No. 647,146.

Patented Apr. 10, 1900.

E. MORETON.

PRINTING ROLLER.

(Application filed Sept. 17, 1898.)

(No Model.)

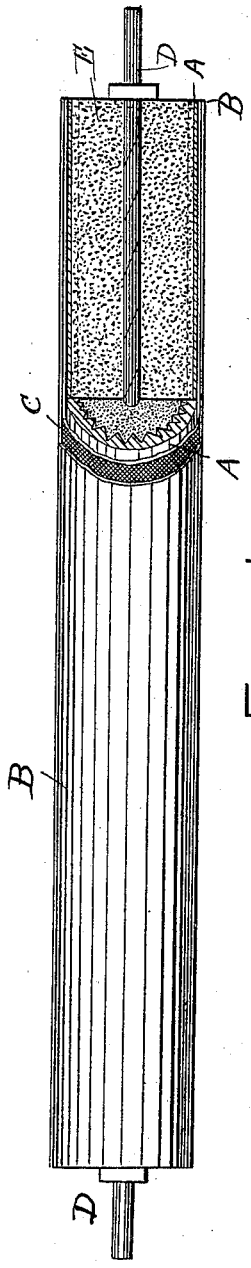

FIG. 1.

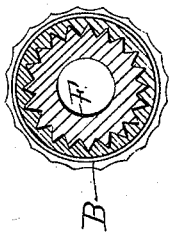

FIG. 4.

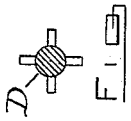

FIG. 7.

FIG. 3.

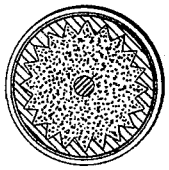

FIG. 5.

FIG. 6.

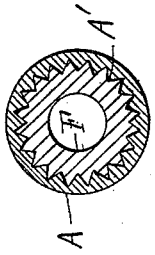

FIG. 2.

WITNESSES:
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UNITED STATES PATENT OFFICE.

EDWIN MORETON, OF STOCKPORT, ENGLAND, ASSIGNOR TO THE PERFECTION PRINTING ROLLER SYNDICATE, LIMITED, OF MANCHESTER, ENGLAND.

PRINTING-ROLLER.

SPECIFICATION forming part of Letters Patent No. 647,146, dated April 10, 1900.

Application filed September 17, 1898. Serial No. 691,272. (No model.)

To all whom it may concern:

Be it known that I, EDWIN MORETON, a subject of the Queen of Great Britain and Ireland, and a resident of South Reddish, Stockport, near Manchester, England, have invented new and useful Improvements in Processes of Making Printing-Rollers, of which the following is a specification.

This invention refers to a novel construction of roller for use in letter-press, lithographic, and collotype printing machines and the like, and has for its object to construct a roller which under ordinary conditions of working cannot alter or exceed its normal diameter or get twisted out of alinement with its central axis or stock and which affords and maintains the maximum amount of elasticity under compression, with facilities for varying such elasticity to suit the uses of the roller.

A roller constructed in accordance with my invention consists of two (or more) tubes of india-rubber superimposed, with a layer of textile material between, the inner tube being formed with roughenings (flutes, corrugations, or the like) upon its inner surface. Within such composite tubing after the central spindle or stock has been inserted a gelatinous compound is placed in fluid state, which flows into the flutings aforesaid, and when set thereby fixes the composite tubing upon the spindle and prevents all lateral twist or distortion.

On the accompanying drawings, Figure 1 represents my improved roller with one end in section to show the several component parts. Figs. 2 to 5 show the various stages of its manufacture. Figs. 6 and 7 show certain modifications of the roller-spindle.

A designates the inner tube of india-rubber with flutings A′; B, the outer tube of india-rubber; C, the intermediate layer of textile material, and D the stock or spindle. E designates the gelatinous composition within the composite tubing engaging with flutings A′ of tube A and spindle D.

In proceeding to make the roller I prefer the following *modus operandi:* I first take a mandrel F of the length of the intended roller and upon its exterior surface produce any suitable form of roughenings, but preferably fine parallel flutes or corrugations for the entire length. Upon such mandrel I apply india-rubber in its pasty or plastic condition, filling all the flutes and evenly spreading it over the entire surface, as shown in Fig. 2. I then wrap around such rubber-covered mandrel a layer of thin textile fabric, as shown in Fig. 3, and fix the same down upon the rubber by cement or rubber solution. I then apply a further but thinner layer of plastic india-rubber, as shown in Fig. 4. I then place the mandrel and its covering in a vulcanizing-chamber, and by heating in the ordinary way I vulcanize the said coverings into a homogeneous mass. If immediately removed from the mandrel after leaving the vulcanizing-chamber, the outer covering or sleeve of rubber B would (owing to the fluted cross-section of the inner tube A) have the peculiar wavy outline shown in Fig. 4. Hence when it is required to give the roller a perfectly-true circumference I grind the said outer surface until the wavy outline is eliminated and a perfectly smooth and regular exterior surface is obtained, as shown in Figs. 1 and 5. The composite tubing is then ready to receive the gelatinous compound E, and to effect the introduction of such compound I place the tubing vertically into a mold, place and support the stock D centrally within such mold, and then run the gelatinous compound in a fluid state into the space surrounding the spindle until perfectly full from end to end. Being in a fluid state, the compound readily finds its way into the flutings A′ and when set partakes of the same shape, and thus locks with the composite tubing and prevents all lateral twist or distortion in relation to the spindle, while the textile insertion C effectually resists all undue stretching of the rubber. In such way I produce a roller with the maximum elasticity within the compass of the roller and at the same time one that permanently retains its proper relationship with the spindle, which features for good printing are of the highest importance. By varying the ingredients of composition the elasticity of the roller may be varied.

Although I believe the flutings A′ will be sufficient for properly locking the composite tubing upon the spindle, I may form the spin-

dle with flutings or roughenings, pegs, threads, or flanges, as shown in Figs. 6 and 7, with which the gelatinous compound may also engage, and thus lock both spindle and tubing. In lieu of the roughening a piece of tape or cord wrapped in spiral form around the spindle, as shown by dotted lines in Fig. 1, might suffice.

To give a finish to the ends of the roller, also to support such ends and inclose the gelatinous compound, I may provide small metal or other disks within the inner tube and adapted to be fixed by fine wire or cement or to be fixed by projections thereon taking into the gelatinous compound or by being fixed or keyed to the spindle or in some other manner, as may be suitable for the purpose.

Although I prefer the tubes A and B to be of india-rubber, they may be of any suitable rubber substitute. Likewise there may be more than two tubes, with textile insertion between, and the application of a supporting-spindle may vary according to the use of the roller.

While chiefly intended for printers' inking-rollers for letter-press, lithographic, or collotype purposes, my invention is also applicable to platen-rollers for type-writing machines, varnishing-machine rollers, and to any other rollers requiring to be of an elastic character.

Having thus particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

In a process for the production of a printer's inking-roller or the like, applying a layer of rubber in a plastic state to a fluted or roughened mandrel, covering such rubber with textile material, and fixing by adhesive solution, superimposing a further layer of rubber and vulcanizing into a composite mass, grinding the outer surface to an even circumference, removing the composite tubing from mandrel, placing said tubing in a mold around a central stock or spindle, and molding gelatinous compound between said tubing and stock and retaining the said compound within the tube by means of a cap of metal or other material, as set forth.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

EDWIN MORETON.

Witnesses:

WALTER GUNN,

ARTHUR GRESTY.