

Constructing Leather Bottells: The Art of Pounding Sand

wInterkingdom XIX
A.S. XLII

H.L. Tadhg macAedain uiChonchobhair

Introduction

This workshop is intended to introduce interested parties to the basic tools, materials, and skills for producing leather drinking vessels. The main focus will be on some simple period bottles. Included as attachments are some drawings, sketches, and brief notes from Black Jacks and Leather Bottells by Oliver Baker.

Background

Documentation regarding construction techniques is sketchy at best. The practices were controlled by guilds. The earliest manuscript regarding the Company of Botellars contains the Ordinances of the Guild, which date to the 14th century. This document itself refers to a heritage of the Guild that “had been well and in order made from the time whereof memory does not run to the contrary”. A quaint phrase implying the great antiquity of their art. Of course, none of the available documents refer to the actual practice.

Instead, we must look more to the bottles themselves, and attempt to discern their construction. Most of the bottles found to date are costrels, which look like small kegs. A sketch of one such costrel is shown on the next page, middle left (Fig. 1 from Baker’s work). Indeed, the heraldic symbol for the bottle is the costrel. A far smaller number are shaped like modern bottles or flasks. Or more accurately, more of the costrels have survived through the ages.

Dating the bottles themselves is also quite problematic. Discerning the difference between an original and a well-made modern fraud is almost impossible without actually destroying the vessel. Of course, that problem is more for the antiquarians. This workshop is to re-create facsimiles appropriate to our personae.

Basic Construction Techniques

With regard to constructing leather bottles and jacks, there are two distinctly different shaping forms: sand and wooden lasts, respectively. The former technique, which will be used in this workshop, involves constructing the leather bottle (cutting and sewing), filling the bottle with sand (for shaping), and sealing the bottle using cuir bouilli techniques (drying and waxing).

The technique for constructing leather jacks involves building a wooden last (and frame), using the last to shape the leather, sewing the jack together (after removal from the last), and sealing the jack (with pitch and/or wax). This technique is far more difficult and not given to such a forum as this. In addition, the production of bottles does not seem to have used this technique. The lasts used for making jacks still exist today; to my knowledge, none have been found for costrels.

Tools

- 2-3 large-eye (Easy Thread) needles
- 1 3-hole or 4-hole stitching chisel (1/16" or 3/32")
- 1 circular punch (1/4" or larger, for cord)
- 1 tracing scribe
- 1 pair of shears or scissors or X-acto/razor knife
- 1 leather or wooden mallet
- 1 pair of pliers (needle-nosed or regular)
- 1 pen or pencil
- 1 funnel
- 1 dowel or spoon (slightly smaller than neck of funnel)

Materials

- 2-3 sq. ft. 4-5 oz. leather (preferably vegetable tanned)
- 25-30 ft. waxed thread or artificial sinew
- 2 lb. beeswax
- 10 lb. paraffin
- 10 lb. sand
- 7/8" or 1" wooden dowel
- 220 or higher grit sandpaper (optional)
- isopropyl alcohol (optional)
- leather dye (optional)

Process

1. Preparation

First, prepare a suitable work area. For punching, you will need a clean, sturdy surface, e.g., a strong desk or table. The work surface will need to be covered with a resilient material, preferable a rubber or leather mat. Remember, the next steps are cutting and punching the leather. The razor knife (if used) and the chisel will penetrate the leather into the surface below.

Next, trace the pattern onto your leather. Using a pen or pencil, transfer the pattern pieces onto the skin (rough) side of the leather. There are three pieces to the pattern: front, back, and bottom (gusset). The front and back pieces are the same shape.

Using the shears, scissors, or knife, cut out the pattern pieces. Compare the front and back pieces. If necessary, trim the pieces to match. Also, make sure the length of the bottom (or gusset) matches the bottom of the front and back pieces.

2. Punching

Using the scribe, mark a line on the tanned (smooth) side approximately 1/8" from the edge as shown by the dotted lines on the patterns. The patterns show the additional marks to be used to form the neck. Following the inscribed marks, use the chisel to punch holes in the leather.

TRICK: *To keep the spacing equal, place the first chisel point in the last hole. On a 4-hole chisel, you will be making three (3) new holes with each strike. Slightly slower but more accurate.*

Start about 3/4" below the top lip of the leather, punch holes along one side of the bottle's neck to the top of the main body. Repeat the process along the other side of the bottle's neck. Both sides need to have the same number of holes.

Repeat the procedure for the other side panel. Again, make sure the holes are the same for both sides and for both panels.

