

Drum Sander

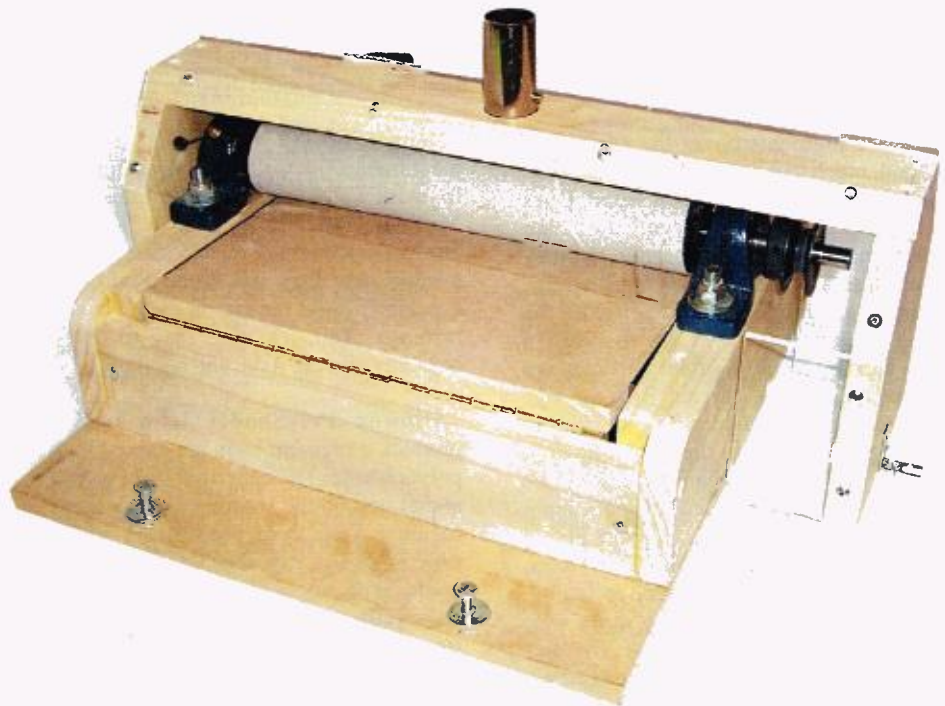
I build model ships, and prefer to use thin pieces of exotic wood to add colour, rather than painting the ships. While I could mill the wood I need, I did not own a thickness sander, and had to sand all the parts by hand. I found that a commercial sander would be much too expensive, would take up a great deal of shop space and would be difficult to use for the shorter and thinner pieces needed to build models. I chose to build a sander to fit my needs. It is small and light, I can bolt it to the top of a workbench, and the motor can be interchanged with other machines. A dust hood collects most of the dust when attached to a vacuum cleaner, and serves as a shield around the moving parts of the machine.

The Frame

- The frame is built in a U shape, and consists of two arms (A) and a cross piece (B).
- Cut the parts for the arms: two pieces of 3/4" x 3 1/2" poplar that are 11 1/4" long and two that are 12" long.
- Laminate each 11 1/4" piece and a 12" piece so that you have a rabbit at one end to accept the cross piece (B).
- Cut the cross piece 2 3/4" x 13 3/4".
- Glue and screw the cross piece into the



Adjustable bolt and thickness gauge



- Position the pillow blocks (F) so that they sit on top of the frame arms about 7" from the cross piece. Mark the location for 3/8" x 5" carriage bolts to attach the pillow blocks to the frame. Use a drill press to keep these holes perpendicular and centered.

• Set these parts aside for the moment, as you will mount the pillow blocks after the frame is completed.

The Moveable Plate

- Cut the moveable plate (C) from 5/8" MDF or plywood.
- Attach an 11 1/2" length of 1 1/4" piano hinge (D) to one of the sides of the plate using #8 - 5/8" pan head screws.
- Cut three lengths of 3/4" angle iron (E), two pieces 10" and one 8 1/2".
- Drill holes on one side of the angle iron to accommodate #8 x 5/8" pan head screws.
- Chamfer the two bottom edges of the plate that will be in contact with the angle



