C. E. LOMBARD.
Needle-Sharpener.

No. 201,115. Patented March 12, 1878.

Fig. 1.

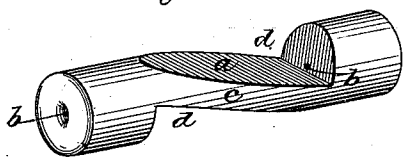


Fig. 2.

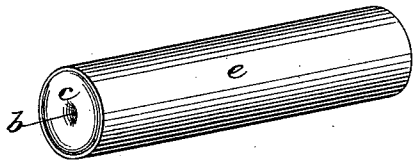


Fig. 3.

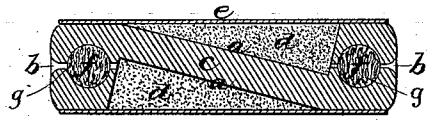


Fig. 4.

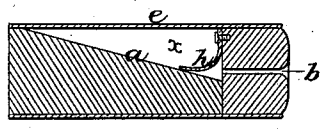
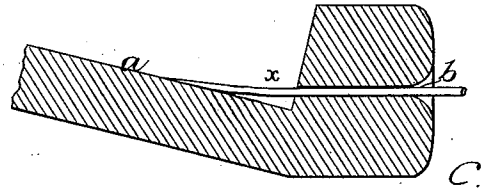


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES E. LOMBARD, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN NEEDLE-SHARPENERS.

Specification forming part of Letters Patent No. **201,115**, dated March 12, 1878; application filed August 2, 1877.

To all whom it may concern:

Be it known that I, CHARLES E. LOMBARD, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Needle-Sharpeners, of which the following is a specification:

In the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view of a device embodying my invention. Fig. 2 represents a perspective view of the same inclosed in a shell or tube. Fig. 3 represents a sectional view. Fig. 4 represents a sectional view of a modification. Fig. 5 represents an enlarged sectional view, showing the relation of the needle to the grinding-surface.

Similar letters of reference in the several figures refer to like parts.

The invention has for its object to provide a simple, compact, and cheap device for sharpening flat and twist as well as round pointed sewing-machine needles, and imparting a smoothly-finished and sharp point to such needles, without the necessity of special skill or care on the part of the operator.

To this end my invention consists in a needle-sharpener combining a guide adapted to direct the needle in a longitudinal direction when it is moved or reciprocated by the operator, and a grinding-surface which is arranged beyond the inner end of the needle-guide, and extending across the axial line of the opening, and is adapted to form a bearing for the inner end of the needle, and deflect the same by bending the shank as it is reciprocated, the deflection being sufficient to cause the point of the needle to lie against the grinding-surface at a proper angle, the elasticity of the needle holding the point in yielding contact with the grinding-surface at all times.

My invention also consists in certain details, all of which I will now proceed to describe.

In the drawings, *a* represents the grinding-surface, which may be of any desired material, such as roughened cast-iron, or any suitable stone. *b* represents the needle-guide, which consists of an orifice adapted to receive and guide a needle longitudinally without allowing it to move laterally.

The grinding-surface *a* and guide *b* are so arranged relatively to each other that there shall be an intervening space, *x*, greater than the diameter of the needle, so that a needle inserted into the guide will be guided thereby diagonally against the grinding-surface, the latter being inclined or diagonal to the path in which the needle is guided.

In sharpening a needle with the improved device, the operator inserts the needle into the guide *b* until the point comes in contact with the surface *a*, and reciprocates the needle longitudinally therein until the sharpening is effected.

As the needle is moved inwardly its point comes in contact with the inclined grinding-surface, and is deflected thereby. This deflection causes the elasticity of the needle to hold the point thereof against the grinding-surface with a yielding pressure, which is sufficient to insure the sharpening of the point by its rubbing contact with the grinding-surface without danger of breakage or injury.

The operator is thus enabled to sharpen the needle on one side at a time, which is obviously the only way a flat or twist pointed needle can be sharpened. In sharpening round-pointed needles, the operator can rotate the needle during the operation, if desired.

The inclination of the grinding-surface is preferably greater than that of the sides of the needle at the point thereof, so that the lateral deflection of the needle will not throw the point out of contact with the grinding-surface.

It will be seen that the cutting-surface must be unobstructed, so as to permit the needle to be moved with perfect freedom over it, and that the space between said face opposite the opening and the inner end of the latter must be greater than the diameter of the needle, in order that the shank may be bent, as a more limited space would cause the bending of the needle only at the point.

I prefer to make the grinding-surface and the guide in one piece and in duplicate, as shown in Figs. 1 and 3. In doing this I take a body, *c*, of the desired material, (cast-iron being preferred,) and form recesses *d d* in opposite sides thereof, one side of each recess forming the grinding-surface *a*, this side being suitably corrugated or roughened when the body *c* is made of metal. I then form the

guides *b* by drilling holes from the ends of the body *c* into the recesses *d*, these holes being preferably of different sizes, so as to adapt the device to two sizes of needles. The ends of the body *c* are preferably rounded and polished around the guides *b*, so that the point of the needle may be inserted into the guides easily and without injury.

The device is adapted to be used in the form shown in Fig. 1; but I prefer to inclose the body *c* in a shell or tube, *e*, which fits the periphery of the body closely, as shown in Figs. 2 and 3, this shell closing in the recesses *d*, and thus forming spaces, which are preferably filled with powdered emery, (or other like substance adapted to assist the grinding operation,) as shown in Fig. 3. When such powdered material is employed, I provide the guides *b* with a suitable packing, *f*, adapted to prevent the escape of the powder, this material being felting, sponge, or other expansible material inserted in a compressed condition into cavities *g* in the body *c*, or otherwise applied in such manner as to form barriers across the guides *b*, which will yield to allow the needle to pass through said guides, and expand and prevent the escape of the powder when the needle is withdrawn. The powder is thus securely confined, and constitutes a useful adjunct to the grinding-surface, as will be readily seen, besides keeping the needle in a bright and polished condition.

If desired, a spring, *h*, may be applied to the device, as shown in Fig. 4, to press the needle against the grinding-surface.

The guide *b* and the grinding-surface *a* may be made in separate pieces, if desired, as shown in Fig. 4, in which case the shell *e* holds the parts in the proper relation to each other. This construction is preferable when the grinding-surface is composed of stone.

The device, constructed as described, forms a very cheap, simple, and useful auxiliary to a sewing-machine. It can be operated by any person without special care or skill, as the operator has only to move the needle in and out. It is adapted to sharpen a flat as well as a round pointed needle, and to remove the hook that is often formed by the turning or bending of the point of the needle when the latter accidentally strikes the throat-plate or other rigid part of a sewing-machine. All the marks of wear made by the grinding-surface are lengthwise of the needle, so that the latter is kept in condition to penetrate the stock to the best advantage in sewing. The device is compact, and is therefore adapted to be inserted into the handle of another tool—such, for instance, as a screw-driver.

I claim as my invention—

1. The combination, with the unobstructed sharpening-face *a*, of a guide having an opening, *b*, at an angle to said face, with an intervening space greater than the thickness of the needle, the whole relatively arranged to insure the bending of the needle at the shank in proportion to the extent to which it is thrust beyond the inner end of the guide-opening, as specified.

2. The inclined grinding-surface *a* and the needle-guide *b* having an expansible packing, *f*, combined with the inclosing-shell *e* and a powdered filling held in the space between the grinding-surface and the inclosing-shell, substantially as and for the purpose specified.

3. The combination of the spring *h* with the grinding-surface *a* and needle-guide *b*, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES E. LOMBARD.

Witnesses:
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