No. 694,954. Patented Mar. 11, 1902.

B. B. FARNHAM.

COUCH ROLL.

(Application filed Sept. 20, 1901.)

(No Model.)

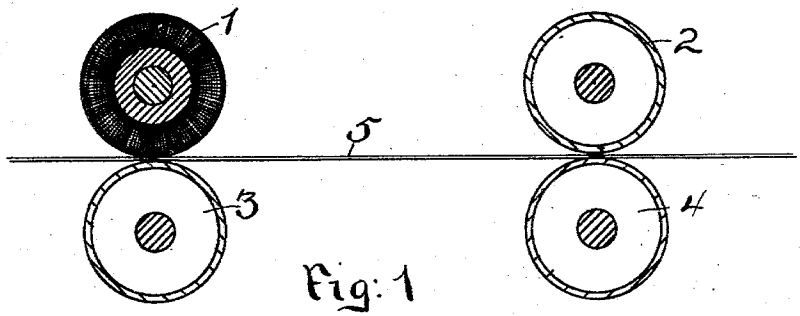


Fig: 1

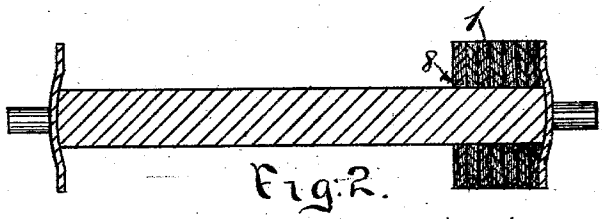


Fig: 2.

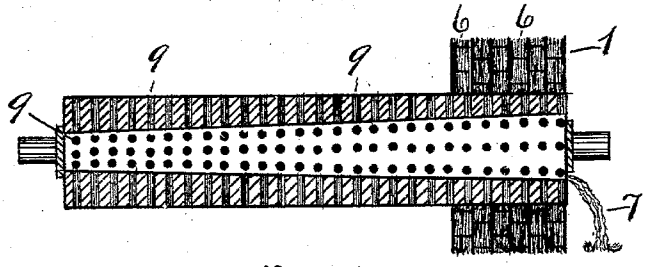


Fig: 3.

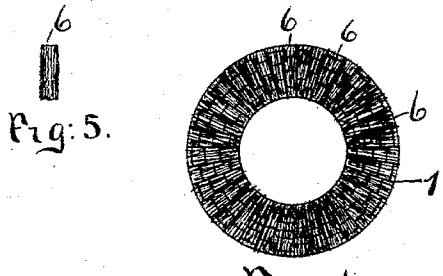


Fig: 5.

Fig: 4.

Witnesses:
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UNITED STATES PATENT OFFICE.

BION B. FARNHAM, OF CASTLETON, NEW YORK.

COUCH-ROLL.

SPECIFICATION forming part of Letters Patent No. 694,954, dated March 11, 1902.

Application filed September 20, 1901. Serial No. 75,943. (No model.)

To all whom it may concern:

Be it known that I, BION B. FARNHAM, a citizen of the United States, residing at Castleton, Rensselaer county, New York, have invented certain new and useful Improvements in Couch-Rolls; and I do hereby declare the following to be a full, clear, and exact description of the invention, 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, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to rolls for paper-machines known to the trade as "couch-rolls."

In the drawings, Figure 1 shows a sectional view of three rollers in series with a couch-roll; Fig. 2, a longitudinal sectional view of one of my improved couch-rolls; Fig. 3, a similar view of still another form thereof; Fig. 4, an absorbent washer shown in plan, and Fig. 5 an elevation of one of the bundles of fiber or hair that makes the washer.

In all paper-making machines a couch-roll is used to press out the water from the strip of partly-formed paper as it passes the roller on the endless apron 5. These rolls are usually covered with felt, either laid on lengthwise of the roller in strips or wound spirally on the roll and fastened generally by tacks. They are sometimes simply broad sheets of felt wound upon the roller and fastened. When a roll is so made and is first put in operation, when it is soft and of uniform density, it works very well; but as soon as a few days' or weeks' use have been given it it becomes lumpy or ridges form in it, and these lumps or ridges make a corresponding depression in the forming sheet of paper which it is impossible to remove, and the sheet is therefore spoiled and wasted. When this occurs, there is no remedy except to discard the couch-roll and insert a new one. This is not only an expensive operation, but the whole machine must be stopped and all paper-making cease while the new roll is being set and adjusted, entailing a considerable loss. The manner in which a couch-roll performs its functions is that it presses upon the paper as it rolls, absorbing considerable of the water from the paper-pulp, and prevents the water not absorbed from passing under the couch-roll, thus delivering the paper at a point beyond the couch-roll in a drier and more compressed condition than before it was acted upon by it.

My improvement provides a better water-absorber and a roll that will not work into lumps and ridges, but will always maintain a perfectly even surface, while it will absorb vastly more of the water than any other style of roll known to me.

My roll 1 is composed of washers made of any material having the fiber diverging from the center outward or at least standing practically on end, as seen at 1 in all the figures. When I make the washers of a piece of especially-prepared felt, I cut them out circular in form and make an opening in the middle, so they will slip on the spindle, and preferably tack them in position, as seen at 8 in Fig. 2. It will be seen at 1 in Figs. 1 and 2 that the hair, wool, or fiber rises or projects at right angles to the spindle, or, in other words, practically stands on end, and this is done for two main reasons—viz., that the full capillary capacity of the hairs, wool, or fiber may be given full opportunity to act and also to make a mat on the surface of the brush or roll that has entire uniformity over the entire surface and which will not form into ridges or lumps, such forming into ridges and lumps being called "backing up" of the material of the roll. In the ordinary rolls now in use this backing up forms ridges and lumps and soon becomes permanent or acquires a permanent set and cannot be remedied except by discarding the old and inserting a new roll.

In Figs. 1 and 2 I show a roll made for use where the amount of water to be absorbed is not great, and it answers admirably for such positions.

In Fig. 3 I show a form of my roll for use where the absorption of water will be considerable, and this roll is made by using a perforated spindle and having an opening therein tapering, as shown. The perforations will be seen at 9. On this form of roller I use a specially-prepared absorbent material preferably made by having the tufts of hair, wool, or fiber in small bunches, as seen at 6, especially, in Fig. 5, and these tufts are woven together to form a sufficiently stiff fabric as a

whole, as seen at 6 in Fig. 4. When this form of roll absorbs water, it does so with great readiness, the material soon becoming soaked beyond the retaining capacity of the material, when it is squeezed inward and through the perforations 9 and flows out at the end of the roll, as seen at 7, this waste water being conducted back again to the original pool or supply, if desired. Practice has proven that my form of roll herein shown and described will operate indefinitely and never spoil the paper or otherwise damage it.

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

1. A couch-roll for use in paper-making and other purposes consisting of a drum or journal; rings or washers of capilliform material set upon the same side by side in unbroken contact with each other and with the drum or journal and arranged so that the capillaries practically stand on end and radiate from the drum or journal and so as to form a practically unbroken smooth surface at the periphery of the roll substantially as described.

2. A couch-roll consisting of a perforated and hollow spindle, its outer surface being covered by an absorbent material arranged so that any surplus water absorbed will enter the hollow spindle and be discharged therefrom substantially as described.

3. Material for the covering of couch-rollers formed by forming the capillaries or fiber of which it is composed into tufts and binding the tufts into sheets, the tufts radiating from a practically common center substantially as described.

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

BION B. FARNHAM.

Witnesses:
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A. M. TURNER.