

March 26, 1940.

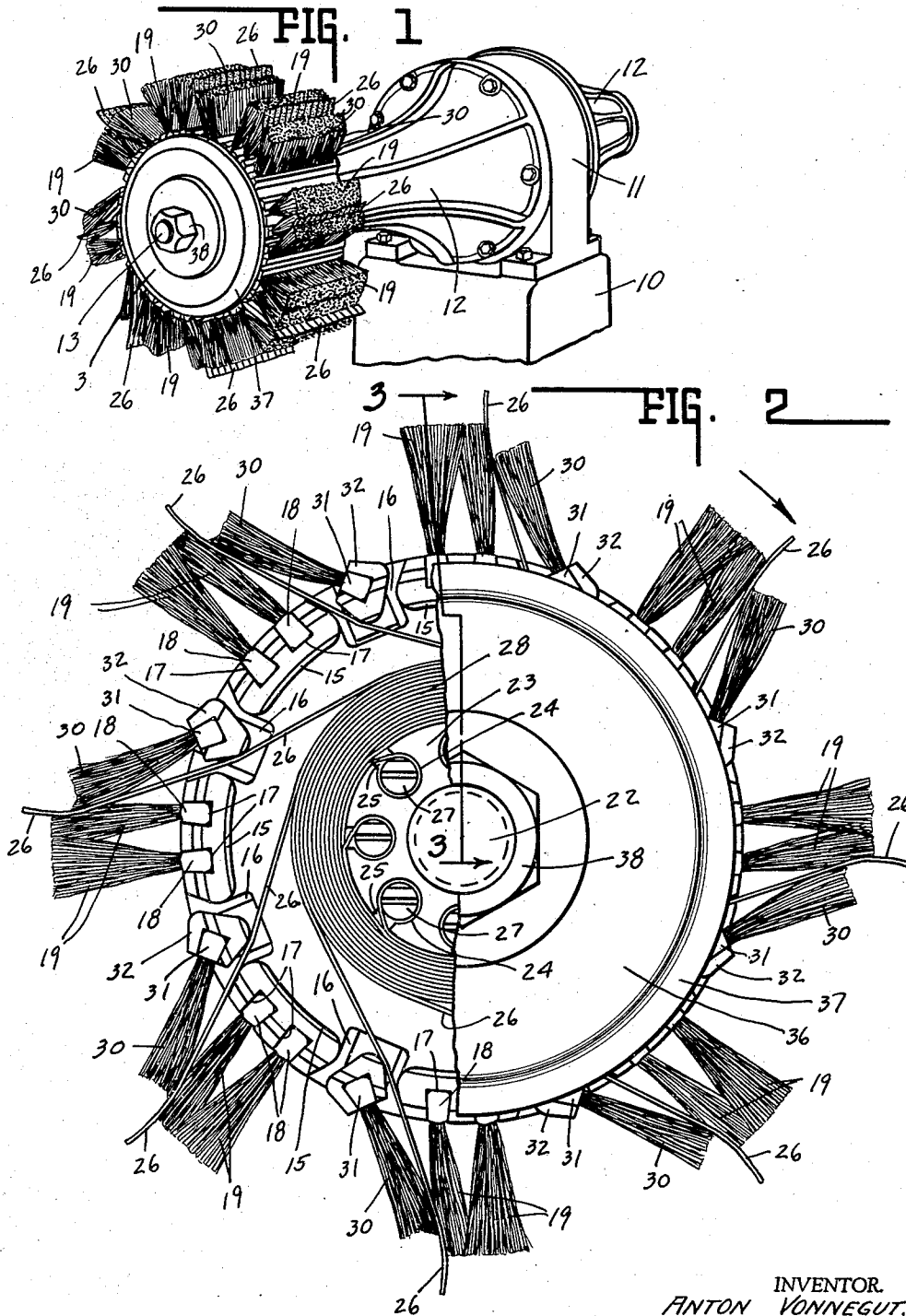
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2,194,577

