

# Letter from



# AMERICA



**Mark Corke has his own version of an air filter which he shares with you here. It can be bench mounted or hung from the ceiling and will take about two hours to make**

## Breathe the air

**A**s promised in my last *Letter From America* I bring you my do-it-yourself workshop air cleaner. Fast, cheap and easy to build, it is perhaps not as elegant as some of the tool store bought models but it is surprisingly efficient.

Any workshop air cleaner works in much the same way; air is drawn through the unit with the help of a large fan. A couple of filters at the front trap airborne particles down to about 1 micron, which is so small that you cannot see them. As these filters become clogged and dirty they are simply replaced.

You will see from the photos how easy the unit is to make, I made mine in less than two hours and that including taking the pictures as I went along. Of course you could make it with a little more finesse but that would not increase the efficiency in any way, it would just look smarter in the workshop.

I have given dimensions and a cutting list but these reflect the size of filters and



fan that I used; feel free to alter these to suit the availability of materials.

### Filters and Fans

Don't go for small filters; basically the larger the surface area the better your unit will be at attracting dirty air. Talking of filters I used some from a forced air conditioning system. You should be able to get these

from a plumbing and heating suppliers. The fan came from the same source and is meant for a forced ventilation system where it would fit into metal ductwork. Filters and fan cost me about \$50; I already had some ply kicking around the workshop, which I used for the carcass.

One final word by way of introduction, the workshop air cleaner is just that. It is to

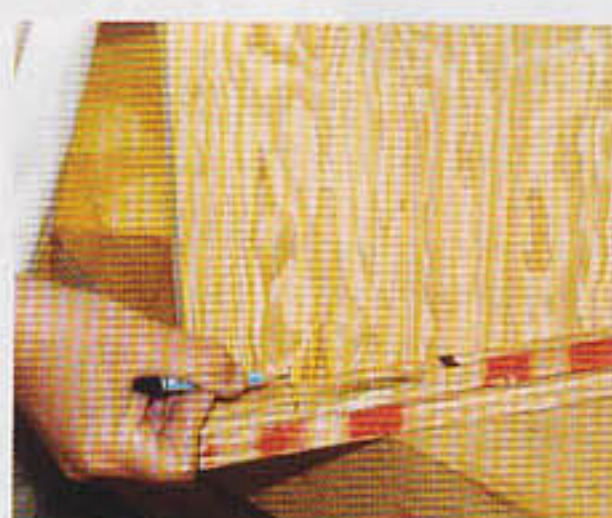
## Making the cabinet



**01** Cut all the components to size. The main box is made from ply but for a deluxe job use solid timber



**02** Use the filters to mark out the position of the filter battens. The filters need to be a sliding fit



**03** One cheek is narrower than the other to allow the filters to slide in. For a 25mm thick filters it's 60mm narrower



**04** Rip the material to width on a table saw or bandsaw then plane to remove any rough edges

**TIP**

Using two filters the front one always gets soiled the soonest. When the time comes to replace this instead of simply sliding in a new one move the rear filter to the front and slide the new one into the vacant rear slot in this way you will get the maximum use from each filter.

clean the air in the workshop, it is not a dust extractor. The aim should always be to extract as much of the dust as possible at source with suitable vacuums etc.

### Building the Carcase

**1** The first thing is to cut all the parts to size as outlined in the cutting list. Although the box is simply screwed together you still need to cut the ends square or the job will go together with a twist making the filters hard to slide in. Do not use material thinner than 18 mm for the carcase or it will resonate when the fan is running.

After cutting the ply on the circular saw plane up the edges to remove any roughness. Some glues used in sheet materials can be very hard on machine knives so consider doing your planing with a sharp jack plane

**2** Use one of the filters to mark out the position of the filter battens, I am sure that there is a better name for these little pieces of wood but they are the small sections that form the channels for the filters to slide in. If you are using 25mm thick filters,

which are a common size, place a mark 60mm back from the front edge and, if you have not done so already, use this mark to mark the final width of the narrow cheek. Then cut and plane this to width.

**3** With all the four sections of the carcase ready glue and screw the corners. Make sure that the box is square; you can do this by measuring across the diagonals with a pinch rod.

