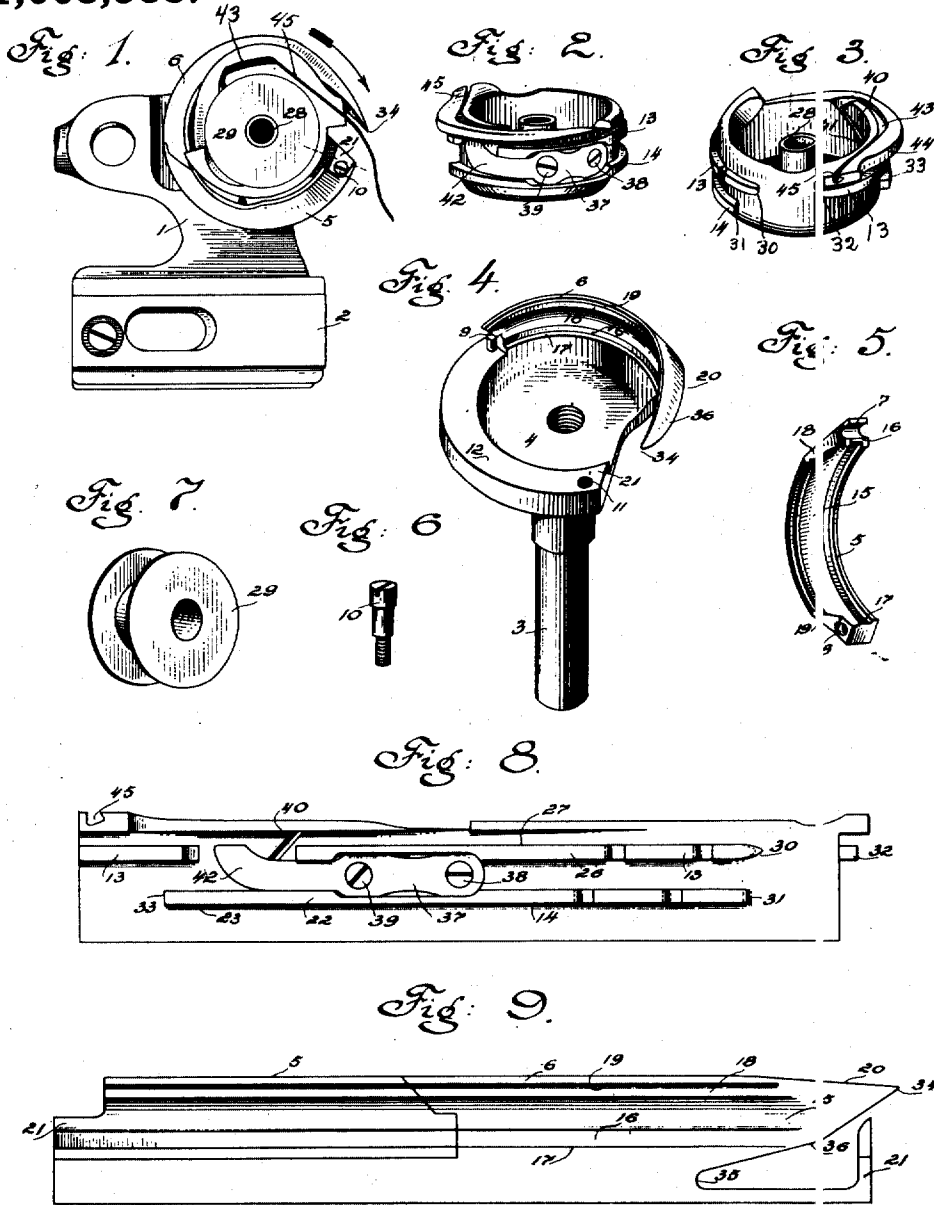


C. F. GRAY.
SEWING MACHINE.
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1,008,538.

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WITNESSES:

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SEWING-MACHINE.

1,008,538.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES F. GRAY, a citizen of the United States, residing at Sierra Madre, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has for its object to improve that class of sewing machines wherein a loop-taker engages a loop of needle thread and, without passing through it, casts said loop about a cop or bobbin of under thread held in a non-rotatable bobbin case, which latter is mounted in an annular groove in the inner wall of the flange forming the cast-off portion of the loop-taker, as is represented by U. S. Patent to W. F. Dial, No. 480,181, dated August 2, 1892, and the present description will be confined as much as possible to the new parts employed.

