



US00D787475S

(12) **United States Design Patent** (10) **Patent No.:** **US D787,475 S**  
**Lee et al.** (45) **Date of Patent:** **\*\* May 23, 2017**

(54) **ANTENNA**

(56) **References Cited**

(71) Applicants: **AGC AUTOMOTIVE AMERICAS R&D, INC.**, Ypsilanti, MI (US); **AGC Flat Glass North America, Inc.**, Alpharetta, GA (US)  
(72) Inventors: **Ming Lee**, Ypsilanti, MI (US); **Jesus Gedde**, Dexter, MI (US); **Frederick M. Schaible, III**, Grosse Pointe Park, MI (US); **Yasutaka Horiki**, Ypsilanti, MI (US); **Jun Noda**, Canton, MI (US)

U.S. PATENT DOCUMENTS

3,728,732 A 4/1973 Igarashi  
3,945,014 A 3/1976 Kunert et al.  
4,072,955 A 2/1978 Comastri et al.  
4,768,037 A 8/1988 Inaba et al.  
4,849,766 A 7/1989 Inaba et al.  
5,005,020 A 4/1991 Ogawa et al.  
5,132,161 A 7/1992 Shibata  
5,142,460 A 8/1992 McAtee

(Continued)

FOREIGN PATENT DOCUMENTS

CN 3660226 6/2007  
CN 302680880 \* 12/2013

(Continued)

OTHER PUBLICATIONS

Research Gate website, published paper Jun. 2015, site visited Feb. 9, 2017, [https://www.researchgate.net/publication/282741052\\_Textile\\_antennas\\_for\\_on-body\\_sensors](https://www.researchgate.net/publication/282741052_Textile_antennas_for_on-body_sensors).\*

(Continued)

*Primary Examiner* — John Windmuller  
*Assistant Examiner* — John R Yeh  
(74) *Attorney, Agent, or Firm* — Howard & Howard Attorneys PLLC

(57) **CLAIM**

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

**DESCRIPTION**

FIG. 1 is a front plan view of an antenna according to the present invention;  
FIG. 2 is a rear plan view thereof; and,  
FIG. 3 is a front plan view of the antenna in use.  
All claimed surfaces of the design are flat and coplanar. The broken lines in FIG. 3 illustrate environment and form no part of the claimed design.

**1 Claim, 1 Drawing Sheet**

(73) Assignees: **AGC AUTOMOTIVE AMERICAS R&D, INC.**, Ypsilanti, MI (US); **AGC FLAT GLASS NORTH AMERICA, INC.**, Alpharetta, GA (US)

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

(21) Appl. No.: **29/546,481**

(22) Filed: **Nov. 23, 2015**

**Related U.S. Application Data**

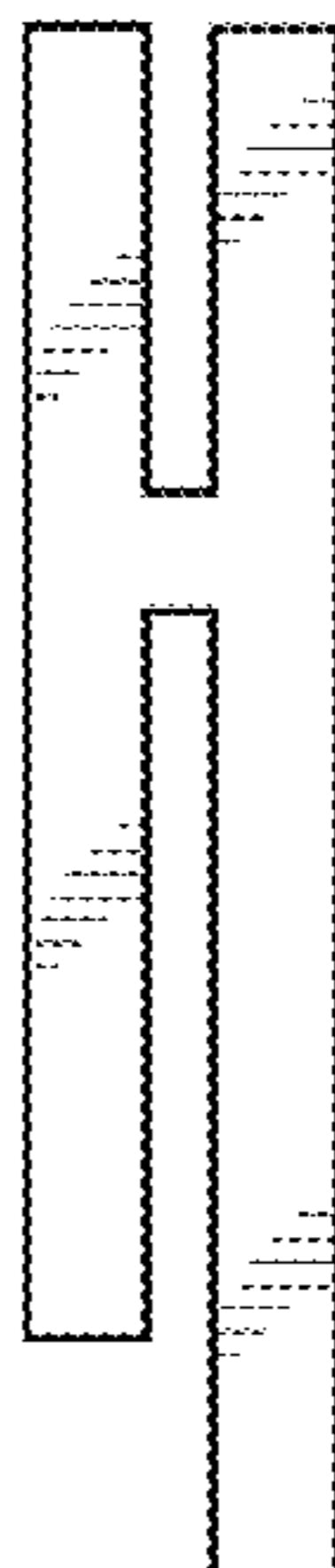
(62) Division of application No. 29/480,024, filed on Jan. 22, 2014, now abandoned.

(51) **LOC (10) Cl.** ..... **14-03**

(52) **U.S. Cl.**  
USPC ..... **D14/218**

(58) **Field of Classification Search**  
USPC ..... D14/230, 358, 233–236; D25/138, D25/149–150, 156  
CPC .. H01Q 1/12; H01Q 1/32; H01Q 3/44; H01Q 19/30; H01Q 19/12; H01Q 1/125; H01Q 1/273; H01Q 1/3275; H01Q 1/1271; H05K 1/03

See application file for complete search history.



