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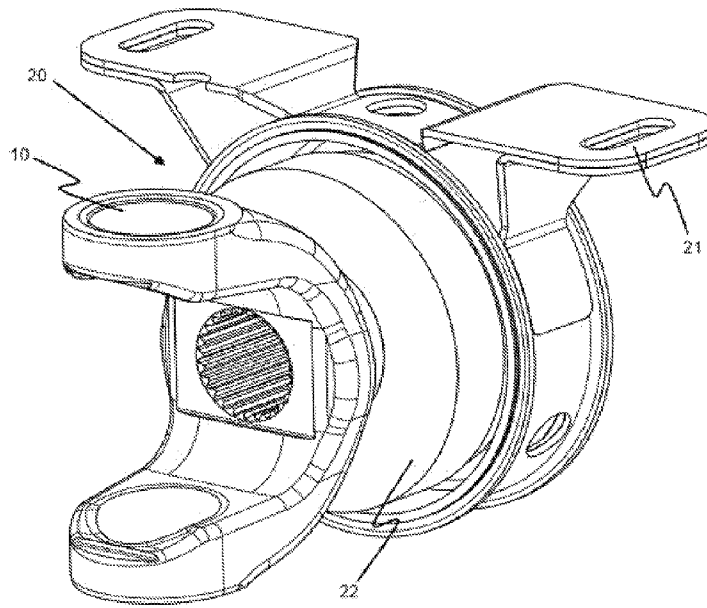


Fig.1

(57) **Abstract:** The invention relates to a mechanical embodiment (20) comprises a transmitter coil (30) and a receiver coil (40) located to provide wireless power transmission on cardan shaft. In order to perform wireless power transmission on cardan shaft uninterruptedly, the mechanical embodiment (20) further comprises a center bearing (21) located on cardan shaft, a fixed coil support (23) carrying transmitter coil (30) and located on said center bearing (21) in such manner that it does not contact rotary components of the cardan shaft and thus ensuring fixing, a rotary coil support (24) supporting the receiver coil (40) and located on the cardan shaft to rotate together with the cardan shaft, a protector (22) carrying an electronic circuit supplied by said coils (30, 40) and located on the center bearing (21) in a manner surrounding the fixed coil support (23) and the rotary coil support (24).



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A MECHANICAL EMBODIMENT PROVIDING CONTINUOUS WIRELESS POWER TRANSMISSION ON CARDAN SHAFT

THE RELATED ART

5 The invention relates to fixed and rotary coils located in order to supply uninterrupted wireless power supply on cardan shaft and a mechanical embodiment hosting an electronic circuit supplied by said coils.

The invention also relates to a mechanical embodiment providing permanent adaptation of wireless data and power transmission elements onto cardan shaft in
10 order to provide uninterrupted data transfer on cardan shaft.

BACKGROUND OF THE RELATED ART

In current related art wireless data transmission method is used to measure parameters such as temperature, torque, cycle etc. on the rotary mechanical
15 components. For this purpose an electronic circuit performing transfer of data measured on the rotary mechanical components and receiver and transmitter coils providing wireless power transmission to such electronic circuit are used.

The prior art is not able to apply onto cardan shaft permanently due to need for placement of a fixed transmitter coil supplied from a permanent power supply away
20 from cardan shaft, onto a rotary mechanical component. Permanent case means the status of being on cardan shaft continuously and becoming part of it.

In the prior art transmitter coil has to be placed on a fixed place away from cardan shaft. Receiver coil is placed onto the cardan shaft. For that reason, collection of data on cardan shaft can only be possible by means of adding the above mentioned
25 components onto cardan shaft temporarily.

Therefore, there is no system having both fixed and rotary coils permanently on the cardan shaft and providing continuous power transmission.

In conclusion, the problems mentioned above and not solved in the light of related art have necessitated novelty in the related art.

BRIEF DESCRIPTION OF THE INVENTION

The invention relates to a mechanical embodiment having wireless power transmission components onto it to eliminate the above mentioned disadvantages and bring some new advantages in the related art.

Main purpose of the invention is to make the wireless power transmission components one of the parts constituting cardan shaft product and disclose a mechanical embodiment providing data transmission on cardan shaft.

Another purpose of the invention is to provide a mechanical embodiment enabling operation of wireless power transmission components without being affected by environmental conditions.

A further purpose of the invention is to disclose a mechanical embodiment having a light and compact structure providing adaptation of wireless power transmission components onto cardan shaft permanently.

