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(12) **United States Design Patent**
DeLeon et al.

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(54) **CENTER PORTION OF A FLUID CYLINDER FOR A PUMP**

FOREIGN PATENT DOCUMENTS

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AR 084230 A1 5/2013
AR 084231 A1 5/2013

(Continued)

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OTHER PUBLICATIONS

Canadian Exam Report by the CIPO, dated Jan. 10, 2103, regarding App No. 146660.

(Continued)

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(**) Term: **14 Years**

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(21) Appl. No.: **29/467,436**

(57) **CLAIM**

The ornamental design for a center portion of a fluid cylinder for a pump, as shown and described.

(22) Filed: **Sep. 19, 2013**

DESCRIPTION

Related U.S. Application Data

(63) Continuation of application No. 29/445,736, filed on Feb. 15, 2013, now Pat. No. Des. 691,180, which is a continuation of application No. 29/419,417, filed on Apr. 27, 2012, now Pat. No. Des. 679,292.

This application is related to U.S. Design application Ser. No. 29/419,425, filed Apr. 27, 2012, the entire disclosure of which is incorporated herein by reference.

(51) **LOC (10) Cl.** **15-02**

(52) **U.S. Cl.**
USPC **D15/7**

(58) **Field of Classification Search**
USPC D15/7-9; D23/231, 232; 417/410.1, 417/359, 415-416, 234, 321, 265, 405; D24/107, 108, 111

FIG. 1 is a perspective view of a center portion of a fluid cylinder for a pump showing our new design; FIG. 2 is another perspective view thereof; FIG. 3 is a front elevational view thereof; FIG. 4 is a rear elevational view thereof; FIG. 5 is a top plan view thereof; FIG. 6 is a bottom plan view thereof; FIG. 7 is a right side elevational view thereof; FIG. 8 is a left side elevational view thereof; and, FIG. 9 is a perspective view thereof that is identical to FIG. 1, but for the depiction in broken lines of unclaimed environmental structure that is different from the unclaimed environmental structure depicted in broken lines in FIGS. 1 through 8.

See application file for complete search history.

The broken lines in FIGS. 1 through 9 form no part of the claimed design. The areas encircled by broken lines in FIGS. 1 through 9 are unclaimed areas and form no part of the claimed design.

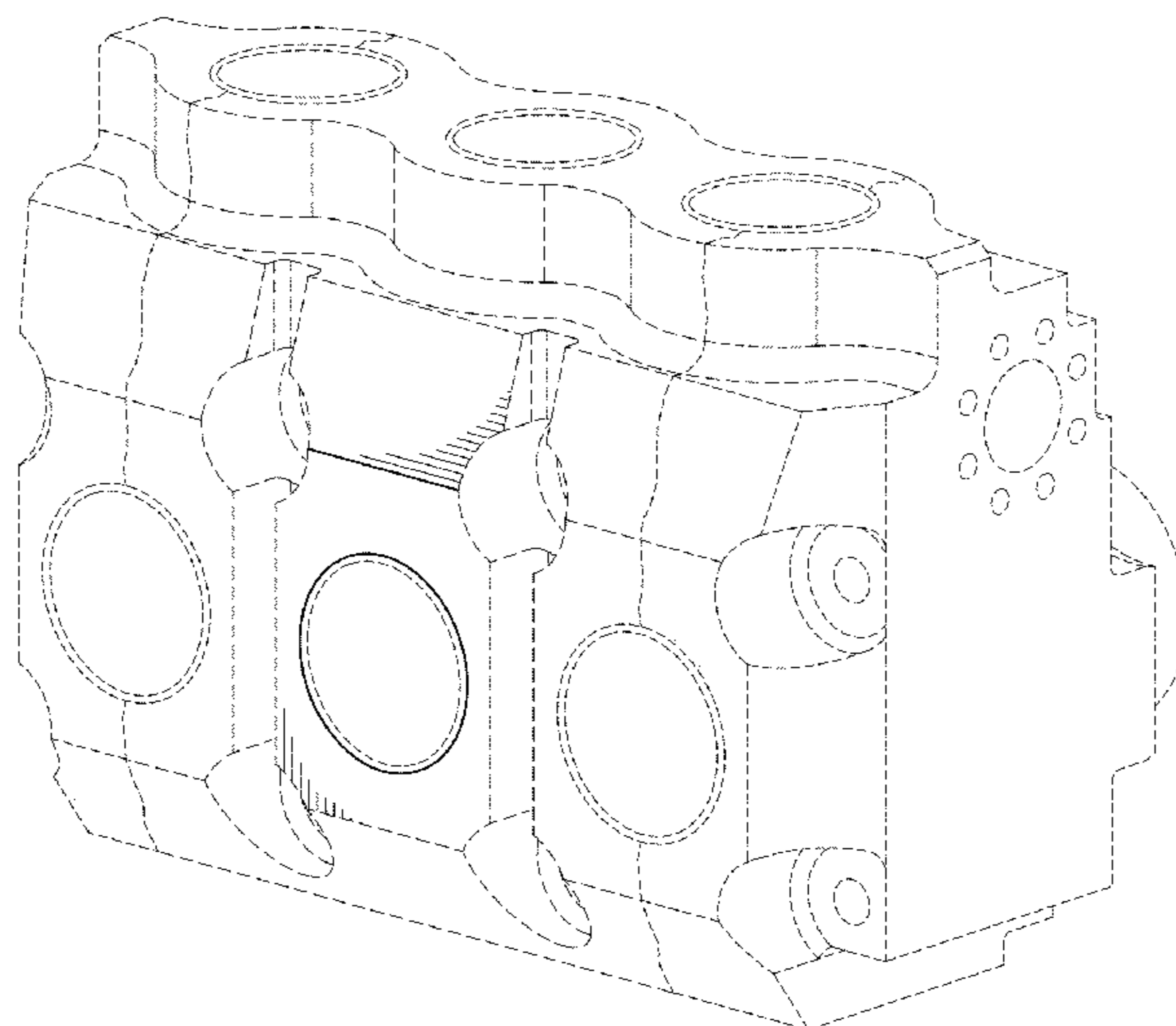
(56) **References Cited**

U.S. PATENT DOCUMENTS

2,666,026 A 1/1954 Gibbs
2,776,701 A 1/1957 Denis

(Continued)

