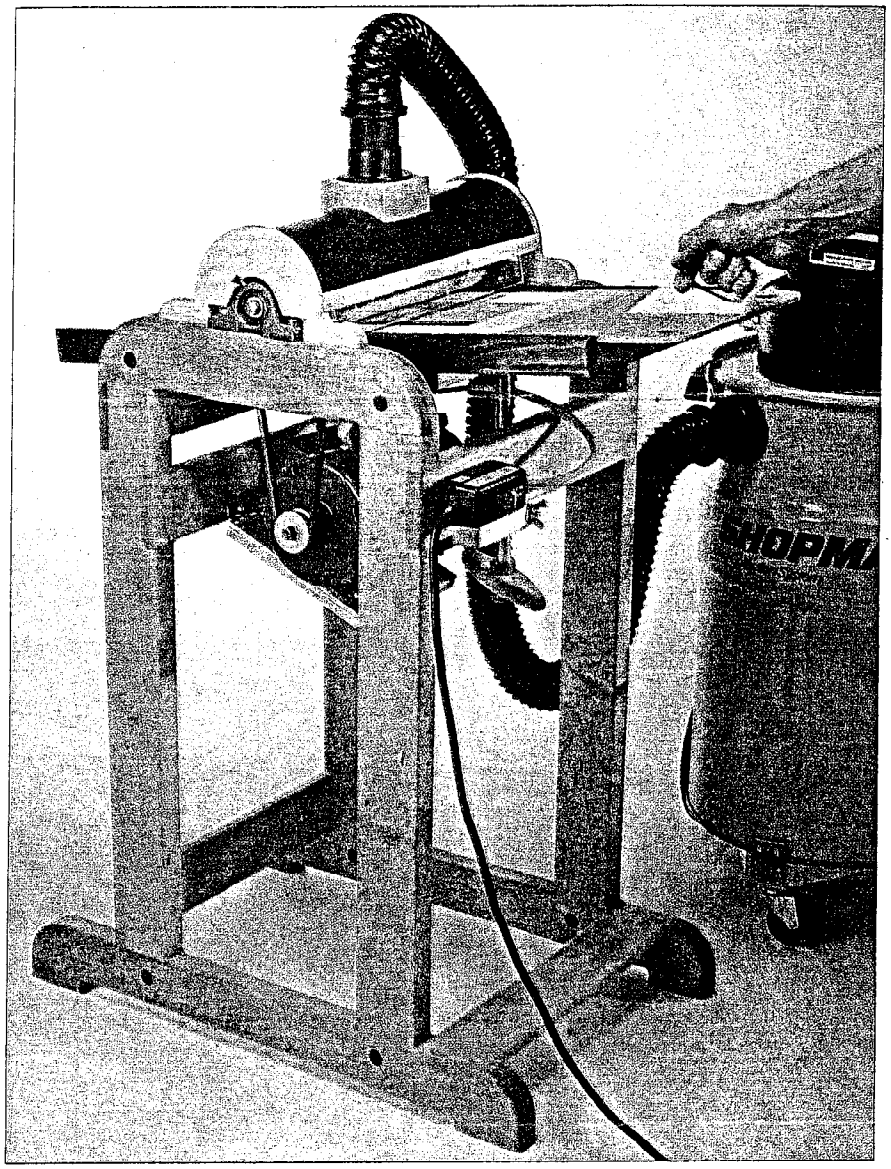
THICKNESS SANDER

Make your own thin stock by resawing thicker boards, then using this thickness sander to remove the saw marks. The sander also excels at truing up surfaces for cutting boards and other edge-joined projects.

The sturdy maple stand will take years of hard use, and the hood keeps the whole operation practically dust-free. The sander adjusts easily and can handle stock up to 2" thick and 12" wide.



Note: While several parts of the base are the same size (A and B, for example; see the Cutting Diagram on page 69), we call them out separately because they are mirror images of each other and need to be machined individually. To avoid making errors, we found it much easier to lay out the location of the joints before *cutting.*

Build the base

1. Rip and crosscut the feet (A, B), legs (C, D, E, F), top braces (G), and rails (H, I) to size.

2. Using the Parts View Drawing, page 70, and the Exploded View Drawing, page 68, lay out and mark the dadoes, rabbets, notches, and half-lap joints on pieces A, B, C, D, E, F, G, and H. (Since B is the mirror image of A, clamp A to B and mark both pieces at the same time for uniformity. Mark C and E, and D and F the same way.)

