Dec. 17, 1935. G. M. EAMES 2,024,435

SEWING MACHINE THROAT PLATE

Original Filed Oct. 3, 1933 2 Sheets-Sheet 1

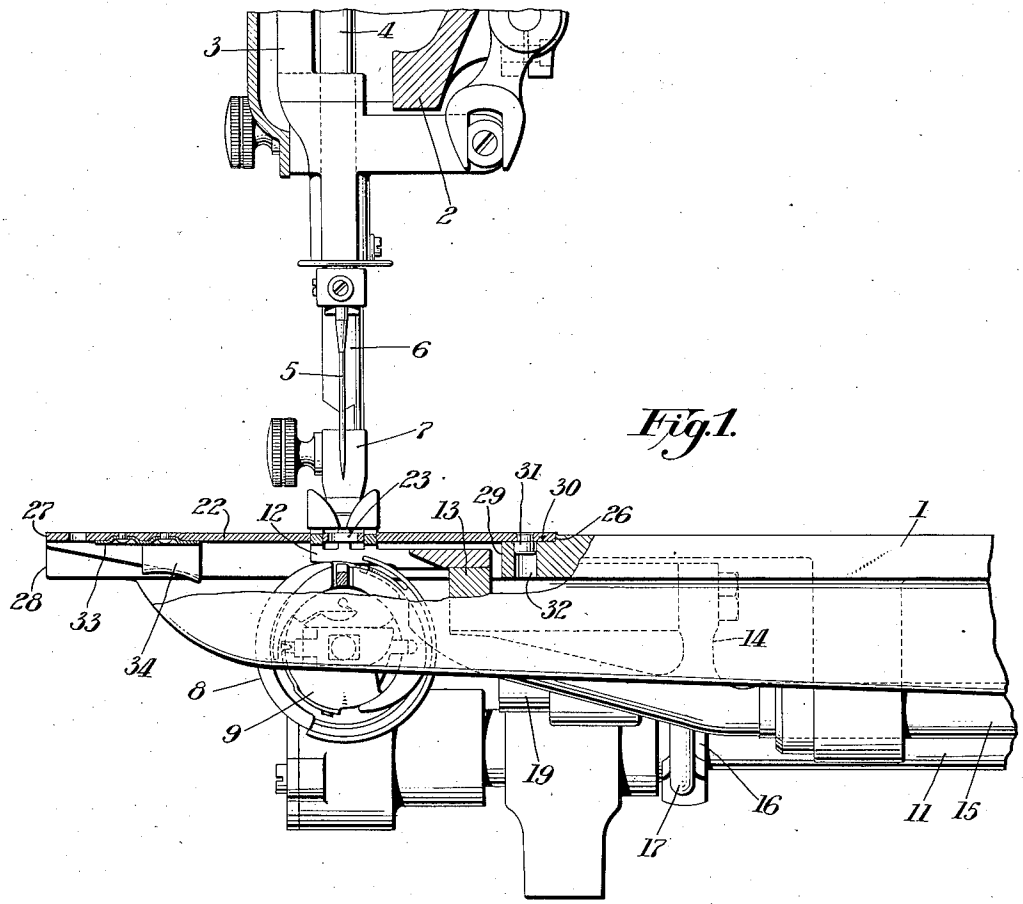

Fig. 1.