1 Claim, 8 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

3,081,252 A 3/1963 Preiser et al.
 3,159,559 A 12/1964 Eberhardt, III
 3,470,077 A 9/1969 William
 3,679,332 A 7/1972 Yohpe
 3,810,716 A 5/1974 Abrahams et al.
 3,844,921 A 10/1974 Benedict
 3,919,068 A 11/1975 Gary
 3,963,384 A 6/1976 Bastenhof
 4,097,357 A 6/1978 Jacquelin
 4,339,227 A 7/1982 Furst
 4,370,211 A 1/1983 Hybler
 4,378,853 A 4/1983 Chia et al.
 4,412,792 A 11/1983 LaBorde et al.
 4,520,837 A 6/1985 Cole et al.
 4,861,241 A 8/1989 Gamboa et al.
 5,059,101 A 10/1991 Valavaara
 5,102,297 A 4/1992 Thompson
 5,127,807 A 7/1992 Eslinger
 5,154,589 A 10/1992 Ruhl et al.
 5,171,136 A 12/1992 Pacht
 5,246,355 A 9/1993 Matzner et al.
 D355,199 S 2/1995 Ousey
 D361,575 S 8/1995 Makino
 5,584,672 A 12/1996 Simonette
 5,636,975 A 6/1997 Tiffany et al.
 5,639,227 A 6/1997 Mills
 5,823,541 A 10/1998 Dietle et al.
 5,839,468 A 11/1998 Allred
 5,848,878 A 12/1998 Conti et al.
 5,947,697 A 9/1999 Morrison
 D420,683 S 2/2000 Suzuki
 6,065,453 A 5/2000 Zych
 6,382,940 B1 5/2002 Blume
 6,386,751 B1 5/2002 Wootan et al.
 D461,733 S 8/2002 Iida
 D461,827 S 8/2002 Koebbe
 6,544,012 B1 4/2003 Blume
 6,595,278 B1 7/2003 Lam et al.
 6,623,259 B1 9/2003 Blume
 6,705,396 B1 3/2004 Ivannikov et al.
 6,843,313 B2 1/2005 Hult
 D506,210 S 6/2005 Selic et al.
 6,910,871 B1 6/2005 Blume
 7,036,688 B2 5/2006 Stettes et al.
 7,118,114 B2 10/2006 Burdick et al.
 7,186,097 B1 3/2007 Blume
 7,255,163 B2 8/2007 Rivard
 D552,139 S 10/2007 Cho
 D556,861 S 12/2007 Yokohari
 D556,862 S 12/2007 Yokohari
 D557,286 S 12/2007 Pedrollo
 7,335,002 B2 2/2008 Vicars
 7,364,412 B2 4/2008 Kugelev et al.
 7,404,704 B2 7/2008 Kugelev et al.
 D583,389 S 12/2008 Bilger
 D584,320 S 1/2009 Huang
 7,484,452 B2 2/2009 Baxter et al.
 7,513,759 B1 4/2009 Blume
 D603,870 S 11/2009 Mehnert et al.
 D605,665 S * 12/2009 Falkenberg D15/7
 D606,629 S 12/2009 Tokumoto
 D623,200 S 9/2010 Fulkerson et al.
 D629,423 S 12/2010 Varini
 7,874,369 B2 1/2011 Parker et al.
 D641,382 S 7/2011 Hawes et al.
 8,016,027 B2 9/2011 Boyles
 8,074,999 B2 12/2011 Burdick et al.
 D655,314 S * 3/2012 Yoshimura et al. D15/9
 D657,799 S 4/2012 Jung
 8,147,227 B1 4/2012 Blume
 D660,191 S 5/2012 Asaba
 D667,532 S 9/2012 Asaba
 D670,312 S * 11/2012 Alexander et al. D15/7
 D670,790 S 11/2012 Tokumoto
 D676,111 S 2/2013 Fukano et al.

D679,290 S * 4/2013 Skurdalsvold D15/7
 D679,292 S * 4/2013 DeLeon et al. D15/7
 D679,293 S * 4/2013 DeLeon et al. D15/7
 D687,125 S 7/2013 Matzner et al.
 D691,180 S * 10/2013 DeLeon et al. D15/7
 2003/0235508 A1 12/2003 Vicars
 2004/0219042 A1 11/2004 Kugelev et al.
 2006/0002806 A1 1/2006 Baxter et al.
 2006/0159573 A1 7/2006 Inoue et al.
 2007/0051508 A1 3/2007 Pecorari et al.
 2007/0237651 A1 10/2007 Tojo
 2008/0003122 A1 1/2008 Tian et al.
 2008/0138224 A1 6/2008 Vicars
 2009/0314645 A1 12/2009 Kim
 2010/0322802 A1 12/2010 Kugelev
 2011/0189040 A1 8/2011 Vicars
 2011/0198072 A1 8/2011 Cote et al.
 2011/0308967 A1 12/2011 Byrne
 2012/0063936 A1 3/2012 Baxter et al.
 2012/0144995 A1 6/2012 Bayyouk et al.
 2012/0183424 A1 7/2012 Bayyouk et al.
 2012/0288387 A1 11/2012 Freed et al.

FOREIGN PATENT DOCUMENTS

AU 343913 8/2012
 AU 343914 8/2012
 CA 2486223 C 9/2010
 CA 2350047 C 10/2010
 CA 138269 7/2011
 CA 2514769 C 9/2011
 CA 2716430 C 5/2012
 CA 144435 9/2012
 CA 2711206 C 9/2012
 CN 201148968 Y 11/2008
 CN 101397672 A 4/2009
 CN ZL201030691447.0 2/2012
 CN ZL201230031196.2 12/2012
 CN ZL201230337093.9 3/2013
 CN ZL201230324855.1 5/2013
 CN ZL201230513325.1 5/2013
 CN ZL201230643096.5 7/2013
 DE 10214404 A1 10/2003
 EM 001994054-0001 2/2012
 EM 001335699-0001 7/2012
 EM 001335699-0002 7/2012
 EM 002125732-0001 1/2013
 EP 0580196 A1 1/1994
 EP 1780415 A1 5/2007
 GB 1449280 A 9/1976
 GB 2419642 B 7/2009
 GB 2416811 B 9/2009
 IN 243221 2/2012
 IN 246712 3/2013
 JP 2000170643 A 6/2000
 RU 2168064 C2 5/2001
 SA 2446 9/2012
 SG 2012/168 I 2/2012
 SG 2012/874 8/2012
 SG 2012/875 G 8/2012
 SG 2012/1221 12/2012
 WO 2004092538 A1 10/2004
 WO 2005015024 A1 2/2005
 WO 2005088125 A1 9/2005
 WO 2011018732 A2 2/2011
 WO 2011027273 A2 3/2011
 WO 2011054948 A1 5/2011
 WO 2011160069 A1 12/2011
 WO 2012078870 A2 6/2012
 WO 2012078888 A2 6/2012
 WO 2012145591 A1 10/2012

OTHER PUBLICATIONS

Cole B.N., "Strategy for Cross-Bores in High Pressure Containers,"
 Journal of Mechanical Engineering Science, 1969, vol. 11 (2), pp.
 151-176.
 Co-pending U.S. Appl. No. 29/420,822, filed May 14, 2012.
 Co-pending U.S. Appl. No. 29/424,801, filed Jun. 15, 2012.

