

E. HUNT.

DEVICE FOR DRIVING A HELICAL SEWING NEEDLE.

No. 294,627.

Patented Mar. 4, 1884.

FIG. 2.

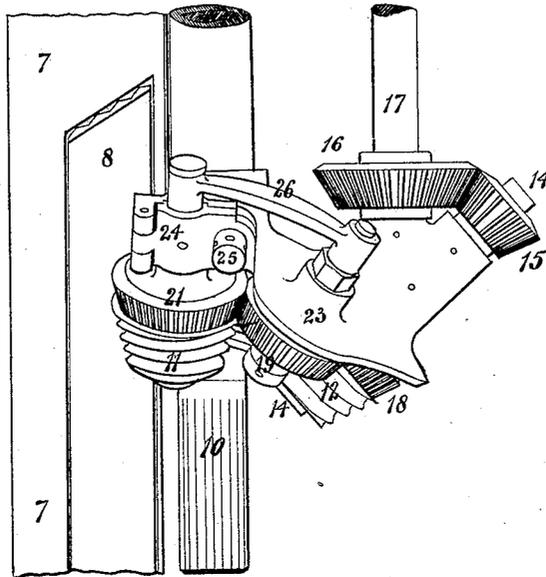


FIG. 4.

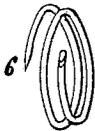


FIG. 3.

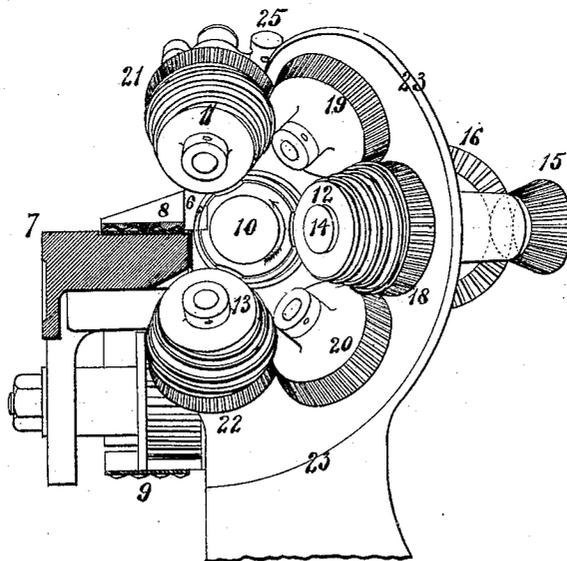
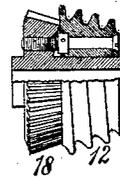


FIG. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

EDMUND HUNT, OF GLASGOW, COUNTY OF LANARK, SCOTLAND.

DEVICE FOR DRIVING A HELICAL SEWING-NEEDLE.

SPECIFICATION forming part of Letters Patent No. 294,627, dated March 4, 1884.

Application filed December 5, 1883. (No model.) Patented in England July 17, 1878, No. 2,856; in France January 16, 1879, No. 128,474, and in Germany February 11, 1879, No. 9,802.

To all whom it may concern:

Be it known that I, EDMUND HUNT, a subject of the Queen of Great Britain and Ireland, and residing at Glasgow, in the county of Lanark, Scotland, have invented an Improved Device for Driving a Helical Sewing-Needle, (for which the following patents have been obtained, namely: British, dated July 17, 1878, No. 2,856; French, dated January 16, 1879, No. 128,474, and German, dated February 11, 1879, No. 9,802,) of which the following is a specification.

My invention relates to sewing-machines of the kind by which a thread (or combination of two or more threads acting as one thread) is laid in a helical form, and is made to pass round the edge or edges of the cloth or material to be overcast or sewed together.

In Laing's machine—which I believe to be the most successful of the earlier machines of the kind referred to, and which is fully described in the specification of Laing's United States Patent, dated April 27, 1875, No. 162,665—the needle is a smooth cylindrical helix frictionally driven by means of a belt. This needle goes completely through the cloth, like the needle used in ordinarily sewing by hand, and cannot therefore be fixed to any part of the machine.

