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(12) **United States Design Patent**
Kucharski

(10) **Patent No.: US D869,348 S**
(45) **Date of Patent: ** Dec. 10, 2019**

(54) **GEARBOX ASSEMBLY FOR AN AXLE**

(71) Applicant: **Allison Transmission, Inc.**, Indianapolis, IN (US)

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(73) Assignee: **Allison Transmission, Inc.**, Indianapolis, IN (US)

(**) Term: **15 Years**

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(22) Filed: **Jan. 10, 2018**

Related U.S. Application Data

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(30) **Foreign Application Priority Data**

Jun. 6, 2016 (EM) 003174960

(51) **LOC (12) Cl.** **12-16**

(52) **U.S. Cl.**
USPC **D12/160**

(58) **Field of Classification Search**
USPC D12/159–160
CPC B60G 2200/10; B60G 2200/143; B60G 2200/156; B60G 2200/20; B60G 2200/21; B60G 2200/341; B60G 2204/1242; B60G 2300/026; F16H 57/0483; F16H 1/46; F16H 48/38; F16H 57/037; F16H 2057/02052; F16H 57/082
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,093,631 A 4/1914 Kennedy
1,984,830 A 12/1934 Higley
3,439,767 A 4/1969 Lynes et al.
3,799,284 A 3/1974 Hender
3,923,115 A 12/1975 Helling
(Continued)

FOREIGN PATENT DOCUMENTS

CA 1213470 A 11/1986
CN 2541230 Y 3/2003
(Continued)

OTHER PUBLICATIONS

Computer-Generated English language abstract and computer-generated English language translation for CN 107244234A extracted from espacenet.com database on Dec. 13, 2017, 14 pages.
(Continued)

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(57) **CLAIM**

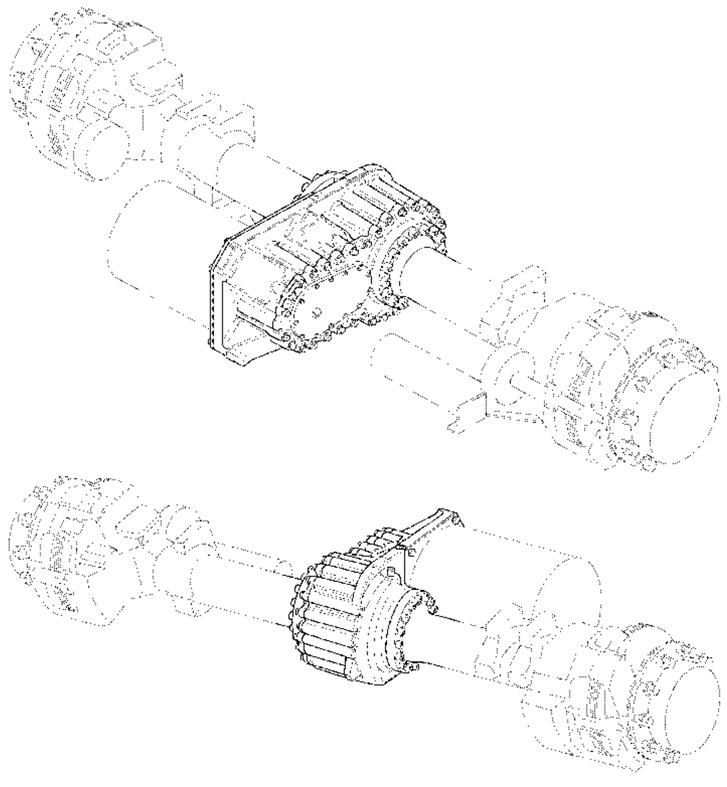
An ornamental design for a gearbox assembly for an axle, as shown and described.

DESCRIPTION

FIG. **1** is a front perspective view of an embodiment of a gearbox assembly for an axle;
FIG. **2** is a rear perspective view of the gearbox of FIG. **1**;
FIG. **3** is a top plan view of the gearbox of FIG. **1**;
FIG. **4** is a bottom plan view of the gearbox of FIG. **1**;
FIG. **5** is a front elevational view of the gearbox of FIG. **1**;
FIG. **6** is a right side elevational view of the gearbox of FIG. **1**; and,
FIG. **7** is a left side elevational view of the gearbox of FIG. **1**.

The broken lines, depicted as dot-dot-dot lines, are included for the purpose of illustrating the axle and/or portion(s) of the gearbox assembly that form no part of the claimed design.

