US00D613275S

(12) United States Design Patent

Omori et al.

(10) Patent No.: US D613,275 S
(45) Date of Patent: ** Apr. 6, 2010

(54) **ANTENNA DEVICE**

(75) Inventors: **Takashi Omori**, Nishinomiya (JP); **Yoshihiro Tada**, Nishinomiya (JP)

(73) Assignee: **Furuno Electric Co., Ltd.**, Nishinomiya (JP)

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

(21) Appl. No.: **29/271,344**

(22) Filed: **Jan. 17, 2007**

(30) **Foreign Application Priority Data**

Jul. 18, 2006 (JP) IGAN2006-018850

(51) **LOC (9) Cl.** **14-03**
(52) **U.S. Cl.** **D14/230**
(58) **Field of Classification Search** ..... D14/230–238; 324/332; 343/700 MS, 702, 846; 375/347, 375/299, 267, 286, 200, 222, 279–281, 308; 455/101, 132, 277.1, 277.2; D10/65, 70
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

D543,975	S *	6/2007	McCown	D14/230
D550,659	S *	9/2007	Noro	D14/230
D573,984	S *	7/2008	Ferguson et al.	D14/230
7,436,362	B2 *	10/2008	Noro	343/700 MS
2003/0231136	A1 *	12/2003	Du	343/713
2005/0093755	A1 *	5/2005	Byrne et al.	343/713
2006/0273981	A1 *	12/2006	Thompson et al.	343/906
2008/0100521	A1 *	5/2008	Herbert et al.	343/713

OTHER PUBLICATIONS

Manual and Catalog of Vector made by CSI Wireless.

* cited by examiner

Primary Examiner—Antoine D Davis
(74) *Attorney, Agent, or Firm*—Birch, Stewart, Kolasch & Birch, LLP.

(57) **CLAIM**

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

DESCRIPTION

FIG. **1** is a front elevational view of an antenna device according to our new design;

FIG. **2** is a top plan view thereof;

FIG. **3** is a left side elevational view thereof;

FIG. **4** is a right side elevational view thereof;

FIG. **5** is a rear elevational view thereof;

FIG. **6** is a bottom plan view thereof;

FIG. **7** is a tope perspective view thereof seen from a rear side thereof;

FIG. **8** is a tope perspective view thereof seen from an upper displaced side thereof;

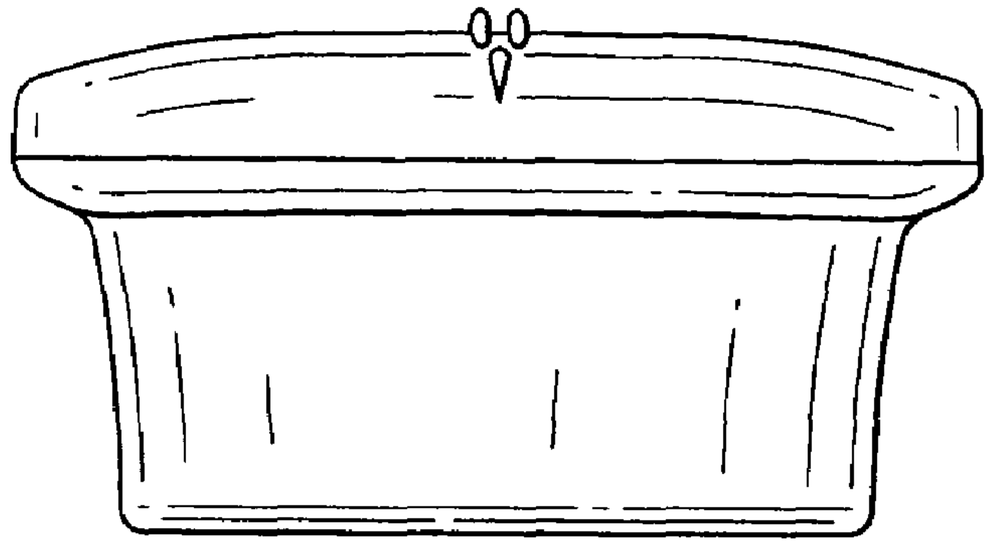
FIG. **9** is a cross section view thereof taken across line AA' in FIG. **6**; and,

FIG. **10** is a cross section view thereof taken across line BB' in FIG. **6**.