SANDER

Filed Feb. 9, 1939

2 Sheets-Sheet 1



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FIG. 3

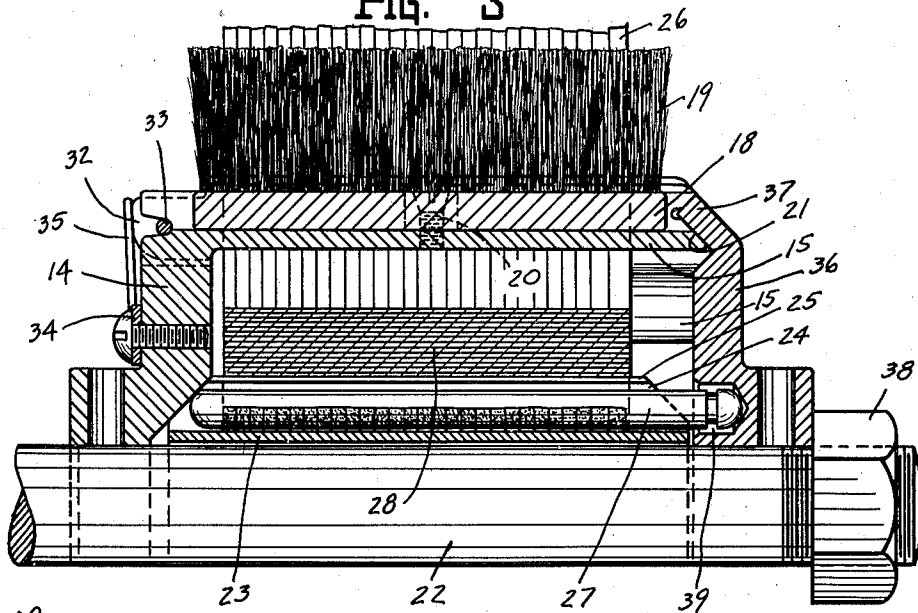
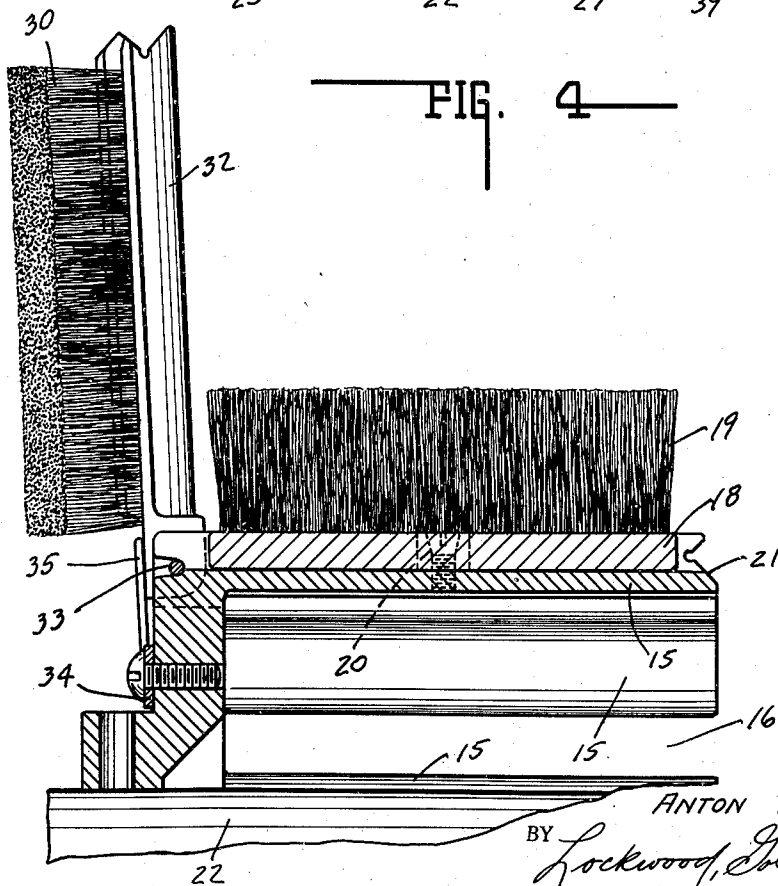


FIG. 4



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UNITED STATES PATENT OFFICE

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SANDER

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7 Claims. (Cl. 51-194)

This invention relates to a sander head of the type employed in smoothing wood products such as moldings and carvings or any wood pieces having irregular shapes and surfaces. Its use for finishing metal and plastic surfaces of curved and irregular contour is also contemplated.

