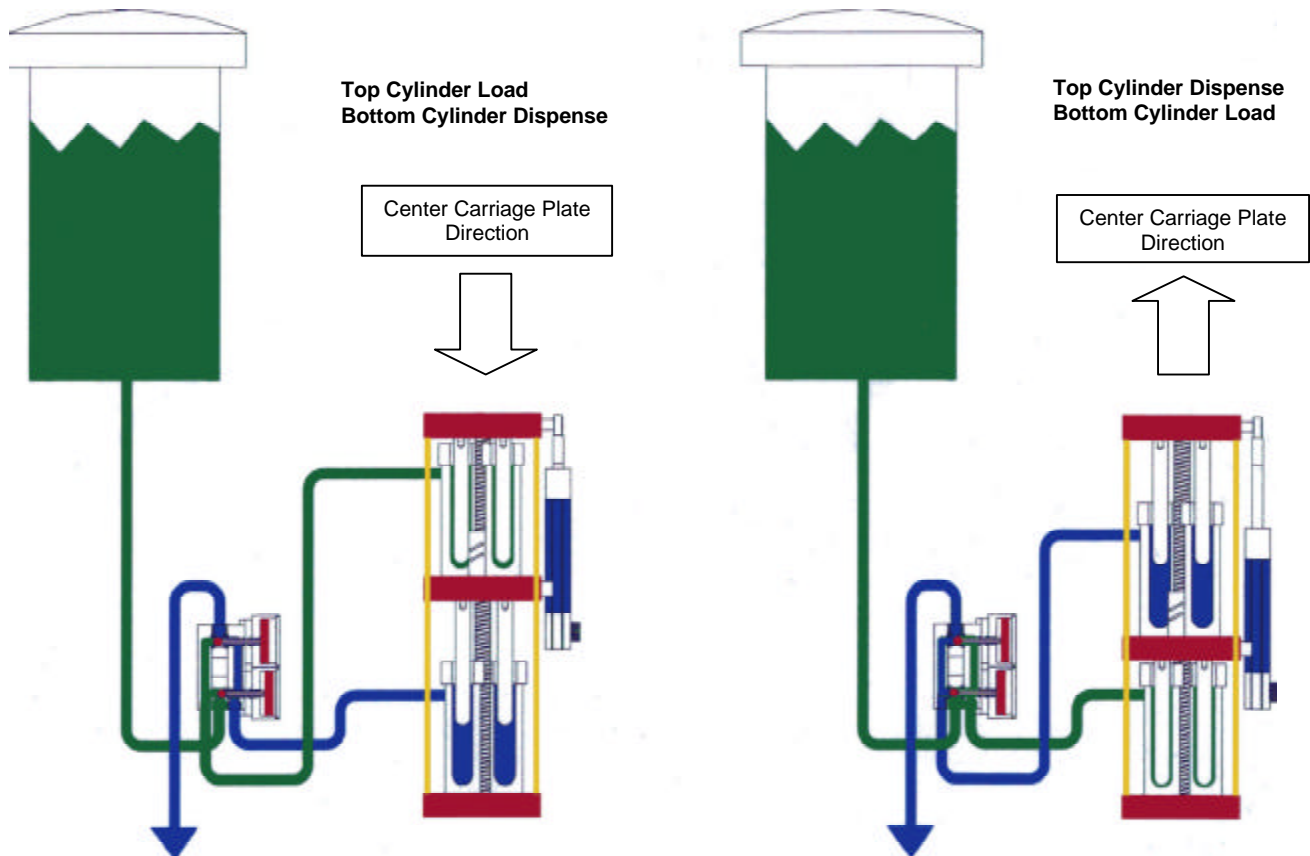


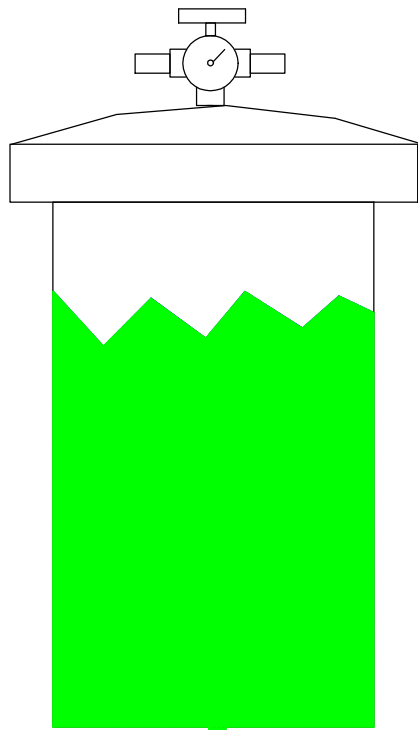
LINEAR DISPLACEMENT PUMP (LDP) CROSS OVER VALVE (XV2) FUNCTIONALITY



Top LDP Rods are fixed. Top LDP Cylinders reciprocate on center carriage.
 Bottom LDP Cylinders are fixed. Bottom LDP Rods reciprocate on center carriage.
 Each LDP cylinder set is filled and dispensed from a single port. This is facilitated by Fluidic's patent pending XV2 4-way cross-over valve that redirects fill and dispense port orientations. This design eliminates separate fill and dispense ports utilizing check valves. Check valves are not efficient and malfunction affecting metering accuracy. When the LDP changes direction, the XV2 is simultaneously actuated to reverse the Fill and Dispense