



US00D666178S

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

(10) **Patent No.:** **US D666,178 S**
(45) **Date of Patent:** **** Aug. 28, 2012**

(54) **ANTENNA**

(75) Inventors: **Richard E. Schneider**, Wildwood, MO (US); **John Edwin Ross, III**, Moab, UT (US); **Corey Feit**, St. Louis, MO (US); **Dale Picolet**, House Springs, MO (US)

(73) Assignee: **Antennas Direct, Inc.**, Ellisville, MO (US)

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

(21) Appl. No.: **29/376,791**

(22) Filed: **Oct. 12, 2010**

Related U.S. Application Data

(63) Continuation of application No. 12/606,636, filed on Oct. 27, 2009, which is a continuation-in-part of application No. 12/050,133, filed on Mar. 17, 2008, now Pat. No. 7,609,222, application No. 29/376,791, which is a continuation-in-part of application No. 12/040,460, filed on Feb. 29, 2008, now Pat. No. 7,839,347.

(51) **LOC (9) Cl.** **14-03**

(52) **U.S. Cl.** **D14/230; D14/238**

(58) **Field of Classification Search** D14/138, D14/230-238, 299, 358; D12/42, 43; 343/700 MS, 343/700 R-705, 711-713, 735, 736, 741, 343/748, 767, 795, 819, 840, 846, 866, 871-908; 455/90.2, 90.3, 91, 128, 269, 344, 347, 562.1; 333/193, 195

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,060,098 A * 11/1936 McLachlan 181/165
(Continued)

FOREIGN PATENT DOCUMENTS

CN ZL2008200072832 5/2009
(Continued)

OTHER PUBLICATIONS

European Supplementary Search Report and Opinion dated Oct. 7, 2010, issued by the European Patent Office for European Patent Application No. EP 08747115 (6 pages).

European Search Report dated Jan. 17, 2011, issued by the European Patent Office for European Patent Application No. EP 10193159.0 which is related to the instant application through a priority claim; (5 pages).

(Continued)

Primary Examiner — John Windmuller

(74) *Attorney, Agent, or Firm* — Harness, Dickey & Pierce, P.L.C.

(57) **CLAIM**

The ornamental design for an antenna, as shown and described.

DESCRIPTION

FIG. 1 is a front perspective view of the antenna, showing our new design, wherein the support is shown in a first configuration suitable for supporting the antenna on a horizontal surface;

FIG. 2 is a right elevation view of thereof;

FIG. 3 is a left elevation view thereof;

FIG. 4 is a front elevation view thereof;

FIG. 5 is a back elevation view thereof;

FIG. 6 is an upper back perspective view thereof;

FIG. 7 is a top plan view thereof;

FIG. 8 is a bottom plan view thereof;

FIG. 9 is another front perspective view of the antenna, wherein the support is shown in a second configuration suitable for supporting the antenna from a vertical surface;

FIG. 10 is a right elevation view of the antenna shown in FIG. 9;

FIG. 11 is a left elevation view of the antenna shown in FIG. 9;

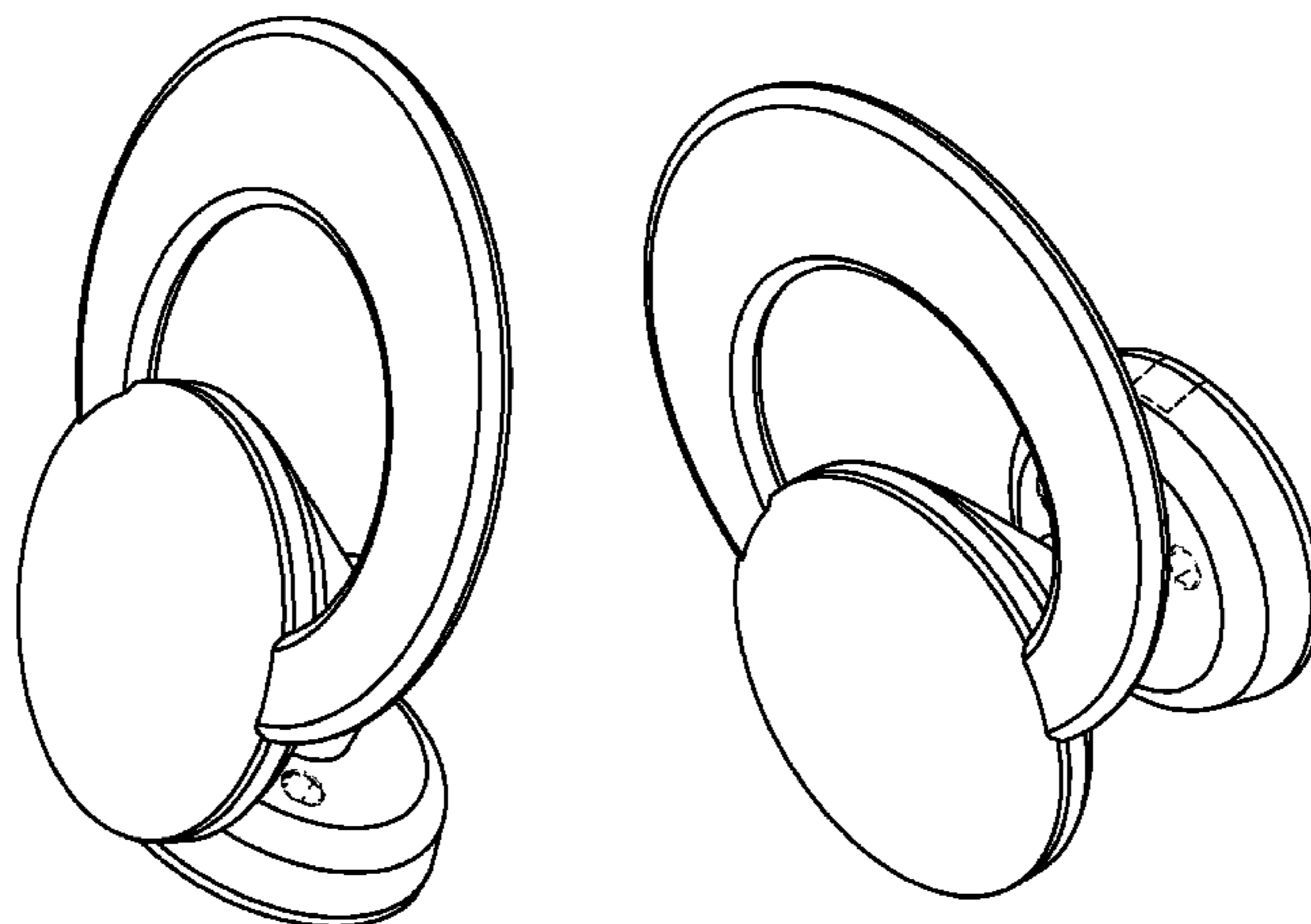
FIG. 12 is a front elevation view of the antenna shown in FIG. 9;

FIG. 13 is a back elevation view of the antenna shown in FIG. 9; and

FIG. 14 is a top plan view of the antenna shown in FIG. 9; and, FIG. 15 is a bottom plan view of the antenna shown in FIG. 9.

In the drawings, the broken lines depict environmental subject matter only for illustrative purposes and form no part of the claimed design. The dot-dash lines represent boundaries between claimed and unclaimed subject matter.