Continue punching the leather along the incised mark from the top of the main body to the bottom of the curve. Repeat the process along the other curve of the main body. The number of holes should be almost the same. They will not necessarily match exactly. For example, the left curve may have 40 holes and the right curve have 41. It is important at this point to count the holes and know how many each side has.

Repeat the procedure for the other side panel. It is critical that the holes match on the corresponding side of the other panel. In other words, it is critical to have the same number of holes on both the right curve of one panel and the left curve of the other panel. The final hole count can be adjusted at the joint where the gusset is added.

Finish punching the leather along the flat bottom of the main body. Repeat the process on the other panel. These two may not match each other exactly. As before, it is important to count the holes and know how many each side has. The final alignment will be adjusted on the gusset (done in the same way as noted earlier.)

Punch the long sides of the gusset. Make sure to punch the holes to exactly match those on the main body panels. If the panels were not the identical, clearly mark your gusset to know which side corresponds to which panel piece. For example, if the front panel had 20 holes and the back panel had 19, make sure one side of the gusset has 19 holes and the other has 20.

Punch the short sides of the gusset. Each end of the gusset has a triangular extension. Make sure to punch exactly the same number of holes on each side of a given triangle.

Using the scribe, mark the center hole on each of the following seams: both long gusset sides and both main body panel bottoms. If the count is even, mark the two (2) holes on either side of the seam center.

3. Sewing

Draw out 7' to 10' of waxed linen thread or artificial sinew. Make a small knot in the center of the string. Thread each end with a large-eyed needle.

From the flesh (rough) side of the gusset, insert one needle into the center hole of one of the long gusset sides. From the flesh side of the corresponding panel, insert the other needle into the center hole of the panel bottom. One needle is now on the tanned side of the panel; the other needle on the tanned side of the gusset.

Thread one needle through the next hole (both layers of leather). Draw the entire thread through the hole. Holding the first thread in place, thread the other needle through the same hole in the opposite direction. Draw the second thread entirely through the hole. Pull tightly on both threads to firmly set the stitch.

Repeat this stitch pattern (referred to as the "saddle stitch") until you reach the point of the gusset. Make sure you firmly set the stitches after each operation.

Once you have set the last stitch at the point of the gusset, you will need to secure the corner:

- a) Loop one thread over the outside of the seam and re-thread the same hole;
- b) Repeat for the other thread;
- c) Pull both threads VERY tight;
- d) Loop the thread on the panel side over the outside of the seam;
- e) Thread that needle through the gusset leather ONLY and into the bottle interior;
- f) Thread the "interior" needle from the flesh side of the second panel to the tanned side;
- Note: Line up the center holes for the gusset and second panel to find the hole you need to use.*
- g) Draw the entire thread to the tanned side of the panel;
- h) Loop one thread over the outside of the seam and thread through both layers;
- i) Repeat for the other thread;

- j) Pull both threads VERY tight;
- k) Repeat AGAIN for both threads;
- l) Continue saddle stitching as before towards the other gusset point.

Continue the process until you finish stitching the second long gusset side. Once you have set the last stitch at the second point of the gusset, secure the corner using the process described above in steps a) through h).

When you complete the gusset, stitch two holes past the starting point. In the third hole, thread both needles through ONE layer of leather to the interior. Tie the threads TIGHTLY in a knot in the interior seam.

Draw out about 7' of waxed linen thread or artificial sinew. Make a small knot in the center of the string. Thread each end with a large-eyed needle.

From the flesh side of one panel, insert one needle into the hole where you secured the gusset corner. From the flesh side of the second panel, insert the other needle into the equivalent hole. Secure the third point on the corner as we did earlier:

- a) Loop one thread over the outside of the seam and re-thread the same hole;
- b) Repeat for the other thread;
- c) Pull both threads VERY tight;
- d) Repeat AGAIN for both threads;
- e) Continue saddle stitching as before along the curve of the main body and up the neck.

Continue the process until you finish stitching the neck. Once you have set the last stitch at the mouth of the bottle, secure the final edge:

- a) Loop one thread over the outside of the seam and re-thread the same hole;
- b) Repeat for the other thread;
- c) Pull both threads VERY tight;
- d) Repeat AGAIN for both threads;
- e) Thread both needles through ONE layer of leather to the interior;
- f) Tie the threads TIGHTLY in a knot in the interior.

Repeat the same process for the other seam along the main body and neck. Once you finish sewing, fold the unsewn lip into the interior of the neck.

Draw out about 2' of waxed linen thread or artificial sinew. Make a small knot in the center of the string. Thread each end with a large-eyed needle.

From the flesh side of one tab, insert one needle into the top hole. From the flesh side of the second tab, insert the other needle into the top hole. Stitch the tabs together using a saddle stitch.

