

J. H. RIVERS.  
PROCESS OF TREATING PULP.  
APPLICATION FILED MAR. 13, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

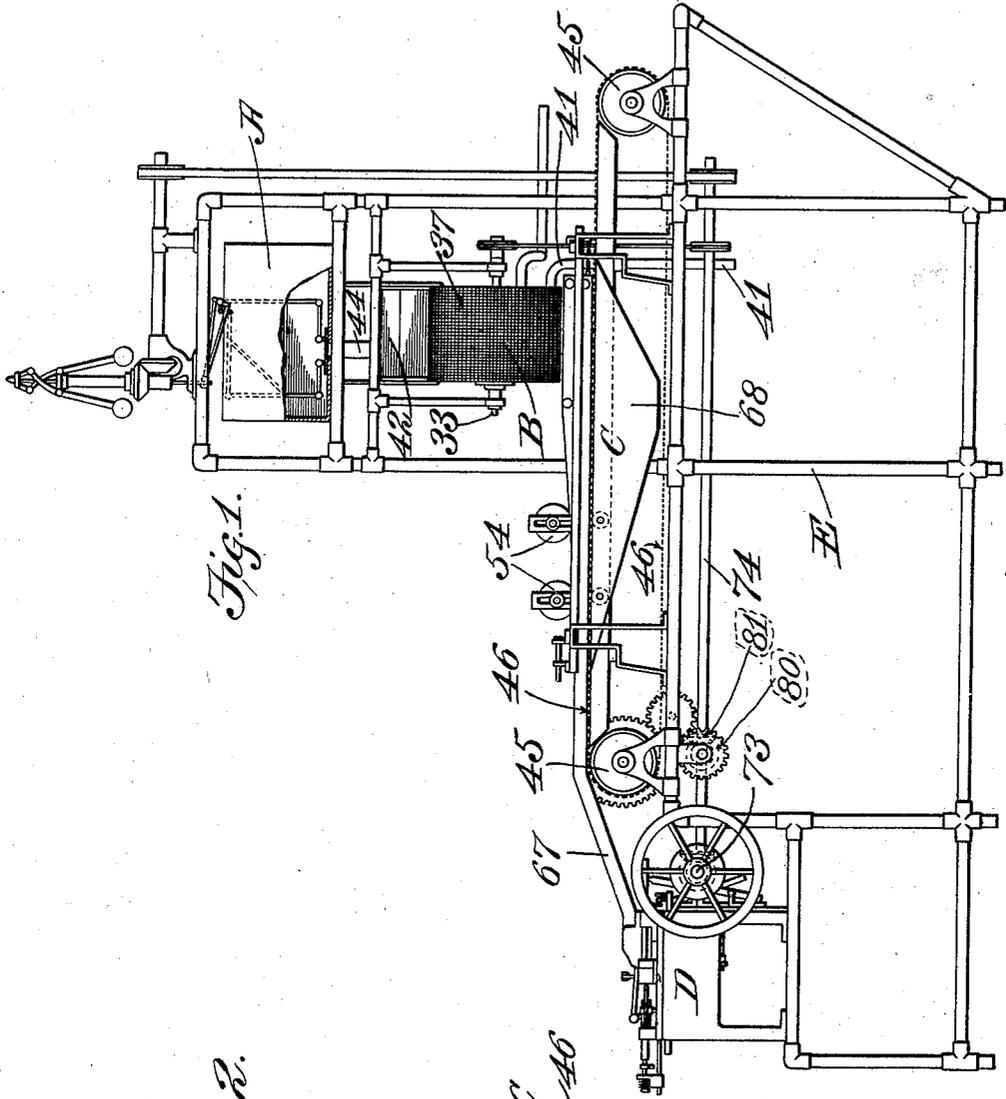


Fig. 1.

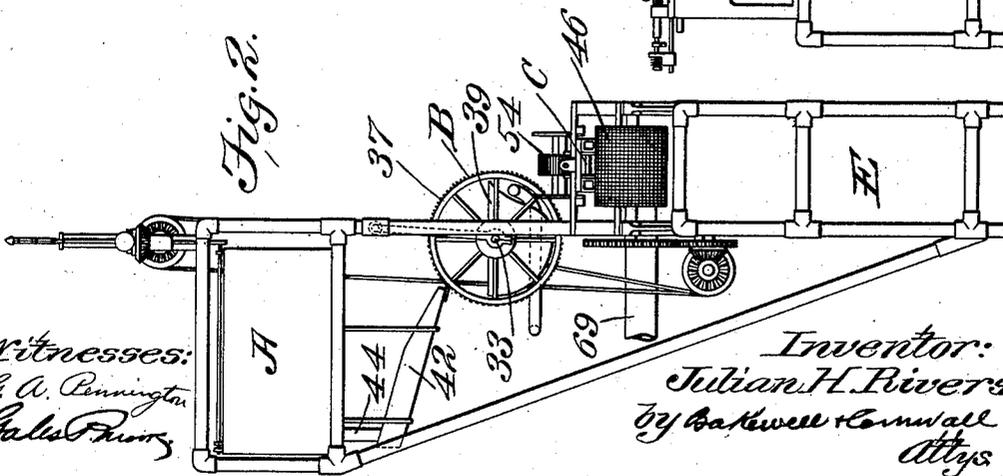


Fig. 2.

