Hand woodworking

PHOTOGRAPHS BY MICHAEL T COLLINS

Creating a cutting board *using breadboard ends*

Michael T Collins takes us through the process of making a cutting board with breadboard ends

Our kitchen table has been handed down for several generations. In the centre of the table is a severe bow; however, the bow in the wood is not caused by poor workmanship. The table is in fact a nice piece of furniture. Instead, the bow is caused by the actions of humidity and natural stresses in the wood. This could have been avoided in a number of ways: the tabletop could have been made thicker – making it less pleasing on the eye – or the ends of the table could have been screwed down – not an option in this case because of the sliding extension leaves. The only option would have been to use breadboard ends.

Essentially breadboards are nothing more than pieces of wood attached across the end grain of a panel, preventing it from cupping and at the same time allowing it to expand and contract seasonally.

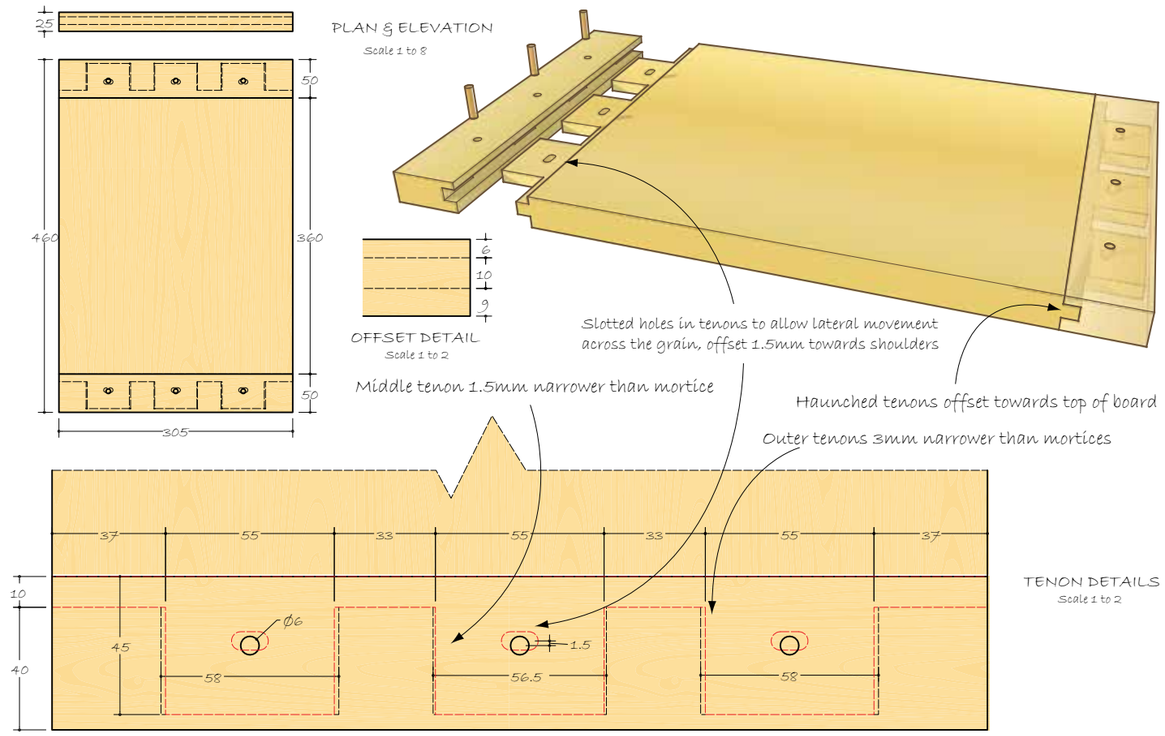
Breadboards lend themselves to any construction where boards need to be kept flat, including tabletops and cutting boards and even doors. Aesthetically, they also provide a clean and pleasing finish to end grain.

