

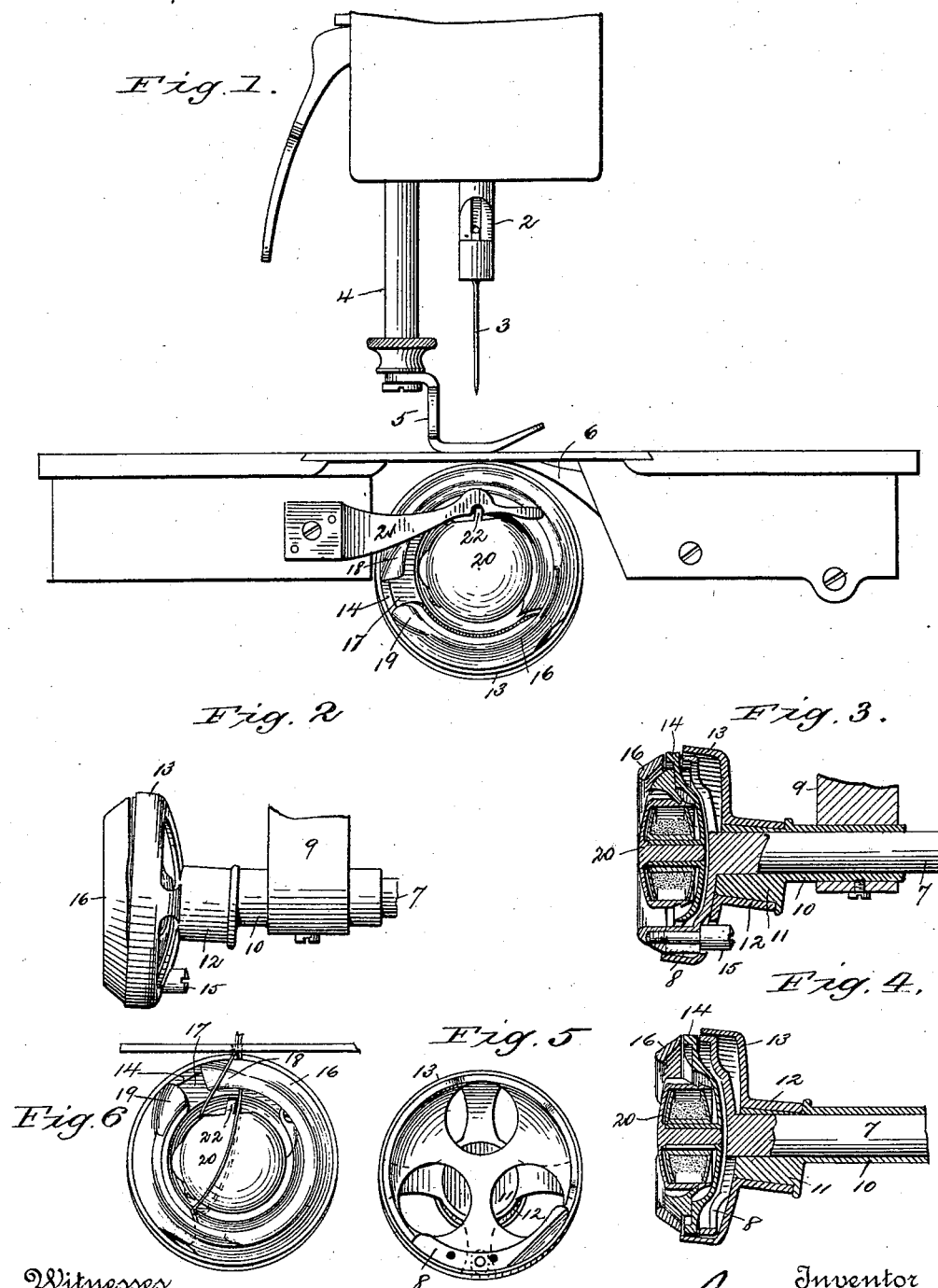
(No Model.)

J. BOLTON.

SHUTTLE OPERATING MECHANISM FOR SEWING MACHINES.

No. 455,156.

Patented June 30, 1891.



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SHUTTLE-OPERATING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 455,156, dated June 30, 1891.