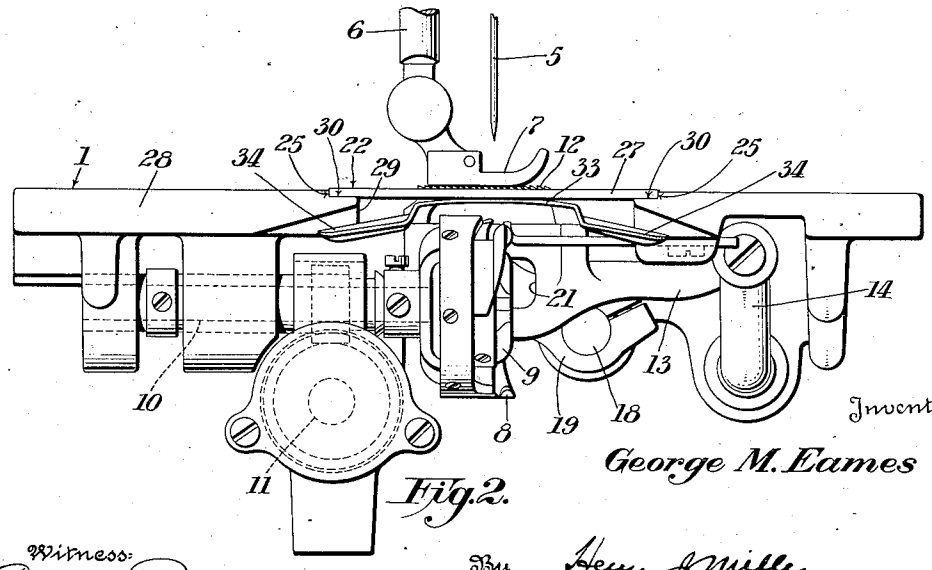

Fig. 2.

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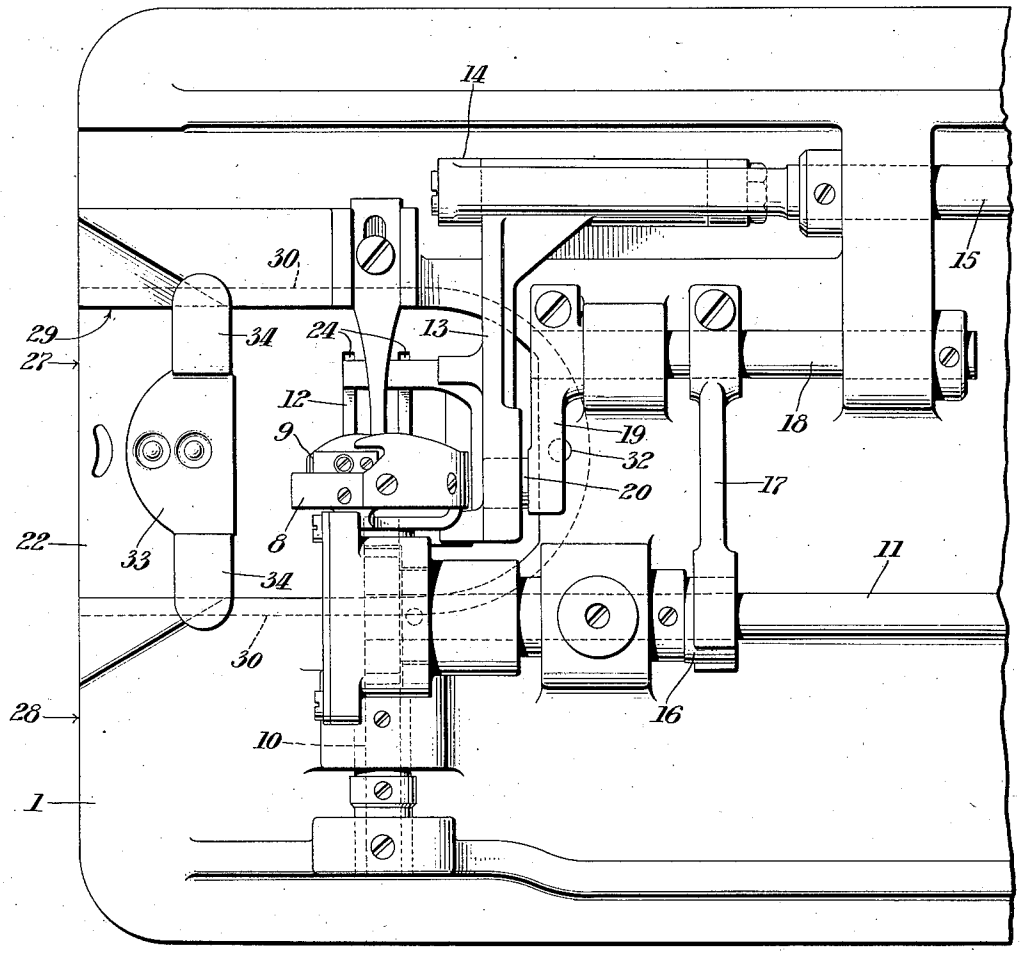

Fig. 3.

