Oct. 5, 1948. L. C. MARSAC 2,450,837

BOBBIN-WINDER FOR SEWING MACHINES

Filed April 23, 1947

2 Sheets-Sheet 1

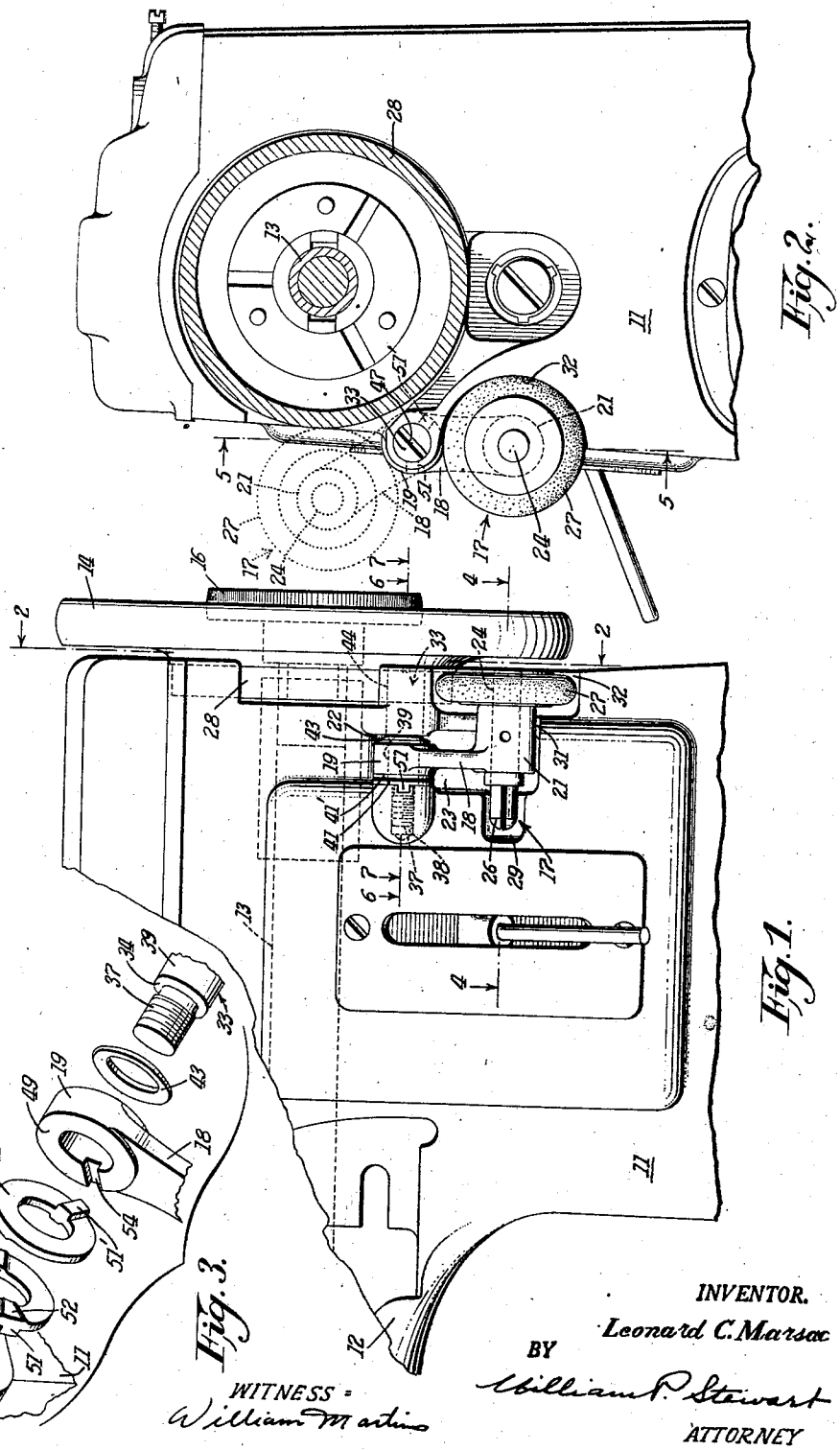


Fig. 1.

Fig. 2.

Fig. 3.