(56)

References Cited

U.S. PATENT DOCUMENTS

5,243,357 A \* 9/1993 Koike ..... H01Q 19/195  
343/776

5,670,966 A 9/1997 Dishart et al.  
5,790,080 A 8/1998 Apostolos  
5,856,035 A 1/1999 Khandkar et al.  
5,898,407 A 4/1999 Paulus et al.  
5,973,648 A 10/1999 Lindenmeier et al.  
5,999,136 A 12/1999 Winter et al.  
D434,752 S 12/2000 Kudo  
6,211,831 B1 4/2001 Nagy et al.  
6,239,758 B1 5/2001 Fuchs et al.  
6,320,276 B1 11/2001 Sauer  
6,417,811 B1 7/2002 Adrian  
D490,801 S 6/2004 Iwai et al.  
6,906,287 B2 6/2005 Sol  
D534,902 S \* 1/2007 Su ..... D14/230  
D535,290 S \* 1/2007 Su ..... D14/230  
D543,974 S 6/2007 Oshima et al.  
D544,469 S 6/2007 Oshima  
D580,418 S \* 11/2008 Yang ..... D14/230  
D588,586 S \* 3/2009 Montgomery ..... D14/230  
7,508,345 B2 3/2009 Pan et al.  
7,518,558 B2 4/2009 Kato et al.  
D602,010 S 10/2009 Yakubo  
7,656,357 B2 2/2010 Ishibashi et al.  
D615,966 S 5/2010 Shinkawa et al.  
D616,163 S 5/2010 Nam et al.  
D618,223 S 6/2010 Tsai et al.  
D620,857 S 8/2010 Noguchi et al.  
D620,858 S 8/2010 Noguchi et al.  
D621,819 S 8/2010 Tsai et al.  
7,834,274 B2 \* 11/2010 Yang ..... H05K 3/182  
174/255

7,847,745 B2 12/2010 Martin  
D635,560 S 4/2011 Tsai et al.  
D635,964 S 4/2011 Podduturi  
D636,382 S 4/2011 Podduturi  
8,004,465 B2 8/2011 Schano  
8,081,130 B2 12/2011 Apostolos et al.  
8,268,222 B2 9/2012 Aisenbrey  
8,269,676 B2 9/2012 Lin  
D675,195 S 1/2013 Huang et al.  
8,350,766 B2 1/2013 Hisaeda  
D676,429 S 2/2013 Gosalia et al.  
8,466,842 B2 6/2013 Dai  
D686,600 S 7/2013 Yang  
D689,474 S 9/2013 Yang et al.  
8,576,130 B2 11/2013 Dai  
8,590,797 B2 11/2013 Kato et al.  
D694,738 S 12/2013 Yang  
8,830,128 B2 9/2014 Fuchs et al.  
8,906,523 B2 12/2014 Brantner  
D740,261 S \* 10/2015 Man ..... D14/230  
D772,849 S \* 11/2016 Chen ..... D14/230  
2003/0034927 A1 2/2003 Deininger  
2004/0056805 A1 \* 3/2004 Chen ..... H01Q 1/243  
343/700 MS  
2004/0183728 A1 \* 9/2004 Zinanti ..... H01Q 1/085  
343/700 MS  
2004/0200821 A1 10/2004 Voeltzel  
2004/0222936 A1 \* 11/2004 Hung ..... H01Q 1/38  
343/795  
2004/0257291 A1 \* 12/2004 Man ..... H01Q 1/243  
343/795  
2006/0055610 A1 \* 3/2006 Borisov ..... H01P 1/203  
343/719  
2006/0214863 A1 9/2006 Fujimoto et al.  
2007/0040028 A1 2/2007 Kawamata  
2008/0068276 A1 3/2008 Noro  
2008/0079639 A1 4/2008 Jen-Huan  
2008/0143630 A1 6/2008 Kato et al.  
2008/0143632 A1 6/2008 Apostolos  
2008/0158075 A1 7/2008 Villarroel et al.

2008/0218417 A1 9/2008 Gillette  
2008/0258992 A1 10/2008 Tsai et al.  
2008/0283173 A1 11/2008 Hisaeda  
2010/0283694 A1 11/2010 Kato  
2011/0043412 A1 2/2011 Kim  
2011/0068986 A1 3/2011 Tezuka et al.  
2011/0175672 A1 \* 7/2011 Nguyen ..... G02B 1/002  
327/534  
2011/0227808 A1 \* 9/2011 Takano ..... H01Q 1/1271  
343/906  
2011/0241961 A1 10/2011 Aizawa  
2012/0256798 A1 10/2012 Paulus et al.  
2012/0280873 A1 11/2012 Rofougaran  
2012/0306704 A1 12/2012 Li et al.  
2013/0141297 A1 6/2013 Gomme et al.  
2014/0266477 A1 \* 9/2014 Sekiguchi ..... H01Q 1/38  
331/96  
2014/0327583 A1 \* 11/2014 Sparks ..... H01Q 1/2233  
343/702  
2014/0361948 A1 12/2014 Tanaka et al.  
2015/0207203 A1 7/2015 Lee et al.