1 Claim, 6 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

4,270,622	A	6/1981	Travis	
4,425,989	A	1/1984	Gotoda	
4,431,073	A	2/1984	Nagao et al.	
4,848,507	A	7/1989	Masuda et al.	
5,120,282	A	6/1992	Fjallstrom	
5,352,164	A	10/1994	Bensinger et al.	
5,927,417	A	7/1999	Brunner et al.	
6,024,182	A	2/2000	Hamada et al.	
6,276,474	B1	8/2001	Ruppert et al.	
6,382,339	B1	5/2002	Nemoto	
6,427,797	B1	8/2002	Chang	
6,431,298	B1	8/2002	Ruppert, Jr. et al.	
6,820,707	B1	11/2004	Cantemir	
6,843,750	B1	1/2005	Bennett	
6,964,317	B2	11/2005	Groves et al.	
7,028,583	B2	4/2006	Bennett	
7,115,058	B2	10/2006	Duncan	
7,128,680	B2	10/2006	Holmes	
7,143,861	B2 *	12/2006	Chu	B60G 3/20 180/346
7,216,751	B2	5/2007	Teraoka	
7,297,083	B2	11/2007	Duncan	
7,410,440	B2 *	8/2008	Garcia	B60B 35/08 29/401.1
7,458,433	B2	12/2008	Harrup et al.	
7,559,390	B2	7/2009	Marsh et al.	
7,572,201	B2	8/2009	Supina et al.	
7,819,411	B2 *	10/2010	Eshelman	B60G 3/20 280/124.135
7,854,674	B2	12/2010	Freudenreich	
7,959,170	B2 *	6/2011	Mauz	B60G 3/20 280/124.109
8,118,133	B2	2/2012	Armfield	
8,465,035	B2 *	6/2013	Gander	B60B 35/04 280/124.1
8,475,311	B2	7/2013	Ren et al.	
8,491,432	B2	7/2013	Radermacher et al.	
8,517,140	B2 *	8/2013	West	B60G 3/20 180/360
8,640,801	B2	2/2014	Hennings et al.	
8,678,968	B2	3/2014	Troennberg et al.	
8,708,857	B2	4/2014	Winter et al.	
8,718,897	B2	5/2014	Wright et al.	
8,839,898	B2	9/2014	Mimura et al.	
8,858,379	B2	10/2014	Keeney et al.	
9,102,233	B2	8/2015	Knoblauch et al.	
9,115,792	B2 *	8/2015	Skotty	F16H 1/46
9,140,335	B2	9/2015	Knoblauch	
9,221,496	B2 *	12/2015	Barr	B62D 21/11
9,267,596	B2 *	2/2016	Trost	F16H 57/045
9,296,389	B2	3/2016	Bernhardt	
9,400,034	B1	7/2016	Pritchard et al.	
9,421,862	B2 *	8/2016	Wang	F16H 57/037
9,429,222	B2 *	8/2016	Bassi	B60K 17/36
9,469,214	B2	10/2016	Wright et al.	
9,517,658	B2 *	12/2016	Chung	F16H 48/08
9,541,121	B2	1/2017	Knoblauch	
9,573,452	B2	2/2017	Agnew	
9,719,584	B1	8/2017	Duan et al.	
9,771,037	B2	9/2017	Kugelstadt et al.	
9,878,638	B2	1/2018	Wein	
D821,930	S	7/2018	Kucharski	
2002/0104704	A1	8/2002	Chang	
2003/0111280	A1	6/2003	Platner et al.	
2005/0006164	A1	1/2005	Teraoka	
2005/0023053	A1	2/2005	Bennett	
2005/0023885	A1	2/2005	Bennett	
2006/0094552	A1	5/2006	Duncan	
2006/0225930	A1	10/2006	Schulte	
2010/0276901	A1 *	11/2010	Richardson	B60G 3/20 280/93.512
2011/0094807	A1	4/2011	Pruitt et al.	
2012/0247855	A1	10/2012	Mimura et al.	
2013/0019707	A1	1/2013	Ebihara et al.	
2013/0240282	A1	9/2013	Bindl	
2014/0095002	A1	4/2014	Crecelius et al.	
2014/0288739	A1	9/2014	Braun et al.	
2014/0295979	A1	10/2014	Knoblauch	
2016/0159249	A1	6/2016	Wright et al.	
2017/0219078	A1	8/2017	Wang et al.	
2017/0261082	A1	9/2017	Pritchard et al.	
2017/0320384	A1	11/2017	Kochidomari et al.	
2018/0022230	A1	1/2018	Wright et al.	
2018/0080536	A1	3/2018	Nilsson	