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To all whom it may concern:

Be it known that I, JAMES BOLTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Shuttle-Carriers for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object to provide a driver and carrier for sewing-machines employing rotating or oscillating shuttles, the said driver and carrier being of such construction that a shuttle may be positively held and driven without a race for it to run in, while free passage and escapement around and from the shuttle are at all times permitted for the loops of needle-thread without requiring objectionable looseness to the shuttle in the carrier. To this end I provide an inclined flanged or cup-shaped circular shuttle-carrier which is connected with the shuttle-driver to rotate or oscillate therewith, the bottom portion of the flange of said carrier being, owing to the inclination of the carrier, always extended forward far enough to be beneath the rim of the shuttle so as to support the latter, while the top of the said flange is far enough back to clear the top of the rim of the shuttle laterally, and thus allow a free escape for the loops of needle-thread from the shuttle. The shuttle is preferably held in the driver by a ring attached to and moving with the latter, said ring serving as a guard to hold the shuttle-thread taut and away from the point of the needle and the beak of the shuttle. An opening in said ring permits the shuttle-thread to slacken at the moment when the feed is to occur, and an inclined portion or face on the ring beyond said opening serves to tighten the shuttle-thread against the pull of the take-up and to draw sufficient thread from the bobbin to complete the stitch. The ring may be rigidly attached to the shuttle-driver by a screw and steady-pins, or may be hinged thereto so as to be readily turned down for the insertion or the removal of the shuttle, and in the latter case may be held in open or closed position by a snap-spring.

In the accompanying drawings, Figure 1 is a partial front end elevation of a sewing-machine embodying my invention. Fig. 2 is a detail elevation of the shuttle driver and carrier and adjacent parts, and Figs. 3 and 4 sectional views of the same. Fig. 5 is a front end view of the shuttle driver and carrier with the shuttle-holding and thread-controlling ring removed, and Fig. 6 a detail front view with some of the parts shown in Fig. 1 omitted.

In the machine herein shown the needle-bar 2, needle 3, presser-bar 4, presser-foot 5, feed-bar 6, rotary shuttle-driving shaft 7, shuttle-driver 8, and shuttle 14 are or may be the same as in the well-known "standard" rotary-shuttle machine; but my invention is equally applicable to other forms of rotary-shuttle machines or to oscillating-shuttle machines. Attached to the hanger 9 is a sleeve 10, in which the forward end of the shaft 7 has its bearing, said sleeve having an inclined portion or bearing 11, which receives a neck 12 of the flanged or cup-shaped circular shuttle supporter or carrier 13, which is inclined, relative to the longitudinal plane of its axis of rotation, as shown in Figs. 2, 3, and 4, so that the lower or bottom part of the flange thereof will extend forward beneath the rim or periphery of the shuttle 14, to support the same while the top of said flange is slightly rearward or inside of the said rim laterally to afford a proper escape-passageway on the inner side of the top of the shuttle for the needle-thread as the loops of the latter are tightened by the take-up. The flanged shuttle supporter or carrier 13 is connected with the shuttle-driver, to rotate therewith in any suitable manner. As shown in the present instance, this connection is effected by the elongated head of a screw 15, passing through a slot in the disk-portion of said carrier.

The shuttle 14 is loosely held between the driving-disk or driver 8 and a shuttle-retaining and thread-controlling ring 16, attached to said driver, said ring being separated from the rim of the driver a distance sufficient to loosely receive the rim of the shuttle, the weight of the latter being thus received by the rotary inclined supporter or carrier, as

will be readily understood by reference to Fig. 4 of the drawings. The ring 16 must be turned down or removed when the shuttle is inserted into or taken out of the driving-carrier, and said ring is herein shown as being removably secured to the driver by the screw 15 and steady-pins; but instead of this connection a hinged connection of any usual or well-known form may be employed.

10 The ring 16 is not quite a continuous one, being interrupted by an opening 17, on opposite sides of which are inclined portions or faces 18 and 19. The ring 16, in addition to its office of retaining the shuttle in the driving-carrier, also serves important functions as a controller of the shuttle-thread, holding said thread, which passes up outside of said ring, taut and out of the way of the points of the needle and shuttle during a greater part of the rotation of the latter; but when the feed is about to take place the shuttle-thread is slackened by riding down the inclined face 18 of the said ring into the opening 17, and when the feed has occurred and as the take-up operates to tighten the stitch the said thread is again tightened against the pull of the take-up by the inclined face 19, thus drawing enough thread from the bobbin for the stitch.