3. Using a saw fitted with a dado blade, cut the joints as marked. Make all identical cuts at the same time to ensure accuracy and to avoid having to reset the saw unnecessarily.

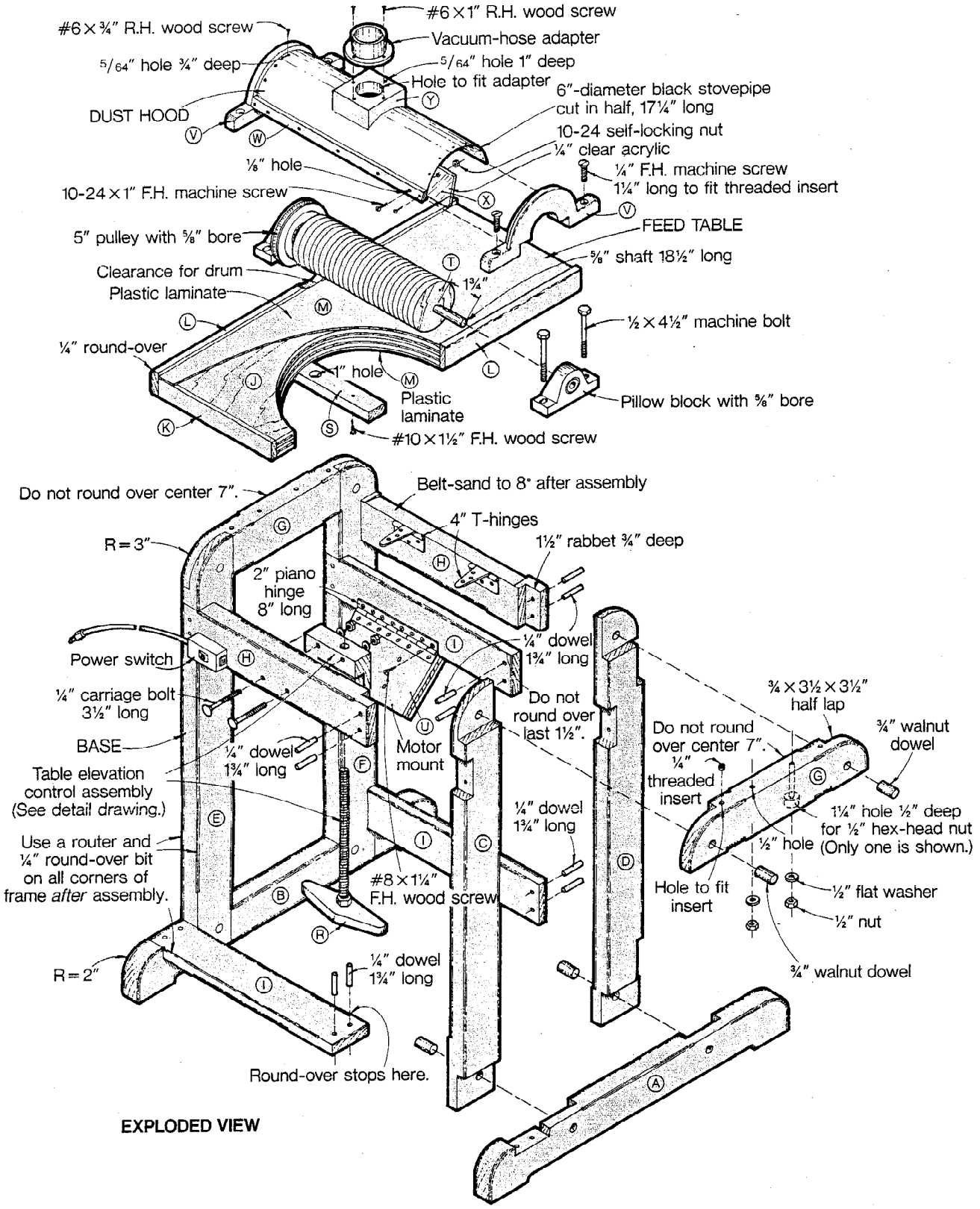
4. Glue and clamp the right-hand assembly (A–C–D–G) together where shown on the Exploded View Drawing. After the glue dries, locate and mark the center of each half-lap joint, then drill a ¾" hole through each, backing the workpiece with scrap to prevent chip-out. Apply glue and insert a ¾" walnut dowel 1¾" long into each hole. Repeat this with the left-hand assembly (B–E–F–G), and sand the dowels flush after the glue dries.