(56)

References Cited

OTHER PUBLICATIONS

Co-pending U.S. Appl. No. 29/425,284, filed Jun. 21, 2012.
 Co-pending U.S. Appl. No. 29/445,736, filed Feb. 15, 2013.
 Co-pending U.S. Appl. No. 29/461,771, filed Jul. 7, 2013.
 Search Report, dated Jan. 18, 2005, from the UK Patent Office, regarding App No. GB0424019.8.
 Search Report, dated Oct. 31, 2005, by the UK Patent Office, regarding App No. GB0516137.7.
 Examination Report by IP India, dated Jan. 3, 2013, regarding App No. 248994.
 Examination Report issued by IP India, dated Mar. 28, 2013, regarding App No. 246713.
 Examiner Interview Summary, mailed Oct. 9, 2007, by the USPTO, regarding U.S. Appl. No. 10/913,221.
 Final Office Action, mailed Jul. 20, 2007, by the USPTO, regarding U.S. Appl. No. 10/913,221.
 Final Office Action, mailed Nov. 6, 2012, regarding Design U.S. Appl. No. 29/411,974.
 First Examination Report, dated Aug. 31, 2012, by the India Patent Office, regarding Design App No. 246713.
 First Examination Report, dated Sep. 14, 2012, by the India Patent Office, regarding Design App No. 246712.
 International Preliminary Report on Patentability, issued Dec. 19, 2012, by the IB, in connection with PCT/US2011/040960.
 International Search Report and Written Opinion for Application No. PCT/US2011/040960 mailed on Nov. 1, 2011, 6 pages.
 International Search Report and Written Opinion for Application No. PCT/US2012/034397 mailed on Jun. 29, 2012, 10 pages.
 International Search Report and Written Opinion issued Apr. 8, 2013, by the ISA/US, regarding PCT/US2013/024172.
 International Search Report and Written Opinion, mailed on Jul. 20, 2012, by ISA/KR, regarding PCT/US2011/063946.
 International Search Report and Written Opinion, mailed on Jul. 20, 2012, by ISA/KR, regarding PCT/US2011/063968.
 L.M.; Masu., "Numerical analysis of cylinders containing circular offset cross-bores—Abstract", Mar. 1998, vol. 75, Issue 3.
 Makulsawatudom P., et al., "Stress Concentration at Crossholes in Thick Cylindrical Vessels," *Journal of Strain Analysis for Engineering Design*, 2004, vol. 39 (5), pp. 471-481.
 Masu L.M., "Cross Bore Configuration and Size Effects on the Stress Distribution in Thick-walled Cylinders," *International Journal of Pressure Vessels and Piping*, 1997, vol. 72 (2), pp. 171-176.
 Notice of Allowance mailed Apr. 12, 2013, by the USPTO, regarding Design U.S. Appl. No. 29/420,822.

Notice of Allowance mailed Apr. 18, 2013, by the USPTO, regarding Design U.S. Appl. No. 29/399,897.
 Notice of Allowance mailed Dec. 12, 2007, by the USPTO, regarding U.S. Appl. No. 10/913,221.
 Notice of Allowance mailed Jan. 10, 2013, by the USPTO, regarding Design U.S. Appl. No. 29/411,974.
 Notice of Allowance mailed Jan. 18, 2013, by the USPTO, regarding Design U.S. Appl. No. 29/419,417.
 Notice of Allowance mailed Jan. 23, 2013, by the USPTO, regarding Design U.S. Appl. No. 20/419,425.
 Notice of Allowance mailed Jul. 26, 2013, by the USPTO, regarding Design U.S. Appl. No. 29/445,736.
 Notice of Allowance mailed Mar. 27, 2008, by the USPTO, regarding U.S. Appl. No. 10/835,749.
 Notice of Allowance mailed Mar. 8, 2011, by the USPTO, regarding Design U.S. Appl. No. 29/363,376.
 Notice of Allowance mailed May 29, 2013, by the USPTO, regarding U.S. Appl. No. 29/425,284.
 Office Action mailed Apr. 25, 2013, by USPTO, regarding U.S. Appl. No. 13/162,815.
 Office Action mailed Aug. 14, 2013, by the USPTO regarding U.S. Appl. No. 13/314,745.
 Office Action mailed Aug. 14, 2013, by the USPTO, regarding U.S. Appl. No. 13/849,228.
 Office Action, mailed Jan. 10, 2008, by the USPTO, regarding U.S. Appl. 10/835,749.
 Office Action mailed Jul. 17, 2013, by the USPTO, regarding Design U.S. Appl. No. 29/420,822.
 Office Action mailed Jul. 22, 2013, by the USPTO, regarding U.S. Appl. No. 13/314,831.
 Office Action, mailed Jul. 23, 2012, regarding Design U.S. Appl. No. 29/411,974.
 Office Action, mailed Jun. 21, 2007, by the USPTO, regarding U.S. Appl. No. 10/835,749.
 Office Action, mailed Mar. 29, 2007, by the USPTO, regarding U.S. Appl. No. 10/913,221.
 Office Action, mailed Nov. 9, 2010, by the USPTO, regarding Design U.S. Appl. No. 29/363,376.
 Xie; He et al., "Fatigue Prediction for Pump End of High Pressure Fracturing Pump", 2011, vol. 337, 81-86.

