



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

(10) **Patent No.:** **US D819,606 S**  
(45) **Date of Patent:** **\*\* Jun. 5, 2018**

(54) **SPEAKER WITH MULTIPLE DIAPHRAGMS**

(71) Applicants: **Masaaki Kabumoto**, Ohta-ku (JP);  
**Michiaki Shinotsuka**, Ohta-ku (JP);  
**Tsutomu Kawase**, Ohta-ku (JP);  
**Takaya Ochiai**, Ebina (JP); **Takashi Saitoh**, Ebina (JP); **Bob Spikman**, Amstelveen (NL)

(72) Inventors: **Masaaki Kabumoto**, Ohta-ku (JP);  
**Michiaki Shinotsuka**, Ohta-ku (JP);  
**Tsutomu Kawase**, Ohta-ku (JP);  
**Takaya Ochiai**, Ebina (JP); **Takashi Saitoh**, Ebina (JP); **Bob Spikman**, Amstelveen (NL)

(73) Assignee: **RICOH COMPANY, LTD.**, Tokyo (JP)

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

(21) Appl. No.: **29/556,287**

(22) Filed: **Feb. 29, 2016**

(30) **Foreign Application Priority Data**

Nov. 26, 2015 (JP) ..... 2015-026359

(51) **LOC (11) Cl.** ..... **14-01**

(52) **U.S. Cl.**

USPC ..... **D14/222**

(58) **Field of Classification Search**

USPC ... D14/209, 209.1, 210, 215, 217, 219, 204,  
D14/250, 258, 222, 238.1, 238; 181/170,  
181/199, 146, 150, 164, 165, 166, 167,  
181/169, 173, 174, 184, 152; 381/191,  
381/412, 309, 399, 408, 186, 427, 334,  
381/388, 174, 173, 423, 424, 425, 391,  
381/386; 455/90.3, 575.1, 569.1;

D23/370, 393

CPC .. H05K 5/00; E04B 1/82; H04R 25/00; H04R  
25/02; H04R 19/02; G10K 11/00

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,560,552 A *	11/1925	Esterbrook	.....	H04R 7/14	181/164
1,640,915 A *	8/1927	Wieland	.....	H04R 7/12	181/174
1,782,278 A *	11/1930	Vogt	.....	H04R 19/00	381/116
1,896,073 A *	2/1933	Dilks	.....	H04R 7/125	181/165

(Continued)

*Primary Examiner* — Paula Allen Greene  
(74) *Attorney, Agent, or Firm* — Oblon, McClelland,  
Maier & Neustadt, L.L.P.

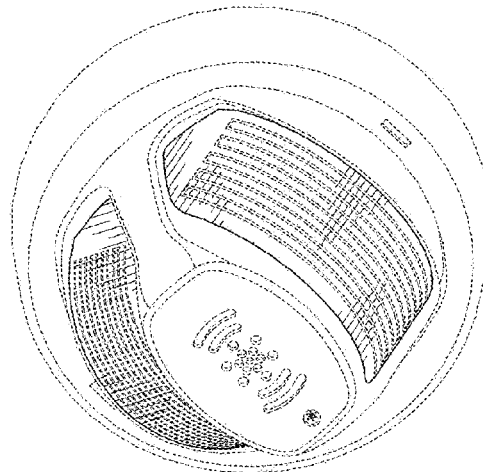
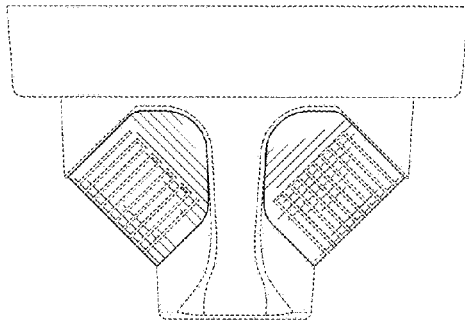
(57) **CLAIM**

The ornamental design for a speaker with multiple diaphragms, as shown and described.

**DESCRIPTION**

FIG. 1 is a top elevational view of a speaker with multiple diaphragms according to our design;  
FIG. 2 is a bottom elevational view thereof;  
FIG. 3 is a left side elevational view thereof, the right side elevational view thereof being a mirror image of the left side elevational view;  
FIG. 4 is a front elevational view thereof, the back elevational view thereof being a mirror image of the front elevational view; and,  
FIG. 5 is a bottom perspective view thereof.  
The broken lines in the figures represent unclaimed subject matter and form no part of the claimed design, particularly where any broken lines immediately adjacent areas associated with surface shading represent bounds of the claimed design, while other broken lines are directed to environment and are for illustrative purposes only and form no part of the claimed design.