FOREIGN PATENT DOCUMENTS

CN	2600273	Y	1/2004
CN	200971047	Y	11/2007
CN	201151343	Y	11/2008
CN	201312154	Y	9/2009
CN	202480779	U	10/2012
CN	103434390	A	12/2013
CN	103496320	A	1/2014
CN	203992104	U	12/2014
CN	104309429	A	1/2015
CN	204095429	U	1/2015
CN	205326780	U	6/2016
CN	205326801	U	6/2016
CN	105799480	A	7/2016
CN	103010016	B	8/2016
CN	205468492	U	8/2016
CN	205951712	U	2/2017
CN	205951969	U	2/2017
CN	103538474	B	9/2017
CN	105034789	B	9/2017
CN	105150862	B	9/2017
CN	107215393	A	9/2017
CN	104986032	B	10/2017
CN	107244234	A	10/2017
CN	107284214	A	10/2017
CN	107284224	A	10/2017
CN	206551871	U	10/2017
CN	105818861	B	11/2017
CN	107344488	A	11/2017
CN	206633786	U	11/2017
CN	206749495	U	12/2017
CN	206812717	U	12/2017
CN	206943366	U	1/2018
CN	104728403	B	2/2018
CN	207021829	U	2/2018
CN	207225059	U	4/2018
DE	102012204717	A1	9/2013
DE	102013005721	A1	10/2014
DE	102013214317	A1	1/2015
DE	102016203970	A1	9/2017
DE	112015004318	T5	10/2017
EP	0079455	A1	5/1983
FR	3003813	A1	10/2014
GB	2548975	A	10/2017
JP	2013068248	A	4/2013
JP	6209297	B1	10/2017
WO	8804241	A1	6/1988
WO	9221529	A1	12/1992
WO	2004094868	A1	11/2004
WO	2013087527	A1	6/2013
WO	2013170848	A1	11/2013
WO	2017106620	A1	6/2017
WO	2017114420	A1	7/2017
WO	2017144905	A1	8/2017
WO	2017172614	A1	10/2017
WO	2017172722	A1	10/2017
WO	2017172788	A1	10/2017
WO	2017193130	A1	11/2017
WO	2017216020	A1	12/2017

OTHER PUBLICATIONS

Computer-Generated English language abstract and computer-generated English language translation for CN 206633786U extracted from espacenet.com database on Dec. 13, 2017, 11 pages.

