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

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- (54) **TRAY VALVE**
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5,147,584 A 9/1992 Binkley et al.  
 5,164,125 A 11/1992 Binkley et al.  
 5,192,466 A 3/1993 Binkley  
 (Continued)

**FOREIGN PATENT DOCUMENTS**

BR 3204953 B1 12/2010  
 CA 2096787 A1 11/1994  
 (Continued)

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

**OTHER PUBLICATIONS**

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- (51) **LOC (11) Cl.** ..... **23-01**
- (52) **U.S. Cl.**  
USPC ..... **D23/249**
- (58) **Field of Classification Search**  
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261/114.5, 113, 114.1, 114.2, 114.3;  
137/512.1; 95/263, 202  
CPC .. B01D 3/163; B01D 3/22; B01D 3/20; F16K  
15/023  
See application file for complete search history.

International Search Report and Written Opinion received for PCT Patent Application No. PCT/US2016/041322, mailed on Sep. 26, 2016, 12 pages.

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(57) **CLAIM**

The ornamental design for a tray valve, as shown and described.

**DESCRIPTION**

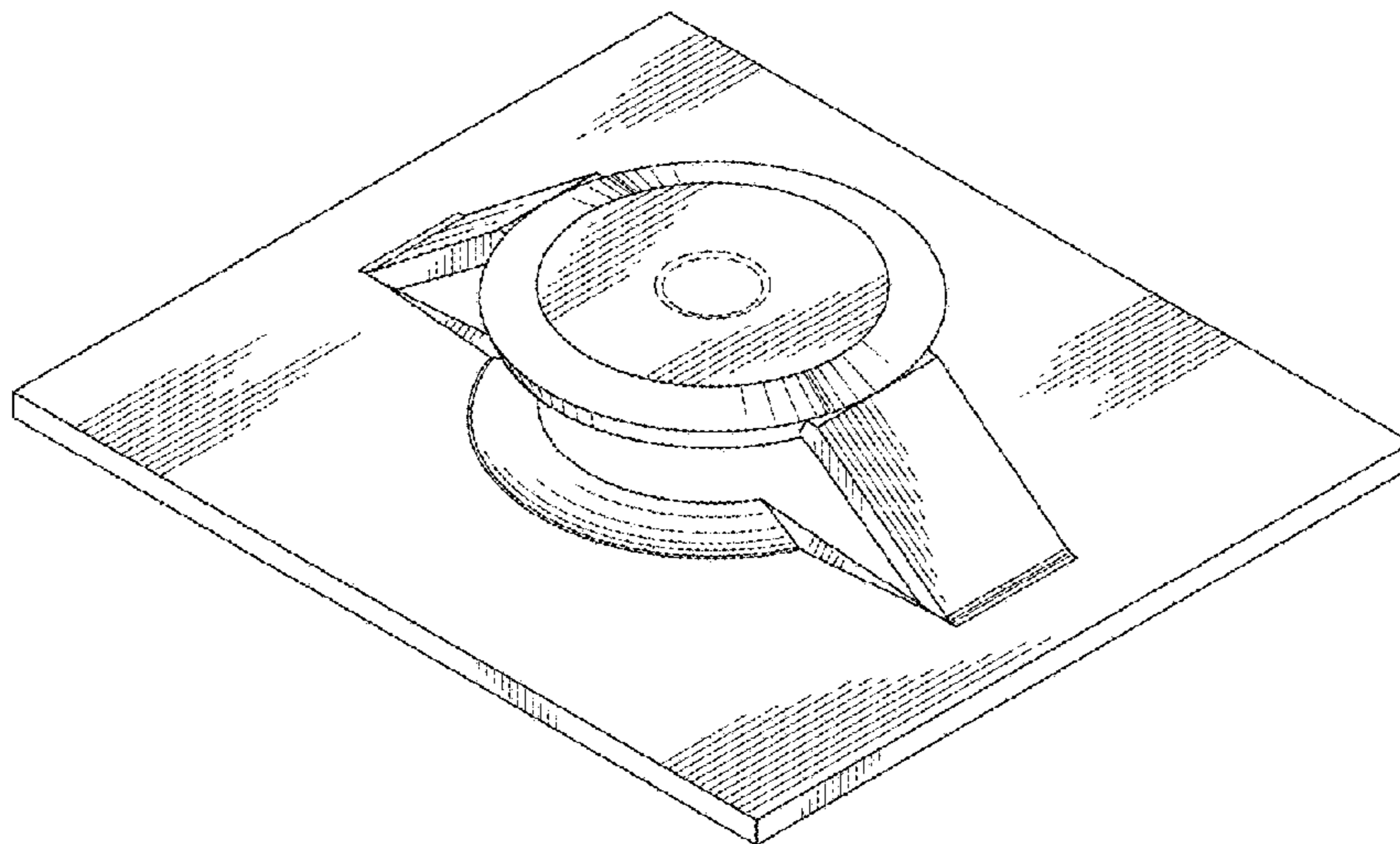
FIG. 1 is a top perspective view of a tray valve showing my new design;  
 FIG. 2 is a left side elevation view of the tray valve shown in FIG. 1, with the right side elevation view being a mirror image thereof;  
 FIG. 3 is a rear elevation view of the tray valve shown in FIGS. 1 and 2;  
 FIG. 4 is a front elevation view of the tray valve shown in FIGS. 1-3;  
 FIG. 5 is a top plan view of the tray valve shown in FIGS. 1-4; and,  
 FIG. 6 is a bottom plan view of the tray valve shown in FIGS. 1-5.  
 The portions of the tray valve shown in broken lines are for illustrative purposes only and form no part of the claimed design.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

