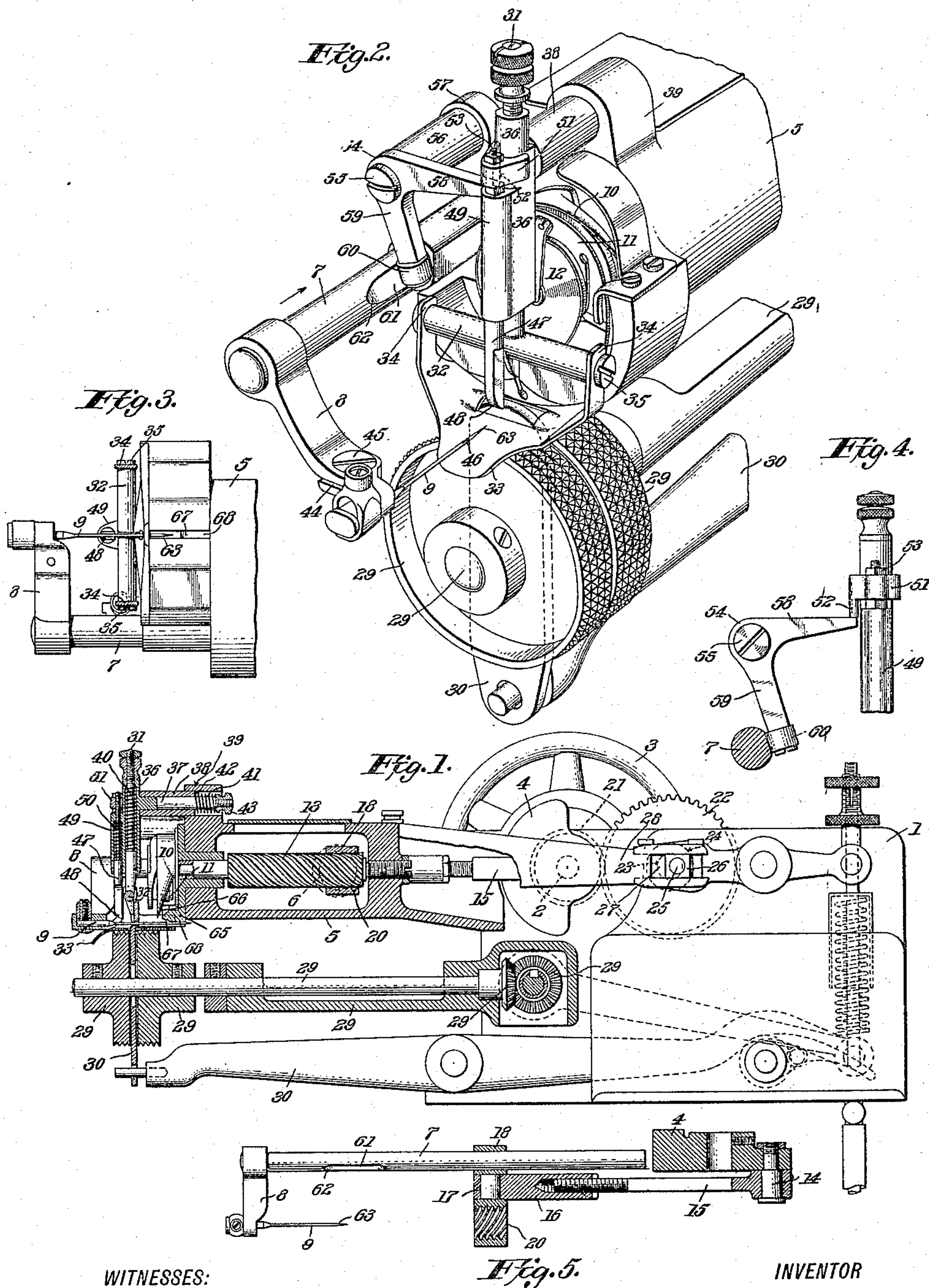


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NEEDLE GUARD FOR SEWING MACHINES.
APPLICATION FILED OCT. 31, 1913.

1,155,086.

Patented Sept. 28, 1915.



WITNESSES:

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NEEDLE-GUARD FOR SEWING-MACHINES.

1,155,086.

Specification of Letters Patent.

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Application filed October 31, 1913. Serial No. 798,400.

