



(51) International Patent Classification:

F16D 1/108 (2006.01) *F16D 11/14* (2006.01)
F16D 11/04 (2006.01) *F16D 43/02* (2006.01)

(21) International Application Number:

PCT/EP2019/052723

(22) International Filing Date:

05 February 2019 (05.02.2019)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

1802513.0 16 February 2018 (16.02.2018) GB

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(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH,

(54) Title: AIRCRAFT ENGINE GENERATOR DISCONNECT DEVICE

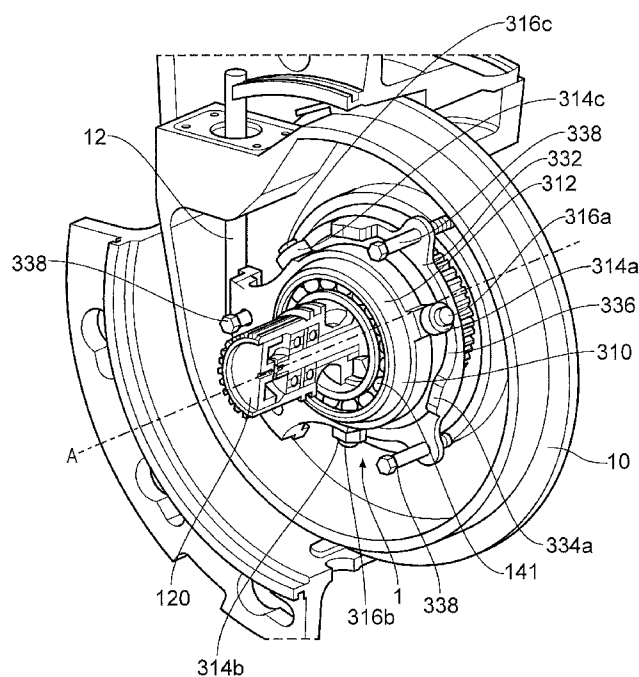


FIG. 3

(57) Abstract: The present invention relates to generator drive disconnect device comprising a drive transfer means (100) having a connected configuration, and a disconnected configuration. The disconnect device (1) further comprises a disconnect mechanism (300), configured to move the drive transfer means from the connected configuration to the disconnected configuration, wherein the disconnect mechanism (300) comprises a rotatable face cam (310) and a follower (330), the face cam (310) and follower (330) being arranged such that rotation of the face cam (310) in a first direction moves the follower (330) to drive the drive transfer means (100) from its connected configuration, into its disconnected configuration. Other aspects of the invention relate to an aircraft engine assembly and an aircraft comprises the generator drive disconnect device (1).

GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

AIRCRAFT ENGINE GENERATOR DISCONNECT DEVICETechnical Field

5 The invention relates to a disconnect device for disconnecting a rotational drive of an engine from a generator driven by the engine. In particular, the invention relates to a fail-safe disconnection device, particularly but not exclusively, for use in aircraft engines. Other aspects of the invention relate to an aircraft engine assembly and an aircraft including the disconnect device.

10

Background of the Invention

Aircraft engines, such as jet or turbojet engines, can comprise electrical generators which generate electricity used by the aircraft during operation.

15 Typically, the electrical generators are driven by a drive shaft which is connected, directly or indirectly (e.g. via a gear box), to the main turbine of the aircraft engine.

As with any mechanical system, mechanical failures can occur during normal operation of the electrical generators of an aircraft engine. A generator drive disconnect device, which can mechanically decouple the electrical generator from the engine's turbine must therefore be provided. Even though the loss of electrical energy generation capacity through disconnection can be serious, if a malfunctioning generator is not disconnected from the turbine, the aircraft engine
20 as a whole may be damaged or its performance impeded.

A variety of generator drive disconnect devices are known in the art. The majority of prior art disconnect devices used in this context provide a means by which an axle force can be applied to the drive shaft, causing the drive shaft to move axially which in turn enables a decoupling mechanism to operate. Known
30 methods exist for providing this axial force in the prior art each of which has its own advantages and disadvantages. Some of the known methods can be categorised as follows:

35 1. A mechanical disconnecter uses an actuator to release a large and powerful spring. This method typically has a robust assembly process and thus proves to be more reliable in service. However, the axial force it can produce is

typically limited. Therefore, this method cannot ensure a successful disconnection in all likely failure scenarios;

2. Using hydraulic pressure from the oil cooling system of an aircraft engine to provide the axial force required for disconnection. Whilst this solution can provide very high disconnecting forces, this method does not work in the event of a failure in the oil cooling system. Therefore, this method also cannot ensure disconnection in all likely failure scenarios.
3. Applying a pneumatically actuated disconnect mechanism to provide the required axial forces for disconnecting the generator drive. Similar to the hydraulic solution, the pneumatic actuators can provide very high disconnecting forces. However, separate gas storage tanks are required to provide the required pressurised gas and valve failure can lead to malfunction of the entire disconnection system.

In view of the above, there exists a need for improved disconnect device. As such, it is an object of the present invention to overcome the shortfalls of the existing disconnecter solutions.

Summary of the Invention

In a first aspect of the present invention, there is provided a generator drive disconnect device, particularly for a generator arranged to be driven by an aircraft engine, the generator drive disconnect device comprising a drive transfer means having a connected configuration, and a disconnected configuration. A disconnect mechanism is provided, which is configured to move the drive transfer means from the connected configuration to the disconnected configuration, wherein the disconnect mechanism comprises a rotatable face cam and a follower, the face cam and follower being arranged such that rotation of the face cam in a first direction moves the follower to transfer the drive transfer means from its connected configuration into its disconnected configuration.

The generator drive disconnect device of the present invention has a variety of advantages over the prior art solutions. In particular, the application of a face cam and corresponding follower for the disconnect mechanism provides the following improvements:

1. The energy and leverage of a rotating face cam ensures that sufficient amounts of actuating force are provided to guarantee disconnection in all circumstances. In particular, the present invention may provide actuating forces
5 of up to and over 5 kN, which can frequently be required to disconnect modern day generators;

2. The new device is a simple mechanical construction and as such not prone to failure;
10

3. The new device is not sensitive to manufacturing tolerances and thus simplifies production and reduces manufacturing costs.

According to another embodiment, the generator drive disconnect device is
15 configured such that rotation of the face cam follower in a second direction, opposite to the first direction, moves the follower to transfer the drive transfer means from its disconnected configuration into its connected configuration. Most prior art solutions are constructed to disconnect the drive transfer means in case of emergency. However, they frequently do not provide a possibility of
20 reconnecting the transfer means. Consequently, generators with conventional drive disconnect devices cannot be reconnected without disassembling the generator device. As such, known generators will have to be reset during a time consuming service operation. By contrast, the generator drive disconnect device of the present invention provides a solution that can re-connect the drive transfer
25 means when the emergency scenario no longer exists, without the need for a full service.

