

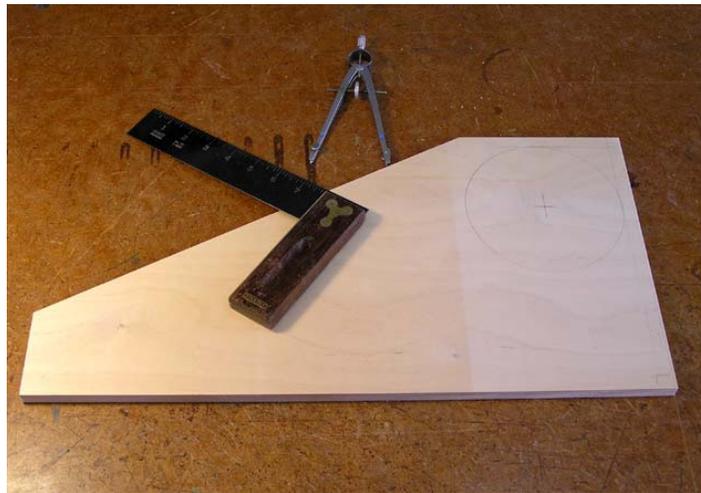
Friday, February 01, 2008

Folding Wall-Hung Spray Booth Chapter II: Venturi

Dear Shop Story Subjectees,

Here we go again...

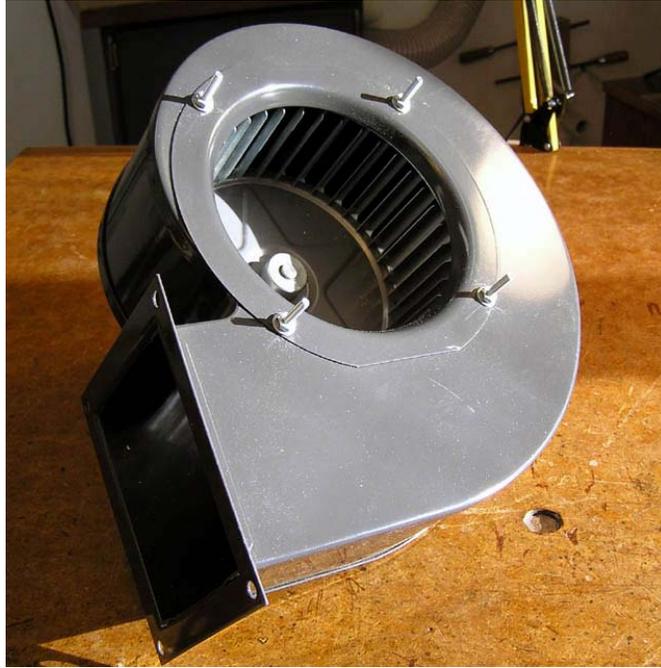
I decided to start construction with the upper intake plenum, a.k.a. “the venturi,” mostly because I already had enough scraps lying about the shop to make this subassembly, but also because it looked “interesting.” The first step was to lay out the front panel:



I made this panel from ½” Baltic Birch because it has to carry the weight (and endure the vibration) of the blower. The rear panel is non-structural and can be made of 1/8” tempered hardboard. I saber-sawed out the intake port and routed a round-over on the entrance face to smooth the incoming airflow:



The entrance port of the blower has a “belled” aperture plate attached to the blower housing with four short sheet metal screws. I removed the sheet metal screws, drilled out the holes, and installed longer 8-32 bolts¹ to serve as mounting studs:



To clear the nuts and washers that secure the studs, I counter-bored the mounting holes in the front panel ½” diameter x ¼” deep:



¹ Threading four of these through from inside the housing simultaneously is a fiddly job, requiring two sets of tweezers and some strong language.

I glued on a perimeter frame, also made from ½” Baltic Birch. When the glue was dry, I added a rear panel and sanded out any unevenness in the fit. Here’s the result:²



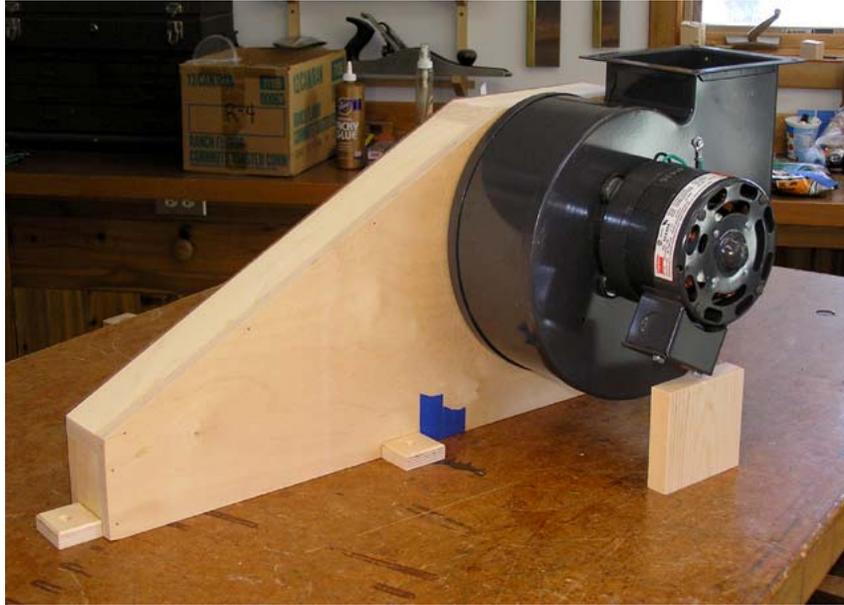
I used screws, rather than glue, to attach the back panel because it has to be removed for access to the blower mounting studs. The venturi operates at sub-atmospheric pressure, so I’m not too worried about any small leaks.

Three glued-on plywood “tabs” provide an effective—if somewhat crude—means to attach the venturi to the top of the booth. I suppose I could have devised something rather more elegant, say something more...well, *internal*. But life is short.

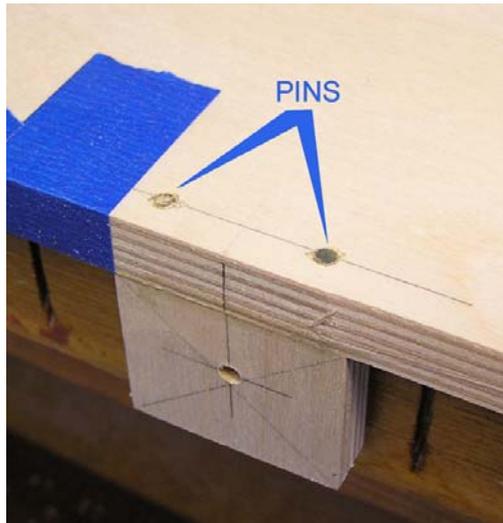


² Notice that while the camera’s viewpoint was *above* the subject the sides of the assembly appear to taper slightly *inwards* toward the top. Reverse perspective? No, just overenthusiastically ham-handed fiddling with Photoshop’s controls...

Et Voilà! Here you have it, fitted to the blower and ready for paint:³



Note added later: The prop under the motor is temporary, of course, but it does point up a potential problem with this design. The motor is quite heavy, and wants to tip the housing forward. The front tab provides the counter torque, but that glued butt joint is clearly at risk. My first thought was to reinforce the vulnerable joint with two 1/8" diameter brass rods:



I hope this will be sufficient, but if not, I'll probably just attach a "flying buttress" to the front panel to take *all* the strain off of the joint. We shall see what works and what doesn't.

³ But for now, I'll just set it aside and move on to the next task—probably the main carcass.