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(12) **United States Design Patent** (10) **Patent No.:** **US D791,192 S**  
**Byrne et al.** (45) **Date of Patent:** **\*\* Jul. 4, 2017**

(54) **POWER END FRAME SEGMENT**  
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(73) Assignee: **S.P.M. Flow Control, Inc.**, Fort Worth, TX (US)

1,867,585 A 7/1932 Moore  
1,890,428 A 12/1932 Ferris et al.  
1,926,925 A 9/1933 Wescott  
2,056,622 A 10/1936 Schaer  
2,420,779 A 5/1947 Holmes  
2,428,602 A 10/1947 Yingling

(Continued)

**FOREIGN PATENT DOCUMENTS**

BR 8700642 A 8/1988  
CA 2486126 A1 10/2005

(Continued)

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(21) Appl. No.: **29/534,054**  
(22) Filed: **Jul. 24, 2015**

**OTHER PUBLICATIONS**

“Simatool Bearing Handling Tool BHT,” Simatec Smart Technologies; Dec. 19, 2013; <http://www.simatec.com/products/simatool/bearinghandlingtool/>.

(Continued)

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(52) **U.S. Cl.**  
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(58) **Field of Classification Search**  
USPC ..... D15/7-9; D23/231, 232, 225; 417/60, 417/235, 265, 321, 355, 358, 363, 359, 417/410.1, 415-416, 405, 900; 60/408, 60/412; 137/343, 565.34; 184/26-37; 415/140-147; 123/495, 509  
CPC ..... F02M 37/04; F02M 37/14  
See application file for complete search history.

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(57) **CLAIM**

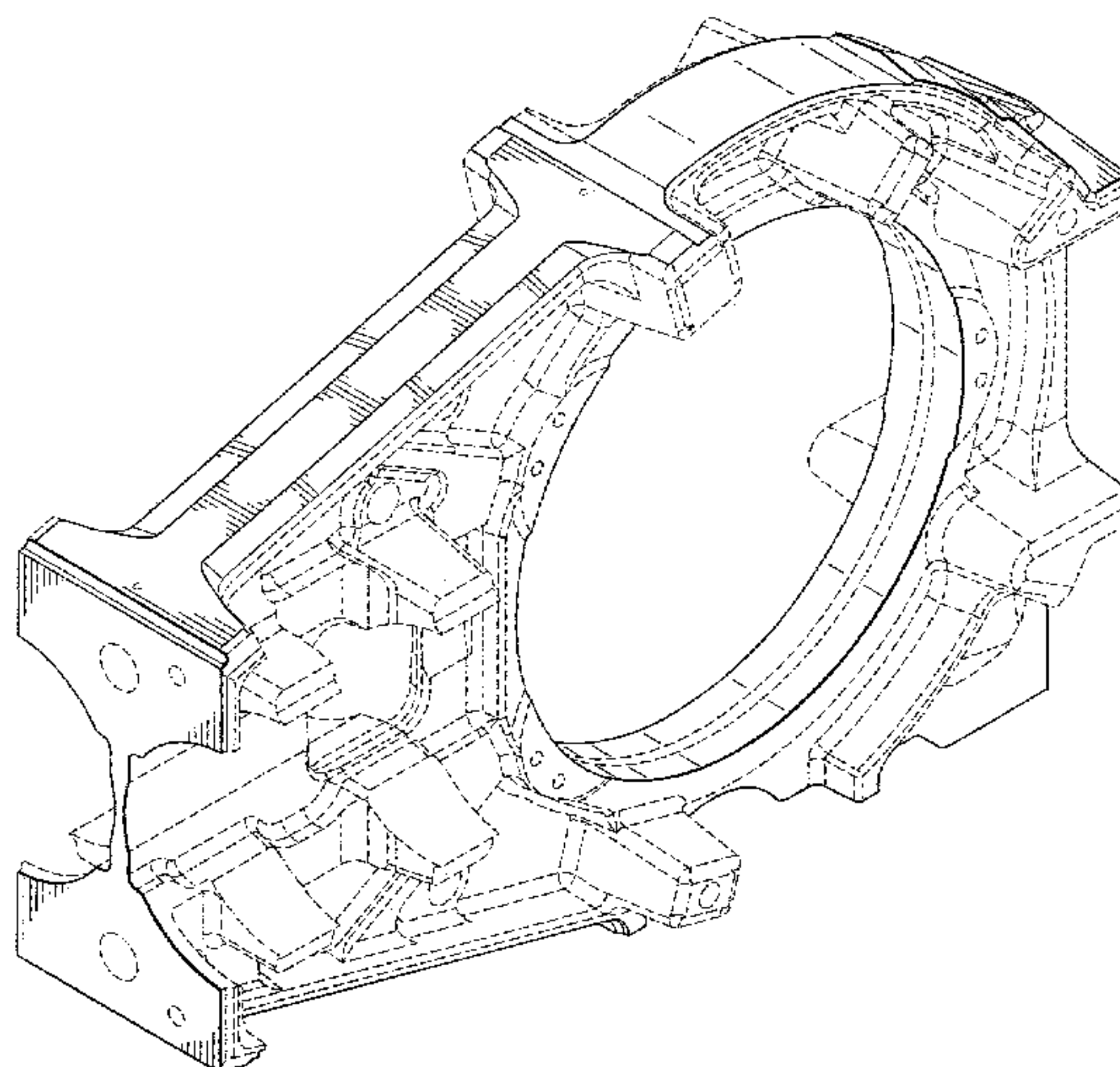
The ornamental design for a power end frame segment, as shown and described.

