

UNITED STATES PATENT OFFICE.

DANIEL EDGAR COE, OF TRENTON, NEW JERSEY.

ART OF MAKING WORSTED YARNS, &c.

SPECIFICATION forming part of Letters Patent No. 361,266, dated April 19, 1887.

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To all whom it may concern:

Be it known that I, DANIEL EDGAR COE, a citizen of the United States, and a resident of the city of Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in the Art of Making Worsted Yarns from the Slivers Delivered from the Combing - Machine, of which the following is a specification.

My improvements are designed more especially for application in the manufacture of worsted yarns, as contradistinguished from carded yarns or those which are manufactured from slivers from which the noil has not been removed; and it has for its object to obviate the conversion of the slivers into "top" before commencing their reduction into roving or yarns, and to reduce to the minimum the draft of the slivers when in a twisted condition.

Heretofore in the manufacture of worsted yarns from the slivers of the combing-machine it has been the custom to first form the slivers into top, and then to reduce such top to a yarn by successive doublings and drawings until the proper degree of attenuation has been attained. In the manufacture of tops several slivers from the combing-machine are combined and passed through either a can-gill or a gill-box, where the combined slivers are drawn to such an extent that the sliver delivered therefrom, while being much smaller than the mass fed to said gill or gill-box, is somewhat larger than any one of the individual slivers forming such mass. The sliver as thus formed by either of these machines, if sufficiently reduced and evened, is wound into a ball, and constitutes what is known in the art as "top." If, however, the drawing and the evening of the mass of slivers have not been sufficient upon the machine employed and it be desired to draw and even it further, the sliver delivered therefrom, instead of being wound into a ball, is delivered into a can, and several of these slivers are combined and passed through a similar machine, as in the preceding operation, where a further drawing and evening is effected, the sliver thus formed being wound into a ball and constituting top. The sliver delivered from this machine, as in the preceding one, while having been drawn so as to be considerably smaller

than the combined mass formed from the union of the slivers at the back of the machine, is larger than any one of the individual slivers of said mass, so that after having been thus operated upon the sliver delivered, instead of being reduced in size, is considerably larger than that furnished by the combing-machine. From this point forward the reduction of the top to a yarn is accomplished by passing it successively through a can gill-box, spindle gill-box, a series of four spindle drawing-boxes, and roving and spinning machines, in which machine it receives the proper doublings, drawings, and twistings to transform it into yarn.

I have discovered that by reducing the number of slivers which are combined at the backs of the several machines, made use of to transform the combed sliver into yarn, and by modifying the treatment thereof, as hereinafter described, the operations incident to the manufacture of the slivers of the combing-machine into top before commencing their reduction into roving may be obviated, as well as several steps in the process of such reduction omitted in consequence thereof, and a superior quality of roving produced thereby.

My invention therefore consists of an improvement in the art of making yarn from slivers of combing-machines, in which said slivers are transformed into yarn without having first been formed into top, as has been the custom heretofore.

In practicing my invention the slivers are taken from the combing-machine and the proper number (usually one-half the number heretofore combined) are brought together and passed through a can gill-box, where they are drawn to such a degree as to form a sliver which is somewhat smaller in diameter than the individual slivers delivered by the combing-machine, and are deposited in suitable cans, care being taken in the operation of this machine that the same number of feet or yards of untwisted sliver are deposited in each of the cans. These cans are then arranged in sets, (containing, generally, about one-third the number ordinarily employed,) so that each set shall contain the same amount of sliver, by weight, as the others, and the slivers from one set of such cans are then combined and passed through a cone drawing-spindle gill-box, where

they are subjected to a further drawing operation, and a sliver produced which is smaller in diameter than are the individual slivers delivered from the preceding machine. The material delivered by this machine is then slightly twisted, forming what is known in the art as "slubbing," and wound upon a bobbin. From this machine the bobbins containing the slubbing are transferred to an open drawing-box, where several of such slubbing are combined, and, after having been subjected to a third drawing therein, are twisted slightly and again wound upon bobbins, as in the preceding operation. The bobbins containing the slubbing, as it leaves this machine, are now taken and arranged in sets, so that each set shall contain the same amount of slubbing, both as regards the weight and number of yards. After having thus been arranged, the slubbing from the bobbins comprising one set are then combined and passed through a second open drawing-box or finisher, where a fourth drawing takes place, the product of this operation being twisted and wound upon a bobbin, as in the last two mentioned operations. From this machine the slubbing is transferred to the ordinary roving-frame, in which it is transformed into roving, and from thence to the spinning-machine, where it is converted into yarn in the ordinary manner.

By this method of procedure, as will be seen, I am enabled to convert the slivers of combing-machines into yarn with the minimum number of operations, and at the same time to produce a yarn which is superior in all respects to that heretofore produced by the old method, obviating the conversion of the sliver into top, and the consequent destructive effects upon the fibers of wool, due to the increased draft of the sliver in the subsequent operations necessitated thereby, and also in addition thereto to greatly cheapen the manufacture of the yarn.

The respective drafts and doubling necessary to the production of yarns may be varied to suit them to the different characters of wool employed and the sizes and numbers of yarn required, and in the manufacture of No. 60 yarns from sound seven-inch wool, of a weight of one hundred and forty drams to forty yards

of sliver, I have found the following to give the best results, viz: drafts, $7 + 7 + 7 + 7 + 7 + 6\frac{1}{2}$; doublings, $5 + 4 + 3 + 2 + 2$.

In the foregoing description I have described six steps as requisite for the transformation of the slivers from the combing-machine into yarn; but I do not limit myself to the exact number, as it is obvious that I may omit one or more of such steps or add others, as may be required to make coarser or finer yarn, respectively. I have also described the machinery which I usually employ in the carrying out of my invention, which I deem the best suited to the purpose; but I lay no claim thereto, and do not restrict myself to the use of such machinery, as it is obvious that I may employ any equivalent form, if I so desire, and still be within the scope of my invention.

Having thus described my invention and one way in which it is or may be carried into effect, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The improvement in the art of manufacturing yarn from the sliver of a combing-machine, which consists, first, in drawing said sliver without transforming it into top, next successively drawing and twisting the untwisted sliver thus formed until reduced to a roving, and finally drawing and spinning said roving into yarn, substantially as described.

2. The improvement in the art of manufacturing yarn from the slivers of combing-machines, which consists in conducting a number of such slivers to a can gill-box and drawing the same thereon, next conducting a number of slivers from such can gill-box to a cone drawing-spindle gill-box and to a first and second open drawing-box, and doubling, drawing, and twisting them thereon, next conducting the slubbing thus formed to a roving-frame and drawing and twisting them into rovings upon such frame, and finally conducting such rovings to a spinning-machine and converting them into yarns, substantially as described.

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Witnesses:

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