Pouring to Perfection – Lips and Spouts

by Ivor Lewis

Forming Lips on Jugs, Ewers and Pitchers

After you understand the principle of what makes a lip dribble and drip (see Touring to Perfection—Fundamental Principles," PM I Fall 1999), the next step is to put theory into practice. Here's how to make efficient pouring edges for a variety of forms.

Throw and shape your form (jug, ewer or pitcher). This may be based on a historic example, have a unique style, or be made to conform to a pattern common for a range of kitchen utensils you have designed. In each of my diagrams, the actual profile of the lip has been exaggerated to emphasize the change of form that occurs when pressure is applied between finger and thumb. In addition, the proportions illustrated are suggestions rather than prescriptions.This is only one solution that can be used to solve the problem of making a rim that pours without dribbles or drips.

Step 1 - Form a Collar

After you've formed the basic shape of the piece, form a collar on the rim by leaving a thick bead of clay, which will provide clay that can be drawn up and modeled to make a well-proportioned lip. The collar should be at least twice as thick as the wall of the neck. Try to give the collar a circular cross-section with only a small fillet where it flares into the neck. As your skill develops, you may wish to embellish the outer contour of this collar with your fingers or a profile rib.

Step 2 - Pull the Collar

Starting on the far side of the piece, place your middle finger outside the pot and your thumb inside, then lightly grip the neck below the collar with your other hand. Squeeze slightly and start gently pulling the clay up. Move to the left and right, and pull the bead up an equal amount. Maintain a thickness equal to that of the wall of the pot at this stage. Thin about a quarter of the circumference of the collar. Use slip rather than water as a lubricant on your finger and thumb as you pull.

Step 3 - Extend and Thin the Tongue

Continue thinning the clay into a low, wide, thick tongue, always starting at the center and pulling upward and squeezing, then repeating the motion to either side. Continue the process, but progressively limit movement to the sides until only the center portion is being thinned. The result should look like a long tapered fingernail and the extreme edge should be less than half the original thickness of the neck. This tongue of clay should taper smoothly back into the throat of the jug.

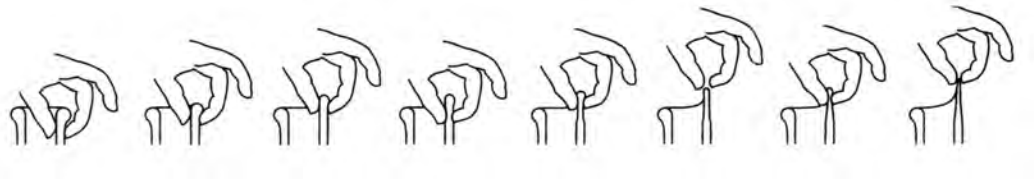
Step 4 - Roll and Stretch the Tongue Outward

Rotate the wheel so the tongue is close to you. The lip is going to be bent out and over. Wet your middle fmger with slip, and place it against the clay on the inside of the part you have just worked. Gently sweep your fmger from side to side. Start in the center and as you sweep, also gently pull against the clay, bringing the lip toward you to thin and bend the lip over. This stretches the clay, so you may need to support the clay with your other hand on the outside. Work toward getting a smooth flowing curve that continues the line of the neck outward without interruption. Repeat the modeling action until you're satisfied with the shape. Try to keep the contour of the symmetrical and even in thickness.

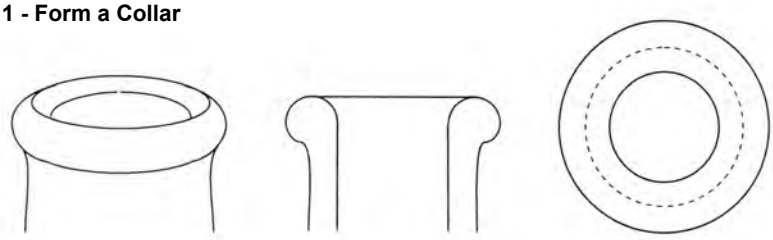
Step 5 - Complete the Gully

Since a wide gape would be prone to splash and spill liquid rather than pour it in a well-directed stream, you'll need to narrow the gully by sweeping fmger and thumb up the outside of the throat of the pot. While doing this, place the fingers of your other hand inside to preserve the contour and prevent the gully from narrowing too far. This gives the channel high shoulders that will constrict and narrow the stream of liquid as it flows over the lip.

