

H. H. GOODWYN.

Sewing Machine.

No. 24,455.

Patented June 21, 1859.

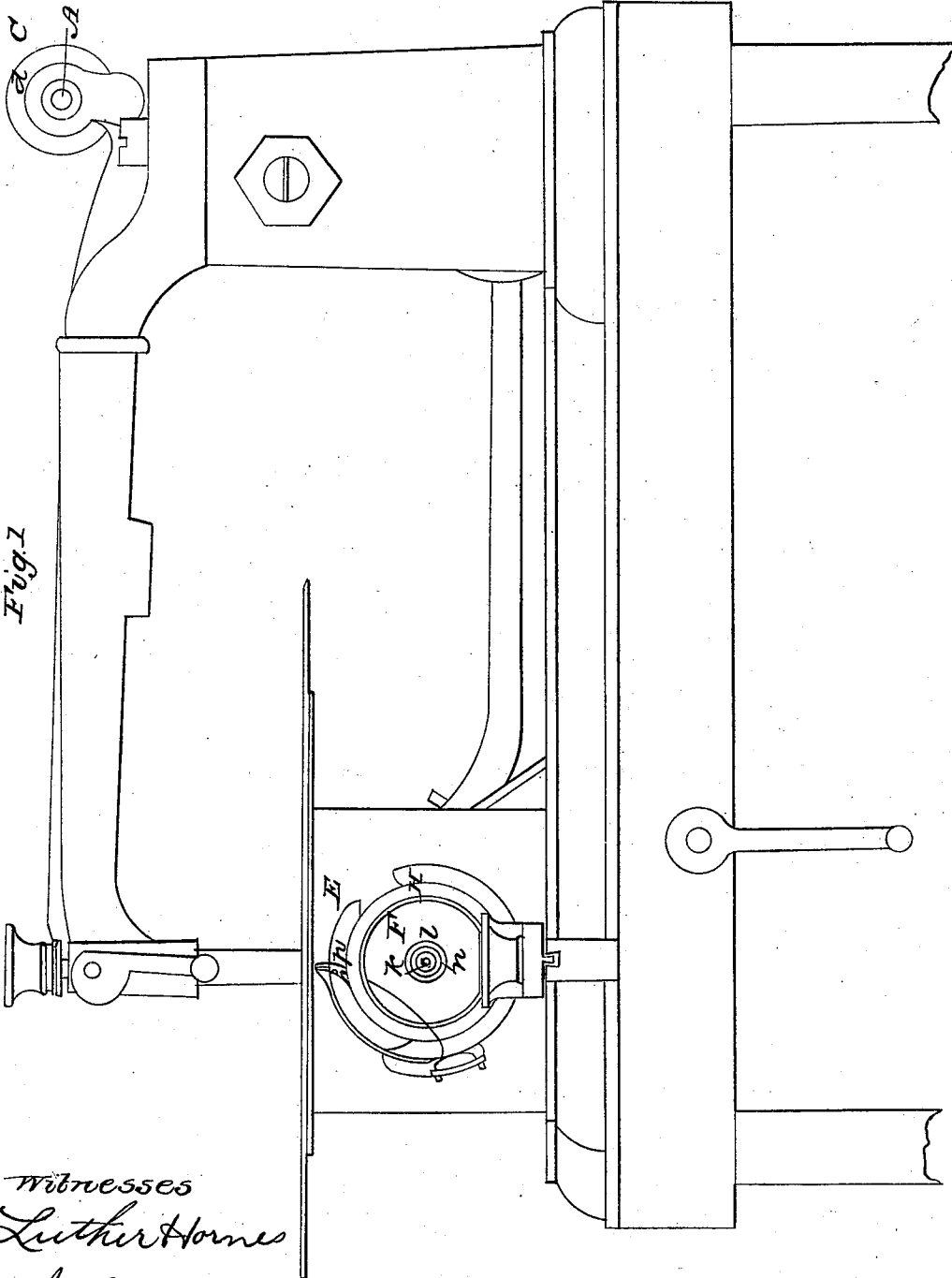


Fig 1

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