No. 649,145. Patented May 8, 1900.

M. W. THRUSH, S. F. AARON & C. P. MATTERN.

PNEUMATIC ROLL.

(No Model.) (Application filed Jan. 16, 1900.)

Fig. 1.

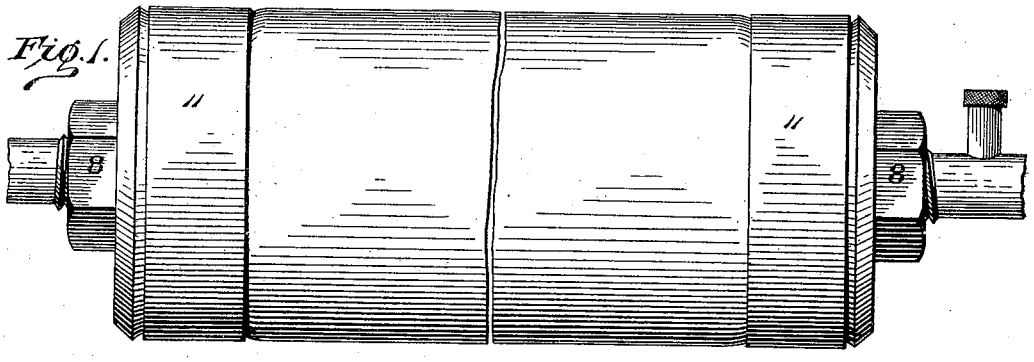


Fig. 2.

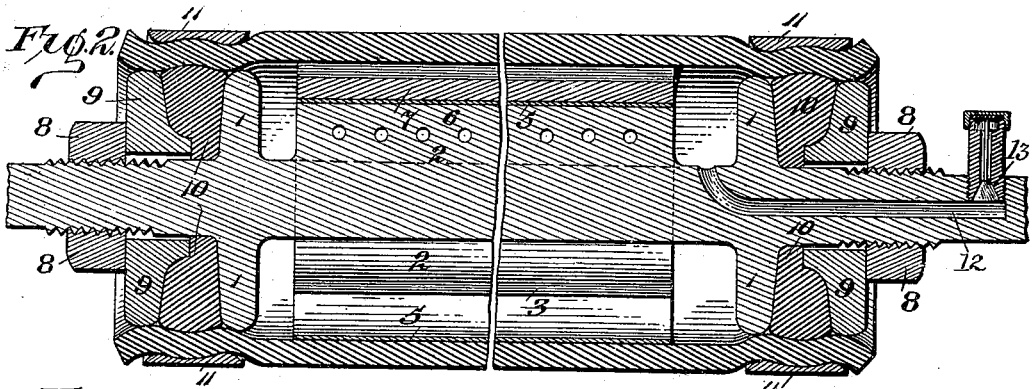


Fig. 3.

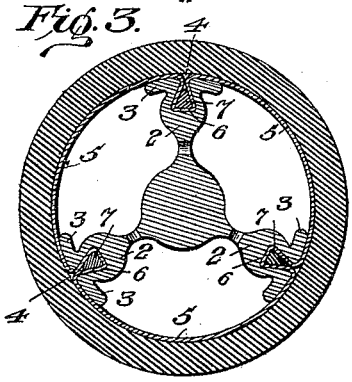


Fig. 4.

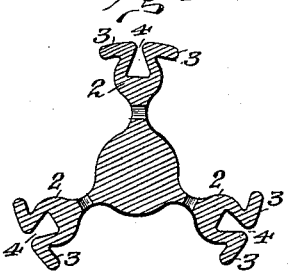


Fig. 5.

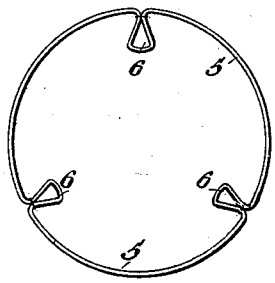
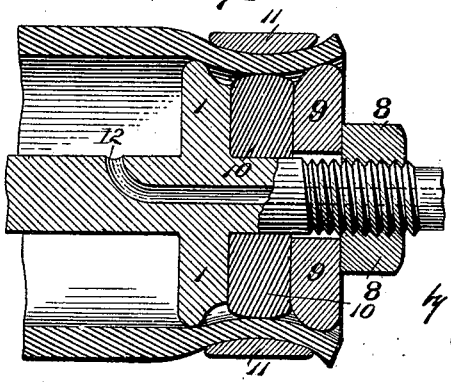


Fig. 6.