porting. The LDP reciprocation and XV2 actuation happens in milli-seconds to provide a continuous fluid dispense output. Additionally, the fill input pressure is balanced to match the dispense output pressure so there is no differential fluid pressure during LDP reciprocation. The combination of the simultaneous LDP reciprocation/XV2 actuation and balanced fill/dispense pressures provides continuous and virtually pulse-free metered flow.

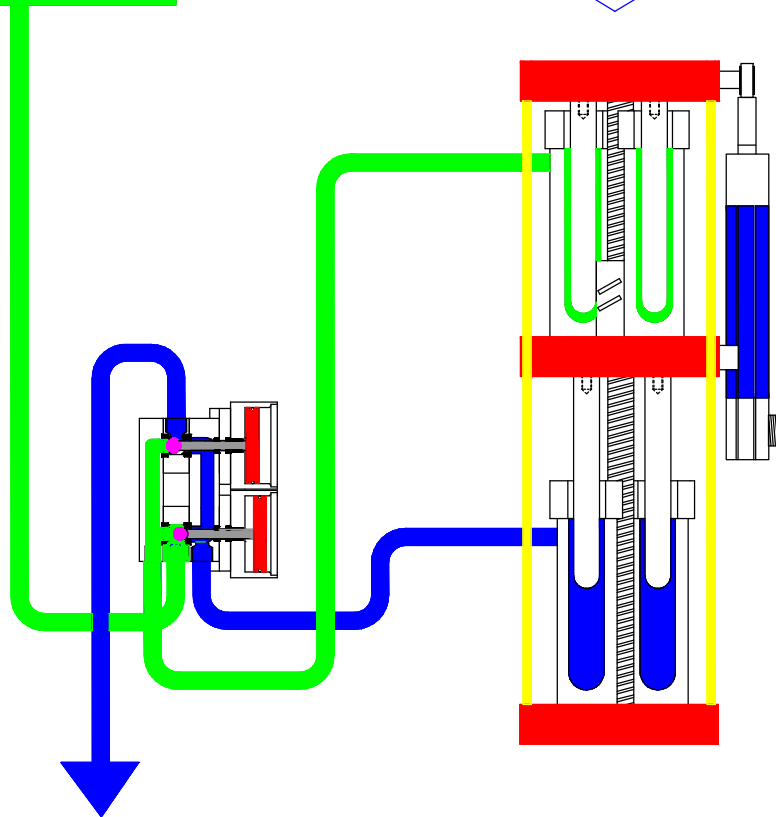
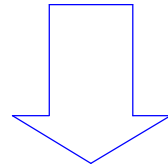
LDP Patent US 6,398,514 B1

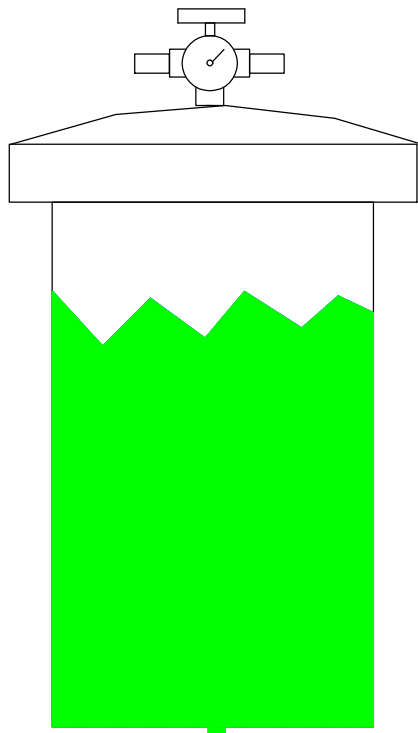
XV2 Patent Pending



TOP CYLINDER LOAD
BOTTOM CYLINDER DISPENSE

CENTER CARRIAGE
DIRECTION





TOP CYLINDER DISPENSE
BOTTOM CYLINDER LOAD

CENTER CARRIAGE
DIRECTION