**1 Claim, 5 Drawing Sheets**



(56)

References Cited

U.S. PATENT DOCUMENTS

1,990,409	A *	2/1935	Lawrance	H04R 7/06	5,069,011	A *	12/1991	Jenne	E04B 1/8236
				181/164					160/135
D178,798	S *	9/1956	Lowell	D14/219	5,103,927	A *	4/1992	Heavener	H04R 1/342
D179,847	S *	3/1957	Griner	454/300					181/158
D186,772	S *	12/1959	Conrad	D14/210	5,322,979	A *	6/1994	Cassity	H04R 1/023
2,924,290	A *	2/1960	Zuerker	H04R 7/12					181/150
				181/165	5,392,358	A *	2/1995	Driver	H04R 19/02
2,975,243	A *	3/1961	Katella	H04R 19/02					381/113
				381/191	D358,205	S *	5/1995	Ruhland	D23/393
3,019,854	A *	2/1962	O'Bryant	B01D 46/10	5,987,647	A *	11/1999	Ouellette	A41D 23/00
				29/432					132/273
3,129,268	A *	4/1964	Evet	F24F 6/04	5,992,561	A *	11/1999	Holben	E04B 1/84
				126/113					181/295
3,194,339	A *	7/1965	Pawlowski	H04R 1/403	D418,138	S *	12/1999	Miyazaki	D14/214
				181/146	6,112,847	A *	9/2000	Lehman	H04R 1/345
3,351,719	A *	11/1967	Schoengold	H04R 7/04					181/152
				181/167	D437,405	S *	2/2001	Schrank	D23/393
3,383,475	A *	5/1968	Wiggins	H04R 21/02	D450,778	S *	11/2001	Engebretson	D14/221
				257/417	6,393,129	B1 *	5/2002	Conrad	H04R 19/00
D218,830	S *	9/1970	Anchel	D14/219					381/191
D222,476	S *	10/1971	Ohyama et al.	D14/210	D482,676	S *	11/2003	Martikainen	D14/215
3,674,946	A *	7/1972	Winey	H04R 9/047	D491,165	S *	6/2004	Hakoda	D14/214
				310/25	D512,988	S *	12/2005	Green	D14/214
3,778,562	A *	12/1973	Wright	H04R 19/02	D532,773	S *	11/2006	Langberg	D14/168
				181/148	D578,633	S *	10/2008	Schluter	D23/370
3,834,486	A *	9/1974	Tsuge	H04R 7/122	7,469,053	B2 *	12/2008	Langberg	H04R 1/026
				181/165					381/332
3,892,927	A *	7/1975	Lindenberg	H04R 19/02	7,845,462	B2 *	12/2010	Moore	H04R 1/345
				381/116					181/155
3,898,598	A *	8/1975	Asahi	H04R 9/047	D659,678	S *	5/2012	Miller	D14/214
				335/231	D674,375	S *	1/2013	Robineau	D14/221
3,935,397	A *	1/1976	West	H04R 19/02	D676,020	S *	2/2013	Matsumura	D14/204
				381/191	D689,042	S *	9/2013	Lum	D14/210
3,944,020	A *	3/1976	Brown	B60N 2/4876	D695,705	S *	12/2013	Shimizu	D14/172
				181/141	D698,751	S *	2/2014	Swendseid	D14/214
4,008,408	A *	2/1977	Kodama	H04R 17/005	8,670,581	B2 *	3/2014	Harman	H04R 19/02
				310/324					381/191
D248,856	S *	8/1978	Saidel	D14/219	D709,856	S *	7/2014	Holzer	D14/171
4,187,926	A *	2/1980	Henricksen	G10K 11/025	D719,929	S *	12/2014	Rye	D14/205
				181/187	D726,684	S *	4/2015	Schmiedbauer	D14/210
4,254,184	A *	3/1981	Tsukagoshi	G11B 3/46	D742,854	S *	11/2015	Warden	D14/204
				148/279	D767,541	S *	9/2016	Baird	D14/208
D260,891	S *	9/1981	Fink	D14/196	D775,608	S *	1/2017	Noro	D14/222
4,934,480	A *	6/1990	Gate	H04R 1/023	2003/0127280	A1 *	7/2003	Engebretson	H04R 1/26
				181/150					181/199
5,020,630	A *	6/1991	Gunness	G10K 11/025	2005/0265569	A1 *	12/2005	Langberg	G11B 33/122
				181/187					381/334
					2016/0014520	A1 *	1/2016	Miura	H04R 7/125
									181/164