The generator drive disconnect device may comprise a resilient member arranged to bias the drive transfer means into its connected configuration. This particular
30 arrangement provides for a simple and cost effective way of enabling the generator drive disconnect device to be reconnected, once the emergency situation no longer exists. For example, when the face cam is rotated in a second direction, the restoring force of the resilient member, such as a coil spring, may be utilised to transfer the drive transfer means from its disconnected
35 configuration into its connected configuration.

The rotation of the face cam in the first direction may cause translatory movement of the follower against the bias of the resilient member. It will be appreciated that, according to this embodiment, the disconnect device of the present invention has to overcome a slightly larger minimum force to transfer the drive transfer means from its connected into its disconnected position. However, since the face cam solution of the present invention provides a particularly advantageous leverage, higher disconnection forces are achieved reliably.

In yet another embodiment, the drive disconnect device comprises a cam actuator arranged to rotate the face cam with respect to the follower. The face cam may comprise a guide slot adapted to limit the rotation of the face cam. In detail, the rotation of the face cam may be limited such that the face cam may only rotate as far as required to transfer the transfer means between its connected and disconnected configuration. The guide slot will prevent the face cam from over rotating, thereby minimising the failure risk of the present disconnect device.

The drive transfer means may comprise a rotatable input shaft delivering a drive for the generator and extending along an input shaft axis, wherein the face cam is rotatable with respect to the input shaft about the input shaft axis. The face cam may comprise a substantially annular main body extending concentrically about the input shaft axis. As such, the face cam of the present invention is also suitable for use in generators with limited space availability. The main body, for example, may be directly or indirectly supported on the input shaft by means of any type of rotary bearing, such as a ball-bearing.

According to another embodiment, the face cam comprises at least one, preferably at least two, cam rollers, extending radially from an outer edge of its annular main body. The rollers may be used to engage a first surface of the cam follower and push the latter axially away from the face cam when the latter is rotated in the first direction. The provision of rollers as the contact means between the face cam and the follower will significantly reduce the amount of friction encountered during actuation of the disconnect mechanism. Alternatively, the face cam may comprise at least one, preferably at least two, protrusions, extending from a first face of its annular main body towards the follower. Similar to the rollers, the protrusions may, for example, be configured to engage an adjacent first face of the follower.

In yet another embodiment, the follower comprises a substantially annular main body extending concentrically about the input shaft axis. This configuration of the follower further reduces the space requirements of the inventive generator drive disconnect device.

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The follower may comprise at least one, preferably at least two, protrusions extending from a first face of its annular main body towards the face cam. The protrusions of the follower may work together with the corresponding rollers or protrusions of the rotatable face cam in order to move the drive transfer means
10 between its connected and disconnected configurations. In particular, the cam rollers or, alternatively, the protrusions of the face cam may be arranged to contact the first face of the annular main body of the follower in the connected and disconnected configuration of the drive transfer means.

15 The at least one protrusion of the follower may be configured as a ramp, wherein the cam rollers / protrusions of the face cam may be adapted to move up the ramp-shaped protrusions when the drive transfer means is transferred from its connected configuration into its disconnected configuration. Similarly, when the drive transfer means is moved from its disconnected configuration into its
20 connected configuration, by rotating the face cam in the second direction, the rollers / protrusions of the face cam may move down the ramp-shaped protrusions of the follower.

In yet another embodiment, the follower may be rotationally fixed. In other
25 words, the follower is only intended to move in a single direction, namely parallel to the input shaft axis. In particular, the follower is arranged to move away from the face cam if the latter is rotated in its first direction and towards the face cam if the latter is rotated in its second direction.

30 The drive transfer means may comprise a separable drive transfer device. The separable drive transfer device may comprise a clutch arrangement, preferably a dog clutch. The clutch arrangement may removably connect the input shaft to an output shaft of the drive transfer device, both of which may be arranged concentrically about the same longitudinal axis.

35

According to another aspect of the invention, there is provided an aircraft engine assembly comprising a generator drive disconnect device as described hereinbefore.

- 5 In another aspect of the present invention, there is provided an aircraft comprising the aforementioned aircraft engine assembly.

Within the scope of this application it is expressly intended that the various aspects, embodiments, examples and alternatives set out in the preceding
10 paragraphs, in the claims and/or in the following description and drawings, and in particular the individual features thereof, may be taken independently or in any combination. That is, all embodiments and/or features of any embodiment can be combined in any way and/or combination, unless such features are incompatible. The applicant reserves the right to change any originally filed claim or file any
15 new claim accordingly, including the right to amend any originally filed claim to depend from and/or incorporate any feature of any other claim although not originally claimed in that manner.

Brief Description of the Drawings

20

In the following detailed description, the invention will be described in more detail, by way of example only, with reference to the accompanying drawings, in which:

- 25 FIGURE 1 shows a perspective cross-section of the generator drive disconnect device according to an embodiment of the present invention, in the connected state;

FIGURE 2 shows a perspective cross-section of the generator drive disconnect
30 device according to the embodiment of Figure 1, in the disconnected configuration;

FIGURE 3 shows another perspective view of the generator drive disconnect device according to the embodiment of Figure 1;

35

FIGURE 4 shows a perspective view of the rotatable face cam according to the embodiment in Figures 1 to 3;

FIGURE 5 shows a perspective view of the cam follower according to the embodiment of Figures 1 to 3; and

- 5 FIGURE 6 shows a partial cross-section of a generator drive disconnect device according to another embodiment.

Detailed Description

- 10 Turning to Figure 1, there is shown a generator drive disconnect device 1 of a generator (not shown) arranged to be driven by an aircraft engine (not shown). The generator drive disconnect device 1 can be comprised in a generator, arranged to be driven by an aircraft engine.

- 15 The disconnect device 1 comprises drive transfer means 100 and a disconnect mechanism 300.

- The disconnect mechanism 300 is configured to move the drive transfer means 100 from a connected configuration shown in Figure 1 into a disconnected configuration, shown in Figure 2. The disconnect mechanism 300 comprises a
20 rotating face cam 310 and a cam follower 330. The face cam 310 is rotatable about an input shaft axis A in a first direction, which is clockwise in Figure 1, and a second, opposite direction, which is anti-clockwise in Figure 1. The follower 330 is rotationally fixed to a housing structure 10 of the corresponding generator, as
25 will be described in more detail with reference to Figure 3. However, the follower 330 is configured for translatory movement along the input shaft axis A, away and towards the rotating face cam 310.

