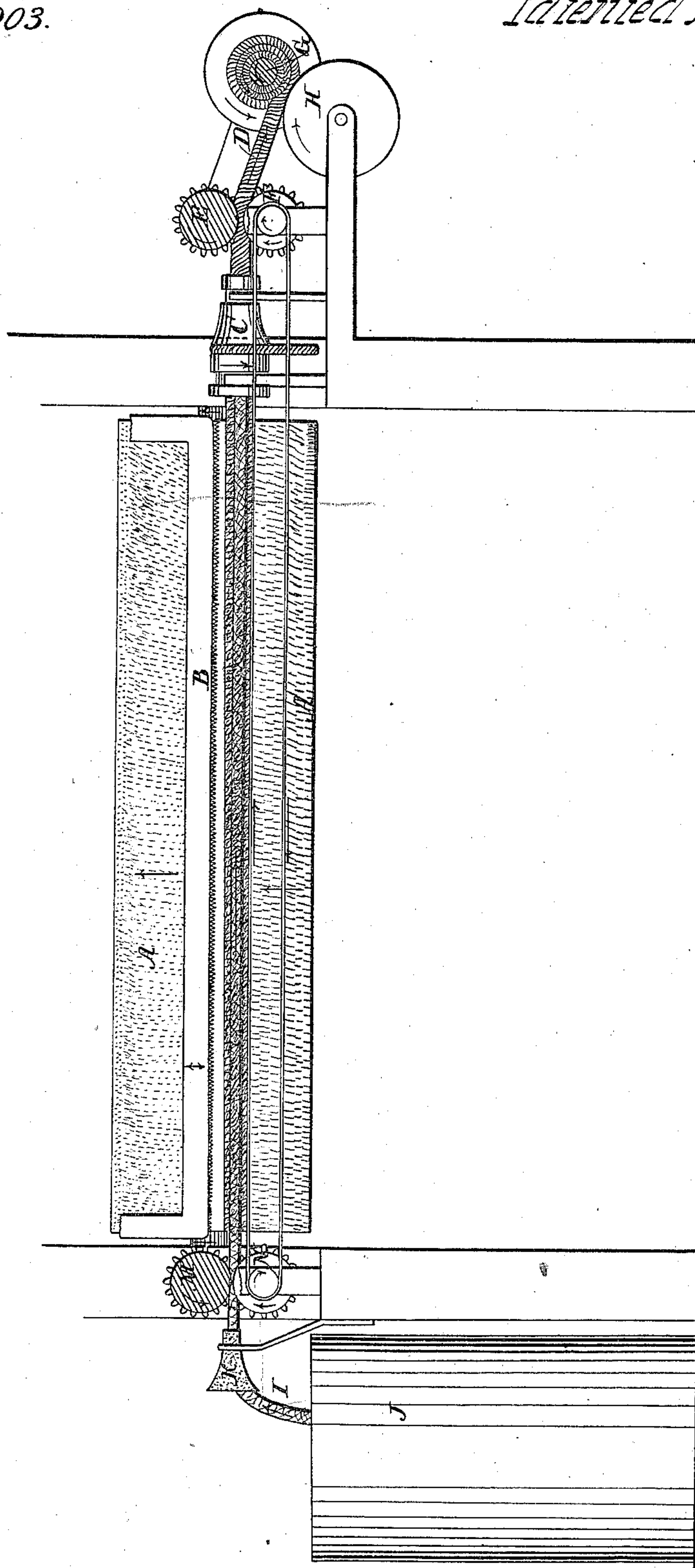


*G. S. Bradford.*  
*Yarn Covering Mach.*

*Nº 16,903.*

*Patented Mar. 31, 1857.*





# UNITED STATES PATENT OFFICE.

GEORGE S. BRADFORD, OF SANDLAKE, NEW YORK.

## MANUFACTURING YARN FROM MIXED COTTON AND WOOL.

Specification of Letters Patent No. 16,903, dated March 31, 1857.

*To all whom it may concern:*

Be it known that I, GEORGE S. BRADFORD, of Sandlake, in the county of Rensselaer and State of New York, have invented a new and  
5 useful Improvement in the Art of Carding and Mixing Wool and Cotton Together for Spinning Into Yarn; and I do hereby declare that the following is a full and exact description thereof, reference being had to  
10 the annexed drawing, making a part of this specification.

Most of the common woolen knit goods now manufactured, as well as some of the cheap woolen cloths in market, consists of  
15 wool and cotton mixed together in carding. The best mode of mixing the cotton with the wool heretofore adopted is to card the wool by itself and form it into side-drawings on the "first breaker" or first wool-carding  
20 machine, and to separately card the cotton and make it into drawings on cotton machinery. Then to run both these wool drawings and these cotton drawings, together, side by side through the "second breaker,"  
25 or second wool-carding machine, to form a side-drawing of mixed cotton and wool ready for the finisher; which latter wool-carding machine produces one roving of mixed cotton and wool ready for the spin-  
30 ning-jack from each drawing fed to it.