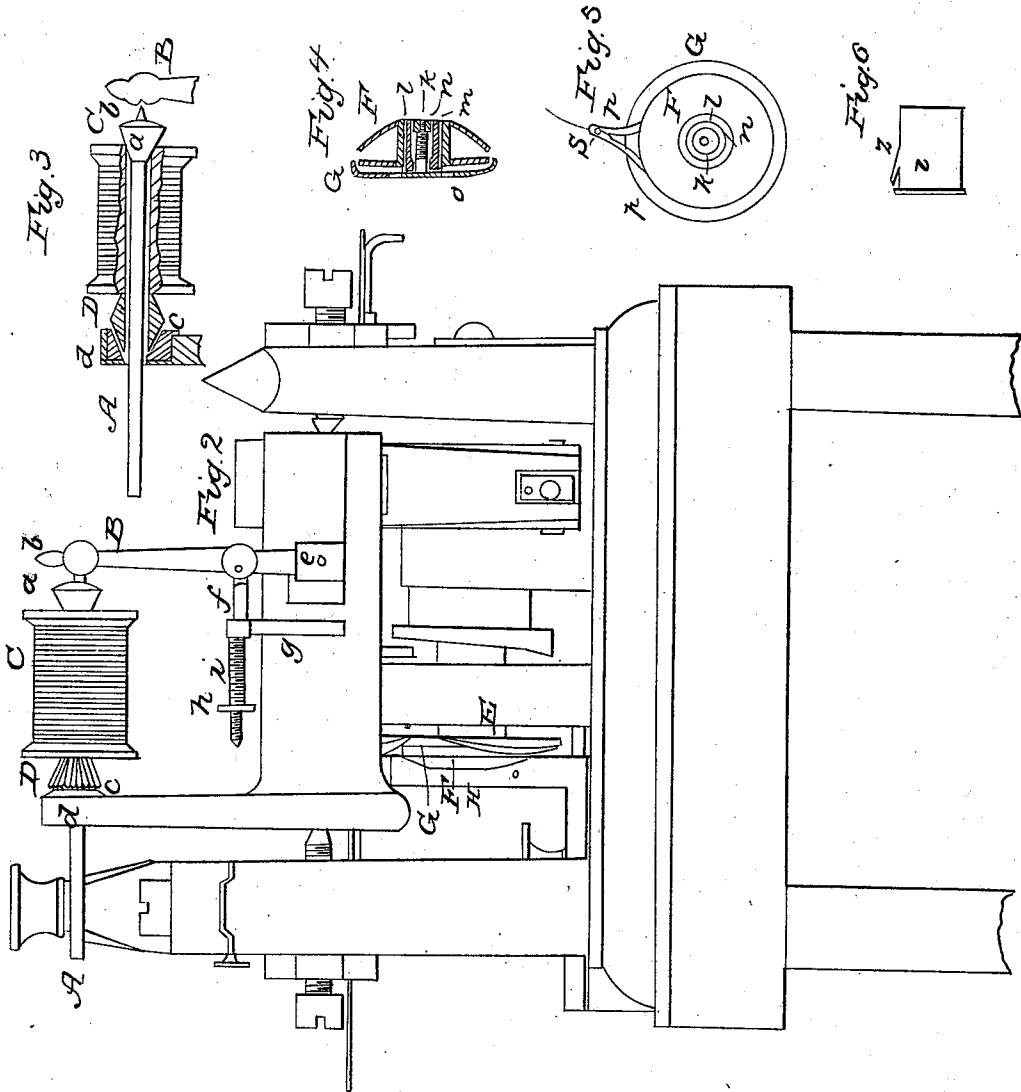
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UNITED STATES PATENT OFFICE.