- The drive transfer means 100 comprises an input shaft 110 and output shaft 120.
30 The input and output shafts 110, 120 are coaxially aligned about input shaft axis A. An end section of the drive transfer means 100 at the input shaft end will be referred to as a proximal end 2, whereas the opposite end section of the drive transfer means 100 at the output shaft 120 end will be referred to as the distal end. The output shaft 120 is partially supported by the input shaft 110 at a distal
35 end section 112 of the input shaft 110. In detail, the output shaft 120 is extends partly over the distal end section 112 of the input shaft 110 and is connected therewith by means of rotary bearings, particularly ball-bearings 114a, 114b.

- In the connected state of the drive transfer means 100, the input shaft 110 and the output shaft 120 are rotated together, at the same speed. To this end, the input shaft 110 is connected to an input rotor 114 at its proximal end 113. The input rotor 114 comprises a drive collar 116 extending concentrically around input shaft axis A and the proximal end 113 of the input shaft 110. The drive collar 116 includes a plurality of first splines 118 extending circumferentially around its interior surface.
- Between the inner surface of the drive collar 116 and the outer surface of the input shaft 110, there is provided a separable transfer device 130. The separable drive transfer device 130 has a generally cylindrical shape at its proximal end, the drive transfer device 130 comprises a second plurality of splines 132. The second plurality of splines 132 are arranged on an outer surface of the drive transfer device 130. The second splines 132 engage the first splines 118 of the drive collar 116. As such, rotary movement of the input shaft 110 is transferred to the drive transfer device 130 via the drive collar 116, and in particular via the first and second splines 118, 132.
- At an opposite, distal end, the drive transfer device 130 comprises a clutch arrangement 134, which in the connected configuration of Figure 1 is in engagement with a corresponding clutch arrangement 122 at the proximal end of the output shaft 120.
- As can be derived from Figure 2, the clutch arrangements 134, 122 are together configured as a dog clutch. The clutch arrangements 134, 122 are axially separable along input axis A, as will be described in more detail below.
- A shoulder portion 136 is arranged between the proximal and distal end of the drive transfer device 130. The shoulder portion 136 acts as a flange for a roller bearing 140 that connects the drive transfer device 130 with the follower 330 of the disconnect mechanism 300. Consequently, axial movement of the follower 330 in the direction of input axis A will be transferred to the drive transfer device 130 via shoulder portion 136. The roller bearing 140 enables for drive transfer device 130 to be rotated with respect to the non-rotatable follower 330, during operation of the generator.

A resilient member 200, particularly a coil spring, is arranged to bias the drive transfer device 130 towards the proximal end of the output shaft 120, i.e. into the connected configuration of the drive transfer means 100. The resilient member 200 is received inside the substantially cylindrical drive transfer device 130 and extends between a proximal end of the input shaft 110 and a second shoulder portion 138 of the drive transfer device 130, which faces the proximal end 113 of the input shaft 110.

Turning to Figure 3, there is shown another perspective of the same embodiment described hereinbefore, particularly from the distal end 3 of the generator drive disconnect device 1. As can be derived from this illustration, the face cam 310 comprises an annular main body 312, which extends circumferentially around the proximal end of the output shaft 120. As such, the face cam 310 is coaxially aligned with the input shaft axis A and connected to the outside surface of the output shaft 120 via roller bearings 141. The face cam 310 is rotatable independently of the drive transfer means 100. In order to rotate the face cam 310 in a first, clockwise direction and a second anti-clockwise direction, a cam actuator (not shown) is provided, which is connected to a radially outer end of the annular main body 312 of the face cam 310 via the schematically illustrated actuator shaft 12.

The face cam 310 comprises a plurality, particularly three, cam rollers 314a, 314b, 314c. The three cam rollers 314a, 314b, 314c are equidistantly arranged around the outer surface of the main body 312 of the face cam. Each of the rollers 314a, 314b, 314c is supported by a cam roller shaft 316a, 316b, 316c. The cam roller shafts 316a, 316b, 316c extend radially from the outer surface of the annular main body 312. The cam rollers 314a to 314c are rotatably arranged on their corresponding roller shafts 316a, 316b, 316c and protrude at least partly over a first, proximal face of the face cam 310 that faces the follower 330.

The parts of the cam rollers 316a to 316c protruding over the proximal face of the face cam 310 engage a distal face 336 of the follower 330. The follower 330 comprises an annular main body 332, which is coaxially aligned with the face cam 310, and thus extends around input axis A. As will be described in more detail with reference to Figure 5, the main body 332 of the follower 330 comprises a plurality, particularly three, tabs extending radially from the outer surface of the annular main body 332. The tabs are configured to receive fastening members

338, which connect the follower 330 to the housing structure 10 of the generator in a non-rotating manner. At the same time, the fastening members 338 act as guide means that allow the follower 330 to travel along the direction of the input shaft axis A to and from the face cam 310. On its first, distal face 336, the main body 332 of the follower 330 comprises a plurality, particularly three, protrusions 334a, 334b, 334c (see Figure 5), which extend from the distal first face 336 of the annular main body 312 towards the face cam 310. In other words, the protrusions 334a to 334c extend in the distal direction of Figures 1 to 3.

10 A more detailed representation of the face cam 310 can be derived from Figure 4. It will be understood that while the illustration in Figures 3 and 4 show three cam rollers 314a to 314c, any number of cam rollers is generally feasible, as long as the number of cam rollers correspond to the number of protrusions of the follower 330, as will be described in more detail below. The three cam rollers 314a to 15 314c of the embodiment illustrated in Figure 4 are equidistantly spaced by an angle of 120 degrees around the outer circumference of the annular main body 312. A guide slot 318 is also provided along a predetermined angle of the outer circumference of the annular main body 312. The guide slot 318 is inserted into a guide protrusion 317, which extends radially from the outer surface of the annular main body 312. Advantageously, the guide slot 318 can be used in conjunction with one of the fastening members 338 of the follower 330 to limit the maximum amount of rotation of the face cam 310 in either of the two directions.