1 Claim, 15 Drawing Sheets



U.S. PATENT DOCUMENTS

2,220,008	A	10/1940	Woodward et al.	
2,437,251	A	3/1948	Frische et al.	
2,480,155	A	8/1949	Masters	
2,589,578	A	3/1952	Sabins	
D170,203	S	8/1953	Leonard	
D171,560	S	2/1954	Ritter	
D177,200	S	3/1956	Valiulis	
D179,111	S	11/1956	Ballan	
3,015,101	A	12/1961	Turner et al.	
3,123,826	A	3/1964	Durham	
3,239,838	A	3/1966	Kelleher	
3,273,158	A	9/1966	Fouts et al.	
D209,402	S	11/1967	Burlingame	
D211,025	S	5/1968	Callaghan	
3,434,145	A	3/1969	Wells	
3,721,990	A	3/1973	Gibson et al.	
3,828,867	A	8/1974	Elwood	
4,183,027	A	1/1980	Ehrenspeck	
4,184,163	A	1/1980	Woodward	
D310,671	S *	9/1990	Weiss	D14/230
D318,673	S	7/1991	Terk	
D327,690	S	7/1992	Ogawa et al.	
5,280,645	A	1/1994	Nguyen et al.	
D344,731	S	3/1994	Witzky	
5,313,218	A	5/1994	Busking	
D414,495	S	9/1999	Heiligenstein et al.	
D421,610	S *	3/2000	Ghalebi	D14/235
6,054,963	A	4/2000	Muterspaugh	
D449,593	S *	10/2001	Schultz	D14/235
6,590,541	B1	7/2003	Schultz	
6,593,886	B2	7/2003	Schantz	
D480,714	S *	10/2003	Wang	D14/235
6,680,708	B2	1/2004	Yamaki	
D501,468	S *	2/2005	Wang	D14/235
6,885,352	B2	4/2005	Lee et al.	
6,917,793	B2 *	7/2005	Wang	455/193.1
7,091,925	B1	8/2006	Wang	
7,126,556	B1 *	10/2006	Wang	343/866
7,209,089	B2	4/2007	Schantz	
D544,471	S	6/2007	Wang	
7,239,290	B2	7/2007	Poilasne et al.	
D558,189	S *	12/2007	Inoue	D14/230
D581,931	S *	12/2008	Pine	D14/426
D585,883	S *	2/2009	Kaneko	D14/230
D598,433	S	8/2009	Schneider et al.	
D598,434	S	8/2009	Schneider et al.	
7,609,222	B2	10/2009	Schneider et al.	
D604,276	S	11/2009	Schneider et al.	
D611,460	S *	3/2010	Chao	D14/230
7,693,570	B2	4/2010	Green et al.	
D624,531	S *	9/2010	Fleck et al.	D14/230
7,898,496	B2	3/2011	Olsen et al.	
2002/0158798	A1	10/2002	Chiang et al.	
2003/0071757	A1	4/2003	Yamaki	
2004/0090379	A1	5/2004	Fourdeux et al.	
2004/0090385	A1	5/2004	Green	
2004/0113841	A1	6/2004	Louzir et al.	
2004/0217912	A1	11/2004	Mohammadian	
2005/0088342	A1	4/2005	Parsche	
2005/0162332	A1	7/2005	Schantz	
2005/0259023	A1 *	11/2005	Wang	343/764
2005/0280582	A1	12/2005	Powell et al.	
2006/0033665	A1	2/2006	Yang	
2006/0055618	A1	3/2006	Poilasne et al.	
2006/0077115	A1	4/2006	Oh et al.	
2006/0103577	A1	5/2006	Lee	
2006/0164304	A1	7/2006	Huang et al.	
2007/0069955	A1	3/2007	McCorkle	
2007/0200769	A1	8/2007	Nakano et al.	
2008/0094291	A1	4/2008	Bystrom et al.	
2008/0211720	A1	9/2008	Hansen	
2008/0258980	A1	10/2008	Chen et al.	
2008/0291345	A1	11/2008	Schneider	
2009/0058732	A1	3/2009	Nakano et al.	
2009/0073067	A1	3/2009	Soler Castany et al.	
2009/0146899	A1	6/2009	Schneider et al.	
2010/0045551	A1	2/2010	Schneider et al.	

FOREIGN PATENT DOCUMENTS

CN	ZL2008301199963	5/2009
CN	101453057 A	6/2009
CN	ZL2008301199978	7/2009
CN	ZL2008300091398	9/2009
EM	000946587	5/2008
EP	1555717	7/2005
EP	1653560	5/2006
EP	1753080	2/2007
GB	2263360	7/1993
JP	D1213590	6/2004
TW	M249233	11/2004
TW	D112283	8/2006
TW	D119092	9/2007
TW	200926506	6/2009
TW	D129744	7/2009
TW	D129745	7/2009
TW	D129746	7/2009
WO	WO2009073249	6/2009

OTHER PUBLICATIONS

Nonfinal Office Action (dated May 25, 2011) from U.S. Appl. No. 12/953,007 which is also a continuation from the same U.S. patent application as the instant application, 6 pages.

Notice of Allowance issued by the United States Patent and Trademark Office dated Jun. 14, 2011, from pending U.S. Appl. No. 12/953,007, which shares the same inventors as the instant application (7 pages).

IEEE Spectrum: Antennas for the New Airwaves, <http://www.spectrum.ieee.org/print/7328>, Published Feb. 2009, 9 pages, Authors Richard Schneider and John Ross.

Antenna Engineering Handbook, 3rd Edition, Edited by Richard C. Johnson, McGraw Hill, 1993, pp. 5-13 to 5-16.

One-Element Loop Antenna with Finite Reflector, B. Rojarayanont and T. Sekiguchi, Electronics & Communications in Japan, vol. 59-B, No. 5, May 1976, p. 68.

Frequency-and Time-Domain Modeling of Tapered Loop Antennas in Ultra-Wideband Radio Systems, Shiou-Li Chen and Shau-Gang Mao, Graduate Institute of Computer and Communication Engineer, pp. 179-182, IEEE copyright notice 2006.

Planar Miniature Tapered-Slot-Fed Annular Slot Antennas for Ultrawide-Band Radios, Tzyh-Ghuang Ma, Student Member, and Shyh-Kang, Jeng, Senior Member, IEEE, IEEE Transactions on Antennas and Propagation, vol. 53, No. 3, Mar. 2005, pp. 1194-1202.

Self-Mutual Admittances of Two Identical Circular Loop Antennas in a Conducting Medium and in Air, K. Iizuka, Senior Member, IEEE, R. W. P. King, Fellow, IEEE, and C. W. Harrison, Jr., Senior Member, IEEE, IEEE Transactions on Antennas and Propagation, vol. AP014, No. 4, Jul. 1966, pp. 440-450.

A Broadband Eccentric Annular Slot Antenna, Young Hoon Suh and Ikmo Park, Department of Electrical Engineering, Ajou University, pp. 94-97, IEEE copyright notice 2001.

A Printed Crescent Patch Antenna for Ultrawideband Applications, Ntsanderh C. Azenui an H.Y.D. Yang, IEEE Antennas and Wireless Propagation Letters, vol. 6, 2007, pp. 113-116.

Design of Compact Components for Ultra Wideband Communication Front Ends, Marek Bialkowski, Amin Abbosh, and Hing Kan, School of Information Technology and Electrical Engineering, The University of Queensland, four pages.

Non-final Office action from co-pending U.S. Appl. No. 12/040,464 (the parent application for the instant application); mail date Mar. 11, 2010; 18 pages.

International Search Report dated Jul. 8, 2008, issued by the International Search Authority for related International Patent Application No. PCT/US2008/061908, 1 page.

Written Opinion dated Jul. 8, 2008, issued by the International Search Authority for related International Patent Application No. PCT/US2008/061908, 8 pages.

Non-final Office action from co-pending U.S. Appl. No. 12/040,464 (the parent application for the instant application); mail date Sep. 3, 2010; 6 pages.

Notice of Allowance from co-pending U.S. Appl. No. 12/040,464 (the parent application for the instant application); mail date Sep. 22, 2010; 7 pages.