In order to achieve all of the purposes mentioned above and to be stated in the following detailed description, the invention relates to a transmitter coil and a receiver coil located to provide wireless power transmission on cardan shaft and a mechanical embodiment hosting an electronic circuit supplied by said coils. In order to perform uninterrupted power transmission on cardan shaft the mechanical embodiment comprising

- a center bearing located on cardan shaft,
- a fixed coil support carrying transmitter coil and located on said center bearing in such manner that it does not contact with rotary components of the cardan shaft and thus ensuring the transmitter coil to be fixed,
- a rotary coil support carrying receiver coil and located on the cardan shaft,
- a protector having electronic circuit and located on the center bearing in such manner that it surrounds fixed coil support and rotary coil support.

In order to make the embodiment and additional members being subject of the present invention as well as the advantages clearer for better understanding, it should be assessed with reference to the following described figures.

BRIEF DESCRIPTION OF FIGURES

Figure 1 is a rear view of mechanical embodiment of the invention showing adaptation of it onto a cardan shaft.

- 5 Figure 2 is a front view of mechanical embodiment of the invention showing adaptation of it onto a cardan shaft.

Figure 3 is a view of mechanical embodiment of the invention showing adaptation of it onto a cardan shaft.

- 10 Figures 4a, 4b, 4c are views of fixed coil support, rotary coil support and protector respectively.

Figure 5 is a cross-section view of mechanical embodiment of the invention showing adaptation of it onto a cardan shaft.

Figure 5a is a detailed cross-section view of mechanical embodiment of the invention showing adaptation of it onto a cardan shaft.

- 15 Figure 6 is a perspective exploded view of the mechanical embodiment being subject of the invention,

Figure 7 is perspective view of unit part of cardan shaft.

REFERENCE NUMBERS

- 20 10 Cardan Shaft Unit Part
11 Abutment Surface
12 Seating Surface
20 Mechanical Embodiment
21 Center bearing
25 22 Protector
221 Initial Cavity
222 Second Cavity
23 Fixed Coil Support

231 Coil Support Surface

232 Center bearing Seating Surface

24 Rotary Coil Support

30 Transmitter Coil

5 40 Receiver Coil

DETAILED DESCRIPTION OF THE INVENTION

10 The mechanical embodiment of the invention is disclosed with samples described in a manner not causing any restrictive effect.

Figure 1 shows the mechanical embodiment (20) providing continuous wireless power transmission on cardan shaft in relation with cardan shaft rotary unit part (10). According to it, an electronic circuit performing data transfer on cardan shaft and a coil system performing wireless power transmission to the electronic circuit are located in the mechanical embodiment (20).

Coil system providing wireless power transmission to the electronic circuit consists of a transmitter coil (30) and a receiver coil (40). The transmitter coil (30) receives power from a power source and provides power transmission to the receiver coil (40). Uninterrupted power supply can only be possible by means of transmission of power from fixed power source to the rotary coil to supply rotating electronic circuit on cardan shaft via a fixed coil integrated onto cardan shaft. For that reason, transmitter coil (30) must remain fixed so that it can perform its functions uninterruptedly. One of the main functions of the mechanical embodiment (20) disclosed under the invention is that it keeps transmitter coil (30) fixed even when the cardan shaft is in rotating status. Uninterrupted power is supplied to the electronic circuit by means of rotary receiver coil (40) located on the cardan shaft unit part (10) and rotating together with it. Thus continuous wireless power supply is provided and data transfer on cardan shaft can be made uninterruptedly. Another important function of the mechanical embodiment (20) is that it protects the electronic circuit and coils against external effects.

As shown in figure 2, the mechanical embodiment (20) comprises of a center bearing (21), a protector (22) surrounding the electronic circuit, a fixed coil support (23) wherein transmitter coil (30) is located and a rotary coil support (24) wherein the receiver coil (40) is located.

5 As shown in figure 3, the fixed coil support (23) is located on the center bearing (21) and rotary coil support (24) is located on seating surface (12) on the rotary coil support (24) of the rotating shaft unit part (10). Thus transmitter coil (30) is located on the cardan shaft but does not rotate together with cardan shaft unit part (10). Receiver coil (40) integrated to rotary coil support (24) is mounted on the rotating
10 cardan shaft unit part (10) and rotates together with cardan shaft. Thus when cardan shaft rotates, transmitter coil (30) remaining fixed continues to supply wireless power to receiver coil (40). The distance between the transmitter coil (30) and the receiver coil (40) is kept short as much as power transfer can be performed and to the extent the design permits.

