Claims

1. A portable apparatus for dispensing of a product, including:

- a product container which contains a product that is to be foamed by and dispensed from the apparatus;
- a gas container, at least containing a gas, wherein the gas substantially does not contain any greenhouse gases;
- at least two dispersion devices, each having a product entrance that is connectable to the product container for receiving product, the at least two dispersion devices further being connectable to the gas container for supplying the gas to the product during product discharge;
-a processing device downstream of the dispersion devices for performing a mixing treatment and/or pressure reduction on the product provided with the gas; and
- a product dispensing head, and being arranged downstream of the processing device, the dispensing head defining a product receiving space to receive the product from the processing device, wherein the dispersion devices are arranged for operating simultaneously.2. A portable apparatus for dispensing of a product according to claim 1,

wherein the apparatus is configured to be used at least in a substantially upside-down orientation during product discharge.

3. The apparatus according to claim 1 or 2, wherein the apparatus has a portable housing, provided with a bottom facing away from the product dispensing head, the product dispensing head being mounted or mountable to a top section of the apparatus.

4. The apparatus according to claim 3, wherein the housing is shaped to be lifted single-handed by a user.

5. The apparatus according to claim 4, wherein the housing has an elongated shape and/or has a maximum width of 10 cm at a gripping position.

6. The apparatus according to any one of claims 3-5, wherein the product container is integrated in the housing.

7. The apparatus according to claim 6, wherein the housing and respective product container have a disposable construction.

8. The apparatus according to any one of the preceding claims, including a pressurized gas supply means containing pressurized gas, for inducing gas flow and/or product flow during operation, wherein an initial pressure in the pressurized gas supply means is higher than 15 bar.

9. The apparatus according to claim 8, wherein the gas container provides the pressurized gas supply means.

10. The apparatus according to claim 8, wherein the pressurized gas supply means is separate from the gas container.

11. The apparatus according to any one of claims 8-10, wherein the pressurized gas supply means are integrated in the top section of the apparatus.

12. The apparatus according to any one of claims 8-10, wherein the pressurized gas supply means include a disposable gas cartridge configured to withstand an internal gas pressure of at least 50 bar.

13. The apparatus according to any one of claims 8-11, including control means for controlling gas flow and product flow, such that a supply of gas from the gas container to each dispersion device is started before supply of product thereto upon actuation of an operation means.

14. The apparatus according to any one of the claims 8-12, wherein an outlet of the pressurized gas supply means is sealed by a closed sealing structure, wherein the apparatus includes an opening mechanism for opening the sealing structure prior to an initial use of the gas supply means.

15. A portable apparatus for dispensing of a product, including:

- a product container which contains a product that is to be foamed by and dispensed from the apparatus;
- a gas container, at least containing a gas, wherein the gas substantially does not contain any greenhouse gases;
- a dispersion device, having a product entrance that is connectable to the product container for receiving product, the dispersion device further being

connectable to the gas container for supplying the gas to the product during product discharge;

- a processing device downstream of the dispersion device for performing a mixing treatment and/or pressure reduction on the product provided with the gas; and

- a product dispensing head, and being arranged downstream of the processing device, the dispensing head defining a product receiving space to receive the product from the processing device,

wherein the product container is integrated in a housing, the housing having a top that includes a discharge valve for discharging the product, the top of the housing further including a gas inlet for feeding propellant gas into the housing, wherein the apparatus also includes a top section that is fitted to the top of the housing, the top section including a pressurized gas supply means containing pressurized gas, for inducing gas flow and product flow during operation, wherein an outlet of the pressurized gas supply means is connectable to the gas inlet of the housing.

16. Apparatus according to claim 15, wherein the product discharge valve of the housing includes a product discharge channel and a gas discharge channel, the gas discharge channel extending in parallel with respect to the product discharge channel.

17. A portable apparatus for dispensing of a product, including:

- a product container which contains a product that is to be foamed by and dispensed from the apparatus;

- a gas container, at least containing a gas, wherein the gas substantially does not contain any greenhouse gases;

- a dispersion device, having a product entrance that is connectable to the product container for receiving product, the dispersion device further being connectable to the gas container for supplying the gas to the product during product discharge;

- a processing device downstream of the dispersion device for performing a mixing treatment and/or pressure reduction on the product provided with the gas; and
- a product dispensing head, being arranged downstream of the processing device, the dispensing head defining a product receiving space to receive the product from the processing device,

the apparatus including a pressurized gas supply means containing pressurized gas, for inducing gas flow and/or product flow during operation, wherein an initial pressure in the pressurized gas supply means is higher than 15 bar.