Turning to Figure 5, there is shown an enlarged perspective view of the follower 25 330 according to the embodiments shown in Figures 1 to 3. As mentioned hereinbefore, a variety of tabs 337a to 337c extend from the circumferentially outer surface of the annular main body 332. Each of the tabs 337a to 337c comprises a through hole 339a to 339c adapted to receive the aforesaid fastening members 338 to connect the cam follower to the housing of the generator in a non-rotational but translatory movable manner. 30

The cam follower 330 comprises first, distal face 336 and an opposite, second, proximal face 335. In use, the first face 336 is arranged to face in the direction of the face cam 310. Three protrusions 334a to 334c are circumferentially equidistantly arranged on the first face 336 of the main body 332 and extend in the direction of the face cam 310. In this embodiment, the three protrusions 334a to 334c are arranged at 120° intervals. 35

The three protrusions 334a to 334c are constructed as ramps for the corresponding cam rollers of the face cam 310. The ramp-shaped protrusions 334a to 334c gradually increase in height in a clockwise direction of Figure 5. Where the protrusions 334a to 334c reach their highest point, a plateau is provided which marks an end position of the cam rollers in the disconnected configuration of the drive transfer means. On a non-ramped end of the plateaus of each of the protrusions 334a to 334c, a shoulder portion is formed, which separates the protrusions 334a to 334c from each other. The skilled person would understand that, in this embodiment, the cam rollers are limited to a maximum angle of rotation of 120 degrees. However, preferably, the cam rollers 314a to 314c will not exceed an angular movement of around 60 degrees, defined by the guide slot 318, described hereinbefore.

Operation

In the following, the operation of the generator drive disconnect device according to the first embodiment shall be described with reference to Figures 1 to 3. In the connected configuration of the drive transfer means 100, shown in Figure 1, the clutch arrangements 134 and 122 of the drive transfer device 100 and the output shaft 120 respectively are connected. In particular, the drive transfer device 130 is biased towards the proximal end of the output shaft 120 by the resilient member 200, such that the clutch arrangements 134 and 122 are in meshing contact.

Rotary drive input via the input shaft 110 is transferred by means of the drive collar 116 to the drive transfer device 130. The drive transfer device 130, in turn, is connected to the output shaft via the clutch arrangements 122, 134, and thus drives the output shaft at the same rotational speed as the input shaft.

If a power failure requires the generator to be disconnected, the disconnect mechanism 300 is actuated to separate the clutch arrangements 122, 134 from each other. To this end, a cam actuator (not shown) pulls the actuator shaft 12 of Figure 3 upwards to rotate the face cam 310 in its first, clockwise direction. As the annular main body 312 of the face cam moves in the first, clockwise direction, the cam rollers 314a to 314c move circumferentially along the first face 336 of the follower 330 towards the plateau of their corresponding ramp-shaped protrusions 334a to 334c.

It will be understood that the face cam 310 is fixed in all three translatory degrees of freedom and thus may not move in the direction of input Axis A. Consequently, as the rollers move up the ramp-shaped protrusions 334a to 334c, the follower 330 is pushed away from the face cam 310 towards the proximal end 2. The cam rollers 314a to 314c stop their circumferential movement on top of their respective protrusions 334a to 334c due to the rotational limitation predetermined by the guide slot 318.

As the follower 330 is pushed away from the face cam 310 in the direction of the input shaft axis A, so is the drive transfer device 130 due to its connection with the follower 330 via roller bearing 140 and shoulder portion 136. As the drive transfer device 130 is moved in a proximal direction, away from the output shaft 120, the clutch arrangements 132 and 122 disengage, thereby mechanically decoupling the input shaft 110 from the output shaft 120. It will be appreciated that the proximal movement of the follower 330 and the drive transfer device 130 acts against the bias of the resilient member 200. As such, in the disconnected configuration of the disconnect device 1 shown in Figure 2, the resilient member 200 (coil spring) is compressed and acts to restore the connected configuration shown in Figure 1. However, for as long as the face cam is in the second position, in which the cam rollers 314a to 314c are aligned with the plateau of their corresponding protrusions 334a to 334c, the follower 330 and the drive transfer device 130 are prevented from moving distally towards the connected configuration. As such, it is only possible to transfer the drive transfer means back into its connected configuration if the face cam 310 is rotated in its second, anti-clockwise direction by means of the cam actuator.

If the power failure requiring disconnection of the generator has been resolved, then the cam actuator can be moved in the opposite direction to rotate the face cam 310 back into its initial position. As the face cam 310 is rotated back in the second direction, the cam rollers 314a to 314c again move circumferentially along the first face 336 of the follower 330, thereby gradually descending from the ramp-shaped protrusions 334a to 334c. When the cam rollers 314a to 314c leave the protrusions 334a to 334c, the drive transfer device 130 and the follower 330 are pushed back into the connected position by means of the resilient member 200.

As will be appreciated, the new arrangement of the generator drive disconnect device according to the present invention provides a reliable and reversible way of disconnecting the generator.

5 Another embodiment of the present invention is schematically illustrated in Figure 6. The embodiment of the generator disconnect device 20 shown in Figure 6 has a substantially identical functionality as the first embodiment described above. Again, a follower 530 comprises one or more protrusions 534, which extend from a first face 536 of the follower 530 towards a face cam 510. The face cam 510,
10 again, includes a radial protrusion 517 to which an actuator shaft (not shown) can be connected in order to rotate the face cam 510 in either direction. The amount of rotation is limited by a guide structure 519 that includes a guide slot or recess 518 and is connected to the housing structure 600 of the generator disconnect device.

15

In contrast to the embodiment shown in Figures 1 to 5, the face cam 510 of the embodiment in Figure 6 also comprises one or more protrusions 514 extending from a first face 516 of the face cam 510 towards the follower 530 in a proximal direction. It will be understood that the protrusions 514 have a substantially
20 identical functionality as the cam rollers 314a to 314c described hereinbefore. In particular, as the face cam 510 is rotated with respect to the follower 530, the protrusion 514 aligns with the ramp-shaped protrusion 534 and pushes the follower 530 away from the face cam 510 in a proximal direction. Although not illustrated in detail, the remaining features of the disconnect device shown in
25 Figure 6 may be substantially identical to the features described hereinbefore with reference to Figures 1 to 5.

CLAIMS

1. A generator drive disconnect device, of a generator arranged to be driven by an aircraft engine, the generator drive disconnect device comprising:
- 5 a drive transfer means having a connected configuration, and a disconnected configuration;
- a disconnect mechanism, configured to move the drive transfer means from the connected configuration to the disconnected configuration,
- 10 wherein the disconnect mechanism comprises a rotatable face cam and a follower, the face cam and follower being arranged such that rotation of the face cam in a first direction moves the follower to transfer the drive transfer means from its connected configuration, into its disconnected configuration.
2. The generator drive disconnect device of claim 1, wherein the generator
- 15 drive disconnect device is configured such that rotation of the face cam in a second direction, opposite to the first direction, moves the follower to transfer the drive transfer means from its disconnected configuration into its connected configuration.
3. The generator drive disconnect device of claim 1 or 2, comprising a resilient
- 20 member arranged to bias the drive transfer means into its connected configuration.
4. The generator drive disconnect device of claim 4, wherein rotation of the
- 25 face cam in the first direction causes translatory movement of the follower against the bias of the resilient member.
5. The generator drive disconnect device of any of claims 1 to 4, comprising a
- 30 cam actuator arranged to rotate the face cam with respect to the follower.
6. The generator drive disconnect device of any of claims 1 to 5, wherein the
- face cam comprises a guide slot adapted to limit rotation of the face cam.
7. The generator drive disconnect device of any of claims 1 to 6, wherein the
- 35 drive transfer means comprises a rotatable input shaft delivering a drive for the generator and extending along an input shaft axis, and wherein the face cam is rotatable with respect to the input shaft about the input shaft axis.

