CLAIMS

1. A diaphragm bellows comprising a plurality of diaphragms with outer edges and inner edges, said diaphragms follow one another in an axial direction of a longitudinal center axis of the diaphragm bellows and are welded together alternately in a region of said inner edges and in a region of said outer edges and first and second end diaphragms form first and second ends of the diaphragm bellows, and at least one guide part adapted for guiding on an outer surface of a rod passing through an inner through-opening in the diaphragm bellows, the at least one guide part is made of sheet metal and includes a holding portion which is located, in a region of an outer edge thereof, between adjacent ones of the diaphragms and is welded to said adjacent diaphragms only in the outer edge region and, starting from the outer edge of the holding portion, extends toward the longitudinal center axis of the diaphragm bellows and projects beyond the inner edges of said adjacent diaphragms in a direction toward the longitudinal center axis of the diaphragm bellows and is connected to a guide portion, located closer to the longitudinal center axis of the diaphragm bellows than the inner edges of said adjacent diaphragms, adapted for guiding on the outer surface of the rod passing through the inner through-opening in the diaphragm bellows, and the guide portion surrounds the longitudinal center axis as a sleeve, wherein the holding portion as well as the guide portion are located, with respect to the axial direction, between the first and second end diaphragms and are axially distanced from the first and second ends of the diaphragm bellows in the diaphragm bellows non-compressed state.

2. A diaphragm bellows comprising a plurality of diaphragms with outer edges and inner edges, said diaphragms follow one another in an axial direction of a longitudinal center axis of the diaphragm bellows and are welded together alternately in a region of said inner edges and in a region of said outer edges and

first and second end diaphragms form first and second ends of the diaphragm bellows, and at least one guide part adapted for guiding on an inner surface of a tube surrounding the diaphragm bellows, the at least one guide part is made of sheet metal and includes a holding portion which is located, in a region of an inner edge thereof, between adjacent ones of the diaphragms and is welded to said adjacent diaphragms only in the region of the inner edge and, starting from an inner edge of the holding part, extends away from the longitudinal center axis of the diaphragm bellows and projects beyond the outer edges of said adjacent diaphragms in a direction away from the longitudinal center axis of the diaphragm bellows and is connected to a guide portion, located farther away from the longitudinal center axis of the diaphragm bellows than the outer edges of said adjacent diaphragms, adapted for guiding on the inner surface of the tube surrounding the diaphragm bellows, and the guide portion surrounds the longitudinal center axis as a sleeve, wherein the holding portion as well as the guide portion are located, with respect to the axial direction, between the first and second end diaphragms and are axially distanced from the first and second ends of the diaphragm bellows in the diaphragm bellows non-compressed state.

3. The diaphragm bellows as claimed in claim 1, wherein a thickness of the holding portion of the guide part is less than five times a thickness of the diaphragms between which the holding portion of the guide part is arranged.

4. The diaphragm bellows as claimed in claim 3, wherein the thickness of the holding portion of the guide part is less than three times the thickness of the diaphragms between which the holding portion of the guide part is arranged.

5. The diaphragm bellows as claimed in claim 1, wherein a thickness of the guide portion of the guide part is less than five times a thickness of the diaphragms

between which the holding portion of the guide part, to which the guide portion is connected, is arranged.

6. The diaphragm bellows as claimed in claim 5, wherein the thickness of the guide portion of the guide part is less than three times the thickness of the diaphragms between which the holding portion of the guide part, to which the guide portion is connected, is arranged.

7. The diaphragm bellows as claimed in claim 1, wherein the guide portion is configured in a material-integral manner with the holding portion or with at least an individual part of the holding portion, or is cohesively connected to the holding portion.

8. The diaphragm bellows as claimed in claim 1, wherein the diaphragms, located on both sides of the holding portion of the guide part, and the holding portion rest against one another in a completely compressed state of the diaphragm bellows.

9. The diaphragm bellows as claimed in claim 1, wherein the guide portion of the guide part has a central opening of which a diameter is at least 80% of a diameter of central openings in the diaphragms located on both sides of the holding portion of the guide part.

10. The diaphragm bellows as claimed in claim 1, wherein the diaphragm bellows has at least two guide parts.

11. The diaphragm bellows as claimed in claim 10, wherein the guide parts that follow one another in the axial direction of the longitudinal center axis of the diaphragm bellows are spaced apart from one another in the axial direction of the

longitudinal center axis even in a completely compressed state of the diaphragm bellows.

