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

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(54) **TIE ROD END**

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(73) Assignee: **Aircraft Gear Corporation**, Loves Park, IL (US)

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

(21) Appl. No.: **29/592,797**

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(51) **LOC (11) Cl.** **12-16**

(52) **U.S. Cl.**
USPC **D12/159**

(58) **Field of Classification Search**
USPC D12/159-162
CPC ... F16C 11/06; F16C 11/0619; F16C 11/0642;
F16C 11/0695

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,103,377	A	9/1963	Scheublein, Jr. et al.	
3,127,192	A	3/1964	Traugott et al.	
3,325,197	A	6/1967	Wehner	
3,389,928	A	6/1968	Wehner	
3,418,011	A	12/1968	Scheublein, Jr. et al.	
D294,219	S *	2/1988	Hamatani	D8/51
5,116,159	A	5/1992	Kern, Jr. et al.	
5,287,776	A *	2/1994	Williams	B25B 27/0035 81/124.2
5,438,741	A *	8/1995	Ni	B25B 27/0035 29/240

(Continued)

FOREIGN PATENT DOCUMENTS

CA	2195295	8/1997
DE	19921148	9/2000

(Continued)

OTHER PUBLICATIONS

AL8054GN—John Deere Axial Ball Joint Adaptable Steering, posted at Recambiosagricolasonline, posting date not available, [site ivisited Jun. 28, 2018] [Available online] URL: <http://recambiosagricolasonline.com/es/rotulas/1089-al80542gn-john-deere-rotula-axial-direccion-adaptable-.html>.*

(Continued)

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(57) **CLAIM**

The ornamental design for a tie rod end, as shown and described.

DESCRIPTION

FIG. 1 is a left, front, and top perspective view of a tie rod end showing my new design;

FIG. 2 is a front plan view of the tie rod end of FIG. 1, the rear view being identical;

FIG. 3 is a top plan view of the tie rod end of FIG. 1;

FIG. 4 is a bottom plan view of the tie rod end of FIG. 1;

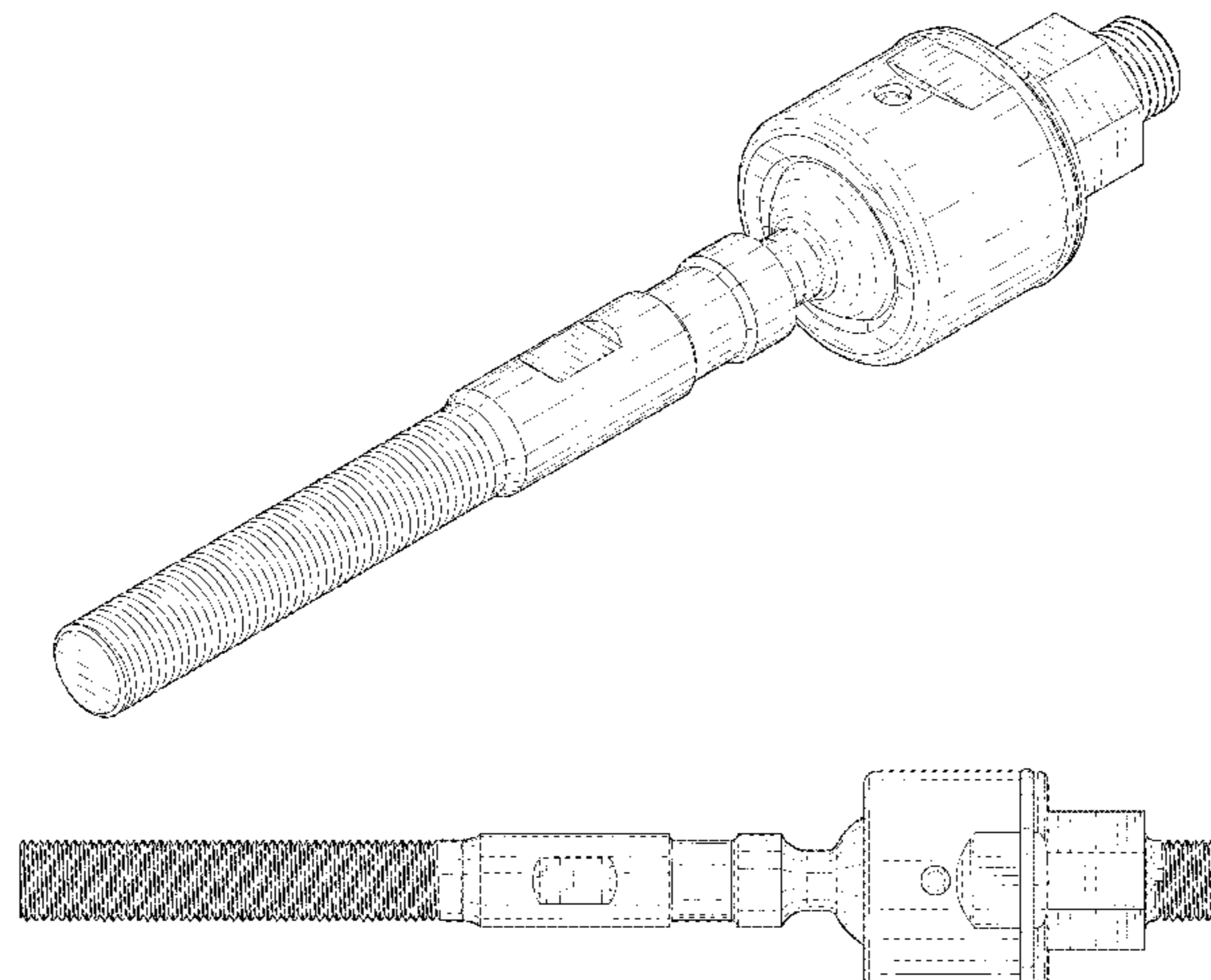
FIG. 5 is a left end view of the tie rod end of FIG. 1;

