

(No Model.)

J. BOLTON.

SHUTTLE OPERATING MECHANISM FOR SEWING MACHINES.

No. 376,364.

Patented Jan. 10, 1888.

FIG. 1.

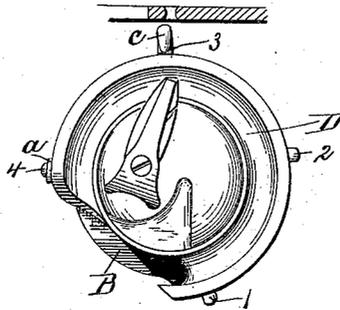


FIG. 2.

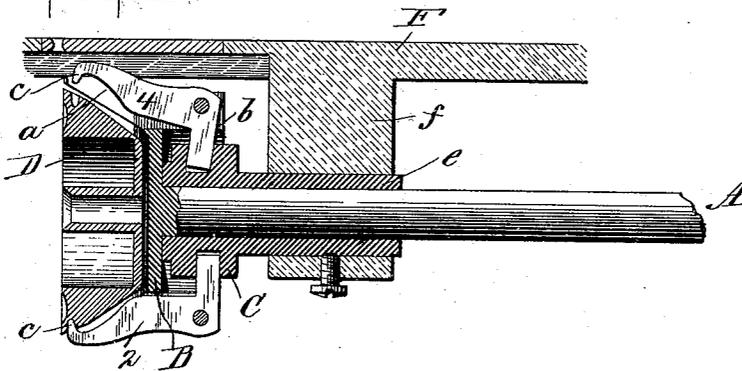


FIG. 3.

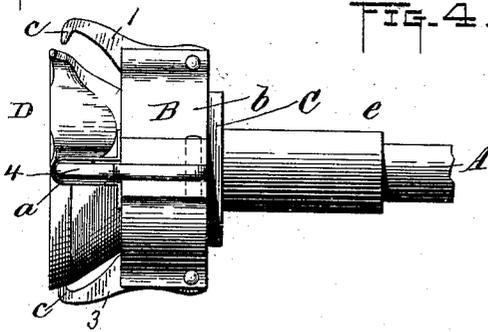
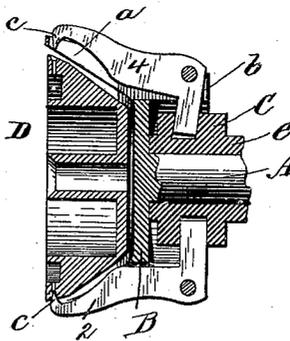


FIG. 4.



Witnesses

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## SHUTTLE-OPERATING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 376,364, dated January 10, 1888.

Application filed December 6, 1887. Serial No. 257,067. (No model.)

*To all whom it may concern:*

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

As is well known to those familiar with rotating shuttle sewing-machines, much trouble is occasioned by the friction between the shuttle and its race. The latter is unavoidably located beneath the needle and feed-opening in the work-plate, and considerable dirt and lint from the work therefore gets into the race, and thus clogs up the latter more or less. Moreover, when the machine stands idle for any considerable time, the oil with which the race is lubricated becomes gummed, and this gum, together with the dirt and lint in the race, makes so much friction that the machine runs hard, and the wear of the parts is therefore excessive.

My invention has for its object to obviate this difficulty by supplying a rotary shuttle-carrier of such construction that no shuttle-race is required. This object I accomplish by providing the rotary shuttle carrier or disk with a series of pivoted arms or levers, between the outer ends of which the shuttle is held, the said arms or levers being successively operated by a stationary cam, so that they are lifted from the shuttle one at a time to permit the loops of needle-thread to pass around the shuttle. To enable the shuttle-carrying levers to hold and carry the shuttle securely the latter is provided at its periphery with small holes or pockets, into which pointed fingers at the ends of the said levers enter, and from which they are withdrawn when lifted from the shuttle. That one of the shuttle-carrying levers which is the last to be lifted from the shuttle as a loop of thread passes around the latter is partly or wholly surrounded by a guard or stripper, which prevents the diminishing loop from catching on the end of the said lever as the said loop is tightened by the take-up.

In the drawings, Figure 1 is a front view of a rotating shuttle-carrier with my invention

applied thereto. Fig. 2 is a partial sectional view through the stationary cam and adjacent parts. Fig. 3 is a plan view of the shuttle-carrying disk and other parts. Fig. 4 is a sectional view showing shuttle-carrying levers with sharp points.

A denotes the shuttle operating shaft, to be rotated by any suitable or well-known mechanism.

