Claims

1. Method for forming a balloon comprising the steps of:
(a) providing a preform (5) having a circumferential wall that encloses an internal space (I) of the preform (5),
(b) pre-heating the preform (5) to a shaping temperature by passing a heated gas or fluid via an inlet (5d) of the preform (5) into said internal space (I), and
(c) shaping the pre-heated preform (5) into a balloon.

2. Method according to claim 1, **characterized in that** the step of providing said preform (5) corresponds to providing a tool comprising a tube (6) extending in an axial direction (A), a first and an opposing second cone (4, 7) facing each other in the axial direction (A), and arranging said preform (5) in said tool, such that the preform (5) extends in the axial direction (A) through the first cone (4), the tube (6) and the second cone (7) and is surrounded by the first cone (4), the tube (6) and the second cone (7).

3. Method according to claim 1 or 2, **characterized in that** a first end section (5a) of the preform (5) comprising said inlet (5d) is held by a first clamping device (3) such that said heated gas or fluid can be passed into the preform (5) via said inlet (5d).

4. Method according to one of the preceding claims, **characterized in that** heating of the gas or fluid is performed outside said tool (6, 4, 7) in a first heater (2), particularly upstream said first clamping device (3).

5. Method according to claim 2 or according to one of the claims 3 to 4 when referring to claim 2, **characterized in that** a second end section (5b) of the preform (5), which second end section (5b) protrudes out of the second cone (7) and comprises an outlet (5e) of the perform (5), is held by a second clamping device (10), wherein particularly the second clamping device (10) is in an open state upon pre-heating of the preform (5) in step (b) so that the gas or fluid passed into the internal space (I) of the preform (5) exits the preform (5) through said outlet (5e).

6. Method according to one of the claims 1 to 4, **characterized in that** a second end section (5b) of the preform (5) comprising an outlet (5e) of the preform (5) is held by a second clamping device (10) and the heated gas or fluid flow from the preform (5) is reduced by a counter pressure in outlet (5e).

7. Method according to claim 6, **characterized in that** heating of the gas or fluid passed into the internal space of the preform (5) via outlet (5e) is performed outside said tool (6, 4, 7) in a second heater (11), particularly upstream said second clamping device (10).

8. Method according to claim 2 and according to claim 3 or one of the claims 4 to 7 when referring to claim 3, **characterized in that** the first cone (4) is integrated into the first clamping device (3).

9. Method according to one of the preceding claims, **characterized in that** shaping the preform (5) into a balloon in step (c) comprises applying a tension to the preform (5) to stretch the pre-form in the axial direction (A).

10. Method according to claim 2 and one of the claims 3 to 9 when referring to claim 2, **characterized in that** shaping the preform (5) into a balloon in step (c) comprises passing gas or fluid into the internal space (I) of the pre-heated preform (5) via said inlet (5d) to apply a pressure in the internal space of the preform (5) such that the pre-heated preform (5) expands radially and axially until it contacts the tube (6) and said cones (4, 7) to form the balloon.

11. Method according to claims 7 and 10, **characterized in that** shaping the preform (5) into a balloon in step (c) also comprises reducing the flow by applying a counter pressure to the end of the preform (5) via outlet (5e).

12. Method according to claim 2 or according to claim 5 or one of the claims 6 to 10 when referring to claim 5, **characterized in that** upon shaping the preform (5) into a

balloon in step (c) by passing gas or fluid into the internal space (I) of the pre-heated preform (5), the preform (5) is closed at the second end section (5b) by the second clamping device (10) so that said gas or fluid cannot exit the preform (5) via said outlet (5e).

13. Method according to one of the preceding claims, **characterized in that** in order to locate a spot at which shaping of the preform (5) starts on a section of the preform (5) that is arranged in the tool (6, 4, 7), at least one of the following steps is conducted:
    - mechanically stretching a region of said section,
    - locally heating a region of said section,
    - adjusting the temperature of the tool (6, 4, 7) to a level below the melt temperature of the balloon material,
    - heating the first cone (4) using a separate heater (20) in order to heat a section of the preform (5) that is arranged in the first cone (4), wherein particularly this section is heated to a temperature at which an expansion pressure in the internal space (I) of the preform (5) that leads to a radial expansion of said section of the preform (5) towards the tapered inside (4a) of the first cone (4) is smaller than a pressure needed for further axial expansion of the preform (5).

14. Method according to claim 2 or one of the claims 3 to 13 when referring to claim 2, **characterized in that** the axial direction (A) extends horizontally or vertically.

15. Device (100) for shaping a balloon, comprising:
    - a tool (6, 4, 7) for receiving a preform (5) that is to be shaped into a balloon,
    - at least a first clamping device (3) for holding a first end section (5a) of the preform (5) when the preform (5) is arranged in said tool (6, 4, 7),
    - at least a first heater (2) configured to heat a gas or a fluid, wherein the first heater (2) is in flow connection with the first clamping device (3) such that a gas or fluid heated by the first heater (2) can be passed into an internal space (I) of the preform (5) via an inlet of the preform (5) at the first end section (5a) of the

preform (5) for pre-heating the preform (5) when the first end section (5a) is held by the first clamping device (3).