No. 33,947. PATENTED DEC. 17, 1861.

C. KAISER.

MACHINE FOR POLISHING THE EYES OF NEEDLES.

Fig. 2.

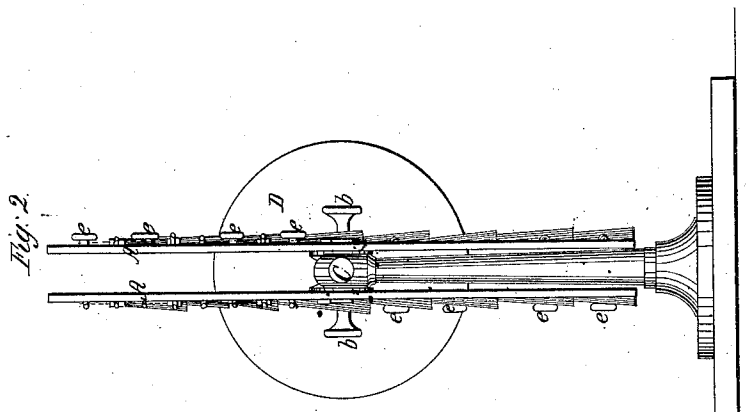
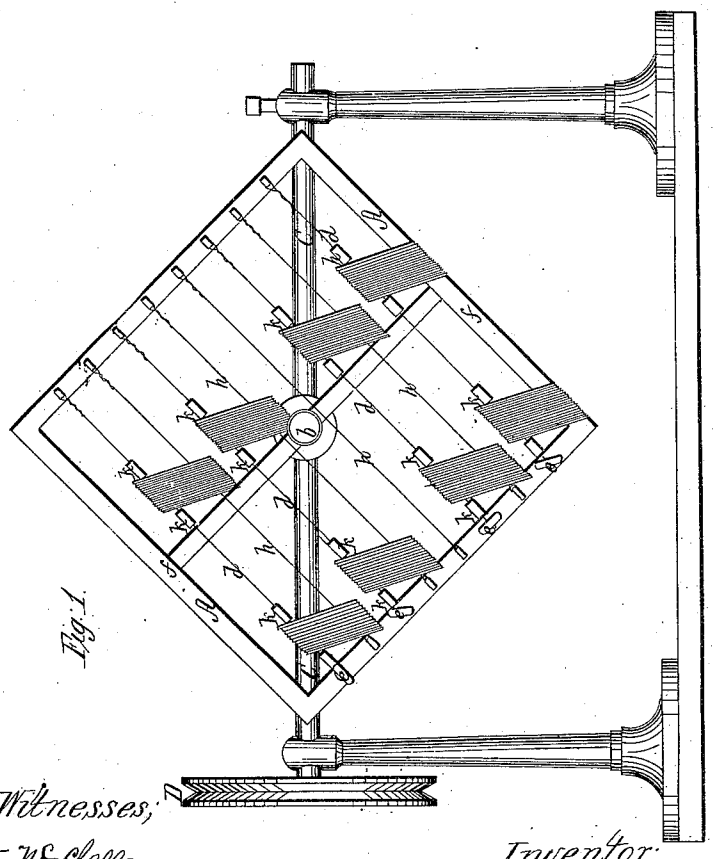


Fig. 1.



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CHARLES KAISER, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR POLISHING THE EYES OF NEEDLES.

Specification forming part of Letters Patent No. **33,947**, dated December 17, 1861.

To all whom it may concern:

Be it known that I, CHARLES KAISER, of the city, county, and State of New York, have invented a new and useful Machine for Polishing the Eyes of Needles and for other purposes to which the invention is applicable; and I do hereby declare that the following is a full, clear, and exact description of my said invention, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of a needle-eye polisher constructed according to the principles of my invention, and Fig. 2 represents an end elevation of the same.

It has been customary heretofore to polish the eyes of sewing-machine needles by hand by moving them to and fro along a thread passed through their eyes and smeared with oil and powdered emery. This hand-polishing requires the expenditure of a great amount of labor and of much care on the part of the operator to polish all sides of the eye equally.

Attempts have been made to polish the eyes of needles by machinery by swinging the needles upon polishing-wires; but such machinery is defective and cannot be used with advantage for sewing-machine needles because it tends to polish only that side of each needle-eye which is farthest from the long end of the needle, which, in sewing-machin needles, is the shank, and as the polishing was effected only by turning the polishing-wire in the needle-eyes it polished but slowly.

The object of my invention is to do the work of polishing the eyes of needles by power by the substitution in place of hand labor of a machine whose operation is to cause needles to move upon polishing-wires in a manner similar to that in which needles are moved in hand polishing.

