CLAIMS

WHAT IS CLAIMED IS:

1. A fluid flow component, the fluid flow component comprising:

a housing comprising:

an inlet;

an outlet;

a cavity, a longitudinal axis extending along the cavity;

a seat within the cavity; and

a flow path extending from the inlet to the cavity and from the cavity to the outlet; and

a closure member slidably movable within the cavity of the housing, the closure member configured to engage the seat to prevent fluid flow through the flow path in a reverse direction; and

wherein a magnetic field biases the closure member into contact with the seat.

2. The fluid flow component of claim 1 wherein the magnetic field is configured to repel the closure member.

3. The fluid flow component of claim 1 further comprising a first magnet, the first magnet generating a first portion of the magnetic field, wherein the first magnet is spaced and isolated from the closure member, and wherein the closure member comprises a second magnet.

4. The fluid flow component of claim 3 wherein the second magnet generates a second portion of the magnetic field and wherein the first portion of the magnetic field comprises a first plurality of field lines and the second portion of the magnetic field comprises a second plurality of field lines, the first plurality of field lines spaced and isolated from the second plurality of field lines.

5. The fluid flow component of claim 1 wherein the closure member comprises a cavity, a second magnet located within the cavity of the closure member.

6. The fluid flow component of claim 5 wherein the closure member further comprises a sealing element which seals the cavity of the closure member.

7. The fluid flow component of claim 1 wherein the cavity of the housing comprises an inner surface and the closure member comprises a plurality of protuberances, the plurality of protuberances engaging the inner surface.

8. The fluid flow component of claim 7 wherein the plurality of protuberances prevent lateral movement of the closure member with respect to the longitudinal axis.

9. The fluid flow component of any one of claims 1 to 8 wherein the fluid flow component is free of mechanical biasing elements.

10. The fluid flow component of any one of claims 1 to 8 wherein the closure member moves within the cavity of the housing in a direction parallel to the longitudinal axis.

11. The fluid flow component of any one of claims 1 to 8 further comprising a stop member, the stop member aligned with the longitudinal axis.

12. The fluid flow component of claim 11 wherein the stop member comprises a first magnet.

13. The fluid flow component of claim 11 wherein the stop member limits motion of the closure member along the longitudinal axis.

14. The fluid flow component of any one of claims 1 to 8 wherein the housing comprises a first pocket, a second pocket, and a third pocket, a first magnet within the first pocket, a third magnet within the second pocket, and a fourth magnet within the third pocket, wherein the closure member comprises a second magnet, wherein each of the first, second, third, and fourth magnets comprise a north pole and a south pole, each of the south poles of the first, second, third, and fourth magnets having the same orientation with respect to the longitudinal axis, and wherein the first, second, and third pockets are arranged at an equal distance from the longitudinal axis.

15. A system for processing articles, the system comprising:

a first fluid flow component, the fluid flow component comprising:

a housing comprising:

an inlet comprising a first port, the first port comprising a seal cavity;

an outlet comprising a second port, the second port comprising a seal cavity;

a cavity, a longitudinal axis extending along the cavity;

a seat within the cavity; and

a flow path extending from the inlet to the cavity and from the cavity to the outlet; and

a closure member slidably movable within the cavity of the housing, the closure member configured to engage the seat to prevent fluid flow through the flow path in a reverse direction; and

a second fluid flow component, the fluid flow component comprising a first port and a second port, a flow path extending from the first port to the second port, each of the first port and the second port comprising a seal cavity; and

a seal;

wherein the second port of the second fluid flow component is aligned with the first port of the first fluid flow component, the seal located within the seal cavity of the second port of the second fluid flow component and the seal cavity of the first port of the first fluid flow component; and

wherein a magnetic field biases the closure member into contact with the seat.

16. The system of claim 15 wherein the magnetic field is configured to repel the closure member.

17. The system of claim 15 or claim 16 further comprising a first magnet, the first magnet generating a first portion of the magnetic field.

18. A closure member for a check valve comprising:

a body extending from a first end to a second end along a longitudinal axis;

a first portion formed at the first end of the body comprising a sealing surface;
a plurality of protuberances extending from the first portion along the longitudinal axis, the plurality of protuberances defining a cavity; and
a magnet located within the cavity.

19. The closure member of claim 18 wherein each of the plurality of protuberances comprises a groove, the groove configured to engage a protuberance of the magnet.

20. The closure member of claim 18 or claim 19 wherein the cavity is open between adjacent ones of the plurality of protuberances.