April 21, 1953 C. H. HENNELL 2,635,653

APPARATUS FOR EMBOSSING GRAINING OF WOOD

Filed July 27, 1950 2 SHEETS—SHEET 1

Fig. 1.

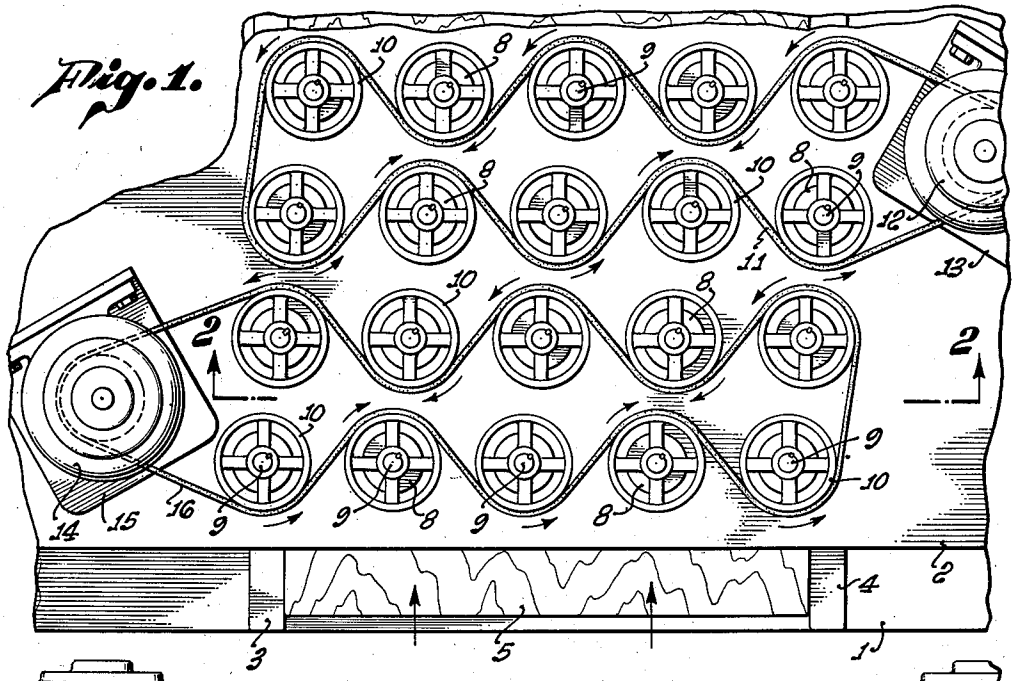


Fig. 2.

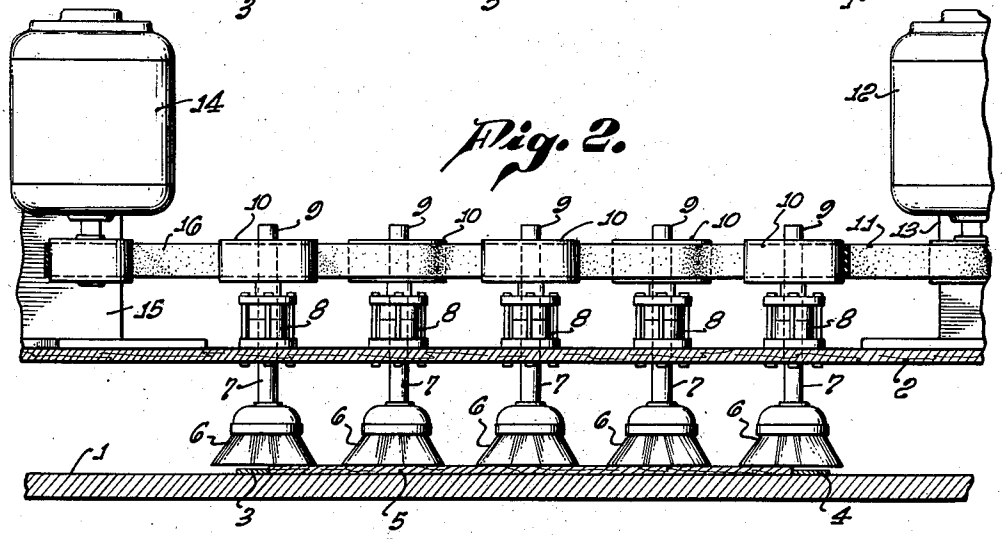


Fig. 3.