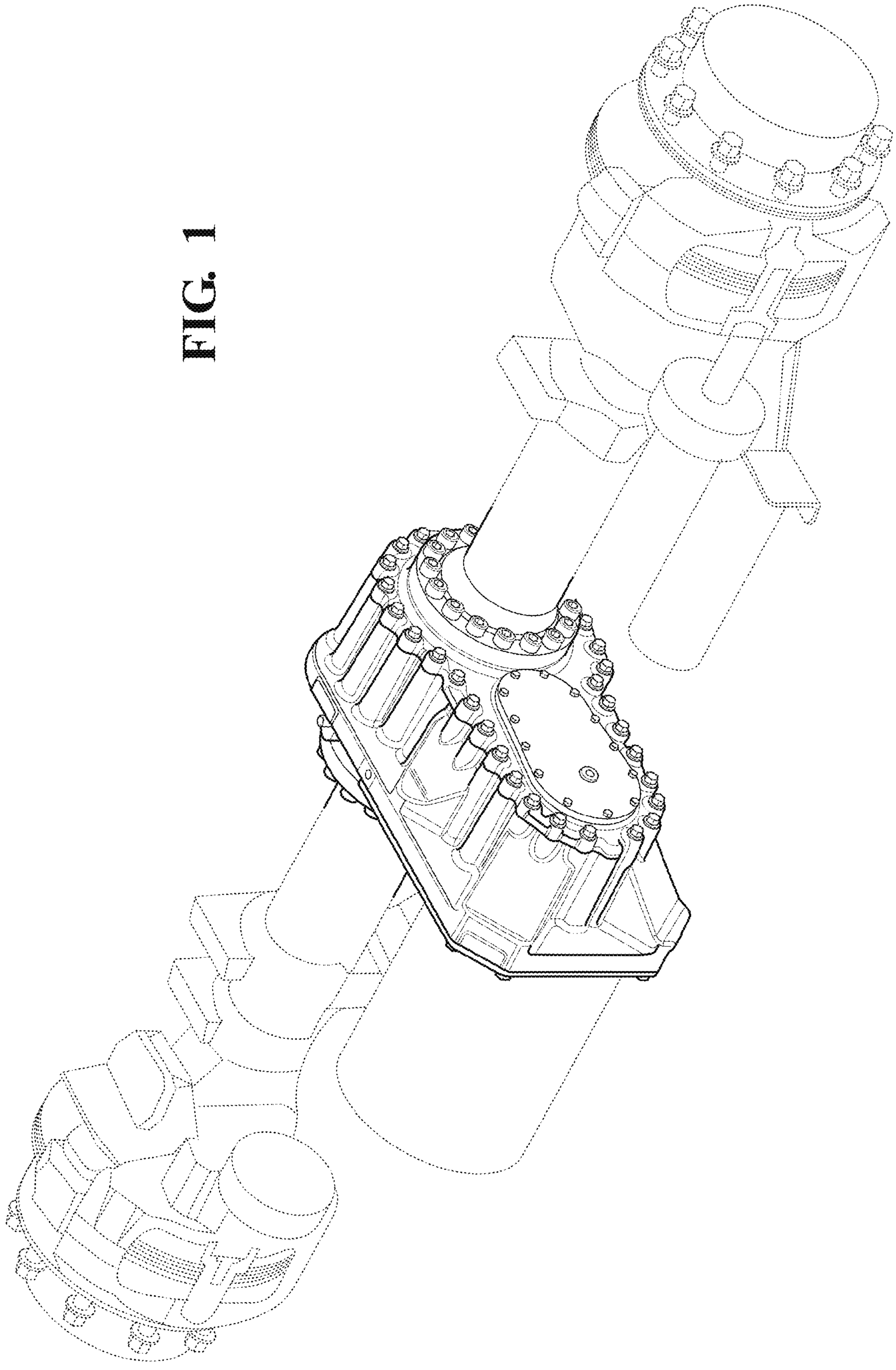
(56) **References Cited**

OTHER PUBLICATIONS

Computer-Generated English language abstract for CN 107284224A extracted from espacenet.com database on Dec. 13, 2017, 2 pages.
Computer-Generated English language abstract for CN 107215393A extracted from espacenet.com database on Dec. 13, 2017, 2 pages.
Computer-Generated English language abstract for CN 107284214A extracted from espacenet.com database on Dec. 13, 2017, 2 pages.
Computer-Generated English language abstract for CN 107344488A extracted from espacenet.com database on Dec. 13, 2017, 2 pages.
Computer-Generated English language abstract for CN 206551871U extracted from espacenet.com database on Dec. 13, 2017, 2 pages.
Computer-generated English language abstract and computer-generated English language translation for CN 205951712U extracted from LexisNexis database on Apr. 12, 2017, 6 pages.
English language abstract and computer-generated English language translation for CN 103434390A extracted from espacenet.com database on May 24, 2017, 12 pages.
English language abstract and computer-generated English language translation for CN 103496320A extracted from espacenet.com database on May 24, 2017, 4 pages.
English language abstract and computer-generated English language translation for CN 105034789B extracted from espacenet.com database on Dec. 13, 2017, 9 pages.
English language abstract and computer-generated English language translation for CN 105818861B extracted from espacenet.com database on Dec. 13, 2017, 9 pages.
English language abstract and computer-generated English language translation for CN 200971047Y extracted from espacenet.com database on May 24, 2017, 6 pages.
English language abstract and computer-generated English language translation for CN 205326780U extracted from LexisNexis database on May 26, 2017, 20 pages.
English language abstract and computer-generated English language translation for CN 205326801U extracted from LexisNexis database on May 26, 2017, 22 pages.
English language abstract and computer-generated English language translation for CN 205468492U extracted from LexisNexis database on May 26, 2017, 23 pages.
English language abstract and computer-generated English language translation for CN 2541230Y extracted from espacenet.com database on May 24, 2017, 7 pages.
English language abstract and computer-generated English language translation for CN 2600273Y extracted from espacenet.com database on May 24, 2017, 4 pages.
English language abstract and computer-generated English language translation for CN 105150862B extracted from espacenet.com database on Dec. 13, 2017, 22 pages.
English language abstract and computer-generated English translation for CN 104309429A extracted from espacenet.com database on Sep. 27, 2016, 8 pages.
English language abstract and computer-generated English translation for CN 201312154Y extracted from Thomson Reuters database on Nov. 2, 2015, 6 pages.
English language abstract and computer-generated English translation for CN 202480779U extracted from Thomson Reuters database on Nov. 24, 2015, 5 pages.
English language abstract and computer-generated English translation for CN 203992104U extracted from Thomson Reuters database on Feb. 8, 2016, 6 pages.
