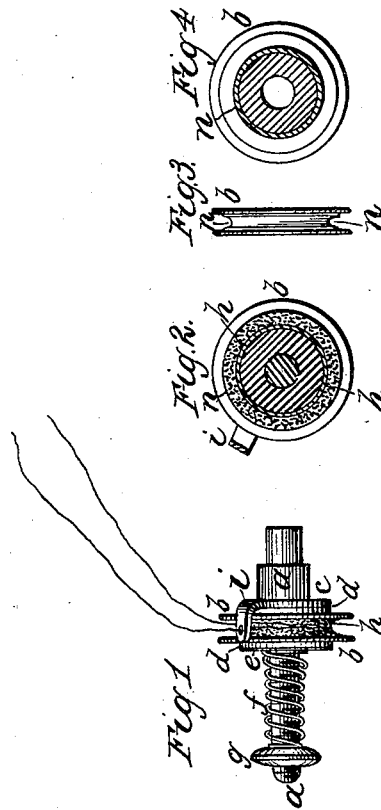


J. L. OTIS.

Thread Tension Device for Sewing Machines.

No. 51,346.

Patented Dec. 5, 1865.



Witnesses.

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# UNITED STATES PATENT OFFICE.

J. L. OTIS, OF FLORENCE, MASSACHUSETTS.

## IMPROVEMENT IN THREAD-TENSION DEVICES FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. 51,346, dated December 5, 1865.

### *To all whom it may concern:*

Be it known that I, J. L. OTIS, of Florence, in the county of Hampshire and State of Massachusetts, have invented a new and useful Improvement in a Thread-Tension for Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a view of a tension mechanism for a sewing-machine with my improvement embodied in it. Fig. 2 represents a section through the roughened tension-wheel. Figs. 3 and 4 are designed to illustrate what has been heretofore used for a thread-tension, but which has been found objectionable.

In sewing-machines it is very desirable to have a tension which will take the thread from the spool and deliver it to the needle without the intervention of a brake or drag of any kind between the spool and tension. A brake or drag on the thread always causes an irregular stitch, because it holds to the coarse places in the thread more strongly than to the finer places; whereas a thread running directly to the wheel from the spool and turning the wheel with it gives a uniform tension independent of irregularities in the thread. This difficulty has been heretofore partially overcome by covering the tension-wheel with rubber, but the rubber wears out very fast and causes much trouble to those working or using this kind of machine, notwithstanding it works perfectly while it lasts. The reason that iron or steel cannot be used for this purpose is that the thread will not adhere to it when loosened; and the moment the machine stops, and the thread, from any cause, become slack the texture and elasticity of the thread causes it to fly away from the wheel, and when the machine starts again there is no tension on the thread until all the slack is sewed into the cloth or otherwise taken up. Thread will not fly away from a rubber wheel in this manner; but the great objection to rubber, as above stated, is its want of durability. Cloth, felt, and other similar substances, have been tried for causing uniform tension, but they do not accomplish the purpose.

My invention consists in making the wheel, or that portion of it with which the thread comes in contact rough by means of emery, sand, pounded glass, or other mineral or earthy substances cemented to the wheel, by which means I attain the desired object, the thread

adhering to such a roughened surface, when the machine is stopped or the thread slackened, as tenaciously as it does to the rubber, while it is as durable as the iron or metal itself.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

*a* represents a stud or stem for supporting the tension-wheel *b*. On this stem *a* there is a flange, *c*, upon which, or between which and the wheel, is interposed a piece of cloth, felt, or other soft or elastic material, *d*, to prevent the wheel from turning too freely. On the opposite side of the wheel is another piece of felt or other soft and elastic material, *d*, against which a disk, *e*, is pressed and made adjustable by means of a coiled spring, *f*, and thumb-nut *g*. By this arrangement the wheel is controlled so as to turn under an adjusted amount of strain.

The wheel *b* has a deep groove formed in its perimeter, so as to guide and take the thread from the bobbin, and the thread thus passing around the wheel should have two turns thereon. This I find to be the best number, though, of course, I do not limit myself to that number. In this groove or depression in the perimeter of the wheel I cement emery, sand, pounded glass, or any other sharp or gritty matter, *h*, that will cause the thread to cling to it and pay out as the wheel turns. The wheel may be furnished with the usual thread-guide *i*.

Figs. 3 and 4 represent the tension-wheel heretofore used, with an application of rubber, *n*, applied to prevent the thread from slipping; but this, though it answers the purpose, soon wears out; and I propose to roughen the surface of the wheel usually occupied by the rubber by adding a sharp or gritty substance to the metal of which the wheel is composed at that part.

Having thus fully described my invention, what I claim is—

Roughening that part of the tension-wheel of sewing-machines around which the thread passes by cementing or otherwise fastening to it emery, sand, pounded glass, or any other equally sharp or gritty matter that will hold the thread in contact with it, substantially as and for the purpose described.

J. L. OTIS.

Witnesses:

D. W. BOND,  
R. M. BRANCH.