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

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(54) **MICROSTRUCTURE APPLICATOR**

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

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(52) **U.S. Cl.**  
USPC ..... **D24/113**

(58) **Field of Classification Search** ..... D24/127-131,  
D24/112-114, 133, 186, 146, 147; 606/162,  
606/180, 181, 185; 604/264, 272, 115, 1,  
604/2, 19, 3, 309, 73, 540, 232, 187, 158,  
604/164.08, 192, 263, 163, 181, 184, 198,  
604/227; 600/572, 101, 139, 143; 128/200.24,  
128/207.14, 207.151; 132/317; 401/196  
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,517,971	A *	5/1985	Sorbonne	.....	D24/130
D283,045	S *	3/1986	Lynn	.....	D24/146
4,938,354	A *	7/1990	Hernandez	.....	604/263
D359,120	S *	6/1995	Sallee et al.	.....	D24/130
5,437,636	A *	8/1995	Snoke et al.	.....	600/139
D393,271	S *	4/1998	Conner et al.	.....	D24/186
5,741,230	A *	4/1998	Miller	.....	604/187
6,451,040	B1 *	9/2002	Purcell	.....	606/181
D535,397	S *	1/2007	Chen	.....	D24/146
7,753,879	B2 *	7/2010	Mernoe	.....	604/232

7,931,621	B2 *	4/2011	Cross et al.	.....	604/158
8,286,644	B2 *	10/2012	Bennett	.....	132/317
8,303,615	B2 *	11/2012	Purcell	.....	606/181

FOREIGN PATENT DOCUMENTS

WO	WO 2009/051802	4/2009
WO	WO 2011/014514	2/2011

OTHER PUBLICATIONS

Burton, S.A. et al.; "Rapid Intradermal Delivery of Liquid Formulations Using a Hollow Microstructured Array"; *Pharmaceutical Research*; vol. 28; 2011; pp. 31-40.  
Hansen, K. et al.; "Transdermal Delivery—A Hollow Microstructured Transdermal System (hMTS) for Needle-Free Delivery of Biopharmaceuticals"; *Drug Delivery Technology*; vol. 9, No. 8; 2009; pp. 38-44.