What you will need:

- Coping saw
- Shoulder plane and a small cabinetmaker's rasp
- Jack and block plane
- Plough plane
- Mortise chisel
- Mortise gauge
- Mallet
- Brace and bits

The bowed table

A breadboard attached with pegs



The construction

Construction-wise they are similar to panel doors, with breadboards taking the place of the rails on the panel door but with some added complexity.

There are many ways that breadboards can be joined to the panel: sliding dovetails, splines, tongue & groove, screwed, dowels and mortise and tenon. Sometimes no one method holds the answer and a combination of joints is required.

Power tools have made the process of making breadboards very easy; for example, cutting a sliding dovetail in the end grain with a router is a relatively simple task. However, hand cutting a dovetail across just a 305mm piece of end grain, let alone a 915mm-wide tabletop, would be difficult.

With hand tools, the preferred method is a plain tongue & groove joint. This method works well if the breadboard is to be supported by the table's skirt. If the tabletop extends beyond the base, then it is better to combine a tongue & groove with tenons, where the combination of joints holds the breadboard tight to the panel and offers additional strength and stability.

In this article I will demonstrate this joint by making a cutting board about 25 × 305 × 460mm.

Preparation

Glue up the panel boards, bringing them to final dimension and making sure the ends are square. I covered the making of a simple tabletop in issue 2. The breadboards are made from straight grain wood and cut about 50mm longer and 3mm thicker than the panel. The size of the breadboard is a purely personal decision, but the final appearance and proportions need to be taken into account.

The joint

Cut the tongue & groove one-third as thick as the material – offsetting them towards the top gives greater strength below the tongue.

Laying out tongue and tenon

1 I generally use an odd number of evenly spaced tenons. Make the mortises as deep as possible to resist any downward stresses on the ends but don't make the depth much more than ⅔ through the breadboard, unless creating a through tenon.

1

Using the marking knife, firmly score the length of the tongue on the ends of the panel. In this example, the breadboard width is 50mm so the total length of the tongue is approximately 45mm. Evenly space the tenons along the breadboard with the outer two starting about 50mm from the ends. Make the tenons about 45-63mm wide.

Set the mortise gauge to the width of your mortise chisel – 10mm – and mark the location of the tongue from the face side – remember to offset the tongue towards the panel's top – 6mm above the tongue and 10mm below. You can then scribe the location on the end grain and around the end grain onto the face edge. ➤

Layout of the mortises

2 Using a pencil, transfer the depth of the tongue to the ends and face of the breadboard. Using the same mortise gauge setting, layout the location of the groove. On the face edge, draw the location of the tongue, tenons and mortises on the face, giving an 'X-ray' view of the hidden joints.

3 Cut the groove by setting the plane's depth stop to the depth you decided for the tongue. Plane between the gauge marks, starting at the far end and working back towards yourself.

Chopping the mortises

4 Mark the mortise depth on the chisel with a magic marker and chop out the mortises. Start about 3mm from one end of the mortise and march the chisel – bevel facing the direction of travel – to within 3mm of the other end, then about face and march back. Repeat the process until the depth has been reached. Finally, tidy up the end walls by chopping vertically down.

Cutting the tongue

5 Set the combination plane's depth stop to a hair less than 6mm on the top and plane a 10mm wide rebate. On the bottom, change the depth stop to a hair over 10mm and cut a rebate.

6 You can now plane away the waste, using the shoulder or jack plane, down to the scribe line. If you angle the plane slightly on the shoulder side for the first few cuts, you can then remove the rest of the wood using the shoulder as the fence – this will leave a tongue approximately 10mm-thick.

7 The next step is to clean up the shoulder and the tongue, using a combination of shoulder…

8 … and block planes.

Cutting the tenons

9 The next step is to transfer the tenon locations from the breadboard back to the panel. From experience, a 305mm piece of top quality cherry *(Prunus serotina)* can move as much as 3mm seasonally, so the tenons need to have space to expand into. To compensate, make the outer-most tenons about 3mm narrower than the mortises and the inner tenons 1.5mm narrower.


