CLAIMS

What is claimed is:

1. A flexible cleaning lance safety apparatus comprising:

a support structure adapted to be placed on a support surface and located above an opening into an object to be cleaned;

a flexible lance drive fastened to the support structure for driving a flexible lance directing a high pressure fluid to and into the object to be cleaned;

an air operated dump valve connected to the high pressure fluid; and

one or more sensors between the support structure and the support surface connected to an air pressure supply connected to the air operated dump valve, wherein the one or more sensors are each configured to sense a predetermined force applied between the support structure and the support surface wherein when the predetermined force is sensed, the high pressure fluid in the flexible lance is diverted from the object to be cleaned via actuation of the air operated dump valve.

2. The flexible cleaning lance safety apparatus according to claim 1 wherein the support structure is a tripod.

3. The flexible cleaning lance safety apparatus according to claim 2 wherein each of the one or more sensors is a micro pressure valve connected to the air pressure supply and further comprising at least one micro pressure valve mounted between the support surface supporting the tripod and at least one leg of the tripod, wherein each micro pressure valve is connected in series with a pilot valve operable to bleed off air pressure applied to the air operated dump valve when the predetermined force is sensed.

4. The flexible cleaning lance safety apparatus according to claim 3 wherein the tripod has a micro pressure valve mounted at a foot of each leg of the tripod.

5. The flexible cleaning lance safety apparatus according to claim 1 further comprising a snout tube directing the flexible lance from the flexible lance drive to the object to be cleaned.

6. The flexible cleaning lance safety apparatus according to claim 3 further comprising a plurality of micro pressure valves connected in series with each other such that the force sensed at any one of the micro pressure valves reaching the predetermined force causes

the high pressure fluid to divert to atmosphere.

7. The flexible cleaning lance safety apparatus according to claim 5 wherein the support structure is a tripod.

8. The flexible cleaning lance safety apparatus according to claim 7 further comprising at least one micro pressure valve mounted between a support surface supporting the tripod and each leg of the tripod, wherein each micro pressure valve is connected with a pilot valve operable to quickly bleed off air pressure applied to the micro pressure valves when the predetermined force is sensed.

9. The flexible cleaning lance safety apparatus according to claim 8 wherein the at least one pilot valve operates to divert fluid pressure applied to the flexible lance to atmosphere.

10. A flexible cleaning lance safety apparatus comprising:

a tripod support structure adapted to be placed on a surface located close to an opening into an object to be cleaned;

a flexible lance drive fastened to the support structure for driving a flexible cleaning lance directing high pressure fluid to the object to be cleaned; and

one or more micro pressure valves on each leg of the tripod support structure operable to sense a predetermined force applied between the support structure and the surface and when the predetermined force is sensed, cause the high pressure fluid to be diverted to atmosphere via an air operated high pressure fluid dump valve.

11. The flexible cleaning lance safety apparatus according to claim 10 wherein each micro pressure valve is connected with a pilot valve operable to bleed off air pressure applied to the air operated high pressure water dump valve when the predetermined force is sensed.

12. The flexible cleaning lance safety apparatus according to claim 10 wherein the tripod has a micro pressure valve mounted at a foot of each leg of the tripod and wherein the micro pressure valves are connected in series.

13. The flexible cleaning lance safety apparatus according to claim 10 further comprising a snout tube directing the cleaning lance from the flexible lance drive to the object to be cleaned.

14. A flexible cleaning lance safety apparatus comprising:

a tripod support structure located close to an opening into an object to be cleaned;

a flexible lance drive fastened to the support structure for driving a lance carrying high pressure fluid to the object to be cleaned;

a snout tube directed between the lance drive and the opening, into the object to be cleaned; and

one or more micro pressure valves on at least one leg of the tripod support structure connected to an air operated high pressure fluid dump valve, wherein each of the one or more micro pressure valves is operative to sense a predetermined force applied between the support structure and a support surface supporting the tripod support structure, wherein when the predetermined force is sensed, the one or more micro pressure valves actuate to cause the high pressure fluid to be diverted from the lance and the object to be cleaned to atmosphere via the dump valve.

15. The flexible cleaning lance safety apparatus according to claim 14 wherein the micro pressure valves are connected to a pilot valve and in series with each other and wherein the pilot valve is operable to bleed off air pressure applied to the micro pressure valves when the predetermined force is sensed.

16. The flexible cleaning lance safety apparatus according to claim 14 wherein the tripod has a one of the micro pressure valves mounted at a foot of each leg of the tripod and wherein the micro pressure valves are connected in series.