Feb. 16, 1932. J. J. THACHER 1,845,209

BRUSH MAKING MACHINE

Filed Feb. 1, 1926 2 Sheets-Sheet 1

Fig. 1.

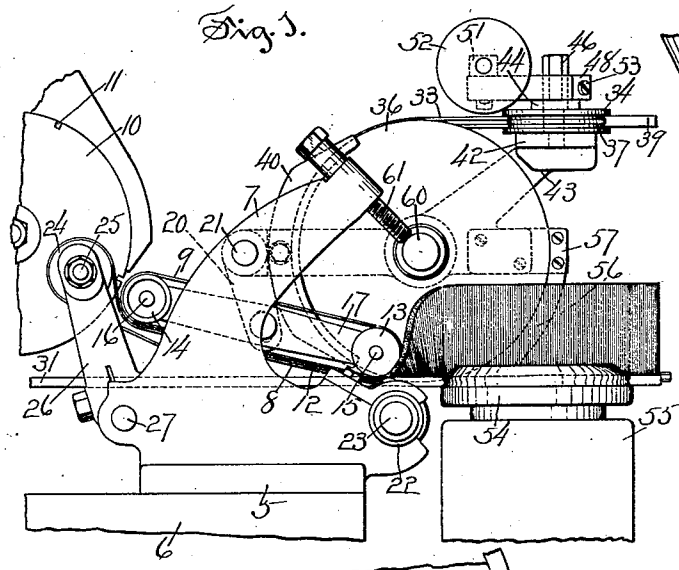


Fig. 4.

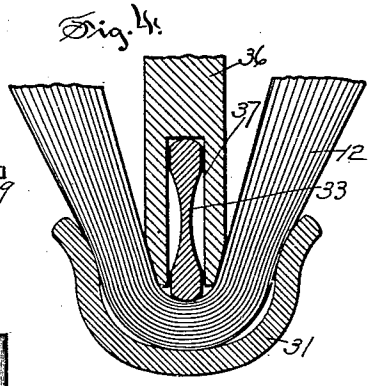


Fig. 5.

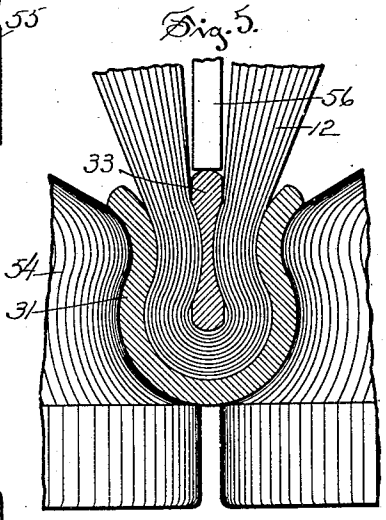


Fig. 3.

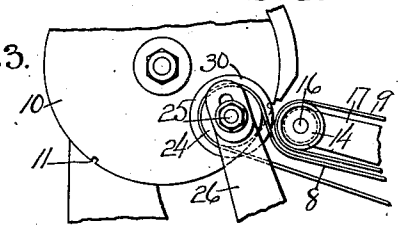
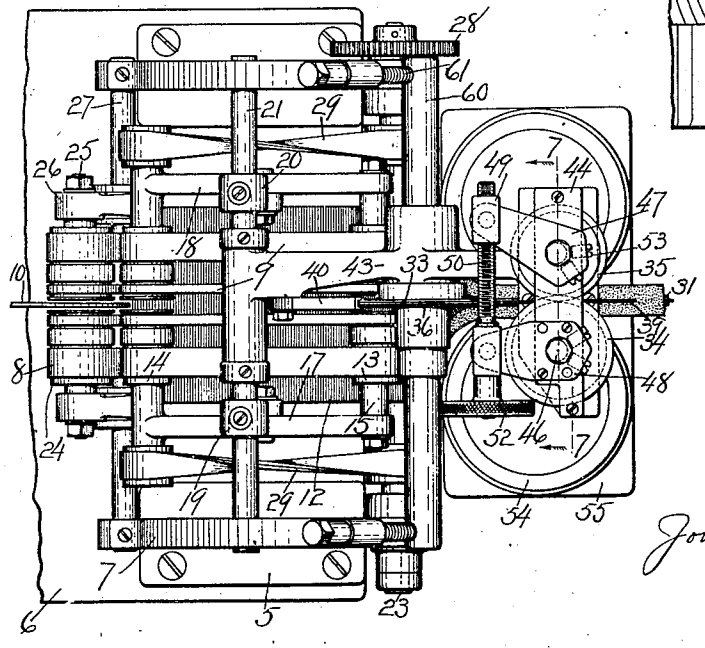


Fig. 2.