5. Mark and cut a 2" radius on the top ends of A and B, and a 3" radius on the top corners of both leg assemblies. Cut the ¼" relief on the bottoms of A and B.

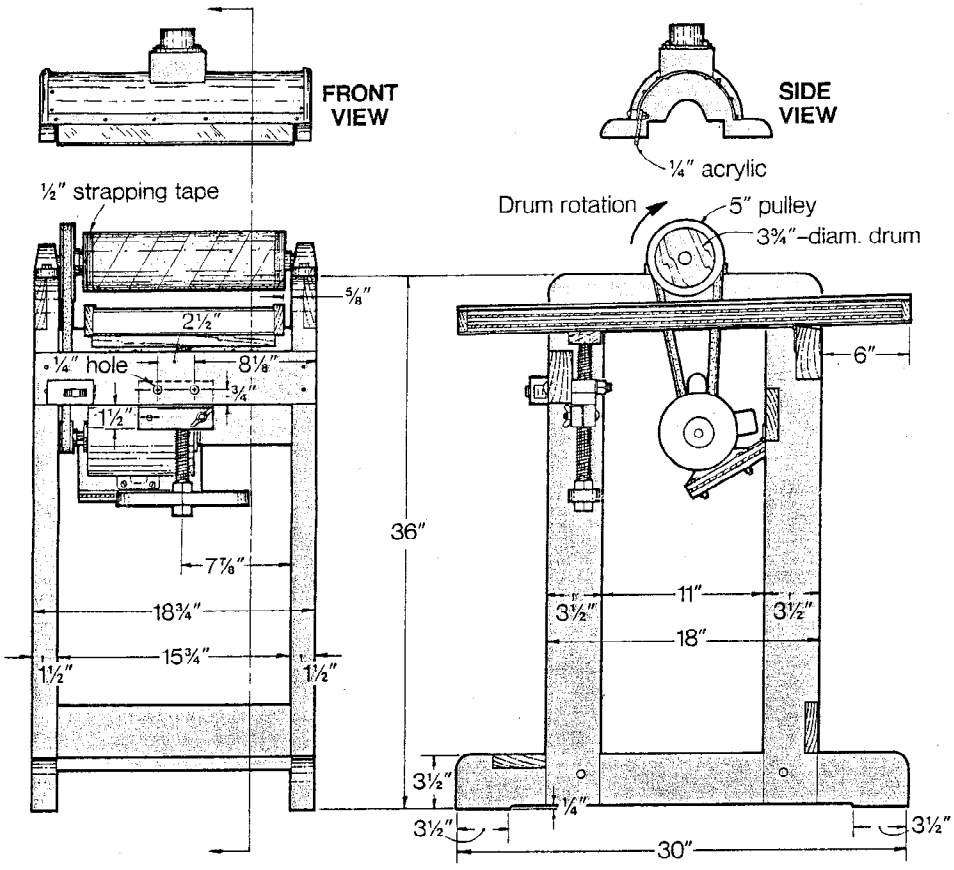
continued

THICKNESS SANDER

continued



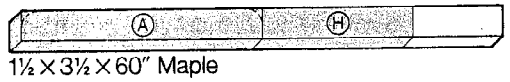
EXPLODED VIEW



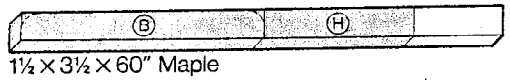
Cutting Diagram

1½ × 3½ × 96" Maple

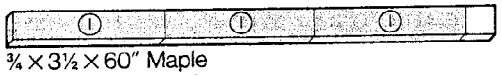
1½ × 3½ × 96" Maple



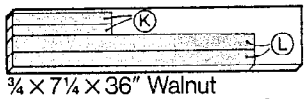
1½ × 3½ × 60" Maple



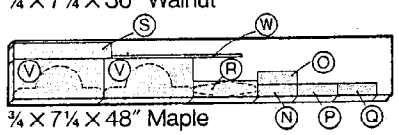
1½ × 3½ × 60" Maple



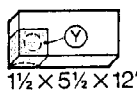
¾ × 3½ × 60" Maple



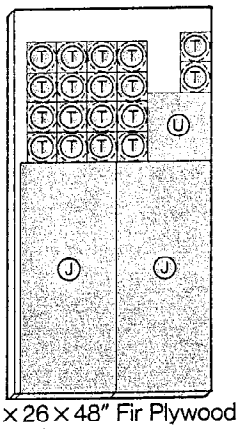
¾ × 7¼ × 36" Walnut



¾ × 7¼ × 48" Maple



1½ × 5½ × 12" Maple



¾ × 26 × 48" Fir Plywood

Bill of Materials

Part	Finished Size* T	W	L	Mat.	Qty.
Base					
A foot	1½"	3½"	30"	M	1
