claims, and in particular of the independent claims. Thus, as a person skilled in the art will appreciate, the invention can also be carried out using other embodiments. In a similar way, features that are introduced by "in one embodiment of the invention" or by "in one exemplary embodiment of the invention" are understood to be optional features, without it being intended that alternative embodiments or the scope of protection of the independent claims are/is restricted thereby. Furthermore, all of the possibilities of combining the features thereby introduced with other features, whether optional or non-optional features, are intended to remain unaffected by these introductory expressions.

In a first aspect, the present invention relates to a method for producing a molded body wherein the molded body comprises a micro-optical component having cavities or protruding structures on the surface of the molded body. In this respect, the method according to the invention comprises the following steps a) to d), which are preferably carried out in the sequence indicated, it also being possible for successive steps to be carried out at least partially at the same time. They can also be supplemented by further steps which may be carried out before, after and/or during one of the steps indicated:

a) providing a molding tool which has structures provided with undercuts giving rise in the molded body to cavities or protruding structures on the surface of the molded body, wherein the molding tool has at least one receptacle in which at least one material is being introduced, wherein the material comprises at least one shape-memory material, wherein the shape-memory material is present in a first state, wherein the material at least partially fills the receptacle of the molding tool in such a manner that said material adjoins at least one surface of the receptacle;

b) creating a molded body in the receptacle of the molding tool from the material, wherein the shape-memory material is present in a second state, wherein a form is embossed into the molded body during the second state;

c) transferring the shape-memory material from the second state to a third state, wherein the molded body ~~can be~~is deformed during the third state in such a manner that the molded body is demolded in demolding direction from the receptacle of the molding tool; and

d) at least partially restoring the form of the molded body by transferring the shape-memory material from the third state to a fourth state, wherein the molded body at least partially resumes the form according to step b) during the fourth state.

The present method therefore consists in a close coordination of properties of the shape-memory material with the proposed method steps. In this respect, the term "shape-memory material" describes a solid body which has what is known as the "shape-memory effect", which has the effect that the solid body can change its external form either autonomously or

by virtue of outside action. Shape-memory materials are generally available and known to a person skilled in the art, see e.g. Angew. Chem. 114, 2002, pp. 2138 to 2162.

The shape-memory materials thus have at least two states of the solid body that are different

Claims

1. A method for producing a molded body, wherein the molded body comprises a micro-optical component having cavities or protruding structures on the surface of the molded body, the method comprising the following steps:
   a) providing a molding tool which has structures provided with undercuts giving rise in the molded body to cavities or protruding structures on the surface of the molded body, wherein the molding tool has at least one receptacle in which at least one material is being introduced, wherein the material comprises at least one shape-memory material, wherein the shape-memory material is present in a first state, wherein the material at least partially fills the receptacle of the molding tool in such a manner that said material adjoins at least one surface of the receptacle;
   b) creating a molded body in the receptacle of the molding tool from the material, wherein the shape-memory material is present in a second state, wherein a form is embossed into the molded body during the second state;
   c) transferring the shape-memory material from the second state to a third state, wherein the molded body ~~can be~~is deformed during the third state in such a manner that the molded body is demolded in demolding direction from the receptacle of the molding tool; and
   d) at least partially restoring the form of the molded body by transferring the shape-memory material from the third state to a fourth state, wherein the molded body at least partially resumes the form according to step b) during the fourth state.

~~2. The method according to the preceding claim, wherein the material provided during step a) comprises at least one shape-memory material or at least one starting material, wherein the starting material is transferred at least partially into the at least one shape-memory material before step b).~~

~~3~~2. The method according to either of the preceding claims, wherein the material provided during step a) comprises non-magnetic particles which are selected from microparticles or nanoparticles.

~~4~~3. The method according to the preceding claim, wherein the particles comprise carbon, silicon dioxide and/or a metal.

~~5~~4. The method according to either of the two preceding claims, wherein the particles are optically active.

~~6~~5. The method according to one of the preceding claims, wherein, during step a) and/or from step a) to step b) and/or during step b), the shape-memory material is transferred from the first state to the second state.

~~7~~6. The method according to the preceding claim, wherein the shape-memory material is transferred from the first state to the second state by virtue of subjecting the molded body to an elevated temperature in comparison with the first state.

~~8~~7. The method according to one of the preceding claims, wherein the shape-memory material is transferred from the second state to a third state during step c) by virtue of exposing the molded body to light, by virtue of subjecting the molded body to a reduced temperature in comparison with the second state or by virtue of subjecting the molded body to a reduced degree of action of force in comparison with the second state.

~~9~~8. The method according to one of the preceding claims, wherein the shape-memory material is transferred into the fourth state during step d) by virtue of exposing the molded body to light, by virtue of subjecting the molded body to a changed temperature in comparison with the third state or by virtue of leaving the molded body under standard conditions.

~~10~~9.The method according to one of the preceding claims, wherein the molded body, after a further deformation of the form that took place following step d) by virtue of transferring the shape-memory material into the fourth state again, at least partially resumes the form.

~~11. The method according to one of the preceding claims, wherein the shape memory material is selected from a temperature-sensitive shape-memory material.~~

~~12. The method according to one of the preceding claims, wherein the shape-memory material is selected from a shape-memory polymer.~~

~~13~~10. The method according to ~~the preceding~~ claim 1, wherein the shape-memory polymer is ~~selected from~~ a thermoplastic polyurethane ~~or a liquid crystal polymer~~.

11. The method of claim 1, wherein the method comprises a process of hot stamping or a process of thermal nanoimprinting.

12. The method of claim 1, wherein at least one negative form in the molding tool that is determined by the at least one receptacle is reproduced dimensionally accurately on the

molded body to be produced.

~~14~~13. A molded body comprising a micro-optical component having cavities or protruding structures on a surface of the molded body, wherein the molded body is ~~which can be~~ obtained by ~~a~~ the method according to any one of the preceding claims.

~~15~~14. The molded body according to the preceding claim, wherein the molded body has at least one undercut or at least one structure with an aspect ratio of at least 10.