English language abstract and computer-generated English translation for CN 204095429U extracted from espacenet.com database on Sep. 27, 2016, 9 pages.
English language abstract and computer-generated English language translation for CN 104986032B extracted from espacenet.com database on Dec. 18, 2017, 9 pages.
English language abstract for CN 103538474B extracted from espacenet.com database on Dec. 13, 2017, 1 page.
Computer-Generated English language abstract and computer-generated English language translation for DE 102016203970A1 extracted from espacenet.com database on Dec. 13, 2017, 10 pages.
English language abstract for DE 112015004318T5 extracted from espacenet.com database on Dec. 13, 2017, 2 pages.
English language abstract for FR 3003813A1 extracted from espacenet.com database on Sep. 28, 2016, 1 page.
English language abstract for JP 6209297B1 extracted from LexisNexis database on Dec. 13, 2017, 1 page.
English language abstract and computer-generated English translation for WO 20131087527A1 extracted from espacenet.com database on Sep. 28, 2016, 15 pages.
English language abstract and computer-generated English translation for WO 88104241A1 extracted from espacenet.com database on Sep. 28, 2016, 12 pages.
International Search Report for Application No. PCT/US2016/067136 dated Apr. 27, 2017, 4 pages.
International Search Report for Application No. PCT/US2017/031570 dated Jul. 20, 2017, 1 page.
U.S. Appl. No. 62/268,852, filed Dec. 17, 2015, 13 pages.
U.S. Appl. No. 62/333,032, filed May 6, 2016, 17 pages.
Computer-generated English language abstract for DE102013005721A1 extracted from espacenet.com database on Jan. 24, 2019, 3 pages.
Computer-generated English language abstract for DE102103214317A1 extracted from espacenet.com database on Jan. 24, 2019, 2 pages.
English language abstract for CN103010016B extracted from espacenet.com database on Jan. 24, 2019, 2 pages.
English language abstract for CN104728403B extracted from espacenet.com database on Jan. 24, 2019, 2 pages.
English language abstract for CN105799480A extracted from espacenet.com database on Jan. 24, 2019, 1 page.
English language abstract for CN201151343Y extracted from espacenet.com database on Jan. 24, 2019, 1 page.
English language abstract for CN206749495U extracted from espacenet.com database on Jan. 24, 2019, 1 page.
English language abstract for CN206812717U extracted from espacenet.com database on Jan. 24, 2019, 1 page.
English language abstract for CN206943366U extracted from espacenet.com database on Jan. 24, 2019, 1 page.
English language abstract for CN207021829U extracted from espacenet.com database on Jan. 24, 2019, 1 page.
English language abstract for CN207225059U extracted from espacenet.com database on Jan. 24, 2019, 1 page.
English language abstract for DE102012204717A1 extracted from espacenet.com database on Jan. 24, 2019, 1 page.
English language abstract for JP2013068248A extracted from espacenet.com database on Jan. 24, 2019, 1 page.
English language abstract for WO2013170848A1 extracted from espacenet.com database on Jan. 24, 2019, 2 pages.
English language abstract for WO2017216020A1 extracted from espacenet.com database on Jan. 24, 2019, 1 page.