B foot	1½"	3½"	30"	M	1
C leg	1½"	3½"	35¾"	M	1
D leg	1½"	3½"	35¾"	M	1
E leg	1½"	3½"	35¾"	M	1
F leg	1½"	3½"	35¾"	M	1
G brace	1½"	3½"	18"	M	2
H rail	1½"	3½"	18¾"	M	2
I rail	¾"	3½"	18¾"	M	3
Feed Table					
J* table	¾"	12⅛"	29"	PLY	2
K trim	½"	1½"	12⅛"	W	2
L trim	½"	1⅞"	30"	W	2
M* laminate	1/16"	12⅛"	30"	PL	2
Elevation Control					
N control	¾"	1½"	5"	M	1
O control	¾"	1½"	5"	M	1
P control	¾"	1½"	5"	M	1
Q control	¾"	1½"	5"	M	1
R handle	¾"	2"	8"	M	1
S holder	¾"	2"	12"	M	1
Remaining Parts					
T disc	¾"	3¾" diam.		PLY	18
U mount block	¾"	8½"	8"	PLY	1
V hood end	¾"	5"	11"	M	2
W strip	⅜"	¾"	17¼"	M	1
X strip	¼"	2¼"	15"	A	1
Y block	1½"	3½"	3½"	M	1
Z pushblock	¼"	12"	12"	HB	1
AA handle	¾"	5"	7"	M	1

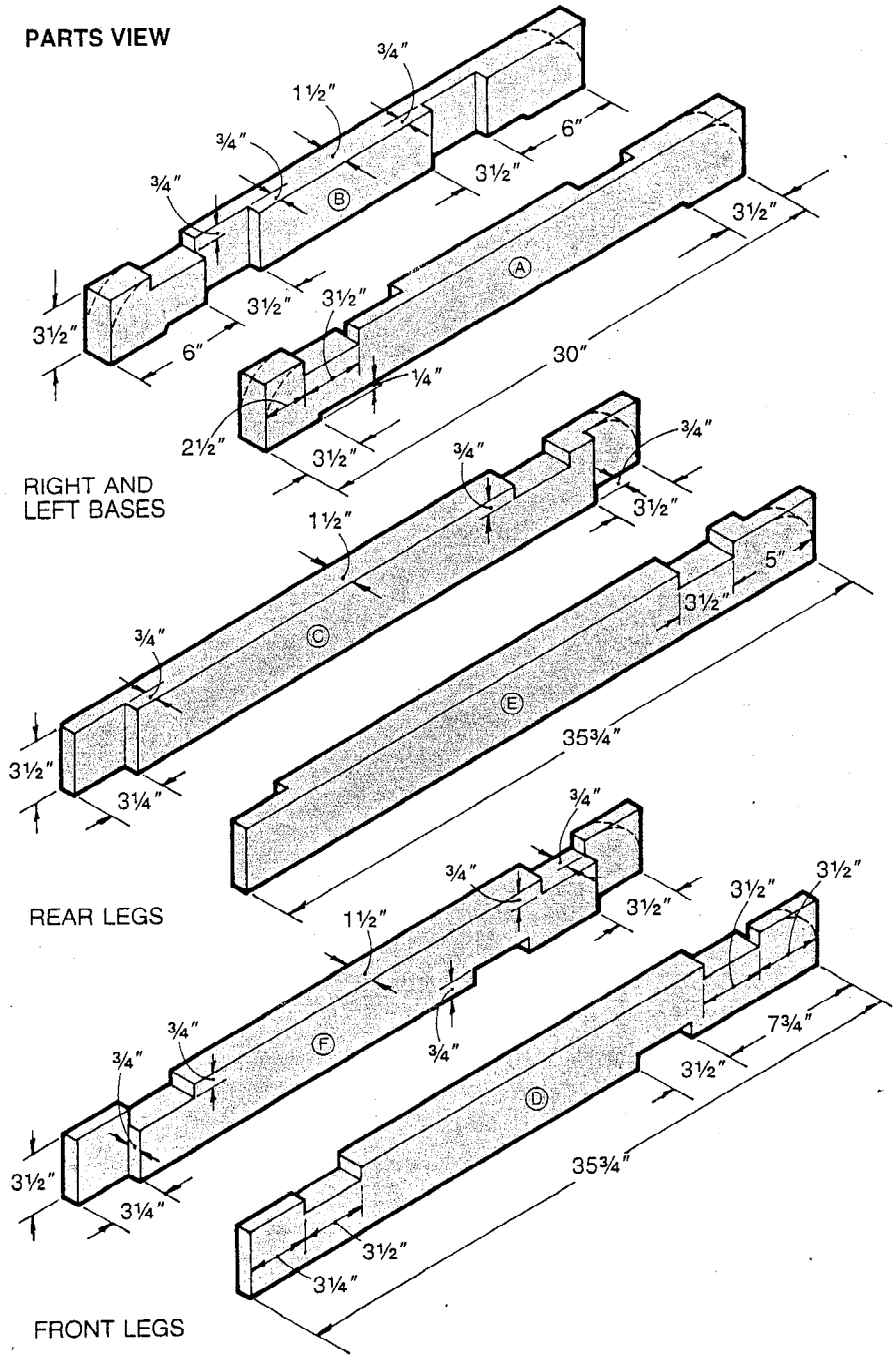
*Parts marked with an * are cut larger initially, then trimmed to finished size. Please read the instructions before cutting.

