplitude of the vibration that may be imparted to the board 11 is very small, of the magnitude of only thousandths of an inch, but is nevertheless appreciable and results in a vibration that is quite visible both to the eye and to the touch.

It is evident that these rapid vibrations acting through a vertical plane upon being imparted to the forming wire 12 aid in the draining of the water from the stock carried by the forming wire and also aid in the matting of the fibers deposited upon the forming wire from the stock.

In Figure 5 there is shown an arrangement of vibrating mechanisms 31 similar in construction to those already described but arranged in sufficiently closely adjacent relation to support the forming wire 12 without the use of table rolls. It will be apparent that all of the table rolls may thus be replaced by the vibrating board 31 or only a part of the table rolls so replaced. The rapid vibration of the board tends to prevent the wear that would otherwise occur were the boards not subject to vibration.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim as my invention:

1. In a paper machine, the combination with a forming wire of a member contacting the underside thereof and means for imparting a definite continuous vibration to said member.

2. In a paper machine, the combination

with a forming wire and table rolls thereof of a member contacting the underside thereof between successive table rolls and means for imparting a definite continuous vibration to said member.

3. In a paper machine, the combination with a forming wire of a member contacting the underside thereof and electrically operated means for imparting a definite continuous vibration to said member.

4. In a paper machine, the combination with a forming wire and table rolls thereof of a member contacting the underside thereof between successive table rolls and electrically operated means for imparting a definite continuous vibration to said member.

5. In a Fourdrinier paper machine including the forming wire and table rolls thereof, a member mounted transversely of the wire and contacting a narrow area of the underside thereof and means imparting a continuous series of shocks to said member.

6. In a Fourdrinier paper machine including the forming wire and table rolls thereof, a member rigidly mounted at its ends to extend transversely of the wire and contacting a narrow area of the underside thereof and electrical vibrators attached to said member for imparting a continuous series of shocks to said member.

7. In a Fourdrinier table structure including table rails, table rolls and forming wire, a plurality of members contacting the underside of the forming wire at spaced intervals between successive table rolls and means for imparting vibratory impulses to said members.

8. In a Fourdrinier table structure including table rails, table rolls and forming wire, a plurality of members contacting the underside of the forming wire at spaced intervals between successive table rolls and electrical vibrators attached to said members for imparting vibratory impulses to said members.

9. In a Fourdrinier table structure including table rails, table rolls and forming wire, a plurality of boards secured at their ends to said table rails and contacting the underside of the forming wire at spaced intervals between successive table rolls and electrical vibrators attached to said members for imparting vibratory impulses to said members.

10. A wire vibrator for paper machines, comprising a member for contacting the underside of a wire and an electrical vibrator attached to said member.

11. A wire vibrator for paper machines, comprising a member for contacting the underside of a wire, an electrical vibrator attached to said member and means for varying the frequency of vibration.

12. In a Fourdrinier table structure including breast roll, table rails, table rolls and forming wire, a plurality of boards posi-

tioned between successive table rolls at the breast roll end, said boards being secured at their respective ends to said table rails and electric vibrators attached to said boards for
5 imparting vibratory impulses thereto.

13. In a Fourdrinier table structure including breast roll, table rails, table rolls and forming wire, a plurality of boards positioned between successive table rolls at the
10 breast roll end, said boards being secured at their respective ends to said table rails, electric vibrators attached to said boards for imparting vibratory impulses thereto and means for varying the frequency of the vibra-
15 tory impulses.

14. In a paper machine, the combination with the forming wire of means for imparting vertically acting vibratory impulses to said wire.

20 15. In a Fourdrinier table structure, the combination with the forming wire of members contacting the underside of the wire for supporting said wire and means for imparting rapid vibratory impulses to said mem-
25 bers.

16. In a Fourdrinier table structure, the combination with the forming wire of members contacting the underside of the wire for supporting said wire and electrical vibrators
30 secured to said members for imparting thereto vertically acting vibratory impulses.

In testimony whereof I have hereunto subscribed my name at Beloit, Rock County, Wisconsin.

35 EARL E. BERRY.

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