FIG. 6 is a right end view of the tie rod end of FIG. 1; and,

FIG. 7 is a left, front, and top perspective view of the tie rod end of FIG. 1 with one environment shown in unevenly-spaced broken lines.

The evenly-spaced circular broken line shown in FIGS. 1, 3 and 7 is a boundary of the claimed design and forms no part thereof; the evenly-spaced broken lines shown in FIG. 6 are included for the purpose of illustrating portions of the article; the unevenly-spaced broken lines shown in FIG. 7 are included to show environmental subject matter; all broken lines form no part of the claimed design.

1 Claim, 4 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

5,794,341 A * 8/1998 Carlini B25B 27/06
29/263

5,997,208 A 12/1999 Urbach et al.

D546,735 S 7/2007 Hahne et al.

D566,630 S 4/2008 Ortiz

D607,912 S * 1/2010 Medici D15/149

7,644,500 B2 * 1/2010 Schmidt B23P 11/005
29/441.1

D624,855 S 10/2010 Hsu

D645,382 S * 9/2011 Verbowski D12/159

D658,097 S * 4/2012 Choquette D12/162

D672,694 S 12/2012 Cooper, Sr. et al.

D696,163 S * 12/2013 Hamer D12/162

D714,926 S 10/2014 Allen et al.

D749,994 S * 2/2016 Verboeket D12/162

9,291,196 B2 * 3/2016 Ersoy F16C 11/0647

9,581,206 B2 * 2/2017 Yamazaki F16D 3/223

D809,437 S * 2/2018 Sugiyama D12/159

D823,735 S * 7/2018 Carlini D12/160

2003/0133745 A1 7/2003 Molenaar

2009/0238636 A1 9/2009 Howe et al.

2012/0014493 A1 * 1/2012 Frank G21C 9/00
376/260

2015/0167744 A1 * 6/2015 Yoo F16C 35/047
384/456

FOREIGN PATENT DOCUMENTS

EP 1473510 3/2004

FR 813920 6/1937

GB 891798 3/1962

GB 916341 1/1963

GB 2077347 12/1981

KR 20080052071 6/2008

KR 1020130112445 10/2013

OTHER PUBLICATIONS

Unique Bargains Car Inner Tire Rod Ends, posted at Walmart, posting date Oct. 15, 2012. [site ivisited Jun. 28, 2018] [Available online] URL: <<https://www.walmart.com/ip/Unique-Bargains-Car-Inner-Tie-Rod-Ends-Steering-Rack-End-Spare-Parts-for-Hyundai-Accent/47648294>> (Year: 2012).*

