

# WORKSHOP HINTS AND TIPS

# LAPPING CONTOURS

By GEOMETER

**I**N the case of contours, which may be of regular or irregular outline, laps may be required to perform two main functions—to correct errors in parts of the profile left from previous machining or grinding, or to smooth and polish the whole profile when it is sufficiently exact, but lacking in finish.

In the case of correction of local errors, it is essential for laps to be in "rigid" material and accurately made, to contact the work only at the required places; since if there is all-over contact, correction of the original errors will inevitably introduce others. Such laps may be of brass, cast iron, aluminium alloy, etc.

In the opposite case, where all-over smoothing and polishing is the object, it is convenient for laps to be in material which is more or less readily deformable to the profile under pressure, or light working. For laps of this type, lead, wood, leather, felt, etc., may be used, the choice

being governed largely by the size of the component and profile.

If component and profile are small, it may be convenient to use lead, as the component can be squeezed between blocks to impart the profile; and if the work is larger, the same general method can be used with wood roughly shaped; and when size would involve too much work, means can be devised of holding felt—more readily deformable still.

An instance of an important profile in error is a thread chaser whose thread form is shallow. A chaser is, of course, often used to clean up and finish threads screwcut in the lathe at diameters for which dies are not practicable. With use, as at *A*, the profile commonly reduces in depth to *X*, whereas correct depth is *Y*. As a

result, the top diameter of a thread is reduced in pushing the chaser down to the core diameter at which a nut will run on. The thread has a shallow, dumpy appearance, and use of a micrometer shows its top diameter to be undersize—a cause for complaint if the work is to be inspected.

Other than a correct chaser, the remedy is to lap the faulty one using a piece of rod on which the thread profile has been correctly screwcut or produced with a die. Application of the chaser can be from a rest as in normal use, or set up like a tool. Initially lapping with the chaser at the centre line leaves a small area of negative rake *Z*; and as this could impede use, a further operation should follow with the chaser above centre or tilted at an angle, for positive rake *Z1*.

In sizes about 1 in. dia., laps should run at about 350 r.p.m., turning down on to the chaser in the normal direction for work, while abrasive compound is applied with a small brush. At the finish, the top surface of the lap can be lightly ground to sharpen the form at the edges.

Circular grooves, like the race-ways of bearings, may be smoothed and polished with laps of lead, wood and felt. For a thrust race member, a wood lap can be in a holder, as at *B*, machined to a simple gauge and used in a pillar drill, the race member(s) being located on a spigot on the machine table. The same effect is obtained in a lathe, running a lap in the chuck and holding the race member to it, as at *C*.

A piece of tube faced and chamfered (or rod drilled up) may be used as a lap for a spherical component, and with wear will automatically accommodate itself to the work.

A fixed felt lap for a revolving contour, as at *D*, can rest firmly, tacked in places, in the step of a holder of two pieces of wood, roughly shaped to contour; and for a contour as in the cavity of a die or mould, a lap in metal or wood must be suitably shaped and revolved. □

