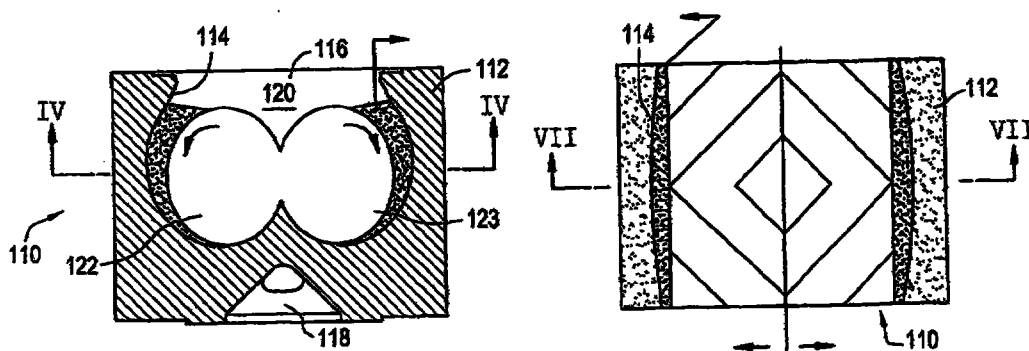




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(54) Title: GEAR PUMP FOR PUMPING HIGHLY VISCOUS FLUIDS



(57) Abstract

A gear pump exhibiting improved efficiency over a broader range of fluid viscosity and pump speed includes a compression zone defined between each of a pair of pump gears and internal walls of a gear chamber, wherein the compression zones have a non-uniform thickness along a longitudinal direction of the gears. The geometry of the compression zones provides a mechanism whereby the drag of the viscous fluid which is induced by the rotation of the pump gears carries the viscous fluid through a progressively narrower gap in the direction of rotation ending in a final smooth pinch-off at the start of the seal zone. The geometry of the compression zone maximizes the drag and pressurization of the viscous fluid being pumped into the teeth of the gears, thereby assisting in the complete filling of the teeth. The result is improved fill efficiency over a broader range of pump speeds and over a broader range of fluid viscosity.