* cited by examiner

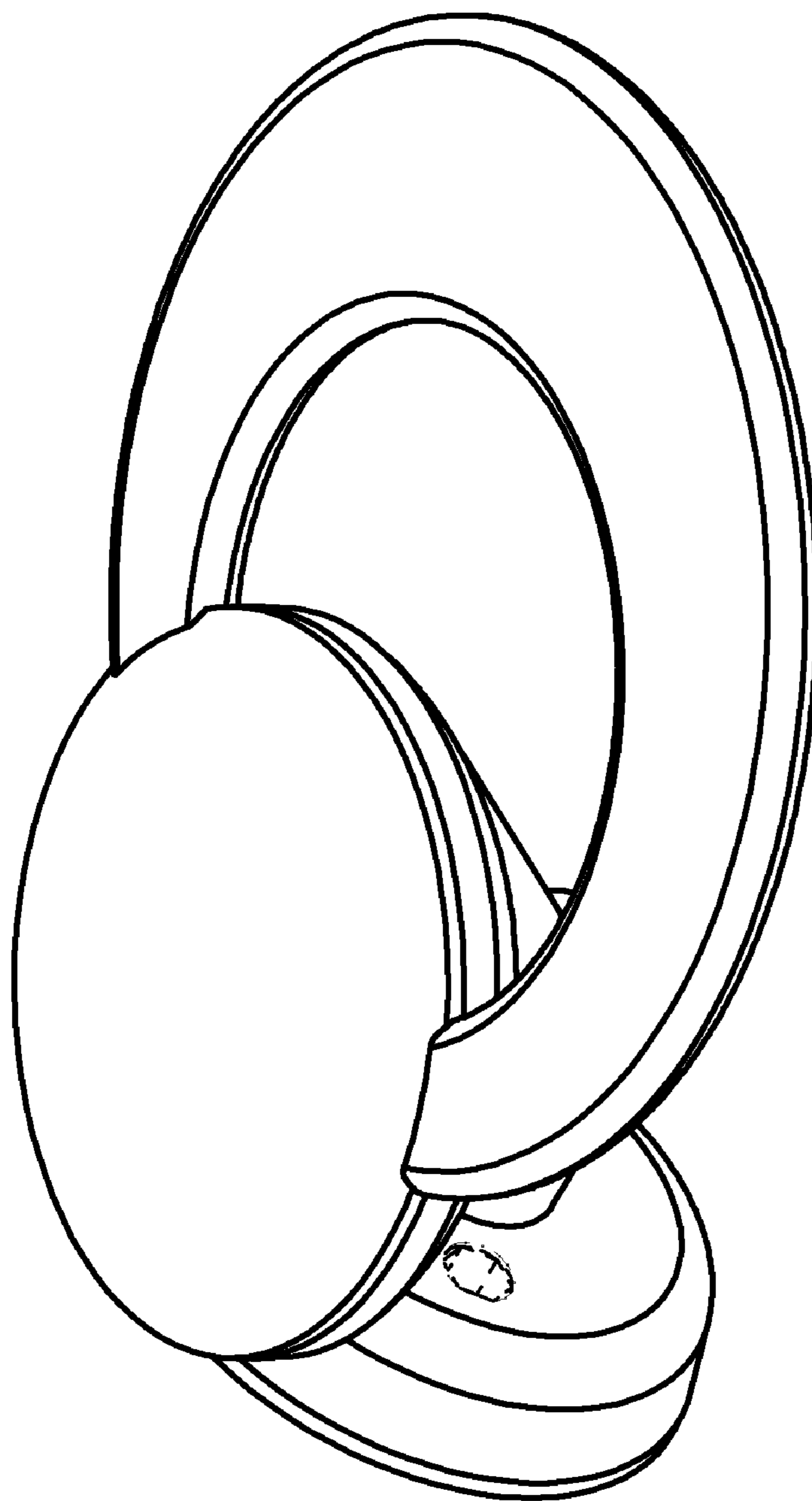


Fig. 1

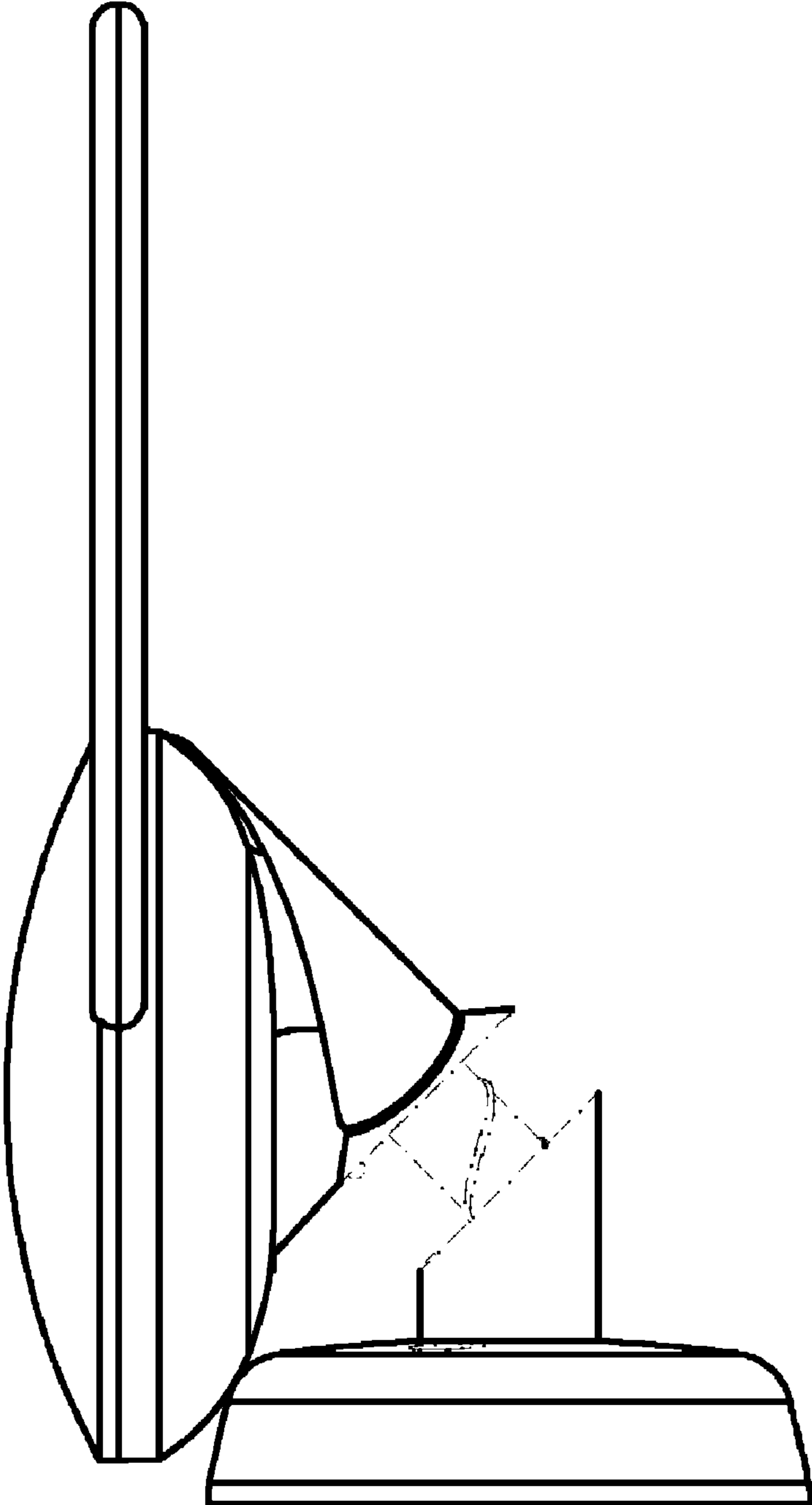


Fig. 2