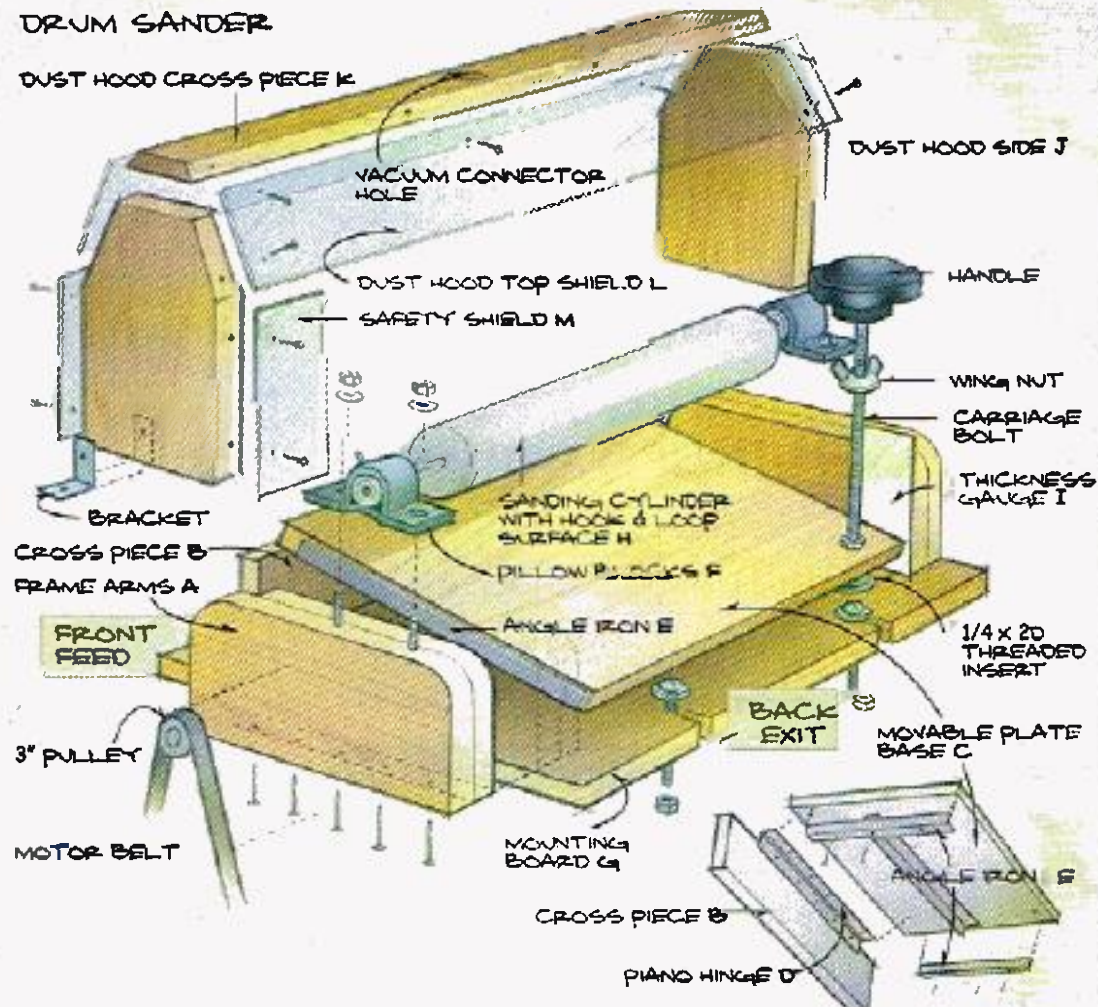
Completed sander from exit end

into the face of the plate, not into the edges.

- Screw the 8 1/2" angle iron to the other side of the plate, flush with the piano hinge.
- Screw the other 10" piece of angle iron so that it runs across the plate, about 6" from the piano hinge.

Assembling the Adjustable Bolt

- On the left corner of the moveable plate, in front of the 8 1/2" angle iron, and about 1" from the end of the plate, drill a 5/16" hole.
- Install a 1/4" x 20 threaded insert into the hole.
- Screw a 1/4" x 5" carriage bolt through the insert from the bottom of the moveable plate so that you have a couple of inches of thread showing on the top side.
- Add a washer, a wing nut and a plastic handle to the end of the bolt.
- Screw the plastic handle down on the bolt far enough so that the threads show well above the handle.
- Peen the end of the bolt with a hammer.
- Twist the handle back over the peened end of the bolt – this will ensure that the handle does not come off. For added insurance you can add a few drops of cyanoacrylate (CA) glue on the threads. It is important that this handle will lock onto the carriage bolt and turn the entire assembly.
- Center the moveable plate in between the arms of the frame and attach it to the piano hinge using #8 x 5/8" screws. Ensure that the bottom of the plate (the side with the angle iron) faces down.