15 As shown in Figure 4a, fixed coil support (23) consists of a center bearing seating surface or surfaces (232) providing mounting onto the center bearing (21) and a coil support surface (231) where transmitter coil (30) is located. The fixed coil support (23) is fixed onto the center bearing (21) by means of said seating surfaces (232). Coil support surface (231) is designed in a manner that it supports the coil having the
20 most efficient winding can be supported for power transfer and that the receiver coil (40) winding and the transmitter coil (30) winding are located at same level mutually.

The protector (22) carries the electronic circuit and also protects the fixed coil support (23) and the rotary coil support (24) against external effects. Thus the electronic circuit and coils can work without being influenced by environmental conditions. The
25 protector (22) may comprise of one or more than one part. The protector (22) is located on the seating surface (12) on the cardan shaft unit part (10) and contacts abutment surface (11) on the cardan shaft unit part (10) and fixes the status. The protector (22) consists of an initial cavity (221) structured in a manner to provide adaptation to the center bearing (21) geometry and a second cavity (222) in order to
30 the rotary coil support (24) is structured in a manner to provide adaptation to rotary coil support (24) geometry.

The mechanical embodiment (20) disclosed under the invention discloses a light and compact structure and provides permanent mounting of the wireless power transmission components and electronic circuit onto the cardan shaft.

5 Thanks to compact structure of the invention, wireless power transmission components can be adapted onto cardan shaft in a manner not recognizable from outside. Thus the mechanical embodiment (20) appears as a natural extension of the cardan shaft.

The mechanical embodiment (20) of the invention can also be adapted onto other rotary mechanical components other than cardan shafts.

CLAIMS

1. The invention is a mechanical embodiment (20) consisting of a transmitter coil (30) and a receiver coil (40) located to provide wireless power transmission on cardan shaft **and it is characterized in that** in order to perform wireless power transmission on cardan shaft uninterruptedly, it comprises
- 5
- a center bearing (21) located on cardan shaft,
 - A fixed coil support (23) carrying transmitter coil (30) and located on said center bearing (21) in such manner that it does not contact rotary components of the cardan shaft and thus ensuring the transmitter coil to be fixed,
 - 10 • a rotary coil support (24) supporting receiver coil (40) and located on cardan shaft to rotate together with cardan shaft,
 - a protector (22) carrying an electronic circuit supplied by said coils (30, 40) and located on the center bearing (21) in a manner surrounding the fixed coil support (23) and the rotary coil support (24).
- 15
2. A mechanical embodiment (20) according to claim 1 **and it is characterized in** comprising at least a center bearing seating surface (232) providing mounting of said fixed coil support (23) onto the center bearing (21).
- 20
3. A mechanical embodiment (20) according to claim 1 **and it is characterized in that**, said fixed coil support (23) comprises a coil support surface (231) to contain number of winding to realise the most efficient power transfer and the receiver coil (40) winding and transmitter coil (30) winding are provided mutually at the same level.
- 25
4. A mechanical embodiment (20) according to claim 1 **and it is characterized in that** the protector (22) comprises an initial cavity (221) structured in a manner to provide adaptation to the center bearing (21) geometry.

5. A mechanical embodiment (20) according to claim 1 **and it is characterized in that** the protector (22) comprises a second cavity (222) structured in a manner to provide adaptation to the rotary coil support (24) geometry.
- 5 6. A mechanical embodiment (20) according to claim 1 **and it is characterized in that** the protector (22) and rotary coil support (24) are located on seating surface (12) structured on the cardan shaft.
7. A mechanical embodiment (20) according to claim 1 **and it is characterized**
10 **in that** the position of the protector (22) is fixed by means of contact of it to the abutment surface (11) structured on the cardan shaft.