**DESCRIPTION**

FIG. 1 is a front perspective view of a power end frame segment;  
FIG. 2 is a front view of the power end frame segment;  
FIG. 3 is a rear view of the power end frame segment;  
FIG. 4 is left side view of the power end frame segment, the right side view being a mirror image thereof;  
FIG. 5 is a top view of the power end frame segment; and,  
FIG. 6 is a bottom view of the power end frame segment.  
The broken lines in FIGS. 1 through 6 form no part of the claimed design.

(56) **References Cited**  
U.S. PATENT DOCUMENTS  
364,627 A 6/1887 Arnold  
879,560 A 2/1908 Lepley  
1,418,202 A 5/1922 Parsons  
1,707,228 A 4/1929 Knapp

**1 Claim, 4 Drawing Sheets**



(56)

References Cited

U.S. PATENT DOCUMENTS

2,443,332 A	6/1948	Summers	5,425,306 A	6/1995	Binford
2,665,555 A	1/1954	Martinsson	5,560,332 A	10/1996	Chang
2,682,433 A	6/1954	Maier	5,594,665 A	1/1997	Walter et al.
2,755,739 A	7/1956	Euwe	5,658,250 A	8/1997	Blomquist et al.
2,766,701 A	10/1956	Giraudeau	5,671,655 A	9/1997	Vollrath
2,823,085 A	2/1958	Keylwert	5,673,666 A	10/1997	Beardmore et al.
2,828,931 A	4/1958	Harvey	5,772,403 A	6/1998	Allison et al.
2,878,990 A	3/1959	Zurcher	5,839,888 A	11/1998	Harrison
2,991,003 A	7/1961	Petersen	5,846,056 A	12/1998	Dhindsa et al.
3,039,317 A	6/1962	Wilson	5,855,397 A	1/1999	Black et al.
3,049,082 A	8/1962	Barry	5,984,645 A	11/1999	Cummings
3,137,179 A	6/1964	Moorhead	6,260,004 B1	7/2001	Hays et al.
3,158,211 A	11/1964	McCue	6,330,525 B1	12/2001	Hays et al.
3,163,474 A	12/1964	Wilson	6,419,459 B1	7/2002	Sibbing
3,168,665 A	2/1965	Holper	6,557,457 B1	5/2003	Hart et al.
3,179,451 A	4/1965	Blank	6,663,349 B1	12/2003	Discenzo et al.
3,206,242 A	9/1965	Fensin	6,697,741 B2	2/2004	Yu et al.
3,207,142 A	9/1965	Gorissen et al.	6,718,955 B1	4/2004	Knight
3,236,315 A	2/1966	Lora	D495,342 S *	8/2004	Tojo ..... D15/7
3,356,036 A	12/1967	Repp	D496,670 S *	9/2004	Ohnishi ..... D15/7
3,358,352 A	12/1967	Wilcox	6,853,110 B1	2/2005	Durham et al.
3,487,892 A	1/1970	Kiefer	6,859,740 B2	2/2005	Stephenson et al.
3,595,101 A	7/1971	Cooper, Sr.	6,873,267 B1	3/2005	Tubel et al.
3,757,149 A	9/1973	Holper	6,882,960 B2	4/2005	Miller
3,760,694 A	9/1973	Lieb	7,111,604 B1	9/2006	Hellenbroich et al.
3,883,941 A	5/1975	Coil	D538,824 S *	3/2007	Tojo ..... D15/7
3,967,542 A	7/1976	Hall et al.	7,219,594 B2	5/2007	Kugelev et al.
4,013,057 A	3/1977	Guenther	7,220,119 B1	5/2007	Kirchmer et al.
4,048,909 A	9/1977	Jepsen	7,272,533 B2	9/2007	Schlosser
4,099,447 A	7/1978	Ogles	7,364,412 B2	4/2008	Kugelev et al.
4,140,442 A	2/1979	Mulvey	7,374,005 B2	5/2008	Gray, Jr.
4,191,238 A	3/1980	Pichl	7,404,704 B2	7/2008	Kugelev et al.
4,210,399 A	7/1980	Jain	D591,311 S *	4/2009	Tojo ..... D15/7
4,211,190 A	7/1980	Indech	7,588,384 B2	9/2009	Yokohara
4,246,908 A	1/1981	Inagaki et al.	7,610,847 B2	11/2009	McKelroy
4,269,569 A	5/1981	Hoover	7,621,179 B2	11/2009	Ens et al.
4,338,054 A	7/1982	Dahl	7,623,986 B2	11/2009	Miller
4,381,179 A	4/1983	Pareja	7,866,153 B2	1/2011	Sollie et al.
4,388,837 A	6/1983	Bender	7,931,078 B2	4/2011	Toporowski et al.
4,476,772 A	10/1984	Gorman et al.	8,100,048 B2	1/2012	Christopher
4,477,237 A	10/1984	Grable	8,162,631 B2	4/2012	Patel et al.
4,494,415 A	1/1985	Elliston	D658,684 S	5/2012	Roman
4,512,694 A	4/1985	Foran et al.	D668,266 S *	10/2012	Ramirez, Jr. .... D15/7
4,553,298 A	11/1985	Grable	D670,312 S *	11/2012	Alexander ..... D15/7
4,606,709 A	8/1986	Chisolm	D676,875 S *	2/2013	Ramirez, Jr. .... D15/7
4,667,627 A	5/1987	Matsui et al.	8,376,723 B2	2/2013	Kugelev et al.
4,705,459 A	11/1987	Buisine et al.	D678,628 S	3/2013	Krueger
4,729,249 A	3/1988	Besic	D678,911 S	3/2013	Prevost
4,762,051 A	8/1988	Besic et al.	D682,317 S	5/2013	Carruth et al.
4,771,801 A	9/1988	Crump et al.	D685,393 S	7/2013	Prevost
4,803,964 A	2/1989	Kurek et al.	8,529,230 B1	9/2013	Colley, III et al.
4,809,646 A	3/1989	Paul et al.	D692,026 S *	10/2013	Alexander ..... D15/7
4,824,342 A	4/1989	Buck	D693,200 S	11/2013	Saunders
4,842,039 A	6/1989	Kelm	D698,502 S	1/2014	Krueger
4,876,947 A	10/1989	Rhodes	D700,622 S	3/2014	Carruth et al.
4,887,518 A	12/1989	Hayakawa	8,707,853 B1	4/2014	Dille et al.
4,939,984 A	7/1990	Fletcher-Jones	D704,385 S	5/2014	Hoofman
4,950,145 A	8/1990	Zanetos et al.	D708,401 S	7/2014	Krueger
4,966,109 A	10/1990	Pusic et al.	D713,101 S	9/2014	Bruno et al.
5,031,512 A	7/1991	Graziani	8,833,301 B2	9/2014	Donegan et al.
5,060,603 A	10/1991	Williams	8,833,302 B2	9/2014	Donegan et al.
5,063,775 A	11/1991	Walker, Sr. et al.	8,857,374 B1	10/2014	Donegan et al.
5,076,220 A	12/1991	Evans et al.	D759,728 S *	6/2016	Byrne ..... D15/9
5,078,580 A	1/1992	Miller et al.	2002/0020460 A1	2/2002	Viken
5,080,319 A	1/1992	Nielsen	2002/0189587 A1	12/2002	Hirano
5,115,725 A	5/1992	Horiuchi	2003/0024386 A1	2/2003	Burke
5,135,031 A	8/1992	Burgess et al.	2003/0079604 A1	5/2003	Seo
5,156,534 A	10/1992	Burgy et al.	2003/0118104 A1	6/2003	Zaccarin
5,216,943 A	6/1993	Adler et al.	2004/0213677 A1	10/2004	Matzner et al.
5,246,355 A	9/1993	Matzner et al.	2004/0219040 A1	11/2004	Kugelev et al.
5,247,873 A	9/1993	Owens et al.	2004/0244577 A1	12/2004	Haughom
5,287,612 A	2/1994	Paddock et al.	2006/0029502 A1	2/2006	Kugelev et al.
5,313,061 A	5/1994	Drew et al.	2007/0041847 A1	2/2007	Inoue et al.
5,337,612 A	8/1994	Evans	2007/0041849 A1	2/2007	Allen
5,370,093 A	12/1994	Hayes	2007/0099746 A1	5/2007	Hahlbeck
			2007/0144842 A1	6/2007	Zhou
			2008/0006148 A1	1/2008	McKelroy
			2008/0078583 A1	4/2008	Cummins
			2008/0213115 A1	9/2008	Hilger et al.



