May 22, 1923. 1,455,932

U. S. PERKINS

BRUSH MAKING MACHINE

Filed Dec. 8, 1921 2 Sheets-Sheet 1

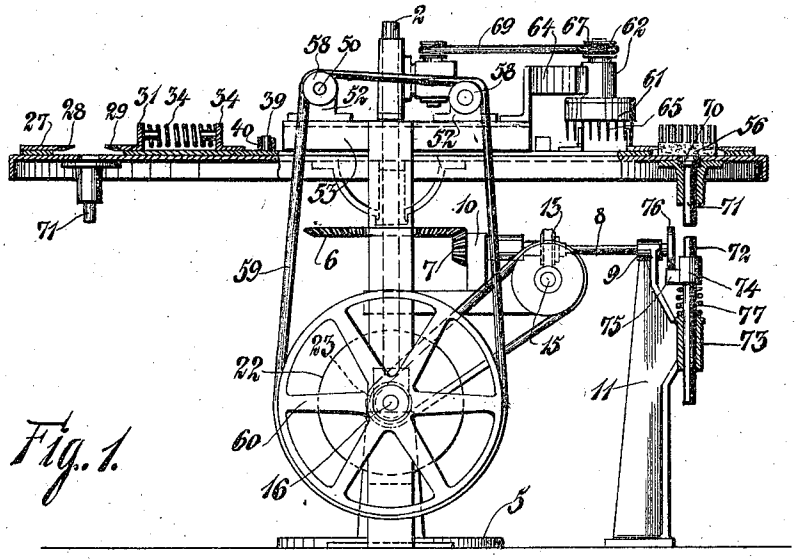


Fig. 1.

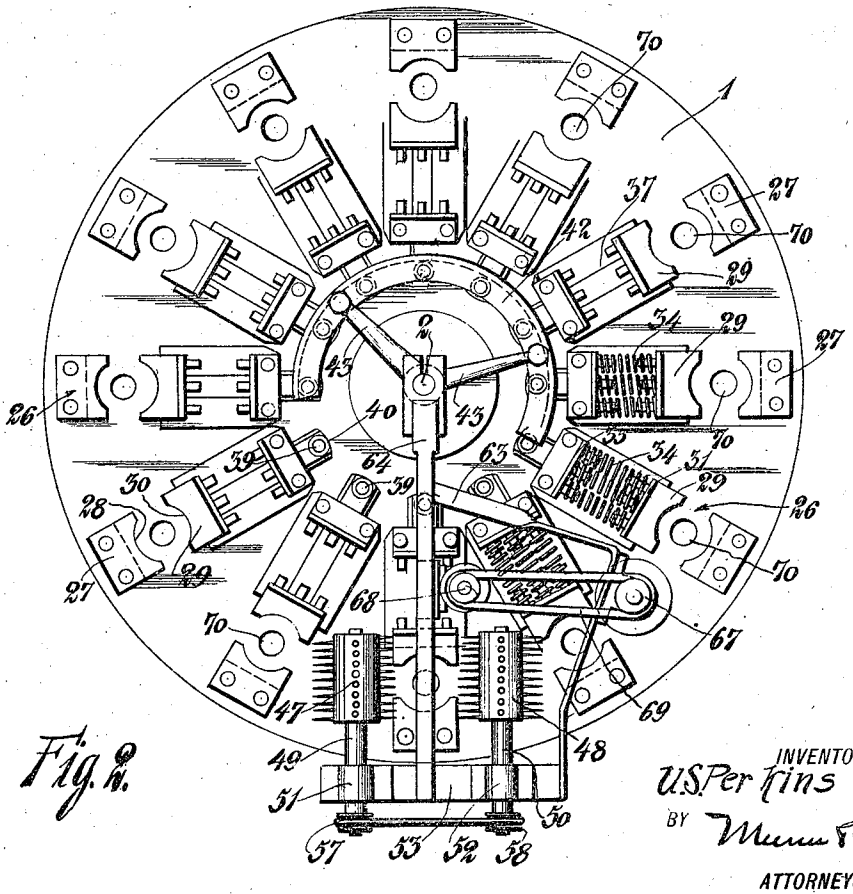


Fig. 2.

