CLAIMS

~~That which is claimed is:~~

1. A nozzle cap for a fire hydrant comprising:
a cap body, the cap body defining a cap axis extending from a first body end of the cap body to a second body end of the cap body; and
a vibration sensor attached to the cap body, the vibration sensor defining a sensor axis extending from a first sensor end of the vibration sensor to a second sensor end of the vibration sensor, the sensor axis aligned perpendicular to the cap axis, and
wherein:
the nozzle cap further comprises a cap cover;
the cap cover encloses the vibration sensor;
the vibration sensor is attached to a circumferential wall of the cap body;
the cap cover defines indicia aligned with the vibration sensor; and
the indicia are configured to notify a user of a placement of the vibration sensor along the circumferential wall.

2. The nozzle cap of claim 1, wherein:
the cap body defines a cavity extending inwards into the cap body from the first body end towards the second body end; and
the vibration sensor is positioned within the cavity.

3. The nozzle cap of claim 2, wherein:
the cap body defines the circumferential wall;
the circumferential wall at least partially encloses the cavity;
the vibration sensor is attached to the circumferential wall; and
the vibration sensor extends radially inwards from the circumferential wall with respect to the cap axis.

4. The nozzle cap of claim 1, wherein the nozzle cap is configured to be mounted on a nozzle with the sensor axis vertically aligned.

5. The nozzle cap of claim 1, wherein the cap body defines a threaded bore, and wherein the threaded bore is coaxial to the cap axis.

6. The nozzle cap of claim 1, wherein the vibration sensor is a piezoelectric sensor.

7. The nozzle cap of claim 1, wherein:
the vibration sensor is a first vibration sensor;
the sensor axis is a first sensor axis;
the nozzle cap further comprises a second vibration sensor;
the second vibration sensor defines a second sensor axis extending from a third sensor end of the second vibration sensor to a fourth sensor end of the second vibration sensor;
the third sensor end is coupled to the cap body; and
the second sensor axis is aligned perpendicular to the cap axis.

8. The nozzle cap of claim 7, wherein:
an angle is defined between the first sensor axis and the second sensor axis; and
the angle is between 45-degrees and 180-degrees.

9. The nozzle cap of claim 7, wherein the first sensor axis is perpendicular to the second sensor axis.

10. A nozzle cap for a fire hydrant comprising:
a cap body, the cap body defining a cap axis extending from a first body end of the cap body to a second body end of the cap body; and
a vibration sensor attached to the cap body, the vibration sensor defining a sensor axis extending from a first sensor end of the vibration sensor to a second sensor end of the vibration sensor, the first sensor end contacting the cap body, the sensor axis aligned perpendicular to the cap axis.

11. The nozzle cap of claim 10, wherein the first sensor end is received by a threaded hole defined by a circumferential wall of the cap body.

12. The nozzle cap of claim 10, wherein:
the vibration sensor comprises a fastener coupled to a piezoelectric crystal; and
the fastener defines the first sensor end.

13. The nozzle cap of claim 12, wherein the fastener defines a cylindrical surface, and wherein the cylindrical surface is coaxial with the sensor axis.

14. The nozzle cap of claim 12, wherein:
the vibration sensor further comprises a base coupled to at least one calibration mass;
the piezoelectric crystal is coupled to the base; and
the at least one calibration mass defines the second sensor end.

15. The nozzle cap of claim 10, wherein:
the vibration sensor is a first vibration sensor;
the sensor axis is a first sensor axis;
the nozzle cap further comprises a second vibration sensor;
the second vibration sensor defines a second sensor axis extending from a third sensor end of the second vibration sensor to a fourth sensor end of the second vibration sensor;
the third sensor end is coupled to the cap body; and
the second sensor axis is aligned perpendicular to the cap axis.

16. The nozzle cap of claim 15, wherein:
an angle is defined between the first sensor axis and the second sensor axis; and
the angle is between 45-degrees and 180-degrees.

17. The nozzle cap of claim 15, wherein the first sensor axis is perpendicular to the second sensor axis.

18. The nozzle cap of claim 10, wherein:
the cap body defines a cavity extending inwards into the cap body from the first body end towards the second body end; and
the vibration sensor is positioned within the cavity.

19. The nozzle cap of claim 18, wherein:
the cap body defines a circumferential wall;
the circumferential wall at least partially encloses the cavity;
the vibration sensor is attached to the circumferential wall; and
the vibration sensor extends radially inwards from the circumferential wall with respect to the cap axis.

20. The nozzle cap of claim 10, wherein the cap body defines a threaded bore, and wherein the threaded bore is coaxial to the cap axis.