

CLAIMS

1. A valve assembly for dispensing gas from a storage vessel, comprising:
a nozzle for dispensing gas from the storage vessel;
a passage having a first end in communication with said nozzle and a second end in communication with an interior volume of the storage vessel;
a shut off valve interposed in said passage for blocking or allowing gas to pass between said first end and said second end of said passage; and
a check valve secured in said nozzle.
2. The valve assembly of claim 1 wherein said check valve comprises an body defining a channel in communication with said passage and a chamber in communication with said channel, said chamber including a movable obstruction that can move into engagement with said channel to prevent fluid flow through said check valve and out of engagement with said channel to allow fluid flow through said check valve.
3. The valve assembly of claim 2 wherein said chamber has a larger lateral dimension than said channel.
4. The valve assembly of claim 2 wherein said obstruction is contained in said chamber.
5. The valve assembly of claim 2 wherein said channel is closer to said passage than said chamber.
6. The valve assembly of claim 2 wherein said channel is at a lower pressure than said chamber to bias said obstruction into engagement with said channel.
7. The valve assembly of claim 2 wherein further comprising a spring in said chamber biasing said obstruction into engagement with said channel.

8. The valve assembly of claim 1 wherein said nozzle has external threading for a male connection with a gas tube and said bore has an internal threading for female connection with an external threading of said check valve.

9. The valve assembly of claim 1 further comprising a regulator interposed in said passage for regulating the flow of gas through said passage.

10. The valve assembly of claim 1 further comprising an adsorbent in said storage vessel in communication with said passage.

11. A process for dispensing gas from a storage vessel, comprising:
biasing an obstruction in a chamber into engagement with a channel in a nozzle to prevent passage of fluid from said channel to said chamber;
communicating an interior volume of said storage vessel with said nozzle,
reducing pressure in the chamber to below the pressure in the channel sufficiently to move the obstruction out of engagement with the channel to permit passage of fluid from said channel to said chamber.

12. The process of claim 11 further comprising passing gas from the storage vessel through said passage past said obstruction and through said nozzle.

13. The process of claim 11 wherein said biasing is provided by a spring.

14. The process of claim 11 wherein said biasing is provided by differential pressure.

15. The process of claim 11 wherein reducing pressure in said chamber communicates a reduction in pressure to a flexible member that flexes to open a port to enable fluid in said storage vessel to pass through said passage.

16. The process of claim 11 wherein reducing pressure in said chamber communicates a reduction in pressure to adsorbent in said storage vessel which desorbs fluid sorbed on said adsorbent to enable fluid in said storage vessel to pass through said passage.

17. The process of claim 11 wherein said obstruction is contained in a check valve and further comprising removing said check valve from said nozzle and securing a gas tube to said nozzle to fill said storage vessel with fluid.

18. A valve assembly for dispensing gas from a storage vessel, comprising:
a nozzle for dispensing gas from the storage vessel, said nozzle defining a bore;
a passage having a first end in communication with said nozzle and a second end in communication with an interior volume of the storage vessel;

a shut off valve interposed in said passage for blocking or allowing gas to pass between said first end and said second end of said passage; and

a check valve secured in said bore, said check valve comprising an outer body defining a channel in communication with said passage and a chamber in communication with said channel, said chamber including a movable obstruction that can move into engagement with said channel to prevent fluid flow through said check valve and out of engagement with said channel to allow fluid flow through said check valve.

19. The valve assembly of claim 18 wherein said channel is at a lower pressure than said chamber to bias said obstruction into engagement with said channel.

20. The valve assembly of claim 18 wherein said nozzle has external threading for a male connection with a gas tube and said bore has an internal threading for female connection with an external threading of said check valve.