G. & E. ASHWORTH.

Apparatus for Making Wire Card-Teeth.

No. 226,262. Patented April 6, 1880.

FIG. 1.

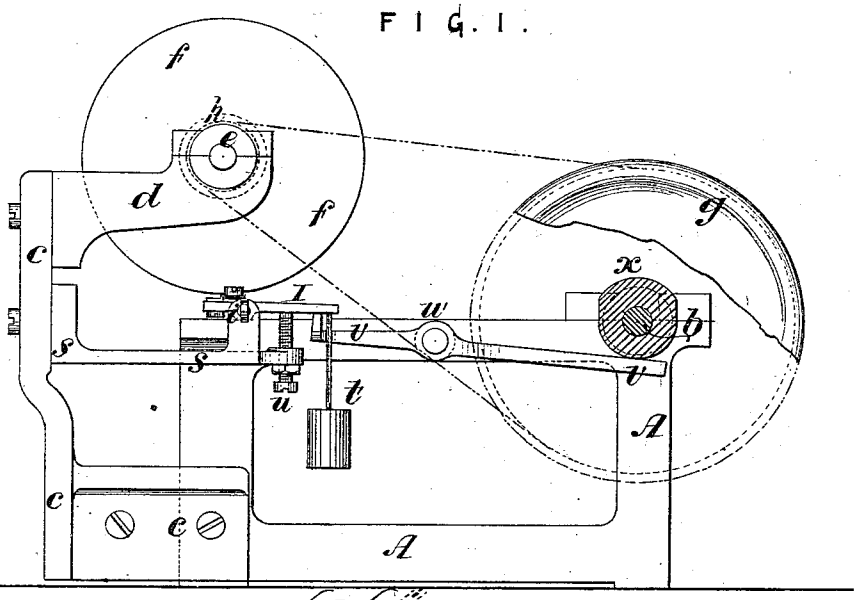


FIG. 8

FIG. 6.

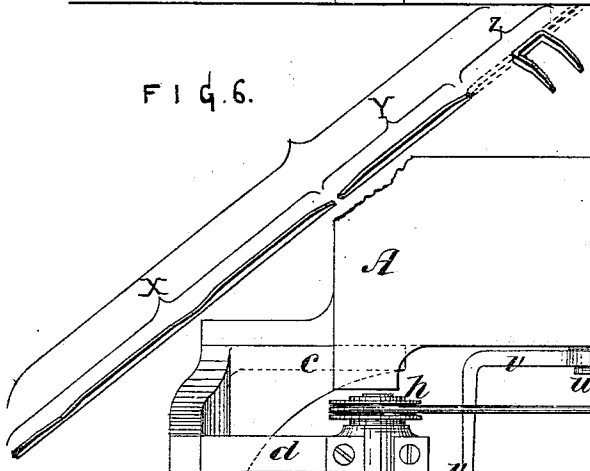


FIG. 7.

FIG. 2.

FIG. 3.

FIG. 5.

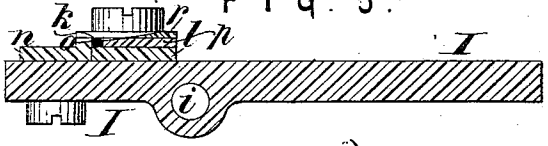
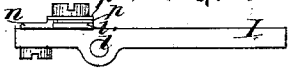


FIG. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE ASHWORTH AND ELIJAH ASHWORTH, OF MANCHESTER, GREAT BRITAIN.

APPARATUS FOR MAKING WIRE CARD-TEETH.

SPECIFICATION forming part of Letters Patent No. 226,262, dated April 6, 1880.

Application filed November 21, 1879. Patented in England December 14, 1878.

To all whom it may concern:

Be it known that we, GEORGE ASHWORTH and ELIJAH ASHWORTH, both subjects of the Queen of Great Britain and Ireland, and residing in Manchester, in the county of Lancaster, England, have invented certain Improvements in the Manufacture of Card-Teeth and Apparatus therefor, for which we have obtained Letters Patent of Great Britain, No. 5,128, dated December 14, 1878, and of which the following is a specification.

Our invention relates to the manufacture of the wire teeth of cards used in the carding and preparation of cotton and other fibrous materials.

The object of our invention is so to prepare the wire from which such teeth are made that the finished teeth will have sharper points than usual, and this object we attain by reducing the wire at intervals by the devices hereinafter described, and then severing the wire into lengths at the center of these reduced parts by the usual card-setting machine, which at the same time forms them into staples and inserts them in the card clothing or foundation.

In the accompanying drawings, Figure 1 is a side view of the grinding apparatus which we employ in connection with the ordinary card-setting machine in making our card-teeth. Fig. 2 is a plan view of the same; Figs. 3, 4, and 5, views illustrating parts of the machine; Fig. 6, a perspective view or diagram, illustrating the successive steps in the process of making the teeth; and Fig. 7 represents a length of wire reduced at intervals ready to be cut into lengths and formed into staples, as shown in Fig. 8.

In order to produce a finished card-tooth with the sharp points desirable, we reduce the length of wire from which the tooth is to be formed at intervals equal to the length of the tooth or staple to be produced, as indicated in Fig. 7 and at X in Fig. 6. We then sever the wire near the center of these reduced parts, as indicated at Y, Fig. 6, so that when the length of wire is bent up into the staple or tooth indicated at Z, Fig. 6, and in Fig. 8, it will have points of the necessary sharpness.