Illustrations by Mike DelRizzo

- Make sure that the plate moves freely up and down between the frame sides.

The Mounting Board

- Cut the mounting board (G) from 5/8" MDF or plywood.
- Drill two bolt holes in each end of the mounting board, about 1" from the end.
- Epoxy two 7/16" washers over the holes. The 1 1/2" machine bolts will extend through these holes to fasten the sander to your workbench.
- Cut slots into the washers and the mounting board to enable the sander to slide into place.

Attaching the Frame to the Mounting Board

- Place the frame on the mounting board, 3" in from the end of the board with the mounting holes. There should be about 1" of the board showing at the other end.
- Glue the frame to the board, and then turn over and secure it with # 8 - 2 1/4" flat head wood screws. You can use masking tape around the frame to facilitate glue cleanup.

Attaching the Pillow Blocks

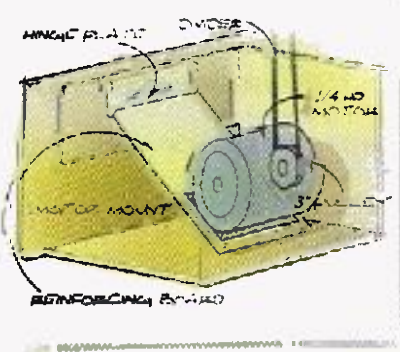
- Position the sanding cylinder (H) on the pillow blocks (F) so that the long axle of the cylinder will be on the side where you are going to have the belt drive. Attach the pillow blocks to the frame arms (A), with 3/8" x 5" carriage bolts.
- Secure the pulley on the longer axel in line with the pulley on the motor. I have found that the sander works more efficiently when you slow it down by using a

3" pulley on the cylinder and a 1 1/2" pulley on the motor.

- Make sure that you use either lock nuts or lock washers on the bolts that secure pillow blocks so that they will not vibrate loose. If you ever need to sand thicker wood, it will be easy to raise this part of the assembly by putting shims under the pillow blocks.

- Be certain to file flat spots on the axles and tighten all the set screws to secure this very important piece in place.

TYPICAL MOTOR INSTALLATION



Attaching the Sander to Your Workbench

- Mount a motor under your work table, and cut out an access hole for the V-belt. I used a 1/4HP motor that I also use for other shop machines.
- Align the motor and the sander, and mark the location of the four holes at the ends of the mounting board.
- Install four 1/4" x 20" inserts into the top of the workbench and attach the sander securely to the bench top. Attach the V-belt to the motor under the workbench.

Safety Notes

When you first begin to use the sander do not attempt to sand off too much wood at a time. As with any power tool, the operator must be ever alert to prevent accidents from happening. Always push the wood through the sander while standing at the side. Under no circumstances should you stand at the end to push material into the sander. If you take your hand off the wood for a split second, the wood may be propelled from the machine with a dangerous force.

Operating the Sander

- Wrap a length of hook and loop sandpaper around the sanding cylinder.
- Before turning the sander on, ensure that the motor is turning in a clockwise direction.
- Stand at the side and turn the sander on.
- Feed wood through the sander slowly, pushing the wood from the feed end until you can pull the piece the rest of the way from the opposite end of the sander. You

will have to practise this so that you can do a complete length in one smooth motion. It is important that you do not stop pushing at any point or you will sand grooves in the wood surface. The minimum length you can sand using the dimensions in this article is about 14". This means that the piece you are sanding will extend slightly over the end of the moveable plate while you are pushing it from the front.

Building the Thickness Gauge

- The first wood that you need to sand will be for the thickness gauge (I).
- Cut a piece of hardwood somewhat thicker than 1/8" and at least 1" wide and 14" long.
- Sand the piece to 1/8" thick.
- Cut off a piece about 4" long.
- Rubber cement unlined paper to the front of the gauge and attach it to the inside of the frame (A) in the space that is between the moveable plate and the side.
- Sand a piece of wood to the largest thickness you think you will need; then,

after each pass through the sander, check the thickness of the wood with a micrometer. When you are satisfied that you are close enough to the thickness that you regularly use, follow the edge of the moveable plate and draw a line on the gauge exactly in line with the edge of the plate.

