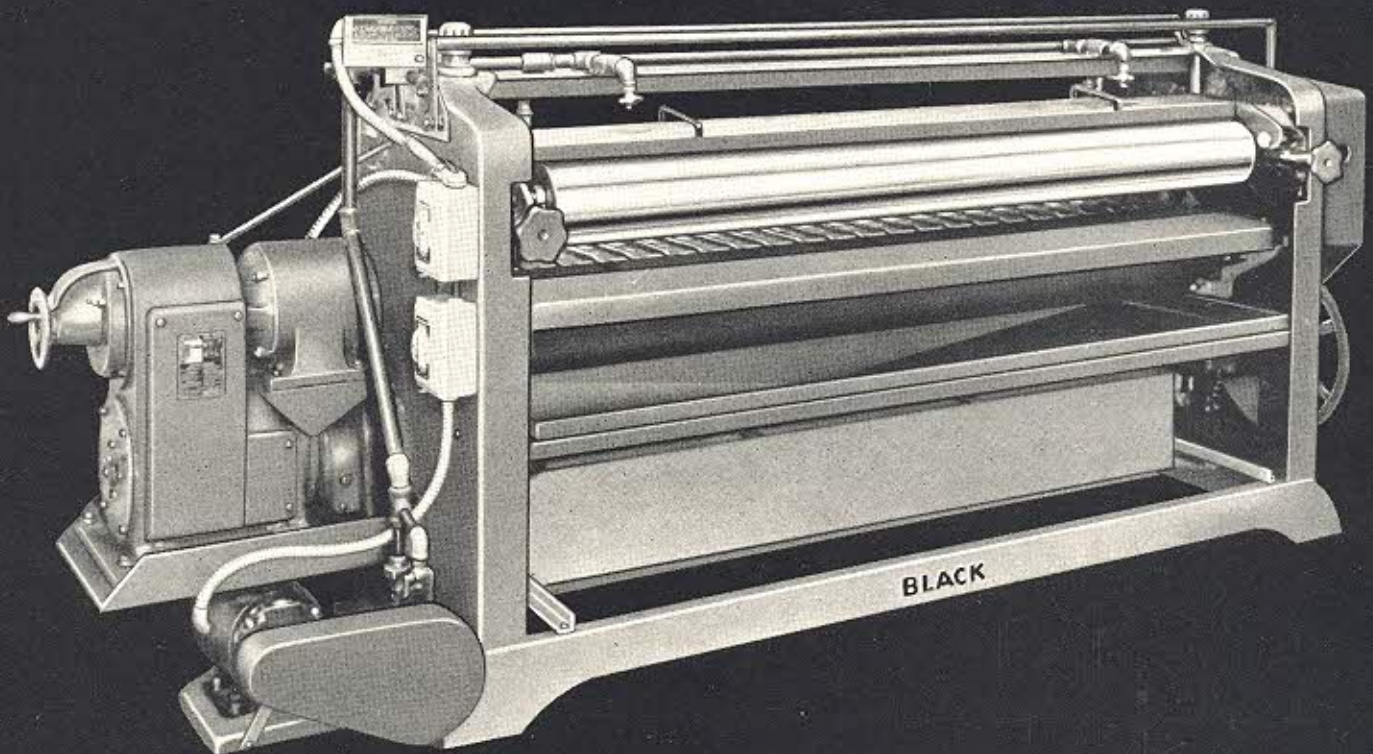


## Black Brothers No. 22-D RESILIENT ROLL GLUE SPREADER



For resins, caseins, polyvinyls, protein and similar adhesives—

a total of 39 sizes in four models—

8" through 122" capacities in 6" increments.

SINCE 1882

**The BLACK BROTHERS CO., Inc.**

MENDOTA, ILLINOIS 61342

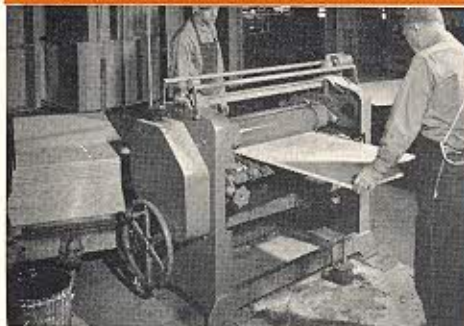
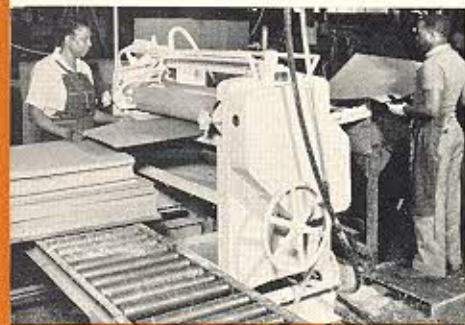
Gluing, Clamping, Laminating & Roller Coating Equipment



