(No Model.)

W. A. MACK.

SEWING MACHINE.

No. 596,447. Patented Dec. 28, 1897.

Fig. 1.

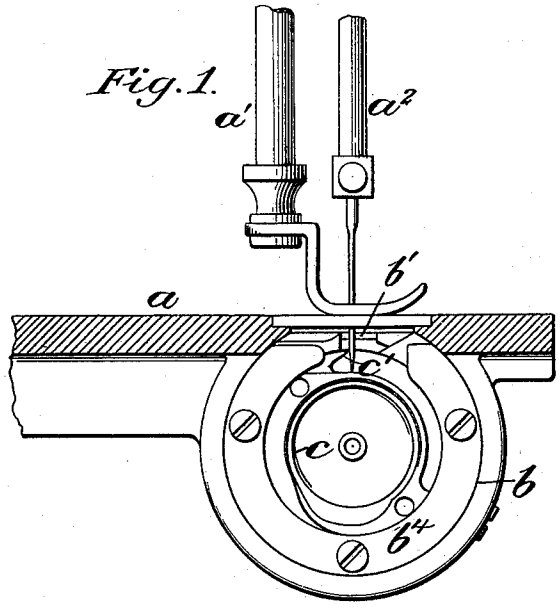


Fig. 2.

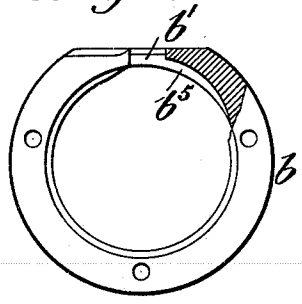


Fig. 3.

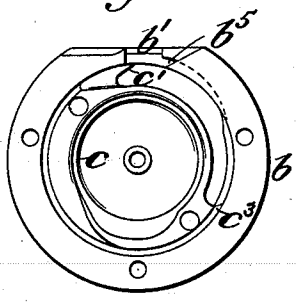


Fig. 4.

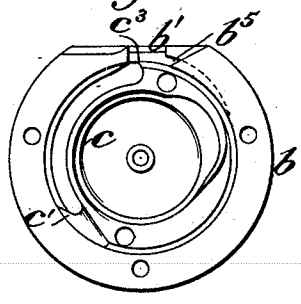


Fig. 6.

Fig. 6a.

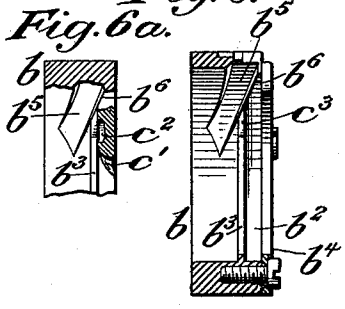


Fig. 5.

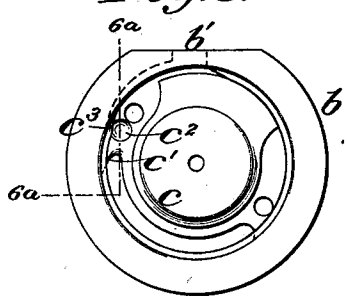
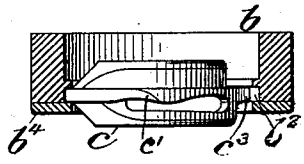


Fig. 7.

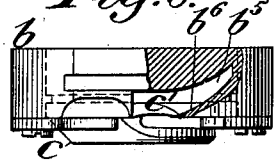


Witnesses:-

W. N. Haywood

A. L. Hayes.

Fig. 8.



Inventor:-

William A. Mack

by Chas. F. Dann

his Atty.

UNITED STATES PATENT OFFICE.

WILLIAM A. MACK, OF NORWALK, OHIO, ASSIGNOR TO THE STANDARD SEWING MACHINE COMPANY, OF OHIO.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 596,447, dated December 28, 1897.

Application filed October 10, 1892. Serial No. 448,331. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. MACK, a citizen of the United States, and a resident of Norwalk, county of Huron, and State of Ohio, have invented new and useful Improvements in Sewing-Machines, of which the following description, taken in connection with the drawings herewith accompanying, is a specification.