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2 Sheets-Sheet 2

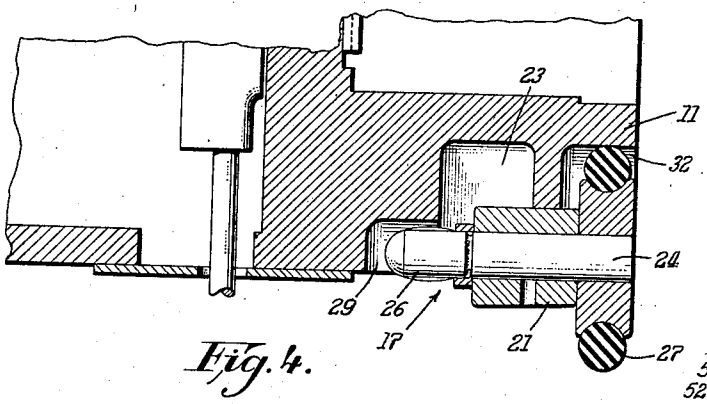


Fig. 4.

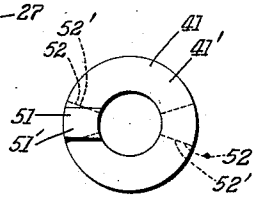


Fig. 8.

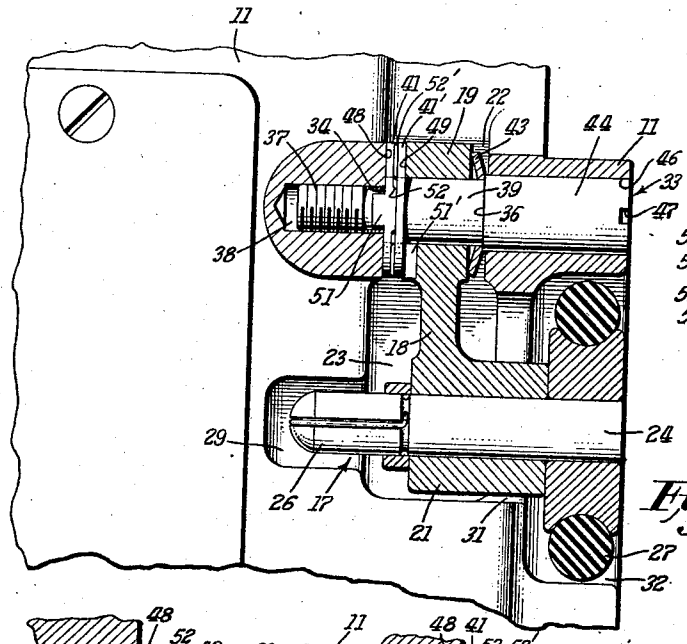


Fig. 5.

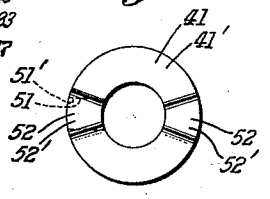


Fig. 9.

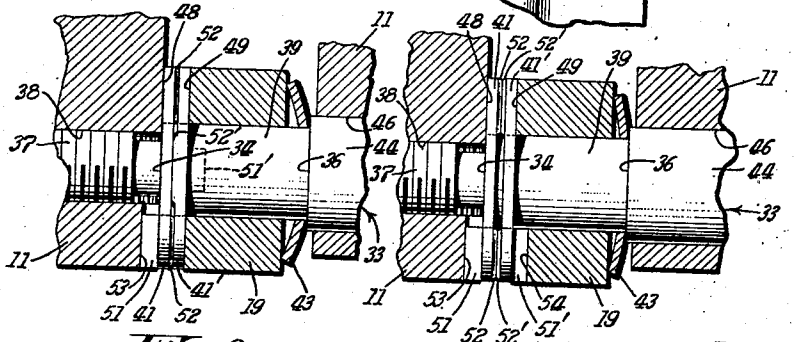


Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE

2,450,837

BOBBIN WINDER FOR SEWING MACHINES

Leonard C. Marsac, Cranford, N. J., assignor to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

Application April 23, 1947, Serial No. 743,244

9 Claims. (Cl. 112—218)

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This invention relates to sewing machines and more particularly to bobbin-winders for family type sewing machines.

The present invention has for an object to provide an improved bobbin-winder that is simple in construction and is inexpensive to manufacture.

A more specific object of the invention is to provide an improved mechanism for maintaining a bobbin-winder in either of the bobbin-winding or throw-out positions.

