2 Sheets—Sheet 1

C. PALMER.

Broom-Sewing Machine.

No. 202,749. Patented April 23, 1878.

Fig: 1.

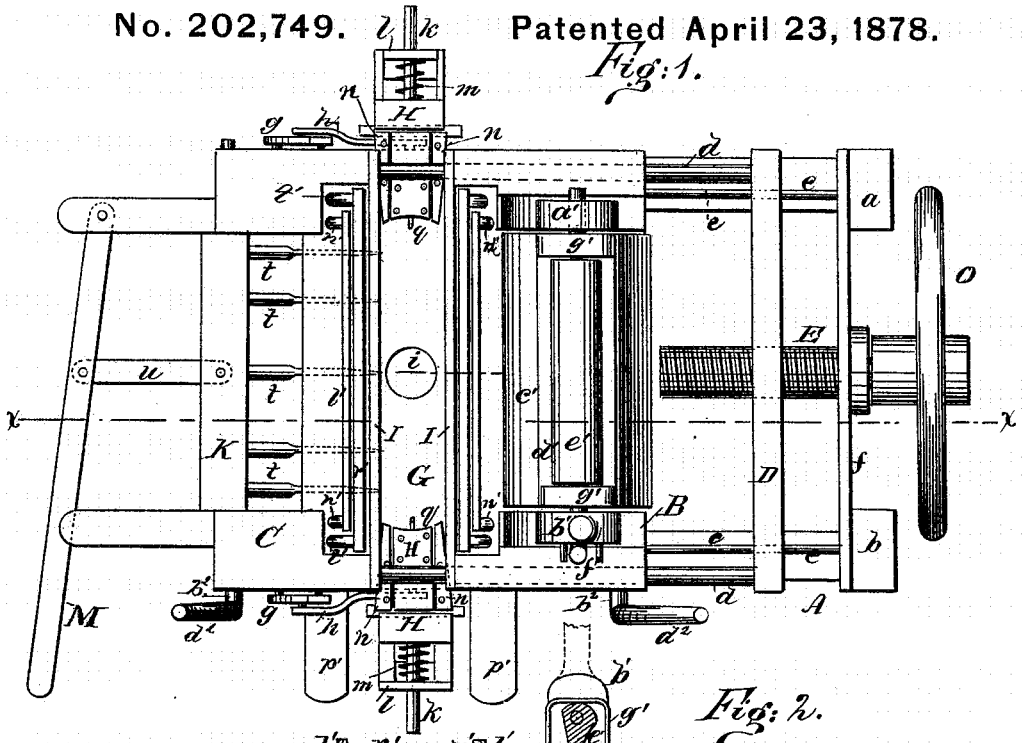

Fig: 2.