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MARTIN W. THRUSH, SAMUEL FRANK AARON, AND CHARLES P. MATTERN, OF PHILADELPHIA, PENNSYLVANIA.

PNEUMATIC ROLL.

SPECIFICATION forming part of Letters Patent No. 649,145, dated May 8, 1900.

Application filed January 16, 1900. Serial No. 1,656. (No model.)

To all whom it may concern:

Be it known that we, MARTIN W. THRUSH, SAMUEL FRANK AARON, and CHARLES P. MATTERN, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pneumatic Rolls for Clothes-Wringers and other Purposes, of which the following is a specification.

Our invention is directed to the production of a pneumatic roll the novel features of which are designed to provide a durable construction, the lack of which, so far as we know and can find, has been the chief difficulty with such devices, and to render the roll efficient for use in clothes-wringers and for what other purposes it may be deemed useful.

A particular statement of the improved construction and of the combination of devices therein will be set out in the concluding claims.

In the accompanying drawings, Figure 1 shows a pneumatic roll in elevation and the rings which bind the end thereof. Fig. 2 shows a longitudinal section thereof. Fig. 3 is a transverse section of the same. Fig. 4 shows in transverse section the roll-shaft constructed as a skeleton cylinder adapted to be provided with an inclosing fabric sleeve. Fig. 5 shows in cross-section the fabric sleeve and the provision whereby it is fastened to the skeleton cylinder, and Fig. 6 shows a modified construction of the fastening and sealing devices for the roll.

The mounting-shaft of the roll is provided at each end with a screw-thread, and between these screw parts and at a distance therefrom of one or more inches is a circular collar 1, having a diameter preferably less than the interior of the roll. Between these collars radial arms 2, three or more, are preferably formed upon the shaft and, extending therefrom to the walls of the roll, terminate in surfaces 3, concentric with the roll-walls, making a convex surface of two or more inches. Mediately of their width these convex surfaces have longitudinal grooves 4, the bottoms of which are preferably wider than the surface opening and open at its ends. Surrounding and inclosing this skeleton cylinder is a fabric sleeve 5, preferably of canvas, and the grooves of the arms are provided as a means of fastening this sleeve upon the arms. As a means for fastening the sleeve it is formed with loops 6, folded from its body, corresponding to the groove in the arms and extending their full length. The loops are formed by stitching, and within them are inserted bars 7, which correspond in cross-section to the inward-flaring form of the grooves and by inserting these bars into the grooves places and holds the fabric sleeve upon and over the arms.

The function of the skeleton cylinder and its fabric sleeve is to form a frictional binder for the rubber covering at the surface of the arms to prevent the covering from twisting upon the arms.

The outer covering of the roll is of rubber or other yielding material suitable to contain air under pressure, is open at both ends, of proper thickness, and of a length greater than the distance between the fixed collars, and the provision for sealing its open ends is one of the features of our improvement.

Between the fixed shaft-collars and the screw-nuts 8 clamping or pressure collars 9 are fitted loosely upon the shaft and are of the same diameter as the fixed collars and preferably of somewhat conical form on the face next the fixed collars. Between these collars is placed a rubber ring 10, having a sufficient thickness to be compressed to expand its diameter preferably a little beyond that of the collars and give it a thickness between the collars at their periphery of an inch or more.