2,804,935 A	9/1957	Hutchinson	
3,087,711 A *	4/1963	Glitsch	B01D 3/163 261/114.1
3,573,172 A	3/1971	Streuber	
3,759,497 A	9/1973	Black	
3,770,255 A *	11/1973	Nutter	B01D 3/163 261/114.4
4,060,399 A	11/1977	Gleason	
4,118,446 A *	10/1978	Burin	B01D 3/163 261/114.4
4,620,952 A	11/1986	Hsieh	
4,956,127 A	9/1990	Binkley et al.	
5,106,556 A	4/1992	Binkley et al.	
5,120,474 A	6/1992	Binkley et al.	

**1 Claim, 2 Drawing Sheets**



(56)

References Cited

U.S. PATENT DOCUMENTS

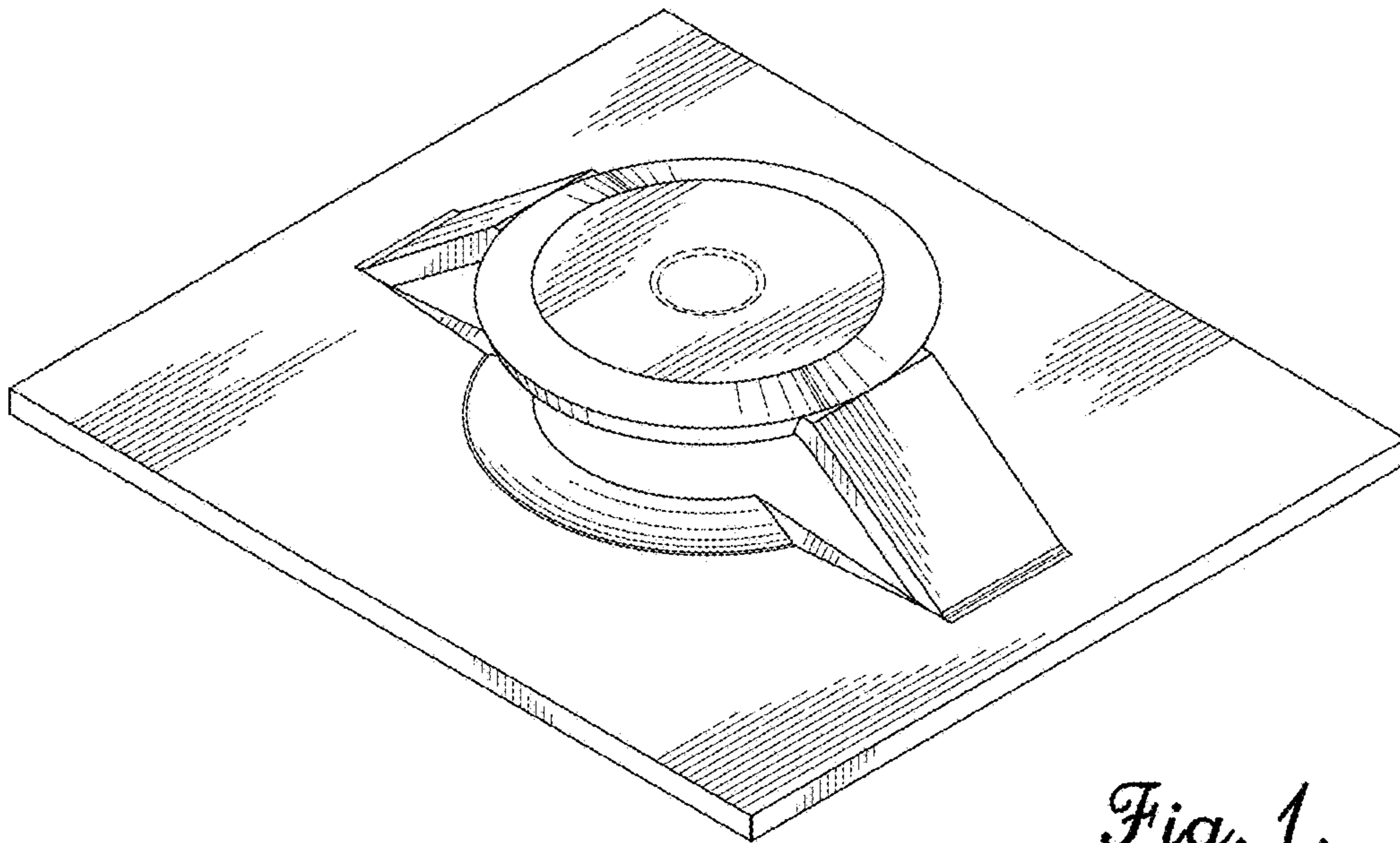
5,213,719 A 5/1993 Chuang  
 5,223,183 A 6/1993 Monkelbaan et al.  
 5,244,604 A 9/1993 Miller  
 5,262,094 A 11/1993 Chuang  
 5,277,848 A 1/1994 Binkley et al.  
 5,318,732 A 6/1994 Monkelbaan  
 5,453,222 A 9/1995 Lee et al.  
 5,480,595 A 1/1996 Yeoman  
 5,547,617 A 8/1996 Lee et al.  
 5,618,473 A 4/1997 Sauter et al.  
 5,632,935 A 5/1997 Yeoman  
 5,702,647 A 12/1997 Lee et al.  
 5,762,668 A 6/1998 Lee et al.  
