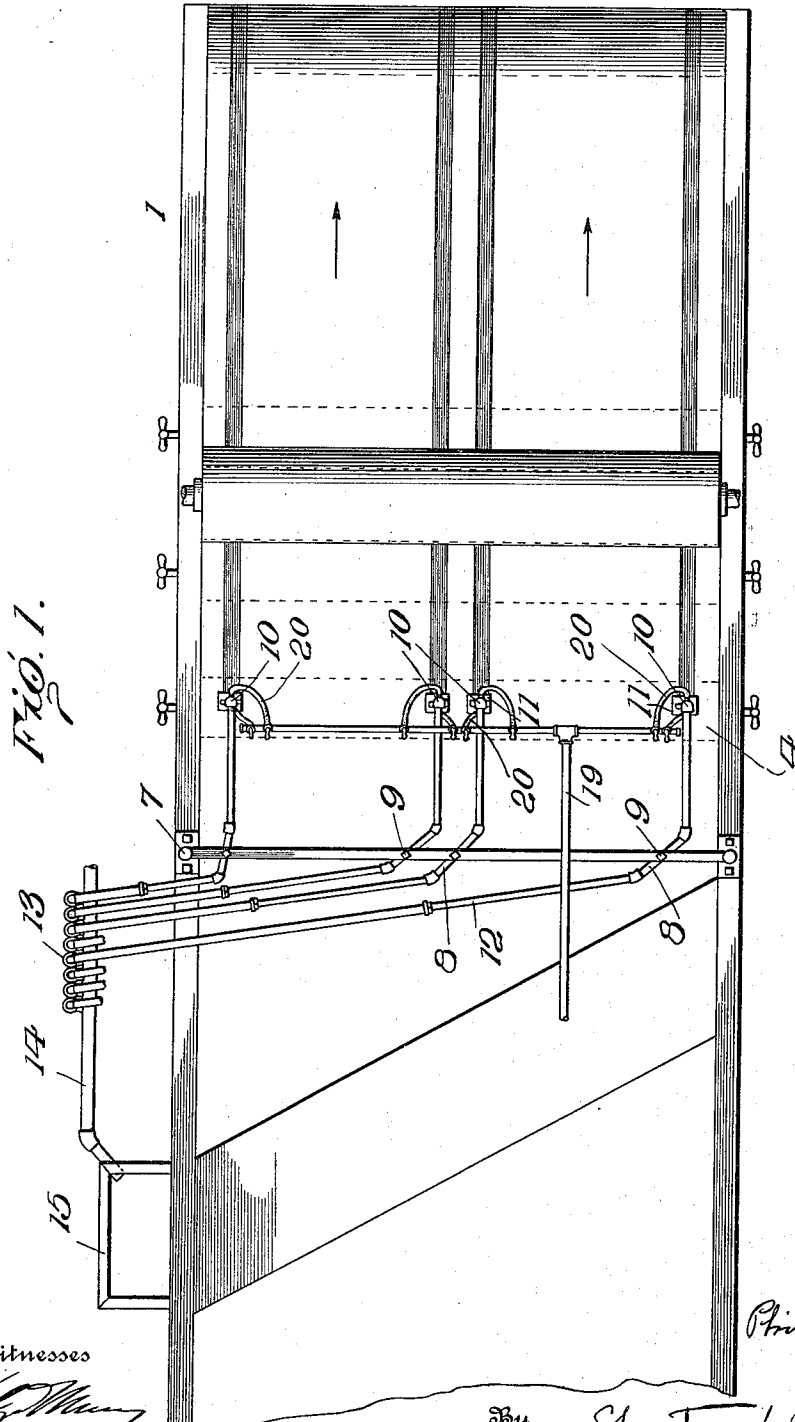


P. WESTON.
 APPARATUS FOR PRODUCING THIN SECTIONS IN PAPER.
 APPLICATION FILED OCT. 3, 1914.

1,155,853.

Patented Oct. 5, 1915.
 3 SHEETS—SHEET 1.



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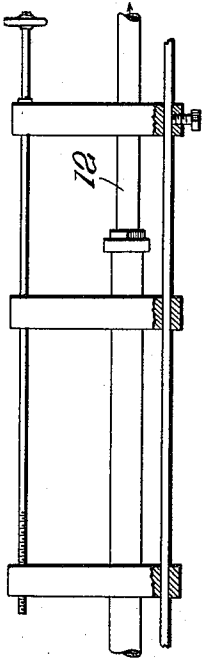


Fig. 10.