To all whom it may concern:

Be it known that I, DONALD NOBLE, citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Needle-Guards for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to improvements in needle-guards for sewing machines and is designed more particularly for use in connection with machines employed for effecting blind-stitch seams wherein the needle enters and emerges from the same side of the fabric, and when operating on fabrics of from ten to fifteen thousandths of an inch thick, as is often required, the fabric piercing movements of the needle must be controlled to meet the requirements of such limit in thickness, and to this end the present invention comprises a needle-guarding element controlled by means acting synchronously and in parallelism with the stitch-forming movements of the needle.

Reference being had to the accompanying drawings, Figure 1 is a view in side elevation partly in full lines and partly in section of a blind-stitch sewing machine embodying the present invention; Fig. 2 a view in perspective of the front end portion of the oscillating cylinder, the fabric feeding elements and their carrier and the fabric bender and its carrier, of the machine shown in Fig. 1; Fig. 3 an under side view of the front end of the oscillating cylinder shown in the previous figures, and Figs. 4 and 5 details later to be referred to.

The present invention is shown in connection with a Singer blind-stitch sewing machine, the same as is represented by United States patent application Ser. No. 660,255, filed November 14, 1911, but as it relates only to the construction and application of the needle-guard it is not limited in its application and, accordingly, only such features of construction of the stitch-forming and cloth-feeding mechanisms will be referred to as it is believed are important to an understanding of the invention.

Referring to the figures, 1 represents the sewing machine frame in which is mounted in suitable bearings the main-shaft 2, shown in dotted lines only in Fig. 1, carrying at

one end the hand or band-wheel 3 and at its opposite end the shaft-flange 4 and 5 the oscillating cylinder having formed integrally with it a bearing stud 6, shown in dotted lines only Fig. 1, mounted in suitable bearings formed in said frame.

Mounted to move endwise in suitable bearings formed in the cylinder 5 is a needle-carrying bar 7 provided at its forward end with a needle-bracket 8 in which is suitably secured the needle 9, and coacting with said needle is an oscillating thread-carrying loop-taker 10 provided with the usual bobbin-case 11 carrying the bobbin 12, and 13 is the spirally threaded looper-oscillating shaft journaled in the cylinder 5.

Upon the crank-wrist 14, threaded in the shaft-flange 4, is pivoted one end of a pitman 15 whose opposite end is threaded into a pitman connection 16 provided with the bearing 17 into which latter is journaled a cross-head 18 secured at one end to the needle-carrying bar 7, the opposite end of the latter being provided with a spirally threaded opening 20 which coacts with the spirally threaded looper-oscillating shaft 13 to effect oscillatory movements of the loop-taker 10. Upon the main-shaft 2 is secured a gear 21, shown in dotted lines only Fig. 1, which meshes with a gear 22 secured to one end of the rotary feed-actuating shaft 23 shown in dotted lines only Fig. 1, said gears being of the ratio of two to one, thus giving to the shaft 23 one rotation to two rotations of the shaft 2, the opposite end of the shaft 23 being provided with a flange 24 into which is secured a crank-pin 25 provided with a block 26 which works in an opening 27 formed in the extended portion 28 of the cylinder 5, thus transmitting to the latter oscillatory movements.

The elements designated by the numerals 29 and 30 comprise parts of the cloth-feeding and cloth-bending mechanisms, respectively, but as such features in construction have no bearing on the present invention, further reference to such elements is deemed unnecessary.

The cloth-presser comprises an upright threaded portion 31, integrally formed crossbar 32 and swinging presser-foot 33, the latter being provided with upturned lugs, as 34, through which pass pivot screws, as 35, threaded into said cross-bar. The

upright portion 31 passes through a vertical tubular portion 36 formed integrally with a horizontal arm 37 slidably mounted in the tubular bearing 38, which latter is rigidly secured in an upwardly extended portion 39 of the oscillating cylinder 5, a spring 40 acting to hold the presser-foot 33 down upon the fabric, the horizontal arm 37 being free to oscillate in the tubular bearing 38 and to be moved endwise in opposition to the resiliency of the spring 41 mounted on the arm 37, said spring being held confined between the shoulder 42 and the inner side of the nut 43 threaded upon the arm 37, thus permitting rocking movements of the cloth-presser 33 in the direction of and transverse to the line of seam.

The needle-thread (not shown) is passed from a suitable supply through suitable thread-leaders and tension disk (not shown) to a suitable needle-thread take-up (not shown) and from the latter through the opening 44 in the bracket 8, the screw 45 being provided with a guide-roller (not shown) for leading the thread to the needle-eye 46, in a manner common to the present variety of sewing machine, the usual bobbin-thread (not shown) being supplied from the bobbin 12 in a manner common to sewing machines generally.