 5,762,834 A 6/1998 Hauser et al.  
 5,788,894 A 8/1998 Yeoman  
 5,837,105 A 11/1998 Stober et al.  
 5,885,488 A 3/1999 Konjin  
 5,895,608 A 4/1999 Lee et al.  
 5,911,922 A 6/1999 Hauser et al.  
 5,951,827 A 9/1999 Breedon  
 5,972,171 A 10/1999 Ross et al.  
 6,003,847 A 12/1999 Lee et al.  
 6,053,484 A 4/2000 Fan  
 6,053,485 A \* 4/2000 Pan ..... B01D 3/163  
 261/114.4  
 6,059,934 A 5/2000 Stober et al.  
 6,076,813 A 6/2000 Yeoman  
 6,089,550 A 7/2000 Petschauer et al.  
 6,224,043 B1 5/2001 Fan  
 6,270,062 B1 8/2001 Chuang et al.  
 6,565,071 B2 5/2003 Chuang et al.  
 6,575,438 B2 6/2003 Nutter et al.  
 6,592,106 B1 7/2003 Eaton, Jr.  
 6,629,687 B1 10/2003 Gage  
 6,736,378 B2 5/2004 Colic et al.  
 6,817,596 B2 11/2004 Fischer  
 6,877,725 B2 4/2005 Buchanan et al.  
 6,966,548 B2 11/2005 Buchanan et al.  
 6,994,331 B2 2/2006 Coney  
 7,028,995 B2 4/2006 Weiland et al.  
 7,055,810 B2 6/2006 Gage