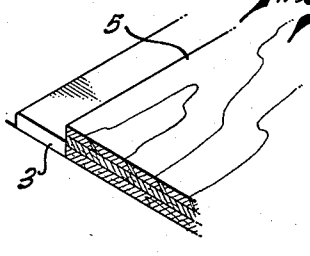
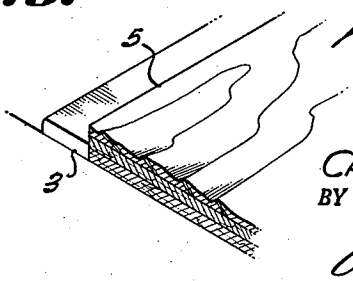


Fig. 4.



INVENTOR.
CHARLES H. HENNELL
BY
John Flam
ATTORNEY.

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Fig. 5.

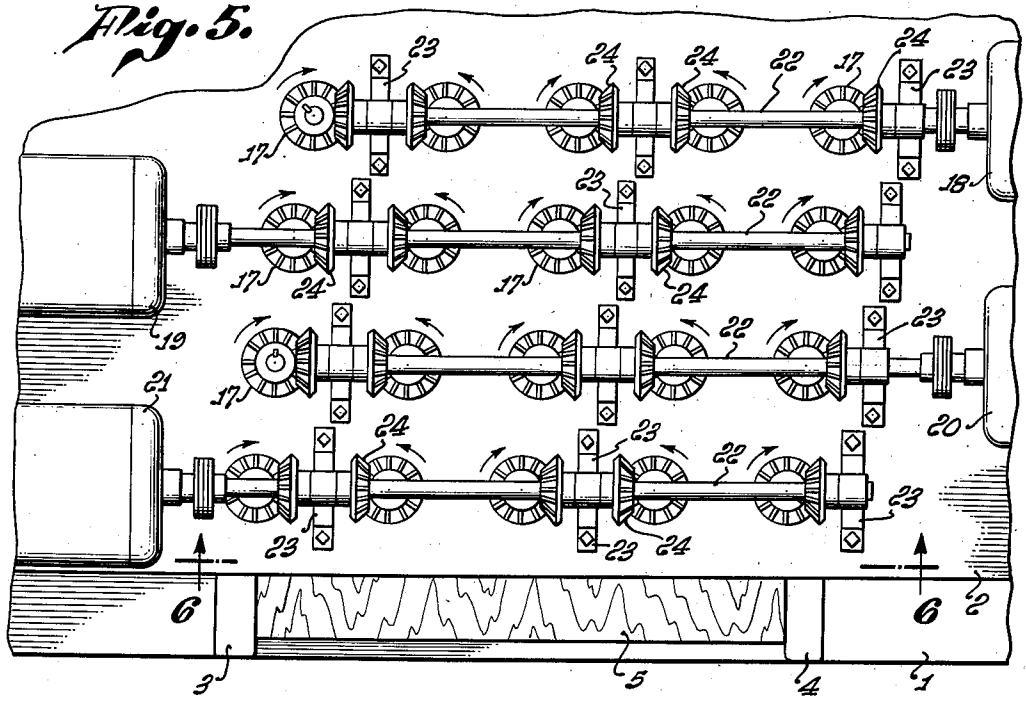


Fig. 6.