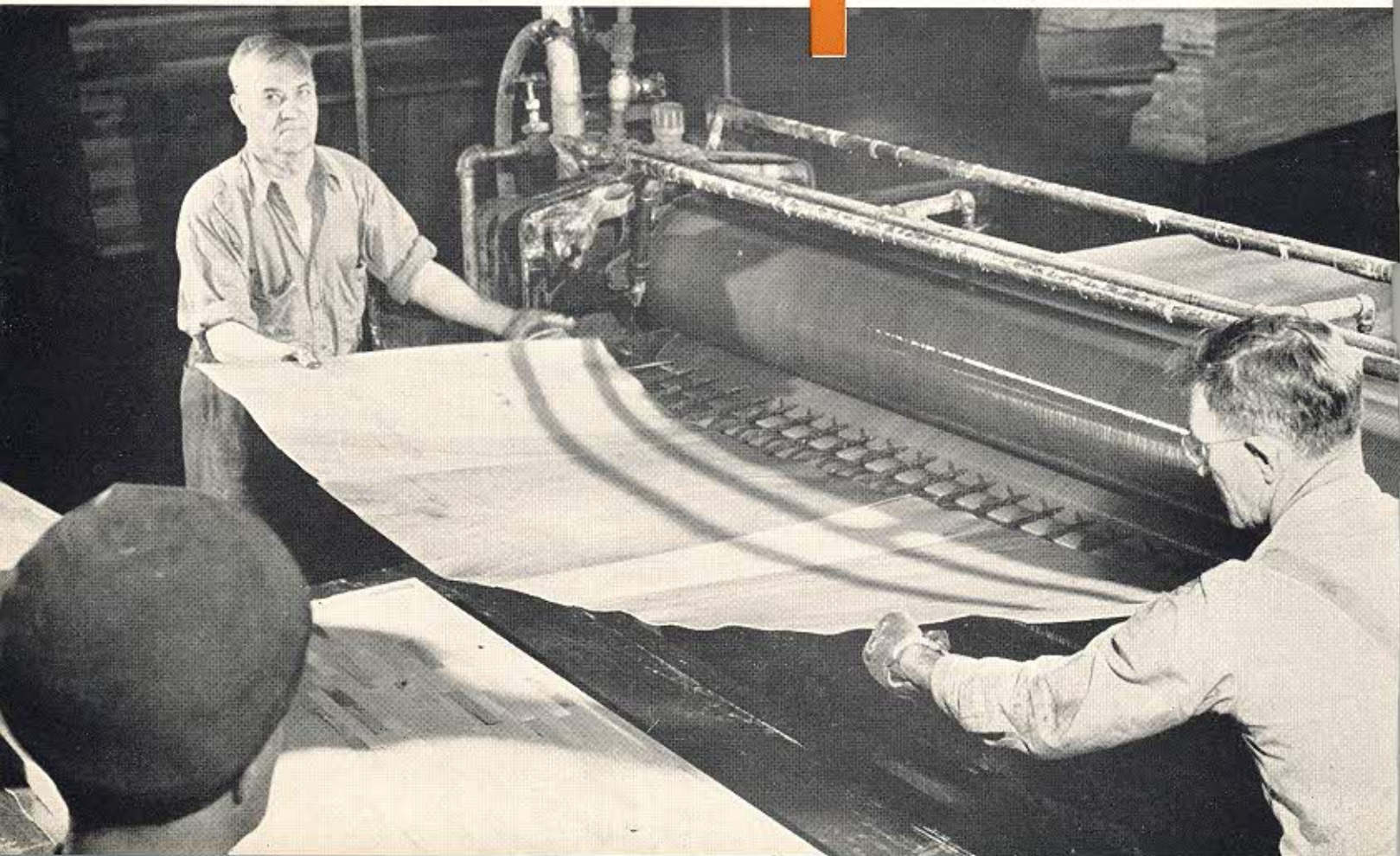
# A Truly Superior Spreader Whose Performance Cannot Be Remotely Approached By Anything Else Offered For The Purpose. . . . .