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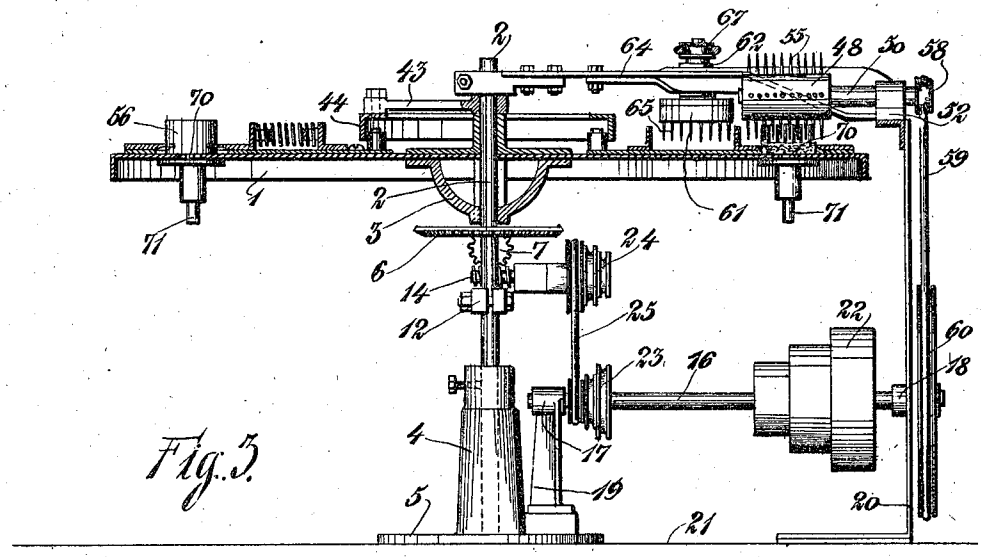


Fig. 3.

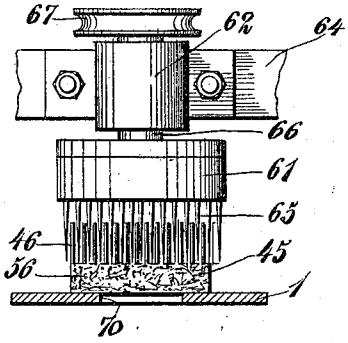


Fig. 5.

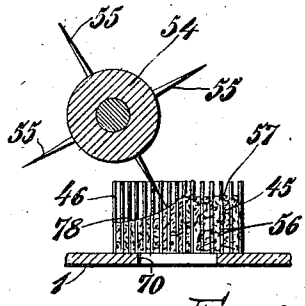


Fig. 6.

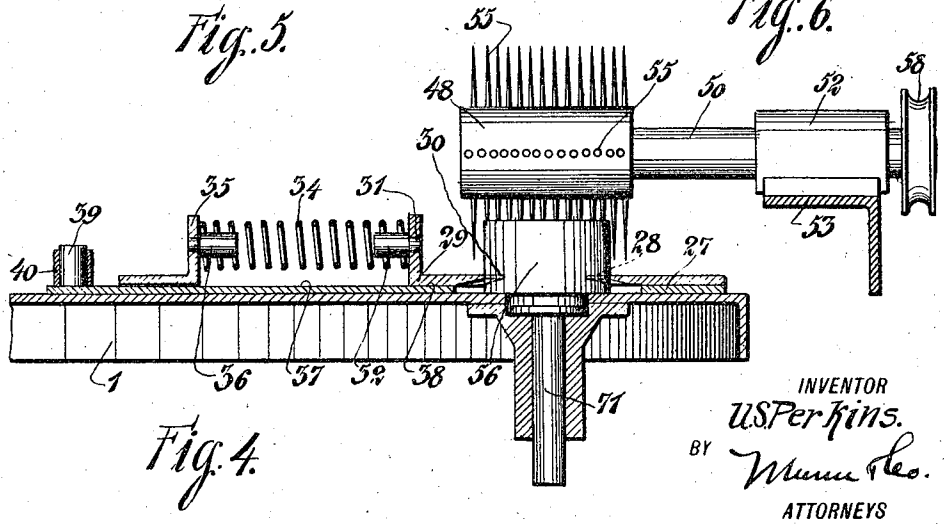


Fig. 4.