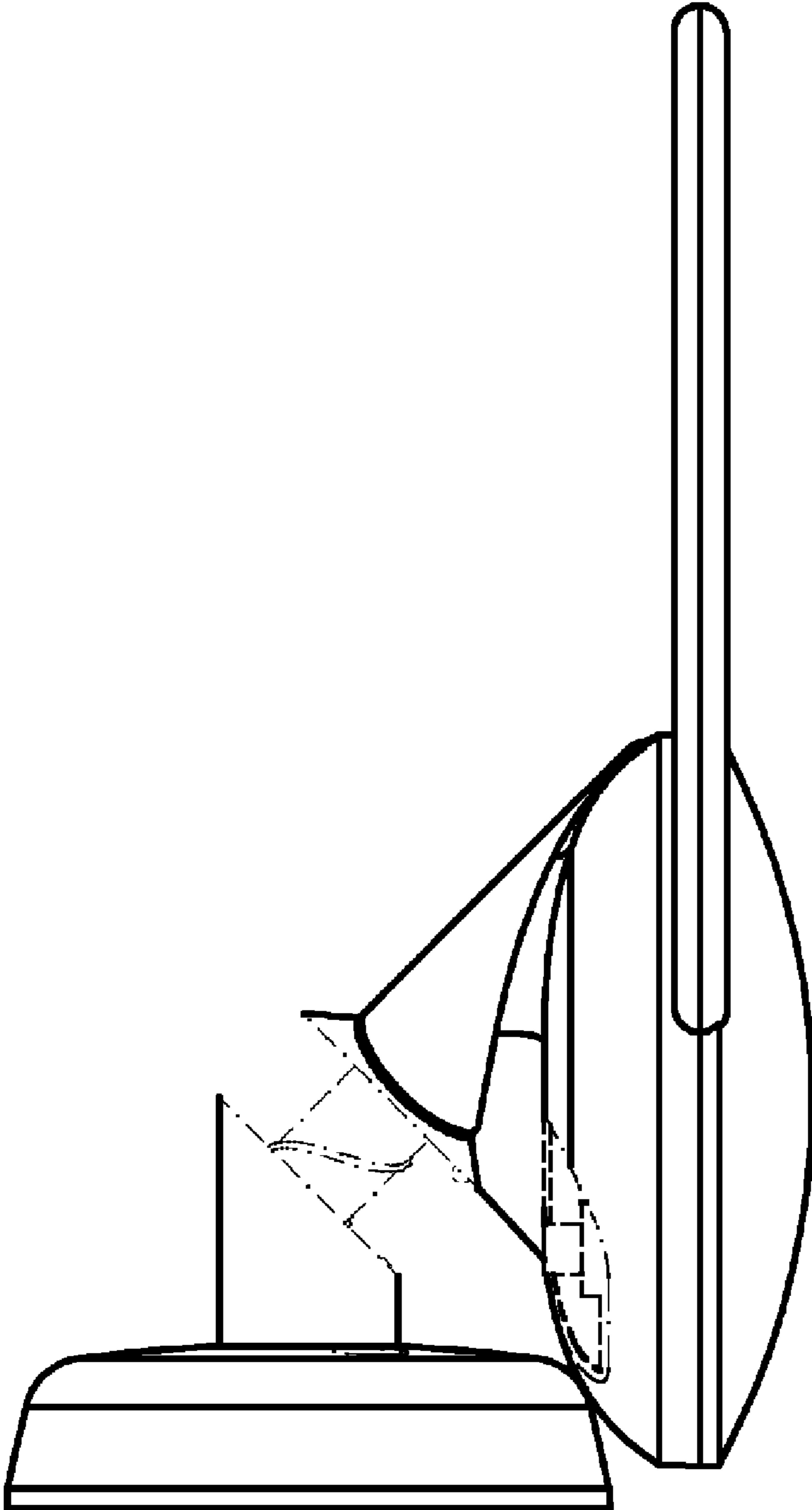


Fig. 3

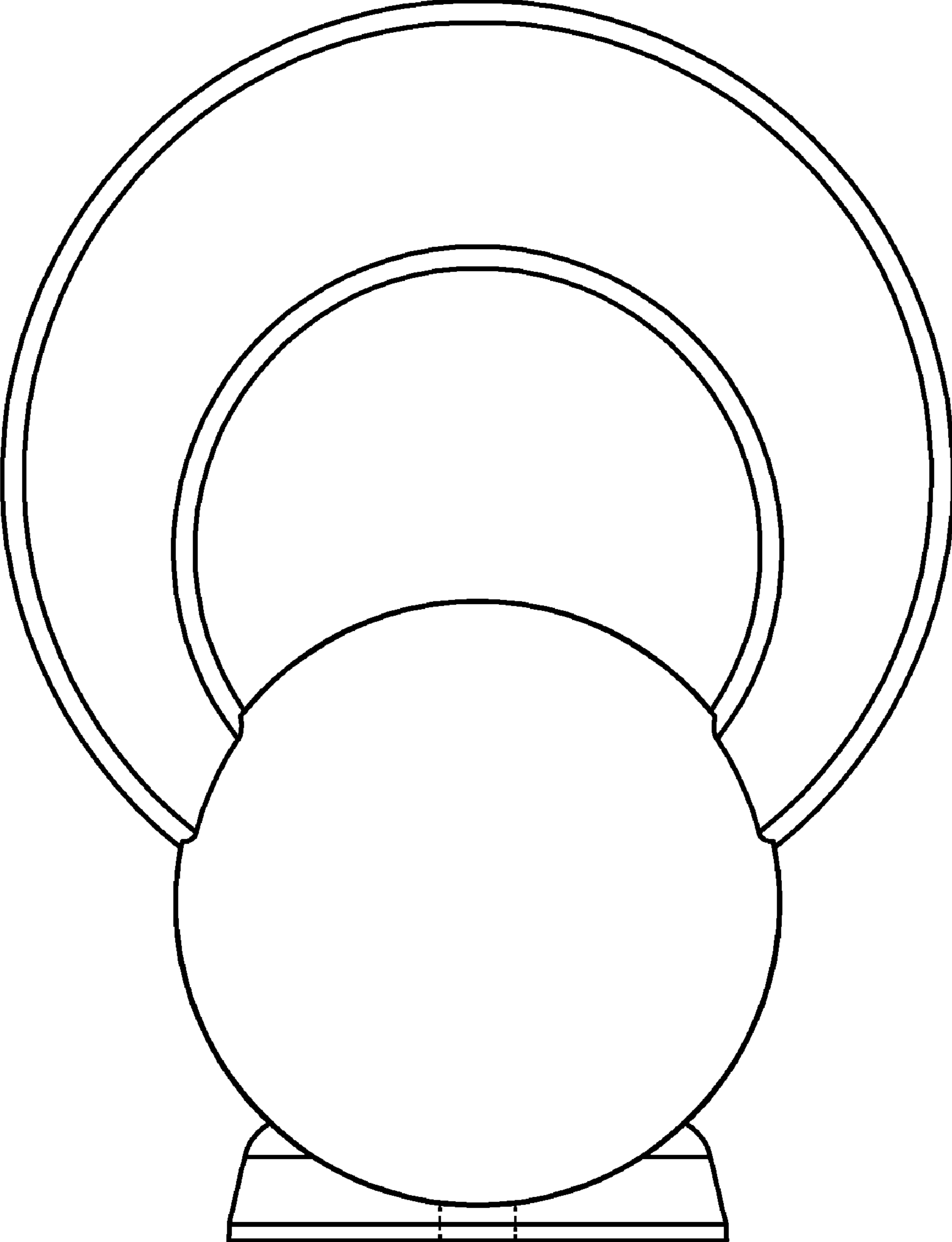


Fig. 4

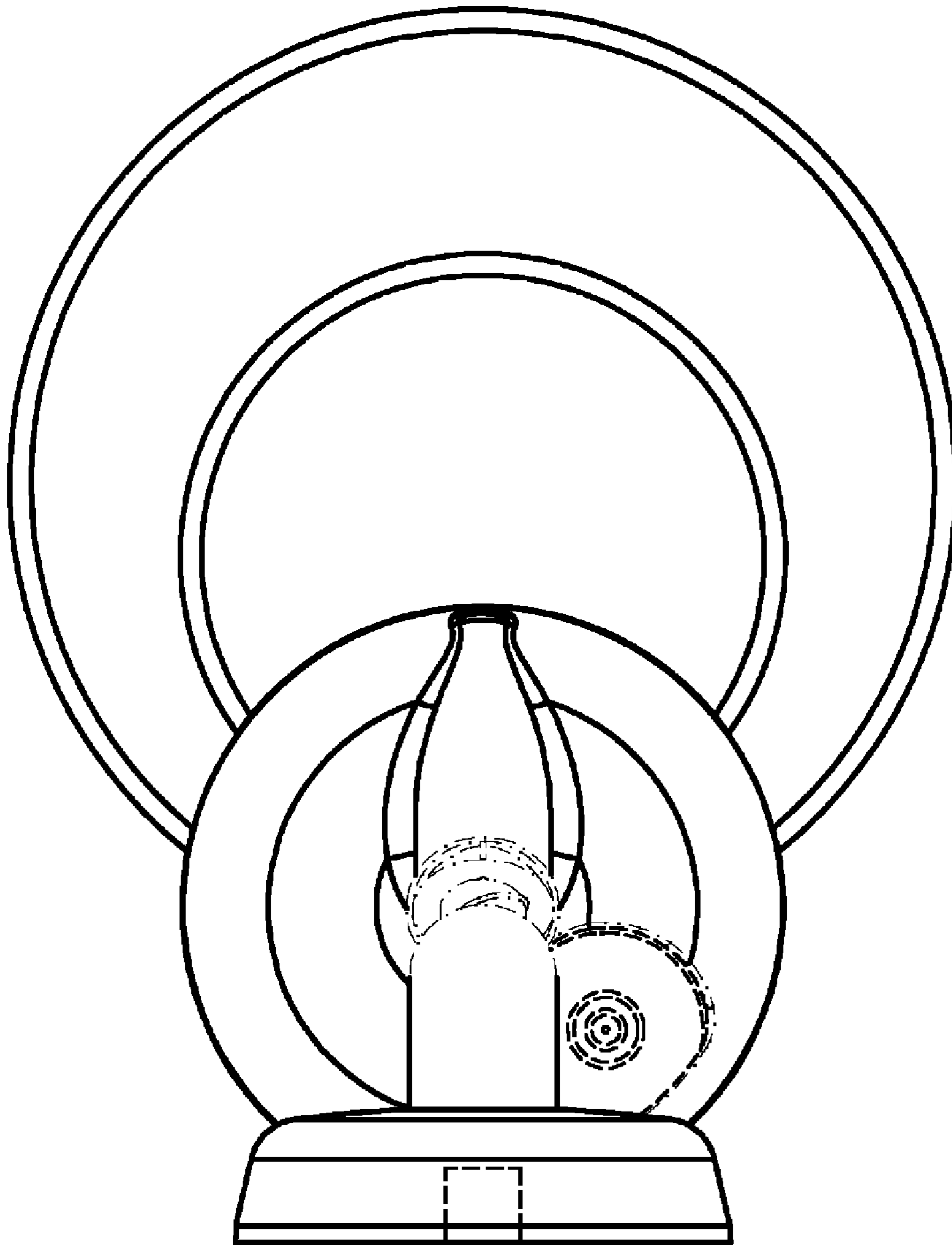