(56)

## References Cited

## U.S. PATENT DOCUMENTS

2008/0271562 A1 11/2008 Yasuhara et al.  
 2009/0084260 A1 4/2009 Christopher  
 2009/0092510 A1 4/2009 Williams et al.  
 2010/0044028 A1 2/2010 Brooks  
 2010/0129245 A1 5/2010 Patel et al.  
 2010/0129249 A1 5/2010 Bianchi et al.  
 2010/0158726 A1 6/2010 Donald et al.  
 2010/0160710 A1 6/2010 Strickland  
 2010/0172778 A1 7/2010 Kugelev et al.  
 2010/0242720 A1 9/2010 Matzner et al.  
 2010/0260631 A1 10/2010 Kugelev et al.  
 2010/0322802 A1 12/2010 Kugelev  
 2012/0141305 A1 6/2012 Landers et al.  
 2012/0144995 A1 6/2012 Bayyouk et al.  
 2012/0148430 A1 6/2012 Hubenschmidt et al.  
 2012/0167759 A1 7/2012 Chinthan et al.  
 2013/0064696 A1 3/2013 McCormick et al.  
 2013/0206108 A1 8/2013 Schule et al.  
 2013/0233165 A1 9/2013 Matzner et al.  
 2014/0196570 A1 7/2014 Small et al.  
 2015/0377318 A1 12/2015 Byrne  
 2016/0025082 A1 1/2016 Byrne et al.  
 2016/0025088 A1 1/2016 Byrne et al.  
 2016/0025089 A1 1/2016 Kumar et al.  
 2016/0025090 A1 1/2016 Bayyouk et al.