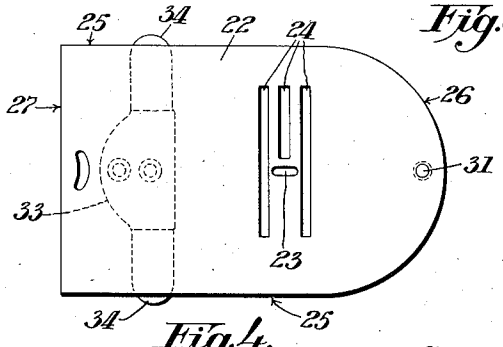

Fig. 4.

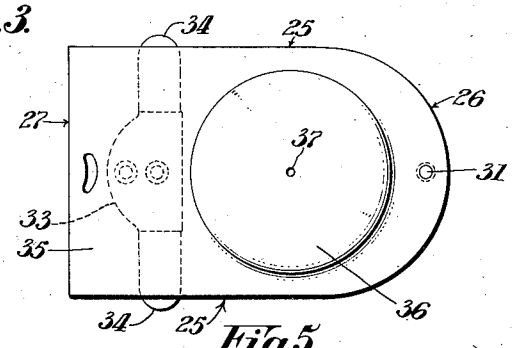

Fig. 5.

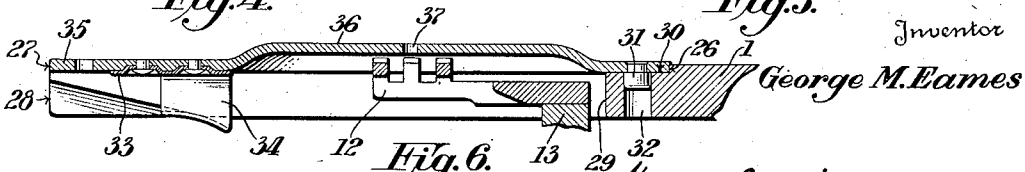

Fig. 6.

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UNITED STATES PATENT OFFICE

2,024,435

SEWING MACHINE THROAT-PLATE

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Original application October 3, 1933, Serial No. 691,938. Divided and this application March 13, 1934, Serial No. 715,270

9 Claims. (Cl. 112—260)

This invention relates to improvements in sewing machines and has for its primary object to facilitate adaptation of a sewing machine for straightaway stitching, embroidering, darning and like operations. More specifically, the invention has for its object to provide for quickly and easily replacing a sewing machine throat-plate by another having different characteristics.

The invention consists in the combination throat-plate and slide-plate arrangement hereinafter described and claimed, the present application being a division of my prior patent application Serial No. 691,938, filed Oct. 3, 1933.

In the accompanying drawings, Fig. 1 is a front side elevation, partly in section, of a portion of the stitch-forming end of a sewing machine. Fig. 2 is a front end elevation of the machine, omitting the bracket-arm. Fig. 3 is a bottom plan view of a portion of the cloth- or bed-plate. Fig. 4 is a top-plan view, reduced in size, of a throat-plate employed for zigzag stitching with a straightaway feed. Fig. 5 is a top-plan view, reduced in size, of a feed-cover type of throat-plate employed for embroidering and darning purposes. Fig. 6 is an enlarged vertical section of the throat-plate shown in Fig. 5 and as applied to the cloth-plate of the sewing machine.

Referring to the drawings, the present improvement has been embodied in a sewing machine having a flat-top bed-plate or work-support 1 overhung by a bracket-arm terminating in a head 2.

Mounted in the bracket-arm head 2 is a vibratory gate 3 in which a vertically disposed needle-bar 4, carrying at its lower end a needle 5, is journaled for endwise reciprocation. Also journaled for vertical movement in the head 2 is the usual spring depressed presser-bar 6 to the lower end of which is secured a presser-foot 7.

Cooperating with the needle 5 below the work-support 1 is a loop-taker 8 of the horizontal-axis rotary hook-type, in which hook is journaled a thread-case 9 containing a bobbin or mass of under thread around which the needle-thread loops are cast in the formation of lock-stitches. The loop-taker 8 is supported for rotation in a vertical plane parallel to the plane of lateral vibration of the needle 5 and is carried by a loop-taker shaft 10 extending horizontally rearwardly from the loop-taker in a direction transverse to the plane of needle-vibration. The loop-taker shaft 10 is rotatably journaled in suitable bearing lugs depending from the bed-plate 1 and is driven from a rotary loop-taker actuating shaft 11 by suitable gear connections therewith whereby the loop-taker is rotated twice for each needle reciprocation.