To this end the first part of my invention consists in the combination of a polishing-wire upon which the needles are strung, with a frame across which the wire is stretched, and with mechanism to cause the needles to move longitudinally upon the wire.

The object of the second part of my invention is to equalize the polishing of the sides of the needle-eyes, so that the side of the eye which is farther from the adjacent end of the needle shall be properly polished. To this end the second part of my invention consists in combining the first part thereof with suitable means that cause the needles to move upon the polishing-wire with the ends that are nearer the eyes downward.

Both parts of my invention are embodied in the needle-eye polisher represented in the accompanying drawings.

In this machine there are two frames A and A, each of which is secured by a screw *b* at its center to a shaft C. The shaft is fitted with a pulley D, to which a belt is applied, so as to cause the shaft with its frames to revolve.

As this machine is constructed to polish a large number of needle-eyes simultaneously, each of its frames is fitted with four polishing-wires *d*. These wires are made of copper and are annealed. They are secured at one end to the frame and at the other to a key *e*, mounted upon the frame, by turning which key the wire may be drawn tight across the frame. The needles to be polished are strung upon the polishing wires, and as the frames revolve with the shaft each end of each polishing-wire is alternately raised above the other end thereof, so that the needles strung upon the wires are free to slide longitudinally by gravity alternately from one end to the other of each wire. If the needles were permitted to hang freely upon the wires, it is clear that they would always hang with their longer ends downward, and thus the side of the eye which was nearer the shorter end of each needle would be borne upon the wire and polished, while the side of the needle-eye nearer the longer end of the needle would not be borne upon the polishing-wire at all. In order to cause this latter side of the needle-eye to be borne upon the polishing-wire, the outer polishing-wires of each frame are set nearer the outer bars *f* of the frames than the length of the needles. Intermediate wires *h* are also secured to the frame at a less distance from the polishing-wires than the lengths of the needles. With this combination the longer ends of the needles are caught by the bars of the frame and the intermediate wires as the frames revolve, and are carried upward, so that the needles are turned upside down, and the sides of their eyes which are nearer their longer ends are borne upon the polish-

ing-wires by the weight of the needles. As the frames in their revolution pass a vertical plane the needles swing round on the polishing-wires and retake their first positions with their longer ends downward. If the polishing-wires were arranged parallel to the center shaft and the latter were horizontal, the needles would merely swing round on the polishing-wires; but by causing the polishing-wires to incline alternately in opposite directions the polishing is greatly hastened, as the needles not only turn round on the wires, but also slide to and fro thereon. In order to prevent the needles from striking against the frame, sliding tubes *k* are strung upon the polishing-wires at each end of each gang of needles. These tubes intervene between the needles and the sides of the frame on which the wires are strained and prevent the needles from striking the frame.

In practice I find it convenient to construct the frames about two feet square and to apply as many rows of polishing and intermediate wires as can be put on such a frame, according to the lengths of the needles, without the adjacent rows of needles interfering with each other. The needles are strung upon each polishing-wire, the polishing-wires are smeared with fine emery and oil, and the machine is caused to revolve by throwing its belt into gear. At first, as the needle-eyes are comparatively rough, they merely turn upon the polishing-wires without sliding; but as the roughness is polished off the needles begin to slide to and fro on the wires. When the frame has turned a number of hours in one direction, I reverse the revolution of the shaft by crossing the belt, so as to cause the frames to turn in the reverse direction to the first, whereby the polishing of all sides of the eyes is equalized. A good speed for the shaft with frames two feet square is twenty-four revolutions per minute, and at this speed it requires about thirty hours to polish a frame full of needles. As, however, such a frame will contain about five thousand medium-sized needles at a time and as the power required to move it is exceedingly small, the time is a matter of secondary importance. The inclination at which the wires are set causes the eyes to polish as if they were countersunk, so that the eye is funnel-shaped from each side of the needle. This inclination of the wires may be varied, if required, by turning the frames on the screws *b*, which secure them to the shaft.

The construction and mode of imparting motion to the frames of the machine may be varied, as circumstances render expedient or to meet the peculiar views of needle manufacturers.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Arranging the wires upon which the needles are strung upon a frame to which may be imparted either a revolving or reciprocating motion in such manner that the needles will be forced by gravitation to slide longitudinally upon said wires, substantially as described.

2. In combination with the foregoing, by the interposition of suitable mechanical obstructions arresting the needles in their attempted revolution around the wire and retaining them for a portion of the time with their long ends upward, in order that during such period of time that side of the eye of the needle which is nearest the long end may, by coming in contact with the wire and having the weight of the needle superimposed upon it, be polished equally with the other side of the eye, substantially as described.

In testimony whereof I have hereunto subscribed my name.

CHARLES KAISER.

Witnesses:
R. W. McCLELLAN,
W. L. BENNEND.