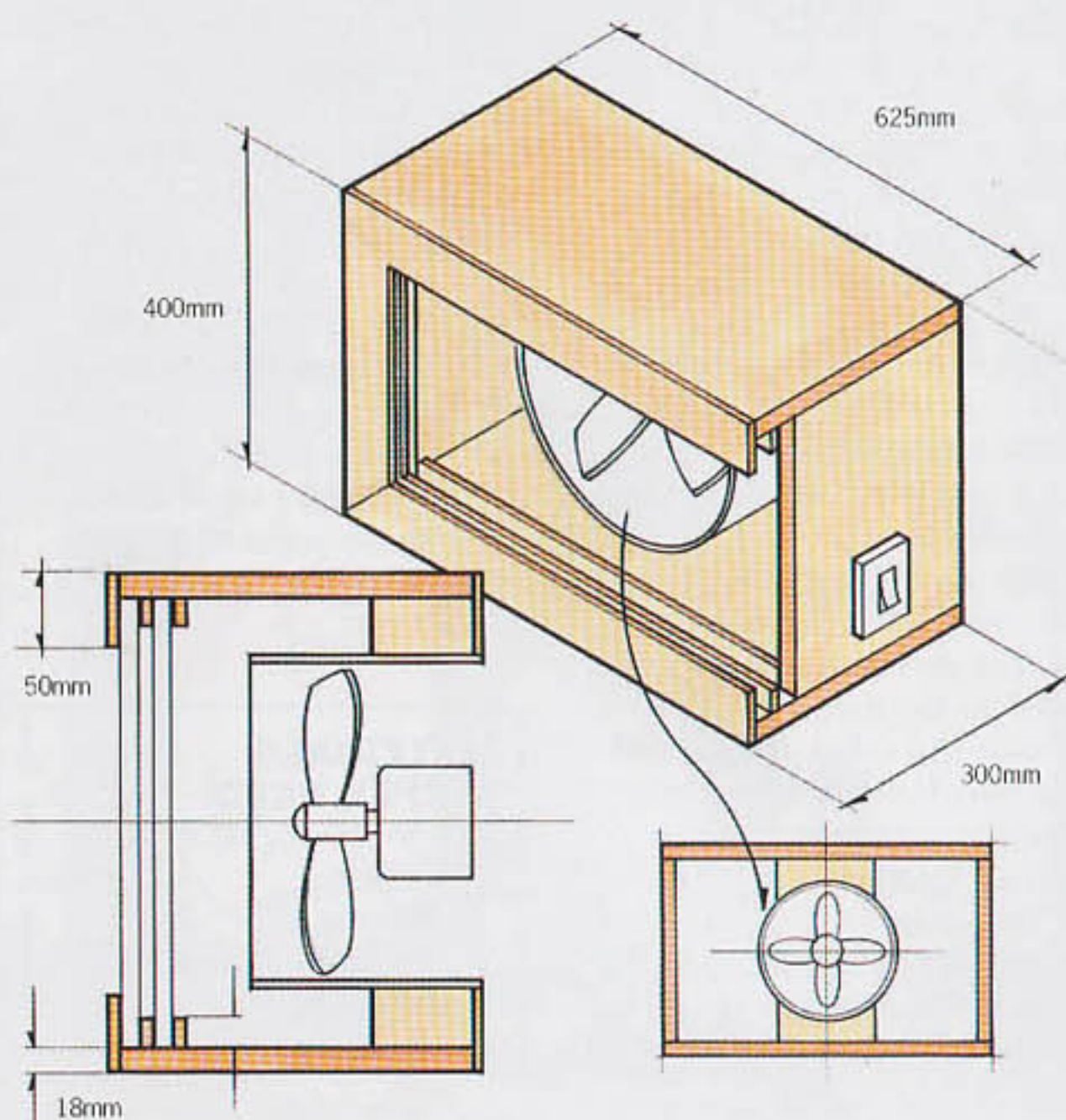
You will notice too that I use plasterboard screws for screwing into the ends of plywood. These screws have a narrow root and the sharp threads hold far better than conventional woodscrews in this instance. Put screws about 50mm in from each edge and then place another couple equally spaced between these, making four on each corner.