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UNITED STATES PATENT OFFICE.

ULYSSES S. PERKINS, OF LEBANON, INDIANA.

BRUSH-MAKING MACHINE.

Application filed December 8, 1921. Serial No. 520,922.

To all whom it may concern:

Be it known that I, ULYSSES S. PERKINS, a citizen of the United States, and a resident of Lebanon, in the county of Boone and State of Indiana, have invented a new and useful Improvement in Brush-Making Machines, of which the following is a full, clear, and exact description.

My invention relates to improvements in brush making machines, and it consists in the combinations, constructions and arrangements herein described and claimed:

An object of my invention is to provide a device of the character described for removing the soft cellular substance from the harder fiber of a palmetto root for making brushes or the like.

A further object of my invention is to provide a device of the character described, in which means is provided for automatically ejecting the product, when finished, from the machine.

A further object of my invention is to provide a device of the character described, which is thoroughly practical for the purpose intended and which is capable of greatly increasing the production of brushes over the present crude means for removing the cellular substance from the fiber.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, forming part of this application, in which—

Fig. 1 is a side elevation, partly in section, of an embodiment of my invention,

Fig. 2 is a top plan view of the mechanism illustrated in Fig. 1,

Fig. 3 is another side elevation, partly in section, of the mechanism illustrated in Fig. 1,

Fig. 4 is an enlarged sectional view of a part of the device,

Fig. 5 is an enlarged sectional view of the vertical cutting comb, and

Fig. 6 is a section of one of the horizontal cutting combs.

In carrying out my invention, I make use of a circular platform 1, which is rotatably mounted in a horizontol plane upon a vertical shaft 2 by means of bearing members 3. The shaft 2 is mounted upon an iron pedestal having a base 5 by means of which the pedestal may be securely fastened to the floor. Means for slowly rotating the platform 1 is provided in a bevel gear 6, which is carried by the bearing member 3 of the platform 1. A second bevel gear 7 on a horizontal shaft 8 is arranged with its teeth in mesh with a gear 6. The shaft 8 is rotatably mounted upon bearings 9 and 10. The bearing 10 is supported upon the vertical support 11 and the bearing 10 is secured, as shown at 12, to the shaft 2. A worm-wheel 13 is carried by the shaft 8 and is operatively engaged with a worm-gear 14 on a shaft 15. Bearing and support for the shaft 15 is provided by the bracket and connected to the shaft 2, as shown at 12.

A horizontal shaft 16 is rotatably disposed in bearings 17 and 18, which bearings are suitably supported by means of standards 19 and 20 secured to the floor 21 by any suitable means. The shaft 16 is provided with a plurality of flat crown pulley wheels 22 which are adapted to be driven by means of a belt by any suitable power device (not shown). A second group of pulley wheels 23 is carried by the shaft 16 and is in alinement with a corresponding group of pulley wheels 24 on the shaft 15. The pulley wheels 23 and 24 are connected by means of an endless belt 25 so that by shifting the belt 25 from one pair of pulley wheels to another, the speed ratio of the shafts 15 and 16 may be varied at will. In Fig. 1, the shaft 15 is shown at the lowest speed ratio with the shaft 16.

The platform 1 is provided in this case with twelve spring actuated clamping members 26. With reference to Fig. 4, the clamping members 26 are composed of a stationary clamping jaw 27 having an arcuate gripping edge 28, which is brought to a sharp point to further insure a close engagement with an object held thereby. A movable clamping member 29 is slidably disposed on the platform 1 and also has an arcuate grip-

ping edge 30 similar to the gripping portion 28 of the clamp 27. The clamp 29 is provided with an upwardly extending member 31 having a pin 32 mounted transverse thereto, a compression spring 34 is disposed against the flange 31 and concentric the pin 32 and has its other end in close engagement with an upwardly extending member 35 which is securely fixed to the platform 1. The member 35 is provided with a pin 36 similar to the pin 32 about which the spring 34 is mounted. A sliding member 37 is secured at 38 to the clamping member 29 and extends through the member 35 and is provided at its rearward end with an upwardly extending shaft 39. A rotatably mounted sleeve 40 is disposed on the shaft 39 for a purpose hereinafter described.