In earlier devices of the character above referred to, there is formed in the inner wall of the flange of the loop-taker an annular groove which extends from slightly back of the loop-receiving point to the heel of said loop-taker, said groove receiving an annular projection which is formed on the periphery of the bobbin case; and for the purpose of retaining the needle thread while it is being cast about the mass of under thread by the action of the loop-taker and to provide for the escape of the needle thread loop from the rear of said bobbin case when it is acted upon by the take-up, said projection is cut away from a portion of the periphery of said case; and on account of said projection performing the function of retaining the needle thread while it is being acted upon by the loop-taker, it is essential that its coacting guide-ways be located at or near the bottom-wall of the loop-taker in machines which employ cops or bobbins of the usual commercial capacity, the extent of the cut out portion of the extension being governed by the demands of the needle thread loop after it has been entered by the point of the loop-taker and the time of its escape from the rear of the bobbin case.

To better adapt the under stitch-forming mechanism for use in connection with "high speed" sewing machines, applicant has provided the hook flange with a groove of suffi-

cient width to bring its outer wall close to the outer edge of said flange, and has added to the bobbin case a coacting projection, correspondingly located, which materially increases the bearing surfaces of the coacting guiding elements, lessens the liability of excessive friction between said elements through the action of the take-up on the sewing threads, especially when tightening the stitch, and provides convenient means for locating the under thread tension spring between the outer walls of the guide-way carried by said case.

Other advantages arising from the invention will be hereinafter fully set forth.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a view of the face of the loop-taker, bobbin case and bobbin, assembled in stitch-forming relationship, together with the bracket in which said loop-taker is mounted. Fig. 2 is a perspective view of the bobbin case and its attached thread tension spring. Fig. 3 is a perspective view of the bobbin case, its axial position being opposite to that shown in Fig. 2. Fig. 4 is a perspective view of the loop-taker, the removable flange section being omitted. Fig. 5 is a perspective of the flange section omitted in Fig. 4. Fig. 6 is a perspective of the screw for securing to the loop-taker the removable flange section. Fig. 7 is a perspective of the bobbin for supplying the under thread. Fig. 8 illustrates a development of the periphery of the bobbin case shown in Figs. 2 and 3. Fig. 9 illustrates a development of the inner wall of the loop-taker flange.

1 represents a loop-taker bracket of ordinary construction provided for the reception of the loop-taker shaft 3 and having a bearing surface 2 for attaching said bracket to the underside of the sewing machine bed-plate (not shown), said shaft being operatively connected with the actuating mechanism of the sewing machine through commonly employed connections.

4 represents the bottom wall of the loop-taker, and 5 the removable and 6 the permanent section of the loop-taker flange.

The section 5 is provided with a notch 7 and screw opening 8, said notch coacting with a pin 9 and said screw opening receiv-

ing the screw 10 which is threaded into the opening 11 formed in the loop-taker base 12 for securing said section to said base. On the inner walls of the sections 5 and 6 is formed a groove or race-way for the reception of the projections or guide-ways 13 and 14 formed on the periphery of the bobbin case, said groove or race-way being provided with a concaved portion 15, inner guide walls 16 and 17 and like outer guide walls 18 and 19, said groove extending from near the free end of the loop-receiving element 20 to the heel 21, as shown in Fig. 9. The guide walls 16 and 17 coact with the walls 22 and 23, respectively, of the projection 14, and the guide walls 18 and 19 coact with the walls 26 and 27, respectively, of the projection 13, the section 5 being made removable to accommodate the suspension of the bobbin case within the groove in the loop-taker.

In the present construction, as in earlier devices, the bobbin-case is provided with a central hub or stud 28, for the reception of the bobbin 29.

By reference to Fig. 8 it will be seen that the end 30 of the projection 13 slightly overlaps the end 31 of the projection 14, and that the oppositely arranged end 32 of said projection 13 overlaps the end 33 of the projection 14 for a substantial distance, such increase in bearing surfaces being made practicable through the angle given the loop of the needle thread, with relation to the line of needle actuation, at the time said loop is passing from the point 34 to the throat 35 of the loop-taker, during which time, as is well understood, the needle thread loop rides the inclined portion 36 of the loop-receiving element 20, thus causing the lower portion of said loop to be carried in the direction of the movement of the loop-taker, which results in giving to said loop an angular relationship with respect to the line of needle actuation. The relationship of the end 32 of the projection 13 with respect to the end 33 of the projection 14 is governed by the action of the take-up when withdrawing the thread loop out of the pocket formed by the bottom wall 4 of the loop-taker and the rear wall of the bobbin-case. It will be evident that the thread loop must first pass out through the opening formed in the projection 14 and later between the ends 30 and 32 of the projection 13, and it is the difference between the time of withdrawal of the thread loop out from between the ends 31 and 33 and the time when it passes from between the ends 30 and 32 that permits of an increased length of bearing being added to the projection 13. The primary advantage of the improved means hereinbefore pointed out is, briefly stated, the providing of an increased bearing surface between said bobbin-case and said loop-taker, thus minimizing the liability of wear

and effecting a relationship of said coacting bearings which reduces the liability of the bearings carried by the bobbin-case tipping and binding in the groove formed in the loop-taker, as is the usual condition after comparatively limited use when bearings of substantially narrow proportions are employed, and especially is this true if the bearing carried by the bobbin-case be located at one side of its median plane, as has been the form of construction employed prior to the present invention.

