producing items, particularly in view of the number of materials which may be connected and the arrangement of functional elements on a single-use bag.

Summary

According to an aspect, the present disclosure refers to a single-use container, particularly a single-use bag such as a single-use bioreactor, comprising: a base material; and at least one functional element being at least partially, preferably permanently connected with the base material, wherein the functional element is obtained by a three dimensional printing technique from at least one printable material, wherein the printable material and the base material is heated during the three dimensional printing thereby at least partly connecting the printed functional element to the base material.

According to another aspect, the present disclosure refers to a method of producing a single-use container by producing a functional element and connecting the functional element with a base material of the container, comprising the steps of: providing the base material; three dimensional printing of the functional element from a printable material on a surface of the base material; and connecting at least a portion of the functional element with at least a portion of the base material by supplying heat to the printable material and the base material simultaneously to and/or prior to at least an interval of the step of three dimensional printing.

According to yet another aspect, the present disclosure refers to an assembly device for producing a functional element and connecting the functional element with a base material to produce a single-use container, comprising: a three dimensional printing device for printing a functional element on a surface of the base material; and at least one heating device for supplying heat to the printable material and the base material during the three dimensional printing and thereby at least partly connecting the printed functional element to the base material.

Claims

1. Single-use container, particularly a single-use bag such as a single-use bioreactor, comprising:

- a base material; and
- at least one functional element being at least partially, preferably permanently connected with the base material, wherein the functional element is obtained by a three dimensional printing technique from at least one printable material, wherein the printable material and the base material is heated during the three dimensional printing thereby at least partly connecting the printed functional element to the base material.

2. Single-use container according to claim 1, wherein the base material is at least one out of:

a two dimensional film;
a stock sheet;
a pre-cut bag;
a pre-made bag, particularly a single-use bag; and
a wall element of a bag or container.

3. Single-use container according to any one of the preceding claims, wherein the functional element comprises at least one out of the following: a flange, a port, an inlet and/or outlet point, a sensor holder, a sensor or a part of a sensor, a window or a window frame, a connector, a label and/or label information, a substantially three-dimensional text, a reference marker or fiducial, a three dimensional structure and/or a three dimensional pattern, particularly a stabilizing and/or stiffening and/or reinforcement element, a tube holder, a handle, a metallic element, particularly an

electronic component.

4. Single-use container according to any one of the preceding claims, wherein the base material and/or the functional element and/or the printable material comprises at least one of: PE, EVA, , ABS, PC, PMMA, PLA, PES, PSU, POM, PEEK, PEI, PPO, PP, PET, PS, PA , PTFE, PU, TPE, silicone, fluoropolymers, copolyesters, acrylic.

5. Single-use container according to any one of the preceding claims, wherein the three dimensional printing technique comprises a fused filament fabrication, a drop-by-drop application of the printable material and/or a layer-by-layer application of the printable material.

6. Single-use container according to any one of the preceding claims, wherein the three dimensional printing technique further comprises printing from a nanoparticle ink and/or spraying atomised metal and/or melting a metal powder and/or aerosol jetting an electronic component.

7. Method of producing a single-use container by producing a functional element and connecting the functional element with a base material of the container, comprising the steps of:

- providing the base material;
- three dimensional printing of the functional element from a printable material on a surface of the base material; and
- connecting at least a portion of the functional element with at least a portion of the base material by supplying heat to the printable material and the base material simultaneously to and/or prior to at least an interval of the step of three dimensional printing.

8. Method according to claim 7, wherein the step of supplying heat comprises the step of pre-heating the base material.

9. Method according to claim 7 or 8, wherein the step of three dimensional printing of the functional element comprises a step of printing from printable material, at least one of: acrylics, EVA, ABS, PC, PE, PMMA, PLA, PES, POM, PEEK, PEI, PP, PS, PTFE.

10. Method according to any one of claims 7 to 9, wherein the step of three dimensional printing comprises the step of printing from a nanoparticle ink and/or spraying atomised metal and/or melting a metal powder and/or aerosol jetting an electronic component.

11. Method according to any one of claims 7 to 10, further comprising the step of removing a portion of the base material and/or removing an excess portion of the functional element.

12. Method according to any one of claims 7 to 11, wherein the three dimensional printing of the functional element comprises a fused filament fabrication, a drop-by-drop application of the printable material and/or a layer-by-layer application of the printable material.

13. Method according to any one of claims 7 to 12, further comprising

- removing, particularly for cutting away excess material from either the functional element and/or the base material; and
- at least partly recycling the excess material being removed by particularly reusing it in the three dimensional printing step and/or in a step of manufacturing the base material.

14. Assembly device for producing a functional element and connecting the functional element with a base material to produce a single-use container, comprising:

- a three dimensional printing device for printing a functional element on a surface of the base material; and
- at least one heating device for supplying heat to the printable material and

the base material during the three dimensional printing and thereby at least partly connecting the printed functional element to the base material.

15. Assembly device according to claim 14, further comprising means for providing and positioning the base material, preferably a conveyor belt, and optionally the assembly device is configured to provide the base material from a roll.

16. Assembly device according to any one of claims 14 or 15, further comprising

- means for removing, particularly for cutting away excess material from either the functional element and/or the base material; and
- means for at least partly recycling the excess material being removed, particularly comprising means for heating and providing the excess material, being removed, to the three dimensional printing device and/or to a system which manufactures the base material.