The antenna device is connected to, for instance, a bearing measurement apparatus comprising a global positioning system (GPS) receiver and used in a moving body such as a ship. The antenna device comprises a plurality of antennas. The bearing measurement apparatus measures phase differences between signals supplied from the plurality of antennas receiving signals transmitted by GPS satellites to provide a bearing. The antenna device is electrically coupled to an indicator displaying a measured bearing.

As shown in the drawings, the antenna device comprises an upper antenna housing part in a form of flat shape and a lower trunk part supporting the antenna housing part. On the upper surface of the antenna housing part, there are formed at a forward point and a backward point projected tips used in installing the antenna device in a ship. In the trunk part, there is formed a space for keeping signal lines therein for connecting the antenna device and the indicator.

1 Claim, 8 Drawing Sheets



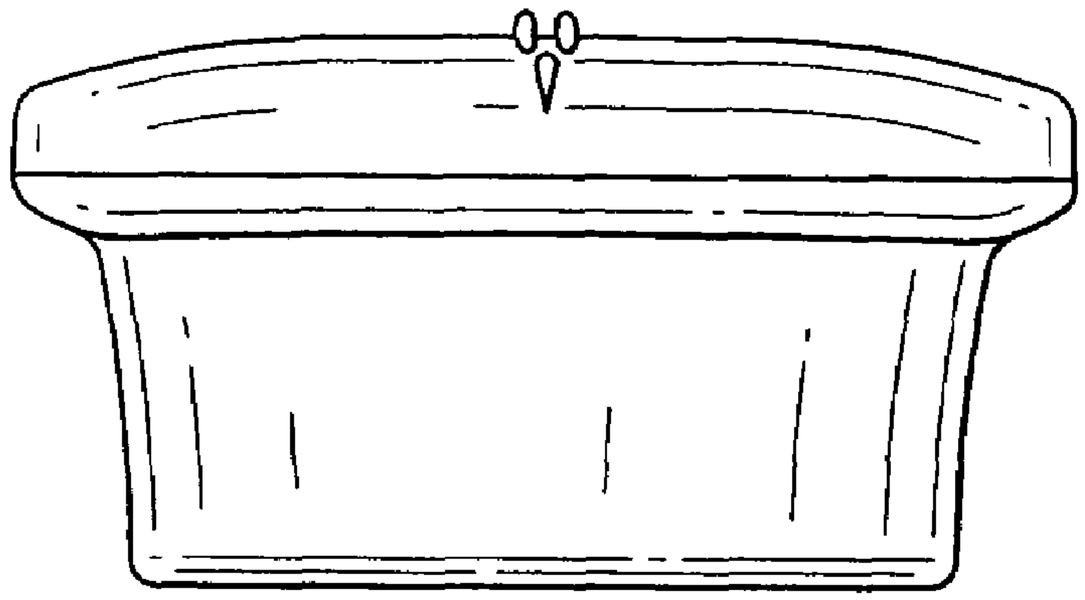


FIG.1

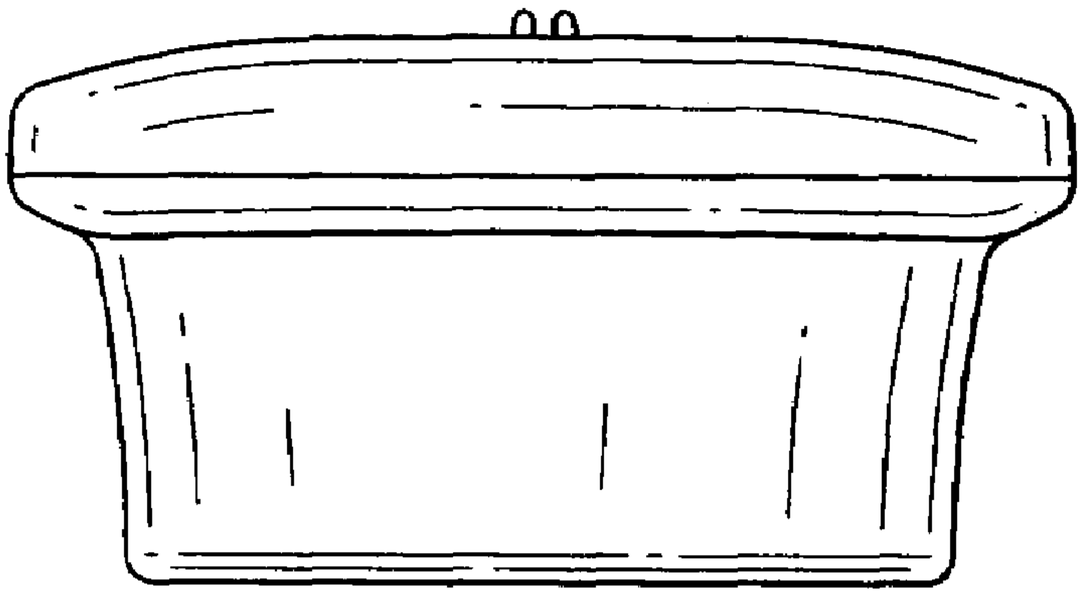


FIG.5

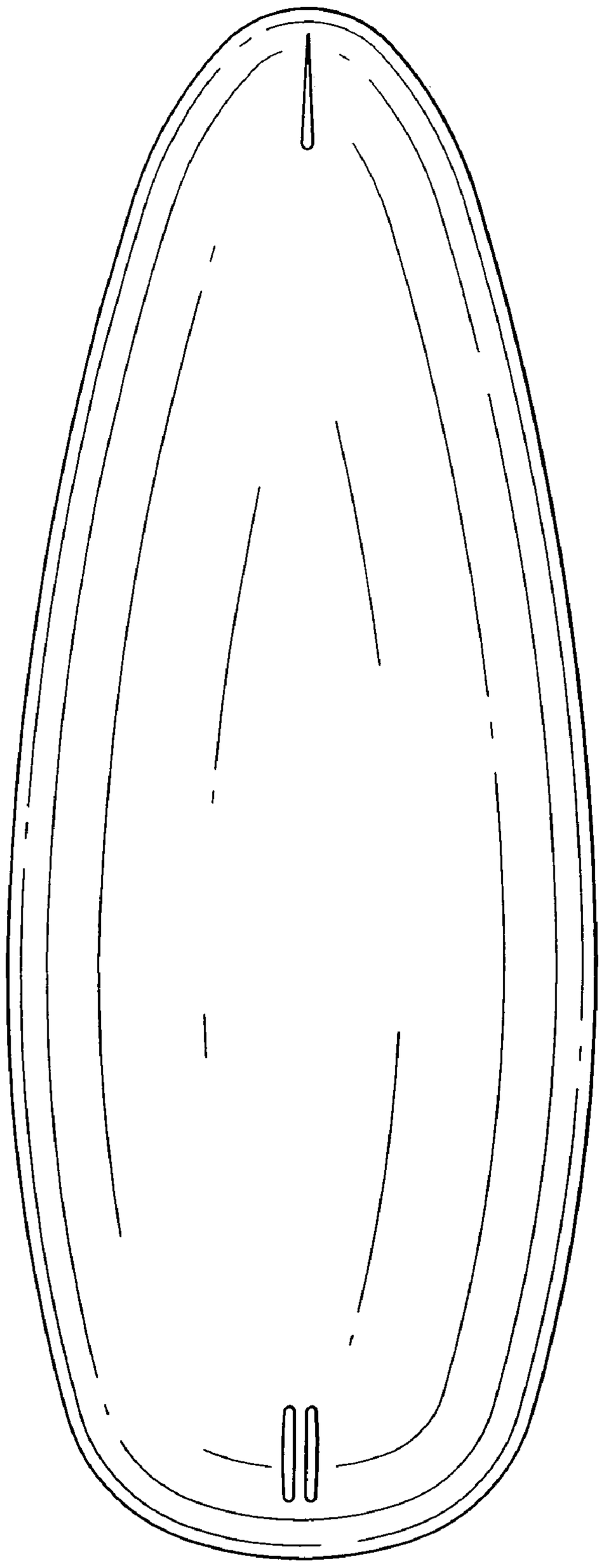


FIG.2