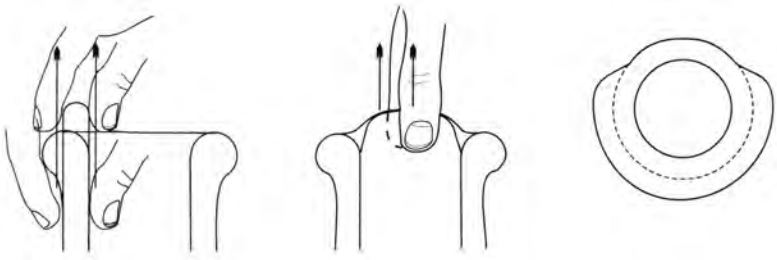
When finished with this process, you should have produced a gully that will deliver a well-controlled steady stream of liquid. Its thickness should be uniformly tapered from the neck to its top edge at the lip. Make sure that the lip edge is thin but does not droop downward. The gully should always slope back (see *correct* image) from the lip into the cavity of the vessel. Allowing the front edge of the lip to droop (see *incorrect* image) increases the chance that liquid will drip or dribble. A sharp lip that instantly cuts the flow and a gully that makes liquid run back down into the body of the pot are essential if dripping or dribbling are to be avoided when the pot is used.



Step 1 - Form a Collar



Step 2 - Pull the Collar



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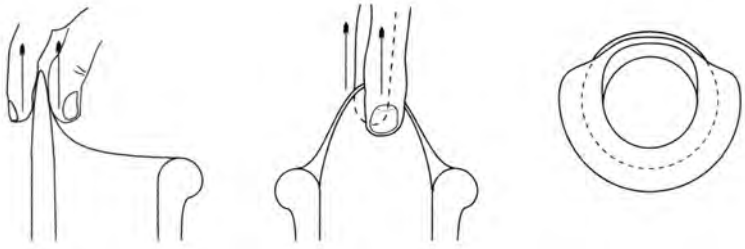
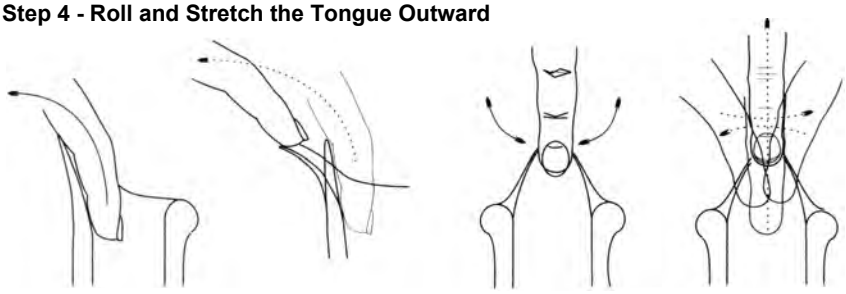
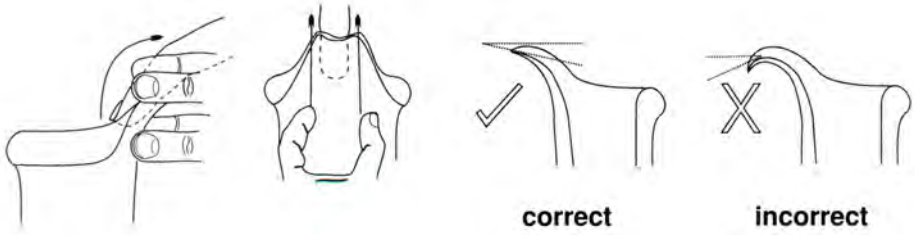
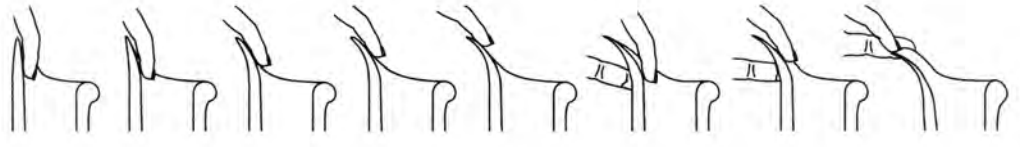


