What is claimed is:

1. A housing assembly, comprising:

a housing having an inlet and an outlet;

a damper disposed in the housing in an orientation that remains centered with respect to the inlet; and

a linear drive mechanism adapted to move the damper linearly between positions that open and close the inlet without rotating the damper.

2. The housing assembly of claim 1, wherein the damper is substantially conical.

3. The housing assembly of claim 1 further comprising:

a filter element disposed in the housing.

4. The housing assembly of claim 1, wherein the housing is at least one of a filter housing, a contamination housing or a stand-alone damper.

5. The housing assembly of claim 1, wherein the linear drive mechanism is at least one of a cam, a scissor actuator, a linear actuator, a power screw, a solenoid, an electric motor, a pneumatic cylinder, a hydraulic cylinder or a gear.

6. The housing assembly of claim 1 further comprising:

a seal interfacing the damper and the housing to providing a bubble-tight seal of the inlet when the damper is in the closed position.

7. The housing assembly of claim 1 further comprising:

a seal coupled to a perimeter of the damper and adapted to sealingly engage the housing to providing a bubble-tight seal of the inlet when the damper is in the closed position.

8. The housing assembly of claim 1, wherein the seal further comprise:

at least one of a gasket, fluid seal or a bladder.

9. The housing assembly of claim 1, wherein the linear drive mechanism further comprises:

a shaft coupled to the damper engaged with a feature that prevents rotation of the damper when the shaft is moved in a linear direction.

10. A housing assembly, comprising:

a housing having an inlet and outlet;

a damper disposed in the housing and linearly movable between positions that open and close the inlet, the damper having a non-planar shape that extends into the inlet when the damper is in the closed position; and

means for restraining the damper from rotating.

11. The housing assembly of claim 10, wherein the means for restraining further comprises:

a first feature coupled to the housing and fixed in orientation relative to the housing; and

a second feature fixed in orientation relative to the damper, wherein the second feature engages the first feature in a manner that permits linear motion without rotation.

12. The housing assembly of claim 10, wherein the means for restraining further comprises:

mating threaded members having truncated crests and valleys.

13. The housing assembly of claim 10, wherein the means for restraining further comprises:

a shaft coupled to the damper, the shaft having a non-circular cross section; and

a bearing or guide circumscribing the shaft, the bearing or guide having a shaft accepting aperture mating the shape of the shaft.

14. A housing assembly, comprising:

a housing having an inlet port, an outlet port and a bag in/bag out filter access port;

a filter receiving mechanism disposed in the housing, the filter receiving mechanism configured to direct gases flowing between the inlet and outlet ports through a filter installed in the housing;

a first damper disposed in the housing and movable between positions that open and close the inlet port;

a second damper disposed in the housing and movable between positions that open and close the outlet port;

a mechanism disposed in the housing and configured to move the first damper between the open and closed positions without rotating the first damper, wherein the first damper is spaced apart from the housing when in the open position.

15. The housing assembly of claim 14, wherein the damper is substantially conical.

16. The housing assembly of claim 14 further comprising:

a seal interfacing the first damper and the housing to providing a bubble-tight seal of the inlet when the first damper is in the closed position.

17. The housing assembly of claim 14 further comprising:

a seal coupled to a perimeter of the first damper and adapted to sealingly engage the housing to providing a bubble-tight seal of the inlet when the first damper is in the closed position.

18. The housing assembly of claim 17, wherein the seal further comprise:

at least one of a gasket, fluid seal or a bladder.

19. The housing assembly of claim 14, wherein the mechanism further comprises:

a shaft coupled to the damper engaged with a feature that prevents rotation of the damper when the shaft is moved in a linear direction.

20. The housing assembly of claim 14, the first damper has a non-planar shape that extends into the inlet when the first damper is in the closed position.

**Claims**

1. A housing assembly, comprising:

a housing having an inlet and an outlet;

a damper disposed in the housing in an orientation that remains centered with respect to the inlet;

a linear drive mechanism adapted to move the damper linearly between positions that open and close the inlet without rotating the damper, wherein the linear drive mechanism further comprises a rack coupled to the damper engaged with a feature that prevents rotation of the damper when the rack is moved axially; and

a seal coupled to a perimeter of the damper and adapted to sealingly engage the housing to providing a bubble-tight seal of the inlet when the damper is in the closed position.

2. The housing assembly of claim 1, wherein the damper is substantially conical.

3. The housing assembly of claim 1 further comprising:

a filter element disposed in the housing.

4. The housing assembly of claim 1, wherein the housing is at least one of a filter housing, a contamination housing or a stand-alone damper.

5. The housing assembly of claim 1, wherein the linear drive mechanism further comprises at least one of a cam, a scissor actuator, a linear actuator, a power screw, a solenoid, an electric motor, a pneumatic cylinder, a hydraulic cylinder or a gear.

6. The housing assembly of claim 1, wherein the seal further comprise:

at least one of a gasket, fluid seal or a bladder.

7. A housing assembly, comprising:

a housing having an inlet and outlet;

a damper disposed in the housing and linearly movable between positions that open and close the inlet, the damper having a non-planar shape that extends into the inlet when the damper is in the closed position; and

a linear drive mechanism comprising:

a gear having flat teeth; and

a rack coupled at one end to the damper, the rack having truncated crests and trenches engaging the flat teeth of the gear in a manner that prevents the damper from rotating relative to the inlet as the rack is advanced axially.

8. The housing assembly of claim 7, wherein the drive mechanism further comprises:

the rack coupled to the damper, the rack having a non-circular cross section; and

a bearing or guide circumscribing the rack, the bearing or guide having a rack accepting aperture mating the truncated crests of the rack.

9. A housing assembly, comprising:

a housing having an inlet port, an outlet port and a bag in/bag out filter access port;

a filter receiving mechanism disposed in the housing, the filter receiving mechanism configured to direct gases flowing between the inlet and outlet ports through a filter installed in the housing;

a first damper disposed in the housing and movable between positions that open and close the inlet port;

a second damper disposed in the housing and movable between positions that open and close the outlet port;

a mechanism disposed in the housing and configured to move the first damper between the open and closed positions and restrain the first damper from rotating relative to the inlet port, wherein the first damper is spaced apart from the housing when in the open position.

10. The housing assembly of claim 9, wherein the damper is substantially conical.

11. The housing assembly of claim 9, wherein the mechanism is at least one of a cam, a scissor actuator, a linear actuator, a power screw, a solenoid, an electric motor, a pneumatic cylinder, a hydraulic cylinder or a gear.

12. The housing assembly of claim 9 further comprising:

a seal interfacing the first damper and the housing to providing a bubble-tight seal of the inlet when the first damper is in the closed position.

13. The housing assembly of claim 9 further comprising:

a seal coupled to a perimeter of the first damper and adapted to sealingly engage the housing to providing a bubble-tight seal of the inlet when the first damper is in the closed position.

14. The housing assembly of claim 13, wherein the seal further comprise:

at least one of a gasket, fluid seal or a bladder.

15. The housing assembly of claim 9, wherein the mechanism further comprises:

a shaft coupled to the damper engaged with a feature that prevents rotation of the damper when the shaft is moved in a linear direction.

16. The housing assembly of claim 9, the first damper has a non-planar shape that extends into the inlet when the first damper is in the closed position.