2


3


4


5


6


7


8


9

10 Once the tenon widths have been determined, you can begin to saw down to the tongue line. Then, using a coping saw, start to cut away the waste. At this point, the fit can be tested and any adjustments can be made as necessary.

11 You can then begin to clean up the tenons with the aid of a rasp.

12 The final joint should go together without undue force, although you may need to use the mallet to get it apart. Tenons tend to crush fibres as they are pushed home, bending them into the mortises and acting like barbs. Another reason why the breadboard ends are made extra-long is so that they can be knocked apart without causing any damage.

Pegging the batten

13 With the joint disassembled, drill 6mm holes through the breadboard about halfway down the tenon. As soon as the drill bit emerges through the other side, withdraw and then drill from the opposite side; this will avoid any tear-out. Place a small block of wood inside the mortise to avoid internal tear-out.

14 The next step is to reassemble the joint and mark the location of the hole on the tenon. Again, disassemble and drill holes through the tenons…

15 … but offset them towards the shoulder by about 1.5mm or, as Joseph Moxon said in the 18th century "the width of a shilling."

16 The outer tenons need to have two holes drilled and offset either side of the mark…

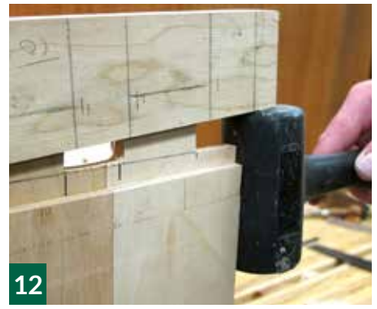
17 … this can then be elongated by chiselling out between.

Making the pegs

18 Pegs are split out of straight-grained contrasting mahogany *(Khaya ivorensis)*, which helps to add visual appeal. Splitting them gives a peg substantially greater strength than if they were sawn. Use a chisel to pare them into tapered pins. Another very quick way to taper the pegs is to use a pen knife or pencil sharpener. You can even use square pegs, but take care not to split the wood. ➤


10


11


12


13


14


15


16


17


18


19


20


21

19 Reassemble the joint – there is no need to glue this joint but if you must, glue just the centre tenon in place. Hammer the pegs home and then saw off close to the face of the breadboard.

20 If the breadboard stands proud of the panel, then simply plane with the sole of the plane resting on the panel and angled onto the breadboard – by planing this way the breadboard will be brought down to the thickness of the panel without marring the panel surface.

21 Throughout the year the table will move, pushing and pulling the edge beyond the breadboard end. Because of this movement, take care to initially centre the breadboard so that any seasonal changes occur symmetrically across the width. Scribe a line and saw off the extra wood, plane flush and then ease all the edges.

The finish

22 Sand with 120 then 220 grit paper. For protection, use any food-safe finish – I like to use a mix of mineral oil and beeswax. Warm half a pint of mineral oil in a saucepan over very low heat, then melt a small egg-sized chunk of beeswax in it. Stir the mixture to dissolve the beeswax. Pour the mixture into a glass jar and let it cool. To apply, smother the wood with the paste using a lint-free cloth, let it dry for a few minutes then wipe off. You can also apply the mixture as a liquid by warming it again. The finish will need to be reapplied once in a while. The beauty of this concoction is that you do not need to remove the previous finish.

23 Properly treated, your cutting board will give you many years of good service. For tabletops, a more durable finish is required – use a good quality varnish or Danish oil. ■


22


23

Michael T Collins

British-born Michael has been working with wood off and on for 40 years. He moved to New York in 1996 and over the years, has made bespoke furniture, including clocks, inlay work, Adams fireplaces, book cases and reproduction furniture.
Web: www.sawdustandwoodchips.com
Twitter: @sawdustandwood