\* cited by examiner

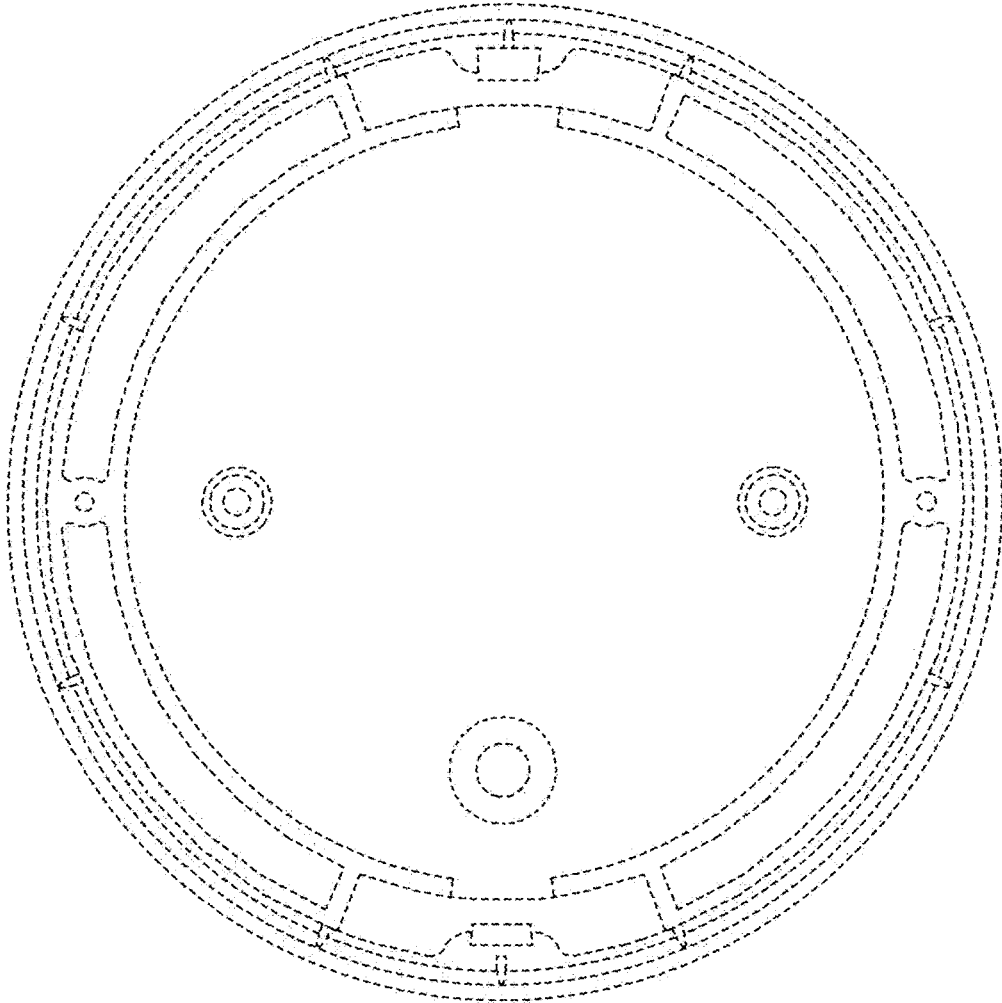


Fig. 1