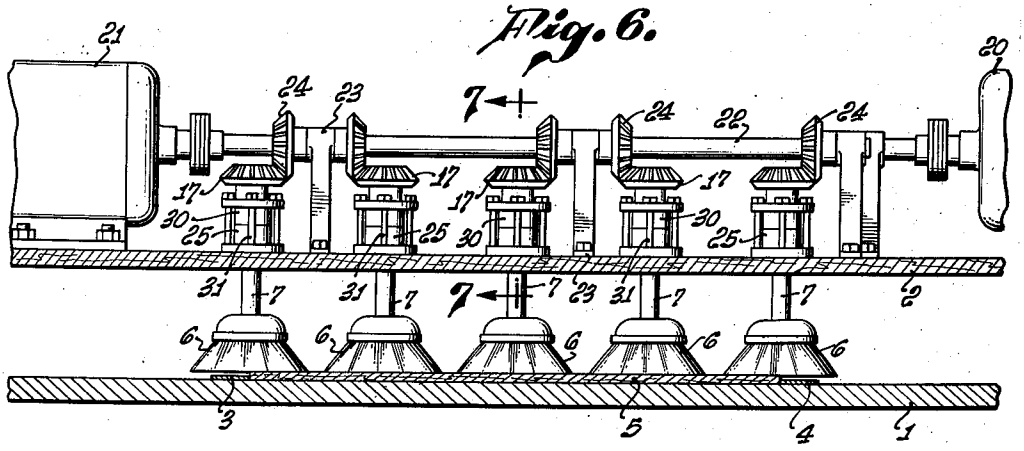
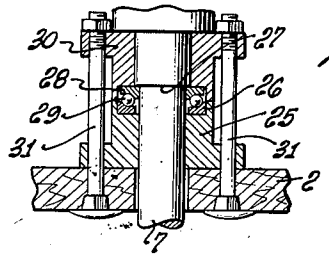


Fig. 7.



INVENTOR.
CHARLES H. HENNELL
BY
John Flam
ATTORNEY

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APPARATUS FOR EMBOSSING GRAINING OF WOOD

Charles H. Hennell, Inglewood, Calif.

Application July 27, 1950, Serial No. 176,105

1 Claim. (Cl. 144—115)

1

Wood utilized for finish work on furniture or walls is intended to be decorative. Although a plane surface exposing the grain is often quite acceptable, a further decorative effect has been heretofore secured by providing a roughened surface for the wood, as by removing some of the softer parts around the dense areas. Thus, an embossing of the grain is obtained that is highly effective for a wall covering, or the like.

Pine plywood, or similar soft grained wood, is especially adapted to this treatment, since there are relatively large intermingled exposed surfaces of soft and hard character.

It is one of the objects of this invention to provide a simple and inexpensive apparatus for treating wood in this manner.

Abrasive action on the wood surface is effective to wear down the softer areas without materially affecting the harder parts. Thus, wire brushes may be used, the bristles performing the abrasion, and these bristles also to some extent produce a burnishing effect upon the harder surfaces.

It is another object of this invention to provide a device of this character, in which the power required is reduced.

It is still another object of this invention to provide a device of this character in which the entire surface of the wood is substantially uniformly treated by a single manipulation.

This invention possesses many other advantages, and has other objects which may be made more clearly apparent from a consideration of several embodiments of the invention. For this purpose there are shown a few forms in the drawings accompanying and forming part of the present specification. These forms will now be described in detail, illustrating the general principles of the invention; but it is to be understood that this detailed description is not to be taken in a limiting sense, since the scope of the invention is best defined by the appended claim.

Referring to the drawings:

Figure 1 is a plan view of an apparatus incorporating the invention, part of the figure being broken away;

Fig. 2 is a sectional view, taken along a plane corresponding to line 2—2 of Fig. 1;

Fig. 3 is a view, mainly pictorial, illustrating a portion of a board prior to its being operated on by the apparatus shown in Figs. 1 and 2;

Fig. 4 is a pictorial view, similar to Fig. 3, illustrating a portion of the board after it has been treated by the apparatus;

Fig. 5 is a plan view of a modified form of the invention;

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Fig. 6 is a sectional view, taken along a plane corresponding to line 6—6 of Fig. 5; and

Fig. 7 is an enlarged sectional view, taken along a plane corresponding to line 7—7 of Fig. 6;

A stationary table 1 is provided, above which there is a supporting shelf or bracket 2. This table 1 is provided with the guide cleats 3 and 4 to guide the movement of the plywood board 5 along the table 1.

