Patent claims

1. A method for manufacturing a component of a rotary machine, the component extending in an axial direction as well as in a radial direction perpendicular to the axial direction, the component having at least one inner channel which extends from a first end at a core of a center of the component, to a second end at a radial limiting surface of the component, the at least one inner channel having an at least partially closed cross-section, comprising the following steps:
   - providing a blank comprising the core of the component, wherein the blank is limited by an outer surface in the radial direction;
   - processing the blank using a first subtractive manufacturing process step in such a manner that(i) an outer contour is formed on the outer surface which extends at least in the radial direction and (ii) a radially-inner part of the at least one inner channel is formed which at least partially extends radially in the blank to the first end; and
   - subsequently processing the blank using an additive manufacturing process in such manner that a radially-outer part of the at least one inner channel is finished which at least partially extends radailly away from the blank to the second end at the limiting surface of the component.

2. The method according to claim 1, wherein the outer contour comprises parts of a cover plate of the component and / or parts of a shroud of the component.

3. The method according to claim 1 or 2, wherein the additive manufacturing process is performed layer by layer, at least in a direction perpendicular to the axial direction.

4. The method according to anyone of the preceding claims, wherein the additive manufacturing process is performed layer by layer in the axial direction.

5. The method according to anyone of the preceding claims, wherein the additive manufacturing process is performed layer by layer in a peripheral direction of the outer surface of the blank and extending at an angle relative to the radial direction.

6. The method according to anyone of the preceding claims, wherein the component is manufactured with a plurality of said inner channels, with each inner channel extending from its first end from the core of the component to its second end at the radial limiting surface of the component, wherein adjacent ones of the inner channels are respectively separated by a separating wall.

7. The method according to anyone of the preceding claims, wherein the blank has a central bore formed before the first subtractive manufacturing process step, which bore is arranged radially inwardly such that in the finished state of the component the or each of the first end(s) of the inner channel(s)is/are arranged in the center, separated from the central bore by an annular body.

8. The method according to anyone of the preceding claims, wherein the additive manufacturing process comprises several additive process steps to successively build up the component.

9. The method according to claim 8, wherein at least one further subtractive manufacturing process step is performed between the additive process steps.

10. The method according to claim 6, wherein the component is built up part by part after the first subtractive process step, and wherein first of all only each separating walls are completed.

11. The method according to anyone of the preceding claims, wherein the additive manufacturing process is performed using a laser.

12. The method according to anyone of the preceding claims, wherein the component obtained is one of an impeller, a guide wheel and a diffusor of a rotary machine selected from a pump, a turbine, a compressor, a compactor and an expander.

13. A method for repairing a component of a rotary machine, the component extending in an axial direction as well as in a radial direction perpendicular to the axial direction, the component comprising a plurality of inner channels, each of which extends from a first end at a center of the component to a second end at a radial limiting surface of the component, wherein adjacent ones of the inner channels are respectively separated by a separating wall, comprising the following steps:
- identifying one or more damaged areas of the component at one or more of the limiting surface, one or more of the channels and one or more of the separating walls;
- manufacturing a blank from the component by a machining removal process or by a separating removal process of the one or more damaged areas, the blank comprising a core of the center of the component; and
replacing one or more of the removed damaged areas by an additive manufacturing process on the blank such as to obtain a repaired component; wherein
- the blank is subtractively processed in a first subtractive process step in such a manner, that(i) an outer contour is elaborated in the area of a radial

outer surface of the blank, which contour extends at least in the radial direction , and (ii) then new inner channel portions radially outward from the blank are fformed using the additive manufacturing process on the blank.

14. The method for manufacturing or a method for repairing a component according to anyone of the preceding claims, wherein at least one material is used for the additive manufacturing process, the material being different from the material the blank consists of.