**4** Glue and pin on the filter battens, noting that they are higher than they are wide. You will see that the inner one that I am fixing in the photograph is aligned with the edge of the narrow cheek.

With the inner battens in place pin on the outer ones, which should be positioned so that the filter is a snug sliding fit, it is a good idea to make up a spacer block just a gnat's thingy wider than the filter that you will be using.

**5** Use some ply offcuts to make up the architrave at the front, mitring it at the corners for neatness. Sand up the inside edges to remove any roughness that could tear the filter fabric.

## DETAILS: Air filter



## CUTTING LIST

Part	Qty	Mats	Length	Width	Thkns
A Top and bottom	2	Ply	625mm	300mm	18mm
B Cheek	1	Ply	364mm	300mm	18mm
C Cheek	1	Ply	364mm	240mm	18mm
D Back	1	Ply	625mm	400mm	6mm
E Fan supports	2	Pine	300mm	100mm	100mm
F Filter battens	4	Pine	600mm	15mm	10mm
G End filter battens	2	Pine	300mm	15mm	10mm

Cutting lists give the full length of a piece including the joint but not wastage. Add 5mm in the width and thickness for sawn material.

**6** The fan is mounted into the carcase with wooden blocks. Space these apart face down on the bench the exact same distance apart to the outside edges as the internal dimensions of the box. Sit the fan on top and use a pencil to mark the fan housing radius.

Cut this out on the bandsaw. Most saws will cut around this easily as the radius is not that tight, but I had a 25mm blade in my saw so I had to make relieving cuts down to the line. Of course I could have changed the blade for something narrower, but with



**05** The main carcase is simply glued and screwed. Check it for square as you assemble it



**06** Plasterboard screws are perfect for screwing ply as they do not split the veneers and the hold is excellent



**07** Glue and pin on the filter battens, making sure that they are parallel with the front edge of the box



**08** Glue and screw 6mm to the front to act as a holder for the primary filter and prevent it falling out. Sand the edges

just these two cuts it hardly seemed worthwhile, and anyway the relief cuts made all the difference.

Screw the blocks to the fan housing then screw this assembly into the inside of the box. Note that the blocks, carcass and fan housing are all flush with each other.

**7** Before fitting the back you have to cut out for the exhaust. Place the carcass on its back on top of the 6mm ply and draw around the inside of the fan housing. Cut this out with a jigsaw.

Before you fit the back, wire up the motor to the switch and cable. I mounted the switch on the side of my box but put yours where you can easily reach it. If you are at all unsure with electrics it might pay to get someone who is to help you wire up the fan to the mains.

I intend to mount my fan in the workshop rafters but if you are going to be operating yours at bench height then you may want to consider adding some expanded metal to the rear to stop fingers coming into contact with the rotating fan.

**8** Slide in the filters and turn on the fan, when air should be drawn through the filters. If air is being blown through from back to front reverse the wires in the plug to make the fan run in the correct rotation.

**MATERIALS YOU'LL NEED**

- Air conditioning filters @ 16x25x1in
- 300mm dia fan
- 2.5mm twin and earth cable
- Plug and switch

*“You could make it with a little more finesse but that would not increase its efficiency”*



The ply cabinet is designed to accept the disposable filters which simply slide into place. They will trap particles down to 1 micron

**In The Woods**

After our workshop visits in New England last September, editor Phil Davy spent a few days exploring Acadia National Park, on the Maine coast. He came across a rather neat store in Bar Harbor, close to the Park. Called *In The Woods*, downstairs is stocked with everything from skateboards to chess sets, bird boxes and wooden items from Africa and Pakistan. A beautiful canoe from local maker *Island Falls* was on display. They feature in next month's *Workshop Angles*.

Upstairs is an information centre for a proposed Maine Woods National Park & Preserve, which may just become America's next National Park...



The upstairs gallery is devoted to info about a proposed National Park. Displays include a traditional birch bark canoe and even a stuffed bear!



**09** The fan is held in place with blocks, mark the radius directly from the fan housing



**10** If the radius is too tight for your bandsaw blade make relieving cuts to the line before cutting away the waste



**11** Screw the blocks flush with the rear face of the ply box so they hold the fan in place



**12** Screw the ply back directly onto the assembled carcass after cutting out for the fan exhaust