* cited by examiner

FIG. 1



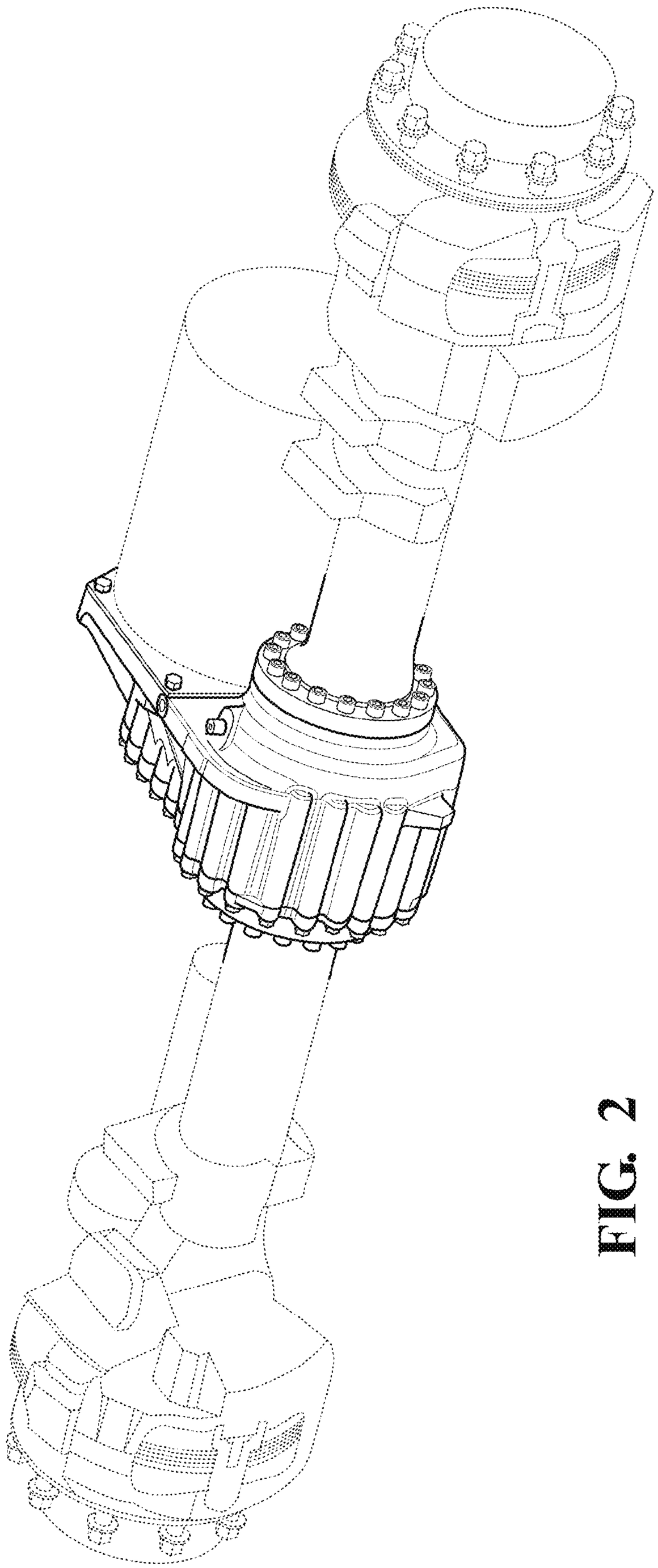


FIG. 2

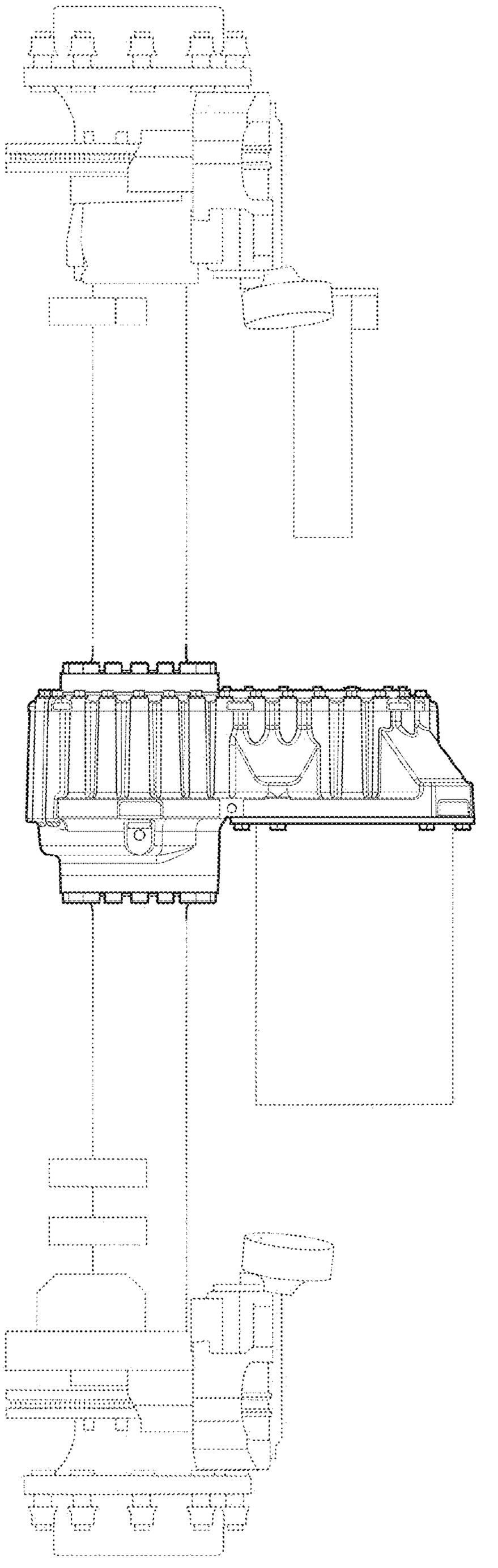


