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J. A. CRISMORE.  
WOOD SMOOTHING MACHINE.  
APPLICATION FILED DEC. 23, 1909.

963,523

Patented July 5, 1910.

2 SHEETS—SHEET 1.

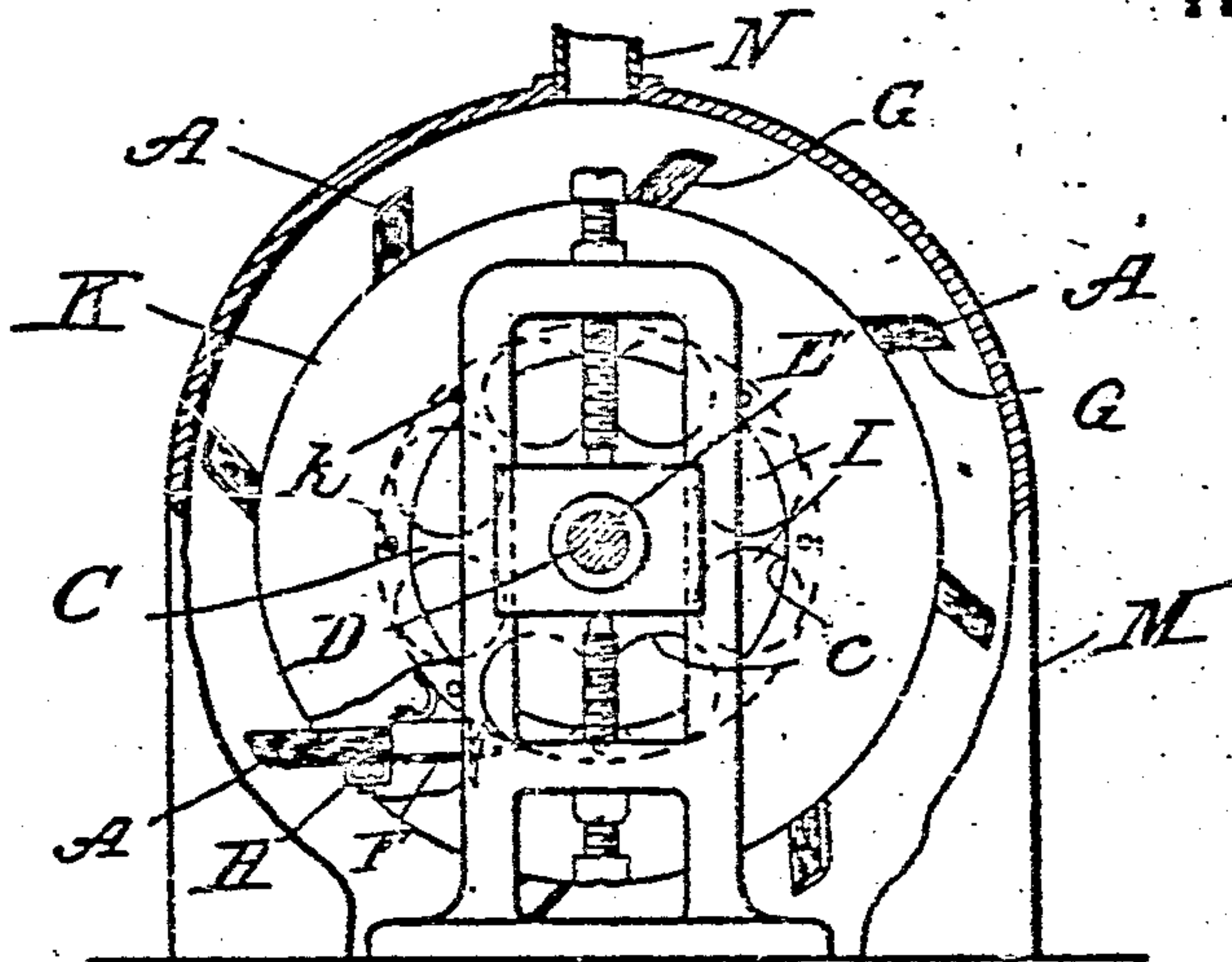


Fig. 1.