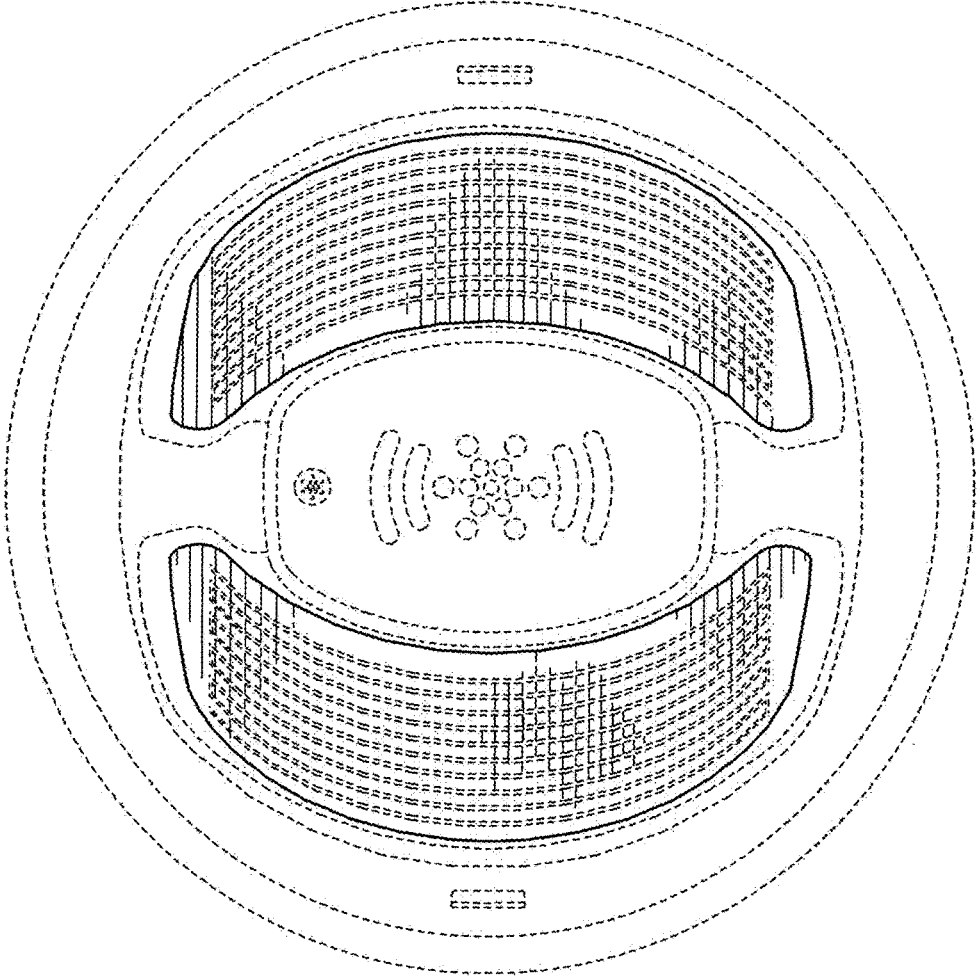


Fig. 2

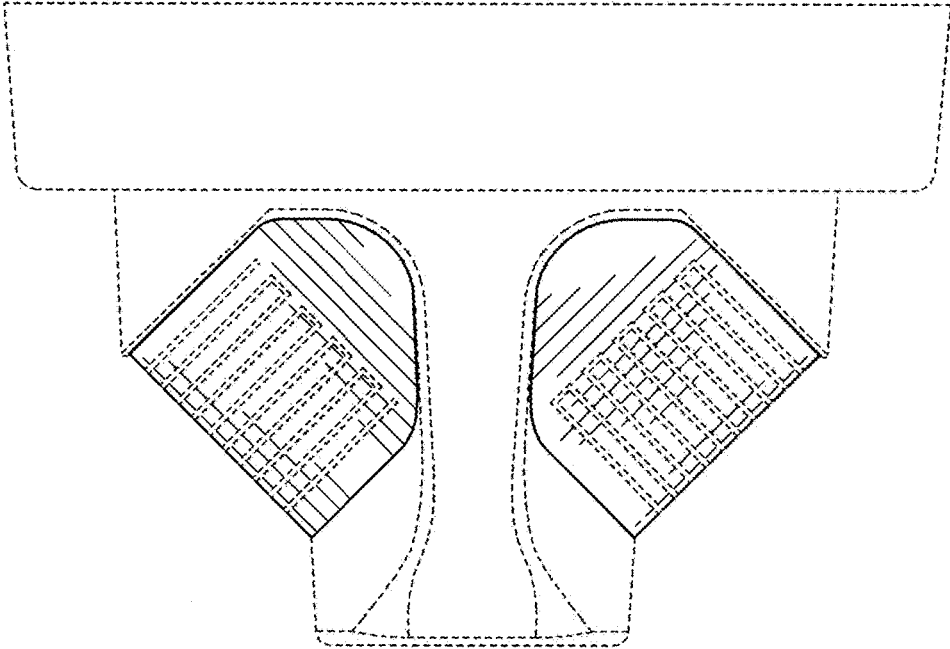


Fig. 3