## FOREIGN PATENT DOCUMENTS

CA 2686204 A1 5/2010  
 CA 2749110 A1 7/2010  
 CA 153846 S 9/2014  
 CN 2436688 Y 6/2001  
 CN 2612816 Y 4/2004  
 CN 2674183 Y 1/2005  
 CN 2705626 Y 6/2005  
 CN 2758526 Y 2/2006  
 CN 1908435 A 2/2007  
 CN 2900853 Y 5/2007  
 CN 2926584 Y 7/2007  
 CN 200964929 Y 10/2007  
 CN 201092955 Y 7/2008  
 CN 101476558 A 7/2009  
 CN 201610828 U 10/2010  
 CN 201836038 U 5/2011  
 CN 201874803 U 6/2011  
 CN 102439314 A 5/2012  
 CN 103403351 A 11/2013  
 CN 2009100265839 4/2014  
 CN ZL201330555622.7 5/2014  
 CN 105264275 A 1/2016  
 DE 975401 C 11/1961  
 DE 1191069 B 4/1965  
 DE 3234504 A1 4/1983  
 DE 3441508 A1 5/1986  
 DE 3802714 A1 8/1988  
 DE 4416120 A1 11/1995  
 DE 19653164 C2 3/2000  
 DE 20120609 U1 3/2002  
 DE 10129046 B4 1/2006  
 EP 0300905 A1 1/1989  
 EP 0449278 A1 10/1991  
 EP 2397694 A1 12/2011  
 FR 2618509 A1 1/1989  
 GB 2342421 B 3/2003  
 GB 2419671 A 5/2006  
 GB 2482786 B 1/2015  
 JP 60175753 A 9/1985  
 JP 194453 7/1991  
 JP 10288086 A 10/1998  
 JP 2920004 B2 7/1999  
 JP 11200947 A 7/1999  
 JP 3974386 B2 9/2007  
 JP 2008539364 A 11/2008  
 KP 19990079544 11/1999  
 KP 100287572 6/2001

KR 101999006043 7/1999  
 KR 100275877 B1 12/2000  
 KR 20010065249 A 7/2001  
 KR 100302886 11/2001  
 KR 102001701082 12/2001  
 RU 2037700 C1 6/1995  
 SG 20131413 3/2014  
 WO WO-2008137515 A1 11/2008  
 WO WO-2010080961 A2 7/2010  
 WO WO-2010080963 A2 7/2010  
 WO WO-2011005571 A2 1/2011  
 WO WO-2012092452 A2 7/2012  
 WO WO-2013183990 A1 12/2013  
 WO WO-2014143094 A1 9/2014  
 WO WO-2015200810 A2 12/2015  
 WO WO-2016014967 A1 1/2016  
 WO WO-2016014988 A1 1/2016  
 WO WO-2016015006 A1 1/2016  
 WO WO-2016015012 A1 1/2016

## OTHER PUBLICATIONS

International Search Report mailed Dec. 4, 2015 in corresponding PCT application PCT/US2015/042078, 13 pages.  
 International Search Report and Written Opinion mailed Dec. 28, 2015 in corresponding international application PCT/US2015/042043, 14 pages.  
 International Search Report mailed Jun. 29, 2015 in corresponding PCT application, PCT/US2015/014898, 14 pages.  
 International Search Report and Written Opinion mailed Oct. 19, 2015 in corresponding PCT/US2015/042104; 11 pages.  
 Search Report mailed Dec. 4, 2015 in corresponding PCT application, PCT/US2015/042111, 13 pages.  
 International Search Report and Written Opinion mailed Dec. 4, 2015 in corresponding PCT Application PCT/US2015/042111; 13 pages.  
 Advisory Action mailed Apr. 7, 2009, by the USPTO, re U.S. Appl. No. 10/833,921.  
 Australia Exam Report, issued Feb. 9, 2015, by IP Australia, re Appl No. 2011352095.  
 Canadian Examiner's Report dated Jan. 11, 2016, by the CIPO, re App No. 2749110.  
 Canadian Examiner's Report, dated Oct. 22, 2015, by the CIPO, re App No. 2686204.  
 Canadian Examiner's Report, mailed Oct. 8, 2014, by the CIPO, re App No. 2823213.  
 Canadian Examiner's Report, mailed May 13, 2014, by the CIPO, re App No. 153846.  
 Chinese Office Action dated Mar. 15, 2013, re App No. 200910226583.9.  
 Chinese Office Action, issued Sep. 2, 2014, by SIPO, re App No. 201080008236.X.  
 Decision on Appeal mailed Feb. 20, 2013, by USPTO, re U.S. Appl. No. 10/831,467.  
 Dirk Guth et al., "New Technology for a High Dynamical MRF-Clutch for Safe and Energy-Efficient Use in Powertrain," FISITA 2012 World Automotive Congress, Beijing, China, Nov. 27-30, 2012, 31 pages.  
 Election Requirement, mailed Nov. 18, 2014, by the USPTO, re U.S. Appl. No. 29/455618.  
 Examiner's Answer mailed Jan. 29, 2010, by USPTO, re U.S. Appl. No. 10/831,467.  
 Examiner's Interview Summary mailed Apr. 10, 2008, by the USPTO, re U.S. Appl. No. 10/833,921.  
 Examiner's Interview Summary mailed Jul. 17, 2008, by the USPTO, re U.S. Appl. No. 10/831,467.  
 Gardner Denver Well Servicing Pump Model C-2500Q Power End Parts List, Feb. 2009.  
 International Preliminary Report on Patentability, by the IPEA/US, mailed Mar. 9, 2015 re PCT/US2013/040106.  
 International Preliminary Report on Patentability, by the IPEA/US, mailed Jan. 4, 2012 re PCT/US2010/039651.  
 International Preliminary Report on Patentability, by the IPEA/US, mailed Jul. 12, 2011 re PCT/US2010/020447.



(56)

**References Cited**

## OTHER PUBLICATIONS

International Search Report and Written Opinion, by the ISA/US, mailed Mar. 4, 2015, re PCT/US2014/069567.

International Search Report and Written Opinion, by the ISA/US, mailed Aug. 3, 2010, re PCT/US2010/020445, 7 pages.

International Search Report and Written Opinion, by the ISA/US, mailed Aug. 3, 2010, re PCT/US2010/020447, 7 pages.

International Search Report and Written Opinion, by the ISA/US, mailed Feb. 24, 2011, re PCT/US2010/039651, 7 pages.