Referring more particularly to Figs. 8 and 9, it is evident that the projections 13 and 14 could consist of a single bearing, but by constructing them as herein pointed out not only is the weight of the bobbin-case reduced, but convenient means are provided for tensioning and guiding the lower or bobbin thread as it is consumed in the sewing operation. The bobbin-case thread tension spring 37 is secured by screw 38 to the bobbin-case and provided with a tension regulating screw 39 which passes through a suitable opening (not shown) formed in said spring and is threaded into said case. 40 represents a thread-guiding slot extending from the outer edge of the bobbin-case to the circular opening 41, which latter is located beneath the free end 42 of the spring 37 and acts to guide the bobbin thread beneath said spring, from which position it is passed through the opening 43 formed in the wing 44 of said case and guided to the action of the stitch-forming mechanism through the groove 45. The throat of the loop-taker is so shaped that immediately after the loop has been taken by the point 34 it is elongated and its lower portion is drawn far enough toward the center of the loop-taker to place it in line with the end 31 of the projection 14; and in the further rotation of the loop-taker the end 31 retains the thread until the loop-taker casts the loop over the bobbin case, after which it is drawn out from the pocket formed by the rear wall of the bobbin case and the bottom wall of the loop-taker, in the manner pointed out in the patent previously referred to.

Claims:—

1. In a sewing machine, a loop-taker for casting the loop of needle thread about the mass of under thread and provided with a two-part peripheral guide flange and, a groove, in combination with a non-rotatable bobbin-case provided with a bobbin whose axis of rotation is parallel with the axis of said loop-taker, said bobbin-case having on its periphery a guide-way whose guiding surfaces terminate at different points in the periphery of said bobbin-case, said guide-way coacting with the groove formed in said flange to hold said bobbin-case in operative relationship with said loop-taker, the guide walls of said guide-way lying in planes par-

allel with the plane of said bobbin case being located on opposite sides of the median plane of said bobbin-case.

2. In a sewing machine, a loop-taker for casting the loop of needle thread about the mass of under thread and provided with a two-part peripheral guide flange and, a groove, in combination with a non-rotatable bobbin-case provided with a bobbin whose axis of rotation is parallel with the axis of said loop-taker, said bobbin-case having on its periphery a guide-way divided in the direction of its length which coacts with the groove formed in said flange to hold said bobbin-case in operative relationship with said loop-taker, the guide walls of said guide-way lying in planes parallel with the plane of said bobbin-case being located on opposite sides of the median plane of said bobbin-case.

3. In a sewing machine, a loop-taker comprising a sectionally-formed peripheral flange for casting the loop of needle thread about the mass of under thread and provided with a groove having a concaved central portion extending in the direction of the length of said groove, in combination with a non-rotatable bobbin-case having on its periphery a guide-way which coacts with the groove formed in said flange to hold said bobbin-case in operative relationship with said loop-taker, the guide walls of said guide-way lying in planes parallel with the plane of said bobbin-case being located on opposite sides of the median plane of said bobbin-case.

4. In a sewing machine, a loop-taker comprising a sectionally-formed peripheral flange for casting the loop of needle thread about the mass of under thread and provided with a groove having a concaved central portion extending in the direction of the length of said groove, in combination with a non-rotatable bobbin-case having on its periphery a guide-way divided in the direction of its length and coacting with the groove formed in said flange to hold said bobbin-case in operative relationship with

said loop-taker, the guide walls of said guide-way lying in planes parallel with the plane of said bobbin-case being located on opposite sides of the median plane of said bobbin-case.

5. In a sewing machine, a loop-taker comprising a sectionally-formed peripheral flange for casting the loop of needle thread about the mass of under thread and provided with a groove, in combination with a non-rotatable bobbin-case having on its periphery a guide-way divided in the direction of its length and coacting with the groove formed in said flange to hold said bobbin-case in operative relationship with said loop-taker, a thread tension spring mounted within the outer walls of said guide-way, and openings in said case for the passage of the bobbin thread beneath said spring.

6. In a sewing machine, a loop-taker comprising a sectionally-formed peripheral flange for casting the loop of needle thread about the mass of under thread and provided with a groove, in combination with a non-rotatable bobbin-case having on its periphery a guide-way divided in the direction of its length and coacting with the groove formed in said flange to hold said bobbin case in operative relationship with said loop-taker, said case being provided with a thread tension spring mounted within the outer walls of said guide-way, a thread slot leading inward from the outer face of said case, a wing carried by said case and provided with a thread opening connecting with said thread slot, and a thread groove extending from said thread opening for guiding the under thread to the action of the stitch-forming mechanism.

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

CHARLES F. GRAY.

Witnesses:

J. D. MACKERRAS,
A. S. MEAD.