

MULTI-LAYER INJECTION MOLDING APPARATUS HAVING THREE
POSITION VALVE MEMBER

ABSTRACT OF THE DISCLOSURE

Valve gated injection molding apparatus having three position valve member actuating mechanism for multi-layer molding. A first melt passage extends to the gate through an annular channel in a heated nozzle, while a second melt passage extends around an elongated valve member in a central melt channel. A rack member engaging the rear end of the valve member is driven by a pinion member connected to a front piston in a front cylinder. A rear piston in a shorter rear cylinder aligned with the front cylinder has a stem extending forwardly into the front cylinder. First, air pressure applied behind the rear piston retracts the valve member from a first closed position to a second partially open position wherein melt flows only through the annular channel. Then, air pressure applied behind the front piston retracts the valve member to a third fully open position wherein melt flows simultaneously through both melt channels to provide the three layers. When the cavity is nearly full, air pressure is released behind and applied in front of the front piston to return the valve member to the second position until the cavity is full. Air pressure is then released behind the third piston to advance the valve member to the first closed position in which its front end is seated in the gate for ejection.

Figure 1