International Search Report and Written Opinion, by the ISA/US, mailed Aug. 28, 2012, re PCT/US2011/067770, 6 pages.

International Search Report and Written Opinion, by the ISA/US, mailed Nov. 27, 2015, re PCT/US2015/038008.

International Search Report and Written Opinion, by the ISA/US, mailed Oct. 19, 2015, re PCT/US2015/042119.

International Search Report and Written Opinion, by the ISA/US, mailed Sep. 5, 2013, re PCT/US2013/040106.

“Metaldyne, Torsional Vibration Dampers, Brochure.”

MSI/Dixie Iron Works, Ltd., Technical Manual for 600 HP Triplex MSI TI-600 Pump, Rev. P. 102 pages, date unknown.

MSI/Dixie Iron Works, Ltd., Technical Manual for MSI Hybrid Well Service Pump Triplex and Quintuplex Modes!, Rev. D, 91 pages, date unknown.

Notice of Allowance mailed Dec. 23, 2011, by the USPTO, re U.S. Appl. No. 12/277,849.

Notice of Allowance mailed Feb. 12, 2016, by the USPTO, re U.S. Appl. No. 29/534,091.

Notice of Allowance mailed Jan. 28, 2015, by the USPTO, re U.S. Appl. No. 29/455,618.

Notice of Allowance mailed Oct. 12, 2012, by the USPTO, re U.S. Appl. No. 12/683,804.

Office Action/Restriction mailed Mar. 29, 2016, by the USPTO, re U.S. Appl. No. 14/565,962.

Office Action mailed Apr. 19, 2012, by the USPTO, re U.S. Appl. No. 12/821,663.

Office Action mailed Jan. 18, 2013, by the USPTO, re U.S. Appl. No. 12/748,127.

Office Action mailed Jan. 2, 2014, by the USPTO, re U.S. Appl. No. 13/866121.

Office Action mailed Jan. 21;2009, by the USPTO, re U.S. Appl. No. 10/833,921.

Office Action mailed Jan. 27, 2012, by the USPTO, re U.S. Appl. No. 12/683,804.

Office Action mailed Jul. 16, 2007, by the USPTO, re U.S. Appl. No. 10/831,467.

Office Action mailed Jul. 16, 2012, by the USPTO, re U.S. Appl. No. 12/683,804.

Office Action mailed Jul. 28, 2008, by the USPTO, re U.S. Appl. No. 10/833,921.

Office Action mailed Jun. 1, 2016, by the USPTO, re U.S. Appl. No. 14/565,962.

Office Action mailed Jun. 24, 2009, by the USPTO, re U.S. Appl. No. 10/831,467.

Office Action mailed Mar. 8, 2016, by the USPTO, re U.S. Appl. No. 14/262,880.

Office Action mailed Mar. 9, 2012, by the USPTO, re U.S. Appl. No. 12/821,663.

Office Action mailed May 23, 2013, by the USPTO, re U.S. Appl. No. 12/683,900.

Office Action mailed May 29, 2007, by the USPTO, re U.S. Appl. No. 10/833,921.

Office Action mailed May 7, 2008, by the USPTO, re U.S. Appl. No. 10/831,467.

Office Action mailed Nov. 14, 2008, by the USPTO, re U.S. Appl. No. 10/831,467.

Office Action mailed Oct. 11, 2011, by the USPTO, re U.S. Appl. No. 12/277,849.

Office Action mailed Oct. 7, 2013, by the USPTO, re U.S. Appl. No. 13/843,525.

Office Action mailed Sep. 18, 2007, by the USPTO, re U.S. Appl. No. 10/833,921.

Office Action mailed Sep. 29, 2014, by the USPTO, re U.S. Appl. No. 13/339,640.

SPM QEM2500 GL Well Service Plunger Pump, Generic Operation Instruction and Service Manual, May 8, 2010.

Suction Requirements for Reciprocating Power Pumps, p. 59, Figure 3.4 Composite Pump Dynamics.

Supplemental Notice of Allowance mailed Mar. 21, 2012, by the USPTO, re U.S. Appl. No. 12/277,849.

International Preliminary Report on Patentability, by the IPEA/US, mailed Aug. 23, 2016 re PCT/US2013/042043.

International Preliminary Report on Patentability, by the IPEA/US, mailed Jul. 12, 2011 re PCT/US2010/020445.

Canadian Examiner’s Report dated Aug. 18, 2016, by the CIPO, re App No. 2905809.

*Estee Lauder Inc. v. L’Oreal, USA*, 129 F.3d 588, 44 U.S.P.Q.2d 1610, No. 96-1512, United States Court of Appeals, Federal Circuit, Decided Nov. 3, 1997.

International Preliminary Report on Patentability, by the IPEA/US, mailed Sep. 16,2016 re PCT/US2015/042104.

International Search Report and nten Opinion, by the ISA/US, mailed Oct. 19, 2015, re PCT/US2015/042104.

Canadian Office Action dated May 17, 2011, re App No. 248126.

Chinese Office Action mailed Oct. 29, 2013, re App No. 201080008236.X.