* cited by examiner

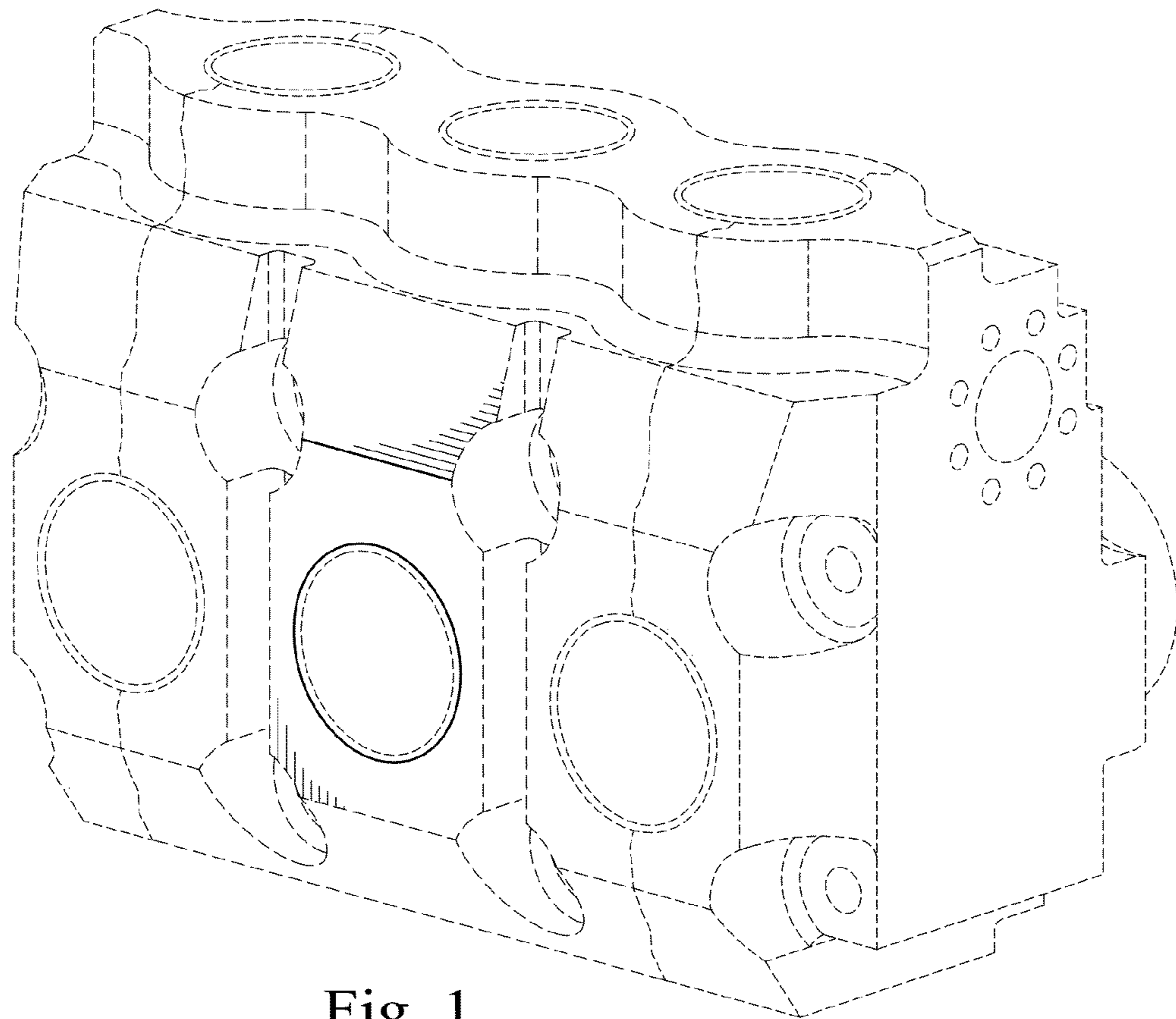
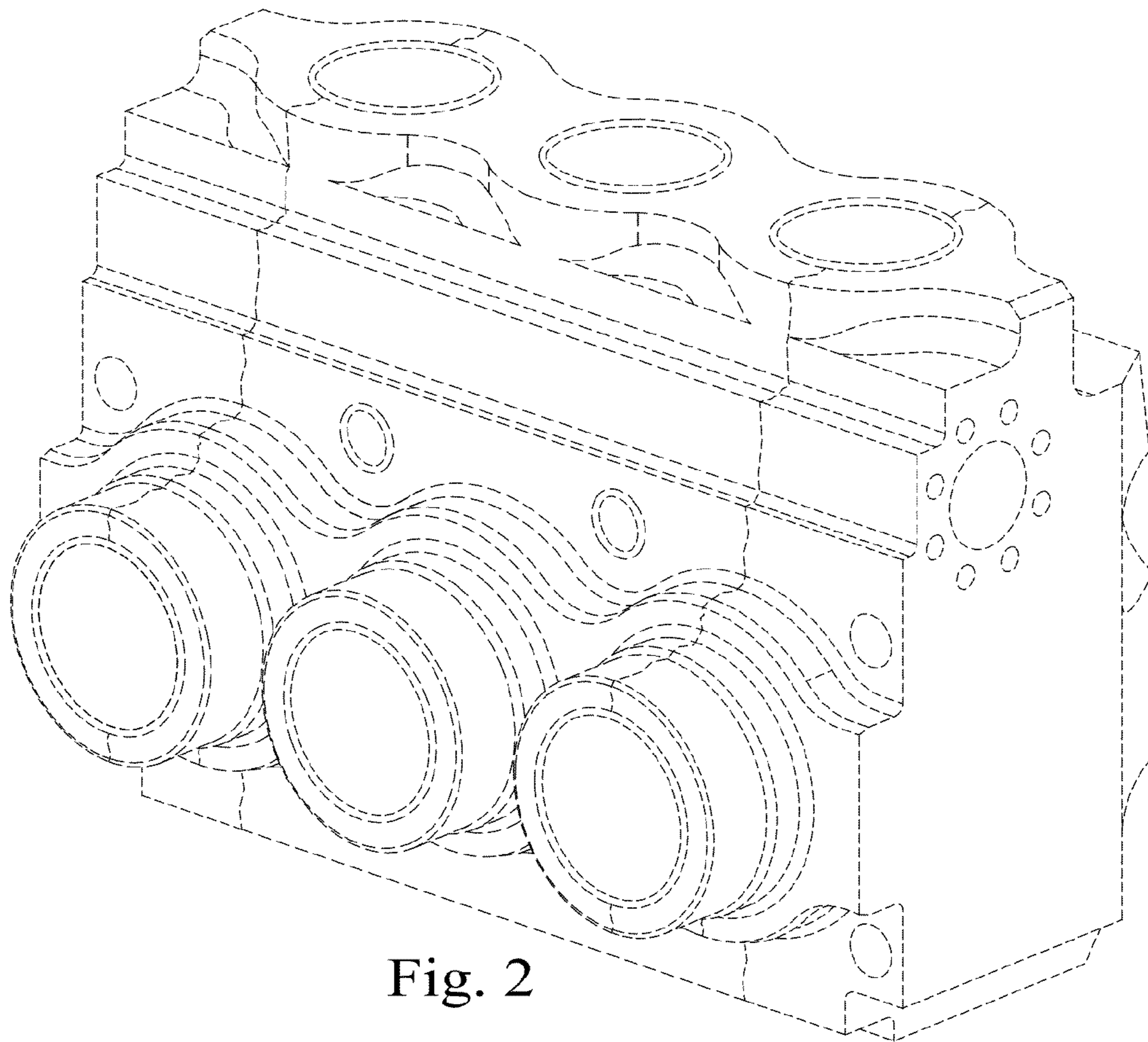