Fig. 5

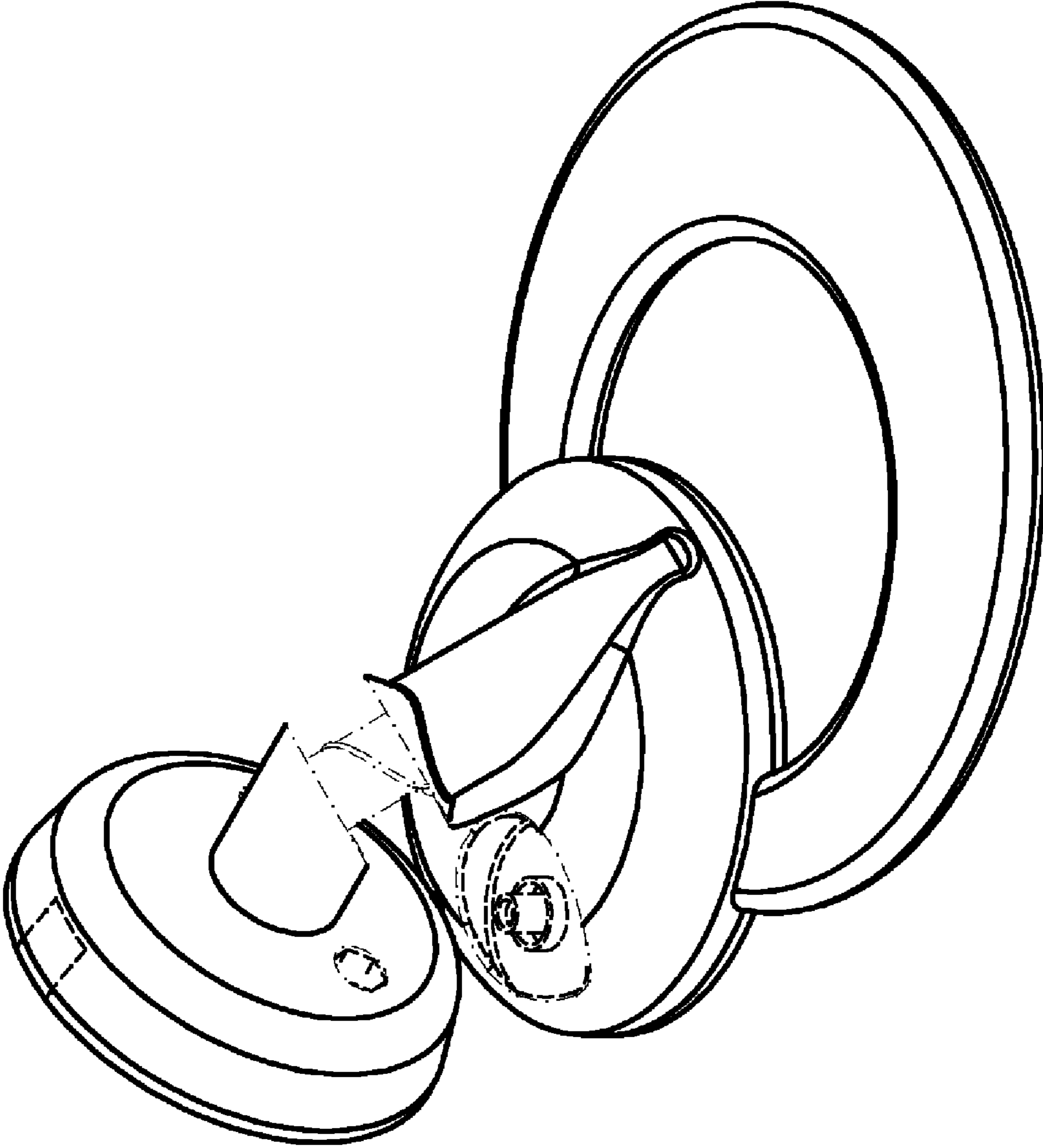


Fig. 6

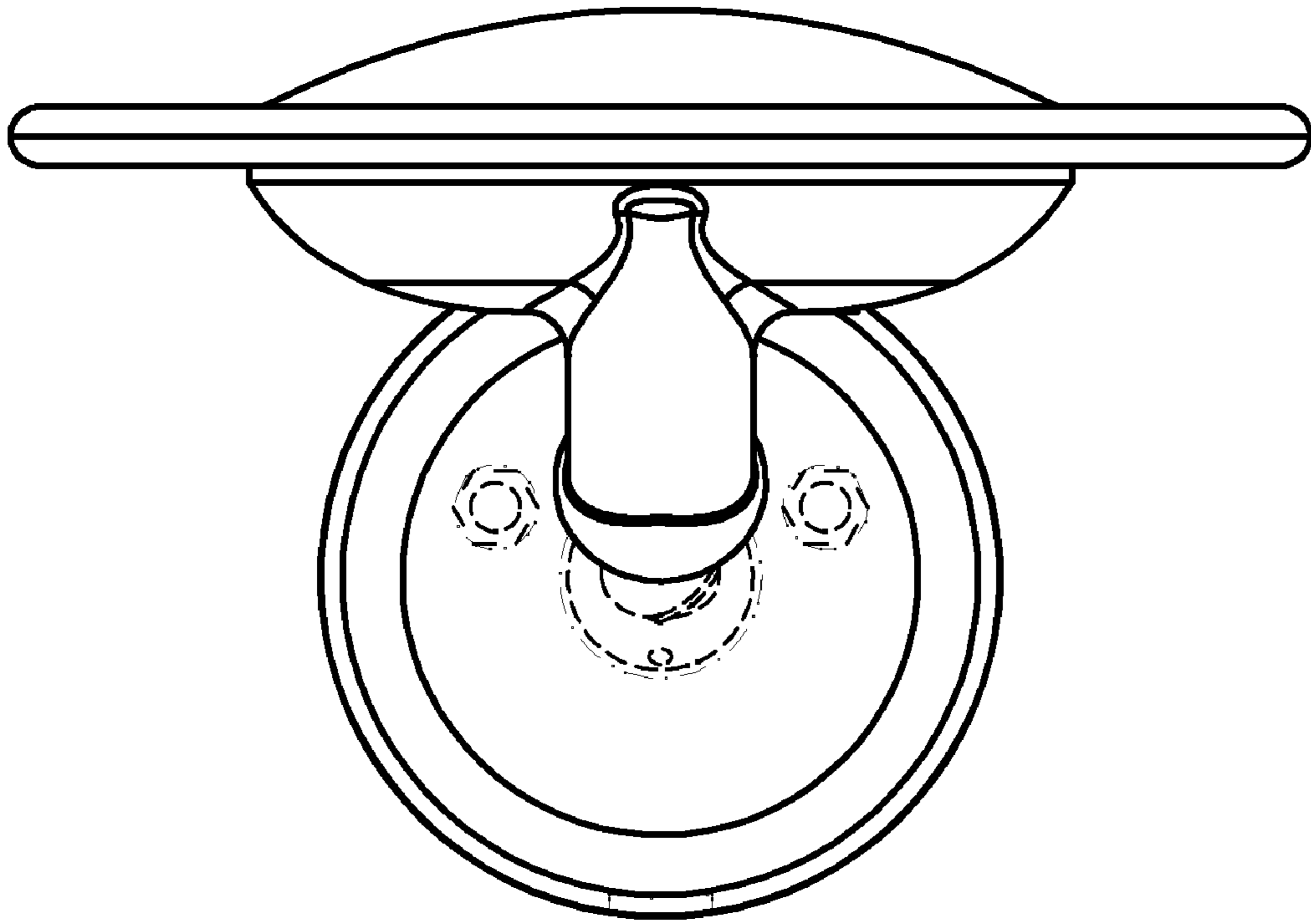


Fig. 7