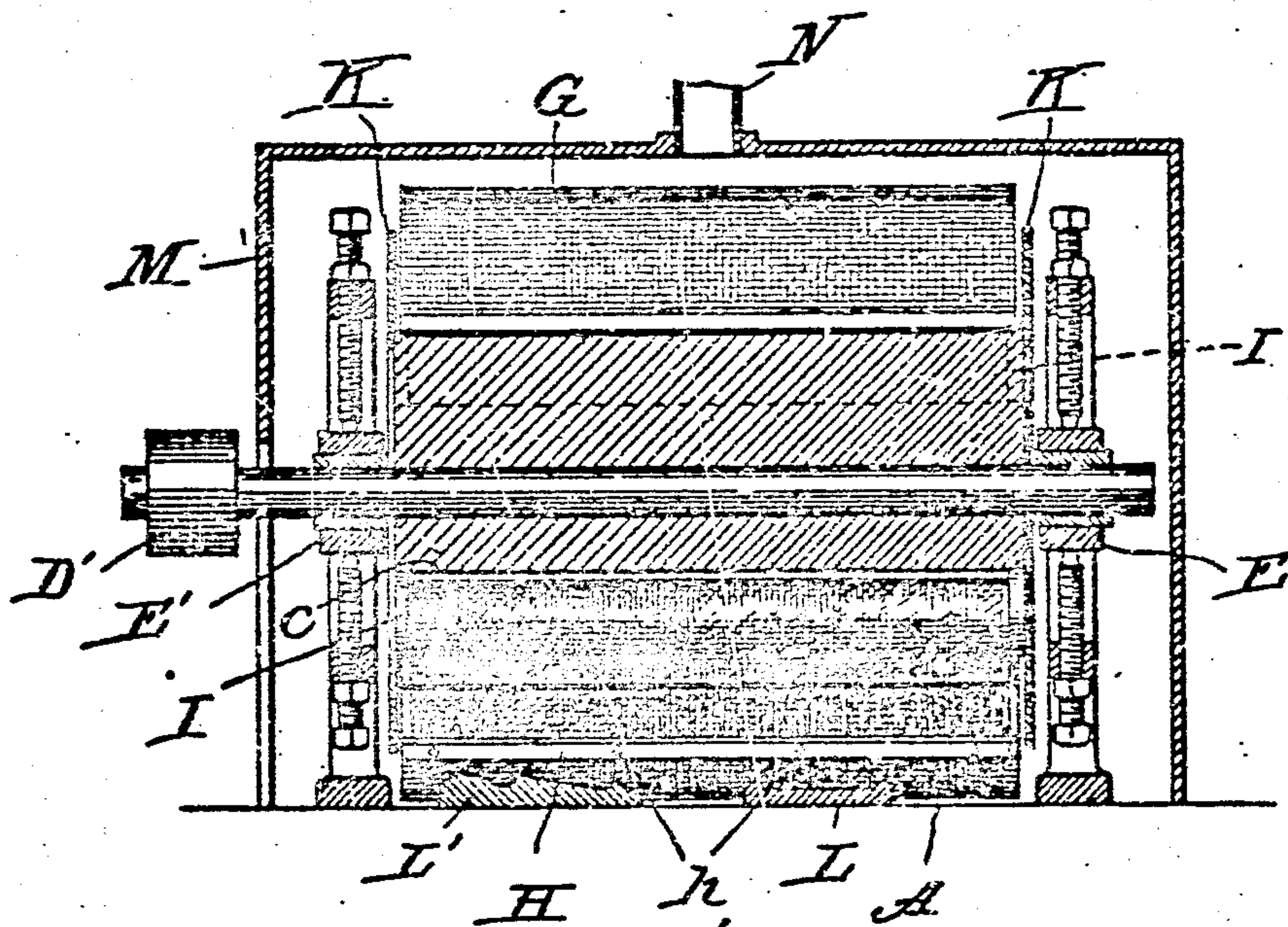


Fig. 2.