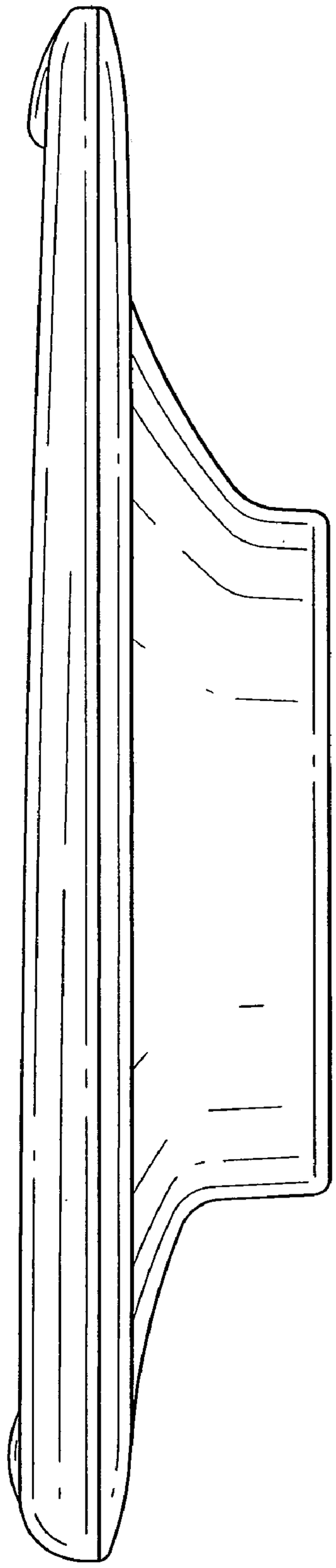


FIG.3

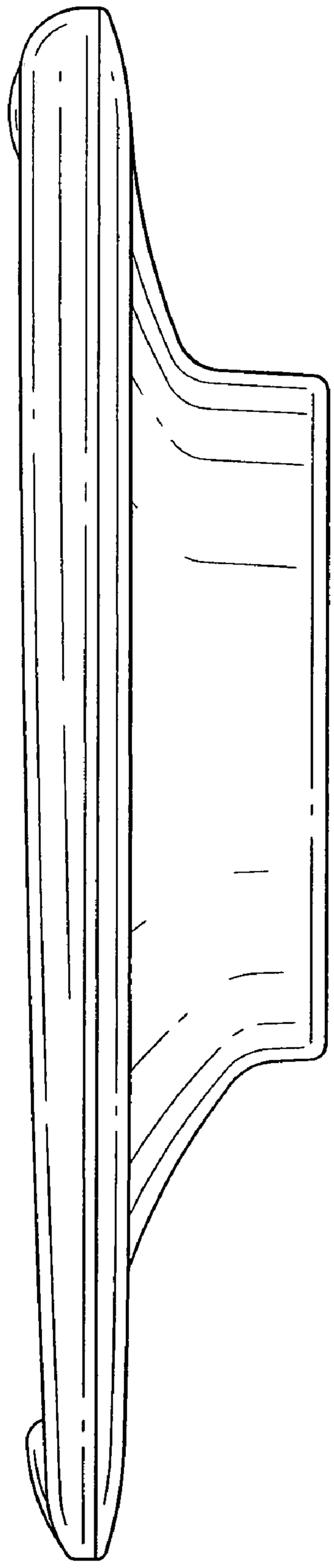


FIG.4

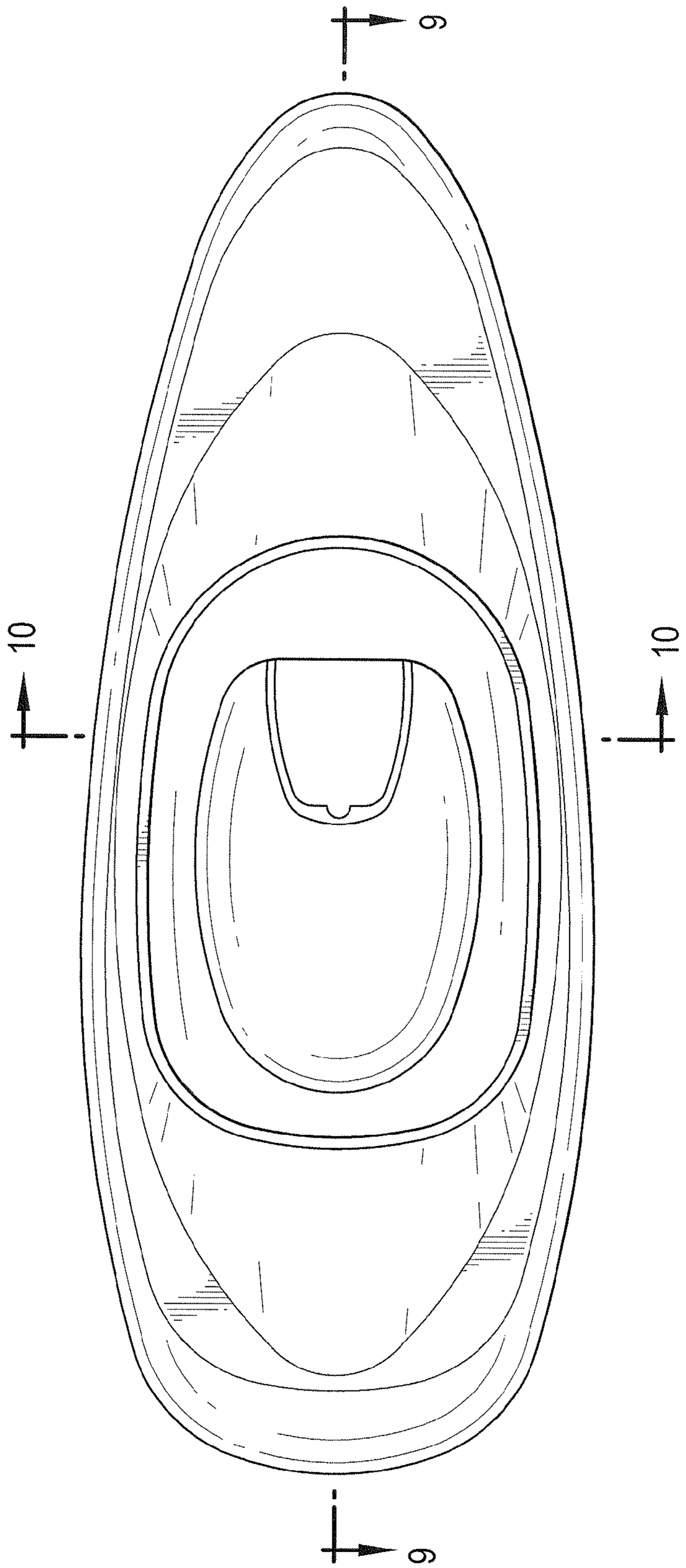


FIG.6

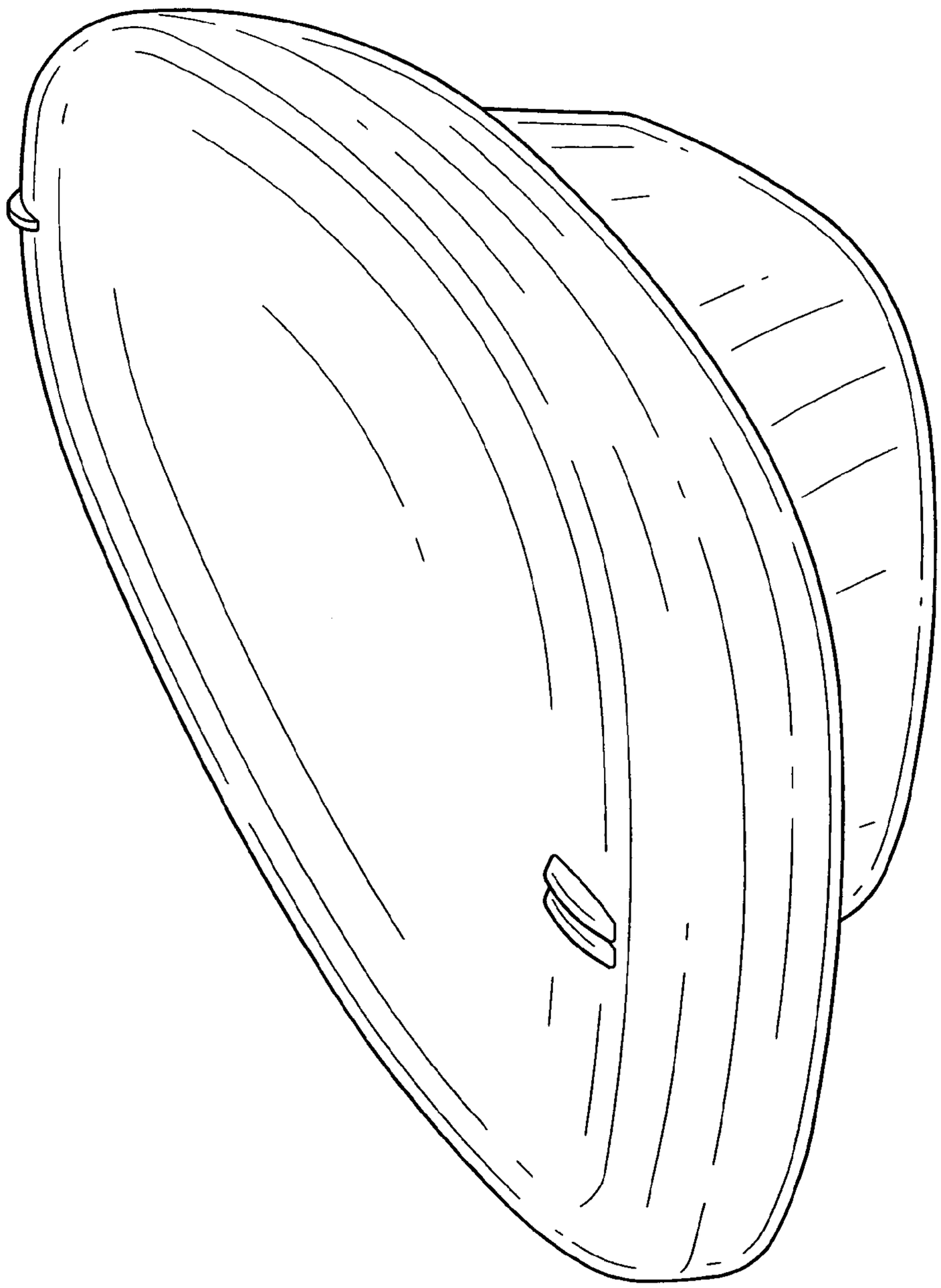


FIG.7

FIG.8

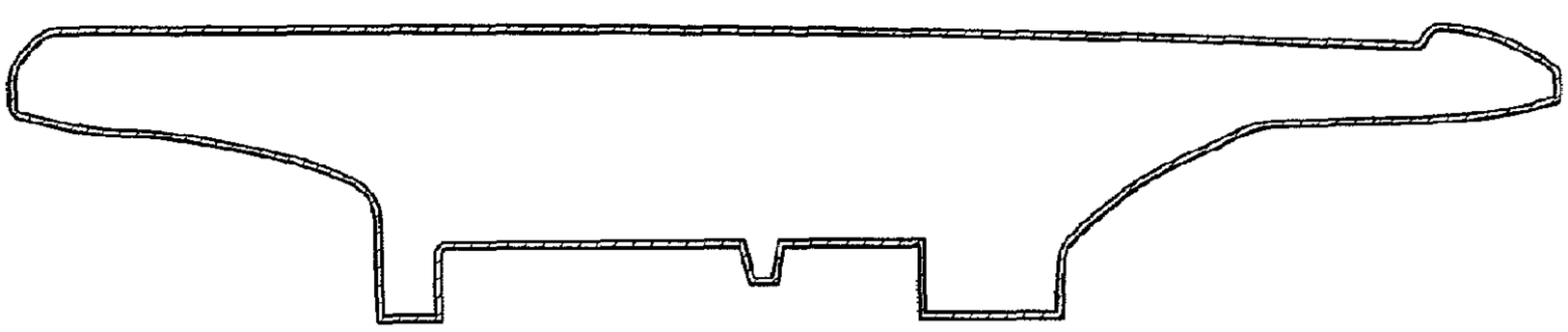


FIG.9

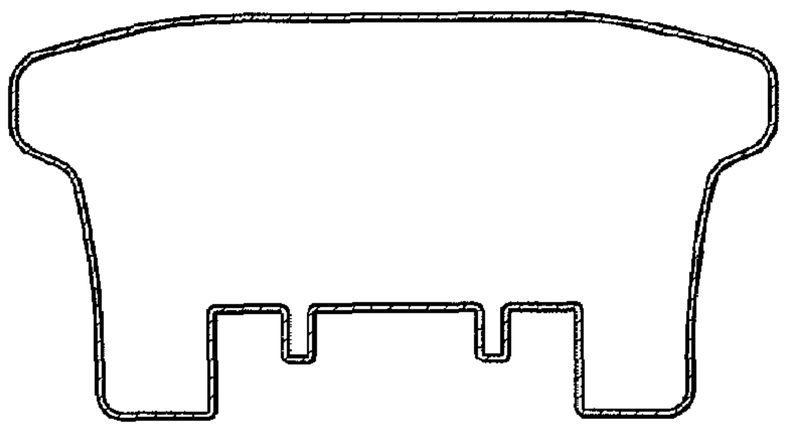


FIG.10