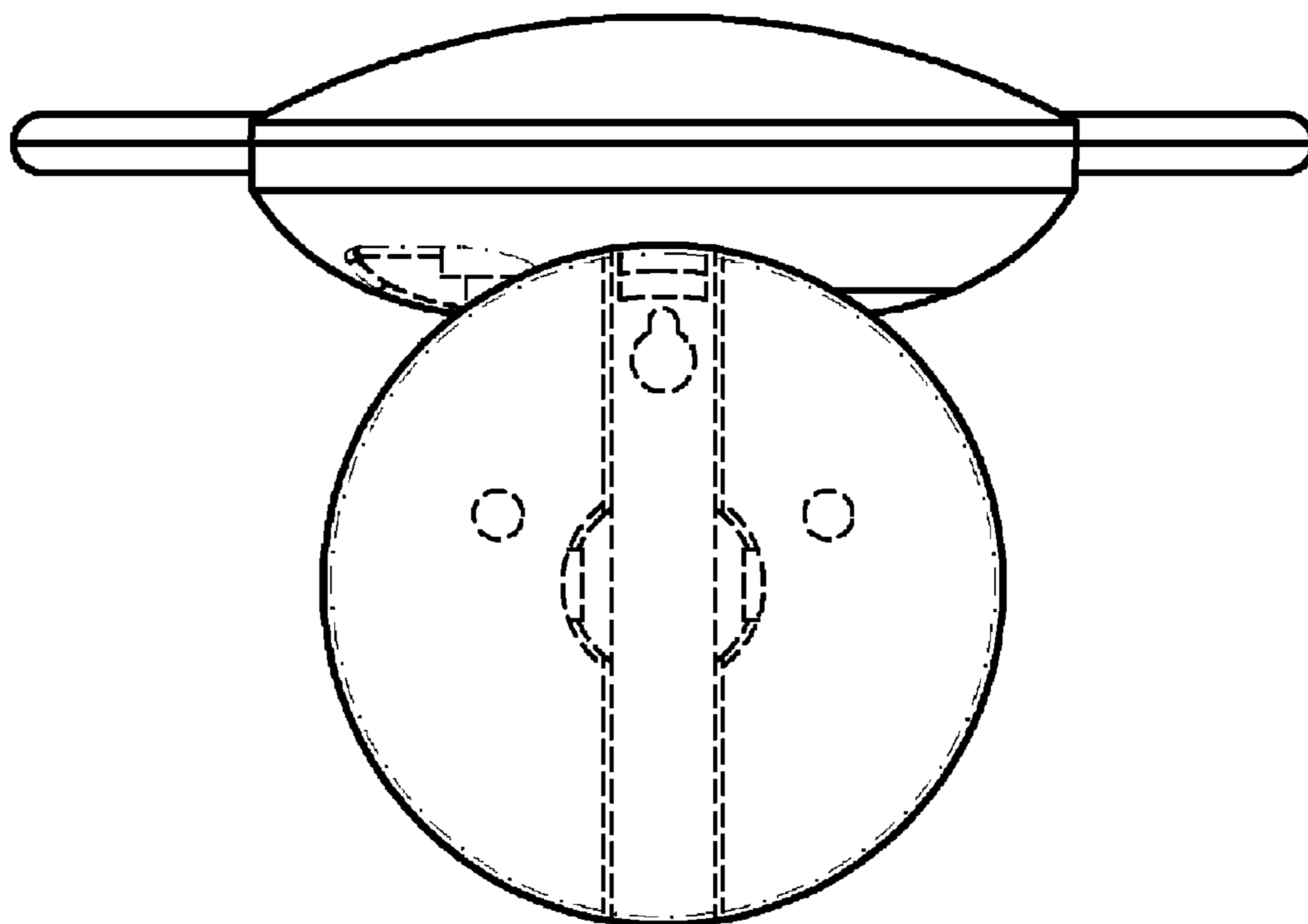


Fig. 8

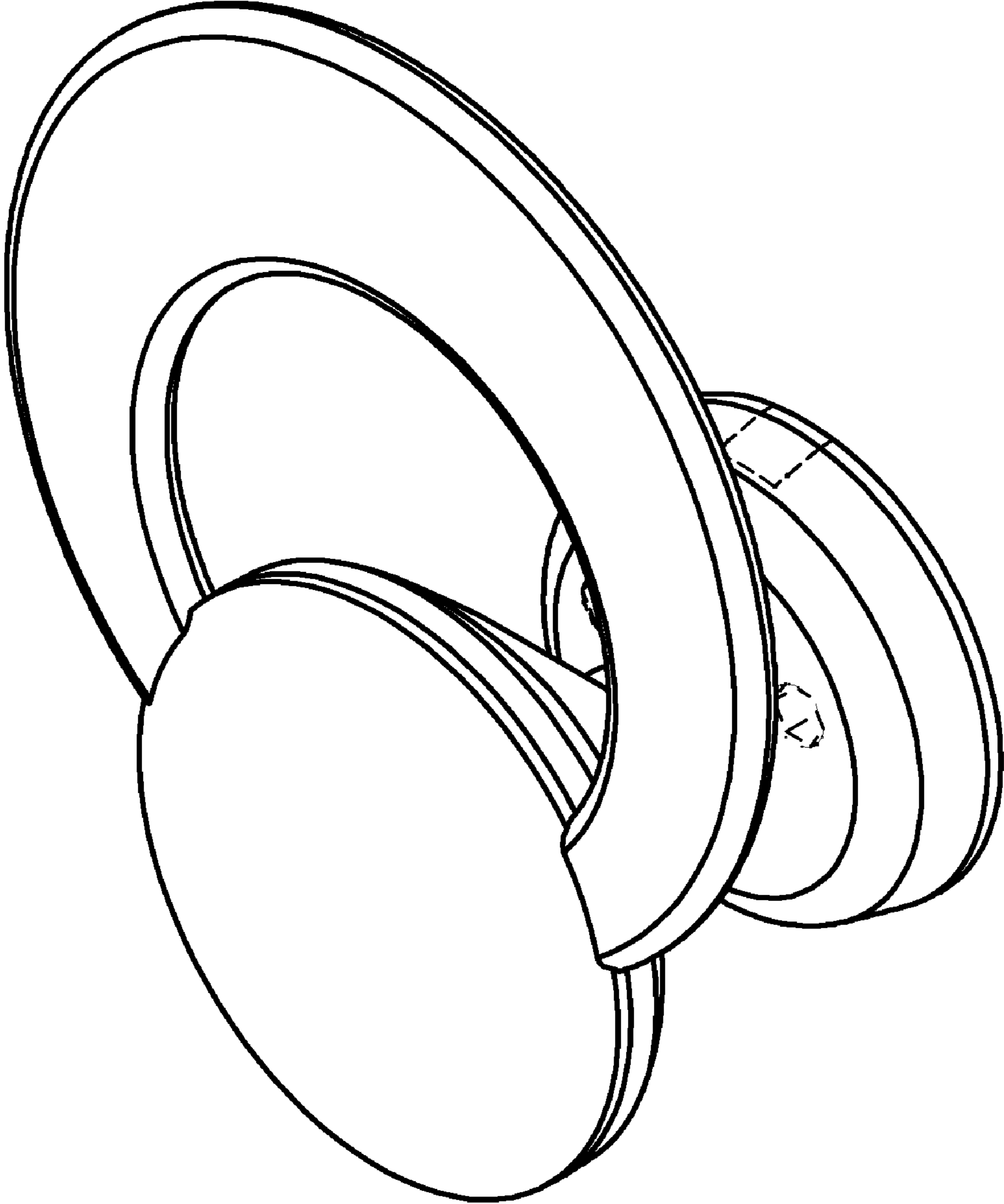


Fig. 9

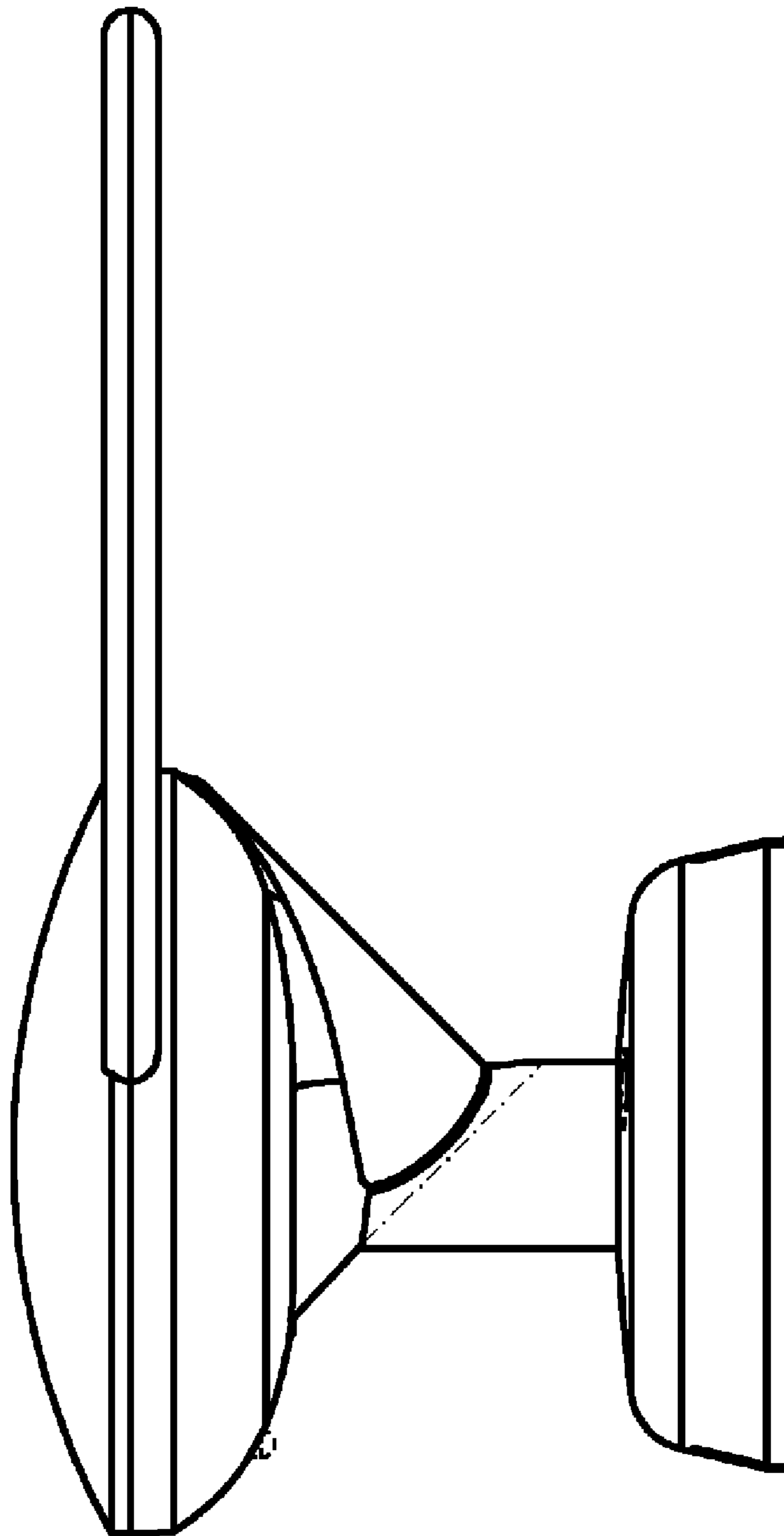


