Patent claims

Pump arrangement comprising a plain bearing arrangement

1. A pump arrangement, in particular magnetic clutch pump arrangement, having an interior space formed by a pump casing of the pump arrangement, having a containment can which hermetically seals off a chamber surrounded by said containment can with respect to the interior space formed by the pump casing, having an impeller shaft which is mounted by way of a plain bearing arrangement and which can be driven in rotation about an axis of rotation, having an impeller arranged on one end of the impeller shaft, having a first bearing sleeve connected rotationally conjointly to the impeller shaft, having a second bearing sleeve connected rotationally conjointly to the impeller shaft, having a first bearing bushing which interacts by way of a radial bearing surface with the first bearing sleeve and which is connected rotationally conjointly to the pump casing or to a component fastened to the pump casing, having a second bearing bushing which interacts by way of a radial bearing surface with the second bearing sleeve and which is connected rotationally conjointly to the pump casing or to a component fastened to the pump casing, and having a retaining ring arranged between the first and second bearing bushings,

characterized in that

a first ring groove (32), which receives a first axial bearing ring (33), is formed in the retaining ring (31) on the face side facing toward the first bearing bushing (27), and a second ring groove (34), which receives a second axial bearing

ring (35), is formed in the retaining ring (31) on the face side facing toward the second bearing bushing (39).

2. The pump arrangement as claimed in claim 1, characterized in that the first bearing sleeve (26) and the first bearing bushing (27) are arranged in an opening (15) of the casing cover (4).

3. The pump arrangement as claimed in claim 1 or 2, characterized in that the first axial bearing ring (33) is clamped in the first ring groove (32) by way of an undular washer (36), and the second axial bearing ring (35) is clamped in the second ring groove (34) by way of an undular washer (37).

4. The pump arrangement as claimed in one of claims 1 to 3, characterized in that, in the retaining ring (31), there is formed at least one bore (61) which connects the first ring groove (32) to a further ring groove (62) formed in the retaining ring (31) in a region facing toward the impeller shaft (13).

5. The pump arrangement as claimed in one of claims 1 to 4, characterized in that, in the retaining ring (31), there is formed at least one bore (63) which connects the second ring groove (34) to the ring groove (62) formed in the retaining ring (31) in the region facing toward the impeller shaft (13).

6. The pump arrangement as claimed in one of claims 1 to 5, characterized in that the opening (15) in a casing cover (4) of the pump casing (2) has an opening region (28) of increased diameter, in which opening region there is formed an encircling groove (30) which receives a tolerance ring (29), and in which opening region the first bearing

bushing (27) is positioned and connected rotationally conjointly to the casing cover (4) by way of the tolerance ring (29).

7. The pump arrangement as claimed in one of claims 1 to 6, characterized in that an opening (51) in a bearing ring carrier (47) has an opening region (52) of increased diameter, in which opening region there is formed an encircling groove (54) which receives a tolerance ring (53), and in which opening region the second bearing bushing (39) is accommodated and connected rotationally conjointly to the bearing ring carrier (47) by way of the tolerance ring (53).

Patent claims

1. A pump arrangement, in particular magnetic clutch pump arrangement, having an interior space formed by a pump casing of the pump arrangement, having a containment can which hermetically seals off a chamber surrounded by said containment can with respect to the interior space formed by the pump casing, having an impeller shaft which is mounted by way of a plain bearing arrangement and which can be driven in rotation about an axis of rotation, having an impeller arranged on one end of the impeller shaft, having a first bearing sleeve connected rotationally conjointly to the impeller shaft, having a second bearing sleeve connected rotationally conjointly to the impeller shaft, having a first bearing bushing which interacts by way of a radial bearing surface with the first bearing sleeve and which is connected rotationally conjointly to the pump casing or to a component fastened to the pump casing, having a second bearing bushing which interacts by way of a radial bearing surface with the second bearing sleeve and which is connected rotationally conjointly to the pump casing or to a component fastened to the pump casing, and having a retaining ring arranged between the first and second bearing bushings, wherein
a first ring groove (32), which receives a first axial bearing ring (33), is formed in the retaining ring (31) on the face side facing toward the first bearing bushing (27), and a second ring groove (34), which receives a second axial bearing ring (35), is formed in the retaining ring (31) on the face side facing toward the second bearing bushing (39),
characterized in that the first bearing sleeve (26) and the first bearing bushing (27) are arranged in an opening (15) of the casing cover

(4) and in that the opening (15) has an opening region (28) of increased diameter, in which opening region there is formed an encircling groove (30) which receives a tolerance ring (29), and in which opening region the first bearing bushing (27) is positioned and connected rotationally conjointly to the casing cover (4) by way of the tolerance ring (29).

2. The pump arrangement as claimed in claim 1, characterized in that the first axial bearing ring (33) is clamped in the first ring groove (32) by way of an undular washer (36), and the second axial bearing ring (35) is clamped in the second ring groove (34) by way of an undular washer (37).

3. The pump arrangement as claimed in claim 1 or 2, characterized in that, in the retaining ring (31), there is formed at least one bore (61) which connects the first ring groove (32) to a further ring groove (62) formed in the retaining ring (31) in a region facing toward the impeller shaft (13).

4. The pump arrangement as claimed in one of claims 1 to 3, characterized in that, in the retaining ring (31), there is formed at least one bore (63) which connects the second ring groove (34) to the ring groove (62) formed in the retaining ring (31) in the region facing toward the impeller shaft (13).

5. The pump arrangement as claimed in one of claims 1 to 4, characterized in that an opening (51) in a bearing ring carrier (47) has an opening region (52) of increased diameter, in which opening region there is formed an encircling groove (54) which receives a tolerance ring (53), and in which opening region the second bearing bushing (39) is accommodated and connected rotationally conjointly

to the bearing ring carrier (47) by way of the tolerance ring (53).