H. H. GOODWYN, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 24,455, dated June 21, 1859.

To all whom it may concern:

Be it known that I, H. H. GOODWYN, of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in the Tension Arrangement of 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, forming a part of this specification, in which—

Figure 1 represents a side view of a Wheeler & Wilson sewing-machine having my improvement applied to it. Fig. 2 is a rear end view thereof; and Figs. 3, 4, 5, and 6 are views of certain details detached, as hereinafter referred to.

Similar letters of reference in each of the several figures indicate corresponding parts.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The sewing-machine to which my improvement is here shown applied being well known and understood, no minute description of its general action and arrangement of parts is necessary in this specification; but I shall at once refer to those parts or features on which my improvement is based.

In those tension arrangements to the needle-thread in which the tension is applied to the spool direct to control the run of the thread therefrom, various appliances have been used to exert a firm but yielding pressure on the spool. Thus the spindle of the spool has been provided with a cone or cones to produce friction in the eye of the spool, or against a fixed eye by a spring or springs acting in unison to govern the run of the spool, with means of adjustment to regulate the degree of frictional pressure, and with adjusting arrangements, including adjustable spool-standards, to adapt the tension device and spool-carrier to different lengths of spools. It is to this class of tension arrangements that the first part of my improvement relates.

A, Figs. 1, 2, and 3, is the spool-spindle, having a fixed cone, *a*, entering the eye of the spool at one end, and formed with a pivot-point, *b*, to run in a female center in a standard, B.

C is the spool.

D is a double conical sleeve moving freely

upon the spindle, with its inner end that enters the eye of the spool fluted to prevent it from turning in the spool. The other end of this double conical sleeve is made smooth and enters into and is supported by an elastic ring, *c*, composed of leather or its equivalent. This ring *c* is fitted tightly, so as not to turn, in a firmly-supported metal cup or band, *d*, formed to bind the edges of the elastic ring or pad *c*, and to constitute a solid bearing at and to the back thereof, but leaving an opening at its center for the spool-spindle to project and play through unconstrained.

The standard B, at the opposite end of the spindle, is hung on a fulcrum, *e*, below, and jointed to said standard is a rod, *f*, which, passing through a support, *g*, has a screw-thread on its end on which is screwed a nut or rosette, *h*, that has arranged between it and the support *g* a spring, *i*, wound around the rod. This spring *i* acts to draw the rocking standard B toward the spool, and so to induce friction or pressure of the smooth end of the double conical sleeve D on the soft-leather pad or ring *c*, and induce a corresponding friction or grip on the spool to restrain it from too freely turning, the force of which may be regulated at pleasure by turning to the right or to the left the rosette *h*; but the arrangement is such that it is not necessary, or but seldom so, to turn this nut or rosette *h* to adjust the rocking or pivoted standard B to suit different lengths of spools which vary with the grade of thread used, or when taking out the spool or fitting in another, as the standard B acts automatically in this respect, being free to rock to or from the spool by reason of the rod *f*, which carries the spring and screw-nut or rosette, being free to slide through its support *g*; nor, excepting where a great change of tension is required, need the rosette *h* be turned or the tension in the least be altered, which is an object to be considered in using or renewing spools of the same length and having the same grade of thread. When inserting a spool of coarser or finer grade of thread, and, as a consequence, of different length, the coarser thread being on the longer spool, and vice versa, the spool itself in many cases regulates the tension automatically by its varying length, causing the rocking standard B to exert a thrust or pull on the spring commensurate with the