7,540,476 B2 \* 6/2009 Pilling ..... B01D 3/163  
 261/114.4  
 7,540,477 B2 \* 6/2009 Fischer ..... F16K 15/023  
 261/114.4  
 8,191,870 B2 6/2012 Nieuwoudt et al.  
 8,480,062 B2 7/2013 Kim  
 8,517,354 B1 8/2013 Binkley  
 8,720,870 B2 5/2014 Pilling et al.  
 8,944,419 B2 \* 2/2015 Pilling ..... B01D 3/163  
 261/114.4  
 D728,075 S \* 4/2015 Roberts ..... D23/249  
 9,027,911 B2 \* 5/2015 Lehner ..... B01D 3/163  
 261/114.3  
 2004/0130041 A1 7/2004 Resetarits et al.  
 2005/0280169 A1 12/2005 Yao et al.  
 2007/0023938 A1 \* 2/2007 Fischer ..... F16K 15/023  
 261/114.4  
 2007/0262022 A1 11/2007 Mosler et al.  
 2008/0018003 A1 \* 1/2008 Pilling ..... B01D 3/163  
 261/114.3  
 2008/0277260 A1 11/2008 Binkley  
 2011/0278744 A1 11/2011 Pilling et al.  
 2013/0099402 A1 \* 4/2013 Lehner ..... B01D 3/163  
 261/114.4  
 2016/0038851 A1 2/2016 Binkley

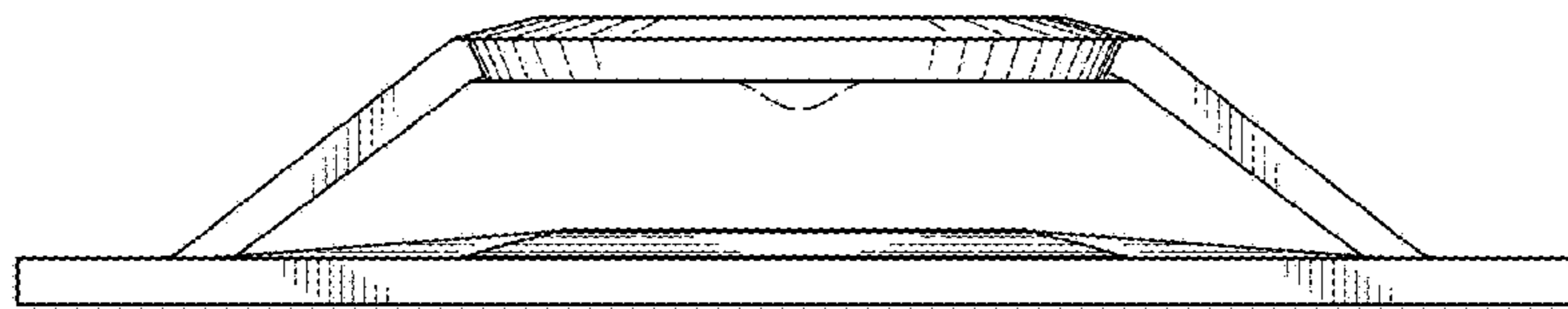
FOREIGN PATENT DOCUMENTS

CN 2260933 Y 8/1997  
 CN 1037747 C 3/1998  
 CN 1275673 C 9/2006  
 CN 203075687 U 7/2013  
 DE 69825739 D1 9/2004  
 EP 0626185 B1 11/1996  
 EP 1062013 A1 12/2000  
 EP 1317948 A1 6/2003  
 EP 1399232 A2 3/2004  
 JP 4623926 B2 2/2011  
 MX PA03011497 A 3/2004  
 MX PA02011993 A 7/2004  
 RU 2233193 C1 7/2004  
 RU 2260465 C2 9/2005