In carrying out our invention we combine with the ordinary card-setting machine the grinding-machine shown in the drawings. This grinding-machine is provided with one or more grinding-wheels or other abrading-surfaces so combined with an adjustable guide that as the length of wire is fed intermittently through this machine to the usual card-setting devices the wire will be reduced at the proper intervals.

In Figs. 1 and 2, A represents the frame of an ordinary card-setting machine, of which *b* is the driving-shaft.

The operating parts of the card-setting machine it has not been thought necessary to illustrate in the drawings, as they may be of any of the ordinary and well-known constructions.

To the frame A is secured a standard, *c*, which may be made adjustable by screws or otherwise in the direction of the traverse of the wire. To this standard is secured a bracket, *d*, which can be adjusted vertically, and secured after adjustment by screws or bolts. To bearings carried by this bracket is adapted a spindle, *e*, to which are secured two emery-wheels, *f*, and a grooved pulley, *h*.

The fly-wheel *g* on the driving-shaft *b* is grooved, and a belt passing over this wheel and the grooved pulley *h* imparts a rapid revolving motion to the spindle *e* and grinding-wheels *f*. Immediately below these wheels is mounted a swinging wire holder or guide, I. (Represented in the enlarged views, Figs. 3, 4, and 5.) This holder is mounted on a pin or axis, *i*, in the bracket *s*, secured to the standard *c*.

The portion of the holder or guide through which the wire is passed consists of a number of plates, as indicated in the enlarged view, Fig. 5, in which *k* represents a section of the wire. Two plates or pieces of metal, *l* and *n*, are secured to the body of the holder, and on the edge of the plate *n* is a flange or rib, *o*. A second plate, *p*, of a thickness equal to the gage of the wire, and having its upper surface flush with the top of the rib *o*, is secured to the plate *l*. The edge of this plate *p* is adjusted at such a distance from the edge of the plate *n* that when a cover-plate, *r*, is secured on the top of these plates a channel or opening just large enough for the passage of the wire is formed.

We prefer to use flattened wire; but round wire or wire of other section may be prepared in the same way.

A weight is suspended from the holder at *t*, and tends to press the other end of the holder toward the emery-wheels, the plate *r* and rib *o* being cut away, as indicated in Figs. 3 and 5, to permit the grinding-wheels to come in contact with the wire in the holder. An adjustable screw-stop, *u*, determines the extent of movement of the holder, and consequently the extent to which the wire is reduced by the grinding-wheels.

On the under side of the weighted end of the holder bears the end of a lever, *v*, pivoted to the frame at *w*, and acted on by a cam, *x*, on the driving-shaft.

When the machine is put in operation the wire drawn off the reel passes through the holder I, beneath the revolving grinding-wheel, to the card-setting mechanism, being fed forward intermittently by the usual devices. At the moment when the wire is fed forward the cam *x* so acts on the lever *v* that the wire in the holder I is withdrawn from contact with the grinding-wheels; but during the interval between each forward movement of the wire the cam *x* does not act on the lever *v*, and the weighted end of the wire-holder raises the wire at the other end into contact with the emery-wheels.

It will be seen that the wire is kept in contact with the grinding-wheels during the time the wire is not fed forward, and is withdrawn from contact therewith when the wire is fed forward.

The two emery-wheels are fixed at a distance apart, measured from center to center of their grinding-edges, equal to the length of wire afterward severed to form the tooth or staple. After each forward motion of the wire the portion reduced by the first grinding-wheel is further reduced by the action of the second wheel. Three or more wheels may be used, especially when acting on thicker wires, the wheels being of equal or varying thickness, as may be desired.

The wire thus reduced at the proper intervals, as indicated in Figs. 6 and 7, then passes to the card-setting devices, which are so arranged in relation to the grinding devices as to sever the wire near the center of the reduced portions, as at Y, Fig. 6, and then bend it into the staple form Z, Fig. 6, which is thus provided with the desired sharp points.

If preferred, the bracket carrying the grinding-wheels may be made movable, while the holder I is stationary. Grinding wheels or cylinders having their axles at right angles to the direction of traverse of the wire may be used, in which case it would be preferable to give the cylinders a to-and-fro motion in the direction of the length of their axes.

If round wire is to be acted on, the holder may be arranged so that it shall be securely griped during the grinding operation, one or more of the plates of the holder being movable for this purpose; but where flat wire is employed a close fit of the wire in the holder will be sufficient to prevent it from turning.

We claim as our invention—

1. The mode herein described of making card-teeth—that is, by first reducing the wire at intervals, then cutting the wire near the centers of the reduced portions, and bending these several lengths to the desired shape, all substantially as set forth.

2. An attachment for wire card-setting machines, consisting of a frame carrying one or more grinding-wheels, and devices, substantially as described, for causing said grinding wheel or wheels to act on the card-wire at intervals as it is fed forward, substantially as described.

3. The combination of a revolving grinding-wheel with the pivoted wire-holder I and devices, substantially as described, for moving the holder, so as to bring the wire into contact with said wheel at intervals, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEO. ASHWORTH.
ELIJAH ASHWORTH.

Witnesses:
EDWARD K. DUTTON,
DAVID FULTON.