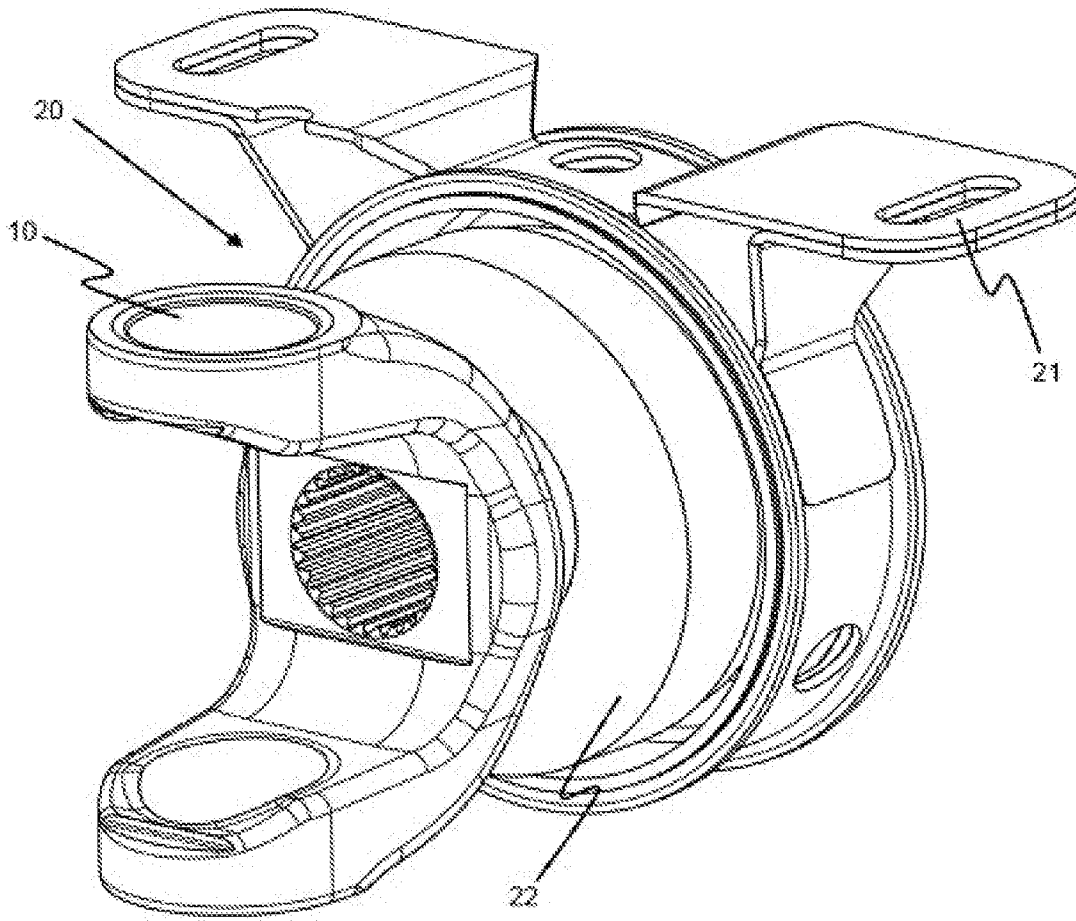


Fig.1

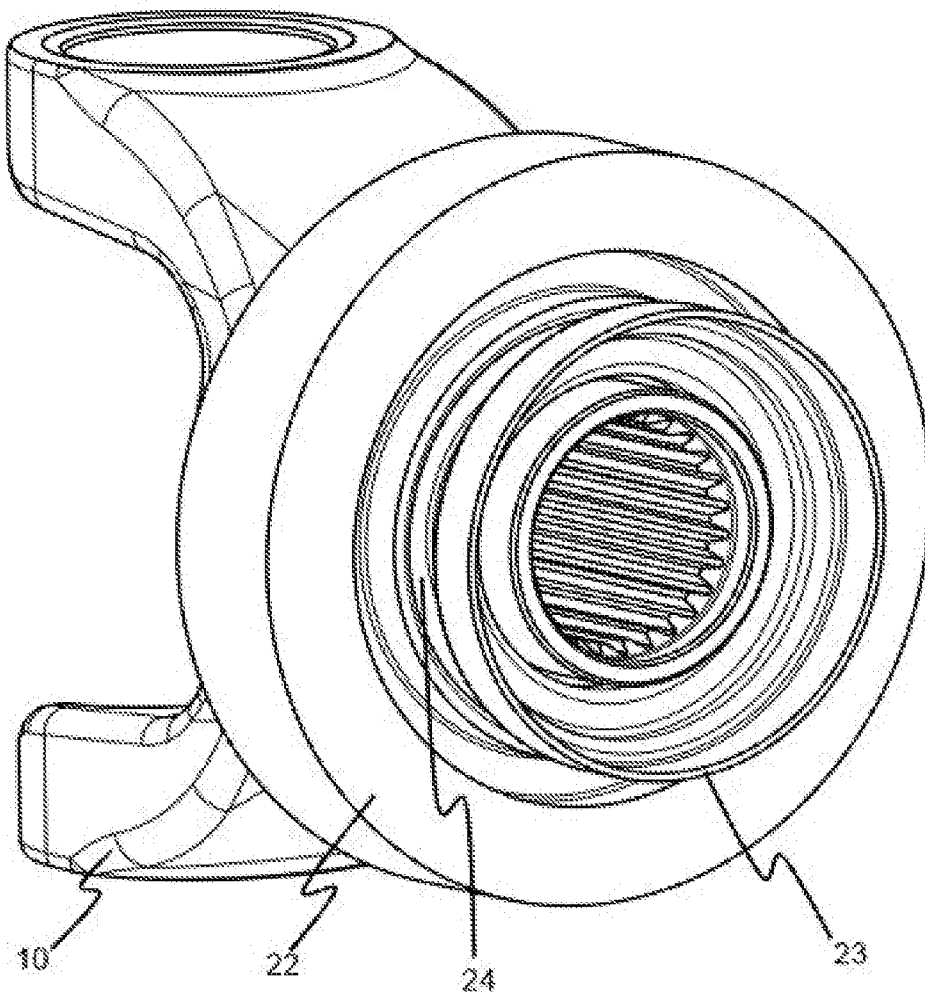


