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Susnjara

[11] **3,919,733**

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[54] **GLAZE WIPING APPARATUS FOR GRAINING FURNITURE**

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[73] Assignee: **Thermwood Corporation,** Dale, Ind.

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[52] **U.S. Cl.** **15/23;** 15/77; 101/425; 118/203; 118/DIG. 9

[51] **Int. Cl.²** **A46B 13/02**

[58] **Field of Search** ..... 15/21 E, 23, 24, 38, 44, 15/48, 77, 97; 118/203, DIG. 9; 101/156, 168, 425

[56] **References Cited**

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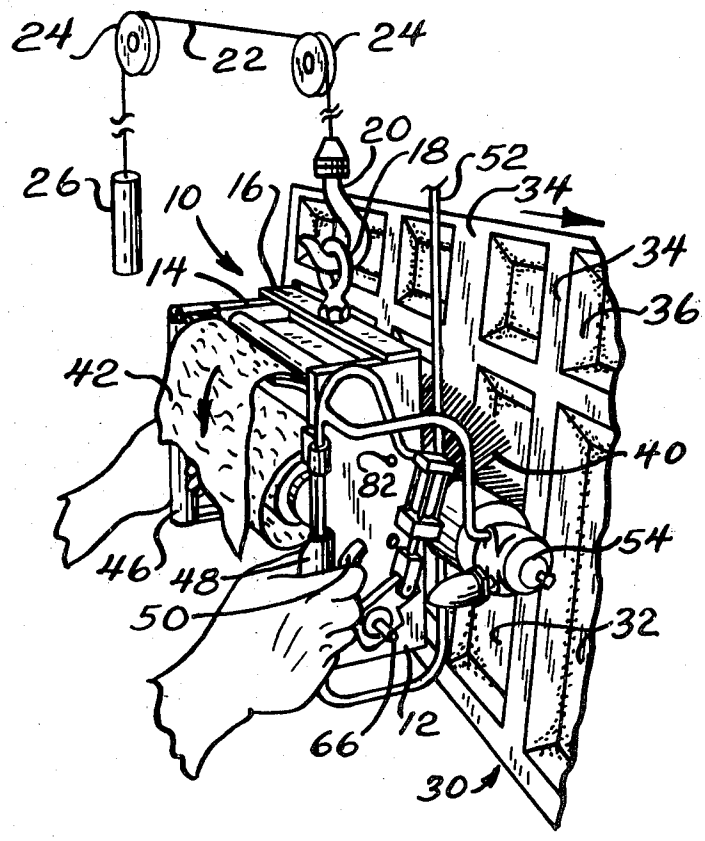
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Primary Examiner—Edward L. Roberts
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[57] **ABSTRACT**

Wiping apparatus for use in the graining of furniture includes a rotating brush and a web of absorbent material such as paper guided in contact with the brush for removing excess glaze picked up from the workpiece. In a preferred embodiment the device is adapted to be supported by a counterbalanced cable so that an operator can easily move it over the surface of a slowly moving or stationary workpiece. The brush is driven by an air motor which is controlled by the operator by means of a trigger actuator. An air cylinder feeds the absorbent web a predetermined increment each time the trigger actuator is operated.