A further specific object of the invention is to provide an improved mounting whereby bobbin-winders will not protrude objectionably from the body of the sewing machine.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangement of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the accompanying drawings:

Fig. 1 is a front elevational view of a portion of a sewing machine embodying the invention;

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1 and looking in the direction of the arrows;

Fig. 3 is a perspective, exploded view showing parts of the bobbin-winder mechanism;

Fig. 4 is a fragmentary, enlarged, sectional view taken along the line 4—4 of Fig. 1 and looking in the direction of the arrows;

Fig. 5 is a fragmentary, enlarged, sectional view taken along the line 5—5 of Fig. 2 and looking in the direction of the arrows;

Figs. 6 and 7 are enlarged, fragmentary, sectional views taken along the line 6—6 and 7—7 of Fig. 1 and looking in the direction of the arrows; Fig. 6 showing portions of the bobbin-winder mechanism in the throw-out position, and Fig. 7 showing the same mechanism in the bobbin-winding position.

Fig. 8 is an elevational view showing one side-face of a cam washer; and

Fig. 9 is a similar view showing the other side of the washer.

Referring to the drawings, the sewing machine in part illustrated therein has a frame including a standard 11 for supporting a bracket-arm 12. Journaled lengthwise in the bracket-arm 12 is a main- or needle-bar driving shaft 13 carrying at its rear end a freely rotating balance- and hand-

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wheel 14 which may be driven from any suitable source of power such, for example, as an electric motor (not shown). In order to drivingly connect the balance wheel 14 with the main shaft 13, a clutch mechanism of a well known type is provided. This clutch mechanism is controllable by a clutch-nut 16, which, when tightened, causes the motor-driven balance wheel 14 to drive the main shaft 13. However, when the clutch-nut 16 is loosened, the balance wheel 14 may be driven independently of the drive shaft and, thus, may conveniently be used in a manner presently to be described.

The standard 11 also supports a bobbin-winder, designated generally by the numeral 17. The bobbin-winder 17 has a carrier-arm 18, having at its pivotally-supported end a bearing boss 19, and at its distal end a bearing boss 21. The boss 19 extends into and is pivotally supported in the upper portion 22 of a recess 23 provided in the front face of the bracket-arm standard 11. The carrier-arm 18 and the distal bearing boss 21 may be swung downwardly into said recess or clearance cavity 23. The distal or free-end-bearing boss 21 is apertured and thereby rotatably journals a conventional bobbin-holding spindle 24 having a bobbin-carrying end 26 and a rubber tired wheel 27 adapted, in a swung-up or bobbin-winding position of the carrier-arm, to engage a hub 28 of the balance wheel 14. In the swung-down or throw-out position of the carrier-arm, the bobbin-carrying-end 26 of the spindle 24 enters a recess or clearance cavity 29 exending horizontally to the left (as seen in Fig. 1) of the recess 23. In like manner, the right end of the distal bearing boss enters a recess or clearance cavity 31 extending horizontally to the right (as seen in Fig. 1) of the recess 23. Also the rubber tired wheel 27 enters a recess or clearance cavity 32 formed in the standard 11 adjacent the recess 23. From this it can be seen that all parts of the bobbin-winder 17, in their swung-down or inoperative position, are at least partly received in recesses provided in the bracket-arm standard 11.

In order to pivotally mount the carrier-arm 18, and to hold this carrier-arm against vibration when it is swung down to the inoperative position, and also to maintain the spindle-wheel 27 in engagement with the hub portion 28 of the balance-wheel 14 when winding a bobbin, there is provided a pivot-pin 33 having mounted thereon a friction creating means which increases in intensity when the carrier-arm 18 and the spindle 24, carried thereby, are swung upwardly (Fig.

2) from the throw-out position to the bobbin-winding position. The pivot-pin 33 (Fig. 5) spans the recess portion 22 and is shouldered as at 34 and 36 to form shanks of three different diameters. A small diameter threaded shank 37 of the pin 33 is screwed into a threaded hole 38 formed in the sewing machine standard 11. A medium diameter shank 39 mounts a pair of apertured cam washers 41 and 41', pivotally supports the bearing boss 19 of the carrier arm 18, and supports an apertured dished spring washer 43. A large diameter shank 44, of the pin 33 is carried in a hole 46 formed in a portion of the standard 11. The outer end of the pivot-pin 33 is provided with a screw driver slot 47, whereby the pin 33 can be inserted and removed from the standard 11. The shoulder 34 abuts a side face 48 of the standard 11 and the shoulder 36 contacts the convex side-face of the washer 43.