Step 4 - Roll and Stretch the Tongue Outward



Step 5 - Complete the Gully





Points to Remember

- If any shaping tasks are done too vigorously, the lip may split, sag or become distorted.
- Problems may occur if the original collar was not stout enough to provide sufficient clay for the process. Pulling a spout is a delicate task, and must be done when the clay is at its most fragile state. Several attempts may be needed before you attain the finesse that combines swift steady movements with a sensitive soft touch.
- Illustrations here have been exaggerated to emphasize principles. In your work, the lip does not need to project so far forward, the gully does not need to be as prominent, nor the side shoulders so high.
- Do not try to create a lip with a knife edge during the early forming stages. The lip is very fragile and needs to set up and become leather hard before it can be wiped and smoothed with a fine sponge.
- It is essential to have a sharp lip that does not droop and shoulders that restrict the breadth of the stream of liquid.
- When glaze is applied, it may form a bead on or under the lip. This should be smoothed out, but be careful not to entirely remove the glaze.
- Lip and spout design is influenced by the vessel contour and the design relationships between foot, belly, neck and rim. The initial thick collar may be given a complex profile that you can incorporate as a design feature, adding visual and tactile emphasis as it draws attention to the spout or lip.

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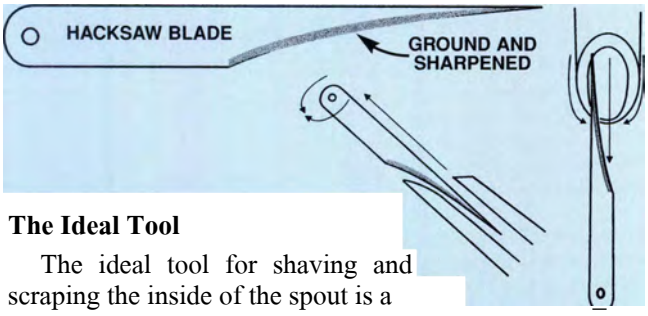
Forming Spouts on Teapots

Ceramics studio practice provides fertile ground for invention and elaboration of teapot design. Yet, whatever form a teapot takes, if it's to function with a degree of efficiency as a utensil, it must dispense tea without trauma or despair—no dribbles or drips.

It is not enough to simply trim the end of a teapot spout to a sharp beak because this termination will not achieve a sharp cut-ofF. A channel must be engineered to give a smooth uninterrupted passage for the flow, and any change in direction will cause an eddy and the potential for a dribble. While there are many solutions to forming a dripless teapot spout, here's one easy solution that provides a razor edge and smooth passage.

Note: As with the pitcher and jug lip, the slope of the spout should be back down into the pot. The tip of the spout, if bent forward and down, will always tend to drip. The problem of drips and dribbles has a single solution regardless of whether the spout is cut across or left untrimmed.



The Ideal Tool

The ideal tool for shaving and scraping the inside of the spout is a ground piece of hacksaw blade. If this blade is inserted well into the cavity and laid flat against the clay, it can be pulled out with a twisting, sliding action that shaves clay from the lower side of the bore of the spout. By cutting first from one side and then the other, it is possible to make a smooth curved plane from deep within the spout to the sharp beak. Do this slowly, first on one side and then on the other. The hole will change in cross-section from a circle to an oval. This new channel can be further refined by wiping gently with a soft damp sponge. Do not increase the width of the hole nor take material from the top side of the spout.

Trimmed Spout

If you intend to trim the length of the spout, make an almost horizontal slice across the end of the tube (B). Next, shave the lower rim (C) inside the tube to form an oval opening (D).