18. The apparatus according to any one of claims 8-14 or 17, wherein the initial pressure in the pressurized gas supply means is higher than 50 bar.

19. The apparatus according to any one of claims 8-14 or 17, wherein the initial pressure in the pressurized gas supply means is higher than 100 bar.

20. Apparatus according to any one of claim 19, wherein the pressurized gas supply means include a gas cartridge, being configured to withstand an internal gas pressure of at least 50 bar.

21. Apparatus according to claim 12, 14 or 20, wherein the gas cartridge is configured to withstand an internal gas pressure of at least 100 bar.

22. Apparatus according to claim 21, wherein the gas cartridge is configured to withstand an internal gas pressure of at least 200 bar.

23. The apparatus according to any one of claim 12, 14, or 20-22, wherein the gas cartridge is made of steel.

24. The apparatus according to claim 12, 14, or 20-23, wherein the gas cartridge has a maximum internal volume of 200 ml.

25. The apparatus according to claim 12, 14, or 20-23, wherein the gas cartridge has a maximum internal volume of 20 ml.

26. A portable apparatus for dispensing of a product according to any one of the preceding claims, wherein a distal part of the dispensing head has product shaping projections.

27. The apparatus according to any one of the preceding claims, wherein each dispersion device comprises a chamber and a gas dispersion tube.

28. The apparatus according to claim 27, wherein the gas dispersion tube is placed substantially spaced apart from an inner side of the chamber.

29. The apparatus according to any one of the preceding claims, wherein each dispersion device is a microfiltration or an ultrafiltration-type dispersion device.

30. The apparatus according to claim 29, wherein each dispersion device is provided with a wall with gas transmissive pores having a pore size in the range of 0.1 – 200 microns.

31. The apparatus according to claim 30, wherein the gas transmissive pores have a pore size in the range of at least 0.1 micron and less than 5 microns.

32. The apparatus according to any one of the preceding claims, further comprising a pressure regulation means, configured to regulate the pressure and/or ratio of product and/or gas fed to each dispersion device.

33. The apparatus according to any one of the previous claims, wherein the processing device comprises an elongated expansion channel.

34. The apparatus of claim 33, wherein the expansion channel extends along a spiral or helix trajectory.

35. The apparatus according to claim 33 or 34, wherein the expansion channel is longer than 1 cm.

36. The apparatus according to claim 35, wherein the expansion channel is longer than 10 cm.

37. The apparatus according to claim 35, wherein the expansion channel is at least 15 cm in length.

38. The apparatus according to any one of the previous claims, wherein the gas container contains substantially pure nitrogen or air or a mixture thereof.

39. The apparatus according to any one of the previous claims, wherein the product is a foodproduct.

40. The apparatus according to any one of the preceding claims, wherein the product container is a flexible bag.

41. The apparatus according to any one of the preceding claims, wherein the apparatus is configured to cooperate with a high pressure external gas reservoir for charging or recharging the gas container.

42. The apparatus according to any one of the preceding claims, wherein the apparatus includes an internal compressor, for charging or recharging the gas container.

43. Method for foaming and dispensing a product using an apparatus according to any one of the preceding claims, including:

supplying product to a dispersion device and supplying a gas to the dispersion device, wherein the gas does not contain any greenhouse gases,

wherein the product follows a first path through the dispersion device and receives the gas via the dispersion device,

wherein the product undergoes a controlled pressure reduction downstream of the dispersion device,

wherein the product follows a second path during the controlled pressure reduction that substantially deviates from the first path.

44. Method for foaming and dispensing a product, including:

supplying product to a dispersion device and supplying a first gas to the dispersion device,

wherein the first gas does not contain any greenhouse gases,

wherein the product receives the first gas via the dispersion device,

wherein the product undergoes a controlled pressure reduction downstream of the dispersion device,

wherein a second gas is used for inducing both the product flow and the flow of the first gas, the second gas being kept separate from the first gas.