

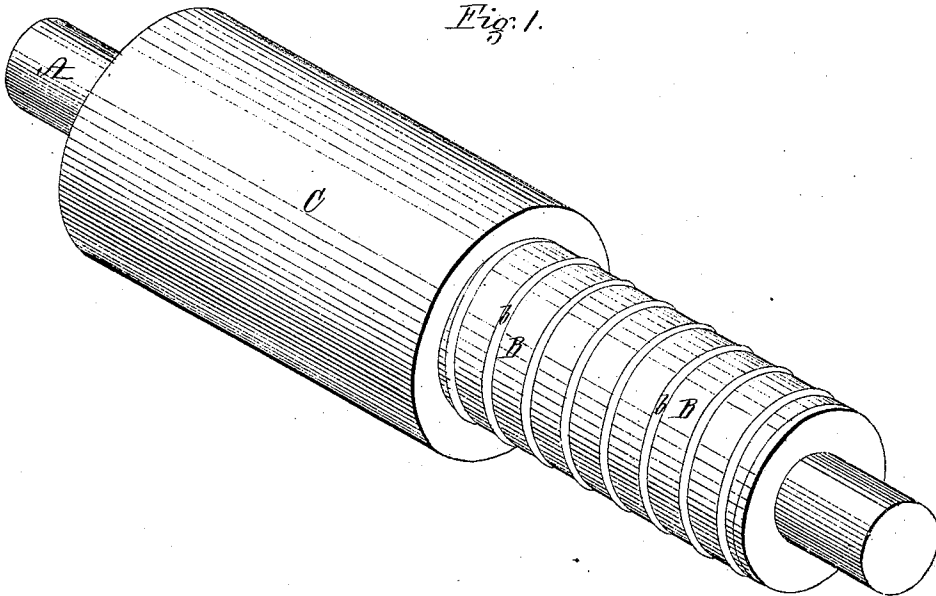
*J. B. Forsyth,*

*Manf. Elastic Rolls.*

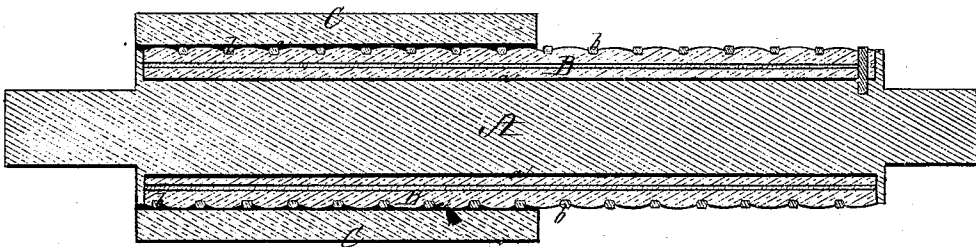
*No. 101,994.*

*Patented Apr. 19. 1870.*

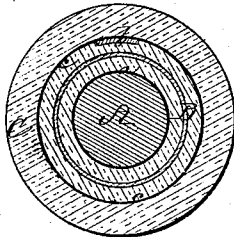
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses,  
W. J. Lambbridge  
L. E. Batcheller.*

*Inventor,  
James B. Forsyth  
By his Attorneys  
Feschmacher & Stearns.*

# United States Patent Office.

JAMES B. FORSYTH, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 101,994, dated April 19, 1870.

## IMPROVEMENT IN THE MANUFACTURE OF ELASTIC ROLLS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JAMES B. FORSYTH, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in the Manufacture of Elastic Rolls, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a perspective view, showing the construction of my improved elastic roll.

Figure 2 is a longitudinal section through the center of the same.

Figure 3 is a transverse section on the line  $xx$  of fig. 1.