grade of thread. The spool being supported at its one end solely by the smooth end of the double conical sleeve *D*, resting and turning in the leather pad or ring *c*, gives a soft and easy action in concert with a spring force applied to the spool, and I find by practice produces a character of friction which does away with those jerks that are incidental to hard bearings having a delicate spring-pressure applied to or against them, and by my improvement I get a greater uniformity of tension generally, with perfect freedom from slip, the soft yielding nature of the elastic ring *c*, acting in concert with the spring force, as described, insuring a greater adaptability of the rubbing-cone to varying circumstances, and producing a uniformity and evenness in the tension, so that when once adjusted it is not necessary to readjust the tension more than once, if at all, in finishing or working up the whole thread on the spool, which, as it reduces in diameter, it is usual in other tension devices acting directly upon the spool to frequently vary the friction or pressure which is thrown on it and which controls the run of the spool. The leather bearing *c*, too, serves to prevent breaking of the thread, and in starting the spool, but little, if any, more power is required to overcome the frictional pressure of the conical sleeve on the leather than is necessary to keep it in motion, which is not the case with a metal bearing.

As much in the formation of a perfect stitch depends upon the action of the tension devices generally, and especially is this true of double-thread machines, I shall now proceed to describe the second part of my improvement, which is only applicable to double-thread machines, and exclusively so to that class known as the "Wheeler & Wilson" machine, in which a revolving hook or shuttle is used for operation in connection with the concentric thread-case or bobbin carrying the secondary thread, which is interlaced with the needle-thread by the joint action of the hook and needle in a manner already well known and understood.

As to perfect the tension arrangement of only one of the threads would be to make the stitch incomplete, the two threads being necessary to make the stitch, it is desirable in the kind of machine I now refer to to provide in an advantageous manner for the tension of the secondary thread. In such machines the rotating hook or shuttle *E*, revolving against or in an opposite direction to the motion of the under spool or bobbin, *F*, often acts with too great a strain on the under or secondary thread, which is thereby prevented from being drawn up, so as to form a perfect stitch on the under side of the cloth, unless a corresponding or increased degree of tension is given to the upper thread, which tests the strength of the upper thread, so as to endanger its breakage. This difficulty increases in proportion as the thread is unwound from the bobbin. Again, the loop being drawn up from the under side of the

cloth-plate by the action of the rotating hook renders the cloth liable, on account of the great amount of tension required on the upper thread, to be drawn down and become wedged fast in the slot of the cloth-plate, which is more especially the case when the material being sewed is of a thin and flimsy character. To obviate this last-named difficulty by slackening the tension of the upper thread often causes the thread to hang in loops on the under side, thereby producing an imperfect stitch, and to slacken the tension of the upper thread involves the slackening of the under one in a corresponding ratio, when these difficulties disappear. I therefore so construct and arrange the tension devices to the under thread as in a general way to produce thereon the least possible amount of tension, with facility for increasing it in an advantageous manner to any degree required, as follows, reference being had to Figs. 1, 2, 4, 5, and 6 of the drawings.

G is a metallic shell, having a fixed shaft, *k*, at its center, upon which a small cylinder, *l*, revolves. This cylinder fits snugly, but not tightly, in the hole through the center of the bobbin *F*, and has on its outside a small spring, *z*, (see Fig. 6, where the cylinder detached is shown on an enlarged scale,) to hold the bobbin securely in its place, as well as to cause the cylinder and bobbin to revolve together. Within the cylinder *l* is a spring, *m*, pressing at its one end against a nut, *n*, on the outer end of the fixed shaft *k*, and acting at its other end on the back end or shoulder of the cylinder, which it forces against a small leather ring or disk, *o*, interposed between the cylinder *l* and shell *G*, to create a slight friction, the object of which is to prevent the bobbin *F* from being impelled by the drawing up of the under thread farther than it is necessary to allow a sufficient quantity of thread to form the under stitch. An elbow, *p*, is fixed upon the outer rim of the shell *G*. This elbow serves the double purpose of regulating the tension of the under thread and of preventing the shell *G*, as will be presently explained, from being carried round by the action of the rotating hook. The shell *G* rests in the cavity of the rotating hook *E* of said Wheeler & Wilson machine, in the same manner as the bobbin now in ordinary use does, the side of the shell to which the elbow *p* is attached being outward, and said elbow being arranged to project from the edge of the shell enough to allow it to rest well in the cavity of the hook. An adjustable guide-ring, *H*, as at present in use, serves to keep the shell *G* in position, care, however, being taken to make said ring of sufficiently large interior diameter, so that though closely fitting round it will not touch the bobbin *F*, and a portion of the face of said ring—say one-fourth of its circumference—I cut away or recess deep enough to allow the elbow *p* to play freely without touching the ring, except at the shoulders or ends of said recess. The shell *G* is prevented from