10 Claims, 4 Drawing Figures



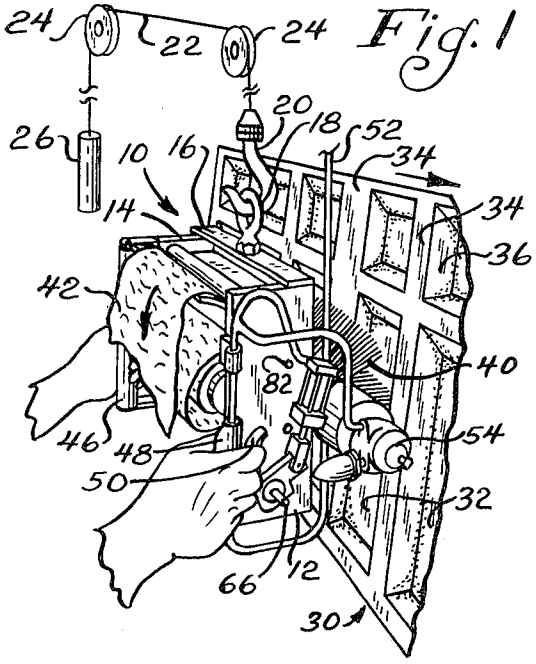


Fig. 1

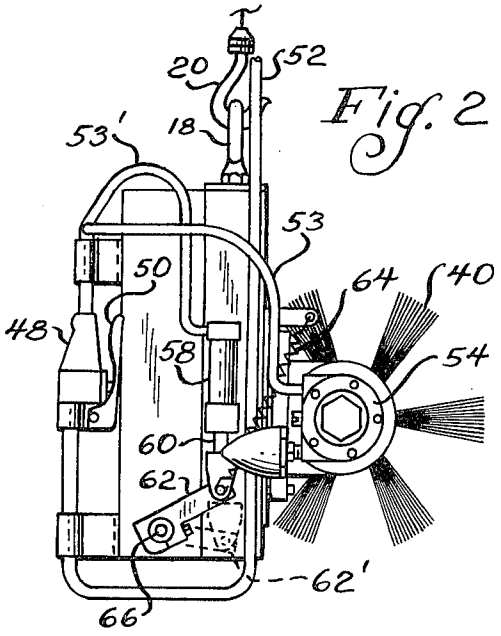


Fig. 2

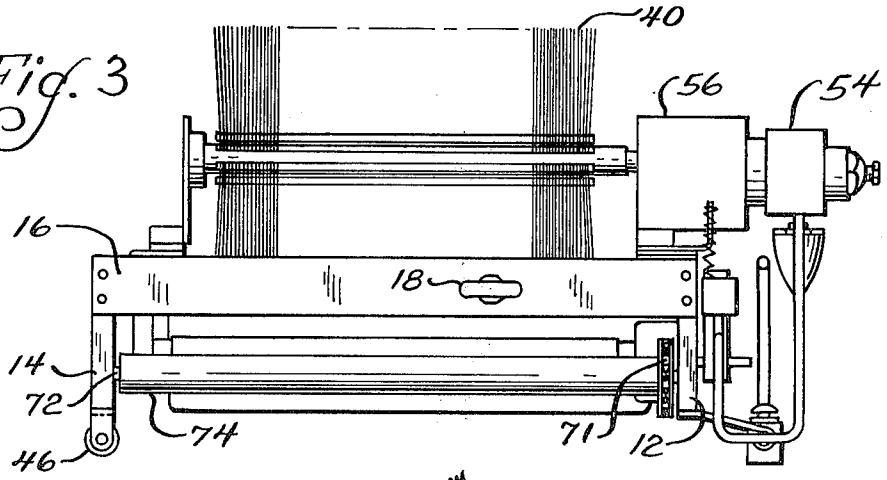


Fig. 3

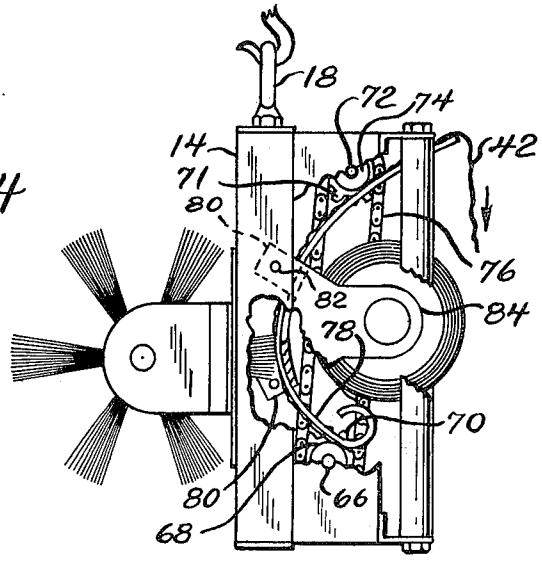


Fig. 4

GLAZE WIPING APPARATUS FOR GRAINING FURNITURE

BACKGROUND OF THE INVENTION

This invention relates to the field of graining and finishing furniture and particularly to the finishing of molded plastic furniture front and panel members being transported on a conveyor apparatus past a plurality of work stations where successive coatings of finish are applied and partially removed to achieve a graining effect. Where the panel members are made of plastic which is to be finished so as to appear as wood it is conventional to spray a base finish coat uniformly over the part and allow it to dry. A darker glaze or stain coat is then sprayed over the base coat. Before the glaze coat has dried, it is brushed by hand. The brushing forces the glaze into the grain and other recessed areas of the material being finished. The brush is also used to remove most of the glaze from the non-recessed areas. Since glaze material is being removed it is necessary to clean the brush very often in order to achieve a desired finish. As the brush becomes more filled with glaze it is less and less able to remove the glaze from the workpiece, with the result being that the appearance of successive workpieces cannot be absolutely uniform unless the brush is cleaned at extremely short intervals. Since the workpieces being finished are usually moving on a conveyor past the operator who must make several dozen hand brush strokes per article it is possible for different workpieces to look considerably different depending on the number of operators handling them or the physical condition of a given operator at a given instant. Although U.S. Pat. No. **3,693,585** teaches that a wiping roll and scraping blade can be used to distribute and wipe off excess coating from a panel of plywood or other flat material, such structure would not be suitable for three dimensional patterned panels such as those molded of plastic and used for cabinet fronts. U.S. Pat. No. **3,648,316** shows a rotary powered brush for cleaning and polishing the metal skin of an airplane but if such a brush were used to brush glaze it would do little more than remove and then redeposit it.

In view of the very tedious nature of the conventionally used hand brushing operation, its slowness, and its non-uniformity, it would be very desirable to have a powered apparatus which could accomplish the task. It is among the objects of the invention to provide a powered brushing apparatus which can simulate the appearance of hand brushing while preventing the removed glaze from being redeposited on the workpiece.

SUMMARY