The shelf 2 serves to support a plurality of rotary wire brushes 6 which have shafts 7 mounted in thrust bearing structures 8 supported on the shelf 2. Above the structure 8, the shafts 7 have shaft extensions 9 to which are keyed pulleys 10. As shown most clearly in Fig. 1, the axes of these pulleys form a series of horizontal rows. The axes of the pulleys of adjacent rows are slightly offset to provide a staggered arrangement of the brushes in the direction of movement of the board 5.

The bristles of these brushes 6 contact the upper surface of the board 5, and define circular abrasive areas that operate upon that surface.

Preferably, the shafts 7 are rotated at the rate of about 2,000 revolutions per minute, and the board 5 is passed through the machine at the rate of forty to sixty feet per minute.

Since succeeding rows of axes of the shafts 7 are offset horizontally from the preceding rows, the circular abrasive areas overlap so that the entire surface of the board 5 is acted upon by the brushes 6.

In the present instance, there are four rows of brushes. The two upper rows are rotated by the aid of a belt 11, driven by an electric motor 12 mounted on the bracket 13 fastened to the shelf 2. This belt 11 passes around the pulleys in such manner that adjacent pulleys in the row are driven in opposite directions, and the end pulleys of these rows are rotated in the same direction.

The two bottom rows are similarly driven by electric motor 14, mounted on a bracket 13, and by the aid of the belt 16 which passes around all of the pulleys in the two bottom rows.

Upon passage of the board 5 through the apparatus, the graining is embossed by the removal of the softer material, to result in a surface illustrated in Fig. 4.

Although four rows of wire brushes are illustrated in this form, any desired number may be utilized. As many motors 12 and 14 are used as there are pairs of rows. Furthermore, the offsetting of one row with respect to the other rows is made such that the brushes of the lowermost row overlap the spaces formed between the top-

most row, as viewed in Fig. 1. In this way, it is ensured that the entire surface of the board **5** will be abraded by the brushes **6**.

In the form shown in Figs. 5 and 6, the brushes **6** have axes arranged in rows as before. Each of the shafts **7** carries a bevel gear **17**. The bevel gears of each row are driven respectively by motors **18**, **19**, **20**, and **21**. Each of these motors has a horizontal shaft **22**, extending above the shelf **2** and supported by bearing brackets **23**. Each of the shafts **22** is provided with a plurality of bevel gears **24**, facing in alternately opposite directions and meshing respectively with the bevel gears **17**. In this way, alternate shafts in a row are driven in opposite directions. The end shafts of the rows are driven in the same direction.

A thrust and radial bearing structrue, utilized for supporting the shafts **7**, is shown most clearly in Fig. 7. Thus, a pedestal **25** is provided for the lower race **26**. The shaft **7** passes through the lower race, and is provided with a shoulder **27** against which the upper race **28** rests. Ball bearings **29** are interposed between the races. In order to hold the bearings in proper position, an upper collar **30** is provided. Bolts **31**, passing through the flanges of the pedestal **25** and the collar **30**, serve to secure the structure to shelf **2**.

The grain of boards, such as boards **5**, is haphazard and highly irregular. The brushes **6** sweep over the surface of the board in circular areas, and attack or operate upon the softer wood at all angles as the board advances from one brush to the next. This action is enhanced by the different directions of rotation of adjacent brushes. Accordingly, no matter how irregular the graining may be, it is assured that the brushes will reach and abrade all of the softer exposed

surfaces of the boards **5**, and will produce clean, sharp steps at all portions of the edges of the harder material. A much better appearance of the finished surface is thereby attained.

The inventor claims:

In apparatus for removing softer parts around the denser areas of a wood surface: a plurality of rotary wire brushes having bristles arranged to provide an area of abrasion corresponding substantially to a circle, the abrasion areas being respectively normal to the axes of rotation, and the centers of the circles falling respectively on these axes; the axes being arranged in parallel rows, and the axes of adjacent rows being offset to an extent that the progress of the wood surface in a direction normal to the axes and past the rows will cause the brush areas to sweep over all of the wood surface; means for driving alternate brushes in a row in opposite directions; and means providing a guide for the movement of the wood in said normal direction.

CHARLES H. HENNELL.

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