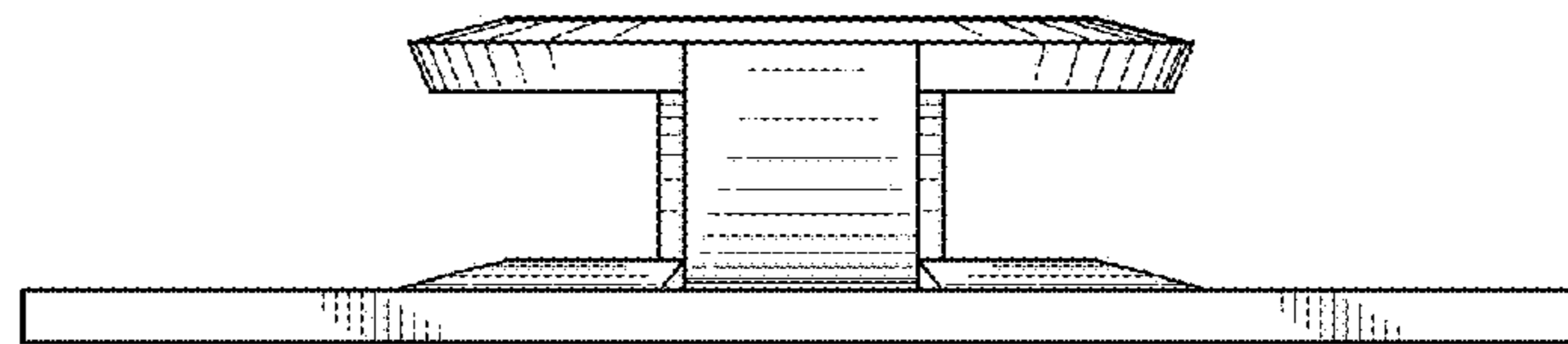
\* cited by examiner



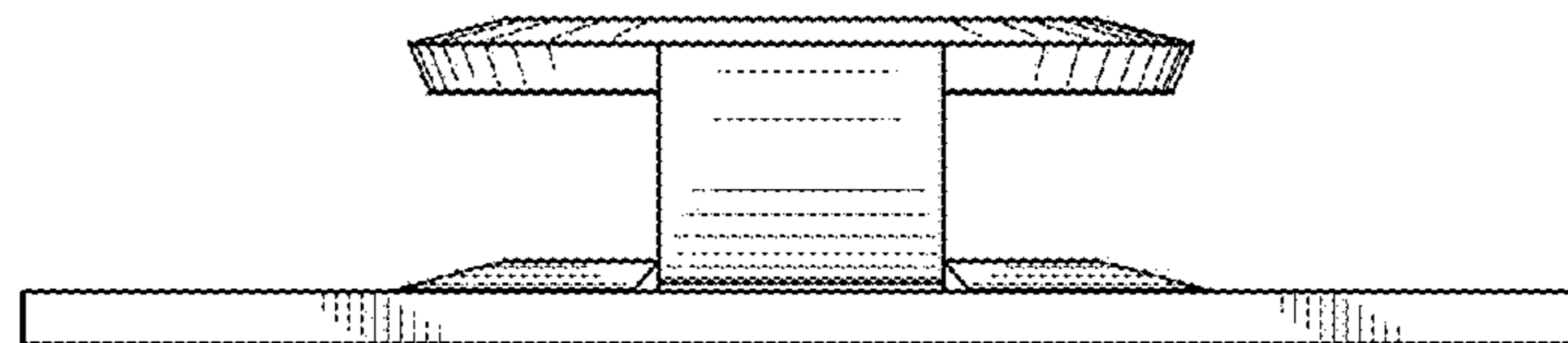
