UNITED STATES PATENT OFFICE.

HORATIO N. GAMBRILL, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN DRESSING COTTON-DUCK.

Specification forming part of Letters Patent No. **8,444**, dated October 21, 1851.

To all whom it may concern:

Be it known that I, HORATIO N. GAMBRILL, of Baltimore, in the county of Baltimore and State of Maryland, have discovered a new and useful Process for Stretching and Softening Cotton Duck or Sail-Cloth; and I do hereby declare the following to be a full, clear, and exact description of the manner of doing the same.

Heretofore in the manufacture of cotton-duck or sail-cloth it has been found impossible to produce an article which would combine both the essentials of the material—namely, the firmness or body sufficient to prevent it from stretching and the softness requisite to an economical sewing of it together—for when made of sufficient body to prevent stretching it was found almost impossible to pass a needle through the double thickness, and when made for easy sewing it was found after a few days; use as sails to require stripping and refitting.

I have also discovered by actual experiment that the unyielding nature of cotton-duck, or harshness, is partially attributable to a gummy substance in the cotton, which can only be removed by the process to be hereinafter described; and also that by any means heretofore known for stretching cotton canvas or duck no desirable result has been obtained, inasmuch as after having been stretched by such process it invariably shrunk back by exposure to moisture and heat, the elasticity of the material not having been entirely checked or set. By my process I have entirely overcome these difficulties, inasmuch as I can remove the gum and make the heaviest quality of cotton canvas perfectly pliable and more easily sewn, and after being sufficiently stretched for the purpose for which it is to be used the body of the fabric is so set as comparatively to prevent any future shrinkage by the most rigid tests that can be applied to it.

The nature of my invention consists in subjecting the canvas to a jet or jets of steam and passing it over, under, or around stationary heated cylinders or friction-rollers and between and around rotary pressure calender-rollers while the canvas is in a state of tension.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the samples herewith presented, which are marked respectively Nos. 1 and 2. No. 1 is the material as it comes from the loom, and No. 2 the same material after passing through the process herein claimed.

The fabric is taken in the bolt (the ends of the bolts being successively basted together, so as to make, as it were, a continuous piece) and allowed to pass over steam-pipes perforated with small holes, or may pass through a steam-chamber, or the steam may be jetted into the folds of the canvas, which loosens and drives out the gummy matter in the canvas. It is then passed over, under, or around heated friction-cylinders, of which there should be a suitable number, so as to give the canvas a sufficient number of turns or folds to strain it up to the desired tautness and draw it hard against said heated cylinders, so that the friction and heat shall polish and dry it. It is then passed around calender-rollers onto a roller which takes it up finished. In passing the canvas between and around the calenders it is strained up to its utmost tension, and in this condition is powerfully pressed by the calenders, which sets the fabric, and which condition it will remain and be a much more merchantable article than any heretofore produced, possessing both the desired pliability for being more easily sewn and a firmness or set which will prevent it from shrinking or stretching until a greater strain is put upon it than when passing through the above-described process.

The strain usually put upon the canvas while undergoing the process is about one ton, but may be varied to suit the varied purposes for which the canvas may be designed.

Having thus fully described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

The process herein described of softening and stretching cotton duck by subjecting it, while strained, to jets of steam, and passing it over, under, or around heated stationary friction-rollers and between and around rotary pressing calender-rollers, for the purposes herein specially set forth and described.

HORATIO N. GAMBRILL.

Witnesses:

A. B. STOUGHTON,

T. C. DONN.