Fig. 10

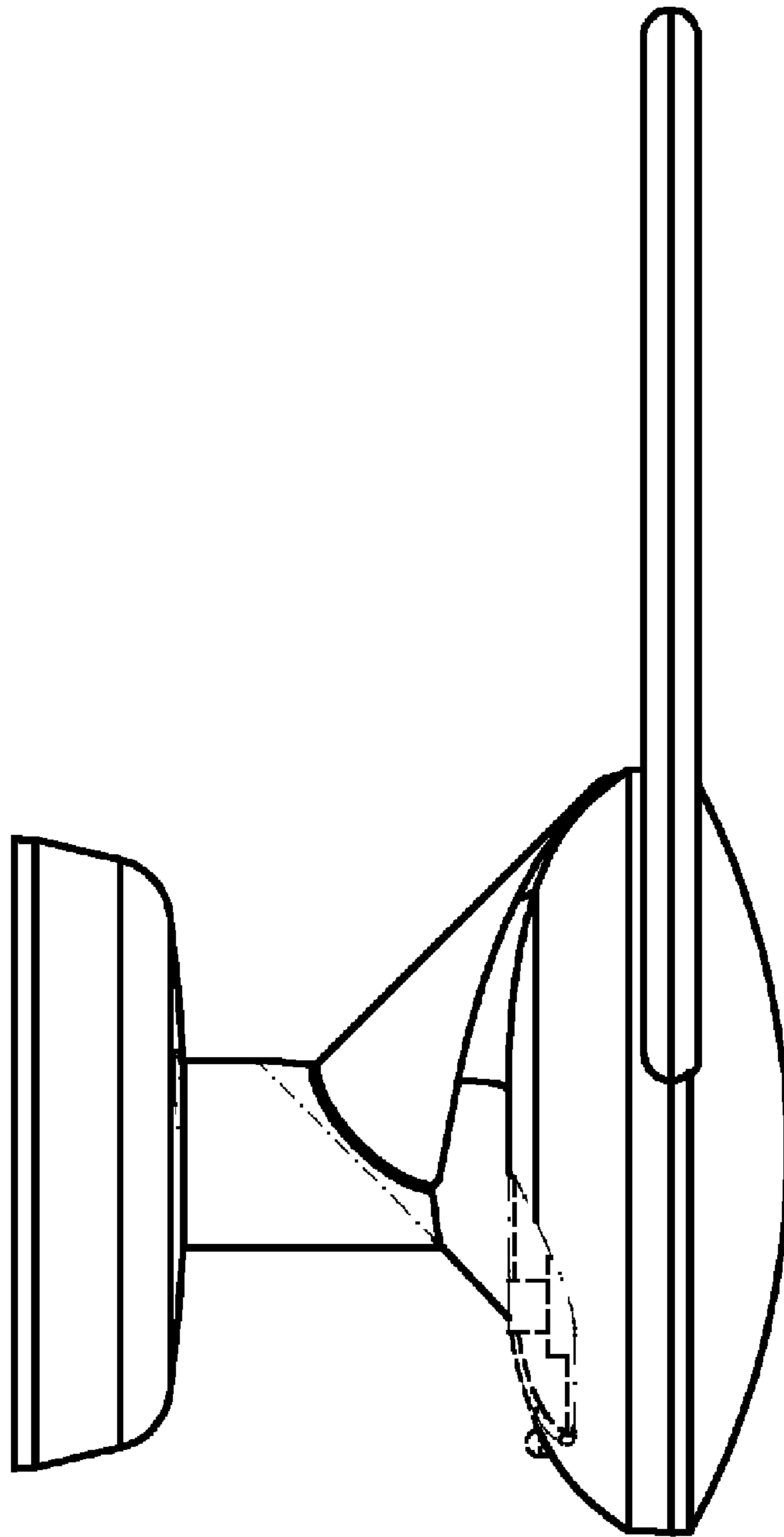


Fig. 11

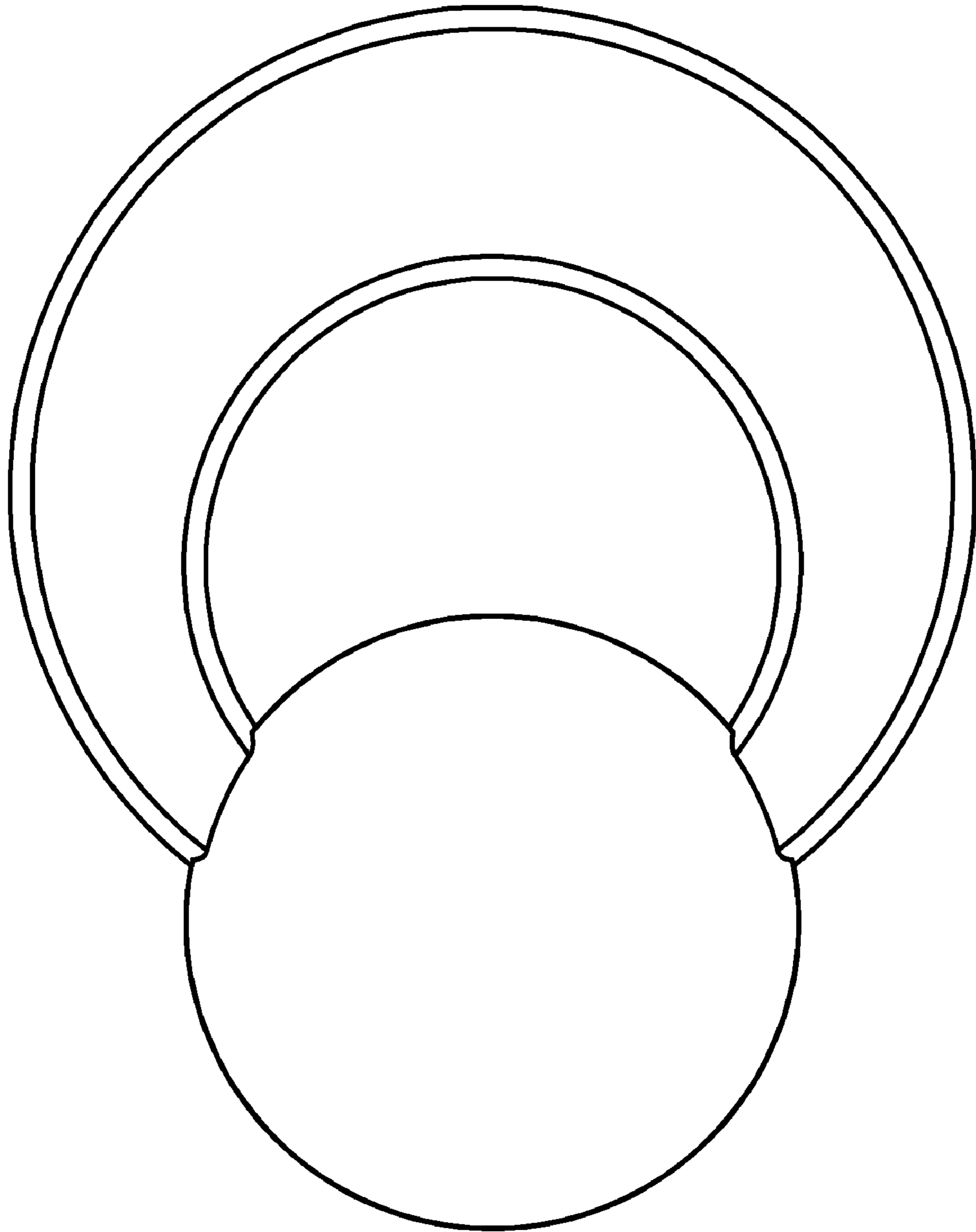


Fig. 12

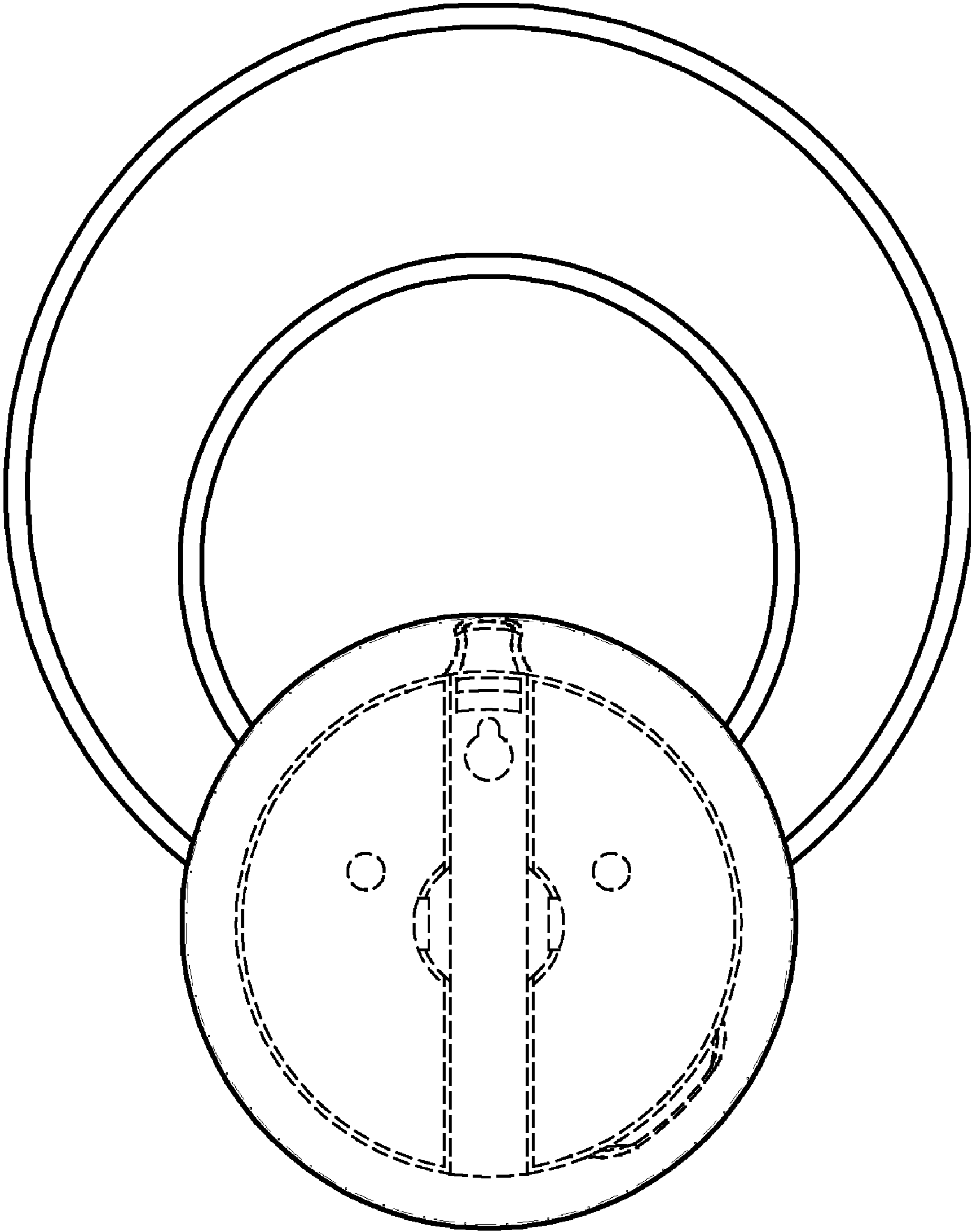