Material Key: M—maple, PLY—plywood or particleboard, W—walnut, PL—plastic laminate, A—acrylic, HB—hardboard.

Supplies: ¾" walnut dowel, ¼" birch dowel, ¾" threaded rod 12" long w/3—¾" nuts, 4—¼ × 1¼" F.H. mach. screws and 4—¼" threaded inserts, ¼ × 3½" carr. bolts w/¼" washers and nuts, ⅜ × 2" carr. bolt w/wing nut and washer, #8 × 1¼" F.H. wood screw, #10 × 1½" F.H. wood screws, 4—½ × 4¼" mach. bolts w/washers and nuts, #6 × ¾" R.H. wood screws, #6 × 1" R.H. wood screws, 10-24 × 1" F.H. machine screws w/self-locking nuts, 2—4" steel T-hinges w/mounting screws, ¾-hp. (1,725-rpm) motor, 2" pulley to fit motor shaft, 5" pulley w/⅝" bore, ½ × 33" V-belt, 2 × 8" continuous hinge w/mounting screws, ⅝" steel rod 18½" long, 6" diam. stovepipe 17¼" long, epoxy, woodworker's glue, contact cement, strapping tape. See Buying Guide, page 73, for additional supplies.

THICKNESS SANDER

continued



6. Clamp H and I in position to join the leg assemblies. Mark the edges of H and I that will be enclosed in the joints. Disassemble and use a router fitted with a ¼" round-over bit to round over all edges of the leg assemblies *except* at the joint locations and on the top and bottom of both Gs where the pillow blocks will be mounted.

7. Glue and clamp H and I to the leg assemblies. After the glue dries, remove the clamps and drill two ¼" holes in each joint. Then glue and insert the dowels, sanding flush after the glue dries.

8. Belt-sand an 8° bevel the length of the back rail (H) to provide clearance when adjusting the feed table.

9. Sand the rounded corners and all surfaces smooth, and apply the finish.

Build the feed table

1. Cut two like-sized pieces of ¾" plywood (J) to size plus ½" in each direction. Laminate the two together, and after the glue dries, trim the lamination to its finished size (12⅛ × 29").

2. Rip and crosscut the walnut trim strips (K, L). Cut a clearance recess for the drum sander in the top center of each L. Glue and clamp one K to each end of the plywood lamination, with the top and ends flush with the ends of the plywood.

3. Cut the plastic laminate (M) slightly oversize and apply the laminate with contact cement. Then, using a router with a flush trimmer, trim the laminate. Glue and clamp the side trim strips (L) to the feed-table assembly.

4. Using a ¼" round-over bit, rout the outside edges of both Ls.

5. Attach the T-hinges to the bottom of the feed table. Then fasten the feed table to the back rail (H) ⅝" from the right leg assembly as dimensioned in the Front View Drawing, page 69.

