CLAIMS

What is claimed is:

1. A sanitary high pressure aerator valve assembly comprising:

a main body having substantially coaxial opposite ends;

a coupling collar attachable to one end of the substantially coaxial opposite ends;

an end cap attachable to the end opposite of the coupling collar end;

an inlet adaptor attachable to the main body, wherein the inlet adaptor is substantially perpendicular to the substantially coaxial opposite ends;

an air chamber comprising a central passageway disposed between the inlet adaptor and the coupling collar end;

an air isolation chamber, wherein the air isolation chamber comprises:

a wave spring; and

a plurality of bushings disposed on either end of the wave spring for compressing the wave spring;

a one-piece unitary piston member slidable for a predetermined distance within a portion of the central passageway coaxial with the main body coaxial ends and the air isolation chamber; and wherein the one-piece unitary piston member comprises:

an enlarged head disposed at one end of the one-piece unitary piston member for sealing the coupling collar end of the air chamber; and

a threaded end disposed at an end opposite the enlarged head end within the isolation chamber and a visual tension spring hole; and

wherein the threaded end is isolated from the central passageway by the air chamber isolation assembly; and

wherein a location of the visual tension spring hole is predetermined as a function of the spring constant, air pressure, and a first predetermined distance.

2. The one-piece unitary piston member as in claim 1 wherein the first predetermined distance is between 3.165 to 3.185 mm.

3. The one-piece unitary piston member as in claim 1 wherein the length of the threaded end is predetermined as a function of the spring constant, air pressure, and a second predetermined distance.

4. The one-piece unitary piston member as in claim 3 wherein the second predetermined distance is between 2.352 to 2.372 mm.

5. The sanitary high pressure aerator valve as in claim 1 further comprising a spring tensioner for adjusting tension of the wave spring.