The two cam-washers 41 and 41' are identical in structure and are positioned on the medium shank 39 of the carrier-arm pivot-screw 33 between that portion of the sewing machine standard designated by the numeral 48 and one side-face 49 of the carrier-arm boss 19. From the drawings, especially Fig. 3, it will be noted that one side face of each washer 41 and 41' has a rib 51 or 51', whereas, the other side face of each washer has a pair of high-land cam-sectors 52 or 52' spaced one hundred and eighty degrees (180°) apart. It will also be noted that each side-face rib 51 or 51' is located directly opposite one of the cam sectors 52 or 52'. When the cam washers are in assembled position on the pivot-screw 33, the side-face rib 51 of washer 41 is anchored in a recess 53 formed in the machine standard 11, and the side face rib 51' of the washer 41' is anchored in a recess 54 formed in the carrier-arm boss 19, thus positioning the two side-faces having cams 52 and 52' adjacent one another. The recesses 53 and 54 are circumferentially positioned around the holes that accommodate the pivot-pin 33 in such a manner that, when the bobbin-winder is in the bobbin-winding position (Fig. 7), the recess 54 will be opposite the recess 53 and due to the hereinbefore described relation between the ribs 51—51' and their cam sectors 52 and 52', the proximate faces of the high land cam-sectors 52—52' will be in contact when the bobbin-winder is in the bobbin-winding position. The same cam faces will be out of contact (Fig. 6), when the bobbin-winder is in the throw-out position. The length of the medium diameter shank 39, the axial length of the washers 41 and 41'; the height of the cam sectors 52—52', the axial length of the boss 19, and the axial length and strength of the spring washer 43, are such that when the bobbin winder is in the throw-out position, the spring washer 43 will cause the boss 19 to press the high land portion 52 of the cam washer 41 into the low land portions of the cam washer 41' and also to press the high land portion 52' of the washer 41' into the low land portion of the washer 41 with sufficient pressure to cause slight friction resistance to the rotation of the boss 19 and arm 18. However, when the bobbin-winder is swung to the bobbin-winding position, engagement of the high land portions 52 with the high land portions 52' effect lateral movement of the boss 19 and the carrier-arm 18 axially of the pivot-screw 33 and this compresses the dished washer 43, thereby increasing the frictional resistance to rotation of the boss 19 and the arm 18. Thus, the spring washer 43 functions to prevent vibration of the carrier-arm when the bobbin-winder is in the throw-out position and also securely holds the carrier-arm in the swung-upwardly or bobbin-winding position during the bobbin winding operation.

Briefly stated, the mechanism above described operates as follows: During the period when the sewing machine is being used to form a line of stitches, the bobbin-winder is placed in the "throw-out" position shown in solid lines in Fig. 2. In this position, the spring washer 43 causes sufficient friction in the mounting of the boss 19 to prevent vibration or rattling of the bobbin-winder 17. At the same time, the bobbin-winder is not so firmly held in the throw-out position, but that an operator can, by grasping the rubber-tired wheel 27, easily move the bobbin-winder from the throw-out position. When it becomes necessary to wind a bobbin, the clutch nut 16 is loosened to disconnect the main driving shaft 13 from the motor driven wheel 14 and, the bobbin-winder is moved from the throw-out position to the bobbin-winder position. In this position, increased frictional resistance is added to prevent easy movement of the boss 19. This increased resistance is obtained by compression of the dished washer 43 which is caused by sidewise movement of the bearing boss 19, and this sidewise movement is caused by the engagement of cam sectors 52 and 52'. Thus, in the bobbin-winding position, the rubber tired wheel 27 is maintained in engagement with the hub 28 of the balance wheel 14.

From the above it will be evident that the bobbin-winder 17 of this invention is inexpensive to manufacture, positive in its action, and easy to operate. It will also be noted that the bobbin-winder protrudes only slightly from the front face of the sewing machine bracket-arm 11.