\* cited by examiner

*Primary Examiner* — David Muller

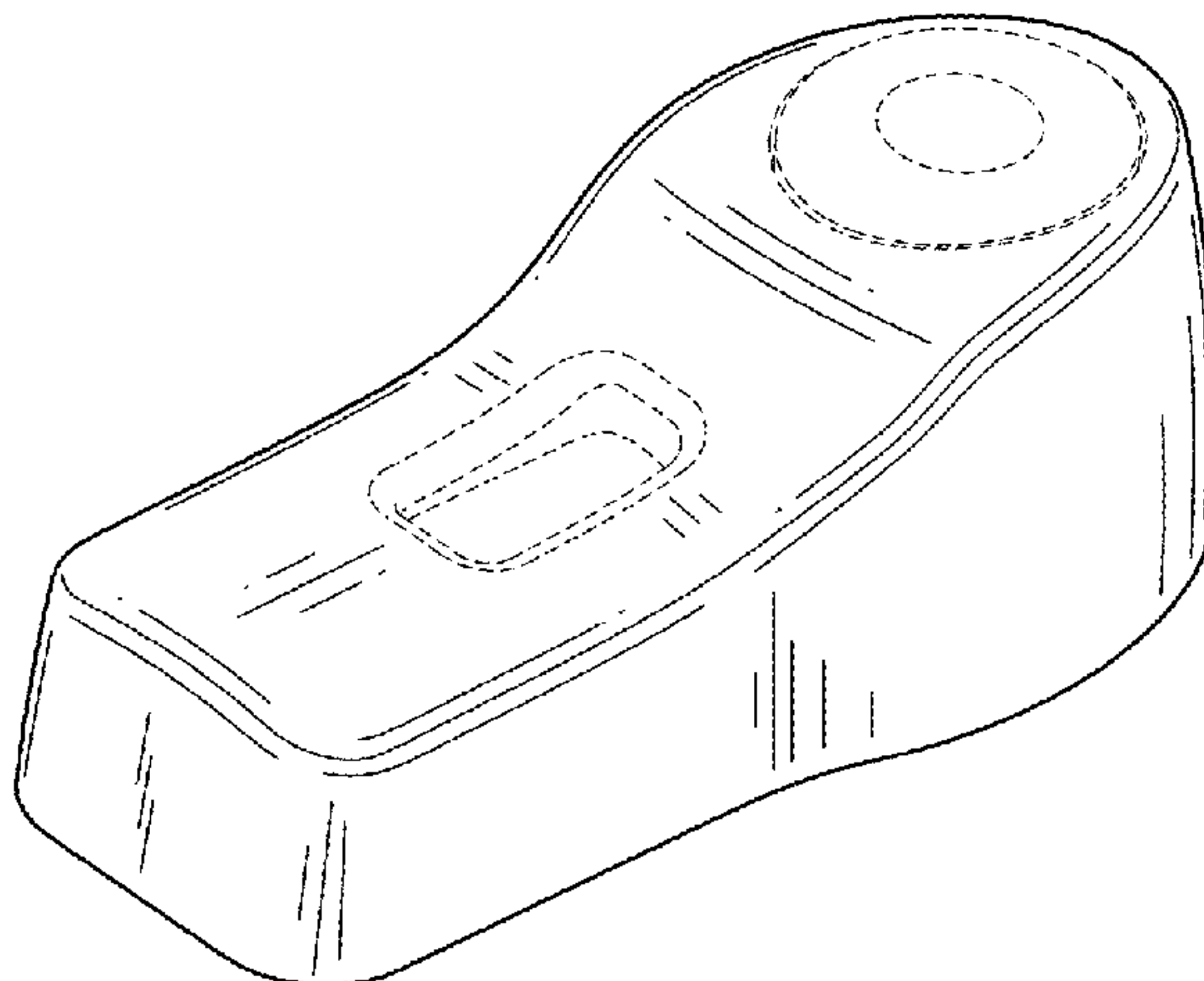
(57) **CLAIM**