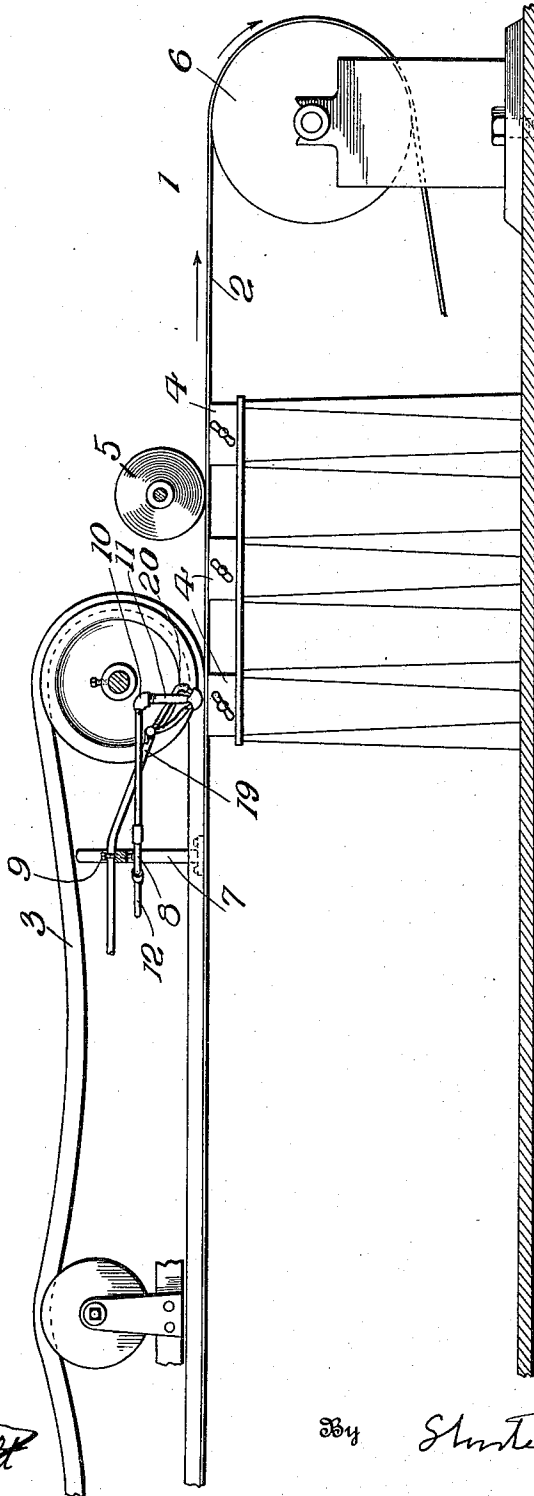


Fig. 2.

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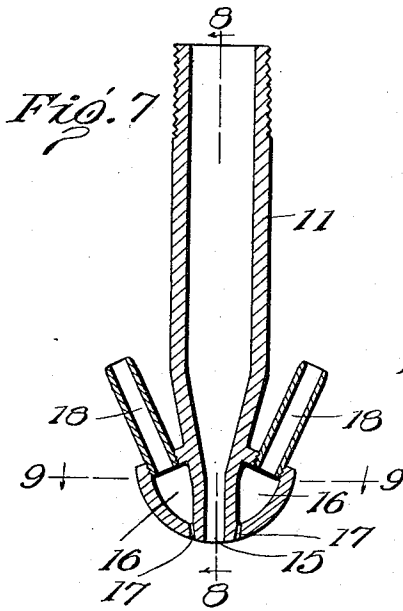


Fig. 8.

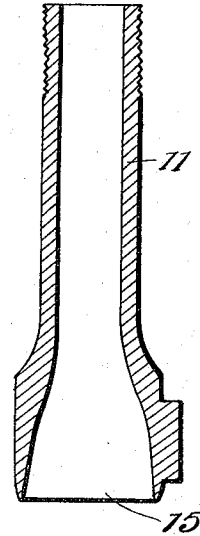


Fig. 9.

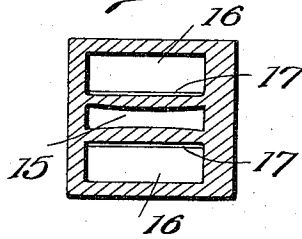


Fig. 5

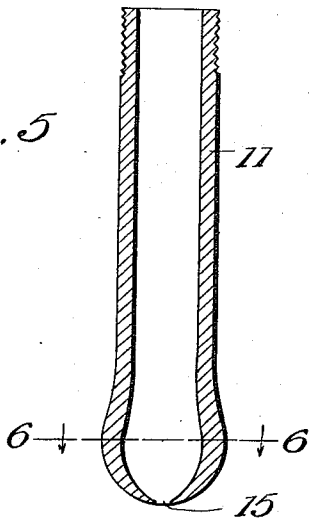


Fig. 3.