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Fig. 6.

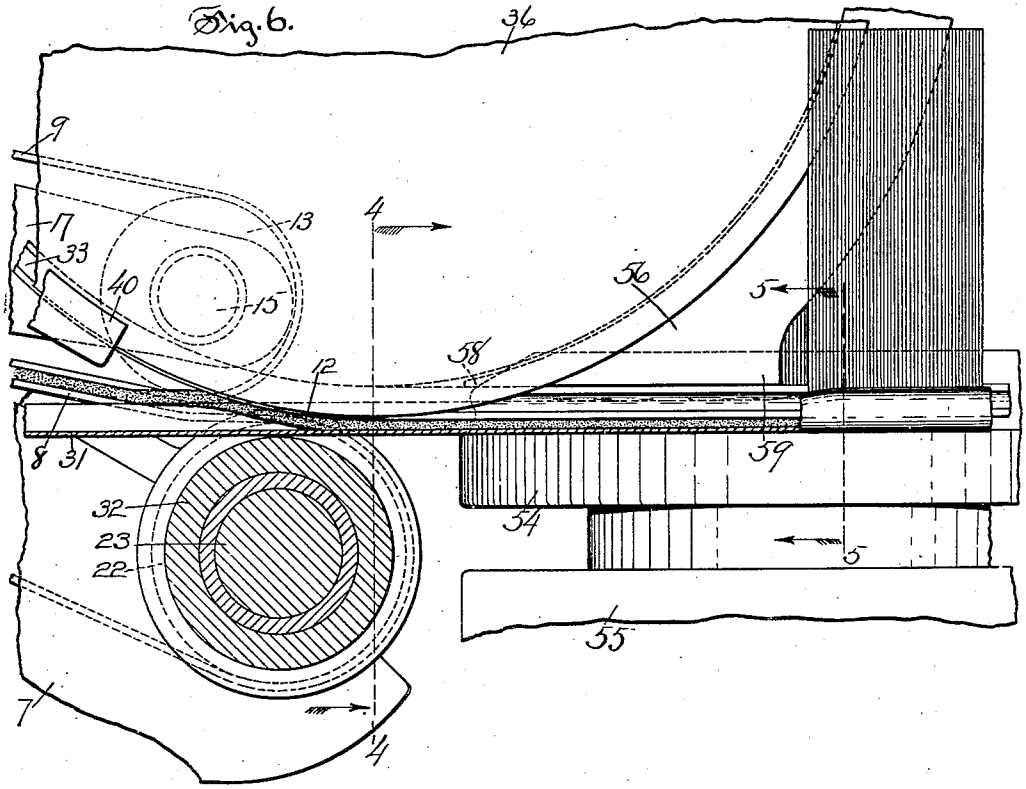
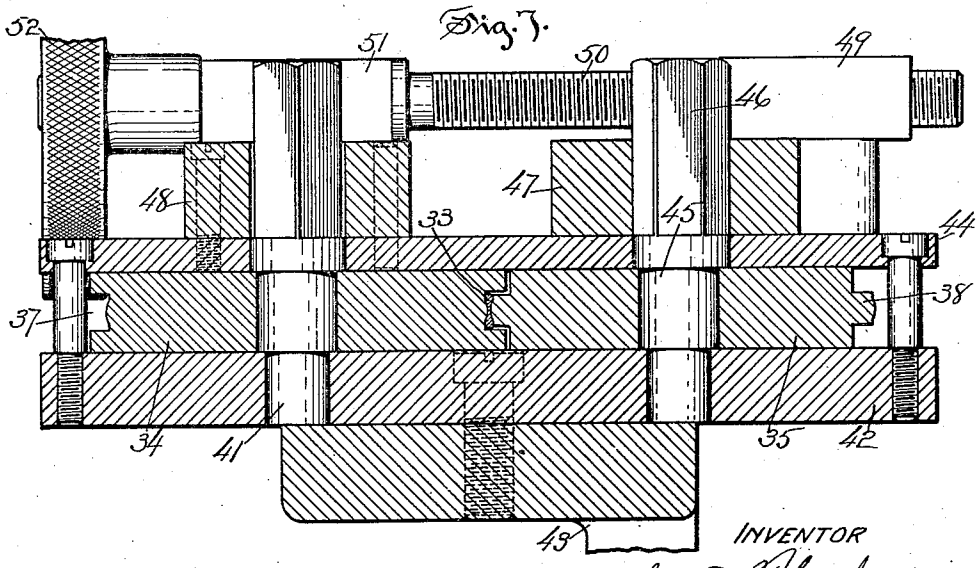