8. The generator drive disconnect device of claim 7, wherein the face cam comprises a substantially annular main body extending concentrically about the input shaft axis.
- 5
9. The generator drive disconnect device of claim 8, wherein the face cam comprises at least one, preferably at least two, cam roller/s, extending radially from an outer edge of its annular main body.
- 10
10. The generator drive disconnect device of claim 8, wherein the face cam comprises at least one, preferably at least two, protrusion/s, extending from a first face of its annular main body towards the follower.
11. The generator drive disconnect device of any of claims 7 to 10, wherein the
- 15
- follower comprises a substantially annular main body extending concentrically about the input shaft axis.
12. The generator drive disconnect device of claim 11, wherein the follower comprises at least one, preferably at least two, protrusion(s), extending from a
- 20
- first face of its annular main body towards the face cam.
13. The generator drive disconnect device of claim 12 in combination with claim 9, wherein the cam roller/s of the face cam is/are arranged to contact the first face of the annular main body of the follower in the connected and second
- 25
- configuration of the drive transfer means.
14. The generator drive disconnect device of claim 12 in combination with claim 9, wherein the protrusion/s of the face cam is/are arranged to contact the first face of the annular main body of the follower in the connected and disconnected
- 30
- configuration of the drive transfer means.
15. The generator drive disconnect device of claim 13 or 14, wherein the at least one protrusion of the follower is configured as a ramp, and wherein the cam rollers/protrusions of the face cam are adapted to move up the ramp shaped protrusions when the drive transfer means is transferred from its connected
- 35
- configuration, into its disconnected configuration.

16. The generator drive disconnect device of any of claims 1 to 15, wherein the follower is rotationally fixed.
17. The generator drive disconnect device of any of claims 1 to 16, wherein the
5 drive transfer means comprises a separable drive transfer device.
18. The generator drive disconnect device of claim 17, wherein the separable drive transfer device comprises a clutch arrangement, particularly a dog clutch.
- 10 19. An aircraft engine assembly comprising a generator drive disconnect device in accordance with any of claims 1 to 18.
20. An aircraft comprising an aircraft engine assembly in accordance with claim 19.

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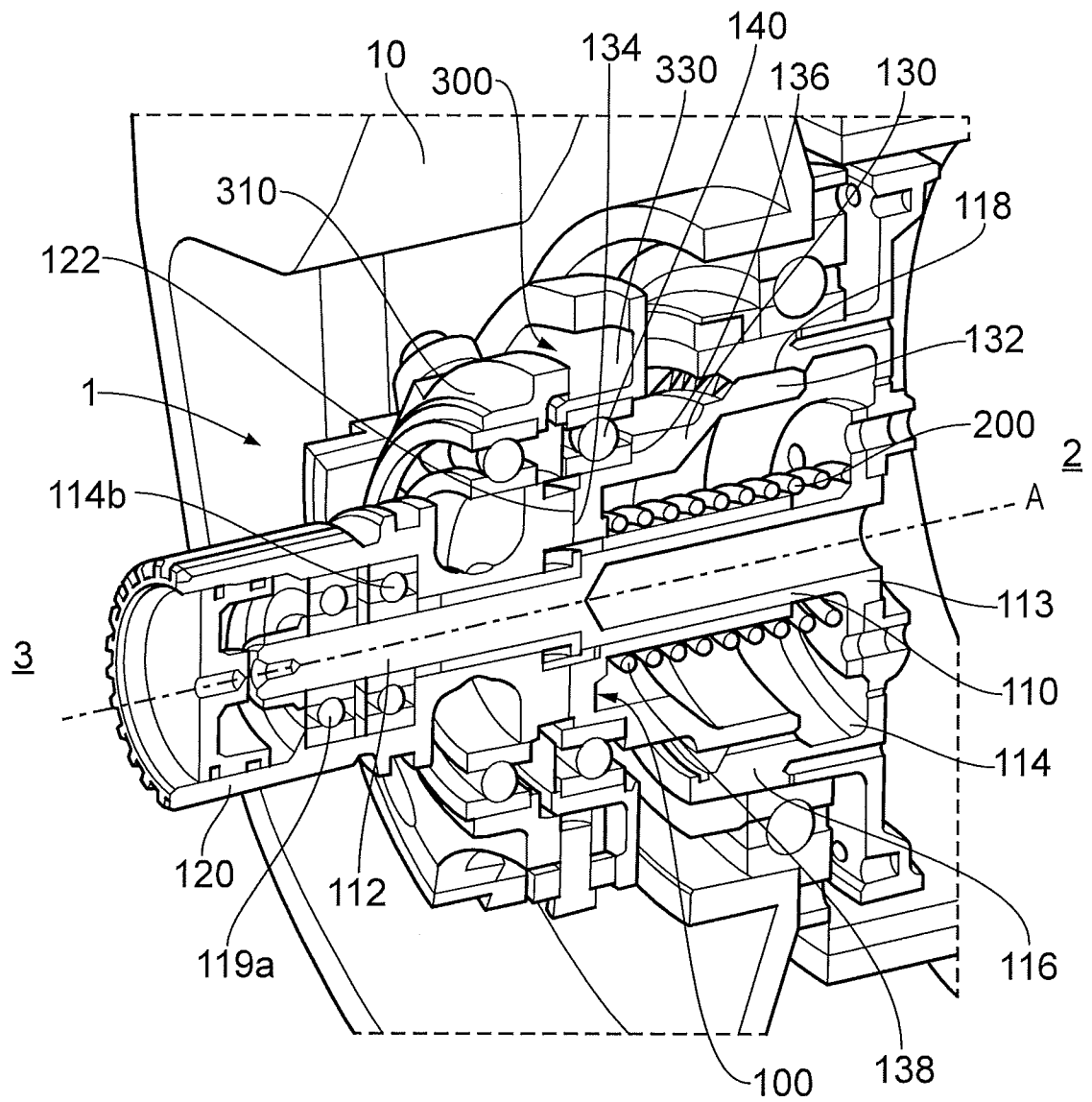