Once you set the last stitch on the tab, reverse the stitching direction for two holes and secure the thread like you did the gusset. In other words, thread through the third hole to the interior and knot the threads.

Draw out another 2' of thread for the other tab and repeat the process.

4. Shaping (“pounding sand”)

Using warm water, COMPLETELY soak the bottle. Fill the bottle ENTIRELY. Allow the leather to soak up as much water as possible. The whole process should take only a few minutes. It will also give your first look at the bottle and how watertight it is. Remember, you have only stitched it. There is still much to do to make it suitable for potables.

Empty the water out of the bottle. Make sure the lips are folded to the interior of the neck. Place the funnel into the mouth of the bottle.

Fill the bottle with sand. Make sure the sand is relatively clean. Strain the sticks and rocks out as they might harm the bottle.

Use a small wooden dowel or spoon to keep the sand flowing. Initially, the bottle will try to collapse in on itself since it is still wet. Use the funnel and spoon to keep filling the bottle.

As noted in the title, this is the art of pounding sand. Use the dowel to pack the sand and make room for more. Do not worry about being gentle--the leather is very resilient.

Keep adding sand. Keep packing it down.

When you get it mostly full, remove the funnel. Get a larger dowel and a mallet. Pound the sand to pack it. Yes, I am serious! But do be careful not pound the dowel past the sand and through the leather. Such is a bit TOO enthusiastic--and you will get to start over.

Fill (and pack and pound) sand until the bottle is filled to the brim. The bottle should feel quite hard to the touch.

Set the bottle aside and allow it to dry completely. It is best to allow several hours for drying. You can shorten the drying time somewhat by placing the bottle in an oven set at NO MORE than 150° F--higher and you will scorch the leather.

5. Dyeing (optional)

Once the bottle has dried, use the sandpaper (220 grit or higher) to rough up the surface. Moisten a rag with alcohol, and wipe off the exterior of the bottle. Let the exterior dry (about 2 to 3 minutes). Apply one (1) to two (2) coats of leather dye to the exterior. Keep in mind, the next step will substantially darken the bottle. Allow the dye to dry completely. It is best to allow several hours for drying. You can shorten the drying time to 1 ½ to 2 hours by placing the bottle in an oven set at NO MORE than 150° F--higher and you will scorch the leather.

6. Exterior cuir bouilli

WARNING: Before proceeding, ensure the bottle has dried completely. Submerging a wet or even damp item in molten wax is **VERY DANGEROUS!**

CAUTION: *This portion of the process requires EXTREME CAUTION. You will be dealing with molten wax and the consequences of a mishap are potentially dire. Please be aware of your surroundings, e.g., small children or animals in the vicinity. PLEASE BE CAREFUL!*

Remove enough sand to allow a 3" length of wooden dowel to be inserted in the neck. Insert the wooden dowel. Attach a cord to the two eyelets in the bottle tabs

In a large pot, melt the paraffin over LOW heat. Whenever possible, use an electric range rather than gas. The wax is less likely to ignite if it should drip or spill.

Once the paraffin has melted completely, submerge the bottle in the paraffin. When the bottle is submerged, small trails of bubbles should be seen coming from the bottle. These bubbles are from air pockets in the leather. Keep the bottle submerged until the bubbles dissipate. However, do not leave the bottle submerged more than about 90 seconds. The leather will begin to cook.

Make sure all exterior surfaces are coated with wax. Use a spoon or ladle, if necessary, to coat the neck and mouth.

Set bottle aside to cool. A cookie sheet or aluminum foil makes a good place for the excess wax to pool.

7. Interior *cuir bouilli*

Once the bottle has cooled, empty the sand. Since a small amount of paraffin always leaches through the seams, you will need to knock the bottle about a bit. This agitation will break up the sand-impregnated, wax chunks.

After you have removed as much of the sand and wax from the interior, wash the bottle out well. Repeat the rattle and wash process until you are fairly sure the bottle is clean.

Set the bottle aside to dry completely. It is best to allow several hours for drying. Unlike the previous step, you can hasten the process using an oven—you will melt the paraffin!

WARNING: Before proceeding, ensure the bottle has dried completely. Submerging a wet or even damp item in molten wax is **VERY DANGEROUS!**

CAUTION: *This portion of the process requires EXTREME CAUTION. You will be dealing with molten wax and the consequences of a mishap are potentially dire. Please be aware of your surroundings, e.g., small children or animals in the vicinity. PLEASE BE CAREFUL!*

In a small lipped pot or coffee pot, melt the beeswax over LOW heat. Whenever possible, use an electric range rather than gas. While beeswax is less prone to burning than paraffin, it is best to be safe.