Fig. 1



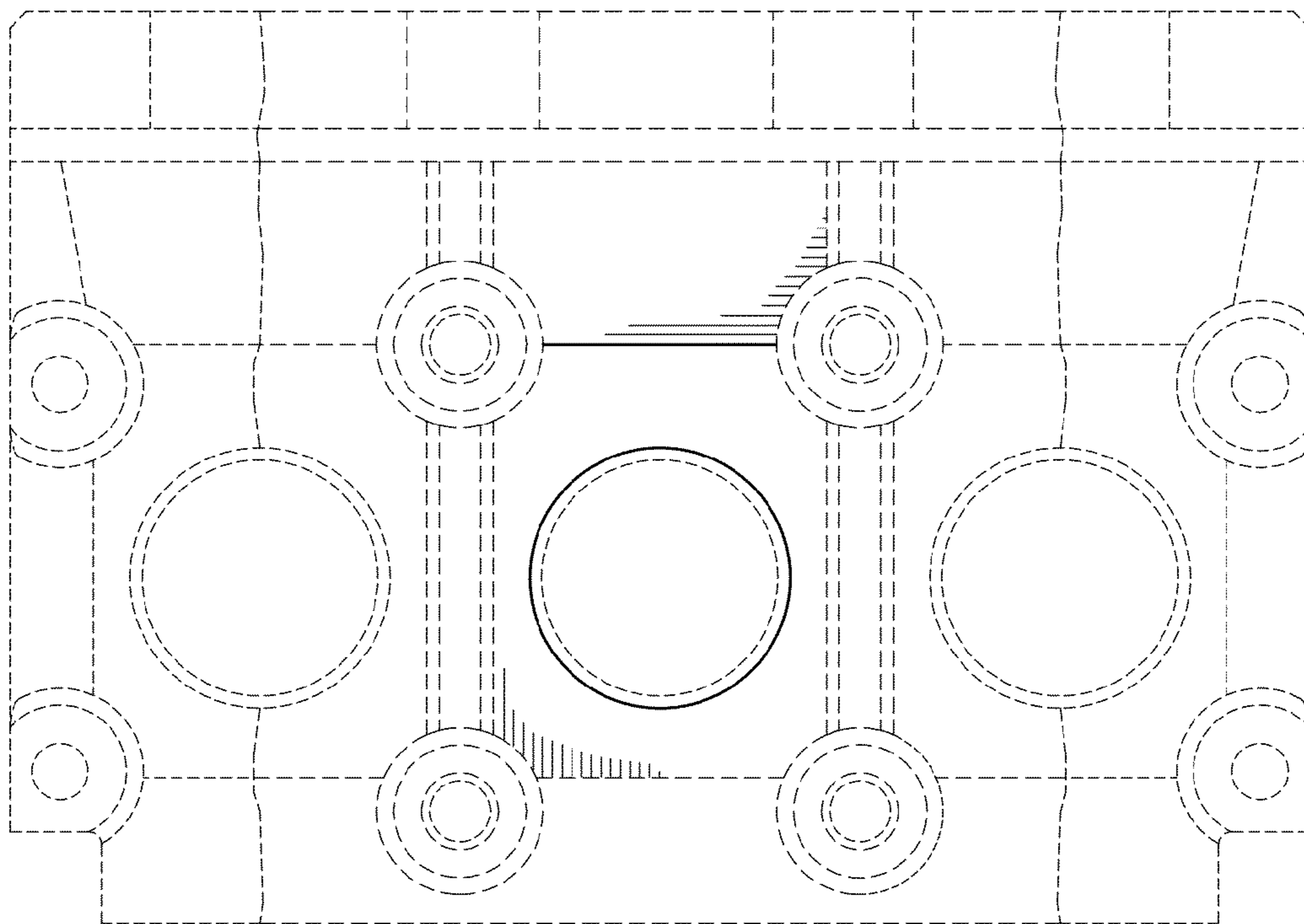


Fig. 3

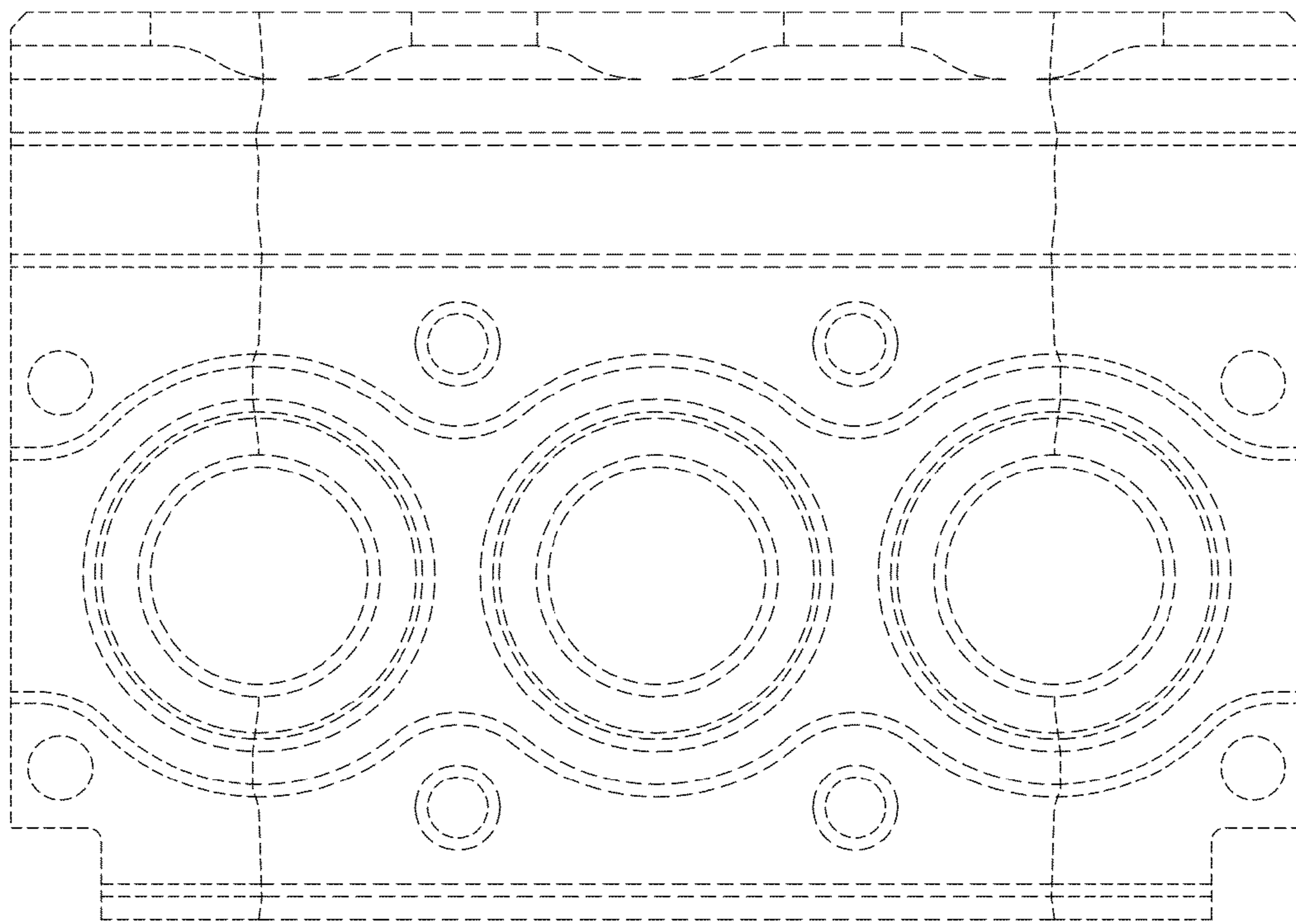


