



# UNITED STATES PATENT OFFICE.

E. HARRY SMITH, OF NEW YORK, N. Y.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 20,739, dated June 29, 1858.

*To all whom it may concern:*

Be it known that I, E. HARRY SMITH, of the city, county, and State of New York, have invented certain new and useful Improvements in the Discoidal Sewing-Machine; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation of the whole machine. Fig. 2 is an elevation of driving mechanism. Fig. 3 is a face view of same, showing the rings forming a universal joint, and their relation to the shuttle and the driving-shaft. Figs. 4 and 5 are sections of the shuttle, exhibiting the bobbin in its interior, and showing its eccentric relationship to the periphery and the nose of the shuttle. Fig. 6 shows the reverse side of the shuttle and the holes in its perimeter, into which the driving-teeth mesh to carry it around.

A continuously-revolving shuttle has heretofore been used in a horizontal position at right angles to the needle, and driven by a ring surrounding and eccentric to the same. My said invention therefore does not relate to this device; but my invention consists in a revolving shuttle, in combination with a continuously-revolving disk set at an angle to said shuttle, having pins or projections entering holes in the shuttle to propel the same in such a manner that the needle and its loop of thread are free to act without coming in contact with said pins on the driving-disk as a loop of thread is taken from the needle and carried around said shuttle.

To enable others to make and use my invention, I will proceed to describe its construction and operation, and also the features which distinguish it from other sewing-machines.

My needle is to receive the desired motion from any suitable connection to the main shaft, and passes through an opening in the bed in the ordinary manner, and the main shaft *f* is to be rotated at the desired speed by suitable means.

I will first proceed to describe the shuttle itself, and then show the means for driving it.

My shuttle *a* is formed with a circular perimeter set and running in an annular plate, receiving its periphery and forming a bearing in which said shuttle is revolved, as hereinafter detailed. The needle passes down

in close proximity to one side of the shuttle, which side is flat or nearly flat, so as not to come in contact with the needle. In this flat side a mouth or opening is formed, so as to allow the bow of needle-thread, as it projects from the side of the needle on the same commencing to rise, to form unobstructedly in said mouth; and for this reason the size of said mouth must be such that the needle-thread loop or bow will not come in contact with the lower edge of this mouth. Within the mouth or opening, and on the line of the flat side of the shuttle, is the hook *i*, that takes the loop of needle-thread, carries the same down, and throws said loop onto a button, 3, formed at the center, in the manner shown in my patent of November 10, 1857. The side of the shuttle opposite to that on which the needle descends is formed as a projection, in which is a recess of as large size as can conveniently be formed between the perimeter and mouth, and into this circular recess I enter the spool-case 1, the same being formed with a center pin, on which the spool *b* is free to rotate. From this spool the thread passes through holes in the said spool-case to cause friction, and from this point the thread passes to a hole in the center of the shuttle, and thence directly to the cloth. Thereby there is no slack shuttle-thread, although the spool is eccentric to the shuttle.

In order to rotate the shuttle, I make use of a disk, *d*, set at an angle to the side of the shuttle, so that the needle passes between the shuttle and disk; and in this disk pins or projections 6 are provided, entering holes or recesses 13 in the shuttle, one or more of which pins are acting to drive the shuttle, while the others are withdrawn to pass the needle. This disk or ring, standing thus at an angle with the shuttle, may be on the end of the main shaft *f* if either the main shaft or shuttle be inclined sufficiently. I have, however, shown a universal joint formed by the second ring, *e*, which is connected to the ring *d* by screws, which in turn is attached to the shaft *f* in the same manner; and to preserve the inclination of the disk *d*, projections 7 from the frame are used, against which said ring *d* travels, and is preserved in an inclined position to the shuttle.

In Letters Patent granted to me November 10, 1857, some of the parts set forth in this

present application are shown and described, but not claimed therein.

At *g h*, Fig. 1, a feeding device is represented; but the means for moving the cloth may be of any desired character and move the cloth in the proper direction, and if said feeding device acts to move the cloth parallel to the axis of the shaft *f* and from the needle toward the projecting side of the shuttle, the loops of needle-thread will be kept away from the needle.

What I claim as my invention, and desire to secure by Letters Patent, is—  
Revolving the shuttle by means of a series

of drivers, 6, on the surface of a disk that is arranged to rotate at an angle to the plane of the shuttle's rotation, by which a continuous motion is given to the shuttle, while the drivers operate in such a manner that the needle and its thread are unobstructed in their action, substantially as specified.

In testimony whereof I have hereunto set my signature this 7th day of May, 1858.

E. HARRY SMITH.

Witnesses:

LEMUEL W. SERRELL,  
THOMAS G. HAROLD.