Volvo P2 S60 Inner & Outer Tie Rod End Replacement, posting date not available. [site ivisited Jun. 28, 2018] [Available online] URL: <<https://blog.fcpeuro.com/volvo-s60-p2-tie-rod-end-replacement>>.*

* cited by examiner

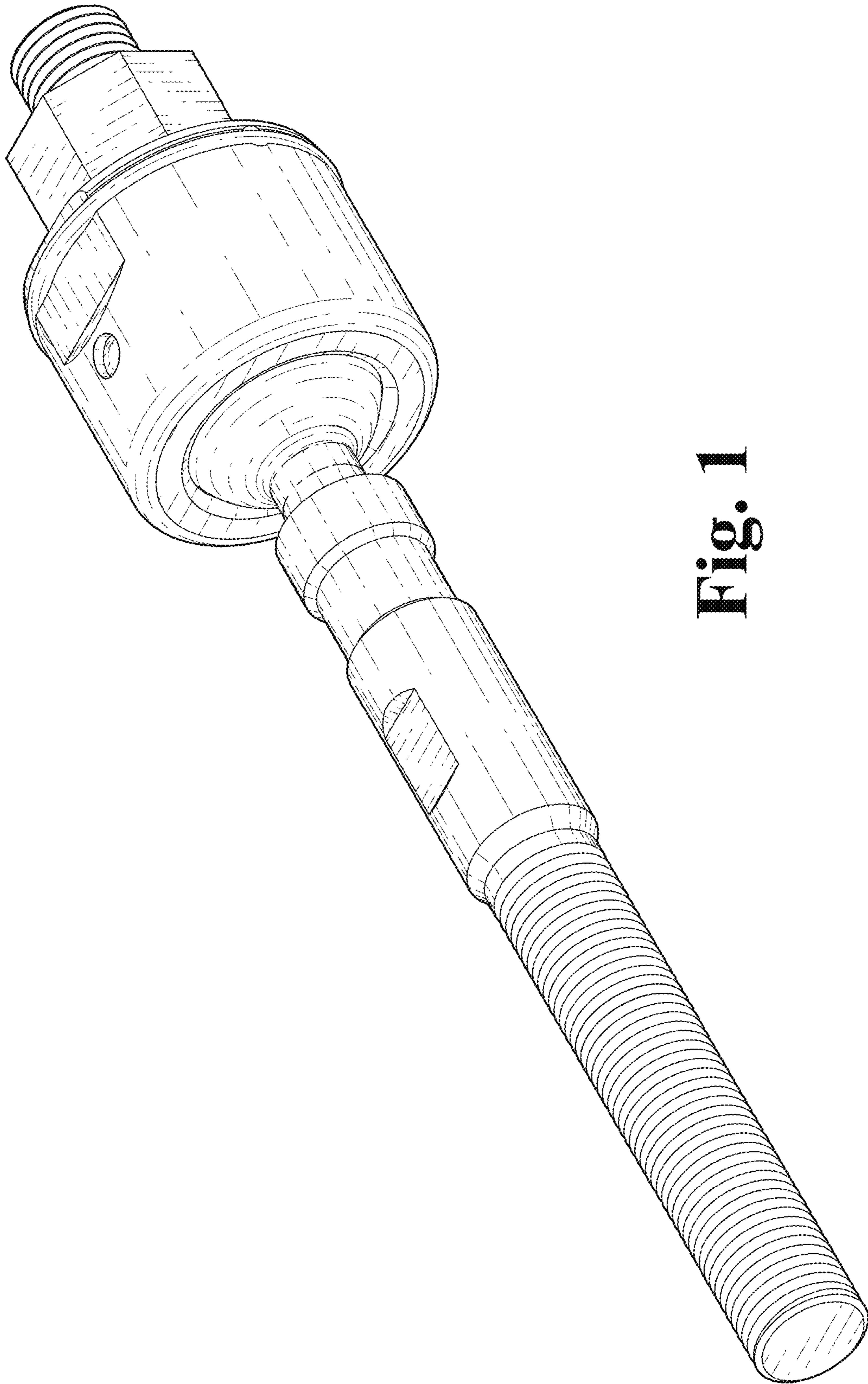


Fig. 1

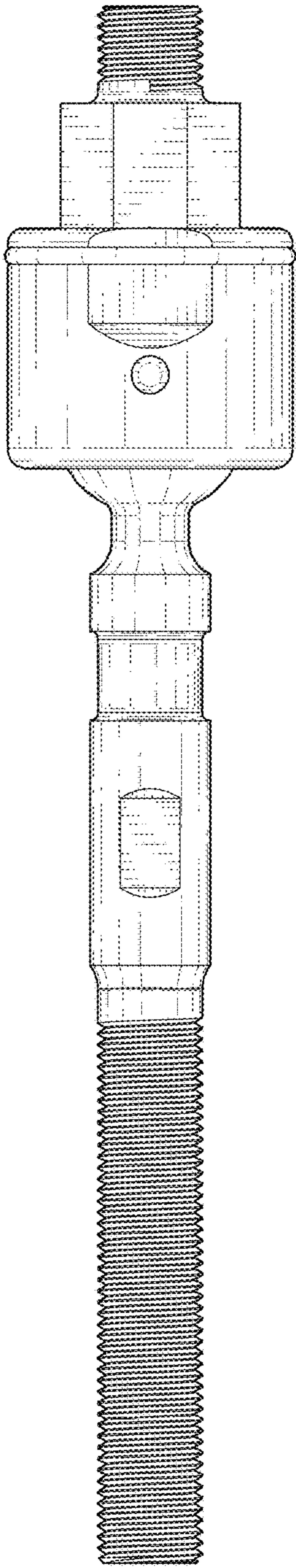


Fig. 3

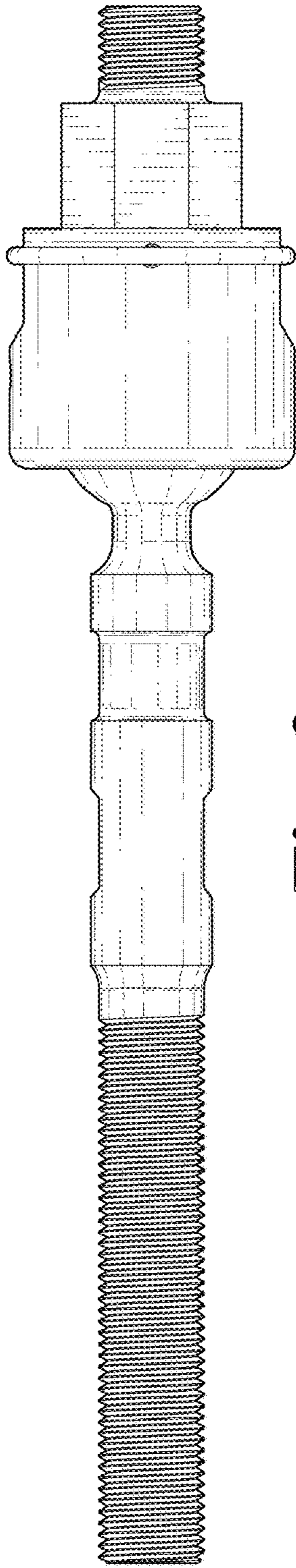