Witnesses:

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Inventor:

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attys

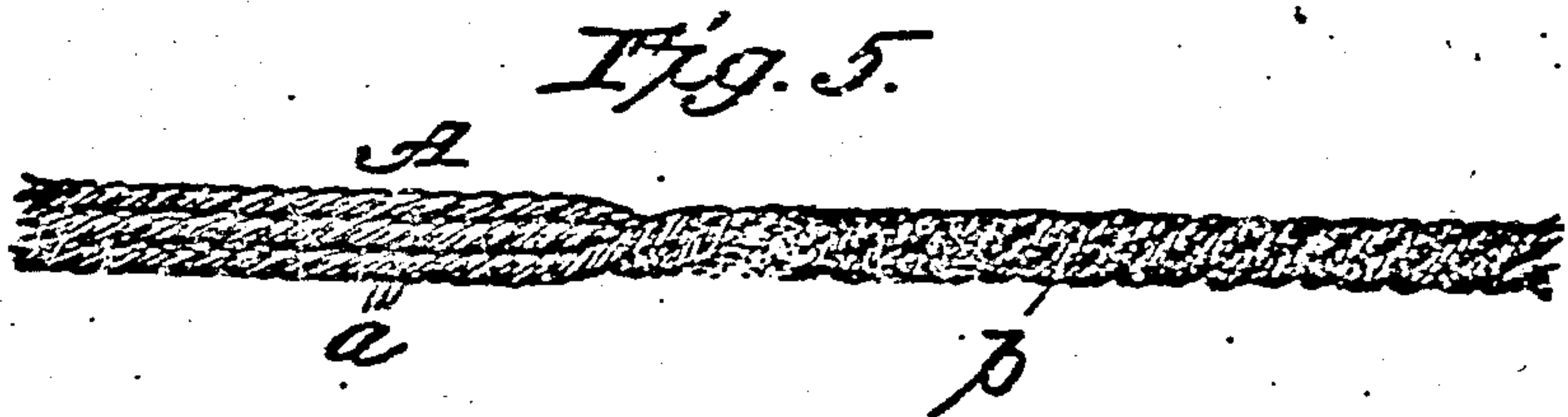
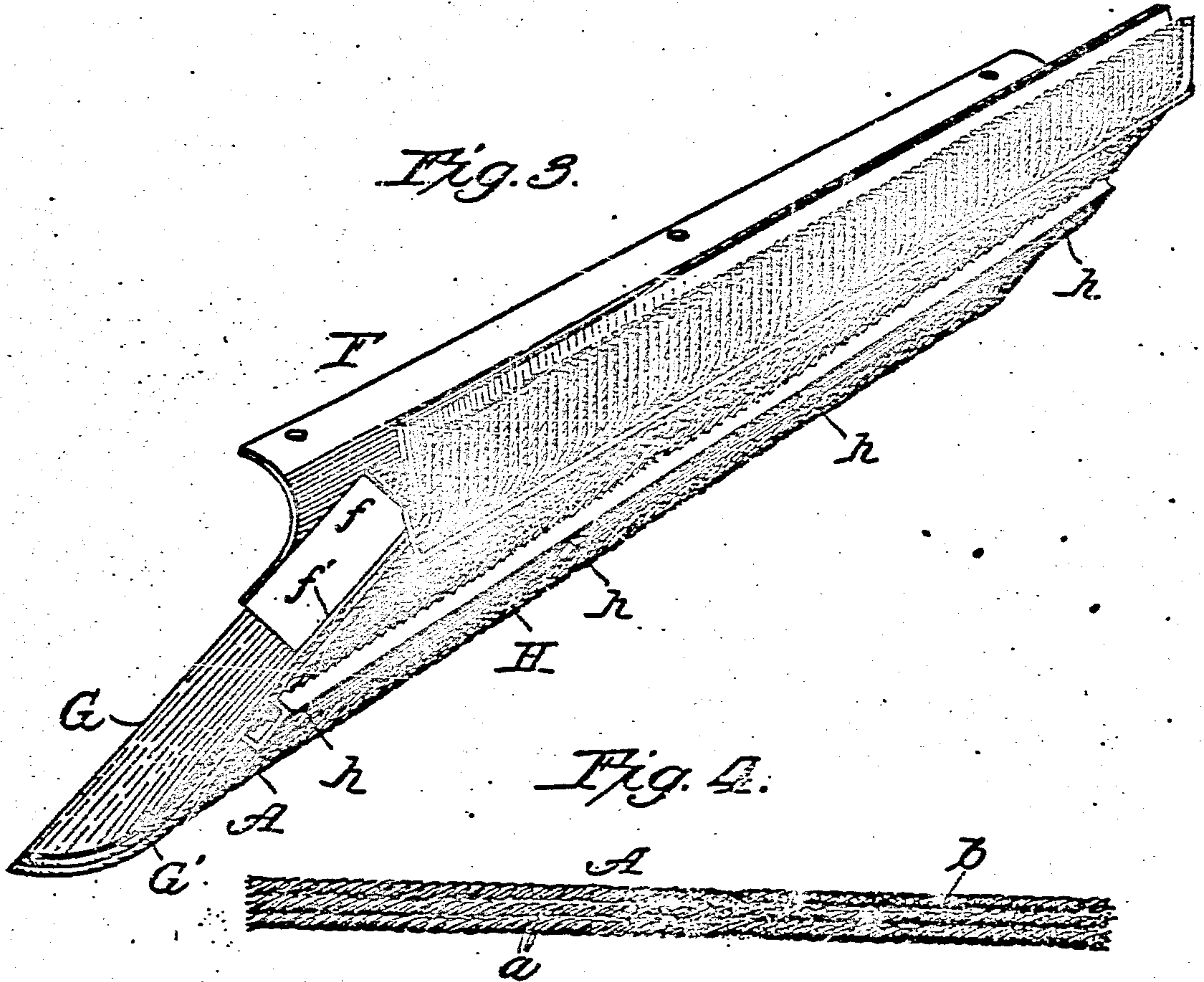