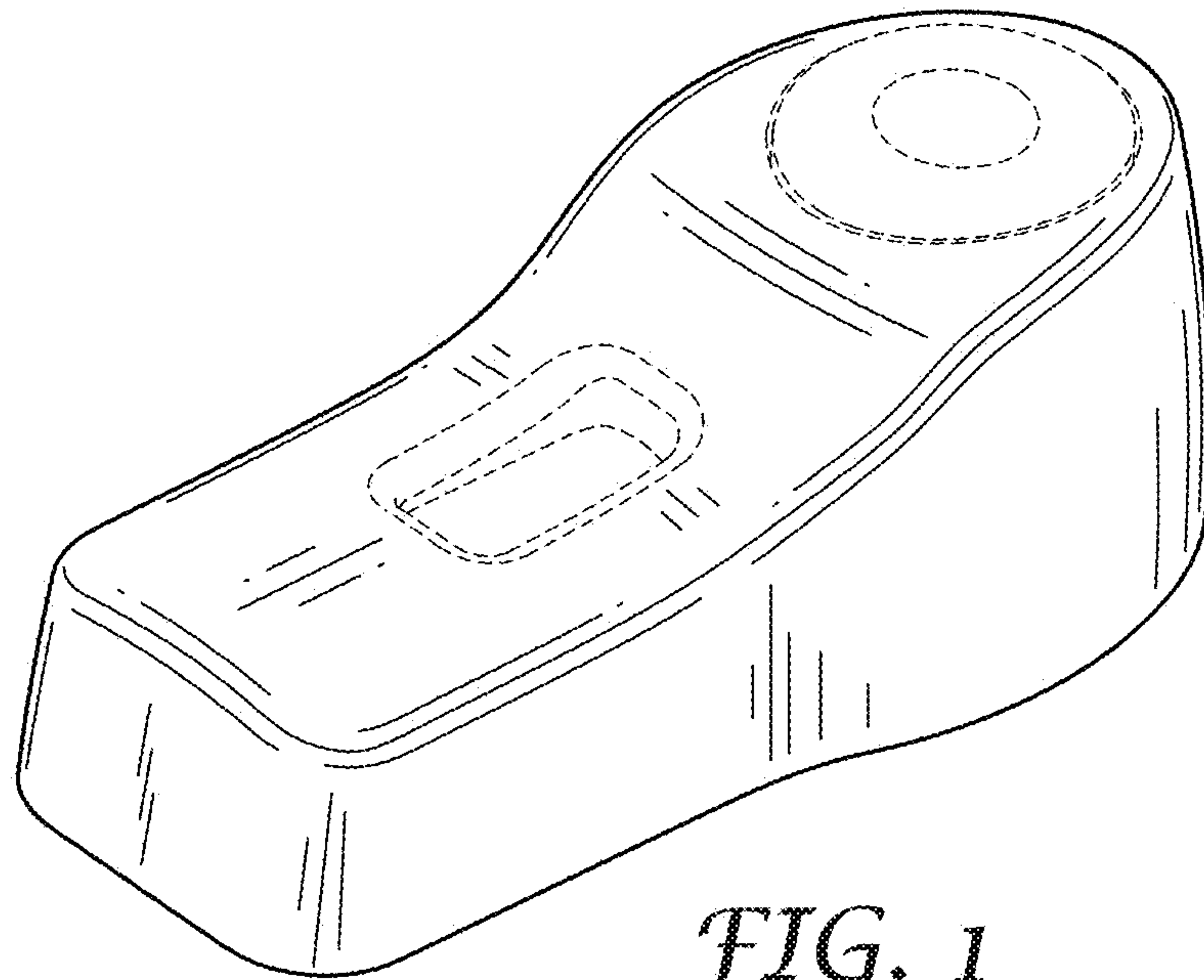
The ornamental design for a microstructure applicator, as shown and described.