Construct the elevation control

1. Cut the elevation control parts N, O, P, and Q to size as dimensioned in the Bill of Materials, page 69. Clamp N and O together, then clamp P to the top of N–O.

2. Drill and countersink holes for the two #10 × 1¼" screws through the top of P and ½" into N and O as shown in the Elevation Control Drawing, *below*. Screw P to N–O.

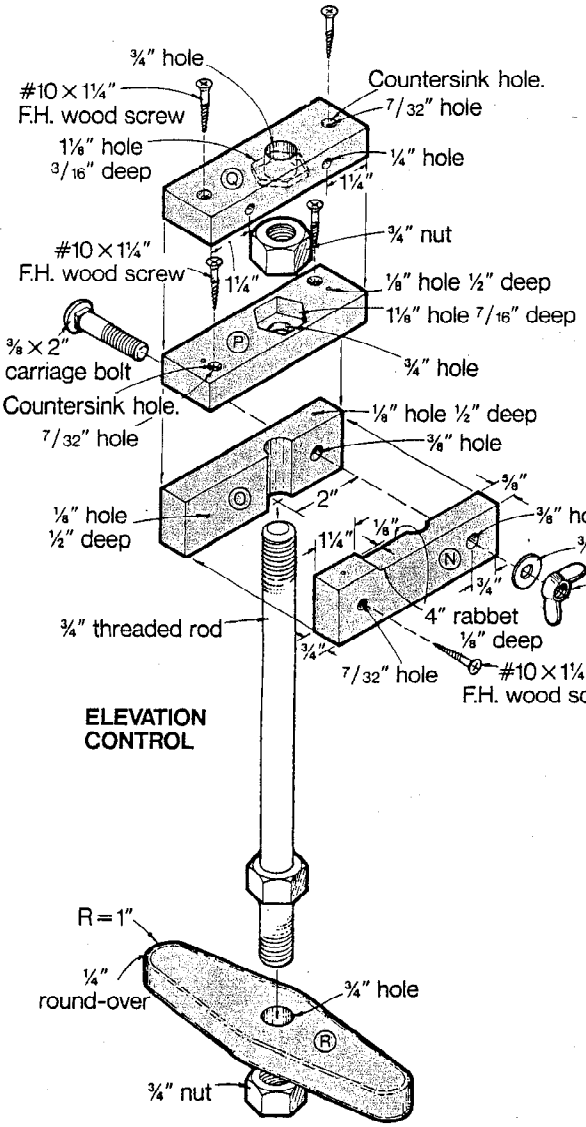
3. Clamp Q to the top of P, then drill and countersink holes for two #10 × 1¼" screws through the top of Q and ½" in P, and one through the side of N ½" into O. Install the screws. Mark the location and drill a ⅜" hole through N–O for the ⅜" carriage bolt.

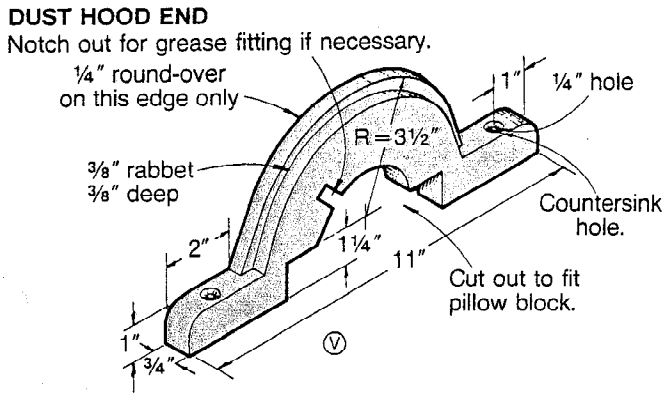
4. Drill a ¾" hole vertically through the entire assembly (N–O–P–Q) where indicated in the drawing for the ¾" threaded rod. Remove all the screws and drill a 1⅛" hole 7/16" deep into the top of P and 3/16" deep into the bottom of Q.

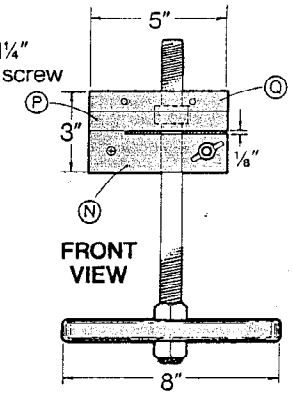
5. Disassemble the pieces, then thread a ¾" nut on the ¾" rod, and insert the rod through P. Trace the outline of the nut and chisel out the excess. Repeat this with Q. The recesses house the nut snugly, stopping it from turning with the rod.