My invention has for its object to prevent the slipping of the roll upon its shaft, and consists in forming the basis of the roll of semi-elastic material, secured to the shaft by wire, string, or in any other suitable manner, a cement composed of metallic filings, sal ammoniac, and sulphur, (with or without rubber,) being first laid upon the shaft to enable the semi-elastic basis to adhere thereto with greater tenacity, whereby I am enabled to produce a strong and durable elastic roll at a much less cost than where the interior or basis of the roll is composed wholly of rubber.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings—

A is a metallic shaft or mandrel, of suitable size, covered with a coating, *a*, of cement, composed of rubber, (one ounce,) filings of metal, (one pound,) sal ammoniac, (two ounces,) and sulphur, (one ounce,) mixed together, and reduced to a semi-liquid state with naphtha.

The shaft so coated should now be set aside for a day or two, to allow the cement to properly "set," after which is laid on the basis B of the roll or portion intended to form its interior, which is composed of semi-elastic material, with cloth, duck, or other suitable material interposed or not.

Next, I bind or secure this semi-elastic basis to its shaft or mandrel, by winding a wire, *b*, spirally outside the former, the end of the wire being securely fastened to the shaft.

A coat, *c*, of ordinary cement, (India rubber "compounded" and reduced,) is now evenly spread over the basis or semi-elastic interior of the roll, covering the wire *b*.

I then lay on a sufficient thickness of rubber C, with cloth or other fibrous material interposed or not, to make the roll of the size and elasticity desired.

The space between the semi-elastic portion or basis B of the roll and its covering or outside may be filled

up with cloth or duck, coated with rubber, so arranged that the fibers will radiate from the center, the outer ends of the fibers being exposed on its outer surface, and serving as a most reliable means of securely holding the covering thereto, as fully described in Letters Patent of the United States, No. 59,798, granted to me on the 20th day of November, A. D. 1866.

The roll is now wrapped in cloth, or put into a mold, and cured or vulcanized, by which process the whole is fused or united into one solid and compact mass.

A metallic cement may be made in which the rubber and naphtha are omitted, and water used instead, but when the rubber is not employed, the cement is not so tenacious.

The action of the metallic cement is to corrode the shaft, and produce inequalities in its surface, so that it will firmly cling thereto.

The semi-elastic interior or basis of the roll unites with the metallic cement, and tenaciously adheres thereto; but to guard against a possibility of its getting loose, a suitable fastening may be employed for securing it in place.

The elastic stock, which forms the covering of the roll, also adheres firmly to the cement laid upon the semi-elastic interior, and the roll thus made, after being properly vulcanized, will not be liable to turn or become loose on its shaft when subjected to any strain it is intended to bear.

The semi-elastic material forming the basis of the roll is composed of the following ingredients, viz:

Rubber, white oxide of zinc, sulphur, and cotton, or other fibrous material, the whole ground together, and then run into sheets, or coated on cloth.

The above-named ingredients I prefer, as I believe they produce the best results, but one or more of them may be omitted, and other substances may be substituted therefor.

India rubber, if highly "compounded," becomes semi-elastic after being cured; the ingredients mentioned will, however, make a very tough and durable roll.

Sometimes it may be necessary or useful to apply a coat of common cement over the metallic cement before laying on the semi-elastic interior or basis of the roll, and to still further provide against the liability of the roll becoming loose and slipping on its shaft, may be roughened or grooved before the cement is applied.

By constructing the basis of the roll of a semi-elastic material, and employing my improved cement for securing it in place, I am enabled to provide a strong and durable roll at a much less cost than a roll as heretofore constructed, in which the interior or basis

is composed wholly of rubber without fibrous material being mixed therewith.

*Claim.*

What I claim as my invention, and desire to secure by Letters Patent, is—

An elastic roll, the basis of which is composed of semi-elastic material, with cloth, duck, or other suitable material interposed or not, and secured to the shaft, substantially as set forth.

Also, the within-described cement, composed of the ingredients and mixed in about the proportions set forth.

Witness my hand this 22d day of March, A. D. 1870.

JAMES B. FORSYTH.

Witnesses:

N. W. STEARNS,  
W. J. CAMBRIDGE.