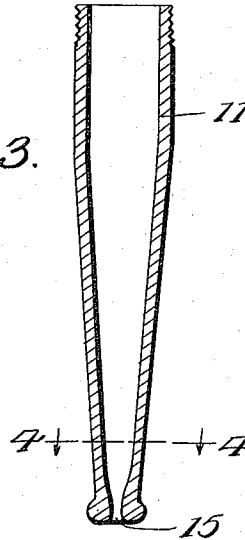


Fig. 6.

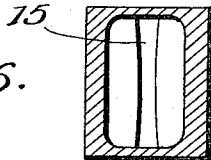
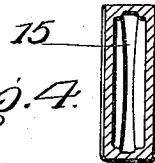


Fig. 4.



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APPARATUS FOR PRODUCING THIN SECTIONS IN PAPER.

1,155,853.

Specification of Letters Patent.

Patented Oct. 5, 1915.

Application filed October 3, 1914. Serial No. 864,852.

To all whom it may concern:

Be it known that I, PHILIP WESTON, a citizen of the United States, residing at Dalton, in the county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Producing Thin Sections in Paper, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

In Patent No. 1,008,228, issued to me on November 7th, 1911, and reissued May 12th, 1914, No. 13,730, I have described and claimed a method of manufacturing paper to be used in making up the so-called "loose leaf ledger" sheets, which method consists in removing a portion of the web or pulp when in a wet or watery state along defined lines, by the application of suction thereto, in order to make a thin section which will form the marginal edge to act as a hinge in the binding of the sheet into a book.

In the drawings of this patent and its reissue, I have shown more or less conventionally an apparatus for carrying out the method, said apparatus comprising in general tubes arranged at intervals across the Fourdrinier wire of the machine and close to its surface, said tubes or nozzles being arranged above the first suction box of the paper-making machine and being connected with a centrifugal pump or similar apparatus arranged so that a portion of the material is sucked through the tubes or nozzles and delivered back into the stuff chest.

The present invention relates to a completely developed and organized apparatus for carrying out said invention, which I have found by a long series of experiments embodies what I believe to be the most practical and simplest apparatus for carrying out the method in the best way. The invention, therefore, includes primarily an organized apparatus for accomplishing the purpose aimed at; and second, it consists in certain improvements in a particular part of the apparatus, that is, the nozzle through which the material is removed from the web, whereby the best and most uniform results are obtained in the making of this thin section along the defined line.

Furthermore, the invention consists in various details of construction and arrangement of parts, as hereinafter referred to and described in the appended claims.

The invention is illustrated in the accompanying drawings, in which,—

Figure 1 represents a side view of a portion of a "Fourdrinier" machine to which my invention is applied; Fig. 2 is a plan view illustrating the invention; Fig. 3 is a detail view showing one form of nozzle; Fig. 4 is a sectional view thereof; Fig. 5 is a detail view of a modified form of nozzle; Fig. 6 is a sectional view thereof; Fig. 7 is a detail view of my preferred form of nozzle; Fig. 8 is a longitudinal section through the same; and Fig. 9 is a horizontal section on the line 9—9 of Fig. 7. Fig. 10 is a detail view of the means for adjusting the section tubes.

In these drawings, the numeral 1 represents as a whole a Fourdrinier machine of the usual construction, having the wire 2 arranged to travel in the direction indicated by the arrows. It is provided with the usual deckle straps 3 and suction boxes 4, herein illustrated as three in number, but I prefer to use two.

The dandy roll is shown at 5 and the bottom couch roll at 6. All these parts are of the usual construction of the well known Rice, Barton and Fales Fourdrinier paper machines, and need not be herein specifically referred to; nor is it deemed necessary to illustrate any of the other parts of the paper-making machine, which are of the usual construction.

Extending transversely across the machine and suitably secured thereto some distance above and ahead of the front suction box, is a suitable rest or support 7 for the pipes 8. These pipes 8 are attached to the rest or support by threaded screws 9, by which an adjustment is effected. Each one of these short pipes 8 is secured at one end to an elbow 10, and from this elbow projects downwardly the suction nozzle or tube 11. The other end of each short pipe which is supported on the rest 7 is secured to a suction pipe 12 which extends transversely across the machine to the opposite side and rests upon a support to which it is secured in such a way as to enable the position of the tube to be adjusted across the machine, as shown in Fig. 10, the suction tube being in telescoping sections.

Each suction pipe is connected with a steam ejector 13, and all the steam ejectors open into a common pipe 14 which leads

back to the fan pump box 15. These create a suction through the nozzles or tubes which are arranged in close proximity to the pulp on the wire and over the first suction box.

5 By proper regulation of the air suction in the tubes with respect to the air suction in the first suction box, a certain amount of the wet pulp is drawn through the suction pipes, discharged by the ejectors into the

10 common discharge pipe leading to the pump chest, and then mixes with the stock from the stuff chest and the water from the save-all and goes to the screen for redelivery onto the wire of the machine in the regular way.