Fig. 4

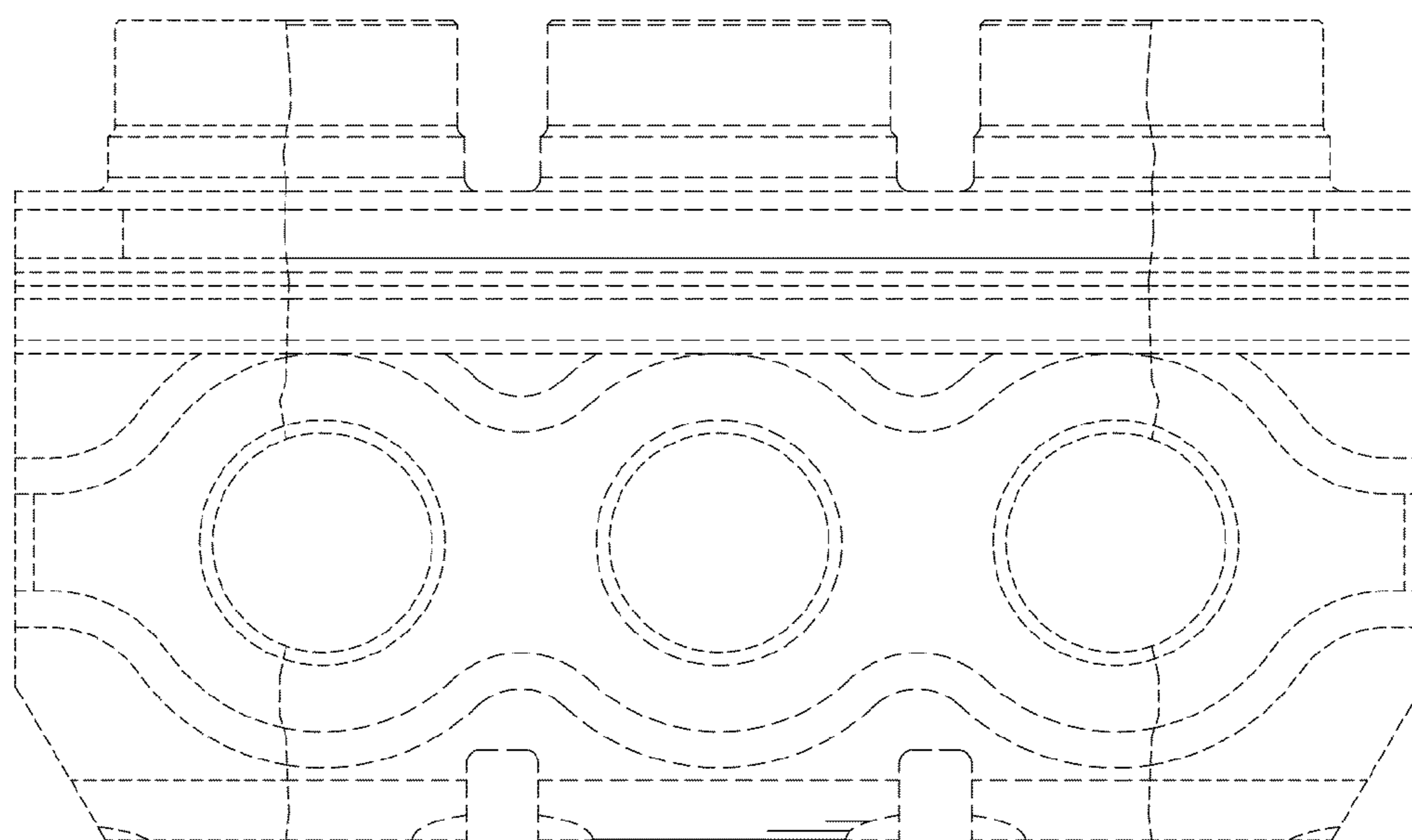


Fig. 5