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2 SHEETS—SHEET 2.



Witnesses:

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# UNITED STATES PATENT OFFICE.

JOSEPH A. CRISMORE, OF BERWYN, ILLINOIS.

## WOOD-SMOOTHING MACHINE.

963,523.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed December 23, 1909. Serial No. 534,623.

*To all whom it may concern:*

Be it known that I, JOSEPH A. CRISMORE, a citizen of the United States, residing at Berwyn, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Wood-Smoothing Machines, and declare the following to be a full, clear, and exact description of the same, such as it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Wood used in the manufacture of furniture and for other high grade work does not leave the planer or other knifed machine which smooths or shapes it with sufficiently smooth surfaces to permit it to be employed without further finishing operations. It has heretofore been customary to sand-paper such wood either by hand or by machinery. The hand process is tedious and expensive and it is almost impossible to prevent sharp corners on the wood from being rounded or marred. Where the sand-papering is done by a machine the same difficulties are experienced unless the surfaces to be finished are simple plane surfaces.

The object of my invention is to provide a simple and novel machine for giving a smooth finish to surfaces regardless of their contour and without in any way destroying or altering the design.

A further object of my invention is to provide a simple and durable abrading brush with which wood may be finished quickly and effectively.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but for a full understanding of my invention and of its objects and advantages reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein;

Figure 1 is an end elevation of a machine arranged in accordance with a preferred form of my invention, the end of the inclosing hood being omitted and a portion being broken away to show one of the brushes; Fig. 2 is a section taken at right angles to Fig. 1 approximately along a center line; Fig. 3 is a perspective view on an enlarged scale of one of the brushes and brush-hold-

ers; Fig. 4 is a view on an enlarged scale showing one of the brush elements before it is completed by twisting a number of strands together; and Fig. 5 is a view showing a completed brush element wherein a plurality of strands have been twisted together.

