P. M. BEERS.

Machine for Polishing the Eyes of Needles.

No. 166,246. Patented Aug. 3, 1875.

FIG. 1.

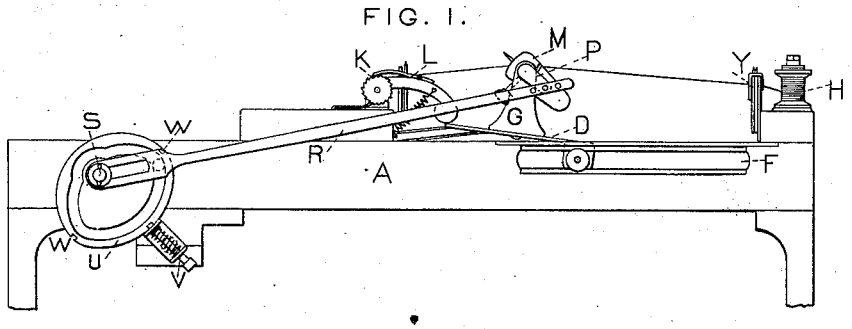


FIG. 2.

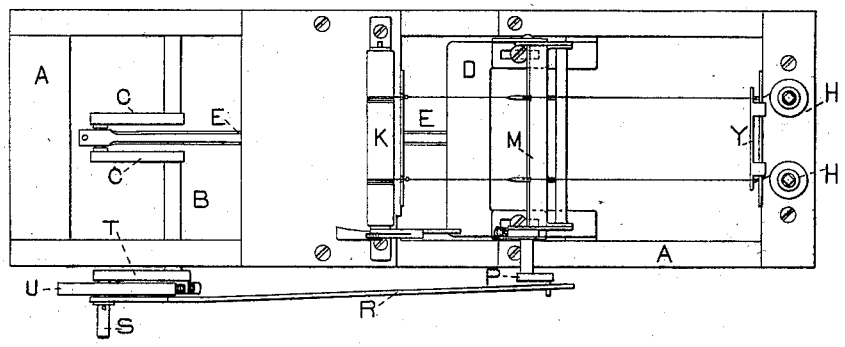


FIG. 3.

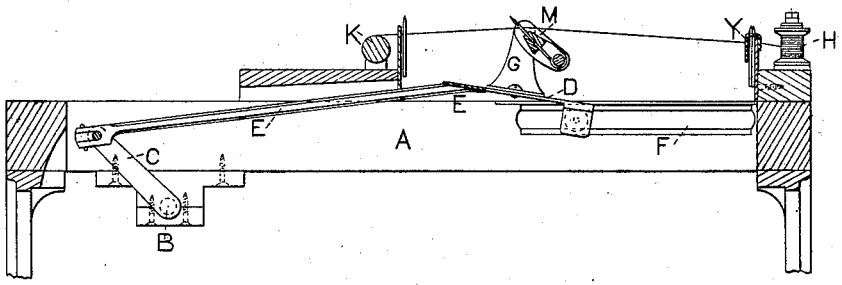
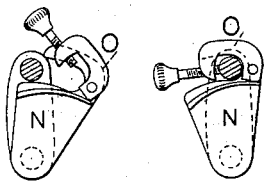


FIG. 4.



WITNESSES.

Philip F. Riley

W. C. Witter

Philo. M. Beers,

by Boyd Elliot

Atty for the

INVENTOR.

UNITED STATES PATENT OFFICE.

PHILO M. BEERS, OF BRIDGEPORT, CONNECTICUT.

IMPROVEMENT IN MACHINES FOR POLISHING THE EYES OF NEEDLES.

Specification forming part of Letters Patent No. **166,246**, dated August 3, 1875; application filed July 9, 1875.

To all whom it may concern:

Be it known that I, PHILO M. BEERS, of Bridgeport, county of Fairfield and State of Connecticut, have invented certain Improvements in Machines for Polishing Needles, &c., of which the following is a specification:

This invention has for its object the polishing or finishing the eyes of needles, &c., after they have been drilled or punched, as the case may be; and the invention consists chiefly in the use of a reciprocating carriage for supporting the needle-clamp, combined with a crank or its equivalent, whereby the needles are raised and depressed on their polishing-threads while being moved to and fro along said thread; and, second, the invention also consists in combining, with a needle-clamp on a reciprocating carriage, a cam or other suitable guiding and holding mechanism, whereby the needles are held during a portion of the movement in a fixed position, and then automatically reversed and held during another portion of their movement along their polishing-threads, as will hereinafter appear.

Figure 1 is a side elevation of the machine. Fig. 2 is a plan or top view of the same. Fig. 3 is a longitudinal section through the center. Figs. 4 are enlarged views of the end of the clamping device that holds the needles on the carriage.