12. An arrangement comprising a diaphragm bellows having an inner through-opening and a rod passing through the inner through-opening in the diaphragm bellows, the diaphragm bellows comprising a plurality of diaphragms with outer edges and inner edges, said diaphragms that follow one another in an axial direction of the longitudinal center axis of the diaphragm bellows being welded together alternately in a region of said inner edges and in a region of said outer edges and first and second end diaphragms form first and second ends of the diaphragm bellows, and at least one guide part that guides the diaphragm bellows on an outer surface of the rod which passes through the inner through-opening in the diaphragm bellows, the at least one guide part is made of sheet metal and has a holding portion which is located, in a region of an outer edge thereof, between adjacent ones of the diaphragms and is welded to said adjacent diaphragms only in the outer edge region and, starting from the outer edge of the holding portion, extends toward the longitudinal center axis of the diaphragm bellows and projects beyond the inner edges of said adjacent diaphragms in a direction toward the longitudinal center axis of the diaphragm bellows and is connected to a guide portion, located closer to the longitudinal center axis of the diaphragm bellows than the inner edges of said adjacent diaphragms, that guides the diaphragm bellows on the outer surface of the rod, and the guide portion surrounds the longitudinal center axis as a sleeve, wherein the holding portion as well as the guide portion are located, with respect to the axial direction, between the first and second end diaphragms and are axially distanced from the first and second ends of the diaphragm bellows in the diaphragm bellows non-compressed state.

13. The arrangement as claimed in claim 12, wherein the guide portion of the at

least one guide part surrounds the rod with a clearance in a range from 0.02 mm to 1 mm, in order to form a sliding guide for the guide portion with respect to the rod.

14. An arrangement comprising a diaphragm bellows and a tube, surrounding the diaphragm bellows, having an inner surface, the diaphragm bellows comprising a plurality of diaphragms that follow one another in an axial direction of a longitudinal center axis of the diaphragm bellows that are welded together alternately in a region of inner edges thereof and in a region of outer edges thereof and first and second end diaphragms form first and second ends of the diaphragm bellows, and at least one guide part for guiding the diaphragm bellows on the inner surface of the tube surrounding the diaphragm bellows, the at least one guide part is made of sheet metal and has a holding portion which is located, in a region of an inner edge thereof, between adjacent ones of the diaphragms of the diaphragm bellows and is welded to said adjacent diaphragms only in the region of the inner edge and, starting from the inner edge of the holding portion, extends away from the longitudinal center axis of the diaphragm bellows and projects beyond the outer edges of said adjacent diaphragms in a direction away from the longitudinal center axis of the diaphragm bellows and is connected to a guide portion, located farther away from the longitudinal center axis of the diaphragm bellows than the outer edges of said adjacent diaphragms, for guiding the diaphragm bellows on an inner surface of the tube, and the guide portion surrounds the longitudinal center axis as a sleeve, wherein the holding portion as well as the guide portion are located, with respect to the axial direction, between the first and second end diaphragms and are axially distanced from the first and second ends of the diaphragm bellows in the diaphragm bellows non-compressed state.

15. The arrangement as claimed in claim 14, wherein the tube surrounds the guide portion of the at least one guide part with a clearance in a range from 0.02 mm to 1

mm, in order to form a sliding guide for the guide portion with respect to the tube.

16. The diaphragm bellows as claimed in claim 2, wherein a thickness of the holding portion of the guide part is less than five times a thickness of the diaphragms between which the holding portion of the guide part is arranged.

17. The diaphragm bellows as claimed in claim 2, wherein a thickness of the guide portion of the guide part is less than five times a thickness of the diaphragms between which the holding portion of the guide part, to which the guide portion is connected, is arranged.

18. The diaphragm bellows as claimed in claim 2, wherein the guide portion is configured in a material-integral manner with the holding portion or with at least an individual part of the holding portion, or is cohesively connected to the holding portion.

19. The diaphragm bellows as claimed in claim 2, wherein the diaphragms, located on both sides of the holding portion of the guide part, and the holding portion rest against one another in a completely compressed state of the diaphragm bellows.

20. The diaphragm bellows as claimed in claim 2, wherein the diaphragm bellows has at least two guide parts.

21. The diaphragm bellows as claimed in claim 20, wherein the guide parts that follow one another in the axial direction of the longitudinal center axis of the diaphragm bellows are spaced apart from one another in the axial direction of the longitudinal center axis even in a completely compressed state of the diaphragm bellows.

22. The diaphragm bellows as claimed in claim 1, wherein the guide portion extends axially inside a plurality of the diaphragms.

23. The diaphragm bellows as claimed in claim 2, wherein the guide portion extends axially outside of a plurality of the diaphragms.