Typical installation views of the hundreds of gluing operations being successfully performed by the No. 22-D Spreaders:

- 1—Hollow core flush door frames
- 2—Heavy chipboard boxboard in card table tops
- 3—Plywood for plastic faced table tops
- 4—Dimension stock
- 5—Cross banding on solid core flush doors, shown below



5





# . . . THE NO. 22-D RESILIENT ROLL GLUE SPREADER

The introduction of synthetic resin glues was one of the epochal events in the history of woodworking. These remarkable adhesives which defy moisture, decay, fungi and time have revolutionized the industry. New markets are being won and old ones regained. Woodworking has profited much, and will profit still more, in the bright future of the world of plastics, because the colloidal nature of resinous adhesives and the cellular structure of wood complement each other perfectly. There is a natural and scientific affinity between the two, the possibilities of which stagger the imagination.

When the makers and pioneer users of resin glues told us what they wanted in a spreader to apply these adhesives, that likewise staggered the imagination. It must, they said, be accurate to the thousandth of an inch, and apply a coat of glue controlled to the gram of weight. It must do so on veneers of any commercial quality, rough or smooth, flat or wrinkled. It must handle materials which tend to corrode ordinary metal surfaces and must have unusual provision for cleanly operation. It must closely approximate 100% efficiency in the use of the resin put into it, and waste practically none. It must maintain this accuracy and economy under the severest production conditions. In short, it must be the super-spreader.

And so the No. 22-D spreader for resinous glues was born. All old conceptions of glue spreader design were discarded, and features were incorporated which were previously undreamed of in a machine for this purpose. Gluing rolls deeply covered with high grade synthetic rubber were used, specially grooved to control the amount of resin deposited and to conform to irregularities in the stock. Accurate, heavy duty ball bearings — sealed to keep the lubricant in and the dirt and glue out — were employed throughout to provide and maintain the required degree of accuracy. The doctor rolls were heavily coated (not merely plated) with pure, hard chromium to eliminate corrosion and to further control the glue spread. All adjustments were calibrated to the thousandth of an inch like a fine machine tool. Full provision was made to insure and maintain absolute roll parallelism. Drip proof glue reservoirs were devised to confine the glue where it was needed, achieving a remarkable degree of cleanliness and economy. Exclusive safety controls were added to protect the machine, the stock, and the operators. Above all, a ruggedly built production machine was produced which ran with the quietness of a watch, providing unmatched performance from the angles of speed, economy, accuracy, cleanliness, and quality production.

In the following pages we endeavor to tell you by words and pictures just how this was accomplished.

THE BLACK BROTHERS COMPANY, INC. — MENDOTA, ILLINOIS



# CONSTRUCTION FEATURES

Here are some of the exclusive features which explain why Black Brothers have built more resilient roll glue spreaders than all other manufacturers combined.

