To all whom it may concern:

Be it known that I, KARL WINKLER, a citizen of the German Empire, residing in Schwarzenberg, in the Kingdom of Saxony, in said Empire, have invented certain new and useful Improvements in Drilling and Filling Attachments for Brush-Making Machines, of which the following is a specification.

This invention relates to a drilling and filling attachment for brush-making machines in which the mechanism for imparting longitudinal reciprocatory and lateral oscillatory movements is readily adjustable to regulate such movements and adapt them for the making of brushes of different sizes.

The object of the invention is to provide a device of this character combining the properties of simplicity of construction and facility of adjustment.

In the accompanying drawings, Figure 1 represents a side-elevation of my improved brush-making machine. Figure 2 represents a horizontal section thereof, on line 2-2 of Figure 1, on a larger scale, showing especially the adjustable lever mechanism for regulating the longitudinal reciprocation of the brush-back supporting table. Figure 3 is a vertical longitudinal section on line 3-3 of Figure 1, showing the adjustable lever mechanism for controlling lateral oscillation or reciprocation of the brush support. Figure 4 is a diagram showing four brush-backs, arranged side by side for the hole-drilling and tuft-filling operations.

Similar letters of reference indicate corresponding parts throughout the different figures of the drawings.

Referring to the drawings, a represents the table, b the drilling tool and d the tuft-filling mechanism for filling the socket-holes with tufts of bristles. A single table a is shown which is provided with the necessary clamping devices a' for holding a brush-back or backs for both the drilling as well as the tuft-filling operations, the drilling mechanism and the tuft filling mechanism being arranged above the table. The hole-drilling mechanism and the tuft-supplying mechanism are old and well known and form no part of this invention. They are both driven by a driving shaft s that receives rotary motion by a belt-and-pulley transmission p, p' from an overhead power-shaft. The driving pulley p' transmits by a connecting rod r reciprocal motion to a vertically-guided slide-piece p, which engages by means of a pair of teeth at its lower end the toothed circumference of a pattern-wheel w, the shaft s, of which is supported in bearings on the rear-portion f' of the supporting frame f of the machine so as to impart a step-by-step rotary motion to the pattern-wheel. The pattern-wheel w can also be turned independently of the driving shaft by a gear-wheel g, pinion g', and hand-crank g'', for the preliminary adjusting of the machine preparatory to starting it for work. The pattern-wheel w is made in the shape of a disk which is provided on one side with a cam-groove w' that is shown in full lines, and at the other side with a cam-groove w'' that is shown in dotted lines in Figure 1. The cam-grooves w', w'' serve to impart, in connection with two intermediate adjustable lever-mechanisms, a horizontal laterally- and a horizontal longitudinally-reciprocating motion to the table a, as required for drilling the holes in the brush-backs on the table and inserting the tufts of bristles into the same.

The improved features relate mainly to the lever-mechanisms for imparting a laterally-reciprocating forward and backward motion to the table on which the brush-backs are supported. These mechanisms are actuated in proper time by a double faced cam v. This cam has a cam groove v' on one face which controls levers, for imparting the longitudinal reciprocation to the table carrying brush-backs and on its opposite face a cam groove v'' which controls the lateral oscillations of said table. The mechanism for imparting longitudinal reciprocation comprises an oscillating lever h which is pivoted at its lower end to a horizontal bar f' of the rear frame f. The lever h is connected below its connection with the pattern-wheel by a short pivot-link h' and a pivot-rod h'' with a clamping pin on a slotted arm of a horizontal elbow-lever h' which is fulcrumed to a bracket-plate f' of the supporting frame f of the machine. The pivot-pin w by which the rod h'' is connected with the arm h' is adjustable in the slot of the same so as to regulate the oscillating motion of the elbow-lever h' and increase or diminish the oscillating motion of the elbow-lever and thereby the distance between the holes to be bored in the brush-back. The elbow-lever h' is connected at its slotted front-arm with a fixed pivot stud h' at the
under-side of the table \( a \), as shown in Figs. 1 and 3.

The mechanism for imparting the lateral oscillations comprises an oscillating lever \( h \) pivoted at its lower end to said horizontal bar \( f \) and provided at its upper end with a pin \( e \) which engages the cam groove \( w \) in the double faced cam \( v \). A pivot link \( i \) connects the oscillating lever \( h \) with the lower end of the vertically oscillated lever \( z \) which is fulcrumed to a bracket \( i^a \) of the supporting frame \( f \). This lever \( z \) is provided with slots in its lower and upper ends, and the slotted upper end is connected by an intermediate pivot rod \( i^b \) with perforated ears \( e^a \) at the center of the rear portion of the table \( a \). The ends of the pivot rods \( i^b \) and \( i^a \) are adjustable in the slots of the lever \( z \) and by adjustment thereof the required length of stroke for imparting the desired lateral oscillation is effected.