B is the shuttle-carrying disk, which may be integral with or secured to the said shaft. The said carrier or disk has a rearwardly-extending flange, *b*, in which are pivoted the shuttle carrying and clamping levers 1, 2, 3, and 4, shown in the present instance as elbow or bell crank levers. The said levers are provided at their forward ends with fingers *c*, entering small holes or pockets in the periphery of the shuttle *D* and near the front or outer edge of the said shuttle. The fingers *c* are preferably formed with sharp points, as shown in Fig. 4, so that the said points will push the thread aside, and therefore prevent it from catching under the said fingers as they come into engagement with the shuttle; but the points of the said fingers may also be somewhat rounded, as shown in the other views, if desired. The rear or shorter arms of the said levers enter a groove in a stationary cam, *C*, and the said cam is provided with a sleeve, *e*, by which it is secured in a hanger, *f*, of the bed-plate *F*, the shaft *A* passing through the said sleeve and cam. The lever 4, which is at the heel of the shuttle, and which is therefore the last to be lifted from the latter as a loop of needle-thread passes, is partly or wholly surrounded by a stripper-guard, *a*, within which the finger *c* on the said lever is withdrawn, as shown in Figs. 2 and 4, when the lever is lifted from the shuttle, the guard stripping the diminishing loop of needle-thread from the finger, and thereby preventing it from catching.

The shuttle-holding levers are arranged at about ninety degrees from each other on the disk *B*, and as three of them are always in contact with the shuttle the latter is always securely clamped and held thereby, so that it is positively supported and rotated without a race, and thus the usual friction between the shuttle and its race is avoided.

From the foregoing it will be apparent that

as the shuttle-operating shaft is rotated the shuttle-carrying levers will be successively raised at the upper part of their orbit by the stationary cam to permit the loops of needle-  
5 thread to pass around the shuttle. The lever 4 is placed slightly nearer to the lever 3 than to the lever 1 to give sufficient time, after a loop has passed the said lever 4, for the take-up to tighten the stitch.

10 It will be observed that the fingers *c* on the shuttle-carrying levers, by entering the recesses or pockets in the periphery of the shuttle, effectually prevent any lateral or back-and-forward movement of the shuttle in the carrier.  
15 In other words, the shuttle is firmly grasped and held positively by the said levers, so that it is impossible for it to move except with the carrier as the latter rotates.

By providing the shuttle-carrying levers  
20 with small fingers, which occupy but little space on the periphery of the shuttle, and which grasp the latter near its outer edge, as shown in the drawings, I am enabled to get a proper timing of the levers, so that they may  
25 all be operated by a single grooved cam, which lifts them successively to allow the loops of needle-thread to pass, the thread passing each finger much more quickly than it could if the lever had a broad grasping portion to engage  
30 the shuttle. Moreover, by operating the shuttle-carrying levers by a grooved cam they are moved positively in both directions, and my machine may therefore be worked at a much higher speed than would be possible if the  
35 said levers were moved in one direction by springs.

It will of course be understood that my invention is not limited to the bell-crank shuttle-carrying levers herein shown, nor to the cam  
40 having a groove in its periphery for operating said levers, as other well-known forms of levers and grooved cams may be used, if desired.

I do not herein claim, broadly, the combination, with a rotary sewing-machine shuttle having  
45 a series of pockets at its periphery, of a rotary shuttle-carrier to engage and rotate the shuttle positively without a race, and a stationary cam, which is preferably a grooved

cam, for operating said levers, this feature of my invention being embraced by my application No. 243,061, filed July 1, 1887; but

What I do claim herein, and desire to secure by Letters Patent, is—

1. The combination, with a rotary sewing-machine shuttle having a series of holes or  
55 pockets at its periphery, of a rotary shuttle-carrier having a series of clamping-levers to engage and rotate the shuttle, said levers having pointed fingers to enter the holes or pockets in the shuttle, and a stationary grooved  
60 cam for operating said levers positively in both directions.

2. The combination, with a rotary sewing-machine shuttle-carrier provided with a series of clamping-levers, and having also a guard or  
55 stripper for one of the said levers, of a stationary cam for operating the said levers.

3. The combination, with the rotary shaft A, the shuttle D, having a series of recesses or pockets at its periphery, and the shuttle-  
70 carrying disk B, having the annular rearwardly-extending flange *b*, of the bell-crank shuttle-carrying levers pivoted to the said flange, and the stationary grooved cam by which the said levers are operated.  
75

4. The combination, with the rotary shaft A and its disk B, of the pivoted shuttle-carrying levers 1, 2, 3, and 4, the guard *a* on the said disk surrounding the said lever 4, and the stationary grooved cam by which the said levers  
80 are operated.

5. The combination, with a rotary sewing-machine shuttle having a series of holes or pockets at its periphery and near its front or  
85 outer edge, of a rotary shuttle-carrier having a series of levers to engage and rotate the said shuttle, said levers having pointed fingers to enter the holes or pockets in the shuttle, and a stationary grooved cam for operating the said levers positively in both directions.  
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In testimony whereof I affix my signature in presence of two witnesses.

JAMES BOLTON.

Witnesses:

HENRY CALVER,  
EWELL A. DICK.