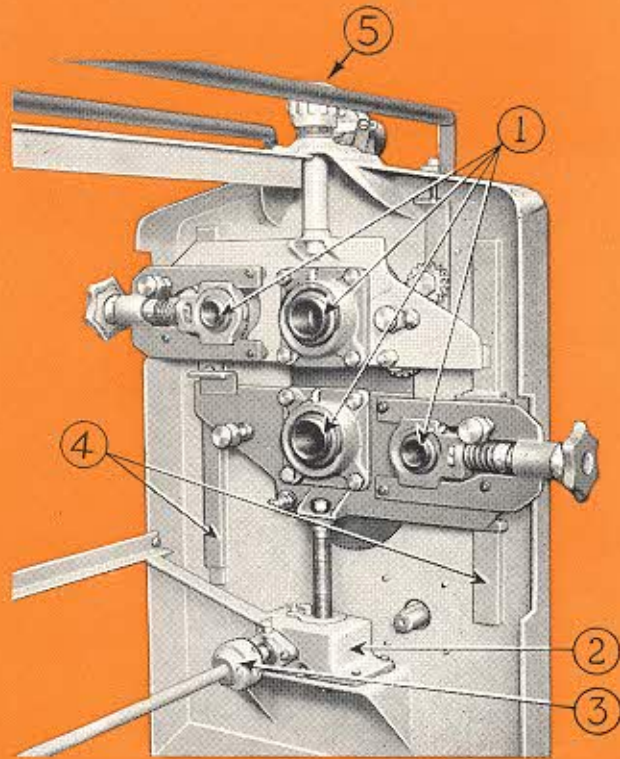


FIG. 1

The #22-D spreaders are made in a total of 39 sizes in four distinct models, 8" through 122" capacities in 6" increments. Bench models 8" through 26"-Regular Production models 26" through 74"-Heavy Series 50" through 122"-and Super Series 50" through 122".

## Fig. 1 End Frame Construction

Rigid box type end frames made of arc-welded plate steel provide a firm base to insure a perfect alignment of all working parts.

(1) *Ball bearings on all roll shafts*—Heavy Duty oversize ball-bearings with pressure lubrication, doubly sealed to keep the lubricant in and the dirt out insure permanent accuracy as well as a remarkably free running machine.

(2) *Fully enclosed, pressure lubricated, elevating mechanism*—This precision gearbox, with bronze worm gear and steel worm, provides a most exacting means of adjusting the opening between rolls. Once set, it remains firmly positioned unless it is reset by the operator.

(3) *Differential coupling in the horizontal adjusting shaft*—This allows the rolls to be adjusted so they are absolutely parallel.

(4) *Vertical guides*—Two widely spaced vertical guides allow accurate vertical roll adjustment and provide a much higher degree of steadiness than is possible with a single vertical guide.

(5) *Top roll pressure springs*—Pressure spring adjustment, by means of pressure caps, allows easy control of top roll spring tension to allow for variation in stock thickness, stock composition, etc.

## Fig. 2 Gluing Roll Drive (with guard removed)

There are four main rolls in this machine which must assume a wide variety of positions with respect to each other and which must be driven at a definite rate of speed in all positions. Vertical adjustment is provided between the gluing rolls, while the doctor rolls adjust horizontally. A problem in kinematics is presented by the design of a drive which will meet the requirements without excessive complication. One of the reasons for the smooth, quiet and efficient operation of the No. 22-D glue spreader is its driving mechanism, which consists of a self-compensating chain drive for the main gluing rolls in conjunction with a gear drive for the doctor rolls. The doctor roll drive incorporates an eccentric mechanism which permits a full range of adjustment with respect to the gluing roll even when the resilient roll has been reduced in diameter due to successive refinishing. This shows full efficiency in the use of rubber. The illustrations show the mechanism used to drive both the gluing and the doctor rolls. As the rolls must assume a great variety of posi-