Fig. 2

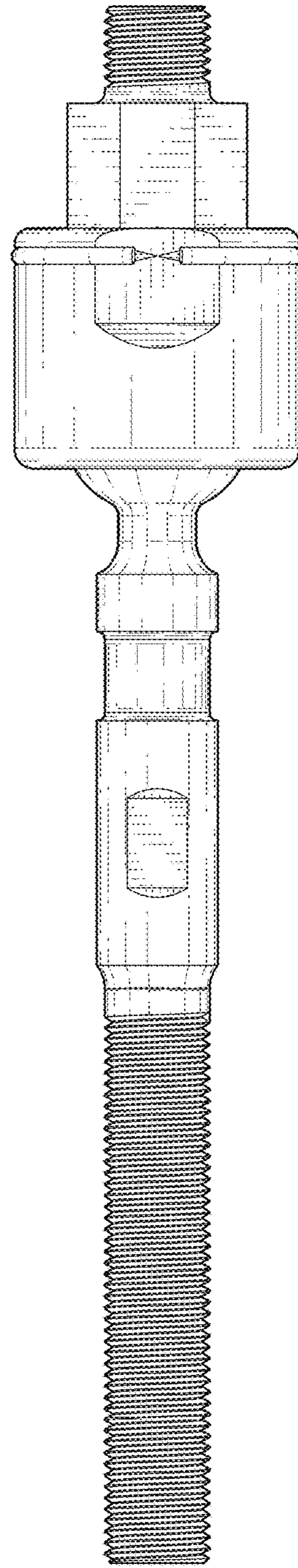


Fig. 4

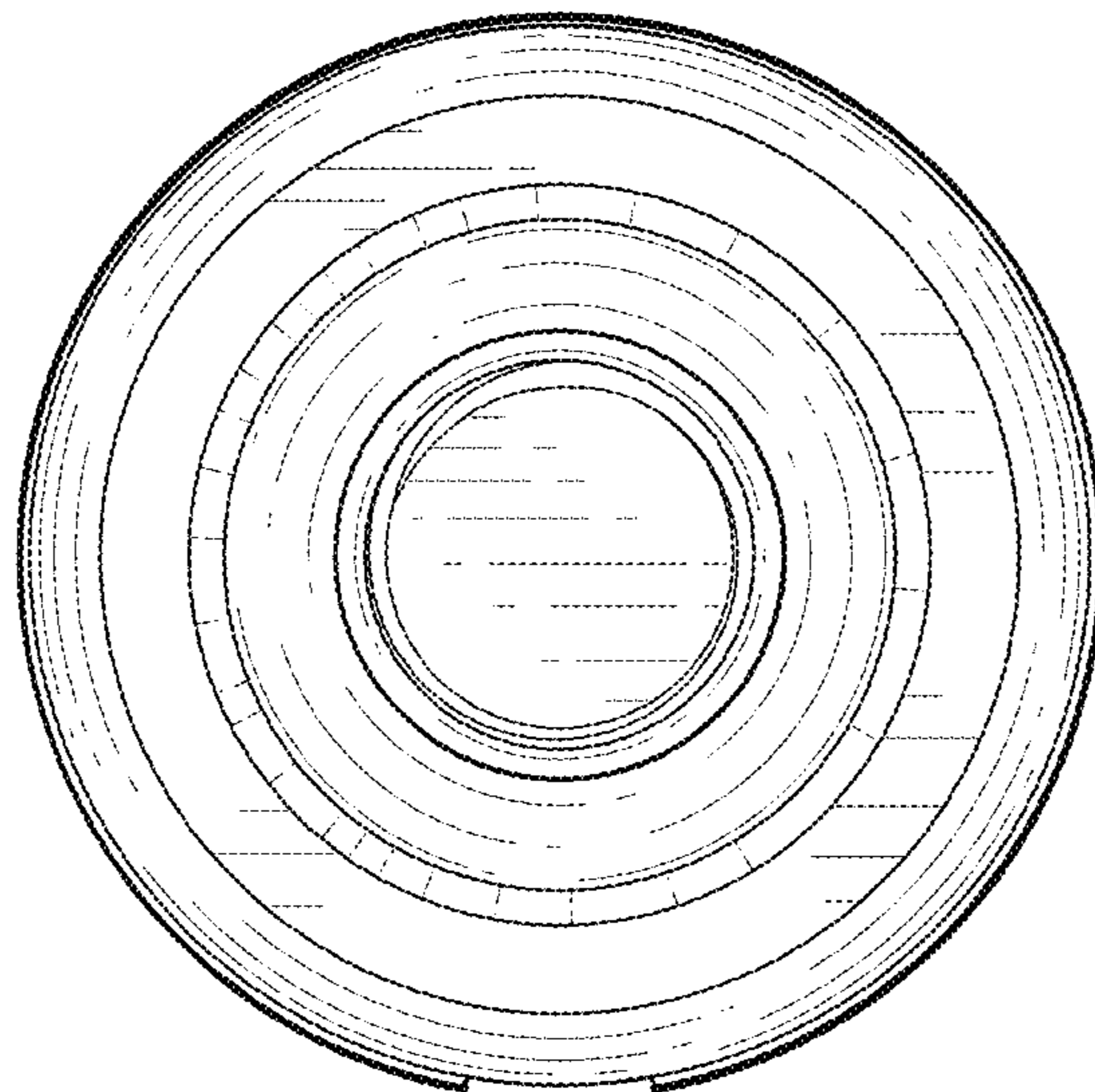