\* cited by examiner

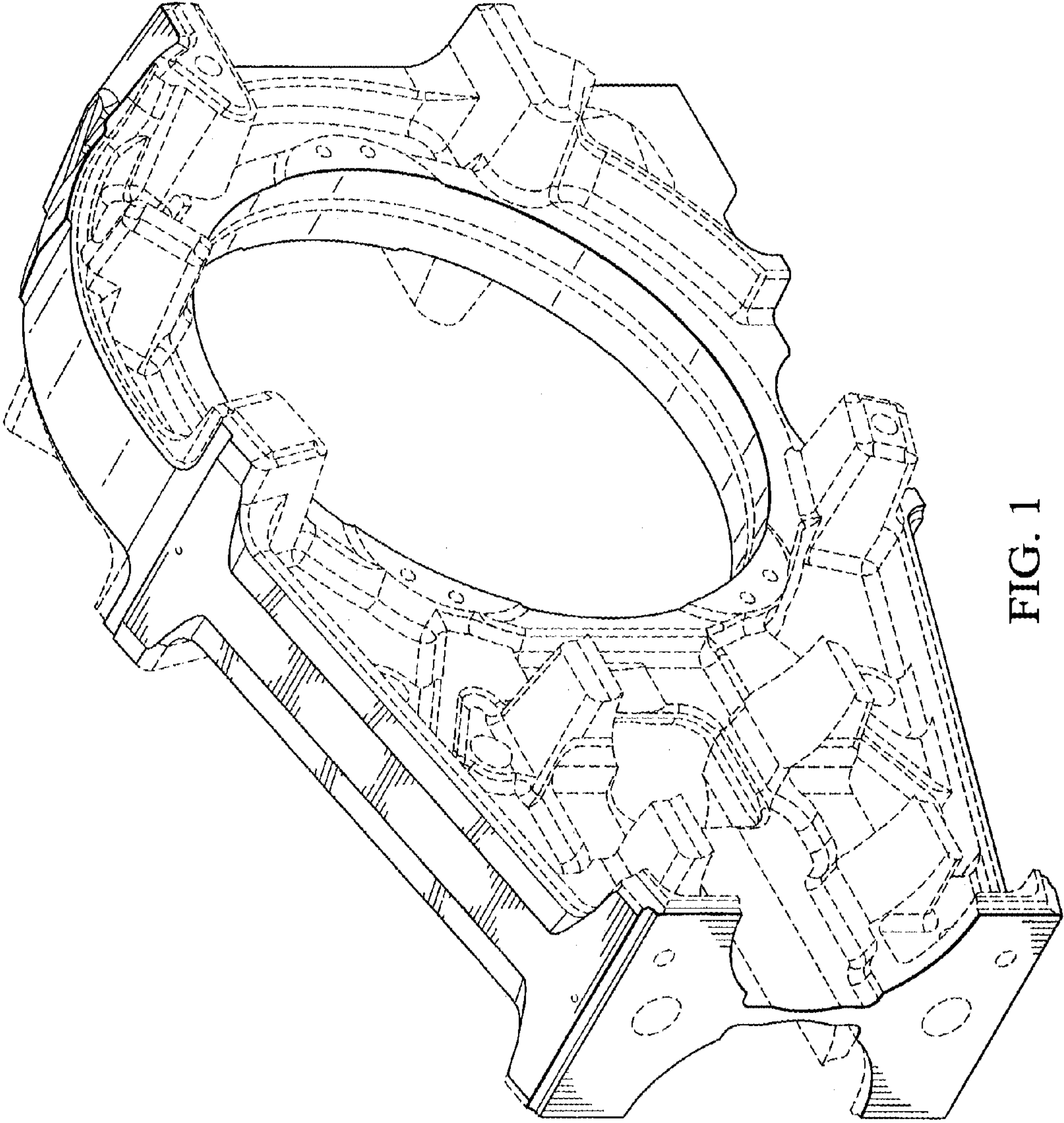


FIG. 1

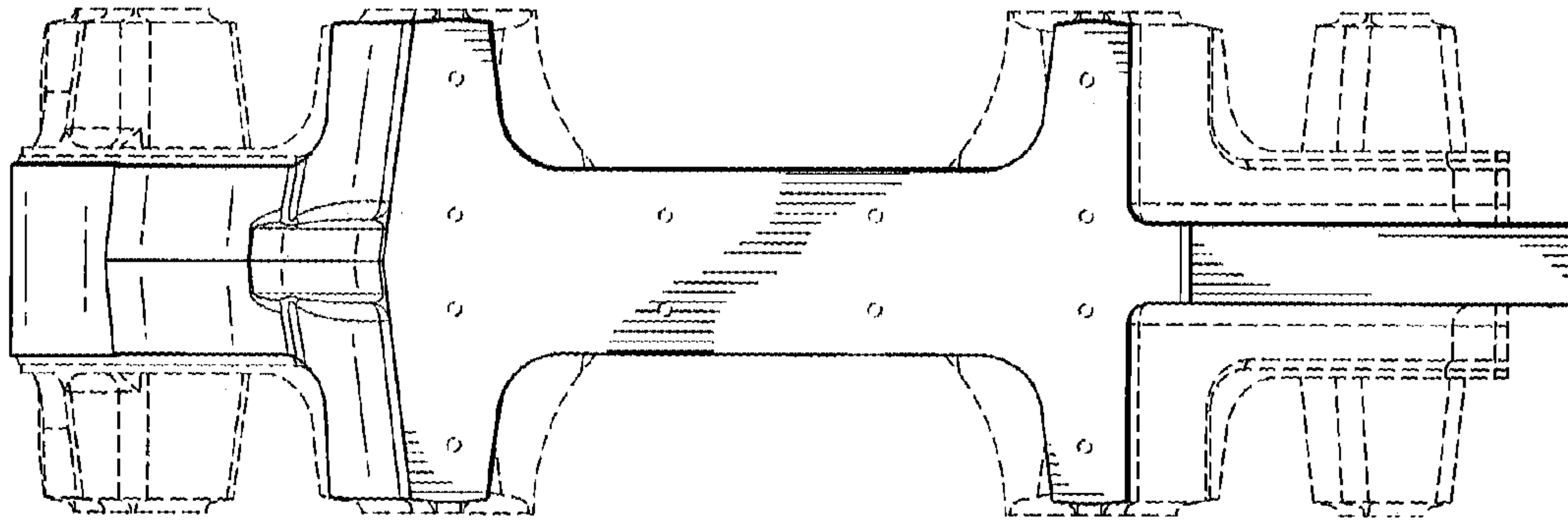