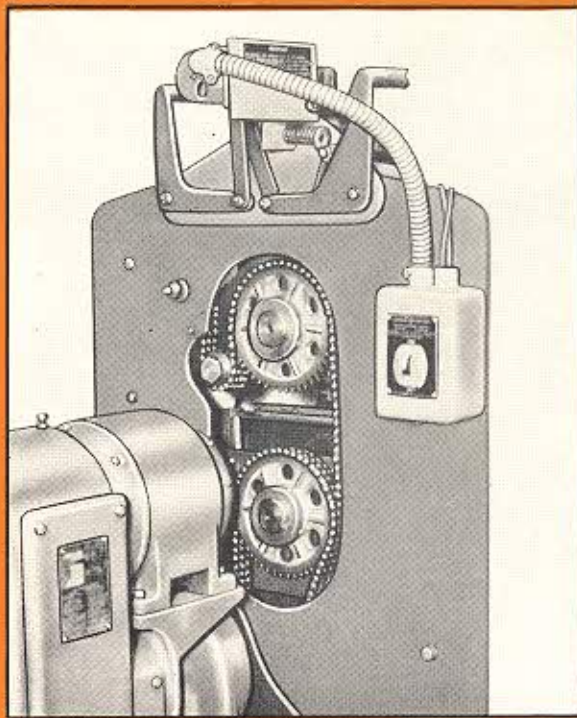


FIG. 2

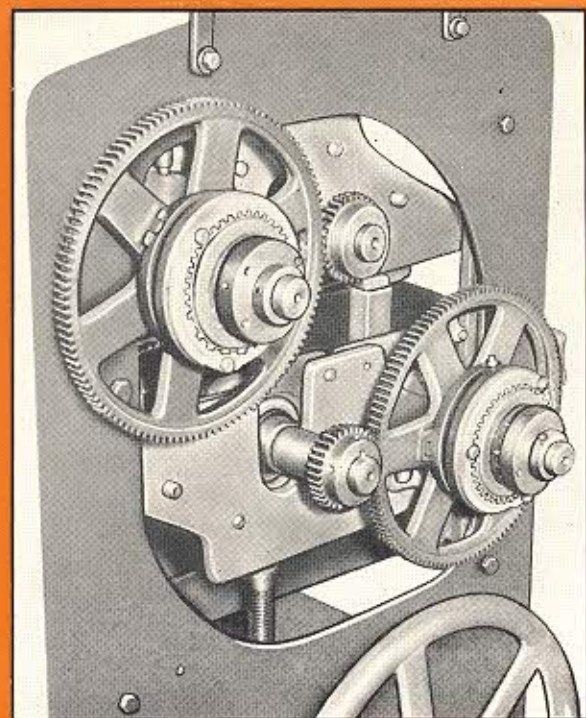


FIG. 3

tions, gearing alone cannot be used without sacrificing sensitivity, as gears operate at best efficiency only on one fixed center distance. The drive is divided, with the gluing roll drive on one end of the machine and the doctor roll drive on the other. A wide double-strand, hardened and ground roller chain is used to drive the gluing rolls. It is self-compensating and operates quietly and smoothly with the rolls in any position.

**Fig. 3 Doctor Roll Drive (with guard removed)**

While the doctor rolls require but little power to drive them, the drive must be very sensitive. It should respond instantly to any change in conditions without the drag and inertia of heavy parts. To control the glue film accurately the clearance between the gluing and doctor rolls must be set within a thousandth of an inch of the desired position, and the adjustment held without wavering.

Our mechanism for doing this is shown in the illustration, and is identical for both rolls. Power is taken from the end of the gluing roll shaft through a small spur gear. This in turn drives the larger gear which fits over the end of the doctor roll shaft. Instead of being fastened to the shaft, the larger gear turns on a trunnion attached to the machine frame. An eccentric mechanism between the gear hub and the shaft causes the shaft to re-

volve with the gear, but at the same time allows the doctor roll to be moved horizontally with respect to the resilient roll. This provides a positive gear drive for the doctor roll, and also permits it to be adjusted horizontally to provide a variable clearance between itself and the resilient roll. The adjustment is great enough to allow a resilient roll to be used after several refinishing. Such rolls may be reground from time to time to maintain 100% efficiency. This arrangement uses practically all the rubber before recovering is necessary.

Normally the doctor rolls run at a much slower rate than the gluing rolls. However, if the two rolls touch it is desirable that they run at the same surface speed to avoid wear on the rubber. This is accomplished by providing a free wheeling or overrunning clutch on each doctor roll shaft. When the two rolls make contact, the positive drive of the doctor roll disengages automatically and the faster resilient roll drives the doctor roll at its surface speed. When the two rolls are separated the positive drive on the doctor roll is resumed. The overrunning clutch is in the internal gear mechanism shown in the illustration. It is a rugged, hardened steel, spring loaded device which has functioned flawlessly for years in thousands of installations. It engages and disengages smoothly and quietly without a slip or jolt, doing a thorough job of protecting the surface of the resilient roll.