FIG. 3

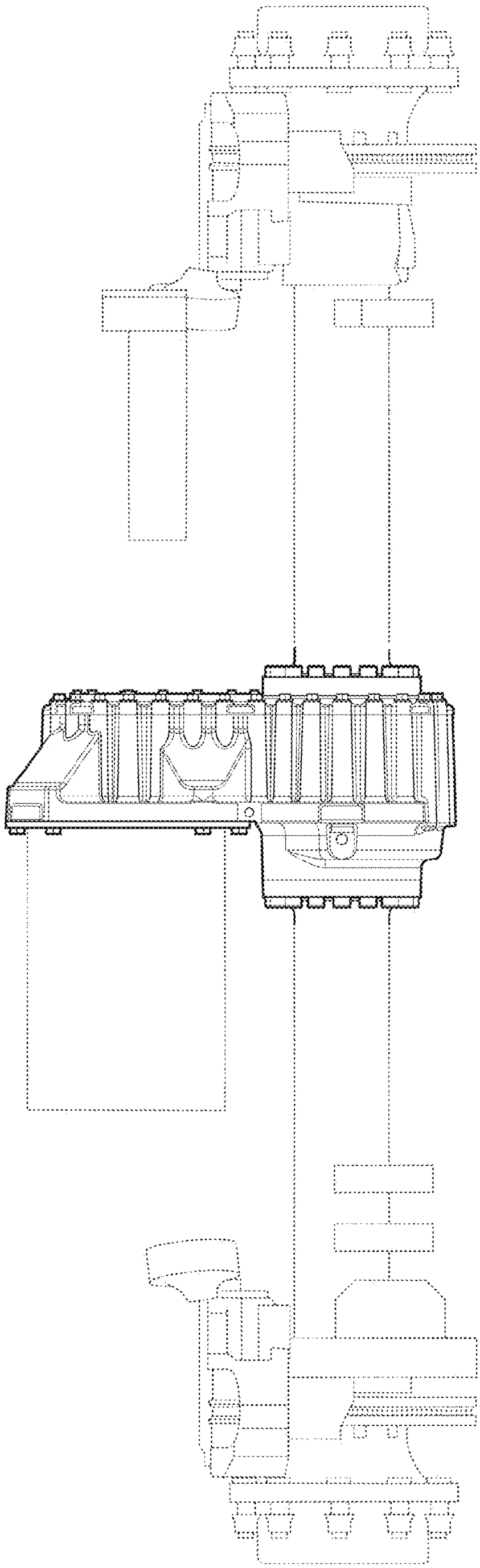


FIG. 4

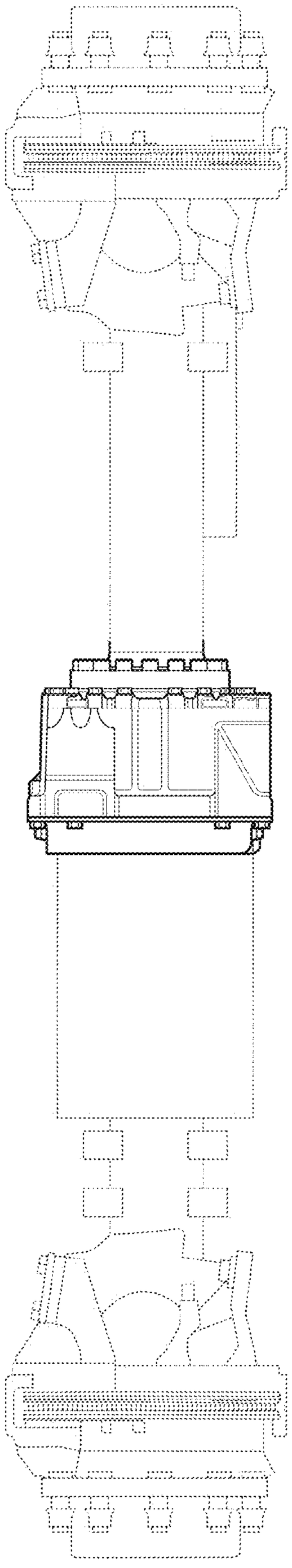