FIG. 1

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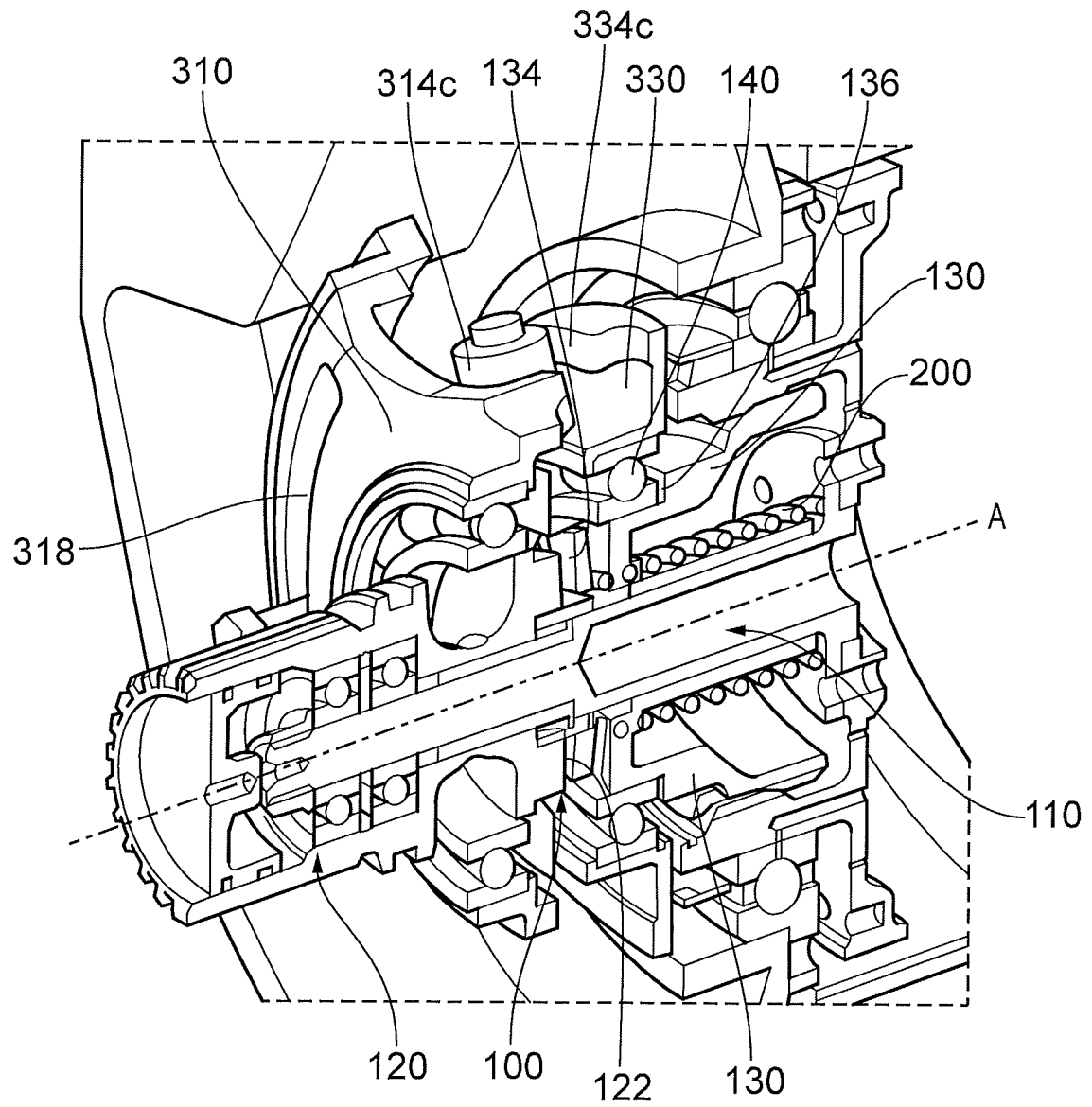


FIG. 2

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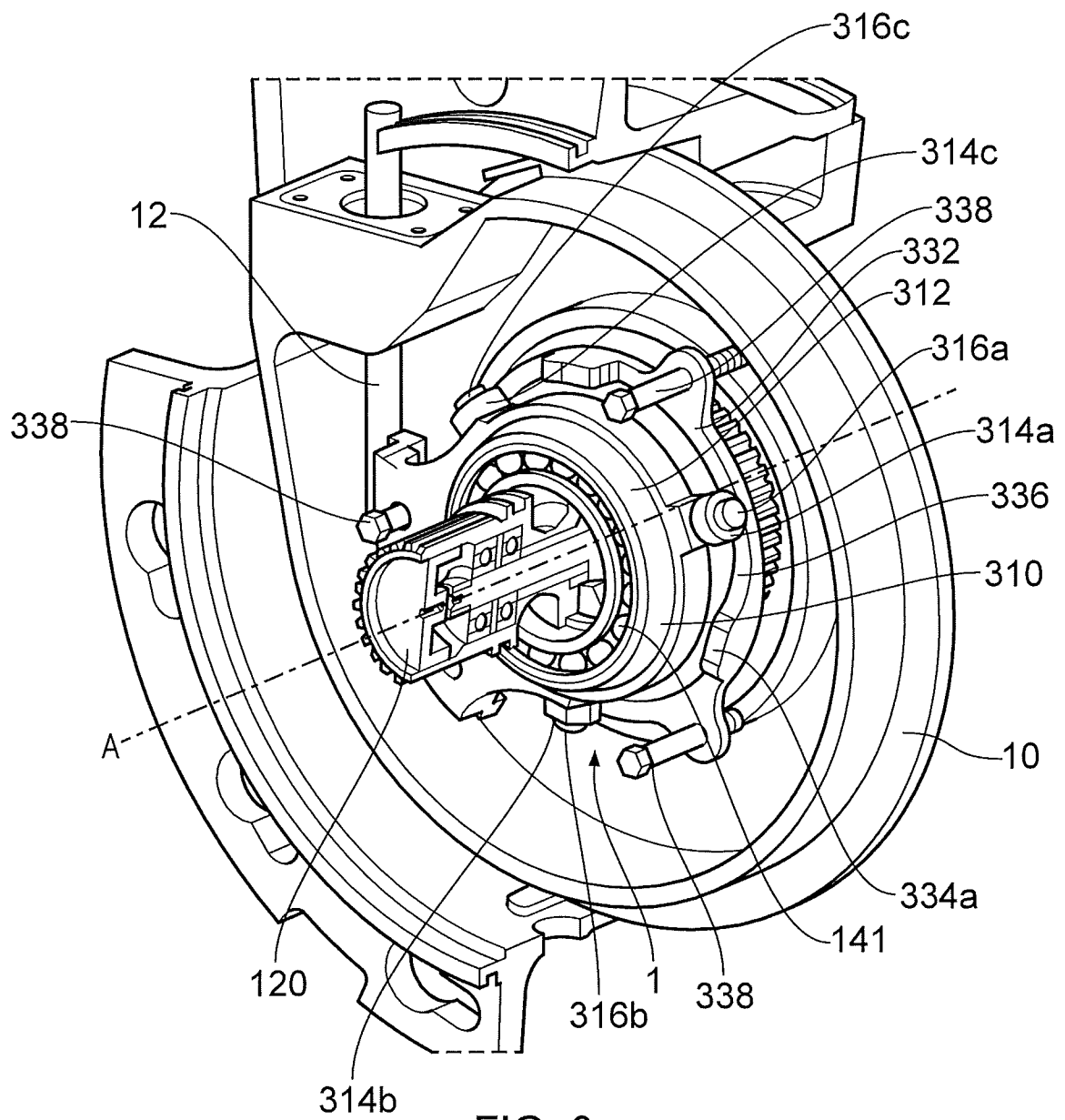