Fig. 13

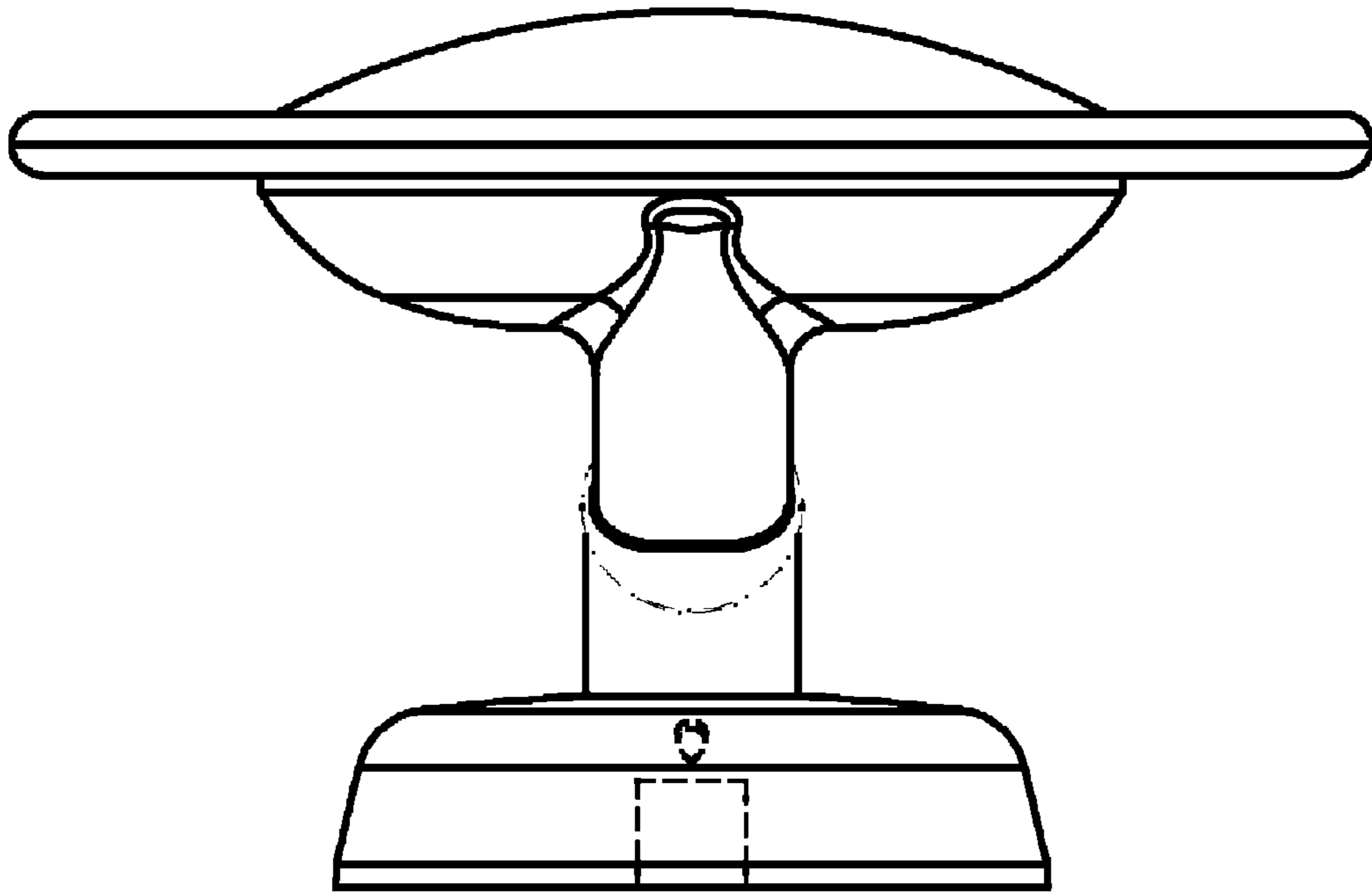


Fig. 14

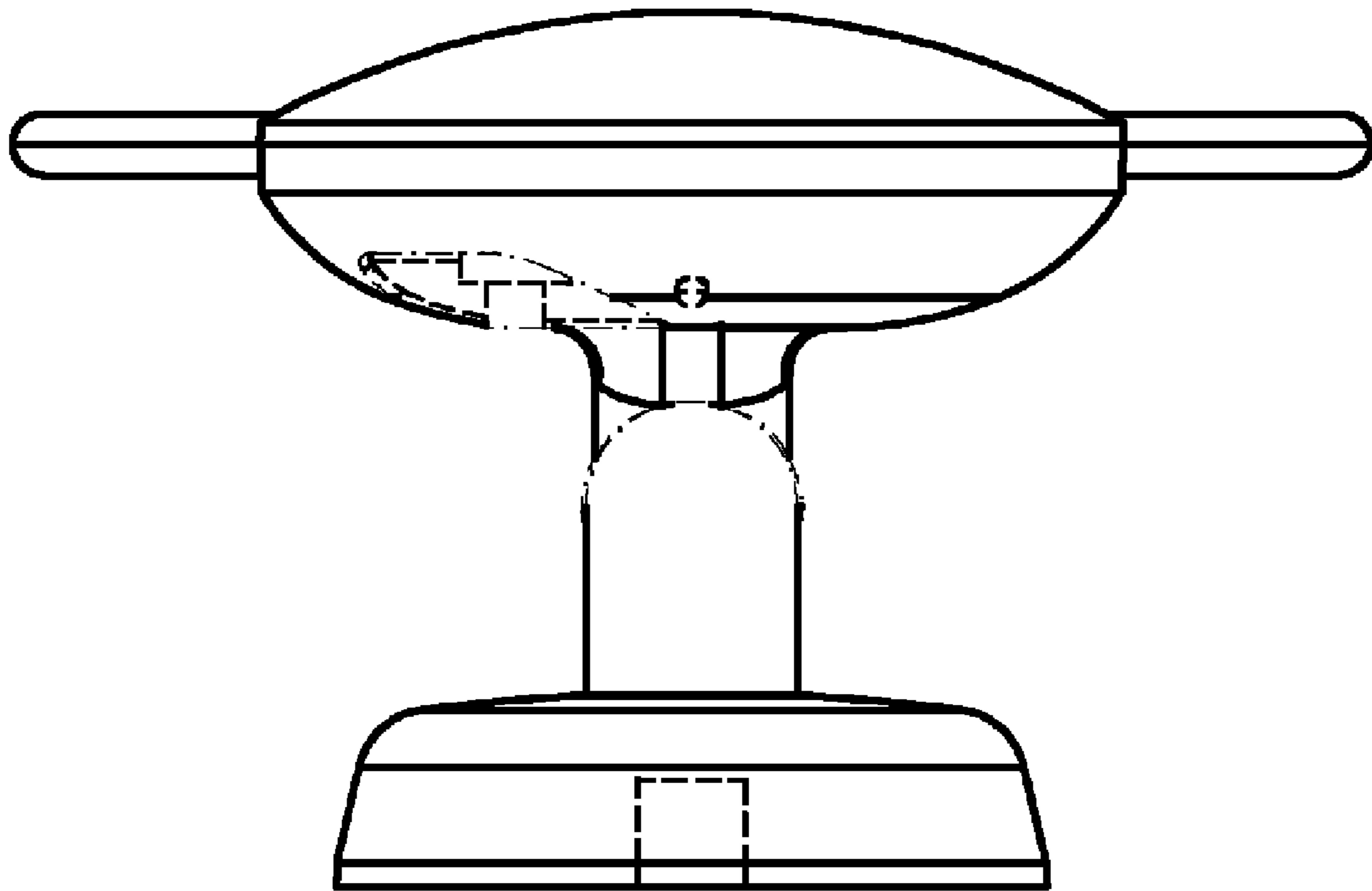


Fig. 15