This invention is an improvement upon the sander construction illustrated and described in Letters Patent to Plegemeier, No. 2,125,460, issued August 2, 1938.

This invention more particularly relates to the construction and arrangement of the brushes as associated with the sanding paper. In sanders of this type, the free ends of abrasive sheets or sanding paper extend outwardly in front of the brushes so that the air pressure developed by the rotation of the sander head tends to hold the abrasive sheets against the sides of the brush bristles. If the slots are not immediately adjacent the brushes, or if the sides of the brushes, adjacent to the abrasive sheets, do not extend exactly along radial lines, centrifugal force tends to throw the abrasive sheets away from the sides of the brush bristles. In such cases there is more or less conflict between the effect of the air pressure and the centrifugal force acting upon the free ends of the abrasive sheets, thereby causing said free ends to flutter, resulting in two detrimental effects. One effect of this flutter or flapping is to increase the slapping action of the abrasive against the work, thereby tending to develop slightly pitted surfaces on the work being presented for sanding. The second detrimental effect is obviously to deteriorate the abrasive sheets by causing them to wear out, tear and generally lose their abrasive effect more rapidly.

This condition may be brought about even with the proper cooperative effect between the position of the brushes and the location of the slots since the abrasive sheets may not necessarily lie snugly against the sides of the brushes because of their inherent stiffness and curling tendencies. Furthermore, the outer ends of the bristles eventually bend away from the exact radial line, thus causing a gap between the abrasive sheet and the outer ends of the bristles such as may induce the detrimental flutter.

It is the purpose of this invention to remedy the above conditions by wedging and thereby stabilizing the abrasive sheets against the bristles of the brushes by a flexible means which will not damage the work through rigid contact therewith. This is accomplished by providing an auxiliary stabilizing brush so arranged that the ends of its bristles exert a laterally directed force

against the bristles of the backing up brush for exerting sufficient pressure against the abrasive sheet to hold it at all times in contact therewith. Preferably, the stabilizing brush is angularly disposed adjacent the backing up brush such that the direction of inclination of the bristles will have a wedging effect while providing a yielding surface for contact with the work.

It is further the object of the invention to provide such a medium for stabilizing the abrasive sheet as may be conveniently removed or adjusted and to permit speedy reloading of abrasive.

Another feature of the invention resides in the provision of a pair of relatively narrow backing up brushes in place of one wide brush, one against which the abrasive directly contacts and the other to reinforce or stabilize the first brush. This arrangement is of advantage in that after considerable usage the bristles of the first brushes are apt to become bent by the constant contact with the work, but, with the auxiliary backing up brush, they are reinforced or braced.

Another feature of the invention resides in so arranging the stabilizing brush and the backing up brush with or without its auxiliary reinforcing brush so that all of the brushes may be identical and interchangeable. Thus, upon one of the two or three sets of brushes becoming worn or misshapen, they may be interchanged and rearranged. Thus, the backing up brush may be substituted for the stabilizing brush and vice versa.

Other objects and features of the invention will be understood from the accompanying drawings and the following description and claims.

Fig. 1 is a perspective view showing the sander unit mounted upon a support and motor driven spindle. Fig. 2 is a front elevation of the sander with a portion of the front locking plate removed. Fig. 3 is a section taken along the line 3-3 of Fig. 2. Fig. 4 is a partial view of Fig. 3 with the stabilizing brush in elevated position.

In the drawings there is illustrated a sander including a supporting base 10 upon which there is mounted an electric motor 11 driven from any suitable source of current, not illustrated. Extending from the motor there is a bearing housing 12, such housing preferably extending from both sides of the motor for balancing purposes and to provide dual sanding units. Driven by the motor and supported in the bearing housing there is a spindle 13 for rigidly supporting and rotating the sanding unit.

The sander unit embodies a head comprising a supporting disc 14 with a plurality of spaced for-

wardly extending rigid arms 15 formed integrally therewith, which in effect provide a cylindrical structure having wide slots extending longitudinally thereof comprising the spaces between the arms 15 and indicated at 16.