Referring now to the parts more directly connected with the invention, 47 represents a needle-guard bar provided at its lower end with an integrally formed needle-guard 48, said bar being mounted in suitable bearings formed in the enlarged portion 49 of the tubular portion 36 and normally held depressed by the spring 50, the opposite end of said bar carrying a collar 51 provided with a depending finger 52, a nut 53 acting to hold said collar against displacement.

54 represents a bellcrank-lever pivotally mounted on a stud-bolt 55 threaded into an arm 56 of a lug 57 forming a part of the cylinder 5, the arm 58 of said lever coacting with the end of the finger 52, the arm 59 being provided with a roller 60 which coacts with the needle-bar 7, the latter being provided with a straight surface 61 and inclined surface 62 comprising needle-guard controlling means which, at times, as will later be explained, act to rock the bellcrank-lever 54 in opposition to the resiliency of the spring 50.

In the present instance, the straight surface 61 is arranged with respect to the stitch-forming movements of the needle so as to permit the spring 50 to hold the guard 48 in its depressed position in line to contact with the bevel portion 63 of the needle when the point of the latter is about to pierce the fabric, and to remain in this position until the needle point has entered the fabric when the inclined surface 62 acts on the roller 60 to rock the bellcrank-lever 54 in opposition to

the spring 50, thus raising and holding the guard out of contact with the needle except when its point is entering the fabric.

From the foregoing it is to be understood that the present invention embodies improved means for guiding the needle point in a given path at the time it enters the fabric, thus making it practicable for the needle to enter and emerge from the same side of extremely thin fabrics without exposing the sewing threads at the opposite side of the fabric.

To further insure the efficiency of the stitch-forming movements of the needle there is provided a stationary needle-guard 65 located back of the loop-seizing point 66 of the loop-taker 10, said guard comprising the inclined and straight surfaces 67 and 68, respectively, the former surface acting to correct any upward deflection of the needle out of its given line of movement and the surface 68 acting to register the needle out of the line of travel of the loop-seizing point of the loop-taker, thus guarding both the needle and loop-seizing point against injury by the latter striking said needle coincident with its entering the needle-thread loop.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In a sewing machine, the combination with fabric feeding and stitch-forming mechanisms including a needle-carrying bar, a needle and coacting loop-taker, of a needle-guard and needle-guard controlling member, the latter, through suitable connections including a bell-crank lever operated by said needle-carrying-bar acting to hold said needle against accidental lateral vibration at the time its point is entering the fabric.

2. In a sewing machine, the combination with fabric feeding and stitch-forming mechanisms including a needle-carrying bar arranged in a plane corresponding substantially to the plane in which the fabric is fed to the action of the stitch-forming mechanism, a needle and coacting loop-taker, of a needle-guard and needle-guard controlling member, the latter through suitable connections, acting synchronously with and in a part parallel to the path of movement of said needle-bar to permit said needle-guard to hold said needle against accidental lateral vibration at the time its point is entering the fabric.

3. In a sewing machine, the combination with fabric feeding and stitch-forming mechanisms including a needle-carrying bar, a needle and coacting loop-taker, of a needle-guard and needle-guard controlling member, the latter formed integral with said needle-bar and through suitable connections, acting to hold said needle against accidental lateral vibration at the time its point is entering the fabric.

4. In a sewing machine, the combination

with fabric feeding and stitch-forming mechanisms including a needle-carrying bar, a needle, a stationary needle-deflecting element and a loop-taker, of a needle-guard and needle-guard controlling member, the latter, through suitable connections, acting to hold said needle against accidental lateral vibration at the time its point is entering the fabric.

5 5. In a sewing machine, the combination with fabric feeding and stitch-forming mechanisms including a needle-carrying bar, a needle, a stationary needle deflecting element and a loop-taker, of a needle-guard and needle-guard controlling member, the latter carried by said needle-bar and, through suitable connections, acting syn-
10 chronously with and in a path parallel to the path of movement of said needle to hold
15 the latter against accidental lateral vibra-

tion at the time its point is entering the fabric.

6. In a sewing machine, the combination with fabric feeding and stitch-forming mechanisms including a needle-carrying bar, 25 a needle and coacting loop-taker, of a needle-guard and needle-guard controlling member, the latter, through suitable connections including a pivotally mounted bellcrank-lever, acting to hold said needle against acci- 30 dental lateral vibration at the time its point is entering the fabric.

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

DONALD NOBLE.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."