FOREIGN PATENT DOCUMENTS

EP 0 720 249 A2 7/1996  
JP S 63-155805 A 6/1988  
JP D 1185796 9/2003  
JP D 1224231 12/2004  
JP D 1239259 5/2005  
JP D 1263798 2/2006  
JP D1291197 \* 1/2007  
JP D 1291197 1/2007  
JP D 1350409 2/2009  
JP D 1421524 8/2011  
KR 300552847 2/2010  
KR 300552847.0000 \* 2/2010  
WO WO 2012/079002 A1 6/2012

OTHER PUBLICATIONS

AGC Automotive website, copyright 2017, site visited Feb. 9, 2017, <http://www.agc-automotive.com/en/our-products/transversal-technologies/integrated-glass-antennas/>.  
International Search Report for Application No. PCT/US2014/012526 dated Oct. 9, 2014, 4 pages.  
English language abstract for JPS 63-155805 extracted from PAJ database on Oct. 16, 2014, 1 page.  
English language abstract/description for JPD 1185796 extracted from <https://www9.orbit.com/index.html?ticket=2ddf4357-c380-4cdc-ba25-4d0fe264c76d&locale=en&embedded=false> &locale=en#DesignFullPage on Jul. 29, 2015, 1 page.  
English language abstract/description for JPD 1224231 extracted from <https://www9.orbit.com/index.html?ticket=2ddf4357-c380-4cdc-ba25-4d0fe264c76d&locale=en&embedded=false> &locale=en#DesignFullPage on Jul. 29, 2015, 1 page.  
English language abstract/description for JPD 1291197 extracted from <https://www9.orbit.com/index.html?ticket=2ddf4357-c380-4cdc-ba25-4d0fe264c76d&locale=en&embedded=false> &locale=en#DesignFullPage on Jul. 29, 2015, 1 page.  
English language abstract/description for JPD 1421524 extracted from <https://www9.orbit.com/index.html?ticket=2ddf4357-c380-4cdc-ba25-4d0fe264c76d&locale=en&embedded=false> &locale=en#DesignFullPage on Jul. 29, 2015, 1 page.  
English language abstract/description for KR 300552847 extracted from <https://www9.orbit.com/index.html?ticket=2ddf4357-c380-4cdc-ba25-4d0fe264c76d&locale=en&embedded=false> &locale=en#DesignFullPage on Jul. 29, 2015, 1 page.  
Gerrelt, "Windscreen Mount Antenna", updated Apr. 2011, downloaded from <http://www.gerrelt.nl/section-aerodynamics/aerody-windscreen-antenna.html> on Jul. 29, 2015, 4 pages.  
Design U.S. Appl. No. 29/480,027, filed Jan. 22, 2014, 16 pages.

\* cited by examiner

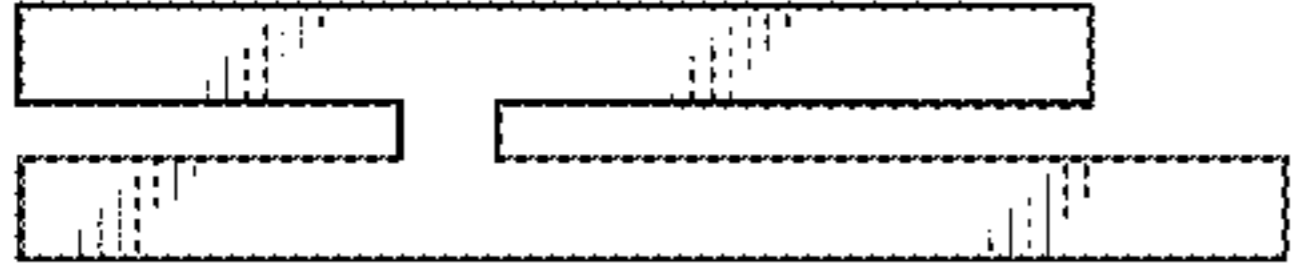


FIG. 1

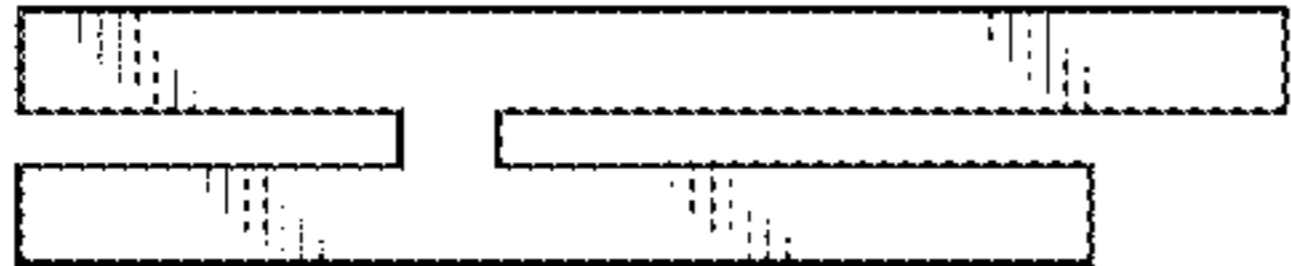


FIG. 2

FIG. 3