- Continue doing this in 1/16" increments until you have marked most of the thicknesses that you will need.

Dust Collector Hood

If you used your sander to mill the wood for the gauge, you know how much dust is created. The dust hood enables you to collect the dust, and provides a safety shield around the belt drive.

- Obtain a suitable connector for your vacuum hose. I obtained a used wand section from a Hoover repair depot. Note: If you are using a connector larger than 1 1/4", you will have to make the cross-piece and the tops of the dust hood end pieces somewhat wider than specified in this project.

• Cut the two dust hood sides (J) and the dust hood cross piece (K).

- Cut a bevelled angle on the top of the sides, 5 1/2" from the base and 1 1/4" from the side.

• Cut the edges of the cross piece to match the angle on the sides.

• Drill a hole in the center of the cross-piece to accommodate the vacuum fitting, and secure the fitting with a small screw.

- Screw the cross piece on to the ends.

• Cut two pieces of 3/16" (4.5mm) Plexiglas (L) 3 1/2" x 20", and screw them in place on the front and back of the dust hood with #8 - 3/4" pan head screws. You can replace the Plexiglas with 1/4" wood, but you will not be able to see the sanding cylinder as you work.

• Attach the dust hood to your work table using 1" right angle brackets. Make sure that there are no screws protruding on the underside of the hood that will catch the sandpaper when the machine is in use.

• Cut two pieces of Plexiglas (M) approximately 3" x 4 1/2" and screw them to the dust collector sides so that the belt and pulley will be covered when the machine is in use.

Congratulations! You now have a drum sander that will give you many hours of productive use.

Pillow blocks, sanding cylinders, related hardware available at:

Stockroom Supply
www.stockroomsupply.com
1-877-287-5017



PHIL MAIN
pmain@golden.net

MATERIALS LIST

- | | |
|----------|---|
| A | 2 Frame arms made from 4 pieces
2 - 3/4" x 3 1/2" x 12"
2 - 3/4" x 3 1/2" x 11 1/4" |
| B | 1 Cross piece
3/4" x 2 3/4" x 13 3/4" poplar |
| C | 1 Movable plate base
5/8" x 11 3/4" x 11 3/4" mdf or ply |
| D | 1 Piano hinge
1 1/4" x 11 1/2" |
| E | 2 Angle iron
3/4" x 10"
1 Angle iron
3/4" x 8 1/2" |
| F | 2 Heavy duty pillow blocks |
| G | 1 Mounting board
5/8" x 15 1/4" x 16" mdf or ply |
| H | 1 Sanding cylinder with hook & loop surface |
| I | 1 Thickness gauge
3/16" x 1" x 14" hardwood |
| J | 2 Dust hood sides
3/4" x 5 1/2" x 7" poplar |
| K | 1 Dust hood cross piece
3/4" x 3" x 20" |
| L | 2 Dust hood top shields
3/16" x 3 1/2" x 20" plexiglas |
| M | 2 Safety shields
3/16" x 3" x 4 1/2" plexiglas |

HARDWARE LIST

- | | |
|-----------|---|
| 10 | Flat head wood screws
#8 x 1 1/4" |
| 8 | Flat head wood screws
#8 x 1 1/2" |
| 10 | Flat head wood screws
#8 x 2 1/4" |
| 24 | Pan head screws
#8 x 5/8" |
| 5 | Threaded inserts
1/4" x 20 |
| 1 | Carriage bolt
1/4" x 5" |
| 6 | Flat washers
5/16" |
| 1 | Wing nut
1/4" x 20 |
| 1 | Plastic threaded handle
1/4" x 20 |
| 4 | Carriage bolts
3/8" x 5" |
| 4 | Flat washers
7/16" |
| 4 | Hex nuts with nylon insert
3/8" |
| 2 | 1" Right angle brackets |
| 6 | Machine bolts
1/4" x 1 1/2" x 20 |
| 1 | Sanding cylinder with hook & loop surface
1 1/2" x 12"
1 1/2" and 3" pulleys
Assorted grades of 3" hook and loop sandpaper |