Fig.2

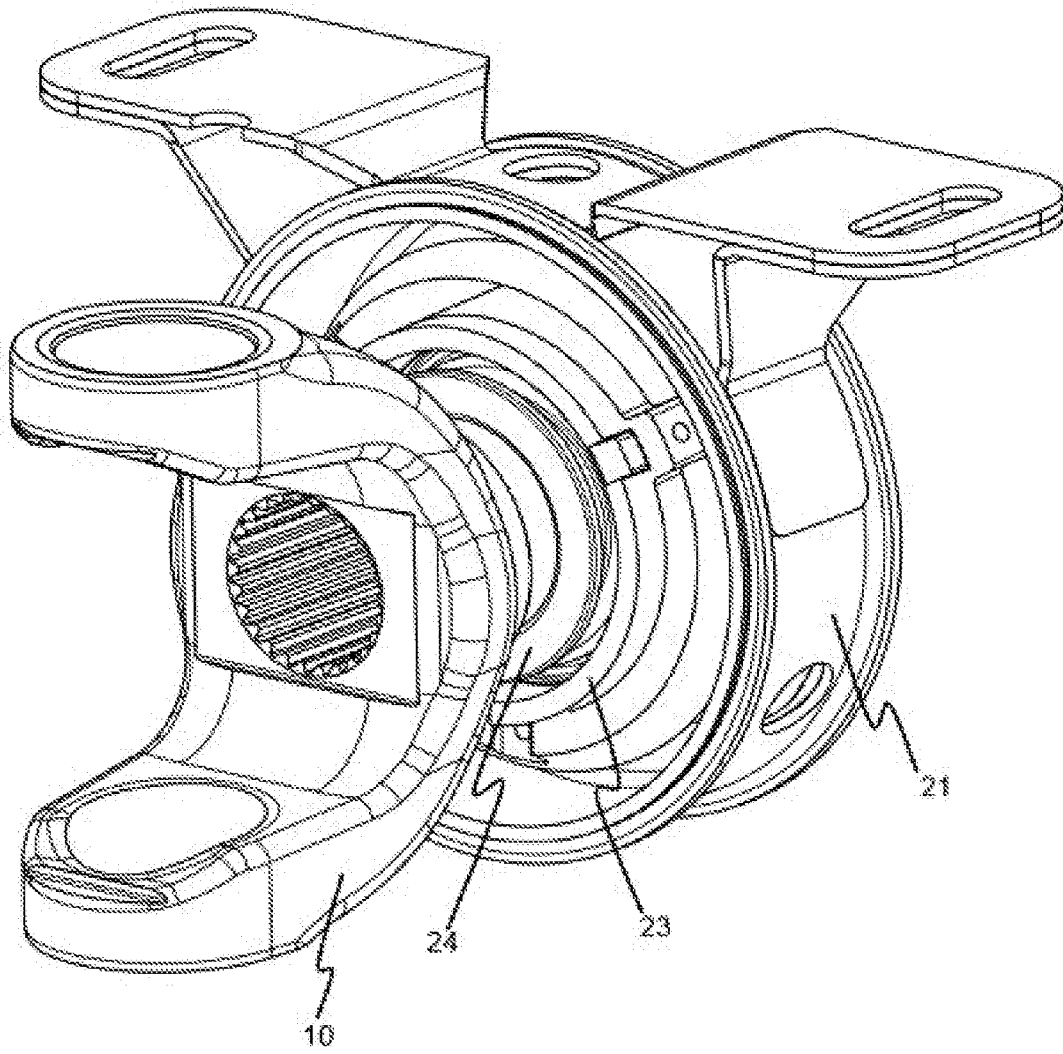


Fig.3

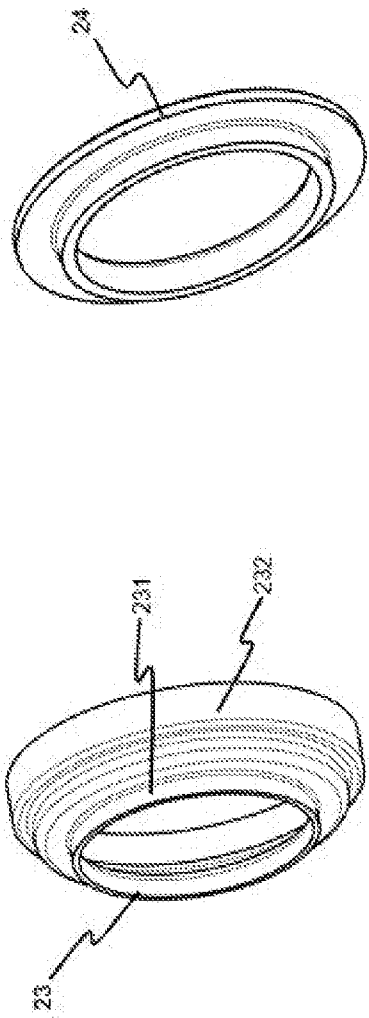