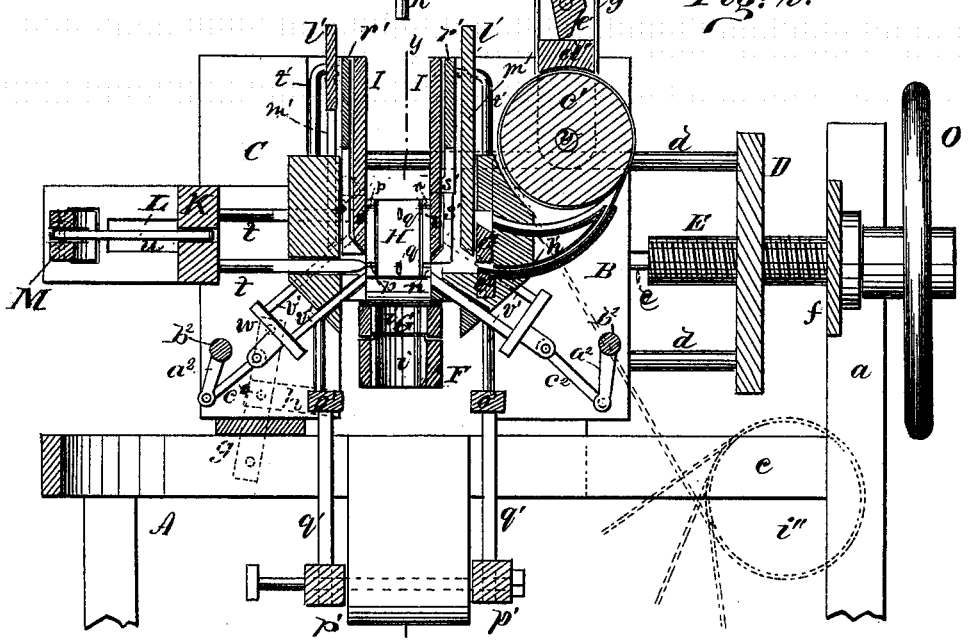

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Fig: 3

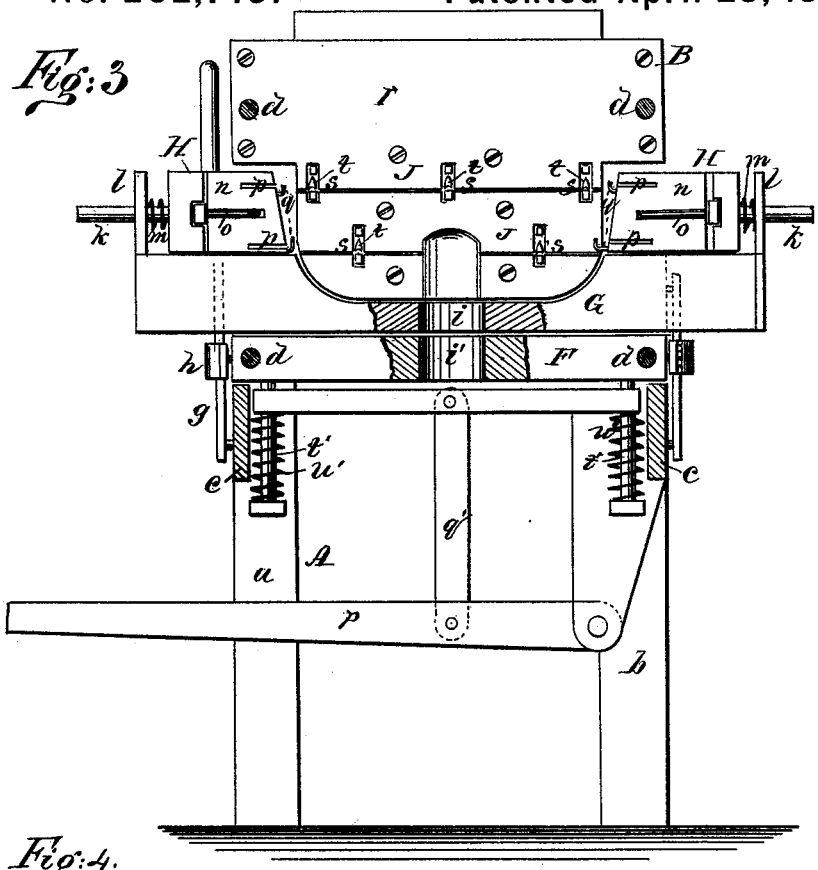

Fig: 4.

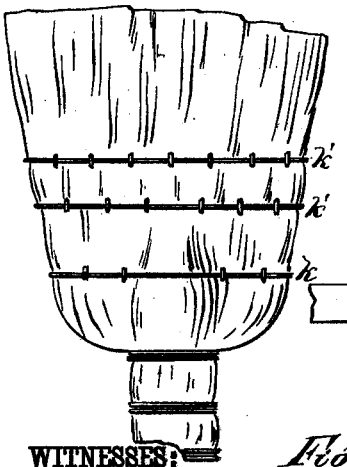

Fig: 5.

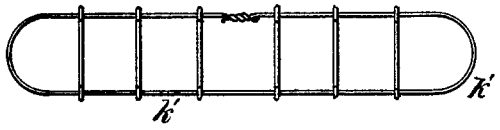

Fig: 6.

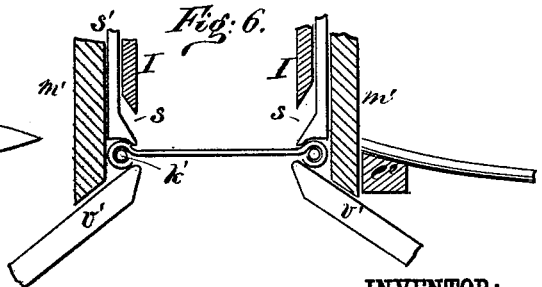

Fig: 7

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UNITED STATES PATENT OFFICE.

CHARLES PALMER, OF SPRINGFIELD, TENNESSEE, ASSIGNOR TO EDWIN A. HICKS, SAMUEL D. OGBURN, GEORGE W. DAVIS, AND THOMAS. K. DAVIS, OF SAME PLACE.

IMPROVEMENT IN BROOM-SEWING MACHINES.

Specification forming part of Letters Patent No. **202,749**, dated April 23, 1878; application filed October 30, 1877.

