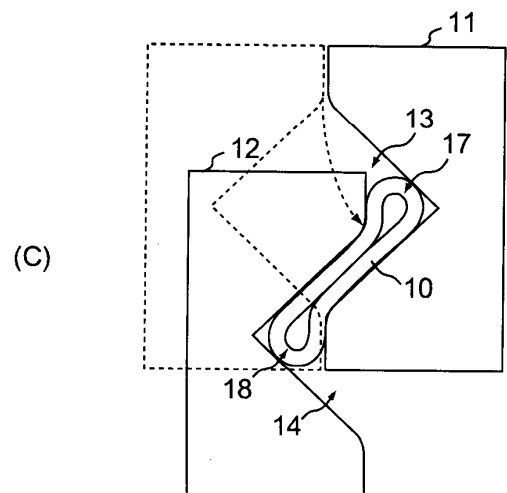
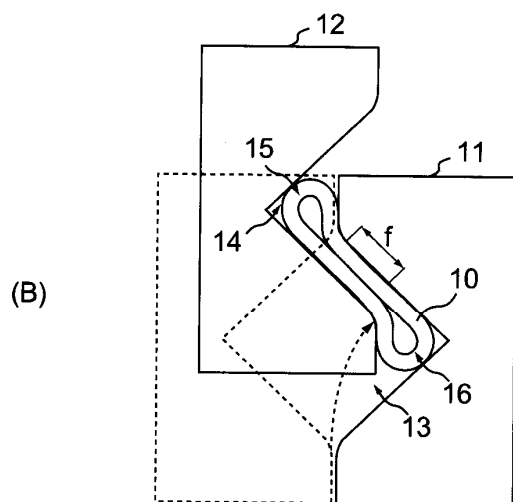
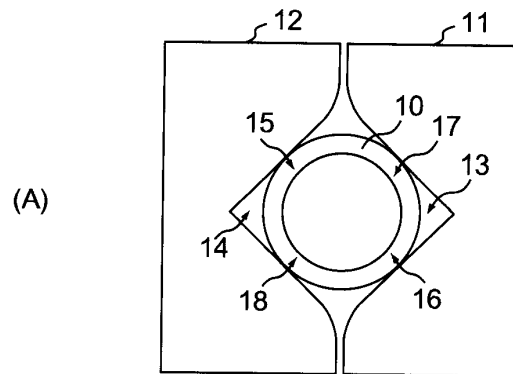


Abstract of the patented technology



The present invention provides such pumping apparatuses that have very little deviation and high stability in pumping flow. A pumping apparatus comprises two opposing members (11, 12) that are set along a longitudinal direction of a tube (10) made of an elastic material with a relation that the space formed by grooves (13, 14) made in the two members (11,

12) holds the tube (15). The two opposing members (11, 12) have reciprocal motion (A -- B -- A -- C -- A) such that at least one of the two opposing members (11, 12) shuttles in parallel with the other opposing member and has a move-in motion such that at least one of the two opposing members (11, 12) vertically moves to the opposing surfaces of the other opposing member so that surrounding part of the groove thereof moves into an inner space of the groove of the other opposing member, by which motion the liquid in the tube (15) is discharged from the tube (10) by the deformation of tube cross sectional shape.

Due to a little stress onto the tube, fluid flow by pumping can be constantly maintained for long term and no tube break due to fatigue is made. The mechanism is simply constructed with a conventional mechanism for a reciprocal motion and additional synchronous one for vertical motion.