Fig. 7.



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UNITED STATES PATENT OFFICE

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BRUSH MAKING MACHINE

Application filed February 1, 1926. Serial No. 85,087.

My invention relates to the class of apparatus herein mentioned, and an object of my invention, among others, is the production of an apparatus of the kind mentioned that shall be particularly efficient in operation.

One form of apparatus embodying my invention and in the construction and use of which the objects herein set out, as well as others, may be attained, is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of an apparatus embodying my invention, with feed driving belts removed.

Figure 2 is a top view of the same.

Figure 3 is a detail view of a portion of the apparatus illustrating a modified construction.

Figure 4 is a view in cross section, scale enlarged, through a partially formed brush strip, on a plane denoted by the dotted line 4—4 of Figure 6.

Figure 5 is a similar view but showing the strip fully formed or compressed, on a plane denoted by the dotted line 5—5 of Figure 6.

Figure 6 is a detail view, scale enlarged, of a part of the machine illustrating the manner of assembling the elements comprising the brush strip.

Figure 7 is a view in section on a plane denoted by the dotted line 7—7 of Figure 2.

My improved apparatus contemplates mechanism for supplying bristles and for delivering a core strip of peculiar construction both at a point where they are united and compressed within a base strip that is intended for use in the making of brushes, such mechanism being shown in the accompanying drawings in which the numeral 5 denotes a base that is adapted to be placed upon and secured to the bed 6 of my improved brush making machine. This base comprises a portion of a bracket that also includes sides 7 rising from the base and adapted as supports for various shafts for feed belts 8—9, all of which will be more specifically hereinafter set forth and described.

A distributing wheel 10, having notches 11 within which bristles 12 may be received, is mounted to rotate in any suitable manner for the purpose of delivering said bristles to the feed belts hereinbefore mentioned.

The feed belts are arranged in sets, a lower set comprising the belts 8 and an upper set comprising the belts 9, the co-operating belts of the sets each comprising a pair of belts that are arranged to travel co-operatively for a portion of their lengths, as shown in Figure 1, and when maintained in proper tension they operate to carry the material from one end to the other of said belts. In order to maintain a proper position of these belts I mount one set of them, as the belts 9, on a suitable support, which support is tiltable. This tiltable support may be arranged in various ways, that herein shown having been found by me to produce satisfactory results. In this construction the opposite ends of two of the belts 9 pass around pulleys 13—14 supported by shafts 15—16 at the opposite ends of an evener 17, and the other two belts 9 are similarly arranged on similar pulleys on similar shafts 15—16 at the opposite ends of another evener 18, these eveners being pivotally attached to the lower ends of evener supporting arms 19—20 secured at their upper ends to an evener supporting shaft 21 mounted in bearings at the upper portions of the side parts 7 of the bracket hereinbefore mentioned. This construction provides for a preliminary automatic adjustment of the upper set of belts after which the eveners are secured against movement and especially during operation of the machine.