Trimmed Spout

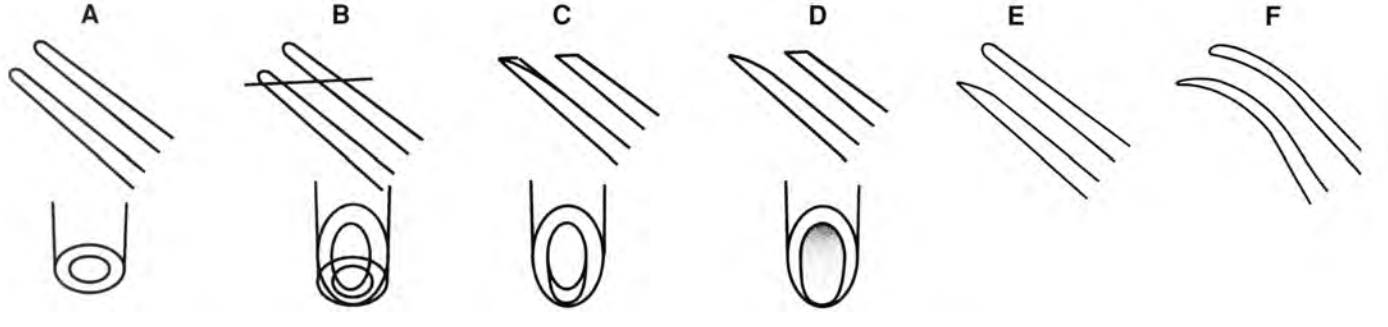
If you choose not to trim the spout, you only need to remove material from the lower side (E).This eliminates the angular change that separates the inside of the tube from the flat face that has been cut to give a pointed end to your teapot spout. Take care not to shave so far that the front edge of the sharp beak is sliced away. This method should be equally effective in preventing drips and dribbles.

Where the design of the teapot has a drooped spout (F), make sure that the curve forward and down is not excessive so that when the pot is brought upright after pouring is complete, remaining tea will flow back into the pot.

Rotating Teapot Spouts

Every clay has the ability to alter shape during firing, depending to some extent on the technique of the potter, the nature of clay and the firing schedule. This characteristic is most notable with teapot spouts, which will twist counter to the direction of throwing used during the forming process. An accurate picture of the degree of rotation for a particular clay can be ascertained by testing one teapot. Slice the spout precisely horizontal and fire the pot. Note the degree of rotation and its direction. Apply this measure in the opposite sense when trimming future spouts of this design.

Ivor Lewis is a retired teacher of Arts, Crafts and Sciences. He has a studio at his home in Redhill, South Australia, and is a frequent contributor to Pottery Making Illustrated, *as well as several other ceramics magazines. He continues making, glazing and decorating pots. Contact Mr. Lewis via e-mail at ivorredhill@.yahoo.com.au or by snail mail at Box 10, CMA Redhill, South Australia 5521.*



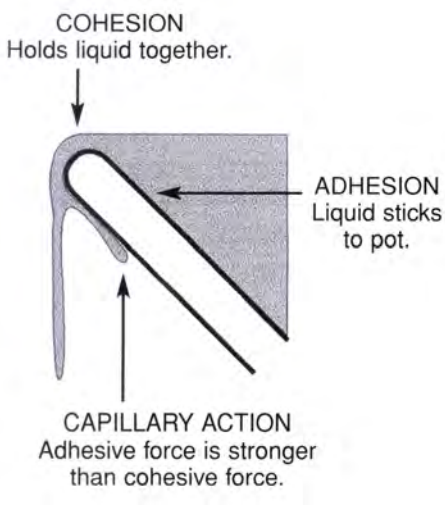
Pouring to Perfection – Fundamental Principles

by Ivor Lewis

A combination of well-known physical forces and forms causes many pots to dribble and drip– effects that cannot be prevented but can be minimized.

One enduring aspect of making pottery throughout the ages has been the constant need for a way of dispensing liquids. The necessity to regulate both the volume and rate of flow has resulted in a variety of solutions, leaving the clear impression that its nearly impossible to fashion a lip or spout that neither dribbles nor drips.

A potters ability to control the flow and behavior of liquids from pots is a craft skill that depends on the ability to combine some understanding of fluid flow, the action of surface tension and capillary forces, and knowledge of clay-forming processes to create an acceptable design solution.



The Forces Be With You

There are good reasons that explain why a drip always eases itself over the edge and trickles toward the foot ring. They arise out of physical relationships between liquids and the surfaces over which fluids flow, from an interplay of the forces that exist within liquids, at the surface where air touches it, through forces that occur between liquid and glaze and the effect of that all-Opervasive force—gravity. Water, alcoholic beverages, milk, fruit juice, custard and gravy (even oil) all exhibit the same behavior when they flow over a glazed or glassy surface. They wet it and stick to it.