The table \( a \) is made of sufficient width for permitting two brush-backs or two sets of brush-backs to be supported thereon, which brush-backs are held against a rear-flange \( e^a \) of the table by the clamping devices \( a^a \), which are adjusted from the front-edge of the table. The table \( a \) is provided with longitudinal ways \( z^b \) at its underside and supported on shiftable rollers \( r \) which are placed loosely on lateral rods \( z^a \) that are supported in eyes of yoke-shaped supports \( v^a \) shown clearly in Figs. 1 and 3. The rollers \( r \) are provided with circumferential tapering flanges \( z^a \) on which the correspondingly-shaped ways of the table are guided with little friction.

By the stroke-adjusting lever-mechanisms described, one and the same pattern-wheel can be employed for first drilling the holes in the brush-back and then filling the same with tufts of bristles by the tuft-filling mechanism. When the operating parts are properly adjusted for the size of the brush-back and the number and the proper distance between the holes both in a lateral and longitudinal direction, the machine is started and the drilling and filling mechanisms produce simultaneously the drilling of the hole in a brush-back supported at the left side of the machine and the insertion of a tuft into a corresponding hole in a brush-back clamped at the right-hand end of the table. These right and left terms have reference to an operator standing at the left of Fig. 2 in front of the machine and looking toward it.

When two or more brush-backs are to be drilled and filled, a special pattern-wheel \( w \) has to be arranged, so as to permit the continuous working of the hole-drilling and tuft-filling mechanisms without requiring any interruption of the machine. When the left-hand brush-back or backs are drilled

with the necessary number of socket-holes, the table is shifted so that the boring tool can drill the holes in the right-hand brush-backs or backs adjacent thereto and the drilling of the holes continued while the left-hand brush-back or brush-backs are exchanged and new brush-backs placed in position. Simultaneously the filling of the socket-holes of the brush-backs below the tuft-filling mechanism takes place at the same rate, and when the left-hand brush-backs are filled the table is shifted so that the right-hand brush-backs can be filled, the filled left-hand brush-back or brush-backs being then removed and another set of drilled brush-backs placed in position on the table while the filling of the right-hand brush-backs is continued, sufficient time being available for producing the exchange of one set of brush-backs and the clamping in position of another set on the supporting table, while the drilling and filling of the other set of brush-backs is going on, in accordance with the diagram shown in Fig. 4.

It is obvious that the holes of one, two or more brush-backs can be simultaneously drilled and filled by the same machine, also that any desired size of brush-back within certain limits can be drilled and filled by the actuation of one and the same pattern-wheel and the adjustable lever-mechanisms by which the lateral reciprocating as well as the longitudinally-reciprocating motion of the table is controlled and adjusted for any desired size of brushes, so that thereby the scope of the machine is considerably enlarged and the same better adapted for the manufacture of cloth, shoe, hair, nail, scrubbing and other brushes.

I claim:

1. The combination of a table support, a brush-back holding table movable longitudinally and laterally on said support and having a projecting stud, a duplex cam provided with cam grooves on its opposite faces, oscillating levers pivoted adjacent to said cam and having pins engaging said cam grooves on its opposite faces, a horizontal bell crank lever provided with slots in both arms one of which engages the stud of said table, a pivot rod connected at one end to one end of said oscillating levers and having an adjustable connection at the other end with the other slot of said bell crank lever, a vertically oscillating lever provided with slots on opposite sides of its fulcrum, a pivot rod connected with said table and having an adjustable connection with said vertically oscillating slotted lever, and a pivot link connected with the other oscillating lever and having an adjustable connection with said vertically slotted oscillating lever.

2. In a drilling and filling attachment for
a brush making machine, a support comprising transverse rods, ribbed rollers slideable laterally on said rods, a brush back holding table provided on its under side with longitudinal grooved ways adapted to travel on said ribbed rollers, a means connected with said table for reciprocating it laterally by the sliding action of said ribbed rollers.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

KARL WINKLER.

Witnesses:

PAUL GOEPFL,  
NIELS JOERGENSEN.