Witnesses:  
*G. W. Pennington*  
*Galus Perry*

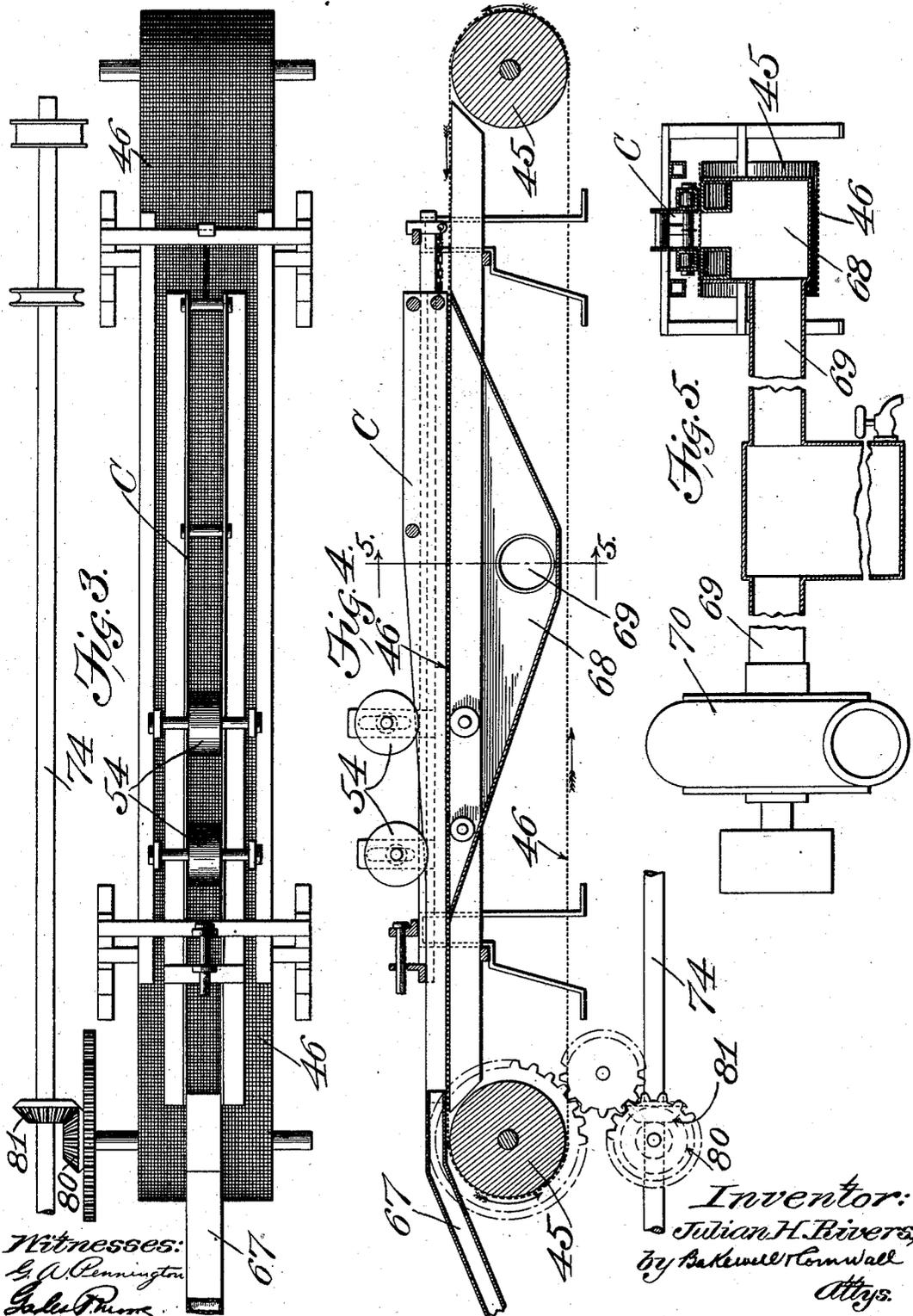
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

JULIAN H. RIVERS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO UNITED STATES FIBER STOPPER COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF SOUTH DAKOTA.

## PROCESS OF TREATING PULP.

SPECIFICATION forming part of Letters Patent No. 748,014, dated December 29, 1903.

Application filed March 13, 1903. Serial No. 147,634. (No specimens.)

*To all whom it may concern:*

Be it known that I, JULIAN H. RIVERS, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Processes of Treating Pulp, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of an apparatus for carrying out the present process. Fig. 2 is an end view looking from the left of Fig. 1, the forming-machine being removed and the exhaust-pipe being broken. Fig. 3 is a top plan view of the condensing mechanism. Fig. 4 is a central longitudinal sectional elevation of the same, and Fig. 5 is a transverse sectional elevation on about the line 5 5 of Fig. 4.