To all whom it may concern:

Be it known that I, CHARLES PALMER, of Springfield, in the county of Robertson and State of Tennessee, have invented a new and Improved Broom-Sewing Machine, of which the following is a specification:

Figure 1 is a plan view of my improved broom-wiring machine. Fig. 2 is a vertical section taken on line *x x* in Fig. 1. Fig. 3 is a vertical section taken on line *y y* in Fig. 2. Fig. 4 represents a broom wired by my improved machine. Fig. 5 represents one of the bands and the cross-wires. Fig. 6 is an enlarged sectional view of the wire cutting and bending devices. Fig. 7 is a transverse section of one of the wire-holding grooves.

Similar letters of reference indicate corresponding parts.

The object of my invention is to provide a machine for sewing brooms with wires.

The invention consists in a combination of mechanical devices for clamping the broom, holding the wire bands that surround the brush, piercing the broom, guiding the transverse binding-wires through it, cutting them, and binding them over the wire bands, all as hereinafter more fully described.

Referring to the drawing, A is a frame, consisting of the uprights *a b* and the horizontal bars *c*, and B and C are frames placed on the bars *c*, the frame B being fixed and the frame C movable.

Four rods, *d*, are secured to the frame C, and pass through holes in the frame B, and are secured to a plate, D, which is placed on guiding-rods *e*, that are supported by the uprights *a b*.

A screw, E, is swiveled in a cross-bar, *f*, that is attached to the uprights *a b*, and extends through a threaded hole in the center of the plate D.

A bar, F, is fitted to the lower rods *d*, so that it may slide thereon, and connected at its ends to the center of the levers *g* by rods *h*. The levers *g* are pivoted at their lower ends to the bars *c*, and are provided at their upper ends with studs, that project into slots formed in the sides of the frame C.

By means of this arrangement of levers the bar F is made to travel in the same direction as the frame C, but at half the speed, so that it is always equally distant from the frames B C.

Ways are formed on the bar F for receiving the broom-holder G, which consists of a bar that is concaved at its center to receive the shoulder of the broom, and provided with a central aperture, *i*, for receiving the broom-handle, which corresponds with a similar aperture, *i'*, in the bar F.

Sliding heads H are placed in ways formed in the ends of the broom-holder, and are provided with rods *k*, that project through standards *l* at the ends of the holder.

Spiral springs *m* are placed on the rods *k* between the heads H and standards *l* for holding the heads against the edge of the broom. The inner ends of the heads H are concave, and to the sides of the heads two pieces, *n*, are connected by parallel bars *o*. Notches *p* are formed in the ends of these pieces, for receiving and holding the wire bands that encircle the broom, and wire hooks *q* project from the heads H for the same purpose.

Upon the face of the frames B C there are plates I, the lower edges of which are fitted to concave surface of the broom-holder G, which is concaved to receive the portion of the broom in which the handle is inserted.

In the face of each plate there are two or more grooves, J, for retaining the wire bands that surround the broom. These grooves are angled, so as to form a lip, *r*, for retaining the wire band, as represented in the detail sectional view, Fig. 7.

Oblong apertures *s* are made in the plates I to receive the ends of the wire-bending fingers *v'* and *s'* and the piercing-needles *t*. These needles correspond in number to the number of transverse binding-wires to be inserted in the broom, and are arranged in series corresponding in number with the wire bands to be placed on the broom and the number of the grooves J formed in the plates for receiving the same.

The several series of needles are all attached to a head, K, which slides in horizontal ways L formed in the frame C.

A lever, M, is pivoted to a stud projecting from the frame C, and is connected with the head K by a short connecting-rod, *u*.

The needles *t* are grooved longitudinally along their under edge, and are of sufficient length to project through the broom into the aperture *s* of the plate I on the frame B.

A shaft, *v*, is journaled in the frame B near its top, and to it two arms, a^1 b^1, are secured, between which a drum, c^1, is placed upon the shaft, and is capable of turning thereon.

The arms a^1 b^1 are slotted to receive the ends of a concave piece, d^1, that is fitted to the surface of the drum c^1. A cam-roller, e^1, is journaled in the arms a^1 b^1, and is provided with a lever, f', by which it is turned when it is desired to force the concave piece d^1 against the surface of the drum c^1. The piece d^1 is provided with two straps, g', which surround the cam-roller, and by which the said piece is withdrawn from the surface of the drum.

Below the drum c^1 curved pipes h' are arranged tangentially in relation to the drum, and extend to the apertures *s* in the plate I on the frame B, for conveying wire from the drum to the said apertures.