The lower set of belts 8 is supported at one end on pulleys 22 secured to a shaft 23 mounted in bearings on the side parts 7 of the bracket. The opposite ends of these belts are supported by pulleys 24 mounted on stud shafts 25 secured to and projecting from shaft supporting arms 26 projecting upwardly from a shaft 27, which shaft is supported by and rigidly secured to the side parts 7 of the bracket hereinbefore mentioned. The arms 26 are adjustably attached to the shaft 27 so that the position of the stud shafts 25 may be fixed to cause the upper reaches of these belts 8 on opposite sides of and adjacent to the wheel 10 to cross the path of movemen of bristles in the notches 11, whereby said bristles

are forced from said notches to be received on the belts 8 and by them carried between the two sets of belts 8 and 9, from which they are delivered at the opposite ends of the belts.

The mechanism thus far described embodying my invention may be operated in any suitable manner, as by means of a connection with a gear 28 secured to the shaft 23. Feed driving belts 29 extend from pulleys on the shaft 23 to pulleys on the shafts 16 to drive the belts 9 and the belts 8 are driven by the pulleys 22 secured to the shaft 23, the mechanism being so arranged that the belts 8 and 9 travel at the same rate of speed. The distributing wheel 10 may be driven in any suitable manner, as by a belt (not shown) secured to the shaft of said disc.

In that form of the apparatus shown in Figure 3 the means for removing the fibers or bristles from the notches 11 embodies a flange 30 on the pulley 24, which flange is so located in the path of movement of the bristles in said notches as to intercept said bristles and force them from the notches in the same manner as hereinbefore described with reference to the belts 8, the arms 26 in this form of the apparatus being located to carry the belts 8 out of the path of movement of the bristles.

The bristles 12 are delivered by the belts 8 and 9 to a trough-shaped base strip 31 that is formed by any suitable mechanism that may or may not comprise an integral part of the machine herein illustrated. This base strip is preferably of indefinite length and has a continuous movement underneath the delivery ends of the belts 8—9, the bristles being placed substantially at their lengthwise centers across this base strip, said strip and bristles thereafter moving along together. The base strip may rest within the groove of a supporting roller 32.

A core strip 33 extends from a pair of core forming rolls 34—35 around a guide disc 36 that has a groove 37 in its periphery to receive the core strip 33. The disc 36 is located with its periphery within the groove in the base strip 31, said disc guiding the core strip into said groove overlying the bristles 12, and, in fact, crowding the bristles at their centers down into the groove in the base strip, as illustrated in Figures 4 and 5 of the drawings, and whereby the outer ends of each of the bristles are raised and closed toward each other.

This core strip is of peculiar shape resembling somewhat the form of a dumb-bell when viewed in section, this shape being for a specific purpose, and as specifically set forth in my copending application filed on even date herewith of Serial Number 85,086 for patent on Brush Structures, a feature of the present invention being the formation of this core strip which is accomplished by means of the forming rolls 34—35 hereinbefore referred to. The roll 34 is formed with a peripheral groove, the bottom of which is shaped to form one side of the core strip and the roll 35 has a peripheral rib 38, the edge of which is formed to produce the other side of the core strip, and as illustrated in Figure 7 of the drawings. The rod 39 from which the core strip is formed is passed, as from a reel, between the rolls 34—35 which impart to it the form shown in Figures 4 and 5, the core strip then passing around the guide disc 36 in engagement with which it may be held as by means of a guard 40 extending for a portion of the distance about the periphery of the disc and to a point adjacent to that at which the core strip makes contact with the bristles, and as illustrated in Figure 6.

The rolls 34—35 are mounted on studs 41 attached to a plate 42 secured to a bracket 43 supported by and extending from the shaft 21, and as shown in Figure 2 of the drawings. A retaining plate 44 holds the rolls in place and the studs 41 each have an eccentric portion 45 and an angularly shaped head 46, one of which is fitted to an opening in an adjusting lever 47, and the other member being free to turn in an opening in plate 48 secured to the plate 44. The lever 47 is pivotally attached to a threaded bearing 49 having an adjusting screw 50, said screw being rotatably mounted in a bearing 51 secured to the plate 48. A hand wheel 52 at the outer end of the screw serves as a means for turning the same whereby the lever 47 is swung to adjust the position of the roll 35 with respect to the roll 34, through the operation of the eccentric 45. The other stud 41 may be adjusted as by means of a wrench applied to the angularly shaped head. Clamp screws 53 are provided as a means for retaining the studs against turning movement except when loosened for purposes of adjustment.

