TRUING CHUCK JAWS

By GEOMETER

HOWEVER carefully a chuck is used, it is normal for some deterioration in chucking to be apparent after considerable use. Gripping parallel bar material, a gap is seen between the outer end of each jaw and the material, where a piece of paper or a feeler gauge may be entered. In addition, if the chuck is a self-centring type, it will not bring material to reasonable running truth.

Loss of parallelism on the jaws is due to strain and wear and in some instances to slight displacement of the metal, all from heavy chucking of short components. Eventually such components may tend actually to slide out of the jaws; and difficulty is experienced in turning parts from springy bar, from the dither permitted by the distant grip.

Truing of jaws will eliminate these defects and at the same time centralising of a self-centring chuck can be improved, though if the scroll is strained there will be wobble at some diameters-but it should be less than previously.

Soft chuck jaws

Soft jaws, which are available for some chucks to be machined as required, are the most sure means of eliminating chucking errors and of providing a secure grip of circular components. These, if fragile or liable to distortion, are given substantial protection, for the jaws should be machined to the diameter to be gripped. In this operation, which is performed with ordinary boring and turning tools, the jaws hold in the direction of chucking so that inside-outside errors of the scroll can have no effect.

Gripping of the chuck is as at ***A***. To machine jaws for holding a bar, they should be closed firmly on to a disc which has a smaller diameter than that of the bar. Then they can be carefully bored to size ; and as each has a radius, it is this which provides the secure grip with minimum distortion. To finish where the jaws have held the disc-and the portions behind it in the chuck-it can be removed and a job-size ring substituted at the front for the boring tool to be used through it.

To machine jaws for holding an internal diameter a ring must be placed outside them as shown. In some instances it can be from rectangular bar, bent and butt-welded. Gripping a disc to secure jaws for turning their outsides is not recommended as it would almost certainly lead to eccentricity when the chuck is opened instead of closed.

Substitution of rings for discs can be avoided and boring of soft jaws at different diameters simplified if they are drilled and tapped for screws to fit clamps, as at B. For securing jaws inside the chuck diameter (right), each clamp can be straight and balanced by a small packing block. For securing, however, where jaws stand proud of the chuck diameter, each must be bent down (left). In both cases regulation of individual holding screws is necessary.

While soft jaws are best employed at the bored sizes they may often be used at smaller diameters without excessive errors; but at larger diameters there is edge contact with the jaws, as at C, and this usually results in eccentricity.

Hardened jaws which are worn or strained can be trued in the manner of soft jaws after softening by heating to red and cooling off in cinders. Alternatively they can be trued in the hard state by grinding. Given a motorised head to run from the slide, slight errors in parallelism and concentricity can be effectively eliminated. Each jaw must have a stepped gripping clamp to pull on the outside of the chuck, as at ***D***, made from two steel plates held by a bolt, with a balancing block between their top edges.

Having obtained a true surface through each jaw, a set-up can be made on an angleplate on the vertical slide, as at ***E***, taking alignment from the true surface. A grinding wheel running on a mandrel in the lathe spindle will then flatten the jaw-material being removed to micrometer checks.

For true holding on occasion, slight radius lapping can be done on jaws, as at ***F***, with the high jaw(s) protected by packing, and the chuck closed to spin on the lap in the tailstock.