Each of the arms 15 is provided with a pair of recesses 17. As shown herein, there is provided a pair of such recesses, but in a smaller head there may be provided only one recess in each arm. Said recesses are undercut to slidably receive and secure therein a brush head 18 carrying the outstanding and radially extending bristles 19. After said heads 18 are slidably mounted in place, they are locked in position by the lock screw 20. The forward free ends of said arms are provided with an angular recess 21 comprising a portion of an annular groove extending about the forward end faces of all of said arms for the purpose hereinafter described.

Mounted within the head and supported upon the spindle 22 there is a central support, here shown in the form of a sleeve 23, having its outer periphery substantially spaced from and concentric with the inner periphery of the head formed by the arms 15. Said sleeve extends the full length of the head or arms and is provided with a plurality of bores 24, related in number to the number of arms 15. Each bore is provided with a longitudinal slot 25 opening to the outer periphery of the sleeve through which the abrasive sheet 26, such as sand paper, may pass. Each abrasive sheet 26, one for each arm with its brush or set of brushes, has its inner end secured within the sleeve by passing partially about a locking pin 27, and from locking engagement with said pin within the bore 24 extends outwardly through the slot 25 to be wound about the sleeve in a roll, as indicated at 28. The several abrasive sheets having their inner ends secured by the locking pins within the sleeve may thereby be rolled one upon the other in a single roll. Extending outwardly from the periphery of the roll, the free ends of each sheet pass through their respective spaces 16 between the adjacent arms 15 and along the bristles 19 of the adjacent brush and extending to the end thereof. As is well understood in the art, the abrasive sheets thus mounted are slashed so as to enable the strips thus formed to conform with uneven surfaces in the work to be sanded in conjunction with and backed by the bristles of the brush.

As shown herein, there is a pair of brushes mounted on each arm 15, one of which is directly engaged by the abrasive sheet for backing it up when applied to the work, which engaged brush is herein termed the "backing up" brush. The other associated brush may be termed the "auxiliary reinforcing" brush. Such functions of the brushes depend upon which side of the arm the abrasive sheet extends and the direction of rotation of the head. Whereas it is shown herein as extending on one side for clockwise rotation of the head, it may be reversed and extended on the other side for counterclockwise rotation.

The stabilizing brush 30 comprises a similar brush to the brushes 19 and is secured within the brush head 31 slidably wedged within the undercut groove of a hinged arm 32. Said arm 32 is adapted to lie when in operative position within the space 16 between the arms 15 in parallel relation thereto, but tilted at an angle so that the bristles of the brush 30 extend at an angle to the radially extending brushes 19. The outer free ends of the stabilizing brushes are positioned to engage and bear against the abrasive sheet so as

to press said sheet against the backing up brush. The fact that the head 31 of the stabilizing brush is spaced a substantial distance from the head 18 of the backing up brush positions the outer end of its bristles at a corresponding distance from the outer end of the brush 19 so as to leave exposed to the work a substantial area of abrasive. This angular disposition of the stabilizing brush has the effect of yieldingly exerting a stabilizing force against the abrasive sheet and its backing up brush so as to maintain contact between the sheet and the backing up brush at all times, thereby preventing loose play and fluttering of the abrasive.

The arm 32 of the stabilizing brush is pivoted to the plate 14 of the head by the hinge pin 33 so that the stabilizing brush may be swung toward and away from between the backing up brushes. This is primarily to permit of the abrasive sheets being positioned relative to the backing up brushes before the stabilizing brushes are moved to position to bear thereagainst. For convenience in manipulation there is a spring latching disc 34 rigidly secured to the outer surface of the plate 14 and having radially extending spring fingers 35 bearing under tension against the pivoted ends of the arms 32. The effect thereof is such that when the arms are raised about their pivotal mounting to extend radially of the head in open position, the rear upper surface thereof is engaged by the spring fingers 35 so that the arms are held in their raised position. While so held, the abrasive sheets may be conveniently manipulated. On the other hand, when said arms are swung downwardly to operative position against the tension of the spring, the spring engages the adjacent ends thereof for yieldingly maintaining them in lowered position.