The aforementioned and other objects are attained by the apparatus of the present invention which basically comprises a rotating brush powered by an air motor. A roll of absorbent paper is mounted within the device so as to pass between the brush and a metal backup member. The paper, which wipes excess glaze from the brush, is fed by a pair of rubber rollers so that a new section can be presented to the brush whenever desired. A small air cylinder which moves in one direction each time the brush motor is actuated advances the rubber rollers so as to move the paper about 1 inch. When the air valve for the brush motor is released, a spring returns the air cylinder to its initial position while a one way clutch holds the paper advancing rollers in their advanced position. The wiper unit hangs from a support cable which is counterbalanced so that the operator needs to expend only the effort required to push the brush against the workpiece and move it up and down in order to cover the entire surface since the workpiece is preferably moving in front of the operator on a conveyor. In practice, a downward pass would be made at the right end of the workpiece. An upward pass would then be made to cover the immediately adjacent unwiped area followed by additional downward and upward passes until the entire piece had been brushed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view showing the relationship of the wiping apparatus of the invention to a workpiece being finished;

FIG. **2** is a view of the right end of the apparatus shown in FIG. **1**;

FIG. **3** is a top view of the apparatus shown in FIG. **1**; and

FIG. **4** is a view of the left end of the apparatus shown in FIG. **1** with portions broken away.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, and particularly to FIG. **1**, the improved glaze wiping apparatus indicated generally at **10** includes a right side frame member **12**, a left side frame member **14** and a top frame member **16**. A hook eye member **18** fastened to the frame member **16** is adapted to be engaged by a hook member **20** mounted on one end of a support cable **22**. The support cable **22** is mounted on pulley members **24** which are mounted on a support (not shown) such as a ceiling. A counterweight **26** on the other end of the cable **22** balances the weight of the wiper apparatus **10** so that an operator can readily manipulate it up and down over the surface of a workpiece indicated generally at **30** which is slowly moving on a conveyor (not shown) in the direction indicated by the arrow.

The workpiece **30** is shown as being a cabinet front member having a plurality of recessed panel segments **32** and surface segments **34** which are joined to the recessed segments by side segments **36**. The workpiece **30** could be wood or other solid material but preferably achieves its three dimensional configuration by being vacuum thermoformed from a flat plastic sheet. As shown, the workpiece **30** would have a dryed base coating of finish covered by a darker, wet glaze or stain coat.

The purpose of the rotating wiper brush **40** is to provide a vertically brushed appearance to the glaze, force the glaze into depressions in the surfaces **32–36** which give the appearance of grain, and remove the excess glaze from the surfaces. The excess glaze is wiped from the brush **40** by an absorbent paper web **42** which contacts it. Since the rotating brush **40** cannot remove all the glaze from recessed areas like the junctures of segments **32** and **36**, the glaze left in such locations will provide a very desirable shadow effect which is very pleasing to the eye and equal to the effect achieved by hand brushing or wiping.