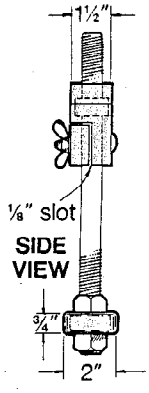
6. With a fine-toothed saw, cut the rabbet and slot in the top and back side of N as shown in the Front and Side views of the Elevation Control Drawing. The gaps will allow you to lock the threaded rod in position, preventing changes in the height of the feed table caused by sanding vibrations. Apply glue to the mating surfaces of N and O, and screw the pieces together.

7. Apply glue to the mating surface of N–O and P, install the screws through P and into N–O, and allow the glue to dry. Install the carriage bolt and attach the washer and wing nut. *continued*









THICKNESS SANDER

continued

8. Insert the 12" threaded rod through N–O, and thread it through the nut in place in P. With the nut in place, glue and fasten Q to the N–O–P assembly.

9. Drill two ¼" holes through Q where indicated for later mounting to the front rail (H).

10. Cut the handle (R) to size and shape. Round over the outside corners with a ¼" bit, then drill a ¾" hole through its center. Secure the handle on the threaded rod with a ¾" nut above and below the handle. Tighten the nuts to hold the handle firmly in position at the bottom of the threaded rod.

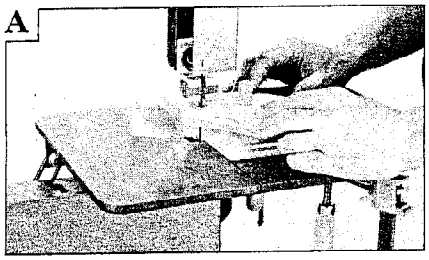
11. Position the elevation-control assembly where shown on the Front View and Side View drawings, page 71, and clamp it in place. Using the two previously drilled ¼" holes in Q as guides, drill like-sized holes through the front rail. Bolt the elevation control to the rail.

12. Cut the rod-tip holder (S) to size. Locate the center of S and drill a 1" hole through it. Slip S over the rod and crank up the rod into contact with the feed table. Align S squarely with the bottom of the table, clamp it in place, drill pilot holes, and install two #10 × 1½" screws where shown on the Exploded View Drawing, page 68.

Construct and mount the drum

1. Rip and crosscut eighteen 3¾" squares from ¾" plywood, mark diagonals to find the center, and drill a ⅝" hole in the center of each. Drill a ⅝" hole in a piece of scrap plywood 1½" from one edge, and place a ⅝" dowel 2" long in the hole. Clamp the jig to the bed of your bandsaw with the center of the dowel 1⅞" from the blade. Fit the squares one at a time onto the jig, and cut the 18 discs (T) to 3¾" diameter as shown in photo A, *below.*

A



2. Rough up the ⅝" steel shaft with a file, then, starting 1¾" from the right-hand end, epoxy the discs to each other and to the shaft. Once all the discs are on the rod, clamp them together with three bar clamps.

3. Slip the 5" pulley onto the left end of the drum shaft, and insert the ends of the shaft into the pillow blocks. Set the shaft assembly in place on the stand.

4. Center the pillow blocks on G, clamp them in position, and mark the mounting-hole locations. Remove the clamps and the pillow block/drum assembly. Drill ½" holes completely through both Gs, and drill a 1¼" hole ½" deep on the bottom of the ½" hole to house the ¾" nut. Bolt the pillow blocks to the stand. Center the sanding drum over the feed table. Tighten the pulley setscrew, stop-collar setscrews, and the nuts on the bottom of the machine bolts.

5. Cut the motor mount block (U) to size, and attach the hinge to it.

6. Attach the 2" pulley to the motor shaft. Clamp the motor to the mounting block, and position the drive belt to align the pulleys. Drill the ⅜" motor-mounting holes, secure the motor mount to part I, and bolt the motor to U.

Make the dust hood

1. Cut the dust hood ends (V) to shape as dimensioned in the Dust Hood End Drawing, page 71 (the shape of the pillow block used will determine the inside shape). With a rabbeting bit, rout a ⅜" rabbet ⅜" deep around the semicircular inside top edges of V. Drill and countersink ¼" holes where indicated for later mounting of V to the stand.