Within a body of liquid such as water, the forces between the molecular particles are equal, so things remain pretty calm. However, where the boundary between liquid and some other substance at an edge or surface exists, there is an attractive force that goes unsatisfied, or alternatively, the force can be over-satisfied. When water and air interface, the former situation exists. Between water and the glaze, the latter happens.

Cohesion

The force of attraction between particles of a liquid is called "cohesion." This attraction surrounds each particle to bind it with neighboring particles. Particles on the surface expend the same amount of energy, but since there is a different substance (i.e., air) next to it, energy is diverted to clinging to neighboring liquid particles. The result is that the liquid appears to have a surface skin, and this force is called "surface tension." Surface tension holds the surface of large volumes of water flat. In addition, it causes small volumes to become spherical droplets and allows immiscible fluids (liquids that don't mix) of the same density to remain suspended like small weightless planets in space. Razor blades will sit on the surface of a dish of water, and surface tension causes a stream of tea flowing from a pot to form a narrow jet.

Adhesion

However, the magnitude of surface tension is small compared to the force between the glaze and a liquid (e.g., water, tea or milk).This force is called "adhesion," and it causes liquids to bind to our glazes, to glass and to other materials. Adhesion is the force that causes water to wet things, and it is a particularly strong force.

Capillary Action

When the force of adhesion is stronger than the force of cohesion, "capillary action" occurs. Capillary action always exerts itself in pottery to provide a reservoir that creates objectionable dribbles and drips when the force of gravity causes all fluids and liquids to flow downward. These effects will be exaggerated if the glaze is one that has a high affinity for the liquid. Capillary action will pull it around the edge, rather than allowing it to project forward and away from the spout or lip.

The combined effects of surface tension and capillary action also cause a small volume of liquid to remain at the top of the lip or spout when pouring stops. The actual thickness and shape of that edge determine the volume and hence its mass or weight. So every potter has problems of designing edges for pouring channels that will retain a minimum volume. The smaller the volume of retained liquid, the less likely there will be a dribble.

If the affinity of the liquid for the glaze is greater than the force of surface tension, liquid will be pulled up to and over the rim by capillary action. A small residual volume that collects may either drip or dribble down the outside of the pot. As the width of the edge gets thinner, the amount of liquid that can collect diminishes down to a minimum quantity. This reduces the size of the final droplet and can effectively prevent dribbling.

Solution

Its important to consider extreme and intermediate solutions to lip or spout design when finishing the rim of a thrown pot. The one solution that's least prone to dispensing that large final drop requires an effort to minimize volume and assist in reversing the movement of the liquid.

Stage A

This stage illustrates, in an exaggerated way, the effect of surface tension and the activity of capillary action between the fluid and the glaze on the pot. These forces create a concave area where the liquid meets the glaze, lifting the fluid.

Stage B

Once the level of the fluid rises higher than the lip, gravity causes liquid to flow over the edge. The width of that edge will determine if it is a wide or narrow stream. If the glaze is one that is easily wetted, then the liquid will be pulled round the lip and flow down the outer surface of the pot.

Stage C

Backward rotation of the pot has the effect of lowering the level below the rim. This stops the flow, but even so, capillary action continues to pull back toward the rim or lip and fractional amounts of fluid can continue to flow over the edge and down the outside of the pot. If the glaze has a strong pull on the liquid, this could result in a continuing dribble for a short period of time, sufficient to cause concern.