Now, I card the wool by itself and form it into side-drawings on the first breaker; but, instead of running cotton drawings through the second breaker along with the  
35 wool drawings, I make drawings ready for the finisher by running only the wool drawings made by the first breaker through the second breaker, and then introducing a cotton drawing which has been evenly prepared  
40 on cotton machinery within the wool as the latter is combed from the doffer of the second breaker and rolled into a side-drawing; as is illustrated by the annexed drawing, in which—

45 A is the doffer of the second breaker; B the comb; C the condenser for the side-drawing D; and E and F the rollers for drawing off, and G and H for taking up the side-drawing—all arranged and operating  
50 together as usual.

I is the evenly prepared cotton drawing, (seen colored red,) which is steadily drawn by the rollers E F, from a can, J, or other suitable retainer, through a guide, K, and  
55 the condenser C, so in front of the doffer A, that as the wool, (seen colored blue,) is

combed from the doffer in the manner of making a side-drawing, the cotton drawing, I, is evenly covered or wound with successive layers of wool—the fibers of the cotton core 60 remaining nearly or quite as straight as they were before being covered. The drawings thus made I run through the finishing cards, form into rovings, and spin into yarn, all in the common manner of making yarn for 65 hosiery.

In the operation of introducing the cotton drawing within the wool, I prefer to employ a second pair of rollers, M N, which may be just like the rollers E F, to draw the cotton 70 from the can just as fast as the completed drawing D, is taken up; for by thus using a second pair of rollers, that portion of the cotton drawing in front of the doffer will be relieved from undue tension, and also, the 75 cotton can be drawn by them through a trumpet-tube to re-smooth its surface before it is covered with wool.

Yarn made from wool and cotton carded and mixed together according to my im- 80 proved mode has less lumps and rough spots in it than when the cotton is run with the wool through the second breaker; for the second breaker is made for carding wool, but is not suited to straighten the fibers of 85 cotton; indeed, however straight the fibers may lay in cotton drawings made by cotton machinery, when such drawings are run with wool drawings through the second 90 breaker into a side-drawing, the fibers of the cotton will be more or less curled up so as to make lumps in the yarn. By my improvement all such curling of the fibers of the cotton by the second breaker is avoided; as 95 is also all waste of cotton by flying while running through the second breaker. Moreover, wool, to card easy and spin smooth, should be well oiled; but cotton works best dry. When drawings of wool and of cotton are run together through the second breaker, 100 only very little oil can be used on the wool; for the oil gets into the cards and makes the cotton roll into little wads in the machine. But when only the wool is run through the second breaker, the wool can be well oiled 105 without material injury to the cotton. But the greatest advantage secured by my invention is that yarn made from wool and cotton mixed together by my method has much more wool on its outside than yarn made of 110 the same proportions of wool and cotton mixed in any way heretofore practiced; so



that hosiery and other goods made of yarn composed of wool and cotton mixed by my method have a much more woolly surface, and are therefore better, than similar goods made of yarn consisting of the same proportions of wool and cotton mixed in the best manner heretofore known. For, the fibers of the cores of my drawings for the finisher are straight, and parallel, or nearly so, with the axes of the drawings, and the wool is laid smoothly around the cotton; hence, when such drawings are run straight through the finishing cards to the ring-doffers—which latter make a sliver from each drawing—the cotton continues between the divided wool while running through the cards, so that the middle parts of the slivers are mostly cotton, and the sides or edges wool; and when these slivers are rolled, twisted, or otherwise condensed into rovings, the most of the wool is left on the outside, and, on account of the straightness of the cotton and the curled and elastic condition of the wool yarn spun from such rovings appears still more woolly.

Drawings for the finisher have heretofore been made with cotton cores, by running all the wool drawings on that side of the second carding machine where the side drawing is completed, and the cotton drawings at the same time on the other side, so that as the wool and cotton are together combed from the doffer and rolled into a side drawing the wool is wound upon the rolled cotton. But when such drawings are made into rovings and spun into yarn, less wool is left on the outside of the yarn than upon yarn made from drawings composed of the same proportions of wool and cotton formed as in my mode; for, when the cotton is run through

the second breaker and combed off and drawn into a roll inside the wool, the fibers of the cotton are not only much curled, but they wind short around the axis of the drawing, and interlock with the fibers of the wool wound upon them, so that in running through the finisher the wool and cotton cling together and become much mixed and crossed so that the fibers of the cotton stick out through the wool more or less in the yarn.

Sometimes when the wool and cotton are run together through the second breaker, instead of running separate drawings of wool, and cotton, the cotton has, for convenience in working, been introduced within the wool as the latter was combed and rolled from the first cards into drawings for the second breaker; but thus introducing the cotton does not tend to make the yarn free from lumps, nor to throw the wool on the surface of the yarn.

I do not, in this specification, claim the mechanism employed by me for covering a cotton drawing with wool, but

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

Carding through the finisher, as specified, the drawing made by covering an evenly prepared cotton drawing with wool substantially as described; thereby leaving most of the wool on the outside of the finished roving without carding the cotton through any wool-carding machine but the finisher, and hence, leaving the staple of the cotton, straight in the finished roving, as set forth.

GEORGE S. BRADFORD.

Witnesses:

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A. F. PARK.