A spring 34 constantly tends to force the clamping member 29 toward the stationary clamping member 27 so that an object such as a section of a palmetto root, as shown at 56, may be securely held between the gripping edges 28 and 30 of the respective clamping members.

Means for automatically moving the clamping member 29 away from the stationary clamping member 27 to occasion the release of an object held therebetween is provided in a substantially semi-circular cam member 42. The cam member 42, as reference to Fig. 3 will show, is substantially L-shaped in cross-section and is mounted by means of arms 43 upon the vertical shaft 2 in the relative position shown in Fig. 2. When the various sleeves 40 come into contact with the vertical wall portions 44 of the cam 42, they are drawn by means of the vertical wall 44, as the platform 1 revolves, back toward the shaft 2 against the action of the tension springs 34, to occasion the rearward movement of the clamping member 29, since the clamping member 29 is fixedly mounted upon the sliding member 27. Each of the clamping members is provided with three of the springs 34, as reference to Fig. 2 will show.

The purpose of the clamping members described is for holding a section of a fibrous root, such as the palmetto root so that the soft cellular substance 45 between the harder fibers 46 may be removed by a suitable means.

Means for removing the cellular substance 45 from the fiber 46 of the root is provided in a pair of horizontally and rotatably mounted cutting combs 47 and 48. These rotary combs 47 and 48 are carried upon shafts 49 and 50, respectively, which shafts are rotatably mounted in bearings 51 and 52 supported upon the bracket 53. The bracket 53 is supported upon a standard 20, substantially as shown at Fig. 3.

Each of the cutting combs 47 and 48 is composed of a central core 54 upon which are arranged 4 equally spaced apart rows of pins 55 which turn with them and provide a comb-like cutting of the root 56, which in this case is a palmetto root, to cause the soft cellular substance 45 to be shredded and removed from the harder fibers 46. This is clearly shown in Fig. 6.

The cutting comb 47 is mounted in a higher plane, as reference to Fig. 1 will show than the cutting comb 48. The purpose of this is to have the comb 47 make a relatively shallow cut, as shown at 57 in Fig. 6 and then permit the cutting comb 48 to finish the cut, as is also shown in Fig. 6. The rotation of the platform 1, as shown in Fig. 2, is counterclockwise. A means for driving the cutting combs 47 and 48 is provided in pulleys 57 and 58 carried by the shafts 49 and 50, respectively. These pulleys are connected by means of an endless belt 59 to a relatively large pulley wheel 60, which is mounted to turn with the shaft 16.

A vertical cutting comb 61 is rotatably mounted in a bearing 62 and is supported directly over the path of the clamping members 27 and 29. Means for supporting the bearing 62 is provided in a bracket 63 which is secured at one end to the bracket 53 and at its opposite end to a cross brace 64 extending from the bracket 53 to the shaft 2. The vertical cutting comb 61 is provided with a plurality of sharp pointed spaced apart cutting pins 65 similar to the pins 55 on the horizontal cutting combs. The pins 65, however, are mounted in planes parallel to the shaft 66 upon which the comb is carried. The opposite end of the shaft 66 is provided with a pulley wheel 67.

Means for driving the vertical cutting comb 61 is provided in a small motor 68 which is bolted or otherwise fixed to the cross brace 64. A belt 69 provides means for operatively connecting the motor 68 and the cutting comb 61, substantially as shown in Fig. 2.

The purpose of this vertical cutting comb is to finish the article, i. e., to trim away the rough edges which would be left when the horizontal cutting comb shredded away the soft cellular substance. The pins 65 travel at a relatively high rate of speed and do not actually cut down into the cellular substance 45 but trim away the fragments which might be left after the horizontal combs have finished their operation on the root 57.

Means for forcibly ejecting the root 57 after a portion of the soft cellular substance has been removed and the fibers 46 are left, forming a hand brush, is provided in the following manner. An opening 70 is provided through the platform 1 intermediate each of the gripping edges 28 and 30 of the clamping members previously desired. Slidably disposed pistons 71 are mounted in ver-

tical alinement with the openings 70. This is more clearly shown in Fig. 1.