30 The bobbin-case 20 is held stationary in a well-known manner by means of a retainer 21, provided with a notch which receives a lug 22 on the said bobbin-case.

The operation of my invention will be readily understood from the foregoing, the loops of needle-thread being caught by the beak of the shuttle and expanded for the passage of the shuttle in the usual manner. The escape-passage at the top of the shuttle afforded by the inclined carrier 13 permits the thread-loops to be readily drawn up at all times as the stitches are tightened by the take-up. As the carrier 13, the flange of which supports the shuttle, rotates with the latter I avoid the friction and other annoyances incidental to the use of a shuttle-race, and while by my improvements I am enabled to hold the shuttle with sufficient firmness to insure its reliable operation and prevent rattling, it is always sufficiently loose to afford easy passage for the loops of the needle-thread. Moreover, as all the parts contiguous to the shuttle are constantly moving therewith, it is impossible for loose ends of thread to become wedged between the shuttle and the other parts; but such ends, even if they get around the shuttle, will soon work out by the action of the machine, as practical tests of my machine have demonstrated.

60 The disks of the shuttle-driver 8 and carrier 13 are preferably made open or skeleton form, as shown in Fig. 5, so that lint and dirt which may work down into the driver and carrier can escape therefrom.

65 I do not wish to be understood as limiting

my invention to all of the details herein shown, as it is obvious that my invention may be varied within the province of mechanical skill without departing from the spirit thereof.

The rotating ring 16 might be dispensed with by employing a stationary device or ring-slide to hold the shuttle against the driver, and by using a shuttle with a thread-guard, and it will therefore be understood that this rotating shuttle-retaining ring is not positively essential to the operation of my inclined rotary-shuttle-supporting carrier.

The term "inclined," as used in connection with the shuttle-carrier in the claims hereunto appended will be understood to mean inclined relative to the longitudinal plane of the axis of the said carrier, or inclined so as to be at an acute angle to a vertical plane, as clearly shown in the drawings.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination, with a sewing-machine shuttle and its driver, of an inclined circular shuttle-supporting carrier connected to said shuttle-driver to move therewith, and having a flange, the lower portion of which is beneath the rim or periphery of the shuttle and the upper part of which clears said rim or periphery laterally.

2. The combination, with a sewing-machine shuttle and its driver, of an inclined circular shuttle-supporting carrier connected to said driver to move therewith, and having a flange extending beneath the rim of the shuttle, and a shuttle-retaining ring, as 16, attached to said driver, and between which ring and driver the shuttle is loosely held with its rim or periphery resting on the lower part of the flange of said inclined carrier.

3. The combination, with a sewing-machine shuttle and its driver, of an inclined circular shuttle-supporting carrier connected to said driver to move therewith, and having a flange extending beneath the rim of the shuttle, and a shuttle-retaining and thread-controlling ring, as 16, attached to said driver and having an opening, as 17, to permit the thread to slacken when the feed is to occur, said ring having also inclined faces or portions, as 18 and 19, on opposite sides of said opening.

4. The combination, with a sewing-machine shuttle and its driver, of the inclined shuttle-supporting carrier connected to said driver to move therewith, and having a circular flange extending beneath the rim of said shuttle, and having also a neck, as 12, of a stationary inclined bearing, as 11, surrounded by said neck.

5. The combination, with a sewing-machine shuttle and its driver, of the inclined shuttle-supporting carrier having a circular flange extending beneath the rim of said shuttle, and having also a neck, as 12, of a stationary inclined bearing, as 11, surrounded by said neck, said driver having a projection, as screw

15, loosely engaging said carrier to cause it to move with the driver.

6. The combination, with a sewing-machine shuttle, of a skeleton or open-disked driver
5 and an inclined circular skeleton or open-disked shuttle-supporting carrier connected to said driver to move therewith, and having a flange, the lower part of which extends be-

neath the rim of the shuttle and the upper part of which clears said rim laterally. 10

In testimony whereof I affix my signature in presence of two witnesses.

JAMES BOLTON.

Witnesses:

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D. G. STUART.