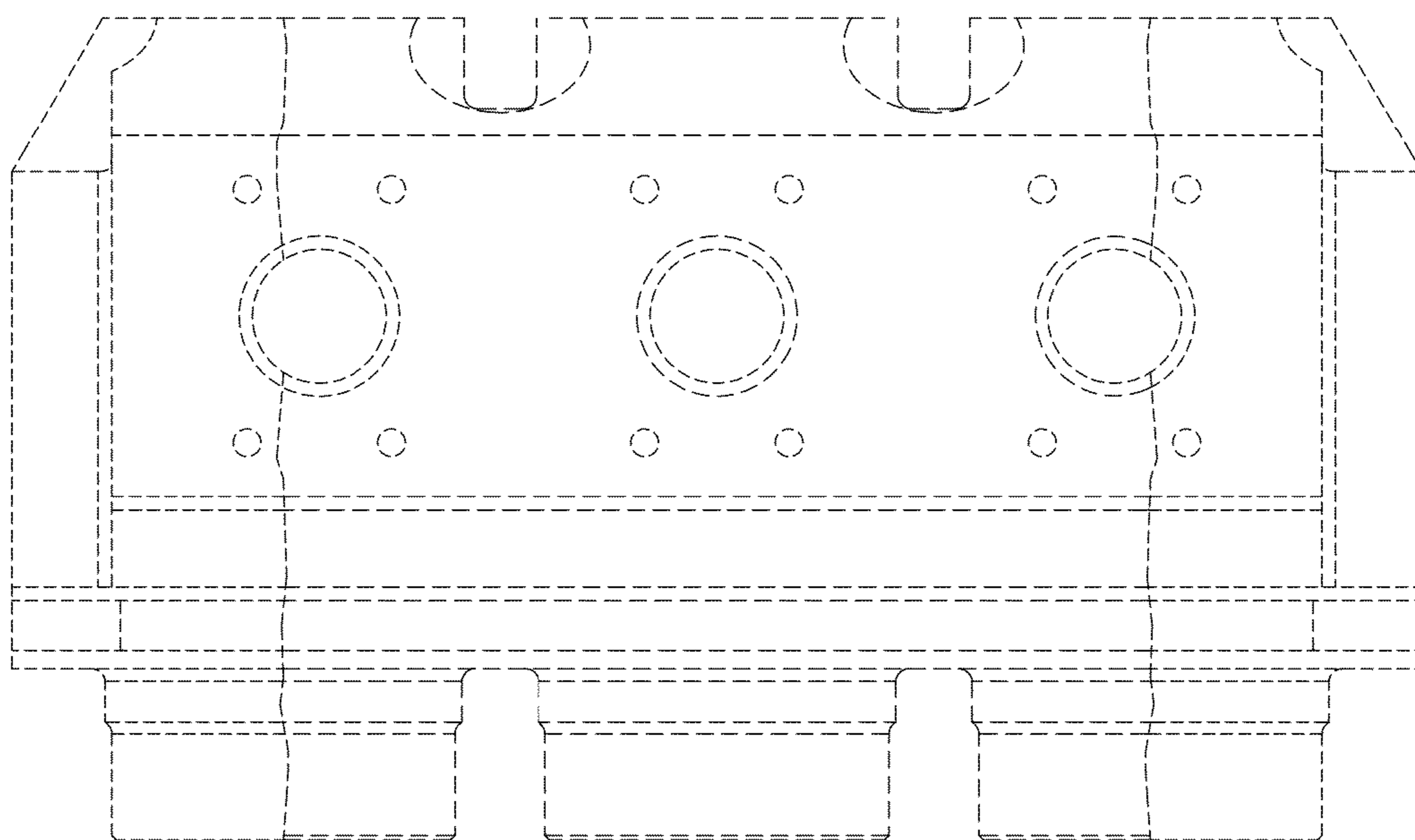


Fig. 6

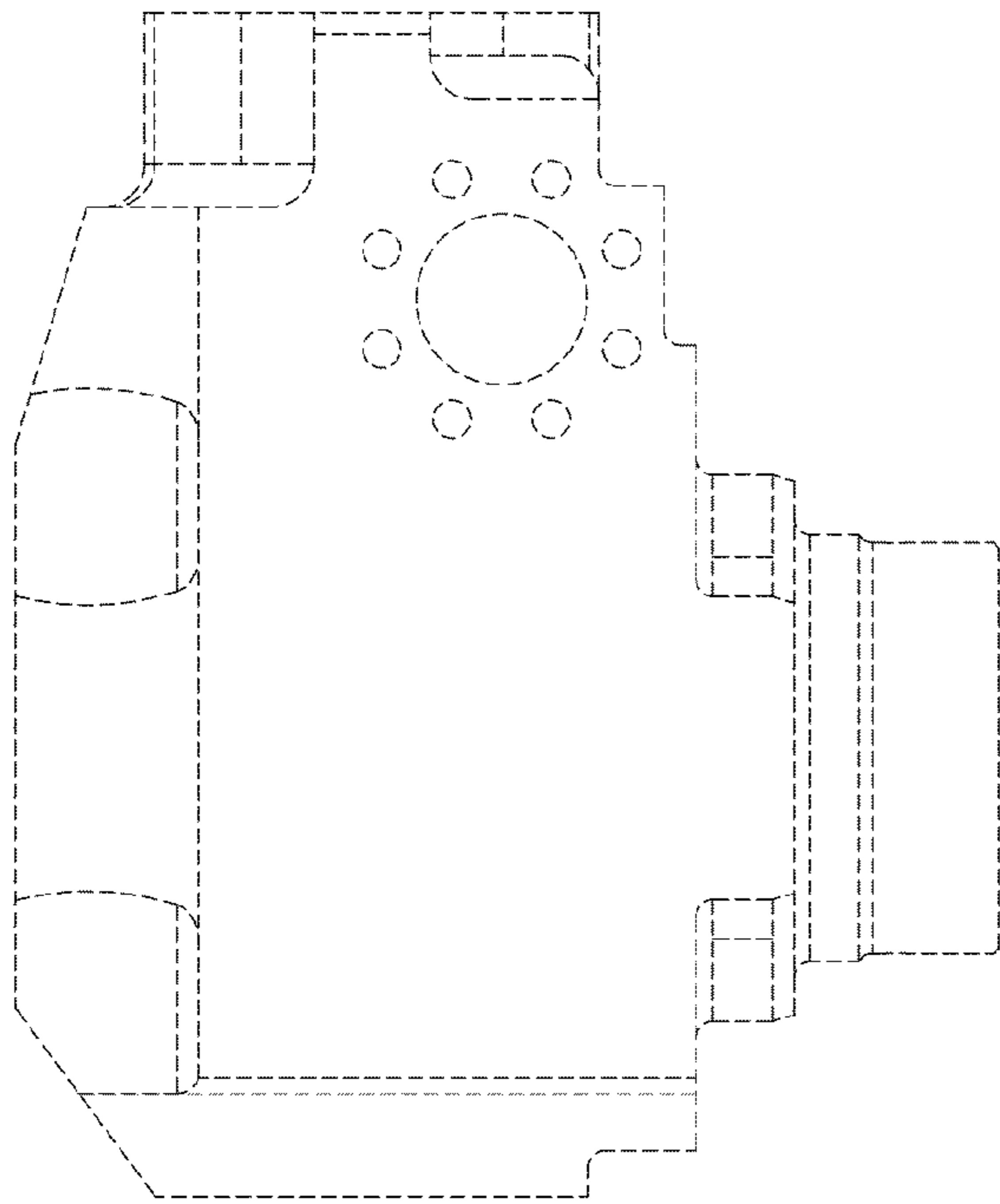


Fig. 7