Fig.4b

Fig.4a

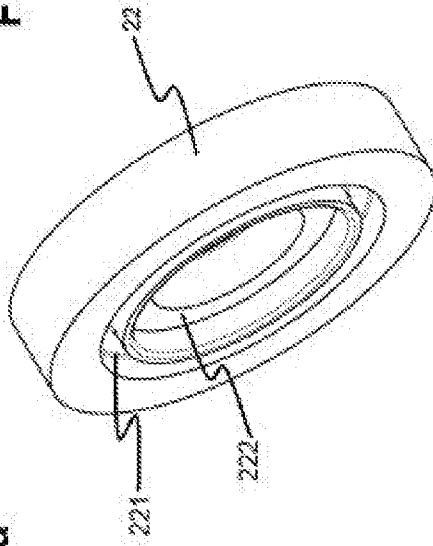


Fig.4c

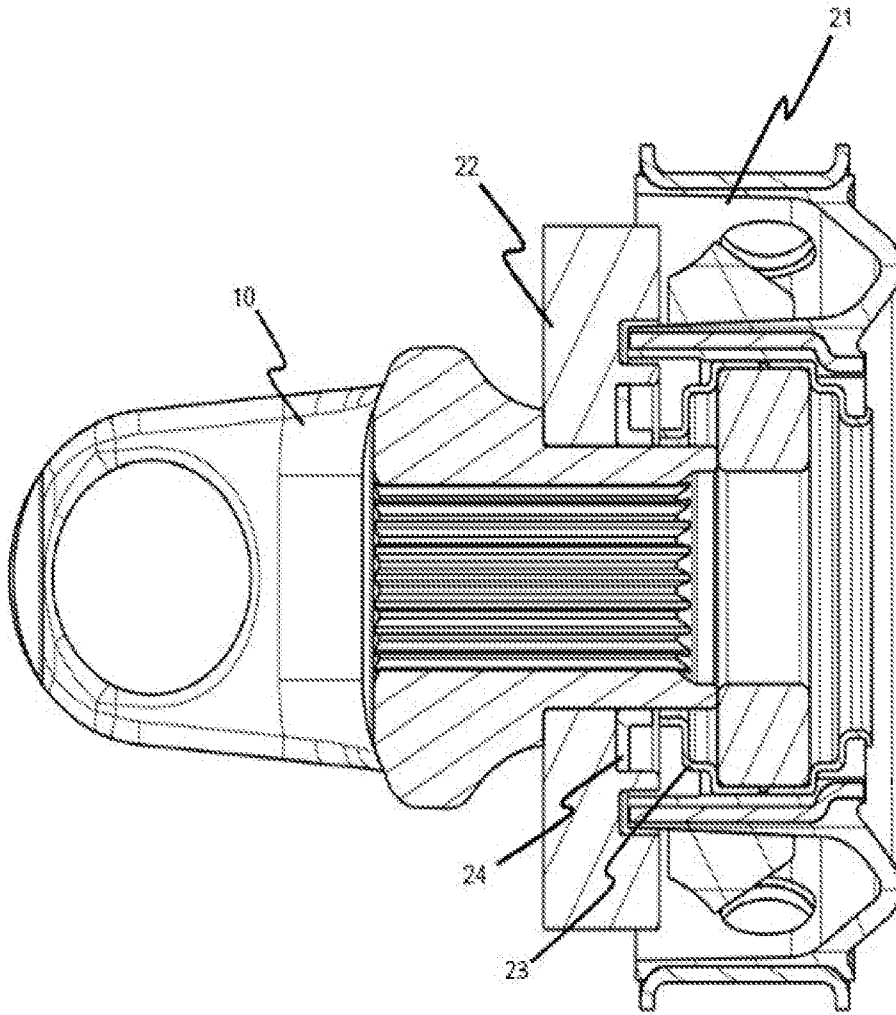


Fig.5

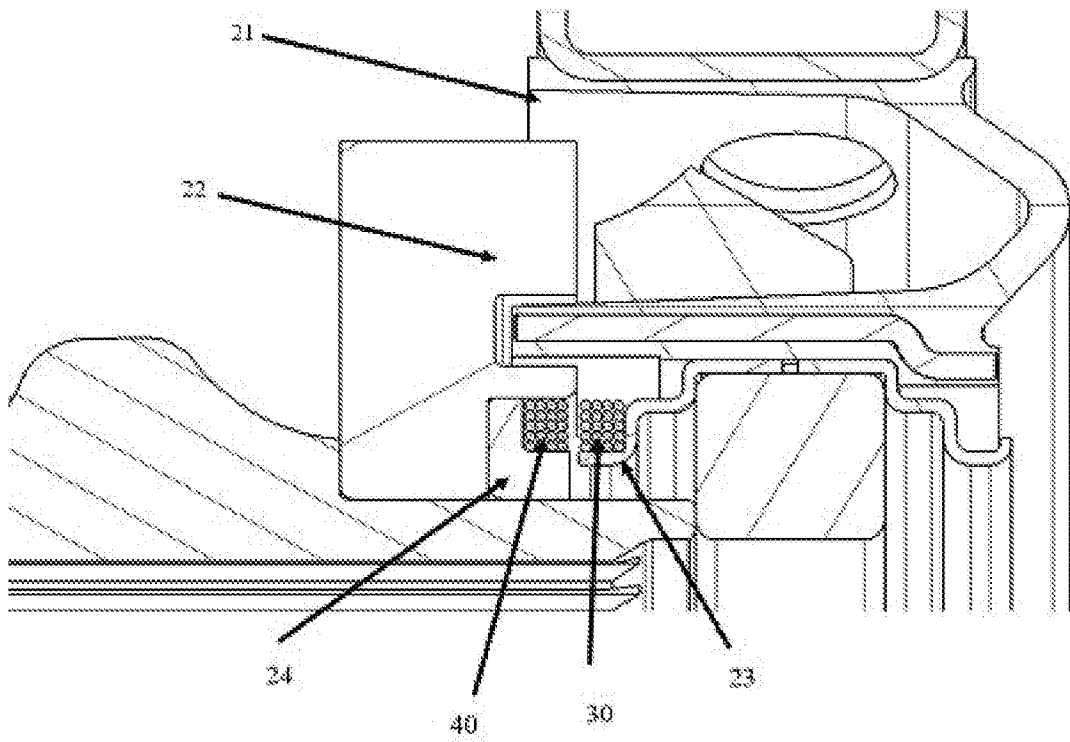


Fig.5a