After the base strip with the core strip and bristles tucked therein have passed underneath the guide disc 36, they are delivered between compressing rolls 54 rotatably mounted upon a pedestal 55, the peripheries of these rolls being shaped as shown in Figure 5 to impart the proper formation to the base strip, the core strip and the bristles, whereby the sides of the base strip are compressed to tightly squeeze the bristles and core strip and secure them in place within the base strip.

In order to maintain the core strip and bristles close against the bottom of the groove in the base strip until the action of the compressing rolls 54 has secured the parts together, a retaining foot 56 secured at its upper end to an extension 57 from the bracket 43 projects underneath the disc 36, and as shown in Figure 6 of the drawings, the toe

58 extending underneath the disc to encounter the core strip and bristles while they are passing underneath the disc, and the heel 59 encountering said parts as near as may be to the point of gripping between the rolls 54, but without said heel being subjected to any pressure between the rolls. This mechanism enables the bristles and core strip to be positioned in the bottom of the groove in the base strip until the action of the rolls 54 secures the parts tightly together and in place.

The support for the guide disc 36 comprises a bar 60 mounted in bearings in the bracket 57 the weight of said bar and of the bracket aiding in compressing the bristles and core strip into the groove in the base strip 31, and this pressure of the bar 60 may be regulated as by means of pressure screws 61 affixed to the upper ends of the side parts 7 of the brackets hereinbefore referred to.

It will be understood that the compressing rolls 45 are driven by means of power applied at the lower ends of their shafts by mechanism (not shown) by means of which the base strip, core strip and bristles are passed through the machine.

In accordance with the provisions of the patent statutes I have described the principles of operation of my invention, together with the device which I now consider to represent the best embodiment thereof, but I desire to have it understood that the device shown is only illustrative and that the invention may be carried out by other means and applied to uses other than those above set out.

I claim—

1. A brush making machine including means for supplying a grooved base strip, means for supplying bristles to said strip, means for delivering a formed core wire into said base strip overlying said bristles, and means for compressing the sides of said base strip to secure the bristles and core wire therein, said last named means engaging the bottom and sides of the base strip, extending outwardly from the open side edges of the strip and spaced from the bristles.

2. A brush making machine including means for supplying a grooved base strip, means for supplying bristles to said strip, means for forming and delivering a core wire into said base strip overlying said bristles, and means for pressing the sides of said base strip and said bristles into the grooves on the opposite sides of said core wire, said last named means engaging the bottom and sides of the base strip, extending outwardly from the open side edges of the strip and spaced from the bristles.

3. A brush making machine including means for supplying a grooved base strip, a pair of coacting core strip feeding rolls, means to receive said core strip to guide it to said base strip, means for delivering bristles between said base and core strip, and means for compressing the sides of said base strip to secure said core strip and bristles therein, said last named means engaging the bottom and sides of the base strip, extending outwardly from the open side edges of the strip and spaced from the bristles.

4. A brush making machine including means for supplying a grooved base strip, means for supplying bristles to said base strip, a guide disc to engage and direct a core strip around one side of the guide disc and on to said bristles to press the core strip onto said bristles, means on the other side of said disc to engage said core strip to retain the core strip and bristles in the groove in the base strip, and means for pressing the sides of said base strip together adjacent to said retaining means to secure the core strip and bristles in the base strip.

5. A brush making machine including means for supplying a grooved base strip, means for supplying bristles to said strip, a guide disc to engage and direct a core strip around one side of said guide disc and onto the bristles to press them into the groove of said base strip, a pair of compression rolls to press the sides of said base strip together, and a retaining shoe located between said guide disc and compression rolls to hold said bristles and core strip in the bottom of the groove in the base strip up to the time of action of said compression rolls.

6. A brush making machine including a movably mounted distributer having an opening for the reception of material, transferring mechanism including belts operatively mounted on opposite sides of the distributer in the path of movement of material located in said opening, a disk rotatably mounted with its periphery passing between said belts, a pair of core forming rolls to direct a core for engagement with the edge of said disk, means for supplying a grooved base strip, and means for pressing brush material and the core into the groove in said base strip.

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