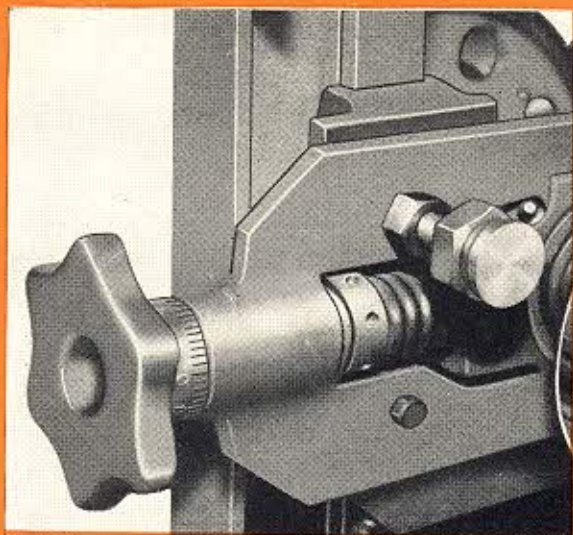


FIG. 4

#### Fig. 4 Micrometric Doctor Roll Adjustment

This illustration shows the mechanism used on the #22-D for micrometric doctor roll adjustment. It is sensitive, accurate and dependable. By employing the same principles as used on fine machine tools, micrometric adjustments calibrated to the thousandths of an inch control the depth of the glue film. One full turn of the screw moves the roll  $1/20$ th of an inch, or 50 thousandths. When set, the adjustment is permanent and cannot be moved except by purposely turning the adjusting handwheel.

#### Fig. 5 Patented Safety Control

Black Brothers patented reversible safety control offers protection to the operator—protection to the stock—and is especially useful in cleaning operations.

It consists of a bar placed along the full length of each side of the spreader at convenient operating height, by means of which the machine may be stopped or reversed instantly at a touch. These bars may be reached and operated from either side or both ends of the spreader, and are connected by means of the linkage shown to a reversing switch which is in series with the regular motor starting switch. When the motor starting switch is closed, the machine will not start until the bar on either side is pulled towards the operator. If it is desired to stop in a hurry, a touch of the control bar in any position stops the spreader instantly. Pushing the bar further momentarily reverses the machine, and when released it stops automatically. The operation of this control is nearly effortless.

*Glue spreaders should be purchased of sufficient roll length so that flexible veneers can be passed at*

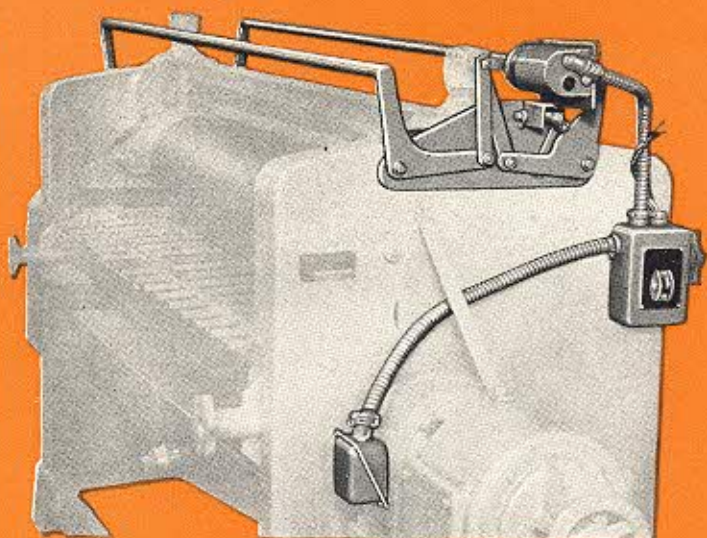


FIG. 5

*right angles to the grain, or at least on the bias.* (See illustrations at bottom of page two and top of page eleven) Should, however, it be necessary to run veneers parallel to the grain, if there is any tendency to follow either roll, a touch of the control bar stops the machine momentarily, the veneer will then pull away from the roll and the operation is resumed. The correction is instant, sensitive and effective. With a less sensitive control the result would be a ruined sheet of veneer and a machine full of splinters.

For cleaning up, reversing the roll direction provides a time-saving, self-cleaning action not available in machines which do not have a reversing feature.

#### Drip Proof Reservoirs

The reservoirs in this machine are especially designed for use with resins and similar adhesives, and are formed by the angular space between the gluing and doctor rolls. Patented drip-proof end plates eliminate dripping while the machine is in motion or idle. This feature puts the Black Brothers #22-D glue spreader in a class by itself for cleanliness, accuracy, and economy.

#### Roll Construction

All gluing rolls, doctor rolls, shaft journals, etc., in the #22-D spreader are precision ground—an important factor in their outstanding performance.

All gluing rolls are of large diameter—5",  $6\frac{1}{2}$ ",  $8\frac{3}{4}$ " or  $11\frac{3}{4}$ " outside diameter, depending upon the length of the rolls. Resilient gluing rolls are used for two reasons: (1) to conform to the irregularities of the stock, and (2) to provide better