The work is advanced in a line transverse to the plane of needle-vibration by a feeding mechanism including a feed-dog 12 of the lower four-motion type. The feed-dog 12 is carried by a feed-bar 13 which is pivotally secured to a feed-rocker 14 of a feed-advance rock-shaft 15, journaled in suitable bearings at the under side of the work-support 1, said rock-shaft 15 being actuated in any suitable manner. Rising and falling movements are imparted to the feed-dog 12 from a feed-lift cam 16 carried by the loop-taker actuating shaft 11, said cam 16 being embraced by a forked rock-arm 17 suitably secured upon a short feed-lift rock-shaft 18 disposed in parallelism with the feed-advance rock-shaft 15. Extending rearwardly from the feed-lift rock-shaft 18 is a feed-lift arm 19 provided at one side thereof with a roller-stud 20 received in a horizontal slot 21 provided in the feed-bar 13.

The present invention comprehends the employment of different types of throat-plates which are readily interchangeable to suit the character of the work. As illustrated in Figs. 1 to 4, inclusive, of the drawings, a flat throat-plate 22 has a needle-aperture in the form of a slot 23 elongated in a direction to accommodate the laterally vibratory needle 5, said throat-plate also having feed-slots 24 through which the feed-dog 12 may operate. The throat-plate 22 comprises a combination of the usual slide-plate and throat-plate heretofore commonly employed and is formed with parallel side edges 25 merging into a rounded inner end 26 opposite to a straight-edge outer end 27 adapted to coincide with the front-end edge 28 of the work-support 1. The work-support 1 is provided with an opening 29, corresponding to the described shape of the throat-plate 22 and extending inwardly from the edge 28 of the work-support in a direction crosswise of the line of feed to expose the loop-taker 8 and the feed-dog 12. Along the side edges and rounded end of the opening 29, the work-support 1 is provided with an upwardly open recessed guideway 30 affording a seat for and confining the throat-plate 22 against movement in the plane thereof, excepting toward the edge 28 of the work-support.

Releasable locking means is provided to normally anchor the throat-plate 22 against movement from operative position in the plane of the work-support, said locking means in the present

instance consisting of a locking-pin 31 depending from the throat-plate at the rounded end thereof and adapted to enter an aperture 32 in the guideway 30. Suitably secured to the under side of the throat-plate 22, adjacent to the straight end 27 thereof, is a member 33 from which extend oppositely directed wings 34 comprising underhung spring means adapted to slidably engage the beveled under side of the work-support 1 at opposite sides of the opening 29 and to yieldingly confine the throat-plate to sliding movements in the guideway 30. By pressing upwardly against the under side of the throat-plate 22 adjacent to the feed-dog 12, the throat-plate may be tilted slightly upwardly against the yielding action of the spring-wings 34 to raise the rounded end 26 of the throat-plate sufficiently to withdraw the locking-pin 31 from the aperture 32 and to clear the feed-dog 12. The throat-plate 22 is now free for sliding movement in the guideway 30 for removal of the throat-plate, to thereby provide for access to the loop-taker and feed-dog, and also for the substitution of another throat-plate therefor. It will be observed that the present throat-plate expedient obviates the necessity of removing securing screws therefor and that the interchanging of the throat-plates is thereby facilitated.

A substitute throat-plate (not shown) may be constructed exactly like the described throat-plate 22, with the exception that the needle-aperture is round instead of elongated, said substitute throat-plate being adapted for straight-away sewing, i e., adapted for use when the needle 5 is non-vibratory.

Figs. 5 and 6 of the drawings illustrate another substitute throat-plate 35 which is particularly adapted for embroidering and darning purposes. It will be observed that the throat-plate 35 differs from the throat-plate 22 primarily in omitting the feed-slots of the latter, and in being formed with an annular raised portion 36 having a substantially central needle-aperture 37. The raised portion 36 of the throat-plate serves as a cover for the feed-dog 12, to provide for manually manipulating the work for embroidering or darning purposes. Obviously, other substitute throat-plates may be employed, as for instance, plates provided with eyelet-spurs.

