

UNITED STATES PATENT OFFICE.

STEPHEN M. ALLEN, OF NIAGARA FALLS, NEW YORK.

IMPROVEMENT IN THE MANUFACTURE OF THREAD AND YARN.

Specification forming part of Letters Patent No. 27,877, dated April 17, 1860.

To all whom it may concern:

Be it known that I, STEPHEN M. ALLEN, of Niagara Falls, in the county of Niagara and State of New York, have invented certain new and useful Improvements in the Manufacture of Thread and Yarns from Fibrous Materials; and I do hereby declare that the following description forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The present invention consists in a new and useful improvement in the production of threads or yarns from fibrous materials by combining the fibers of cotton and wool with a short fiber produced by reducing, substantially in the manner hereinafter set forth, the fiber of flax, hemp, jute, silk, or china-grass, or any other long-staple fiber, whereby they can be spun in the ordinary cotton and wool machinery, and a better and stronger thread or yarn be at a cheaper rate produced than has heretofore been possible. Long fibrous substances, like flax, &c., have heretofore been mixed with cotton or wool; but they could not be spun by the ordinary short-staple cotton and wool machinery for the reason that, although chemically treated to effect disintegration, the system heretofore known and practiced of reducing long-staple fiber in length consisted in cutting the same up into pieces of given lengths, which, when mixed with short-staple fiber, could not be spun, as the blunt end of the cut-up fibers rendered their entwining or their forming perfect union with the ends of the naturally short fibers impossible. Previous to my invention, therefore, no flax, hemp, jute, silk, china-grass, or other similar fibrous materials have ever been prepared so that it could, when mixed with cotton or wool, be spun on the ordinary cotton and wool machinery for the purpose of forming yarn or cloth.

Having thus stated the nature and main object of my invention, I shall now proceed particularly to describe my invention and the general method or manner in which the same is or may be carried into effect.

I take long fibrous material, like flax, hemp, jute, silk, or china-grass, &c., and reduce either or all to the required length by submitting them,

at given distances, (corresponding to the length of the reduced fiber required,) to a tensile strain, whether combined or not with torsion or other strains, but sufficiently powerful to produce the separation of the fiber. The fiber is thus disintegrated or disunited and separated into pieces of uniform length, the ends of which pieces present the individual fibrils of which the fiber is composed in an open and stranded form, and have a great tendency to unite and entangle or interlace with the end of any fiber. I therefore produce a double reduction of the fiber—*i. e.*, not only in the direction of its length, but also in the direction of its thickness, or across the fiber at that point where it is again to unite with other fiber. I effect the reduction of the fibers by means of machinery the functions of which are such as to operate on the fiber in the manner described—*i. e.*, effect the reduction of the fiber by straining it between two given points, so as to disintegrate and separate it, as set forth.

The process of separation should be followed by and combined with one producing the disintegration of the fiber laterally. The short or reduced fibers are therefore subjected to a chemical process or to an electrical process, by which the fibers are more perfectly disintegrated and separated. The disintegrating process I now use with perfect success (and for which Letters Patent of the United States have been granted to me on the 20th day of March, 1860) consists in subjecting the reduced fiber obtained from flax, jute, hemp, or other long-stapled vegetable fiber to heated air charged with steam or the vapor of alcohol, spirits of turpentine, &c., up to its point of saturation. The action of this saturated air produces an effect upon the fiber which has never before been attained by any process heretofore attempted—*viz.*, it softens and separates the elements that hold the fibrils together without destroying or injuring its natural structure, and opens the capillary tubes, so that the albumen, resinous, and coloring matters can be readily reached and removed by water. The short staple thus produced is then bleached or colored, or both bleached and colored, and mixed with cotton or wool, carded, spun, and afterward woven on the ordinary short-staple cotton or wool machinery. By making the fibers of the flax, &c., longer or shorter than those of the cotton or wool the outer surface of

the thread or yarn can be made in spinning to assume the appearance of that fiber which is the shorter, thereby producing such a finish or surface to the cloth when woven as may be desired.

Having thus described my improvement, what I claim as my invention, and desire to have secured to me by Letters Patent, is—

The new article of manufacture, the same consisting in thread and yarn made by combining ordinary short-stapled fibrous materials, like cotton or wool, with a short fiber prepared from long-stapled fibrous materials, like flax, hemp,

jute, silk, china-grass, and similar substances, by both the described mechanical reduction and chemical treatment herein referred to, so that when so combined they can be spun on the ordinary cotton and woolen machinery.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

STEPHEN M. ALLEN.

Witnesses:

A. POLLOK,
STEWART GWYNN.