FIG. 5

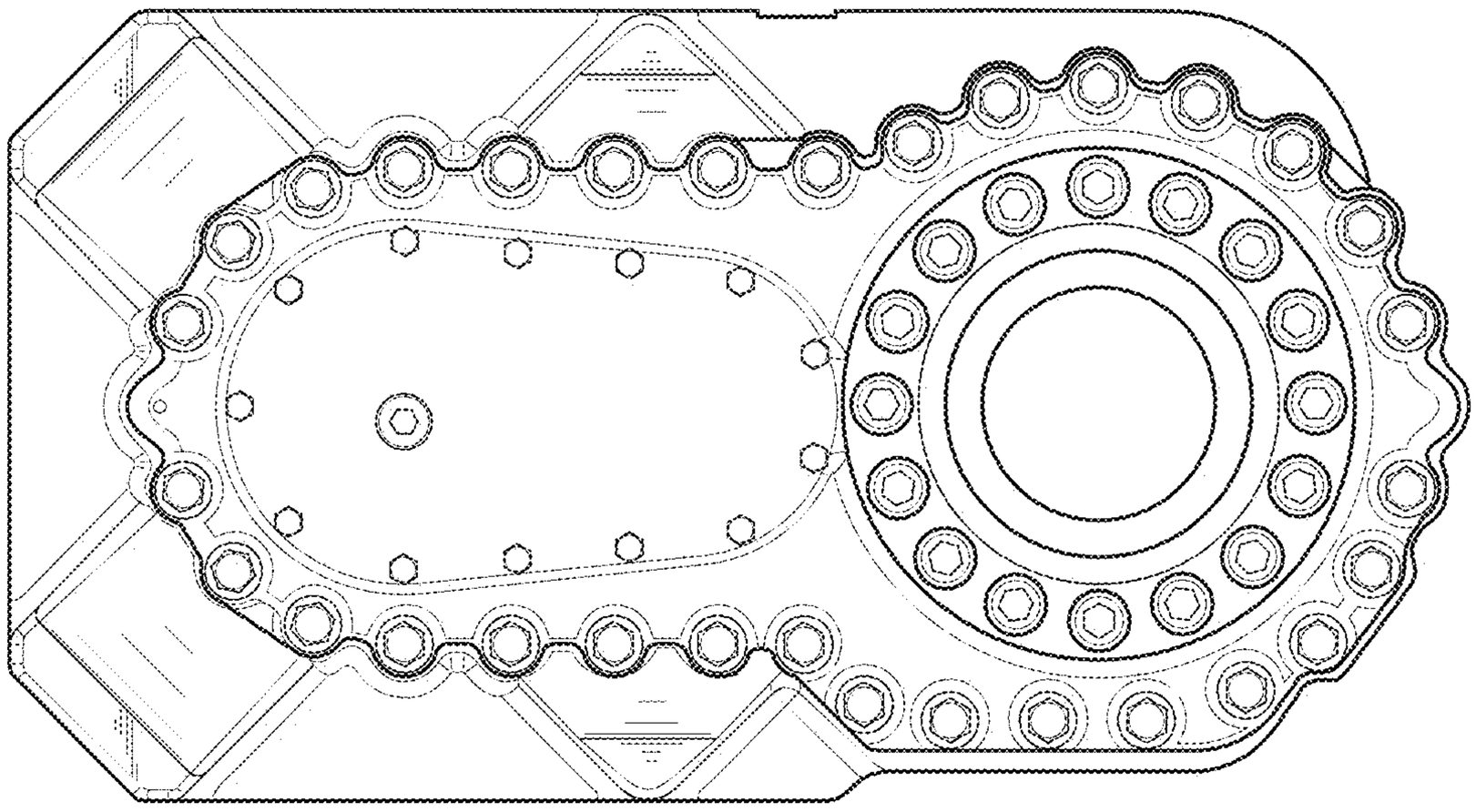


FIG. 6

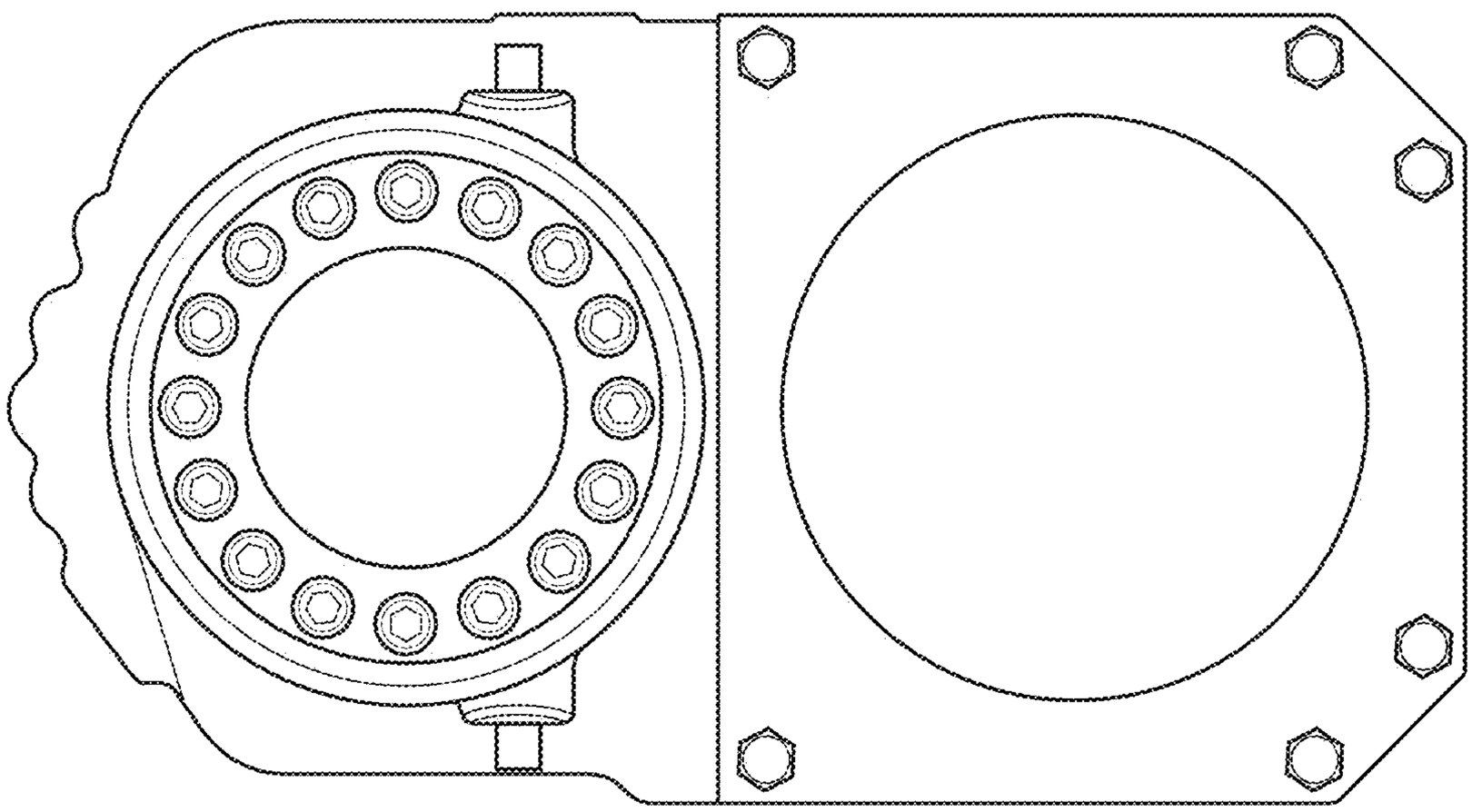


FIG. 7