FIG. 3

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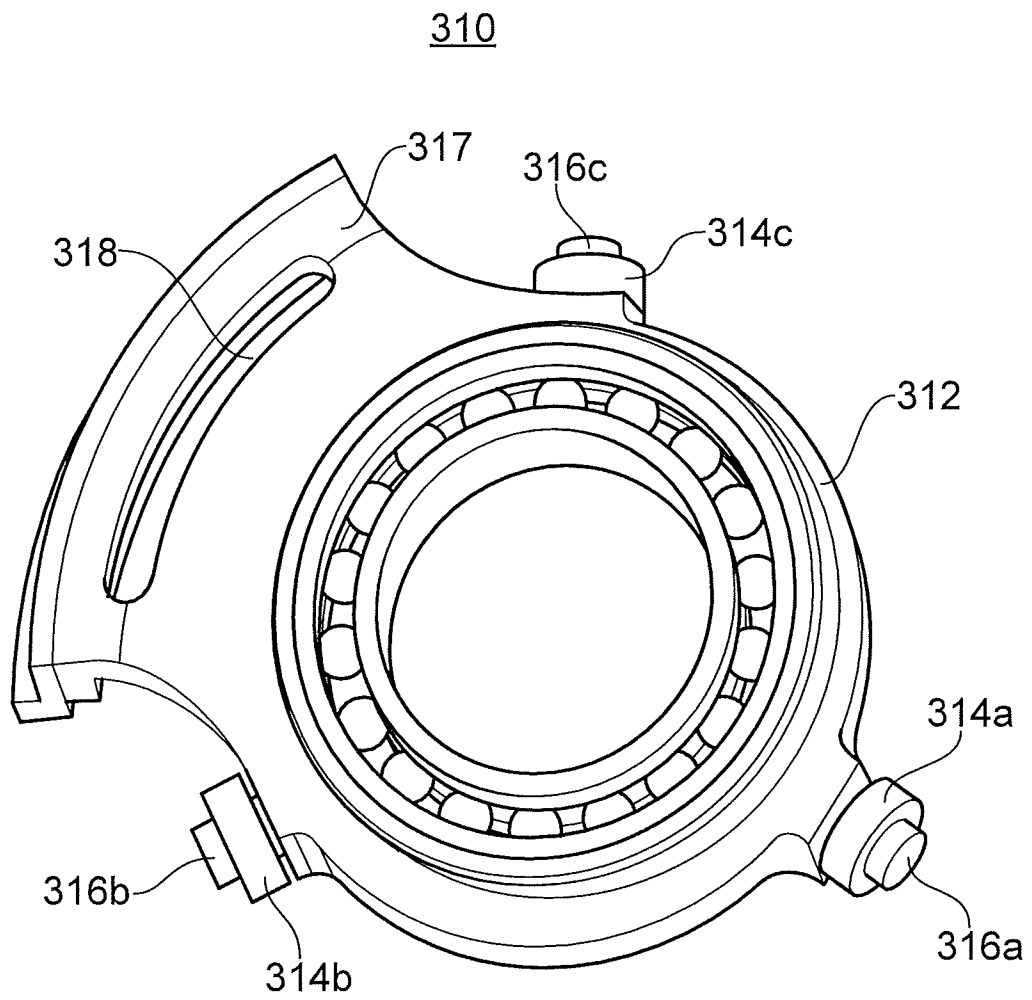


FIG. 4

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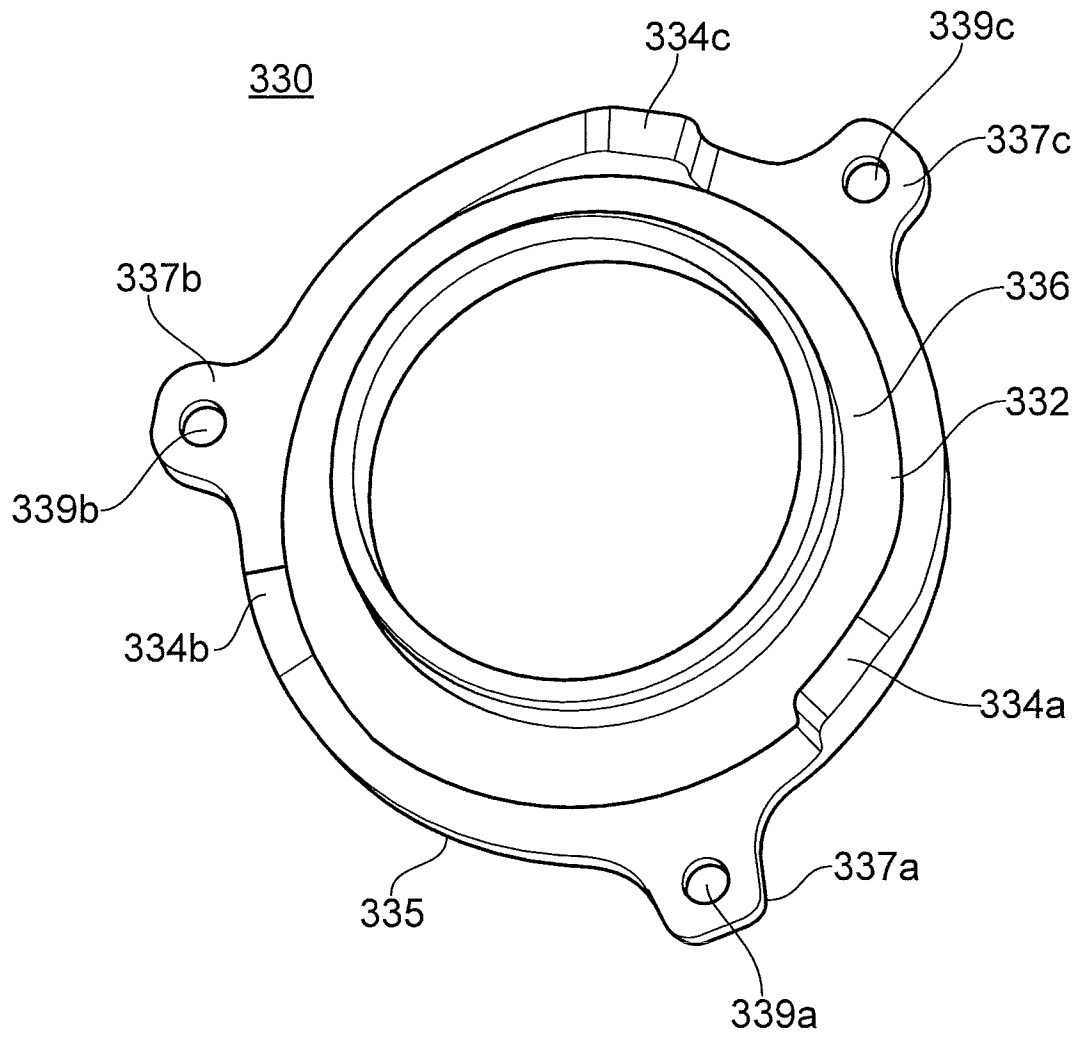