Wires from several reels are taken around the drum i'', (shown in dotted lines in Fig. 2,) whence they pass to the drum c^1, passing partly around it and through the pipes h' to the aperture *s*.

The wire bands K', which are to surround the brush of the broom, are placed in the hooks *q*, and in the notches *p* in the movable pieces *u*, these pieces being thrown forward beyond the main portion of the head H to receive them.

The broom is placed in the support G, with its handle projecting downward through the apertures *i i'*. The heads H are forced against the edges of the broom by the springs *m*, and the broom is compressed laterally by drawing the frame C toward the frame B by turning the screw E, the screw being provided with a hand-wheel, O, for that purpose. The needles *t* may now be forced through the broom by means of the lever M.

The wire band k' is supported in such relation to the needles that they pass over the bands as they are forced through the broom. The piece d^1 is forced down upon the wires surrounding the drum by turning the cam-roller e^1. The drum c^1 may now be turned so as to force the wires through the tubes h' and through the body of the broom, the wires following the groove in the under side of the needles. The drum is turned by bearing downward upon the handled upward extension of the side arm b^1.

The operation of cutting off the wires and bending them around the wire bands k' is performed by devices described below.

A bar, l', carrying fingers m', is attached to rods n', that extend downward through the frame C, and are secured to the ends of a horizontal bar, o', placed below the frame C, and connected with a foot-lever, p', by the connecting-rod q'. r' is a bar, having attached to it fingers s', that have triangular projections formed on their ends, that extend into the apertures *s* above the groove J. Rods t' are attached to the bar r', and extend downward through guides in the frame C, and through apertures in the bar o', and are provided with nuts or heads, between which and the said bar spiral springs w' are placed on the rods.

The holes *s* in the several series alternate in position, and all of the fingers required to clamp and bend one end of the binding-wires are connected with a single set of bars, l' r'.

A set of fingers, v', are placed in inclined ways formed in the frame C, that terminate at the apertures *s*. These fingers are attached to a plate, w w', that is connected with a crank, a^2, on the shaft b^2, by means of a link, c^2. There is a lever, d^2, on the end of the shaft b^2, by which the shaft is moved.

The devices for bending the binding-wires are the same in the frame B as those just described in connection with the frame C, and are designated by the same letters of reference; but the fingers m' are provided with cutting-edges, which move in front of the cutting-bars e^2, and cut the binding-wires from the continuous wires fed through the tubes h'.

The broom is placed in the support G and clamped, and the binding-wires are forced through it by turning the drum c^1, being guided by the groove in the needles, as before described. The needles are now withdrawn, and the wires are clamped by bringing down the fingers s' in the frame C upon them by depressing the foot-lever p'. The bar r', carrying the fingers s', and the bar l', carrying the fingers m', move together until the fingers s' clamp the wires, when, by virtue of the yielding connection between the bars r' and o', the bar r' stops, while the bar l' continues to move, carrying the fingers m' downward, so that their beveled ends bend the ends of the wires downward over the wire bands k'. While the fingers m' s' are in this position the fingers v' are thrown forward against the downwardly-projecting ends of the binding-wires and complete the loop around the wire bands k'.

The movement of the fingers m' s' contained in the frame B is exactly the same as that just described. The fingers m', in this case, in moving downward, perform the additional function of cutters, and cut off the wires as they are clamped by the fingers s'. The lower ends of the fingers s' are concaved, so as to set the binding-wires down over the wire bands k', and form a complete circular eye around wire band. After a broom is wired in this manner it is removed by retracting the screw E.

The machine may be constructed so as to apply any desired number of wire bands, and insert the binding-wires at such intervals as may be required.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The movable heads H, provided with movable notched side pieces *n* and hooks *q* for supporting the wire band, in combination with the concaved bar G, as herein shown and described.

2. The levers *g*, pivoted to the bars *c* and connected with the movable frame C, and the connecting-rods *h*, in combination with the broom-holder G, as herein shown and described.

3. The drum c^1, clamping-piece d^1, and tubes *h'*, in combination, for carrying the wire forward through the broom, as herein shown and described.

4. The movable grooved needles *t*, in combination with the broom-clamping and wire-carrying devices, for piercing the broom and guiding the wires, as herein specified.

5. The plates I, having angled grooves J for supporting the wire bands *k'*, in combination with the frames B C, as herein shown and described.

6. The clamping-fingers *s'*, connected with the bar *o'* by a yielding connection, and the bending-fingers *m'*, connected with the said bar by a rigid connection, and the fingers *v'*, in combination, for bending the binding-wires around the wire band, as herein shown and described.

CHARLES PALMER.

Witnesses:
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R. K. HICKS.