Once the beeswax has melted completely, pour the wax into the bottle. Roll the wax around inside the bottle and empty it back into the pot. This process is fairly quick. The beeswax will harden quickly in the bottle, so do not dawdle.

Repeat the process once again.

Make sure all interior surfaces—especially the seams—are coated with beeswax.

Set bottle aside to cool.

Once it cools, the bottle is ready for a test drive. Fill it with water and check for leaks. If you see some leaks, usually small ones on the seams, repeat the previous sequence: dry bottle completely, pour molten beeswax into bottle and empty back out.

8. Final dress work

The finished bottle will probably have a few runs. They are very easy to correct.

Get some paper towels and a blow dryer. Heat the run using the blow dryer, and wipe it off when it melts. You will need to use the HIGH setting to generate enough heat to melt the wax.

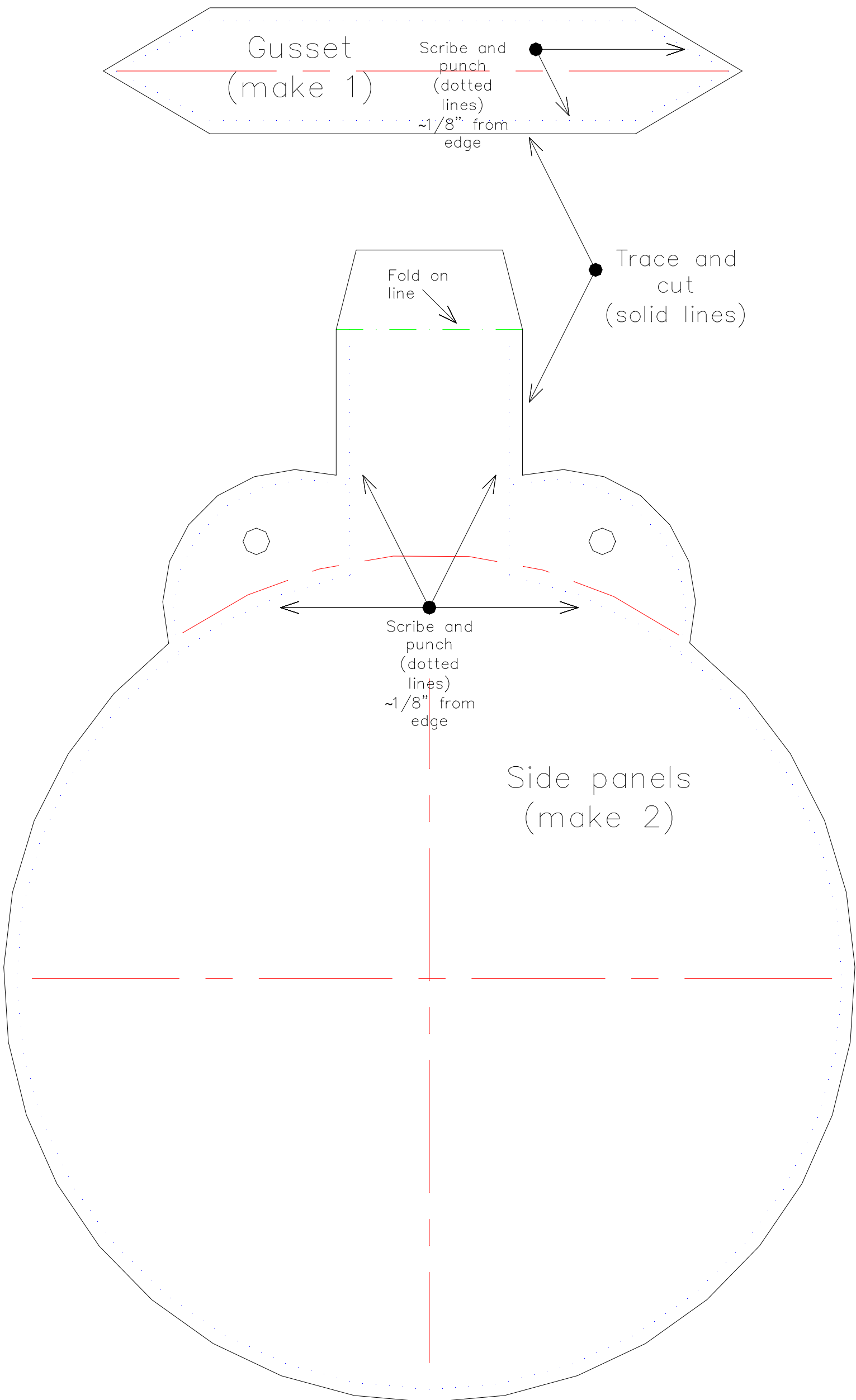
9. Long-term maintenance

Over the course of the bottle's life, it will need to be re-sealed with beeswax. I generally redo mine about once every two years. More often if I forget and leave them in the car on hot summer days.