The object of my invention is to drive the needle in a positive manner, notwithstanding that it is smooth or without notches or teeth. I employ helically-grooved pulleys to hold and drive the helical needle, and inasmuch as the needle, if made a cylindrical helix, would by the resistance to its passing through the cloth be made to creep or gradually slip out of its proper place between correspondingly-cylindrical helically-grooved pulleys, I make the needle in the form of a conical helix, and hold and drive it by means of correspondingly-conical helically-grooved pulleys, forming what I term the "helicone driving arrangement." The axes of the conical needle and driving-pulleys all converge to one point, and the arrangement is such that the resistance would tend to make the needle creep toward that point; but the gradual narrowing of the space between the driving-pulleys prevents the needle from so creeping, excepting at first and to a very limited extent, depending

on its convolutions becoming slightly smaller in consequence of its elasticity.

In the accompanying drawings, Figure 1 is a front elevation of the entire machine. Fig. 2 is an enlarged plan of the needle-driving parts. Fig. 3 is a sectional end elevation corresponding to Fig. 2. Fig. 4 is a front elevation of the needle, and Fig. 5 is a sectional elevation of one of the driving-pulleys with its bevel-wheel.

The needle 6 is in the form of a left-hand conical helix of a little more than two convolutions, and is placed with its axis in a horizontal plane, and with its larger convolution and pointed end toward the left hand, the hook or eye for the thread being at its other or right-hand end. The cloth or sacking to be seamed or overcast is moved along from left to right upon a ledge or narrow table, 7, its right-hand end being entered under the left-hand end of a long narrow presser-foot, 8. The feed motion of the cloth is continuous, being produced by an endless chain, partly indicated at 9 in Fig. 1. The needle leads the thread down through the cloth and brings it up round the edge, and each loop or stitch is also carried round what is known as the "thread-barrel," 10, which extends through the center of the needle. My invention has nothing to do with this thread-barrel or its driving or other details; but it may be briefly explained that the barrel rotates with a surface speed somewhat greater than that of the needle, and acts frictionally on the loops of thread, so as to help the thread forward after the needle. On commencing a seam, the barrel 10 projects to the right hand from the needle to an extent corresponding to the length of seam, and the loops move along (with the cloth) to its right-hand end, on reaching which they slip off in succession, while the barrel then moves slowly backward or toward the left hand. The rate of the progressive motion of the cloth and that of the backward movement of the barrel are such that the stitches in the cloth become tightened to the desired degree as they successively pass forward beyond the end of the barrel.

The needle 6 is placed between three conical helically-grooved driving-pulleys, 11 12 13, the middle one, 12, behind the needle, having

its axis in the same horizontal plane as the needle, and being fixed on a spindle, 14, which is driven by means of bevel-wheels 15 16 from the first-motion shaft 17 of the machine. On the spindle 14 of the middle pulley, 12, there is also fixed a toothed bevel-wheel, 18, which, through intermediate bevel-wheels, 19 20, drives bevel-wheels 21 22, fixed to the upper and lower pulleys, 11 13. The pulleys 11 12 13 and bevel-wheels 18 19 20 21 22 are carried by a standard, 23, partly in the form of part of a spherical shell, all but the middle pulley, 12, and its bevel-wheel 18 being on studs. The stud of the top pulley, 11, is movable, being held in its place by a hinged cover, 24, secured by a screw, 25, while the back of the stud is fitted to an arm, 26, which is centered on the stud of the intermediate bevel-wheel 19 made to project at the back for the purpose. When the cover 24 is opened, the top pulley, 11, with its bevel-wheel 21, can be turned over; but the arm 26 makes the bevel-wheel 21 keep in gear with the intermediate bevel-wheel 19, and thereby prevents the pulley 11 from being turned into a wrong position relatively to the other pulleys, 12 13. The top pulley, 11, is made movable in this way to give access for

placing or removing the needle 6. The front line of the horizontal section of the cone of the needle has necessarily to coincide with the line of stitching—that is, of the holes made successively in the cloth—and as the said line must pass through the apex of the cone, it follows that the point to which the axes of the needle and its driving-pulleys converge is in the line of stitching. It also follows that the axis of the needle, which axis is also the center line of the group of pulleys and their bevel-wheels, is not at right angles to the plane of projection of Fig. 3, and allowance must be made for this in judging of their positions from that figure.

What I claim as my invention is—

A sewing-machine having a needle in the form of a conical helix, and conical helically-grooved pulleys supporting and adapted to drive said needle, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDMUND HUNT.

Witnesses:

ROBT. KINNIBURGH,
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