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

1. In a sewing machine having a bracket-arm standard and a balance wheel rotatably supported by said standard; a bobbin winder comprising a pivot-pin supported by said standard, a bobbin-winder carrier arm pivoted on said pin, a cam washer locked against rotative movement with respect to said standard, a second cam washer mounted adjacent said first cam washer and locked to rotate with the pivotal movement of said arm, and a spring arranged to force said washers together.

2. In a sewing machine having a recessed bracket-arm standard and a balance wheel rotatably supported by said standard; a bobbin-winder comprising a pivot-pin supported from said standard and spanning a portion of the recess in said standard; a bobbin-winder carrier arm pivoted within said recess and on said pin; a cam washer carried on said pin within said recess and locked against rotative movement with respect to said standard; a second cam washer mounted face abutting said first cam washer and locked to rotate with the pivotal movement of said arm; and a dished spring washer carried on said arm and arranged to press said cam washers together.

3. A bobbin-winder comprising a carrier arm; a pin for pivotally mounting said carrier arm; a pair of cam washers mounted on said pin and having cam faces abutting one another; one of said cam washers being locked against rotative movement, and the other of said cam washers being locked to said pivotally mounted carrier arm; and a mechanism for forcing the two cam washers together.

4. A bobbin-winder comprising a bobbin-winder carrier arm; a pin for pivotally mounting said carrier arm; a pair of identical washers mounted on said pin, each washer having on one of its faces a rib and on its other face a pair of diametrically opposed cam sectors, one of said cam sectors being positioned directly opposite said rib, and one of said ribs locking its washer against rotative movement, whereas, the other of said ribs locks its washer for rotative movement with said pivotally mounted carrier-arm, and a dished spring washer carried by said pin and arranged to press said washers together.

5. In combination a sewing machine comprising a bracket-arm standard having a plurality of recesses in the face thereof, one of said recesses extending vertically along said standard and other of said recesses extending horizontally from said vertical recess; a bobbin-winder carrier arm pivotally supported in a portion of said vertically extending recess; a bearing boss carried by the distal end of said arm, and, in one of its positions, being arranged to enter one of said horizontally extending recesses; a bobbin holding spindle rotatably carried by said bearing boss and, in one of its positions, being arranged to enter another of said horizontally extending recesses; and a rubber tired wheel mounted on said spindle and being arranged to enter one of said horizontal recesses.

6. In a sewing machine having a bracket-arm standard and a balance wheel rotatably supported by said standard; a bobbin-winder comprising a pivot supported from said standard, a bobbin-winder support carried on said pivot, a pair of friction producing washers carried on said pivot, and a spring mechanism for biasing said friction producing washers one against the other.

7. In a sewing machine; a standard provided in the front face thereof with a recess; a bobbin-winder pivot-pin carried on said standard and spanning a portion of said recess; a pair of friction producing washers carried on said pivot-pin and

positioned in said recess; a bobbin-winder carrier arm pivoted on said pin and at least partly receivable in said recess; a carrier arm frictioning spring supported in said recess and disposed to maintain said washers in contact with each other; and a bobbin-winder spindle carried by said bobbin-winder arm and at least partly receivable in said recess.

8. In a sewing machine having a bracket-arm standard provided with a recess formed therein and a balance wheel rotatably supported by said standard; a bobbin winder, comprising, a pivot-pin supported by said standard, a washer carried on said pin, a rib formed on one side-face of said washer and arranged to enter said recess in said bracket-arm standard, a pair of cam sectors formed on the other side-face of said washer, a second washer carried on said pin adjacent said first washer, a pair of cam sectors formed on the side-face of said second washer which is proximate to said first washer, a rib formed on the other side-face of said second washer, a bobbin-winder carrier arm pivoted on said pin and said arm being provided with a recess for receiving said rib of said second washer, and a dished-washer spring carried on said pin and arranged to be tensioned when said bobbin-winder carrier arm and second washer are swung on said pin.

9. In a sewing machine; a standard provided with a recess in a face thereof; a bobbin-winder pivot pin carried on said standard and spanning a portion of said recess; a bobbin-winder carrier arm pivoted on said pin and at least partly receivable in said recess; a friction producing mechanism positioned in said recess, said friction producing mechanism being so constructed and arranged as to maintain said bobbin-winder carrier arm in a plurality of selected positions around said pivot pin; and a bobbin-winder spindle carried by said bobbin-winder arm and at least partly receivable in said recess.

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No references cited.