Hand grip portions **46, 48** mounted on the apparatus **10** permit it to be readily controlled by an operator. The right hand grip portion **48** comprises an air valve having a spring loaded trigger **50** which is squeezed by the operator to admit air from the supply line **52**

through an air hose **53** to the air motor **54** which drives the brush **40** through a gear box **56.** A portion of the air leaving the valve **48** is directed by air hose **53'** to an air cylinder **58** having a movable shaft **60** which causes the paper web **42** to advance in the direction indicated by the arrows. The shaft **60** moves the lever **62** to the dotted line position **62'** shown in FIG. **2** when the air trigger **50** is squeezed and holds it there until the trigger is released, at which time the spring **64** returns it to its unactuated position. A one-way clutch (not shown) interposed between the lever **62** and lower roller shaft **66** permits the shaft **66** and the lower rubber drive roller **68** mounted on it to rotate when the movable cylinder shaft **60** is driven downwardly but to remain stationary when the cylinder shaft **60** moves upwardly. A sprocket **70** fixedly mounted on the lower roller shaft **66** transmits rotary movement from the lower shaft to a sprocket **71** on the upper roller shaft **72** and roller **74** mounted on it by means of sprocket chain **76.** Since the two rubber drive rollers **68, 74** are in pressure contact with the paper web **42** by virtue of the spring plate member **78** it will be readily evident that the paper will advance upwardly a predetermined increment each time the trigger is actuated. Depending on how much glaze the operator wishes to remove from the workpiece **30** the trigger **50** can be actuated to present a clean wiping surface to the brush **40** as often as desired. Generally, it is sufficient to actuate the trigger following each upward or downward pass over the workpiece. The spring plate member **78** not only holds the paper web **42** in contact with the drive rollers **68, 74** but also provides the backup for the paper as it is contacted by the rotating brush **40.** Tabs **80** on the spring plate **78** serve as a means to anchor the spring plate to the side frame members **12, 14** where they are held by screws **82.** The screws **82** also anchor the brackets **84** which carry the roll of paper toweling **42.** The paper toweling is preferably of the non-perforated type generally used in industrial towel dispensers for drying one's hands. The rotary brush **40** is shown as having a plurality of individual separated brush segments but could also utilize a continuous brush.

It has been found that use of the wiper apparatus of the invention has provided much faster and more uniform wiping than hand brushing and with far less effort on the part of the operator. Although an air motor **54** has been shown on one end of the rotary brush **40** it will be obvious that a similar motor could also be connected to the other end of the brush to double the power supplied to the brush. Furthermore, although an intermittent feed arrangement has been disclosed for the paper web **42,** it would of course be possible to have the paper feed continuously as the brush rotates. Such an arrangement would, however, use much more paper than the disclosed intermittent arrangement which feeds about a **1** inch length each time it is actuated.

I claim as my invention:

1. Wiping apparatus for brushing and removing a portion of the wet stain or glaze on an article of furniture being finished comprising a housing, rotary brush means mounted on the housing, powered drive means for rotating said rotary brush means, a supply of absorbent web means mounted on the housing, guide means mounted on the housing for guiding fresh portions of said absorbent web means into contact with said rotary brush means so as to remove excess stain or glaze therefrom, and means for advancing fresh portions of said absorbent web means into contact with said rotary brush means.

2. The wiping apparatus of claim **1** wherein said housing includes hanging means for permitting said apparatus to be supported by a downwardly extending cable.

3. The wiping apparatus of claim **2** wherein the weight of said apparatus is counterbalanced by a counterbalance weight on the opposite end of said cable.

4. The wiping apparatus of claim **1** wherein said housing has a pair of spaced hand grip portions mounted thereon.

5. The wiping apparatus of claim **4** wherein one of said hand grip portions includes means for actuating both said powered drive means and said means for advancing said web means.

6. The wiping apparatus of claim **1** wherein said means for advancing said web means produces a predetermined increment of movement of said web each time the rotary brush drive means is actuated.

7. The wiping apparatus of claim **6** wherein said means for advancing said web means comprises an air cylinder.

8. The wiping apparatus of claim **7** wherein said housing includes at least one hand grip portion, said at least one hand grip portion comprising an air valve body and air flow control trigger for controlling the flow of air from a remote source thereof to said air cylinder and to said powered drive means, said powered drive means comprising an air motor.

9. The wiping apparatus of claim **1** wherein said housing has bracket means mounted thereon for supporting a roll of said absorbent web means and a spring plate member for supporting said web in contact with said brush means, said spring plate member further including portions which bias said web into contact with at least one feed roller which is driven by said means for advancing.

10. The wiping apparatus of claim **9** wherein said spring plate member includes portions on either side of said brush for biasing said web into contact with a pair of spaced feed rollers which are driven by said means for advancing.

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