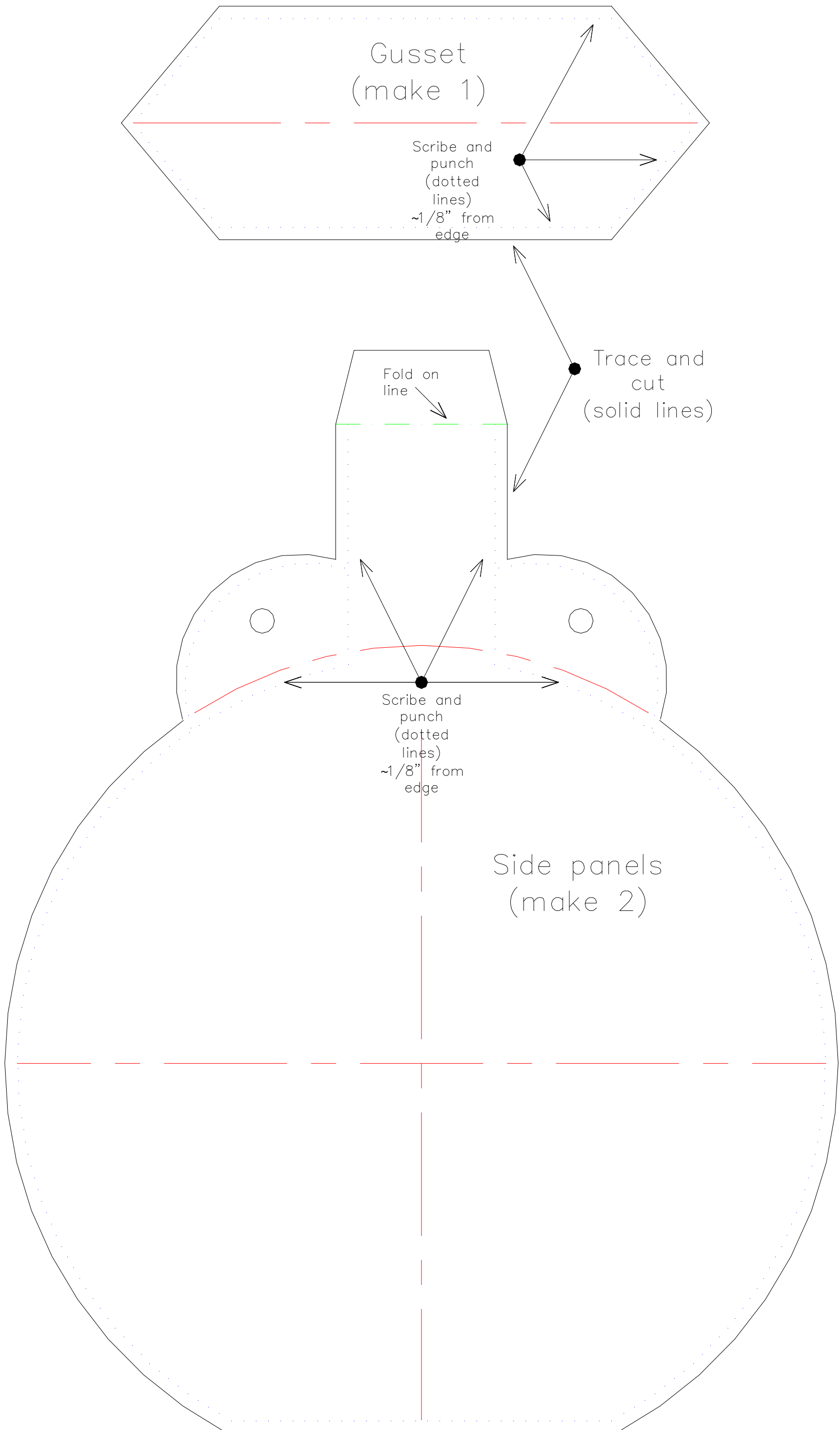
Reference

Black Jacks and Leather Bottels, Oliver Baker, 1921.

8" Leather Flask



8 1/2" Leather Bottle



10 1/2" Leather Bottle

Gusset
(make 1)

Scribe and
punch
(dotted
lines)
~1/8" from
edge

Fold on
line

Trace and
cut
(solid lines)

Scribe and
punch
(dotted
lines)
~1/8" from
edge

Side panels
(make 2)