FIG. 5

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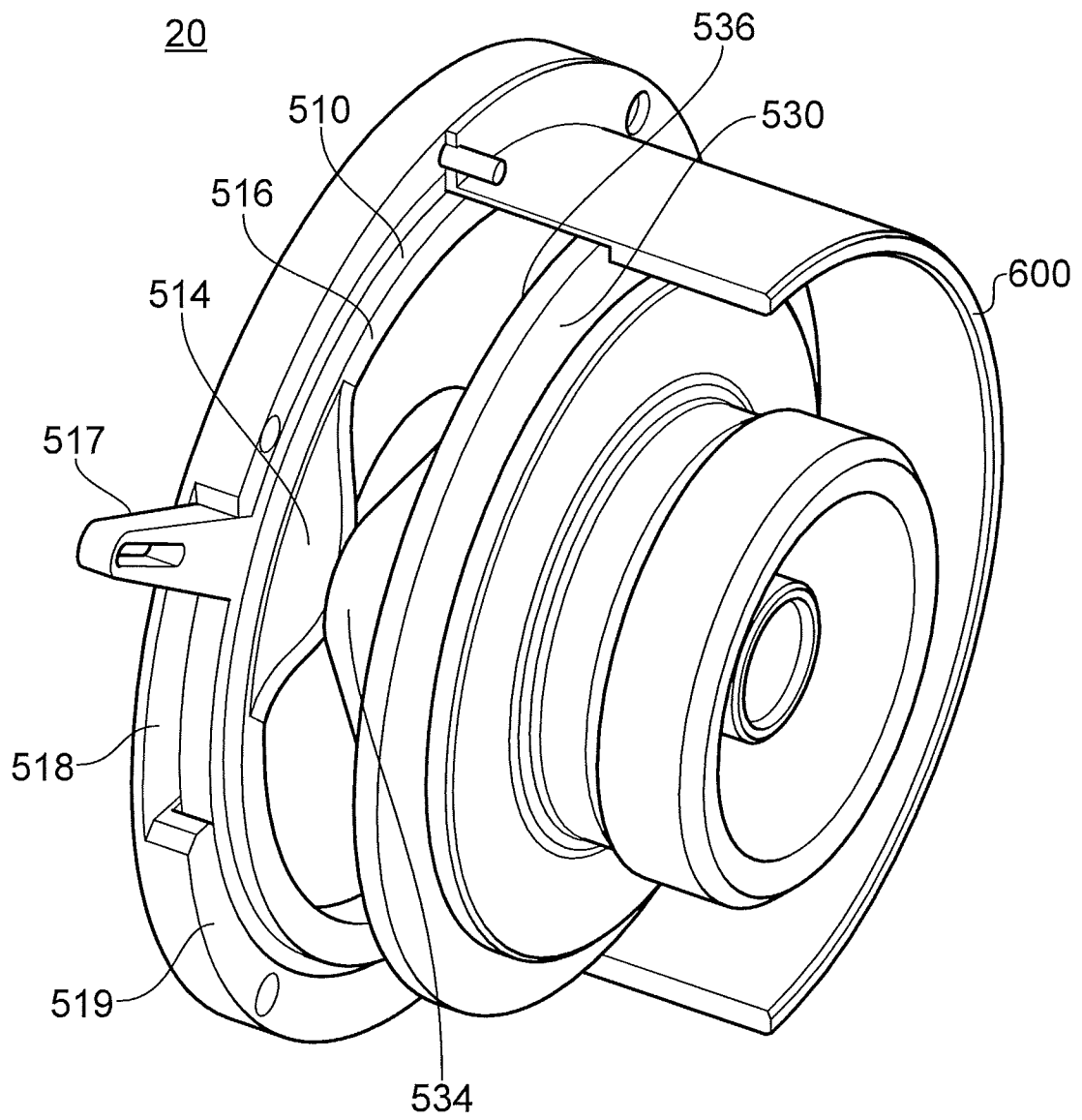


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2019/052723

A. CLASSIFICATION OF SUBJECT MATTER
INV. F16D1/108 F16D11/04 F16D11/14 F16D43/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F16D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 327 821 A (TELFORD THOMAS M) 4 May 1982 (1982-05-04)	1-5,7,8, 10-12, 15-20
A	column 5, line 66 - column 6, line 63; figures 6-9	6,9,13, 14
Y	US 4 997 072 A (LAPTHORNE PETER L [AU]) 5 March 1991 (1991-03-05)	1-5,7,8, 10-12, 15-20
A	column 1, line 5 - column 1, line 12; figures 1,2	6,9,13, 14
Y	US 5 465 819 A (WEILANT DAVID R [US] ET AL) 14 November 1995 (1995-11-14) column 13, line 8 - column 15, line 46; figures 20-22	1-4,8, 12,16-20
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Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

26 March 2019

Date of mailing of the international search report

05/04/2019

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2019/052723

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 391 621 A2 (GOODRICH CONTROL SYS LTD [GB]) 25 February 2004 (2004-02-25) paragraph [0001]; figures 1,2 -----	1-4,8, 12,16-20

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2019/052723

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US 4997072	A	05-03-1991	NONE	
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EP 1391621	A2	25-02-2004	EP 1391621 A2 US 2004055850 A1	25-02-2004 25-03-2004