WHAT IS CLAIMED IS:

1. A pump for medical fluid comprising:

a pump housing;

a manifold within the pump housing, and having a manifold chamber therein, an input port and an output port;

a cannula received within the manifold chamber, and having an input hole and an output hole, arranged on opposite sides of the cannula and offset along an axis of the cannula to correspond with positions of the respective input port and output port of the manifold;

a cam received within a cam chamber, wherein the cam comprises a stem and the cannula is fixed to the stem, and adapted to cause the cannula to reciprocally translate in an axial direction a predetermined distance as the cam is rotated;

wherein the cannula is formed from metal needle stock having a predetermined gauge with a corresponding inner diameter, and the cannula reciprocates axially the predetermined distance to form a discrete pump volume between a distal face of the stem and a distal face of the manifold chamber and defined by the inner diameter of the cannula.

2. The pump of claim 1, wherein the cam chamber is formed from a cam chamber housing having a cam surface, and a cam chamber cap having a cam surface.

3. The pump of claim 2, wherein the cam chamber cap comprises an axial opening, and the cam comprises a motor coupling that extends through a cam chamber cap opening.

4. The pump of claim 1, wherein the cam is arranged to cause the cannula input hole to align with the input port as the manifold chamber is increasing in size.

5. The pump of claim 1, wherein the cam is arranged to cause the cannula output hole to align with the output port as the manifold chamber is decreasing in size.

6. A pump for medical fluid comprising:

a pump housing;

a manifold within the pump housing, and having a manifold chamber therein, an input port and an output port;

a cannula received within the manifold chamber, and having an input hole and an output hole, arranged on opposite sides of the cannula and offset along an axis of the cannula to correspond with positions of the respective input port and output port of the manifold;

a cam received within a cam chamber, wherein the cam is fixed to the cannula, and adapted to cause the cannula to reciprocally translate in an axial direction as the cam is rotated;

wherein the cam chamber is formed from a cam chamber housing having a cam surface, and a cam chamber cap having a cam surface, and

the cam chamber housing cam surface comprises a ramp shape.

7. A pump for medical fluid comprising:

a pump housing;

a manifold within the pump housing, and having a manifold chamber therein, an input port and an output port;

a cannula received within the manifold chamber, and having an input hole and an output hole, arranged on opposite sides of the cannula and offset along an axis of the cannula to correspond with positions of the respective input port and output port of the manifold;

a cam received within a cam chamber, wherein the cam is fixed to the cannula, and adapted to cause the cannula to reciprocally translate in an axial direction as the cam is rotated;

wherein the cam chamber is formed from a cam chamber housing having a cam surface, and a cam chamber cap having a cam surface, and

the cam chamber cap cam surface comprises a ramp shape.

8. The pump of claim 3, wherein the motor coupling is slidably received within a motor portion.

9. The pump of claim 1, wherein the cam comprises ramp surfaces that interact to move the cannula axially in a reciprocal manner as the cam rotates.

10. The pump of claim 1, wherein the input port and the output port are on the same side of the manifold chamber.

11. The pump of claim 1, wherein the input hole and the output hole are arranged such that only one of the input hole and output hole can be aligned with either of the input port or the output port at a given time.