My present invention relates to rotary, oscillating, or other machines in which the shuttle or hook is located and operates within a circular raceway. Heretofore in machines of this class there has always been great trouble and inconvenience caused by reason of thread, lint, and similar foreign matter becoming located in the raceway, which tends to clog or choke up the latter and interfere with the regular and proper operation of the machines; and it is the object of my invention to effectually overcome this difficulty and provide a perfect anticlogging shuttle-raceway. This object I accomplish by means of the construction and arrangement of parts forming my invention, which consists, first, in forming a groove in the inner wall of the raceway to extend from the needle-opening therein at an angle across the raceway to a point in the rear of the same, whereby the inner side of the needle-thread loop, when the latter is engaged by the looper or any other loose ends or pieces of thread that may have become located on or across the point of said looper, will be moved into said groove upon the forward movement of the latter and guided to the rear of the looper and the raceway without liability of becoming caught between the periphery of the looper and the wall of the raceway, which would tend to clog the race and interfere with the proper operation of the stitching mechanism; second, in providing an opening or depression in the rear or inner side of the shuttle or hook adjacent to its outer edge and at the rear of the shuttle-point and in the construction of the rear wall of the shuttle-race at a point adjacent to its receiving end to act in combination with said depression or opening in a manner whereby any thread that might have become caught between the rear point of the shuttle and the adjacent wall of the race will be cut and the end or pieces be received into the said opening or depression in the shuttle and carried or discharged from the race, and, third, in other details of construction and combination of parts, as will hereinafter be described in detail, and pointed out in the claims.

Referring to the drawings, Figure 1 represents an end view of the bed-plate of a sewing-machine, partly broken away, showing the shuttle and shuttle-race frame in position thereon. Fig. 2 shows a face view of the shuttle-race frame or casement detached from its position on the bed-plate and with the shuttle and its retaining face-plate removed, partly in section, to show the angular groove on the inner periphery of the shuttle-race frame. Fig. 3 represents a face view of the shuttle-race frame with the face-plate removed, showing the shuttle in position therein with its point extending into the needle space or opening in the upper part of the frame. Fig. 4 shows the same with the heel of the shuttle just leaving one end of the raceway. Fig. 5 represents a rear view of the shuttle-race frame and shuttle, showing a portion of the opening or depression in the rear of the shuttle just passing behind the rear wall of the raceway. Fig. 6 represents a vertical sectional view through the center of the shuttle-race frame, showing the groove in its inner periphery and the relative position of said groove to the raceway. Fig 6^a represents a sectional view through line 6^a 6^a of Fig. 5. Fig. 7 represents a cross-section through the shuttle-race frame with the shuttle in position. Fig. 8 represents a plan view of the shuttle-race frame with the shuttle in position therein with the frame partly broken away, showing the point of the shuttle passing the edge of the groove in the race.

In the present instance I have shown my invention as applied to a rotary-shuttle machine and one in which the shuttle-race and shuttle are formed and located in a casement or frame constructed for detachable connection with the bed-plate of the machine, (the latter feature forming the subject-matter of another application of mine now pending,) although it will be obvious to those skilled in

the art, as will hereinafter appear, that the invention may be applied to oscillating or other machines having a circular raceway, and also to those in which the shuttle-race is formed in a fixed or stationary support, without departing from the spirit of my invention.

To explain in detail, a represents a section of the bed-plate of a sewing-machine; a' and a^2, the lower positions of the presser and needle bars, respectively; b, the detachable shuttle-race casement, and c the shuttle. The casement b is provided with the usual opening b' in its upper side for the passage of the needle and with a grooved raceway b^2 (see Figs. 6 and 7) adjacent to its face or front side, in which the shuttle is guided and rotates. The inner wall of this race is formed by a rib or flange b^3, made integral with the casement b, and the outer wall by a detachable plate b^4 to allow for the insertion or removal of the shuttle into or from its race.