2. Cut a 17¼" length of 6"-diameter stovepipe in half lengthwise. Drill pilot holes through the pipe and into each V where shown in the Exploded View Drawing, page 68. Attach the stovepipe to V with #6 × ¾" screws. (If you like, use 6" PVC pipe in place of the stovepipe.)

3. Cut the maple strip (W) and acrylic strip (X) to size. Attach them to the hood assembly with machine screws. The acrylic provides a clear view of the sanding, yet it prevents fingers from getting too close to the abrasive action.

4. Cut part Y to size, then cut a hole through it and the stovepipe hood to match the diameter of the vacuum-hose adapter. Using a bandsaw, cut Y to fit the shape of the hood. Screw the adapter to Y and screw Y to the hood from the inside of the hood with #6 × 1" roundhead wood screws.

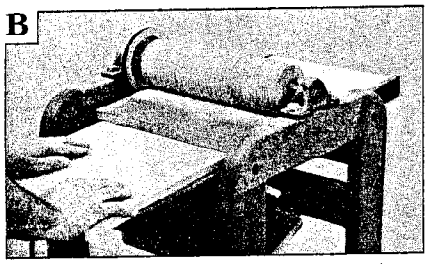
5. Position the hood over the pillow blocks, and mark the mounting holes for the threaded inserts on both Gs. Drill the holes on the marks, and install the four threaded inserts.

6. Sand all remaining wood surfaces and apply the finish of your choice. Connect the power supply switch to the front of the stand assembly.

Sand the drum to size

1. Run a hose from your vacuum to the vacuum-hose adapter on the dust hood. Using contact cement or spray-on adhesive, attach two sheets of 60-grit sandpaper to a piece of ¾" plywood 13¾" wide by 12" long. Attach this to another piece of plywood or particleboard the same width as the feed table (12"). Raise the feed table until the sanding board just makes contact with the laminated drum. Plug the motor into the power-supply switch, then plug the cord running from the switch into an outlet. Turn on the sander and vacuum, and slowly feed the sanding board under the drum as shown in photo B, *below.*

B



Caution: *Feed the sanding board through from the front side only. Continue to sand and raise the feed table with the elevation control until the sanding drum is uniformly round over its entire length. (This sanding ensures that the sanding drum is parallel with the feed table.)*

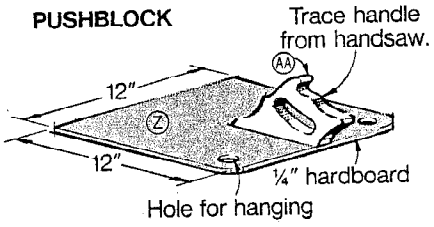
2. See the Buying Guide for our source of Velcro mat and sandpaper strip. Instructions for adhering the mat to the sanding drum and the sandpaper to the mat are included with each order.

Note: *Use 60- and 80-grit paper on the drum to remove unevenness remaining after resawing or for thickness sanding. For progressively smoother finishes, use 100-, 120-, and 150-grit paper.*

Using the thickness sander

1. Raise the table so that the bottom of the drum just touches the top of the material to be sanded, then lock the elevation control.

2. Slowly and steadily feed the material from the front side only, pushing the material on through the sander using the pushblock as shown in the Pushblock Drawing, *below.*



3. Unlock the elevation control and raise the table by turning the handle *no more* than an eighth of a turn at a time. Relock the elevation control. Repeat step 2, and again raise an eighth of a turn and sand to the desired thickness or smoothness.

Buying Guide

- **Two vacuum-hose adapters.** Part no. 516262, from Shopsmith, 3931 Image Dr., Dayton, OH 45414. Call 800-543-7586 or 513/898-6070 for price.
- **Power switch.** Catalog no. A526. Contact AMT, P.O. Box 70, Royersford, PA 19468, or call 215/948-0400, for current price.
- **Ball-bearing pillow blocks.** Rigid-mount VPLE series, ⅝" bore with stop collars. For the current price, contact Standard Bearings, 2350 Hubbell Ave., Des Moines, IA 50317, or call 800-554-8123 or 515/265-5261.
- **Velcro mat and sandpaper strip.** Velcro mat, 3×77"; catalog no. 18VMW. Felt-backed sandpaper, 3×77"; grits range from 40 to 220. Instructions for attaching the Velcro mat and sandpaper included. Contact Woodmaster Tools, 2908 Oak, Dept. WDS, Kansas City, MO 64108. Or call 800-821-6651 or 816/756-2195.