FIG. 3

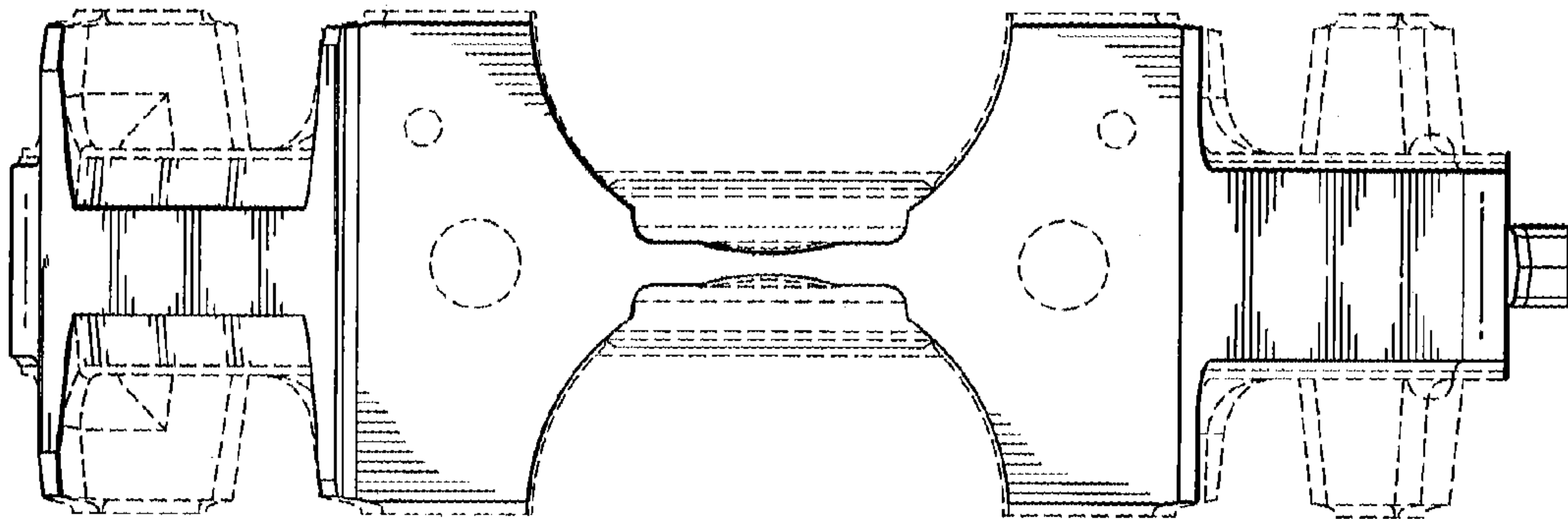


FIG. 2



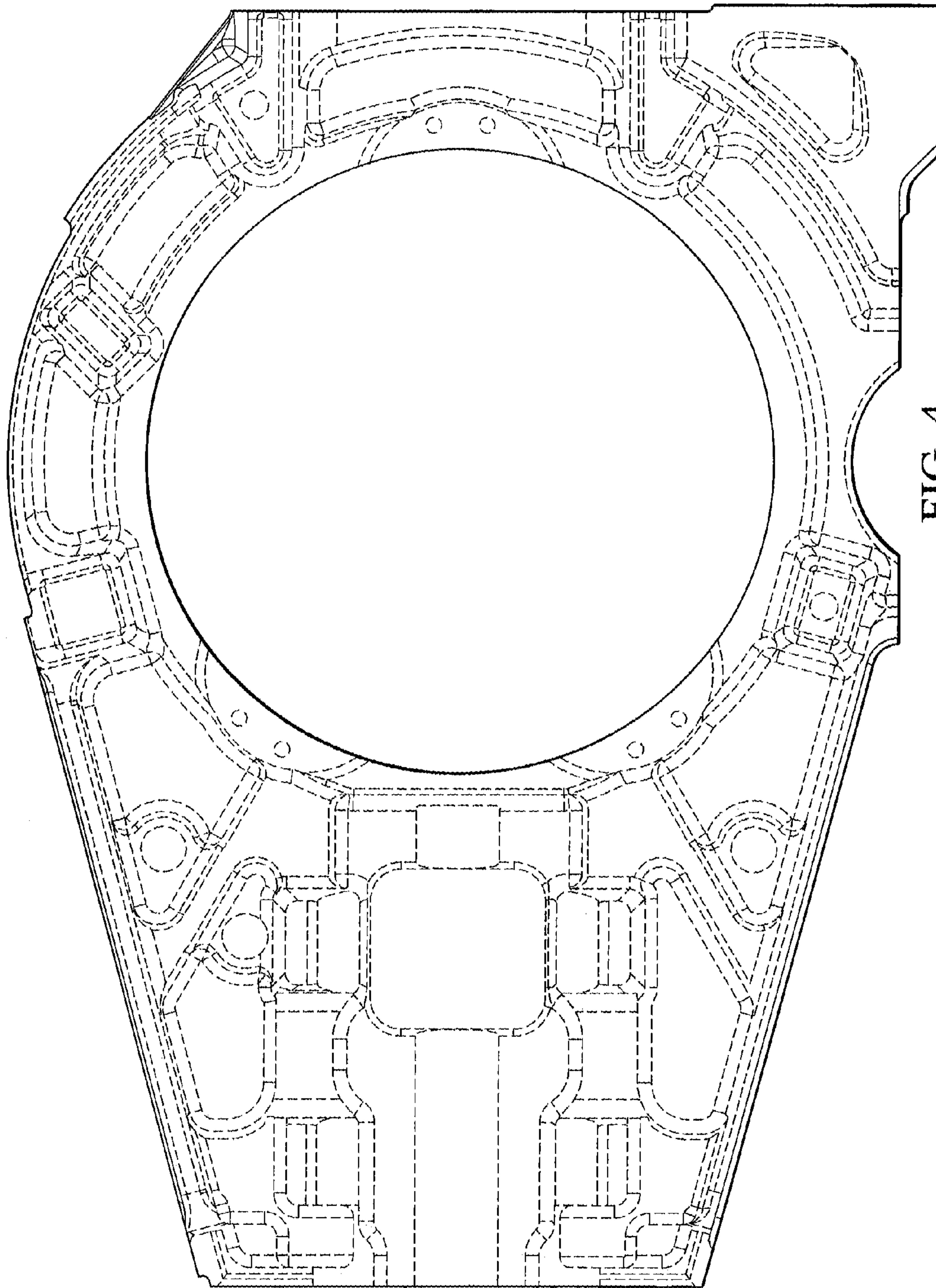


