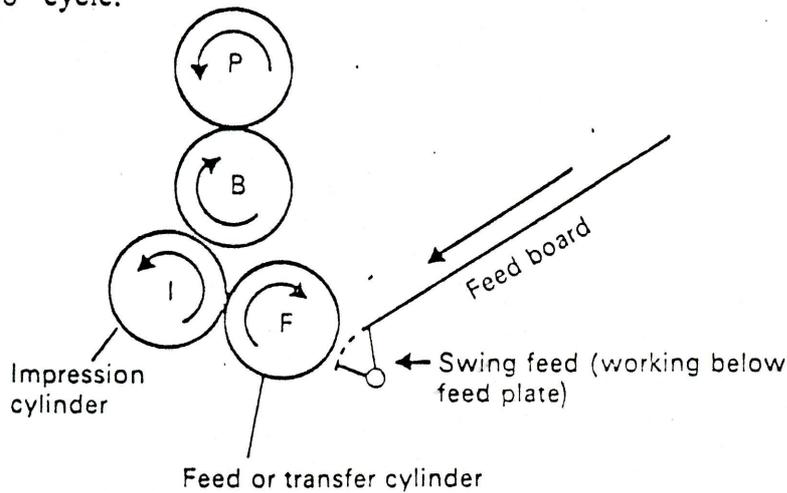


sheet from the register position to the impression cylinder grippers (or to the feed cylinder, *fig. 137*) are all different attempts to solve the same basic problem. That problem is how to move sheets from the stationary position at the register lays to the moving impression grippers, at the same time ensuring that each sheet is positioned accurately in those grippers. In every sheet-fed press the sheet must stop for a brief period of the machine's cycle of operation, in order to effect front-lay and side-lay registration. Roll-feed systems can register the sheet leading edge to lays or stops in the gripper system while moving, but the sheet must stop beforehand to permit the side-lay pull-up mechanism to effect side registration. Therefore the sheet will be stationary for a number of degrees of arc (say about  $30^\circ$ ) out of the  $360^\circ$  cycle.



*Fig. 137. Indirect feed to impression cylinder.*

Gripper systems include the direct methods, referred to in *chapter 11*, where the sheets are fed into the impression cylinder grippers. In this system the moving grippers close on the stationary sheet, which is then instantaneously accelerated to cylinder peripheral (surface) speed. The movement, so far as the sheet is concerned, is virtually a snatch. The grippers are closing at the same time as moving forward and, although the design of the closing movement and the method of operation can ensure that the speed of closing synchronises with press rotational speed, the snatching action will tend to vary gripper "bite" with varying speed. Early presses used a "tumbler" system for direct operation, but enclosed cams (of "inside" cams) are more frequently adopted in current models. In both cases, the grippers are turned through  $180^\circ$  for opening and back through  $180^\circ$  for closing (*fig. 138*), and thus are often referred to as tumbler grippers, whether or not the action is effected by a tumbler device (*fig. 139*) on the end of the gripper shaft.

Swing-arm gripper systems (also called swing-feed) are designed to eliminate the defects inherent in the direct system. They consist of a set of