I have found that by distributing a number of flexible cords or fibers upon and about a rapidly rotating member and rotating this member in proximity to a surface to be finished, the cords or fibers, if coated with a fine abrading material, will produce a smooth finish regardless of the contour of the surface treated and will leave all corners sharp and distinct. I prefer to use tough cord for this will last as long as any of the abrading material is left on it. Any ordinary cord may be soaked in glue, dipped in ground or powdered abrading material such as fine sand, garnet or the like and then rolled or pressed so as to cause the abrading material to adhere firmly. The arrangement which I prefer, however, is that wherein the abrading material lies not only on the surface of the cord but also within the interior thereof. This may conveniently be accomplished by making a cord of a plurality of strands, treating each strand before the group which is to form the cord is twisted together. In this way an abrading element is produced which will act effectively at all times even though it should wear more quickly at one point than at another and even though it should be broken away at the end.

In Figs. 4 and 5 I have shown a brush element A made of three strands each of which is indicated at *a*. One end of each of the strands may be left in its normal condition while the remainder of each strand is soaked in glue and it is then covered or coated with fine particles *b* of some abrading material. The several strands are then twisted together as indicated in Fig. 5 so that there is obtained a flexible cord which contains abrading material distributed not only around the surface thereof but also throughout its entire interior. While this is a preferred form of brush element, individual strands or fibers coated only on their exterior surfaces may, of course, be employed. The brush elements may be made



in any desired lengths depending upon the kind of brush which is to be built up therefrom. I prefer, however, for convenience and cheapness in manufacture, and also for the purpose of preventing waste, to treat long cords a number of which may be grouped together and wound upon a spool, the free ends thereof being led to a suitable holder which unites them into a brush-like structure, the group of cords being unwound from the spool as the free ends of the cords are worn away.

In Figs. 1 to 3 I have illustrated a machine equipped with my improved brushes. The machine consists of a revoluble drum C mounted upon a shaft D which is journaled in bearings E and E' adjustable transversely of the axis of the shaft. The drum may be rotated by means of a pulley D' or in any other suitable manner. In the arrangement shown the drum is provided with a series of cylindrical openings *c* extending longitudinally therethrough adjacent to the periphery thereof. Secured adjacent to each of these openings about the periphery of the drum are brush holders F most clearly shown in Fig. 3. Each of these holders consists of a channel-shaped member *f* and a cover plate *f'* which forms with the channel member a clamp-like structure. The cover is made deeper than the member *f* so that it projects outwardly therefrom. G represents a backing for the active abrading portions of the brush and this is preferably made of a group or bunch of fibers stiffer than the abrading members. I have found that broom straws grouped together form a satisfactory backing. The broom straws or other elements are placed with one end in the channel member *f* and are locked against displacement by means of the cover plate. The abrading members A are adapted to lie along the outer face of the cover member *f'* in one or more layers and to extend outwardly far enough to overlie the outer end of the backing member. The backing member and the brush elements are, of course, made long enough to project a considerable distance beyond the outer edge of the cover plate. The brush elements may conveniently be clamped in place by means of a toothed bar H which extends across the cover plate and is detachably secured thereto by means of bolts or the like *h*. The inner ends of the brush elements extend to spools I which are made to fit easily within the openings *c* of the drum. The parts may conveniently be arranged so that the spools may be slid in place through the ends of the drum, they being held in place by means of large washers K secured to the ends of the drum by means of screws or bolts *k* in a position to overlap a portion of each of the spools. The washers preferably extend a

considerable distance beyond the periphery of the drum so as to constitute wind shields which will prevent air from being drawn into the space between the brushes.

In assembling the parts the spools are slipped in place and the free ends of the brush element are then unwound and laid against the brush holders, the bar H having first been removed. After the free ends of the brush elements have been drawn outwardly far enough the clamping bar is placed in position and the machine is ready to begin its work. When the ends of the brush elements become worn, the clamping bar may be loosened and more stock be unwound from the spools until the ends of the brush elements reach the desired point. The clamping bar is then locked in place and the machine may be operated until further wear occurs. I prefer to arrange the brush holders approximately tangential to the drum so that the ends of the brushes will engage with the surface arranged beneath the drum during a considerable angle of rotation.

The brush elements are flexible and unrestrained except by the backing member so that they will enter every angle or undulation in a surface to be finished and, if the member to be finished be a molding or panel narrower than the brush some of the elements will ride along the side faces thereof so that not only is there a smoothing of the upper face, but also of the side edges.