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

1. A sewing machine having a horizontally disposed work-support, spaced guideways upon said work-support defining therebetween an opening in the work-support, a vertically reciprocatory needle, a loop-taker below and exposed by said opening in the work-support, a throat-plate provided with a needle-aperture and adapted to removably span said opening in the work-support, and spring means yieldably confining said throat-plate upon said guideways for tilting and sliding movements thereupon.

2. A sewing machine having a horizontally disposed work-support, spaced guideways upon said work-support defining therebetween an opening in the work-support, a vertically reciprocatory needle, a loop-taker below and exposed by said opening in the work-support, a throat-plate provided with a needle-aperture and adapted to removably span said opening in the work-support, spring means yieldably confining said throat-plate upon said guideways for tilting and sliding movements thereupon, and a locking device for normally anchoring said throat-plate against movement in the plane thereof upon said guideways.

3. A sewing machine having stitch-forming mechanism including a reciprocatory needle, work-feeding mechanism including a feed-dog, a work-support, substantially parallel guideways upon said work-support extending crosswise of the direction of feed and defining therebetween an opening in the work-support, and a throat-plate slidably mounted for movement lengthwise of said guideways to and from an operative position spanning said opening in the work-support, said throat-plate being provided with a needle-aperture and a feed-dog slot.

4. A sewing machine having stitch-forming mechanism including a reciprocatory needle, work-feeding mechanism, a work-support, spaced guideways upon said work-support extending crosswise of the direction of feed and defining therebetween an opening in the work-support, a throat-plate provided with a needle-aperture and adapted to removably span said opening in the work-support, and spring means extending from the under side of said throat-plate yieldably confining the throat-plate upon said guideways for tilting and sliding movements thereupon.

5. A sewing machine having stitch-forming mechanism including a reciprocatory needle and a loop-taker, work-feeding mechanism including a feed-dog, a work-support, spaced guideways upon said work-support extending inwardly from an edge of the work-support in a direction crosswise of the direction of feed, said guideways defining therebetween an opening in the work-support exposing said loop-taker, a throat-plate provided with a needle-aperture and mounted upon said guideways for tilting and sliding movements thereupon, and a locking device for normally anchoring said throat-plate against sliding movement upon said guideways.

6. A sewing machine having stitch-forming mechanism including a reciprocatory needle, work-feeding mechanism including a feed-dog, a work-support formed with an opening extending inwardly from an edge of the work-support in a direction crosswise of the direction of feed, and a throat-plate closing said opening and formed with a feed-dog slot and a needle-aperture, said throat-plate having near one end thereof underhung spring means slidably engaging said work-support and also having near the other end thereof a downwardly projecting locking pin.

7. A sewing machine having stitch-forming mechanism including a reciprocatory needle and a loop-taker, work-feeding mechanism, a work-support having an open-topped guideway, a throat-plate mounted upon said guideway and covering said loop-taker, said throat-plate having a needle-aperture adjacent one end thereof, underhung spring means carried by said throat-plate yieldably confining said throat-plate upon said guideway for sliding movement thereupon and permitting an upward tilting movement of the needle-aperture end of the throat-plate, and a locking device for normally anchoring said throat-plate against movement in the plane thereof upon said guideway, said locking device being rendered ineffective by said upward tilting movement of the throat-plate.

8. A sewing machine having stitch-forming mechanism including a reciprocatory needle, work-feeding mechanism, a work-support pro-

vided with substantially parallel guideways extending crosswise of the direction of feed and defining therebetween an opening in the work-support, a throat-plate provided with a needle-aperture and removably mounted upon said guideways for sliding movement thereupon crosswise of the line of feed, and throat-plate securing means providing for tilting said throat-plate relatively to said work-support.

9. A sewing machine having stitch-forming mechanism including a reciprocatory needle, work-feeding mechanism including a feed-dog, a work-support provided with substantially parallel guideways extending crosswise of the direction of feed and defining therebetween an opening in the work-support, a throat-plate removably mounted upon said guideways for sliding movement thereupon crosswise of the direction of feed, and throat-plate securing means providing for tilting said throat-plate relatively to said work-support, said throat-plate having a feed-dog covering portion provided with a needle-aperture.

GEORGE M. EAMES.