revolving by the elbow *p* resting against the upper shoulder formed by said recess in the face of the ring.

The thread is wound upon the bobbin *F* in the ordinary way. The end of the thread is then passed through a small eye, *r*, in the shell. Then place the bobbin upon its cylinder *l* and press it home—that is, till it reaches the back projecting rim or end of the cylinder—and fit the whole in its place in the cavity of the rotating hook *E*, and now will be apparent an important difference between this arrangement and other spring-held or tension bobbins or thread-cases, some of which have been situated within a box or shell.

The tension given by the spring-pressure on the bobbin is here, as before specified, made as light as possible. This tension is of a fixed character and never needs lessening, but only increasing as occasion may require. To increase the tension turn and pass the end of the thread through a small eye, *s*, at the upper point of the elbow *p*; and to obtain any further amount of tension from the slightest increase up withdraw the thread from the eye *s* in the elbow and pass it half-way once, twice, thrice, or oftener, according to the amount of tension required, round the left-hand side or one branch of the elbow *p* and rethread through the eye *s* of said elbow. Those acquainted with previous modes of regulating the tension of the needle-thread by twisting the thread round a suitable rod will readily perceive how the tension is increased by thus applying the secondary thread to the elbow of the shell, and that an advantage is derived, felt in drawing on the thread by twisting the thread round the left-hand or inclined branch of the elbow, which elbow also serves, as described, as a stop to the shell to prevent it rotating.

I would remark, in conclusion, that in the throw of the loop of the upper thread round the shell *G* and bobbin *F* by the revolving hook *E* said upper thread cannot, by reason of the protection afforded by the case, pass into the bobbin, instead of on the outside, as now sometimes happens when the slide-ring *H* is not nicely adjusted to suit the size of the thread being used; and by the present arrangement a less frequent adjustment of the slide-ring to

suit different-sized threads is necessary. By this my improvement there is no perceptible change in the degree of tension to the under thread from the time the bobbin is filled till it becomes empty; nor is it necessary to hold the under thread or make it fast in any way when commencing a seam; and a perfect stitch is formed on both sides of the material with less tension upon the upper thread; liability to breakage or chafing of the thread is reduced, and a perfect regularity of tension to both threads easily attainable, so as to secure perfect stitches on both sides of the cloth without pulling the latter down, however flimsy its character, into the slot of the cloth-plate.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the loosely-fitted double conical sleeve *D* with the soft leather or elastic backed and bound bearing-eye *c*, and a spring-pressure whereby the spool is brought to a proper center and the requisite tension produced, the cone-sleeve revolving simultaneously with the spool and pivoted arm, and the friction or tension being obtained by the action of the outer end of the double cone against the elastic eye, in the manner and for the purpose herein described.

2. The arrangement, with the above, of the peculiar spring-pressure herein described, consisting of the pivoted or rocking standard *B*, rod *f*, spring *i*, and rosette or nut *h*, for operation together and with the spool, in the manner herein described.

3. The attachment to the stationary shell or outer case, *G*, of the tension-arm *p*, substantially in the manner and for the purposes herein described.

4. Hanging the bobbin *F* on and so as to rotate together with a cylinder, *l*, when the same is combined with a spring, *m*, inducing friction in the run of the bobbin and operating in connection with a tension arm or elbow, *p*, acting on the thread from the bobbin, as described.

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Witnesses:

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