According to my invention I provide or form a groove b^5 in the inner wall of the casement b, which extends from that end of the raceway at the right of the needle-opening b' therein, which I term the "receiving" end, at an angle across or through the race to a point in the rear of the latter, as more clearly shown in Fig. 6. This groove b^5, extending from the needle-opening b', as described, is adapted to receive the inner side of the needle-thread loop as the thread-engaging point or hook c' of the looper enters the race from the needle-opening and guide the same to the rear of the raceway and so prevent any liability of the thread becoming caught between the periphery of the looper and the wall of the raceway, which is liable to occur without the employment of such groove.

The inner or rear side of the thread-engaging point c' of the looper, which is tapered rearwardly from its point in the usual manner, as clearly shown in Fig. 8, moves gradually across the edge b^6 of the groove b^5 when entering the raceway, as shown in said Fig. 8, and in so doing will move or force the needle-thread or any other loose ends or pieces of thread that may have become located on or across the periphery or edge of the looper-point to the rear of the raceway, as guided by the said groove b^5. By this arrangement of the groove b^5, extending across the raceway from the needle-opening therein to the rear of the same, and the point of the looper coöperating therewith, as described, it will be understood that all liability of the thread becoming caught in the raceway or between the same and the looper will be obviated.

In some instances the thread gets between the rear of the shuttle-point and the inner wall of the race instead of over its outer surface, as before mentioned. To provide against this, I have formed a depression or opening c^2 in the rear wall of the shuttle at a point slightly at the rear of its point c', as more clearly shown in Fig. 5, a portion of which lies within the outer line of the rear wall of the race and the balance outside the line of said wall of the race, as shown.

That end of the flange forming the inner wall b^3 of the shuttle-race, adjacent to the receiving end of the latter, is gradually tapered from the line of the inner wall of the race outward to the line of its periphery, as shown at c^3 in Figs. 5 and 6, in such manner that the depression c^2 or that portion of it lying within the outer line of the raceway passes behind the wall b^3 gradually in order that its edge, which is made sharp, may act against the edge of the wall b^3, as shown in Figs. 5 and 6^a, and cut the thread or other piece that might be located between the engaging parts. The depression c^2 also serves to receive any foreign matter that might be located between the side of the shuttle-flange and the adjacent wall of the race and discharge the same through its uncovered portion, as will be obvious.

Having thus provided means as described for preventing the needle-thread or any other loose ends or pieces of thread from entering the shuttle-race that might tend to clog the same, I have also provided means for cleaning the dust, lint, and similar matter that might not have been reached by the construction as described, which consists in making the heel c^3 of the shuttle of the same width as the race, as more clearly shown in Fig. 7, and extending the same rearwardly slightly, as shown in Fig. 4, to form a scraper, whereby the race may be cleaned of any fine matter accumulated therein by turning the shuttle backward and thus scrape or carry any foreign matter therefrom.

By means of the construction as described I have provided a positive and effectual means for preventing any thread or other foreign matter from entering or clogging the shuttle-race, and I do not wish to be understood as confining myself to the particular form or construction of the parts as described, as it is obvious that slight changes and modifications might be made without departing from the spirit of my invention.

Having thus set forth my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A shuttle frame or casement provided with a needle-opening and raceway therein, and also with a groove extending from the needle-opening lengthwise of the wall of the raceway and across the latter, substantially as and for the purpose set forth.

2. The combination in a sewing-machine, of a frame having a circular shuttle-race and provided with an opening for the passage of the needle and with a groove extending at an angle across said race from the needle-opening to a point in the rear of the race and below said needle-opening, and a looper having its thread-engaging end formed with an inner rearwardly-tapered edge extending at an angle to said groove in the race, whereby, as

the looper moves across said groove, it will coöperate with one edge of the same, in a manner substantially as described and for the purpose set forth.

3. A sewing-machine provided with a frame having a circular shuttle-race and a raised rib forming the rear wall of the latter, said rib having a tapered edge, as c^3, and a looper provided with a depression or opening formed wholly within its rear side thereof and lying partially within the outer edge of the rear wall of said race in order that its edge may coact with the said tapered edge c^3, and also serve as a continuous discharge-passage from the rear of the race, substantially as described and for the purpose set forth.

WILLIAM A. MACK.

Witnesses:
C. FRED EBERHARD,
EDWARD L. DAY.