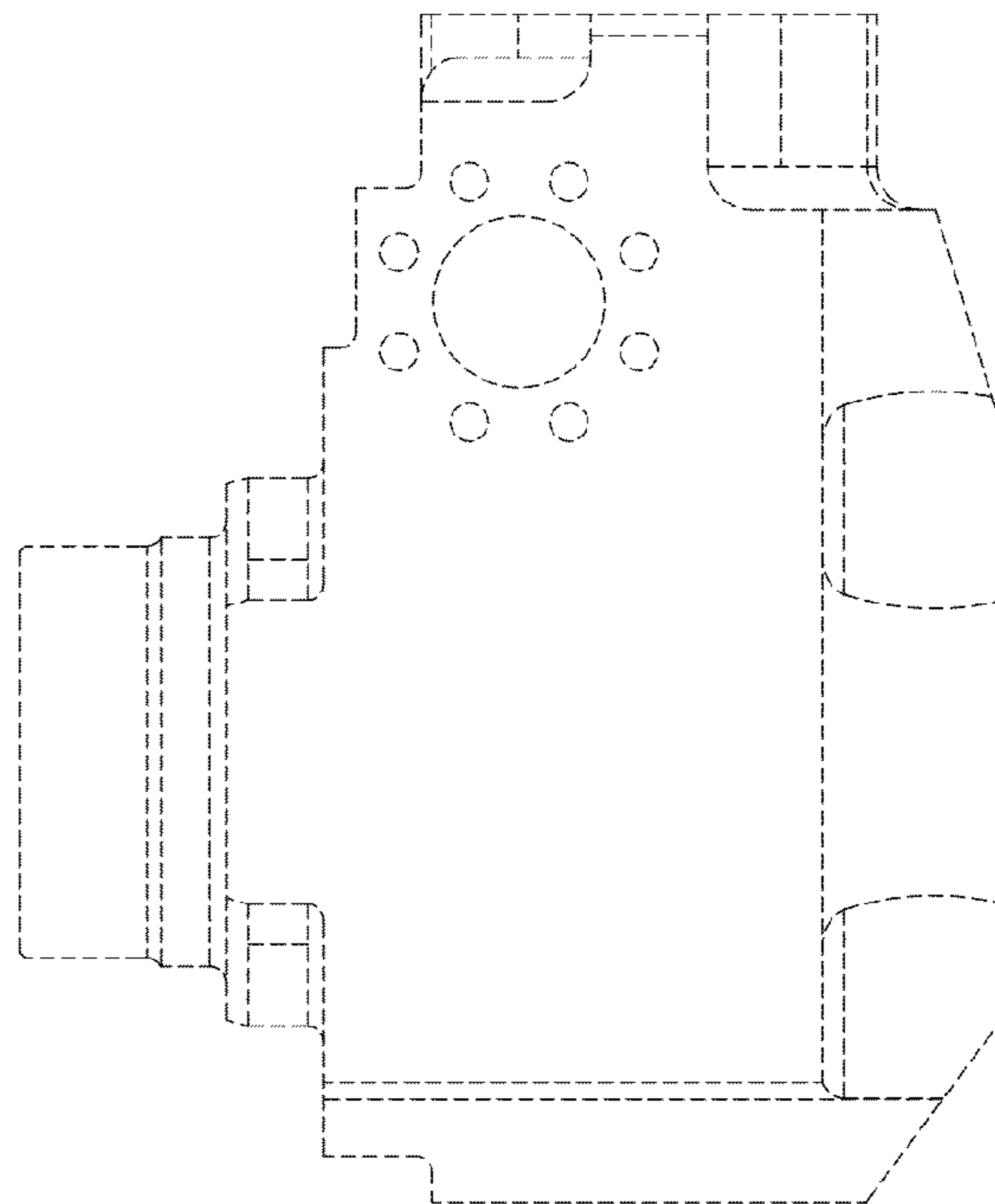


Fig. 8

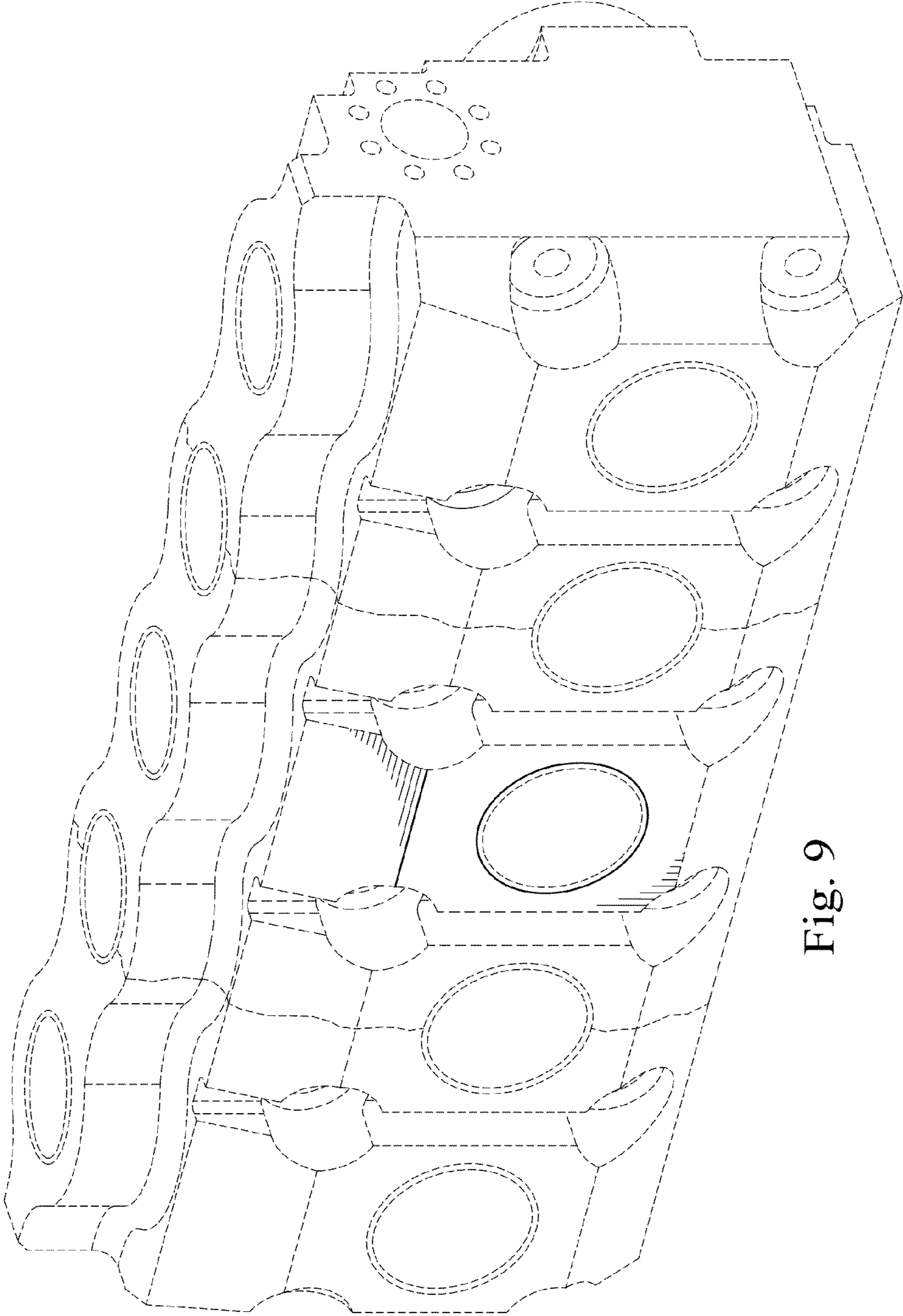


Fig. 9