Fig. 5

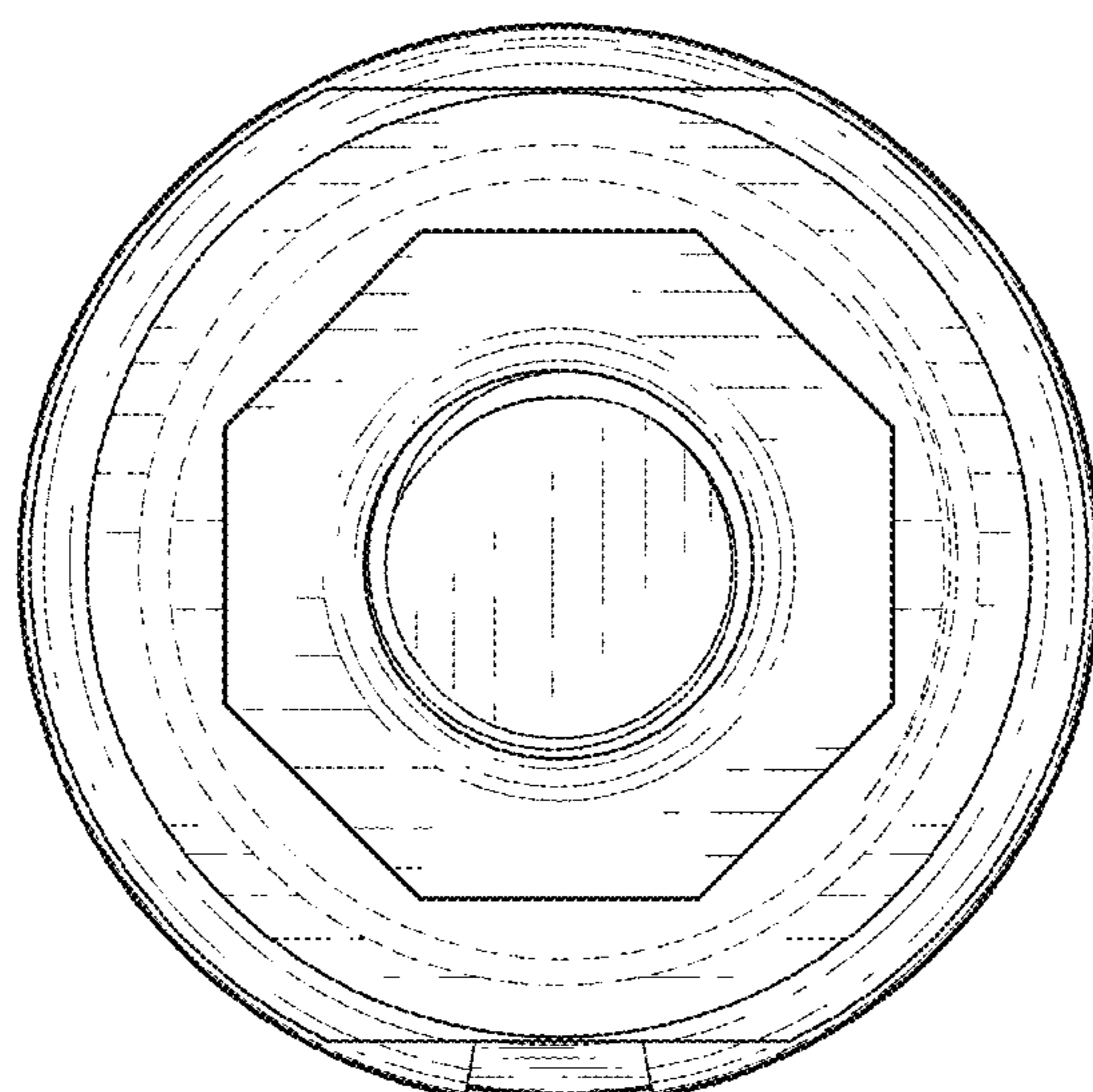


Fig. 6

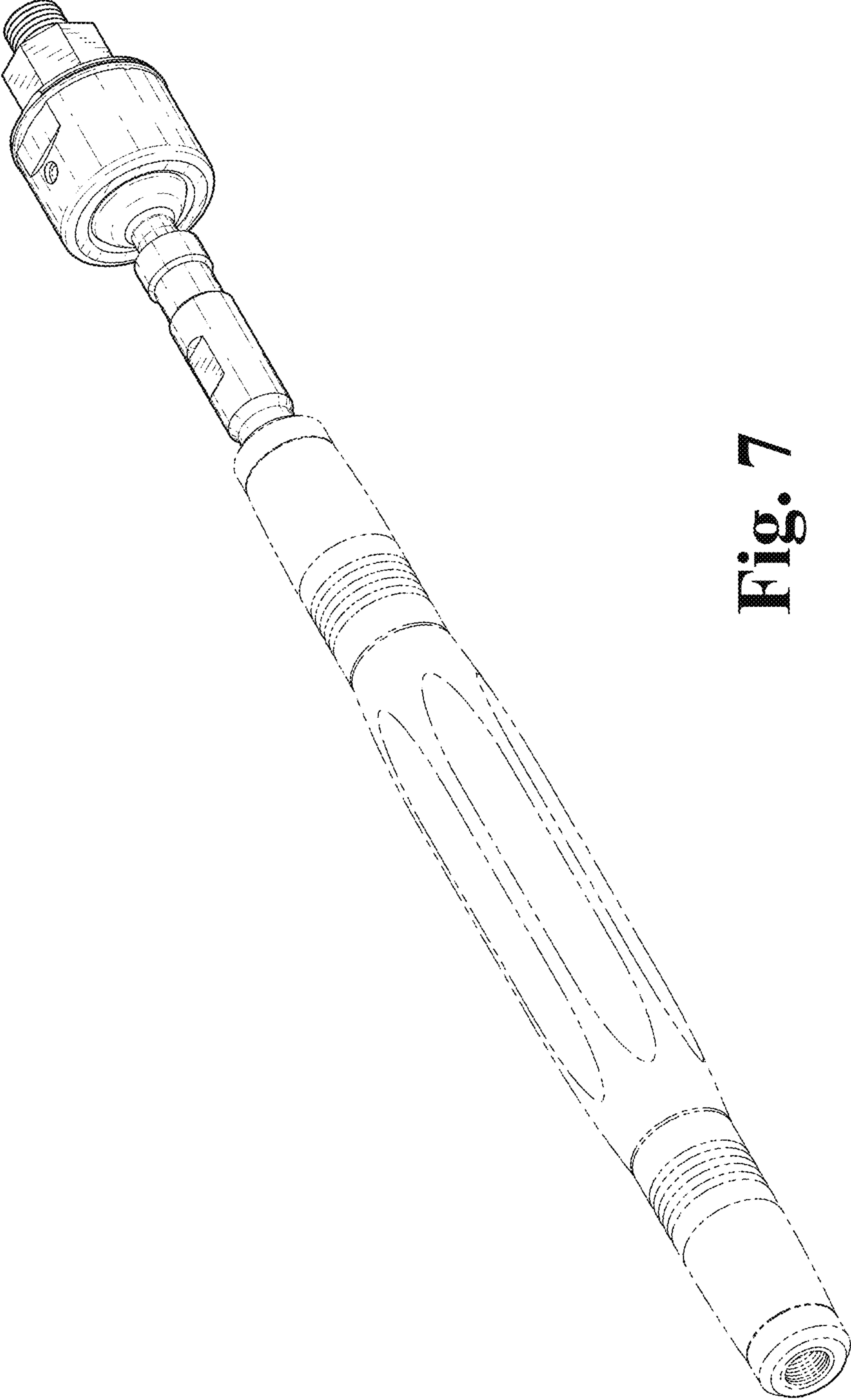


Fig. 7