**DESCRIPTION**

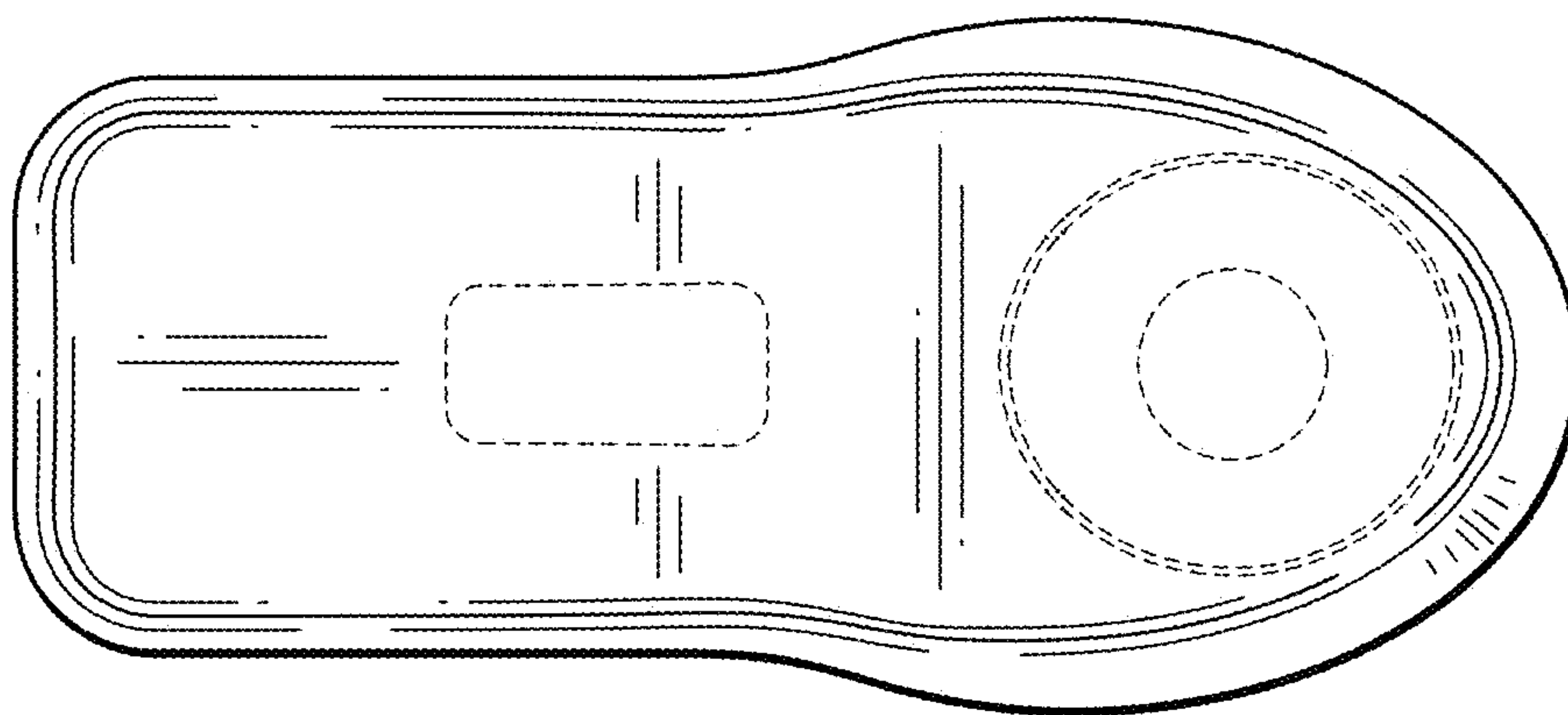
FIG. 1 is a top perspective view of a microstructure applicator;  
FIG. 2 is a top plan view of the microstructure applicator of FIG. 1;  
FIG. 3 is a left side elevational view of the microstructure applicator of FIG. 1, the right side elevational view being a mirror image thereof;  
FIG. 4 is a bottom plan view of the microstructure applicator of FIG. 1;  
FIG. 5 is a rear elevational view of the microstructure applicator of FIG. 1; and,  
FIG. 6 is a front elevational view of the microstructure applicator of FIG. 1.  
The portions of the figures depicted in broken lines form no part of the claimed design.