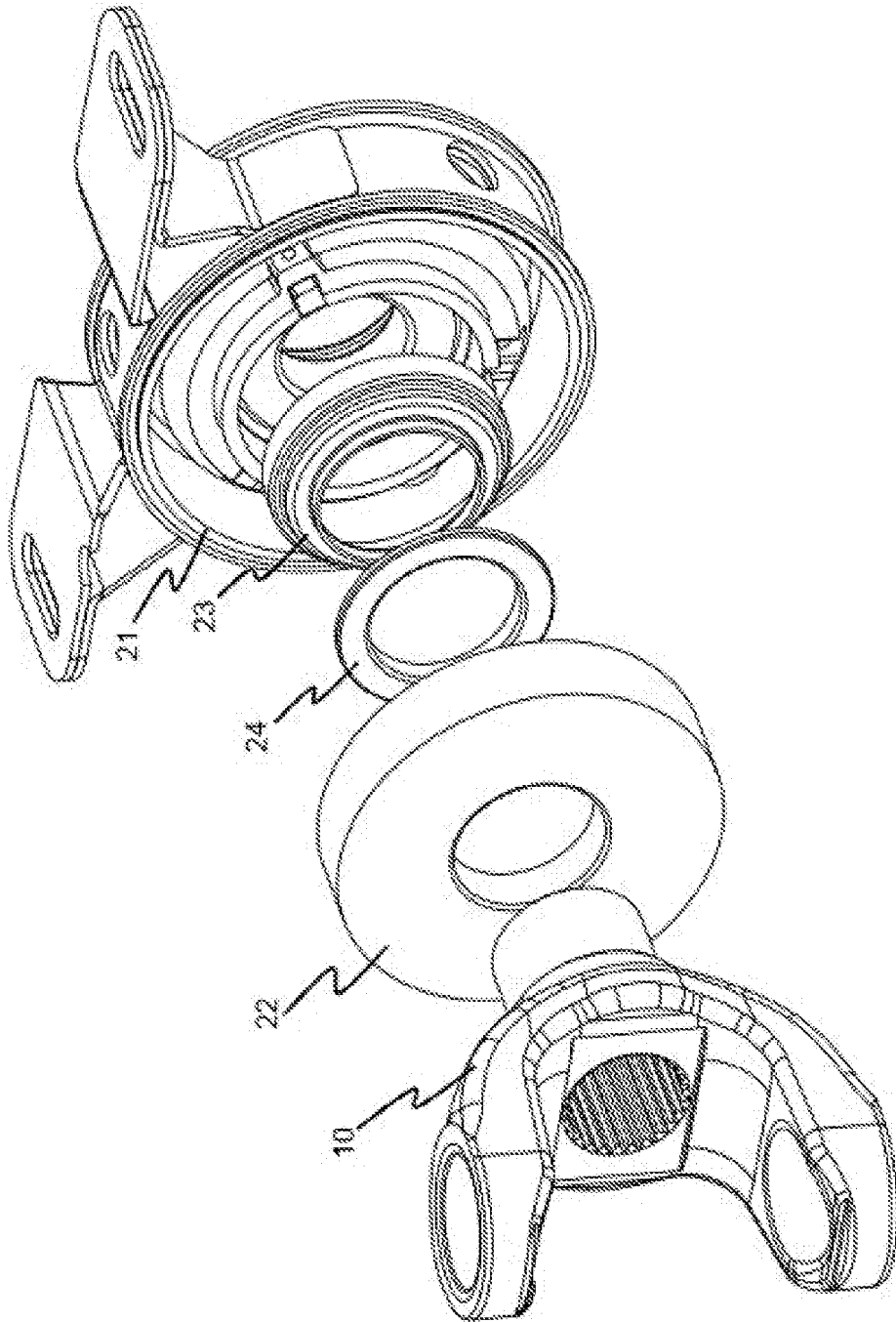


Fig.6

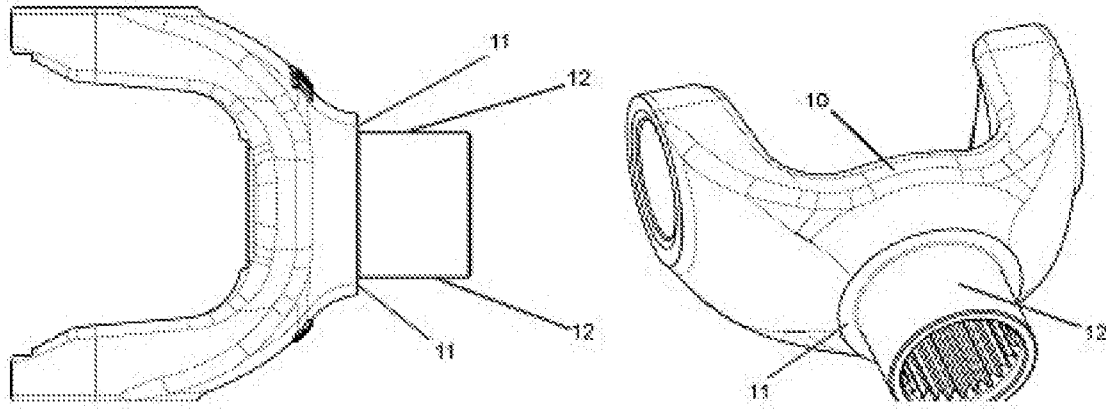


Fig.7