FIG. 4

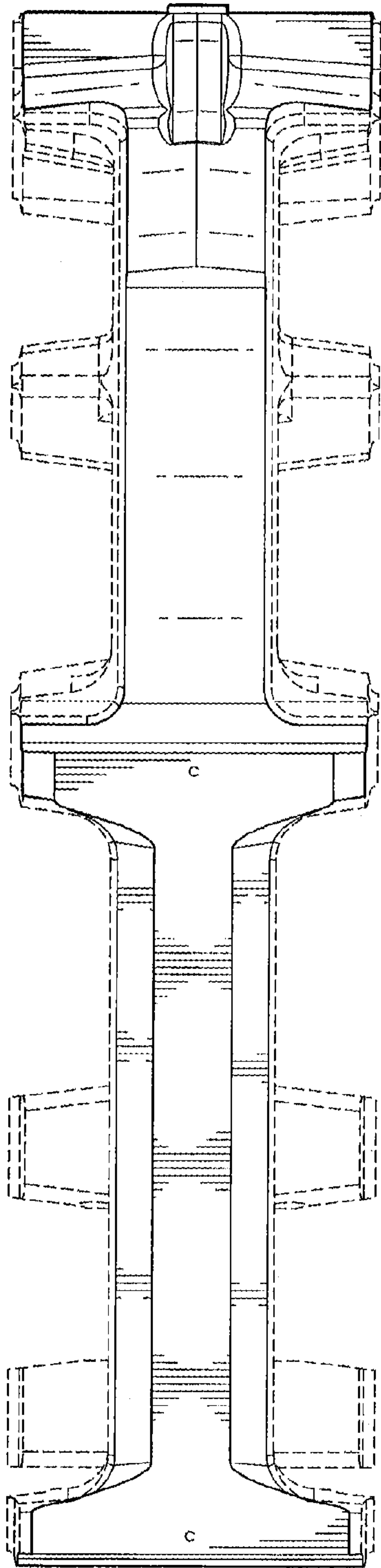


FIG. 5

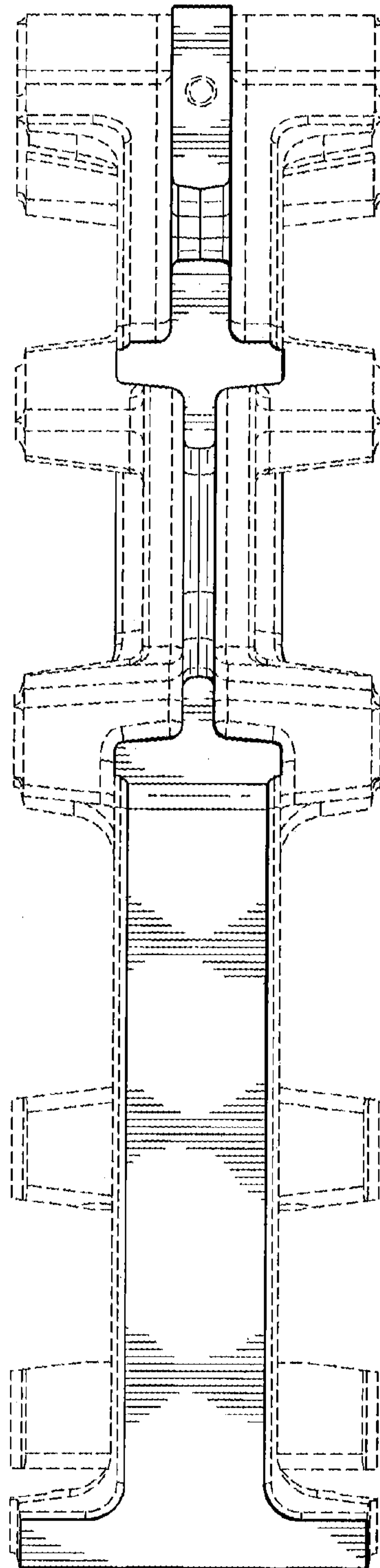


FIG. 6