*Fig. 1.*



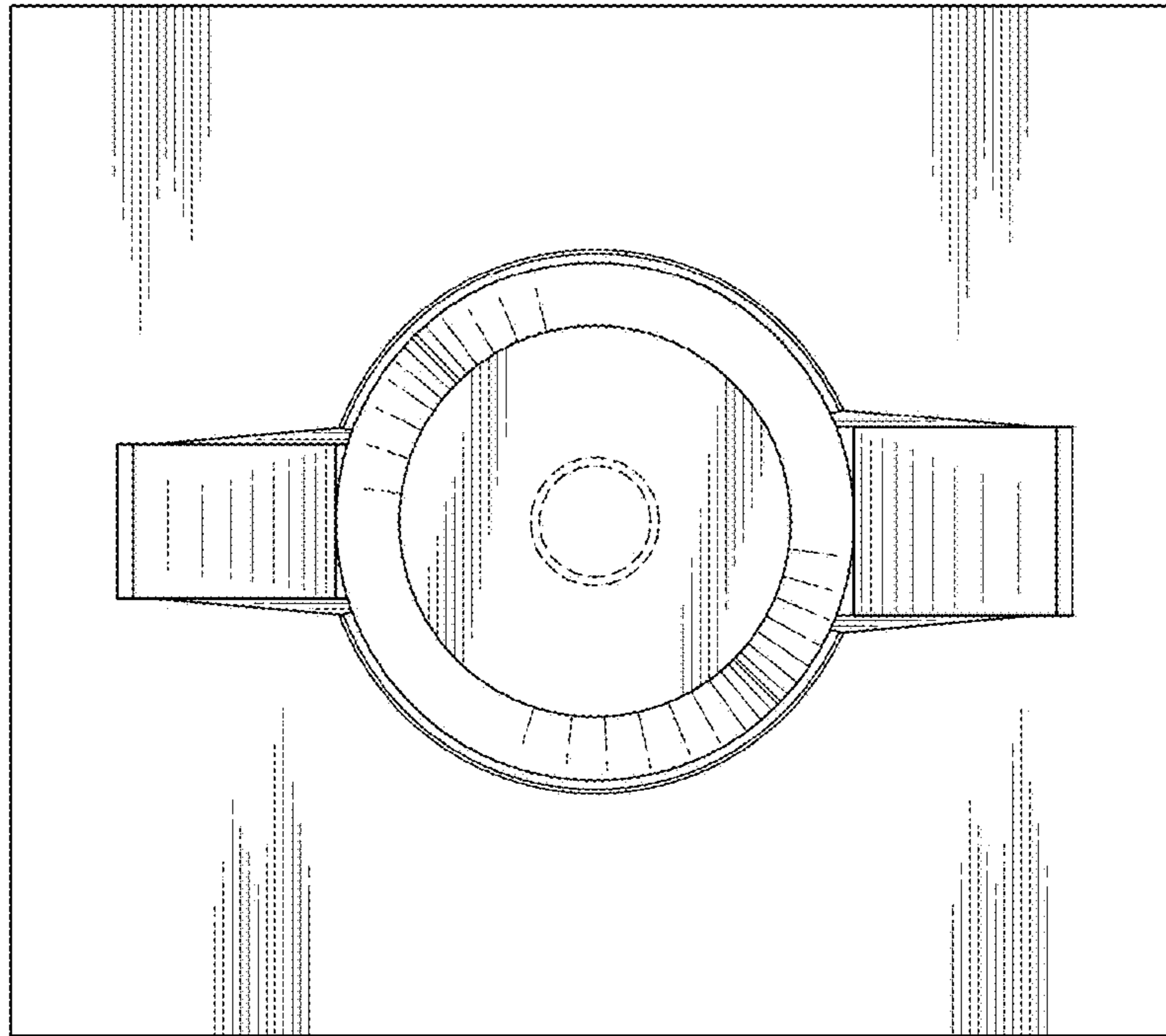
*Fig. 2.*