Looking at Fig. 2, it will be seen that the rubber ring and the collars on the shaft have each a convex formation in cross-section and that on these three surfaces, at each end of the roll, the open end of the rubber covering is clamped and sealed. Coöperating with these sealing-surfaces is a metal binding-ring 11, having a width preferably a little less than that of the collars and the rubber ring. The inner wall of this ring is slightly less than the diameter of the rubber covering of the roll, so as to bend or crimp the latter, and we prefer to give the inner wall of the binding-ring a conformation that will effect

this crimping on the peripheries of the shaft-collars and the rubber ring. As shown in Fig. 2, this conformation has a concave middle and convex edges, so that the concave of the metal ring will be opposite the convex periphery of the rubber ring, while the latter will, by the clamping function of the nut on the shaft, be compressed to expand it outward, and thereby give the rubber covering a concave bearing upon the rubber ring and a convex bearing upon the metal collars. This construction gives three bearing-surfaces, two of which are metal, upon the inner wall at the open end of the rubber covering which renders the sealing perfect and durable and in which the jamming action of the loose collar coöperates with the fixed collar and the external binding-ring. At one end of the shaft is a central air-passage 12, which is provided with a valve 13, whereby compressed air may be admitted and retained in the roll.

Referring to Fig. 6, the external metal binding-ring is seen as convex on its inner wall in cross-section and that the rubber ring is of less diameter than the collars, so that the rubber covering has a regular bearing upon the collars and the rubber ring produced by the convex bearing of the metal ring.

For some uses of the pneumatic roll the fabric sleeve may be dispensed with, and the arms themselves by their concentric surfaces form the reinforcing-bearings for the roll, and in such case the number of the arms may be increased or diminished.

Referring to Fig. 2, it will be noted that the radial arms extend nearly the length of the roll, there being left an unobstructed space at each end of the roll for the passage of the air from the shaft-duct between the arms from one end of the roll to the other end, and the webs of the arms may be perforated to allow the air to pass into the spaces transversely through the arms.

We claim as our improvement—

1. In a pneumatic roll and in combination with the outer covering of the roll open at its ends, the mounting-shaft therefor, a fixed collar and a loose pressure-collar on the shaft both having a diameter less than the interior of the outer covering of the roll and having convex peripheries in cross-section, and a clamping screw-nut on the shaft, a rubber ring between the collars, and a metal ring externally on the roll-covering having its inner diameter less than the outer diameter of the roll whereby to bind and seal the open end of the roll-covering.

2. In a pneumatic roll and in combination with the outer covering of the roll open at its ends, the mounting-shaft therefor, a fixed collar and a loose pressure-collar on the shaft, a rubber ring between the collars, and a clamping screw-nut for the loose collar, a metal binder-ring externally on the roll-covering having an inner diameter less than the outer diameter of the roll-covering and of a width less than the total width of the collars and the rubber ring and means for securing the open ends of the roll-covering upon the shaft.

3. In a pneumatic roll and in combination with the outer covering of the roll open at both ends, a mounting-shaft therefor having radially-disposed arms extending to the inner walls of the roll-covering, terminating in surfaces concentric therewith and having longitudinal grooves open at the surface, a fabric sleeve inclosing said arms and means whereby it is engaged within the said grooves, and means whereby the open ends of the roll-covering are bound and seated upon the shaft.

4. In a pneumatic roll and in combination with the outer covering of the roll open at its ends, a mounting-shaft therefor having radially-disposed arms extending to the inner walls of the roll-covering and provided with longitudinal grooves open at the surface, a fabric sleeve inclosing said arms having loops formed therein, means whereby said loops are secured within the grooves, and means whereby the open ends of the roll-covering are bound and sealed upon the shaft.

5. In a pneumatic roll and in combination with the outer covering of the roll open at its ends, a mounting-shaft therefor having radially-disposed arms provided with longitudinal grooves open at the surface and flaring inward, a fabric sleeve inclosing said arms having loops formed therein, bars having the form in cross-section of the grooves within the loops whereby they are secured within the grooves, and means whereby the open ends of the roll-covering are bound and sealed upon the shaft.

6. In a pneumatic roll and in combination with the outer rubber covering of the roll open at both ends, the mounting-shaft therefor, a rubber sealing-ring on the shaft and means thereon for increasing its diameter by compression, of a ring-band externally on each end of the roll-covering having its inner wall of less diameter than the external diameter of the roll-covering adapted to compress the open ends thereof upon the rubber ring.

In testimony whereof we affix our signatures in presence of two witnesses.

MARTIN W. THRUSH.
SAMUEL FRANK AARON.
CHARLES P. MATTERN.

Witnesses:
WM. J. DIVINE,
JOHN F. DIVINE.