At A is represented the frame of the machine, and at B is the main shaft, upon which is the crank C to give motion to the carriage D, which is connected with the crank C by a rigid connecting arm or rod, as at E, one end of which is connected to the crank, and the other is rigidly attached to the edge of the carriage, as shown at E in Fig. 3. The rear edge of the carriage D is mounted upon roller-bearings that travel upon or within guides, as at F, Figs. 1 and 3, and which are placed in the frame A. Upon the upper surface of the said carriage are placed the supports for the needle-clamp, as shown at G, and they are attached upon the carriage by set-screws, so that they may be moved on the carriage nearer to the bearings or the crank, as may be desired.

Now, it is evident that as the crank revolves the front edge of the carriage will rise and fall at each revolution of the crank or reciprocation of the carriage, and will thereby lift and depress the needles at the same time that they are moved to and fro on the polishing-threads, and therefore both ends of the eyes will thereby be polished at each reciprocation. The spools for holding the threads are mounted at one end of the frame, as shown at H H, and the threads are wound upon a shaft, as at K, which is operated by a ratchet and pawl, as shown at L, one end of the lever coming in contact with the carriage as it rises, as shown at Fig. 1. By such an arrangement the threads are constantly shifted to bring new or unworn portions into action on the needles automatically and regularly with each reciprocation of the needle-carriage.

The clamp for holding the needles is shown at M, and consists of two bars that extend across the carriage, one of which is mounted in bearings upon the standards at G, and in such manner as to be partially rotated, so that the needles may be reciprocating during the movements of the carriage. The other bar of the clamp is supported in proper position to the first by a pivotal connection through pendent arms, as shown at N in Fig. 4 in an enlarged form, and which will allow the two bars of the clamp to fall apart a considerable distance, so that the needles may be easily caught when swinging on their polishing-threads. A link with a set-screw at one end, as shown at O in Fig. 4, serves to bind the two bars together to form a clamp similar to a vise, one view at Fig. 4 showing the clamp open and the other closed. Upon one end of the clamp-bar that is mounted on the standards G, or extending out therefrom, is a crank-arm, as at P, to which is attached a connecting-rod, R, the other end of which rod leads to a crank-pin, S, on a crank-arm, T, mounted on the main shaft B. Said crank-arm T is the same length as the crank at C, and placed so that the connecting-rod R may not interfere with the movement of the carriage D. But the end of the said rod R is slotted where it works on the crank-pin S, to permit it to play to and fro a considerable distance to reciprocate the needle-clamp when desired, and this is caused by means of a cam at U, which is mounted upon the crank-pin S, and which is provided with a groove on its side, into which

a pin in the connecting-rod R works, and which gives the proper motion to the connecting-rod to vibrate the needle-clamp to scour the corners of the eyes during the movement of the carriage.

It will be seen that said cam at U is arranged to turn on the crank-pin, and is held in position by means of a spring-bolt, as at V, which is mounted on the crank-arm. This arrangement permits the point of vibrating the needle-clamp to be varied during their movement on the threads—as, for example, if the cam is placed as shown at Fig. 1, or with the locking-pin in the center of the concentric arc of the cam, then the needle-clamp will be changed at the center of its reciprocation; but if the said pin be locked in the hole or notch at W on the cam, then the vibration of the needle-clamp will occur at one end of its stroke. At Y is shown a clamp, which is placed over the needles that are swinging upon the threads, but not undergoing the operation of being polished, and which are kept out of the way of the needle-clamp by said clamp Y reaching over their points, and holding them at each end of the guides that support the polishing-threads. Only one of said clamps is shown, but another may be used at the other end for the needles not finished.

I am aware that such machines have had needle-clamps for changing the position of the needles upon their scouring-threads, and that the threads reciprocated through the eyes of the needles; but I am not aware that the needle clamp had a reciprocating as well as a vibrating movement, by which the needles could be drawn to and fro any desired distance on the threads, while the threads remain at rest; and

I therefore claim—

1. The combination, with the carriage D and clamp M, of mechanism, substantially as shown and described, for reciprocating the carriage, and causing it to rise and fall at each reciprocation, as and for the purpose set forth.

2. The combination, with the reciprocating carriage and needle-clamp, of the slotted connecting-rod R, cam U, and crank-pin S, as and for the purpose set forth.

3. In combination with the reciprocating carriage and needle-clamp, the winding mechanism for moving and polishing threads at each reciprocation, substantially as described.

4. The needle-clamp M, constructed of two bars, one of which is mounted in bearings, so as to partially rotate, in combination with the link O and its set-screw, for binding the bars together, substantially as described.

PHILO M. BEERS.

Witnesses:
F. W. HURD,
A. W. HURD.