In Fig. 2 I have shown two moldings L—L in the act of being fed through the machine below the rotating drum. It will be seen that some of the brush elements extend along the side edges of the moldings while the others reach every portion of the upper surfaces. The drum may, of course, be made as long or as short as desired, depending upon the particular work to be treated. If it is intended only to finish moldings the drum need, of course, be only a short one, while if table tops or other broad surfaces are to be finished the drum must, of course, be longer. In the same way the length of the projecting brush elements may be varied to suit the character of the particular work, as may also the thickness of the elements and the grade of abrading material employed.

In order to prevent the abrading elements from working in between the elements of the backing member, a thin sheet of flexible material such as rubber or gauze or other fabric may be interposed between the abrading elements and the backing member. Such a device is illustrated at G' in Fig. 3. It will be seen that while the presence of the member G' prevents the abrading elements from becoming intermingled with the elements of the backing member, it does not interfere with the individual operation of



the elements of the backing member, to press the abrading element in front of it toward the surface which is being finished.

If desired the entire machine may be covered by a hood M into which leads an exhaust pipe N, the purpose of this arrangement being to withdraw the fine dust and the particles of abrading material which are loosened.

It will, of course, be understood that my improved machine may be used independently of or in conjunction with wood-working machinery of any character. If used in conjunction with such a machine it acts upon the material as it leaves the machine so that no separate feeding mechanism is required. Otherwise the material to be finished must be fed through my improved machine by hand or by feeding mechanism of some kind.

While I have described in detail only a single preferred form of my invention I do not desire to be limited to this one form, but intend covering all constructions and arrangements which fall in the terms employed in the definitions of my invention constituting the appended claims.

What I claim is:

1. In a machine of the character described, a rotary member having a plurality of brushes distributed about the periphery thereof, each of said brushes comprising a group of flexible fibers coated with an abrading material, together with a backing for each of the brushes composed of a group of stiffer fibers.

2. In a machine of the character described, a rotary member having a plurality of brushes distributed about the periphery thereof, each of said brushes comprising a group of flexible fibers coated on all sides with an abrading material, together with a backing for each of said brushes composed of a group of stiffer fibers.

3. In a machine of the character described, a rotary drum having a plurality of longitudinally extending openings arranged near the periphery thereof, spools in said openings, means for holding said spools in place, a group of flexible fibers coated with abrading material mounted on each of said

spools, a holder projecting outwardly from the drum adjacent each of said openings, and means for securing the free ends of said fibers to said holder.

4. In a machine of the character described, a rotary drum having a plurality of longitudinally extending openings arranged near the periphery thereof, spools in said openings, means for holding said spools in place, a group of flexible fibers coated with abrading material mounted on each of said spools, a holder projecting outwardly from the drum adjacent each of said openings, means for securing the free ends of said fibers to said holder, and a backing member for the free ends of said fibers made of stiffer fibers supported by said holders.

5. In a machine of the character described a rotary drum, a group of stiff fibers projecting from said drum and a layer of flexible fibers covered with abrading material lying in front of the aforesaid fibers and extending somewhat beyond the ends thereof.

6. In a machine of the character described, a rotary drum having a series of brush holders extending from the periphery thereof, a group of stiff fibers supported in each of said holders, a layer of flexible fibers coated with abrading material lying in front of each of said holders and extending toward the ends of the aforesaid fibers, and a clamping bar associated with said holder for clamping the flexible fibers thereto.

7. An abrading brush comprising a group of flexible fibers coated with a finely divided abrading material and a backing composed of stiffer fibers lying on one side of the aforesaid fibers.

8. An abrading brush comprising a group of flexible fibers coated with a finely divided abrading material, a backing comprising a group of stiffer fibers lying on one side of the aforesaid group, and a sheet of flexible material separating one group of fibers from the other.

In testimony whereof, I sign this specification in the presence of two witnesses.

JOSEPH A. CRISMORE.

Witnesses:

WM. F. FREUDENREICH,  
RUBY V. BRIDGES.