Example 1 - Rounded Rim

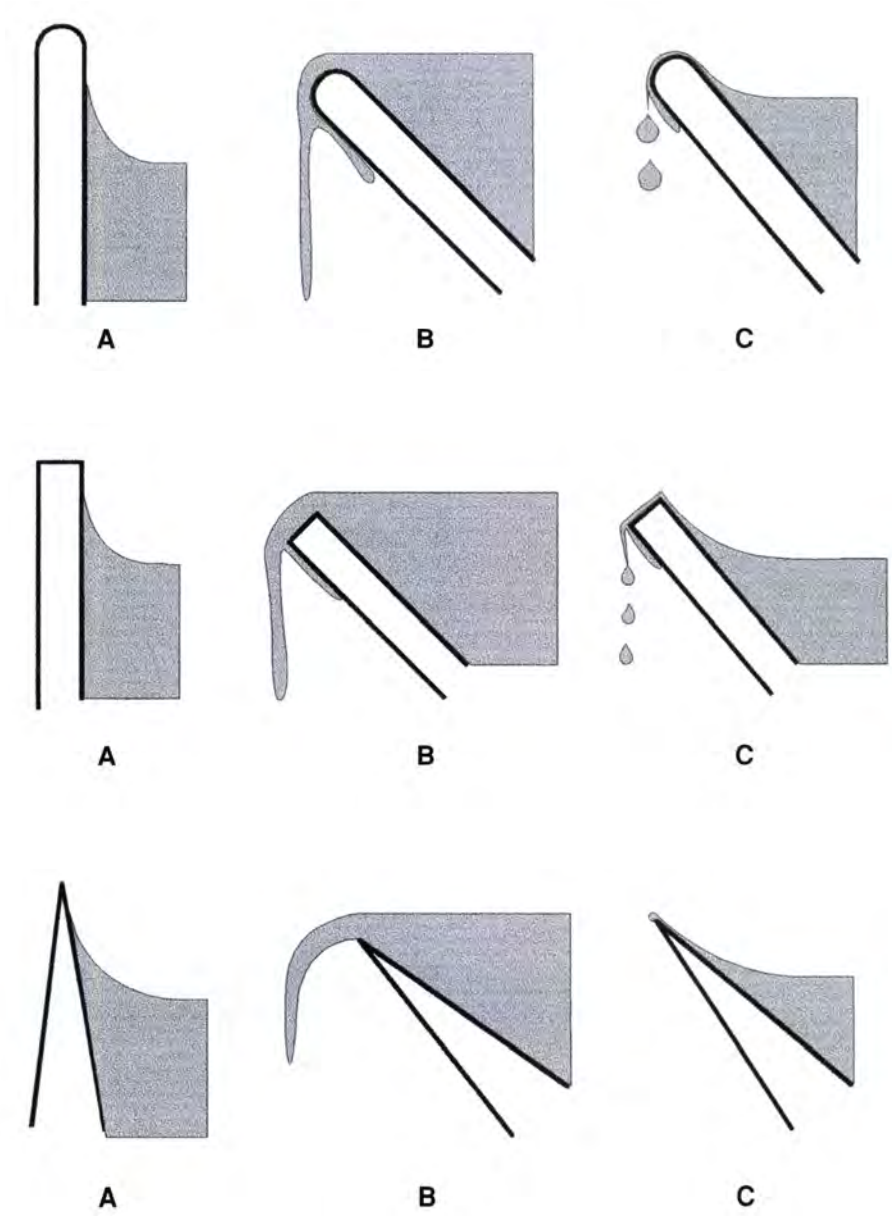
The most common solution is to round the lip by running the clay under a chamois to create a semicircular contour. The amount of liquid that adheres is largely determined by the thickness of the clay. A thick rim retains more liquid so there are larger dribbles, whereas thin clay does the opposite. This has special significance in the design of mugs, cups and beakers.

Example 2 - Square Section Rim

An intermediate solution is where the lip is cut, leaving a horizontal flat surface between two sharp edges. This allows fluid to sit on the rim, forming a reservoir that feeds the dribble, and is often produced when the top of the pot is trimmed with a needle tool, or it may be created by allowing the clay to run between finger and thumb of the left hand while the right forefinger bears down on the top of the spinning clay.

Example 3 - Knife Edge

The extreme solution is to create an acute, sharp angle where the inner and outer surfaces meet—a cutting edge. There is nowhere for a reservoir of excess liquid to be stored so the sharp edge becomes a barrier to capillary movement. It's extremely efficient and is found on metal jugs, teapots and kettles, but on ceramic vessels it's fragile and brittle. Teapot spouts and pitcher lips that employ this solution are effective but prone to chipping. They may exude a single drop, but they never dribble.



Note: Acute angle is for illustrative purposes only. In practice, use less acute angle to achieve reduction in capillary action. ***Ed.***

Ivor Lewis is a retired teacher of arts, crafts and sciences. He has a studio at his home in Redhill, South Australia, writes freelance for several ceramics magazines, subscribes to Clayart and continues making glazing and decorating pots. He can be contacted at ivorredhill@yahoo.com.au.