My invention relates to improvements in processes for treating pulp stock, my object being, primarily, to provide a process by means of which pulp in a very fluid condition, such as that in which it is when mixed, can be so treated that it is formed into a web of proper consistency to be acted upon by a suitable apparatus for producing finished articles—such, for example, as stoppers.

A further object of my invention is to so treat the pulp that it is preliminarily dried, sufficient moisture being extracted to permit the pulp to assume the condition of a thin sheet. This sheet is piled, and the pile of thin stock is gradually condensed to the proper consistency.

To these ends and also to improve generally upon processes of the character indicated my invention consists in the various matters hereinafter described and claimed.

In practicing my process the pulp in the very fluid condition in which it appears when mixed is spread in a relatively broad thin sheet and a large proportion of the moisture is extracted, so that the pulp is presented in a thin web. In order to effect this preliminary drying, the pulp is preferably spread over a reticulated surface, by means of which

the water is permitted to rapidly pass off, and the thin web of pulp is readily delivered from such surface. The thin web is then piled, and this pile of pulp is compressed or condensed, certain moisture being expelled from the pulp during this compressing or condensing action. Preferably between the time that the pulp is piled and that at which it is compressed or condensed moisture is extracted. A convenient means of effecting the desired steps after the pulp is formed into the aforementioned thin web is to deliver this thin web upon a reticulated carrier, so that the thin web can pile upon the carrier as it is delivered from the surface upon which it is preliminarily dried, and this carrier carries the piled pulp to suitable condensing or compressing devices, the openings in the carrier permitting the moisture to escape from the pulp upon the same.

Such being the general features of the present process, I shall now describe the apparatus illustrated in the accompanying drawings, this apparatus being one by means of which the process can be practiced.

In said drawings, E indicates a frame of any suitable construction by means of which the parts of the apparatus are supported.

A represents the vat or hopper for receiving the pulp to be treated.

B indicates the preliminary drying apparatus, C the condensing mechanism, and D the forming-machine for acting upon the stock treated by my present process.

The preliminary drying device is supported below the hopper A and is here shown as comprising a cylindrical screen 37, supported upon a suitable shaft 33, this shaft preferably supporting a drip-cup 39 within the screen, said drip-cup being adapted to receive moisture escaping from the pulp spread over the screen and having at its lower portion a discharge-pipe 41. A spout or delivery-pipe 44 delivers the pulp from the hopper A upon an inclined trough 42, and this trough delivers to the said screen 37. The trough and screen are relatively wide, so that the pulp is spread upon the rotatable screen in a relatively wide thin sheet, whereby the water readily escapes from the pulp mass and falls into the afore-

mentioned drip-cup, a sufficient quantity of water escaping to cause the pulp to be delivered from the screen in a thin web.

Upon suitable rollers 45 is a conveyer-screen 46, which is below the cylindrical screen 37 and adapted to receive the thin web delivered from the said cylindrical screen. The said screen 46 travels in a line substantially parallel to the axis of rotation of the screen 37. Suitably supported above the said conveyer-screen and between the delivery end of the same and the point at which it receives the pulp from the preliminary drying devices is a series of compressing-rolls 54, which are preferably adjustably mounted in any suitable and convenient manner, these rolls being at different heights from the surface of the said conveyer-screen and gradually approaching said screen toward its delivery end. The said conveyer-screen is shown in the drawings as delivering to the feed trough or raceway 67 of the forming-machine D.

Intermediate the top and bottom sheets of the conveyer-screen is a box or casing 68, having an open top over which the pulp-receiving portion of the conveyer-screen travels, and an exhaust-pipe 69 leads from said casing to the eye of an exhaust-fan or similar device 70.

A main shaft 74 receives power from any suitable source, as from the shaft 73 of the forming-machine, and through suitable connections, as beveled gears 80 and 81, said main shaft 74 imparts rotation to one of the rollers 45, whereby the said conveyer-screen is driven. Said shaft 74 is also connected to the shaft 33, upon which the rotatable screen 37 is carried. The driving connections are such that the screen 37 rotates at a relatively high speed compared to the rate of travel of the

conveyer-screen 46, by reason of which the screen 37 can feed the thin web to the conveyer-screen 46 with sufficient rapidity to cause this web to pile upon the conveyer-screen. The piled pulp is then fed to the condensing-rolls 54 and is condensed to the desired consistency, the fan 70 serving to suck certain of the moisture from the pulp on the conveyer-screen.

I am aware that minor changes in the several steps of my process may be made and substituted for those herein described without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The process of treating pulp stock or the like, which consists in preliminarily drying the same, producing a pile of the thus-dried pulp, and then condensing said piled pulp into a mass; substantially as described.

2. The process of treating pulp stock or the like, which consists in forming the stock into a thin web, piling said web, and then condensing the said pile into a mass; substantially as described.

3. The process of treating pulp stock or the like, which consists in producing a preliminarily-dried web, piling said web, and then subjecting the piled web to pressure and suction; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 28th day of January, 1903.

JULIAN H. RIVERS.

Witnesses:

G. A. PENNINGTON,  
GEORGE BAKEWELL.