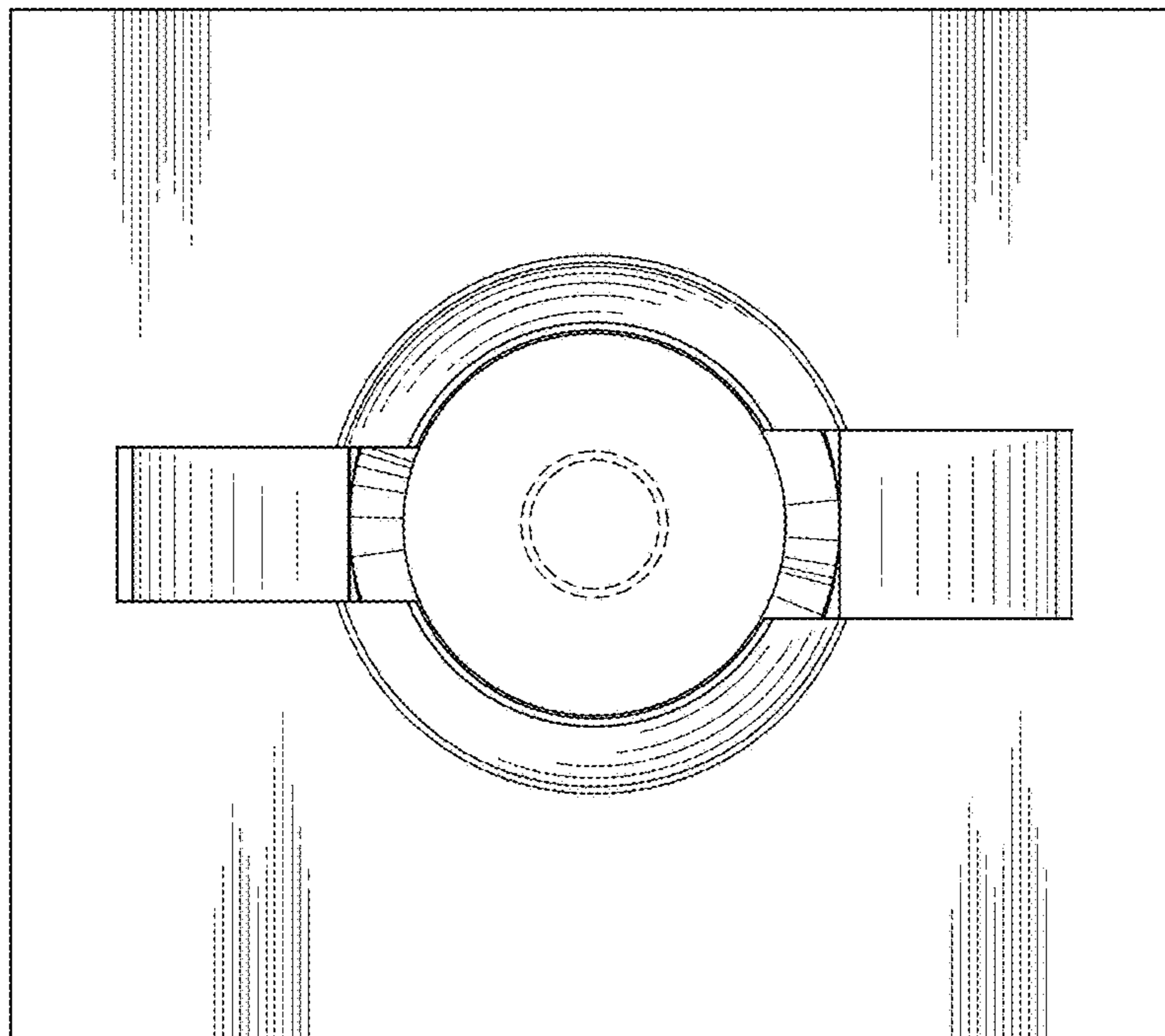
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



*Fig. 6.*