15 Thus there will be formed in the web over the first suction box, a thin section caused by the removal of the material, and when the web has passed through the remaining operations on the machine and the paper is

20 formed and dried, it is provided with thinned sections along defined lines, the position of the lines having been regulated by the adjustment of the suction pipes transversely of the machine.

25 As a further improvement I have devised certain special forms of the nozzles or tubes which are in contact with the web, such being shown in Figs. 3 to 9 inclusive. In general, the nozzle shown in all of these figures

30 is formed with elongated slits 15, contracted at the center and widening toward either end through which the material passes into the enlarged head of the tube and then up through the tube itself into the suction pipe.

35 In Figs. 3 and 4, the head or mouth of the tube having this opening is formed of wedge shape, while in Figs. 5 and 6 it is rounded. Figs. 7, 8 and 9 represent the preferred form of the nozzle in which the lower end of the

40 head is rounded and provided with the opening above referred to, and has on opposite sides of the opening closed chambers 16 having narrow slits 17 in the lower walls adjacent the mouth of the nozzle. Screwed into

45 the upper portions of these chambers 16, are pipes 18, through which water is delivered to the chambers and out through the narrow slits, from a pipe 19 supported on the rest above referred to, and fed with water under

50 slight pressure from the machine fan pump which supplies Artesian water to the machine.

The pipe referred to has pet cocks at suitable intervals, rubber pipes 20 running from

55 these pet cocks down to the other pipes which are screwed into the water chambers 16. The water pressure co-acting with the suction through the opening in the mouth of the nozzle draws the water in a thin curtain

60 from the slits over the mouth of the tube, and up into the tube itself, thus preventing the stock from clogging up the surface of the mouth of the tube, and also helping to keep the inside of the tube or nozzle clean.

65 Having thus described my invention what

I claim as new and desire to secure by Letters Patent, is:—

1. In combination with a paper making machine, means for removing a portion of the material from the web on the wet end of the machine, comprising suction nozzles or tubes arranged with their lower ends adjacent the web, suction pipes connected to the nozzles, ejectors connected to the suction pipes, and a common discharge pipe communicating with the ejectors and connected with a fan pump chest whereby material of the web may be drawn through the nozzles and suction pipes and delivered to the fan pump chest and thence to the screen.

2. In combination with a paper making machine, means for removing a portion of the material from the web on the wet end of the machine, comprising suction nozzles or tubes arranged with their lower ends adjacent the web, means for vertically and laterally adjusting the nozzles, suction pipes connected with the nozzles, ejectors connected to the suction pipes, and a common discharge pipe connecting with the ejectors and connected with a fan pump chest whereby material of the web may be drawn through the nozzles and suction pipes and delivered to the fan pump chest and thence to the screen.

3. In combination with a paper making machine, means for removing a portion of the material from the web at the wet end of the machine, comprising suction nozzles or tubes arranged with their lower ends adjacent to the web, means for vertically adjusting the nozzles, suction pipes connected to the nozzles and adjusted transversely of the machine, ejectors connected to the suction pipes, and a common discharge pipe communicating with the ejectors and connected with the fan pump chest whereby material on the web may be drawn through the nozzles and suction pipes and delivered to the fan pump chest and thence to the screen.

4. In combination with a paper-making machine of ordinary construction including the usual suction boxes, a support extending across the frame, short pipes supported thereby, nozzles extending from said pipes downwardly to the wire over the first suction box, suction pipes extending transversely of the machine and attached at one end to the said short pipes, and at the other end in connection with a common discharge pipe leading to a fan pump chest.

5. In combination with a paper-making machine of ordinary construction including the usual suction boxes, a support extending across the frame, short pipes adjustably supported thereby, nozzles extending from said pipes downwardly to the work over the first suction box, suction pipes extending transversely of the machine and attached at one

end to the said short pipes and at the other end in connection with a common discharge pipe leading to a fan pump chest.

6. In combination with a paper-making machine of ordinary construction including the usual suction boxes, a support extending across the frame, short pipes adjustably supported thereby, nozzles extending from said pipes downwardly to the work over the first suction box, suction pipes extending transversely of the machine and attached at one end to the said short pipes and at the other end in connection with a common discharge pipe leading to a fan pump chest, and means for adjusting the suction pipes transversely of the machine.

7. In an apparatus of the character and for the purpose described, a suction tube or

nozzle having an enlarged head at its lower end, and having an elongated opening with a contracted central portion and widening toward each end.

8. In an apparatus of the character and for the purpose described, a suction tube or nozzle having an opening in its lower end for the passage of material, and having chambers on either side of said opening with slits therein adjacent the opening in the tube, and means for supplying water to said chambers.

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

PHILIP WESTON.

Witnesses:

WILLIAM H. COOPER,
JOHN H. BELLOWS.

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