A spring pressed plunger 72 is slidably mounted in a bearing 73 supported on the vertical support 11 and is provided with an adjustable sleeve 74 adjacent its upper end. The sleeve 74 is provided with an outwardly extending finger 75. The finger 75 is arranged for contact with a cam 76 which is carried at the outer end of the shaft 8. A spring 77 is disposed intermediate the sleeve 74 in the bearing 73 to normally hold the finger 75 in close engagement with the cam 76.

The cam 76 is so timed with the rotation of the platform 1, that the plunger 72 is pressed downward as the opening 70 approaches a point immediately above the plunger 72. When the opening 70 comes into register with the plunger 72, the cam 76 releases the finger 75 and allows the plunger 72 to be forcibly projected against the piston 71, which in turn forcibly ejects the finished root 56 into any suitable container.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. In Fig. 2, I have only shown three of the clamping members complete. The others I have shown in outline without the springs in detail. The sections 56 of the palmetto root are substantially oval in cross section and are cut down to a required thickness. They are then manually placed intermediate the gripping edges 28 and 30 of the clamping members 27 and 29 which are disposed on the left of the ejector mechanism as the device is shown in Fig. 2. Thus there are three clamping members into which the sections may be placed. When the clamping members have travelled with the platform 1, so that the sleeves 40 are released from engagement with the cam wall 44, the sliding clamping member 29 will close toward the clamping member 27, and grip the section firmly. The section 56 of the root will then be moved into engagement first with the cutting comb 47 which will by means of its sharp pins 55 shred and remove a portion of the cellular substance 45 of the root 57. They will then pass beneath the second horizontal cutting comb 48 and the remainder of the cellular substance 45 required to expose the necessary amount of fiber 46 will be removed.

The sections 56 thus treated will continue to move in a counterclockwise direction and will pass under and in engagement with the rapidly revolving vertical cutting comb 61. The pins 65 of the cutting comb 61, will by means of their circular movement virtually clean the upper surface 78 of the section 56 and will also remove any shredded portions of the soft cellular substance which may be disposed adjacent the edges of the section 56, thus finishing the edges of the section to produce a uniform and well finished appearance of the article.

The sections 56, thus treated, will continue to move with the platform 1 until they are directly over the vertical plunger 72. The cam 76, which is mechanically synchronized with the movement of the platform 1, will at this time be released from its engagement with the finger 75 and the plunger 72 will be forcibly projected against the vertical piston 71. The vertical piston 71 will thereupon forcibly eject the section from its position upon the platform 1. This is possible because the revolving sleeves 40 have again come into engagement with the cam wall 44 of the cam member 42 and the sliding clamping member 29 has been again drawn back against the springs 34 away from the stationary clamping member 27.

If it is found that the relative speed of the horizontal cutting combs and the platform 1 is not properly suited to the particular density of the sections 56 under treatment, the belt 25 may be shifted upon the pulley wheels 23 and 24 to properly adjust the speed ratio of the shaft 16 and the platform 1.

I claim:

1. In a device of the character described, a rotatably mounted platform, means for removably securing sections of a fibrous and cellular substance to said platform, a horizontally disposed shaft carrying a comb-shaped cutting member mounted above said platform, a vertically disposed shaft carrying a comb-shaped cutting member mounted above said platform adjacent said first named cutting member, means for rotating said platform, and said first and second named shafts, and an ejector for ejecting said sections after they have passed out of engagement with said cutting members.

2. In a device of the character described, a revolving circular platform having a plurality of openings therethrough arranged in circular alignment, slidably mounted pistons disposed one beneath each of the openings through said platform, and supported by said platform, a plunger disposed beneath said platform and arranged for axial registration with said pistons individually as said platform is revolved, a spring for normally forcing said plunger up into contact with the adjacent piston to elevate said piston, and a cam supported beneath said platform for drawing said plunger against the action of said spring prior to the registration of said plunger in the adjacent piston and for subsequently releasing said plunger as the piston moves into registration with said plunger.

3. In a device of the character described,

a cutting member mounted for rotation on a horizontal axis comprising a cylinder having a plurality of slender radially extending cutting teeth, a cutting member mounted for rotation on a vertical axis comprising a disc having a plurality of longitudinally extending slender cutting teeth on the under face thereof, and means for removing an object through a horizontal plane into engagement with said horizontal and vertical cutting members, whereby portions of said object may be removed.

ULYSSES S. PERKINS.