ACCURATE PLATE BENDING FOR WEB OFFSET PRINTING

If plates crack or shift, no web offset press can produce good quality. Donald Mayston analyses the problems and gives specifications for plate-bending machinery.

The bending of the printing plate is a stage in the printing process often neglected by web press manufacturers and printers. With more colour being printed on larger presses, particularly when more than one plate is fitted per cylinder, the precise forming of the plate is vital.

If insufficient care is taken or inadequate equipment used, two main problems arise: cracking of the plate during the run, and bad register.

The primary reason for cracking is the plate not being in proper contact with the cylinder in certain places. The plate moves each time the rollers or blanket cylinder pass over these unsupported areas and the continuous flexing causes cracking to develop. If the plate is fitted like a skin in intimate contact with the cylinder over the entire area contacted by the blanket and rollers, flexing cannot occur.

The majority of reasons for poorly fitting plates can be traced to the bending machine, though they can be aggravated by poor techniques if packing is used.

Faults in bending

If the bends are *too close together*, the plate cannot seat properly at the trailing edge (*Fig 1*). If they are too far apart, the plate may seat correctly but there is an unsupported area (*Fig 2*) and the plate will tend to crack at point (a), particularly if made of aluminium.

If the bends are *not straight or parallel*, the effect is as described in the previous paragraph, but occurring only in certain areas. It is particularly important that the leading edge be straight, as a concave bend will allow the plate to rock when being fitted, rendering accurate location impossible.

It is particularly important for the leading edge bend to have the *correct angle*. If it is overbent, a situation can arise (*Fig 3*) where the plate is not seated correctly, giving misregister. Abrasion of the raised edge is also likely to occur.

If the bend *radius is too small*, the plate cannot be accurately located, the position varying with the amount of tension applied (*Fig 4*). If the *radius is too large* (*Fig 5*) the plate will move up and down with each revolution and abrasion will take place at point (b).

Bend not a true radius is a common fault with hand-operated plate-benders. It is then difficult to clamp the plate adjacent to the radius along the whole length of the bends without marking the plate. As the bending beam rotates (*Fig 6*), the area (c) lifts up. Instead of a true radius a form such as *Fig 7* results, particularly in the centre of the plate, where deflection of the clamp and bending beams are greatest.

Bad register

A common source of register problems is the lack of a proper method of locating the plate to the bending machine. Visual imposition using register crosses, scribbed lines and similar methods is not good enough and is subject to human error.
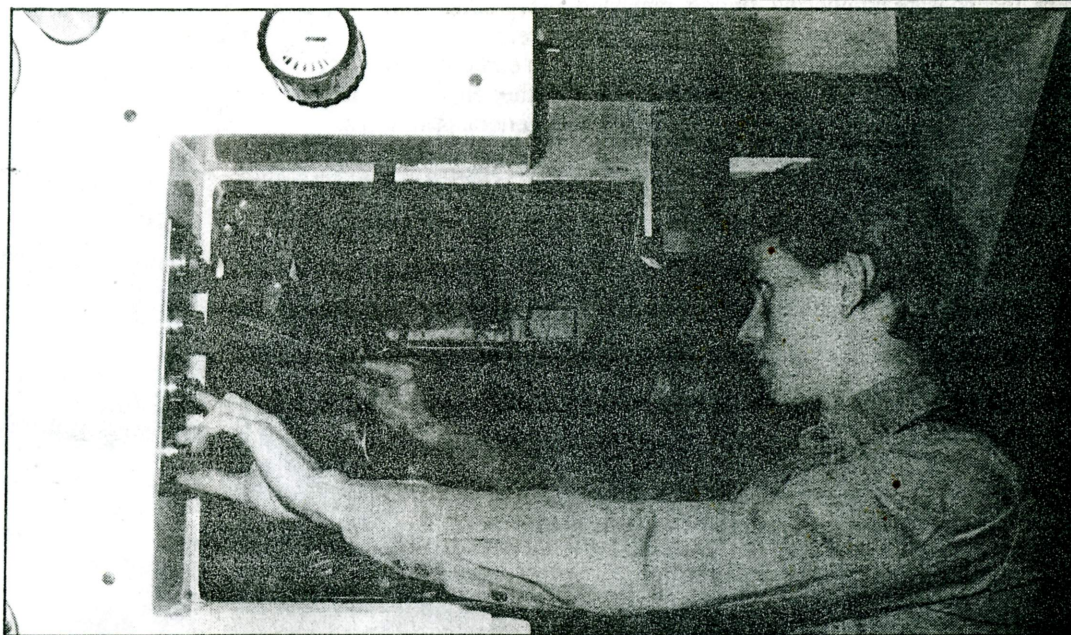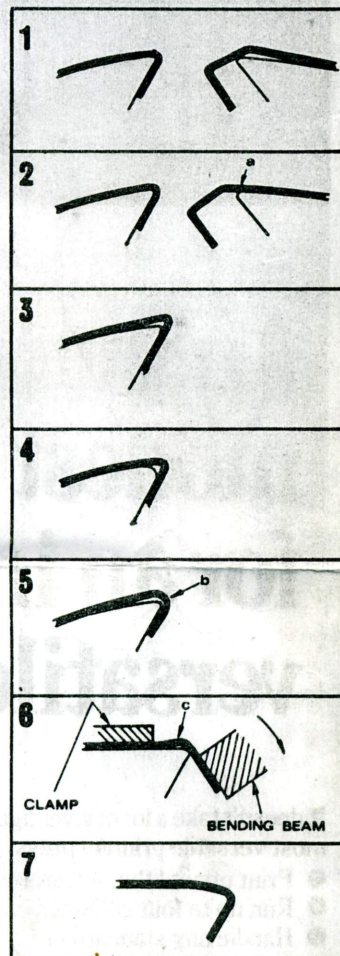
Where a pin system is fitted it must be properly engineered. It will be of little use if not backed up by a reliable and accurate pin-register system, preferably starting at camera, to ensure that every plate is in register relative to the punched holes.

If more than one bending machine is in use, the same bender must be used for all plates on each run. No two bending machines will match exactly.

Most hand operated benders suffer from some or all of the defects described. Few press manufacturers incorporate a good pin system on their benders and they often have little understanding of the repro processes of montage and platemaking. Benders are sometimes supplied with a pin system bearing no resemblance to that in use by the printer.

Hand benders are limited in the amount of pressure they can apply to clamp the plate during bending; so the bends can vary with different operators and often suffer from problems due to flexure of the ▷

CLAMP

BENDING BEAM

Accurately bent plates not only make plating-up easier but help ensure uniform quality.