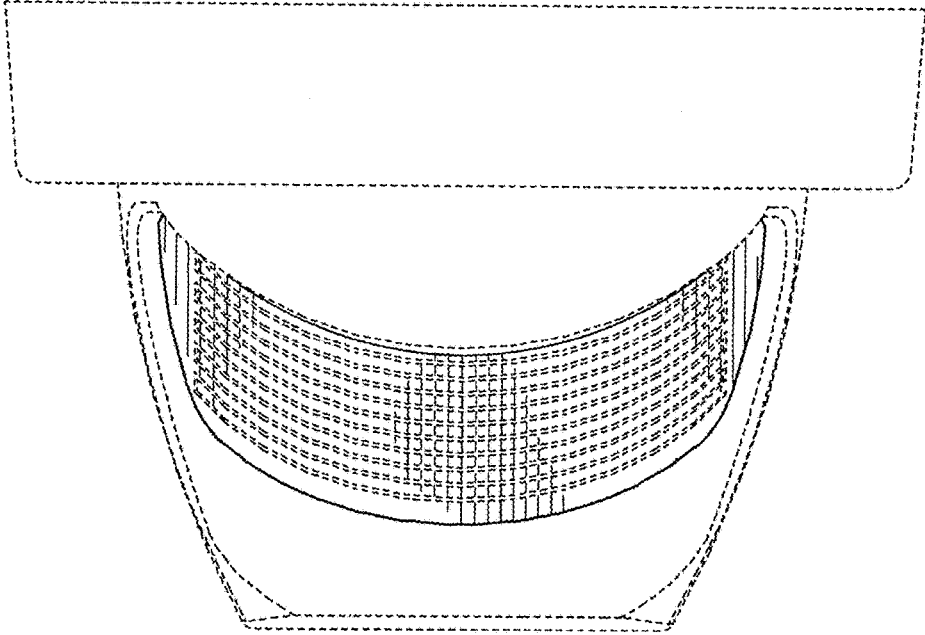


Fig. 4

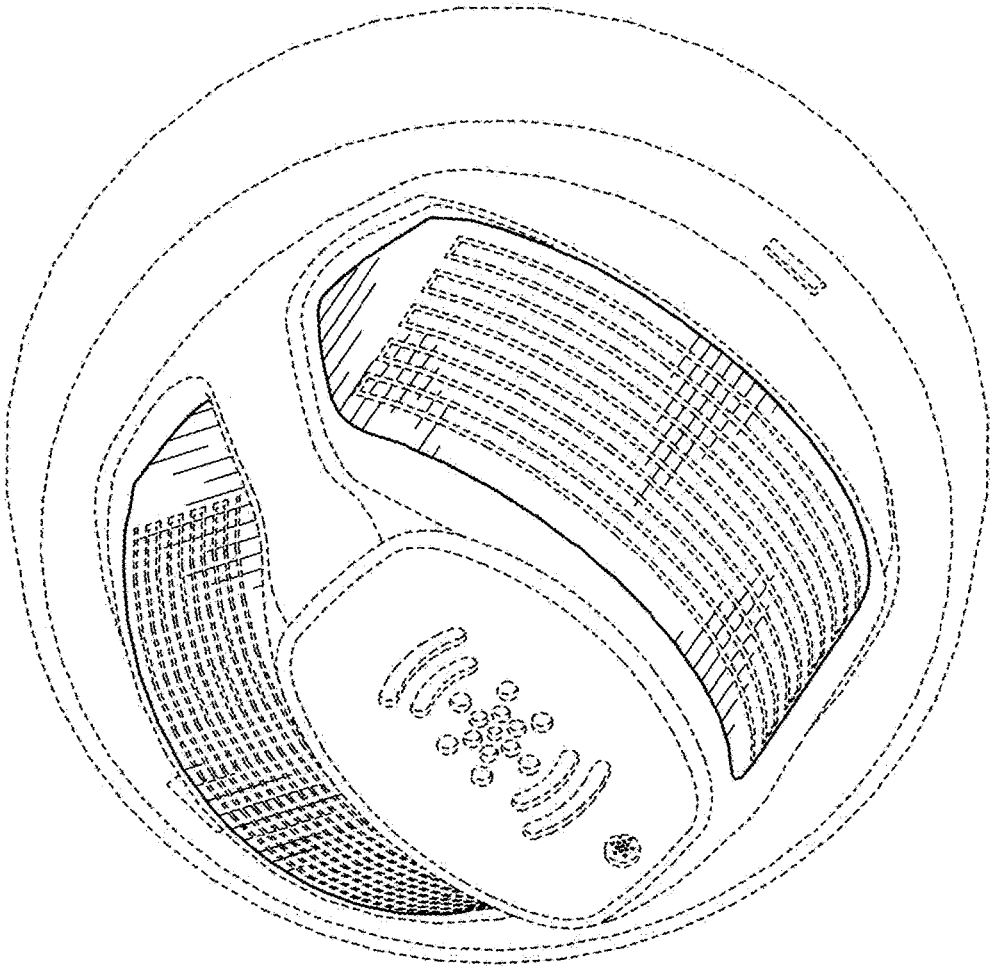


Fig. 5