The arcuate grooves 21 formed in the ends of the arms 15 extend in continuation of a circle across the ends of the arms 32 for receiving the locking end plate or cap 36 which also acts to lock the pins 27 and tie in the ends of the arms 15. The periphery of the cap has an inwardly extending and beveled flange 37 adapted to seat in the annular groove sections 21. This peripheral interlocking structure reinforces and braces the head including the arms against distortion by the action of centrifugal force. The cap is locked for rotation upon the spindle 22 by the nut 38 which locks all parts together as an operative unit. Said cap is provided on its inner surface with a plurality of spaced recesses 39 for receiving the heads of the locking pins 27. Thus, the head, pins and sleeve are interlocked with the spindle. Also, the cap may be manually rotated by any suitable means relative to the head upon releasing the nut 38 to rotate the sleeve with respect to the arms for winding the abrasive sheets upon sleeve 23 or for extending the abrasive therefrom.

The invention claimed is:

1. A sander unit comprising a head having a plurality of outwardly extending brushes mounted longitudinally thereof in parallel spaced relation, means for securing a plurality of abrasive sheets within said head having their free ends extending outwardly between the respective brushes and adapted to lie thereagainst, and a stabilizing brush mounted adjacent each of said first-mentioned brushes with its bristles angularly disposed relative thereto and bearing thereagainst for yieldingly pressing and maintaining the outer

portion of the abrasive sheet in contact therewith.

2. A sander unit comprising a head formed of a plurality of longitudinally extending arms in parallel spaced relation, an outwardly extending brush mounted on each of said arms, means for securing a plurality of abrasive sheets within said head having their free ends extending outwardly between said arms in position to lie against the corresponding brushes, and a stabilizing brush mounted adjacent each of said first mentioned brushes with its bristles angularly disposed relative thereto and bearing thereagainst for yieldingly pressing and maintaining the outer portion of the corresponding abrasive sheet in contact therewith.

3. A sander unit comprising a head, means for securing a plurality of abrasive sheets within said head, said head being provided with passageways through which said sheets extend for exposure to the work to be sanded, a backing up brush mounted on said head adjacent the exposed end of each sheet, and a stabilizing brush mounted on said head on the other side of each sheet arranged to bear thereagainst and yieldingly press said sheet against the backing up brush.

4. A sander unit comprising a head, means for securing a plurality of abrasive sheets within said head, said head being provided with passageways through which said sheets extend for exposure to the work to be sanded, a backing up brush mounted on said head adjacent the exposed end of each sheet, a second auxiliary reinforcing brush mounted adjacent to each of said backing up brushes on the opposite side from said sheet and in reinforcing engagement therewith, and a stabilizing brush mounted on said head on the other side of each sheet arranged to bear thereagainst and yieldingly press said sheet against the backing up brush.

5. A sander unit comprising a head formed of a plurality of rigid arms extending longitudinally thereof in parallel spaced relation, a brush mounted on each of said arms and extending substantially throughout its length, a plurality of abrasive

sheets mounted in said head and arranged for the outer ends thereof to extend to one side of the respective arms to lie against said brushes, a series of removable arms adapted to be positioned between said first mentioned arms, and a brush on each of said movable arms extending toward and at an angle to said first mentioned brushes into engagement with the abrasive sheet for yieldingly pressing and holding it in contact therewith.

6. A sander unit comprising a head formed of a plurality of rigid arms extending longitudinally thereof in parallel spaced relation, a brush mounted on each of said arms and extending substantially throughout its length, a plurality of abrasive sheets mounted in said head and arranged for the outer ends thereof to extend to one side of the respective arms to lie against said brushes, a plurality of hinged stabilizing brushes having one of their ends pivotally mounted upon said head adapted to be moved to and from operative position between said arms and normally lying when in operative position at an angle to said first mentioned brushes for engaging and pressing the abrasive sheets into stabilizing position relative thereto.

7. A sander unit comprising a head formed of a plurality of rigid arms extending longitudinally thereof in parallel spaced relation, a brush mounted on each of said arms and extending substantially throughout its length, a plurality of abrasive sheets mounted in said head and arranged for the outer ends thereof to extend to one side of the respective arms to lie against said brushes, a plurality of hinged stabilizing brushes having one of their ends pivotally mounted upon said head adapted to be moved to and from operative position between said arms and normally lying when in operative position at an angle to said first mentioned brushes for engaging and pressing the abrasive sheets into relatively fixed contact therewith, and a spring for yieldingly maintaining said stabilizing brushes in their respective operative and removed positions.

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