**1 Claim, 2 Drawing Sheets**

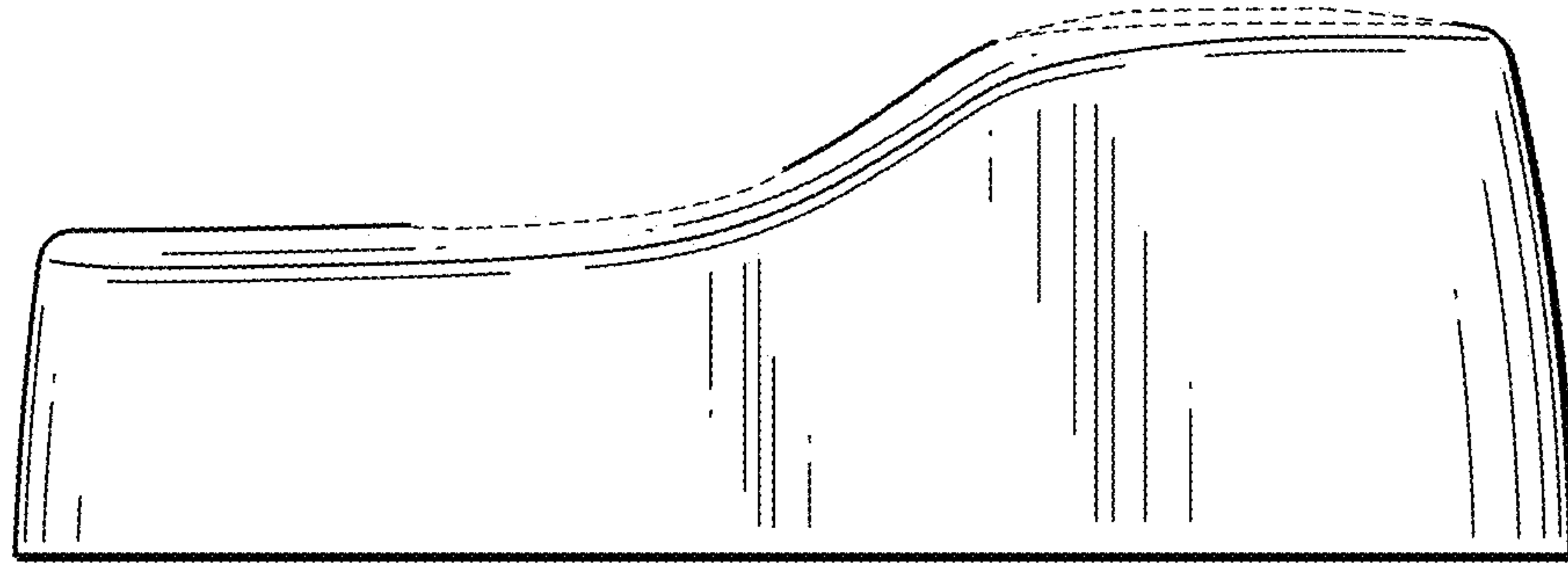




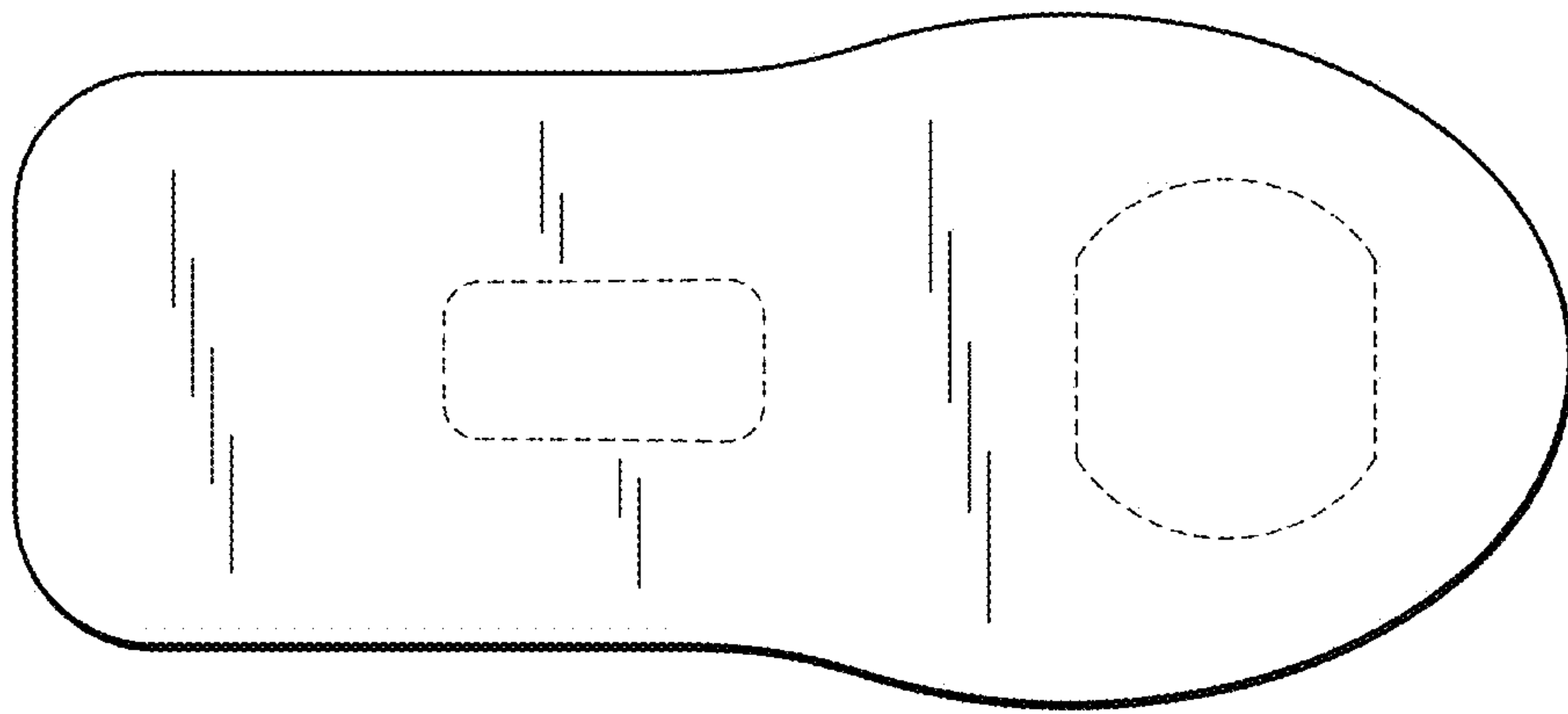
*FIG. 1*



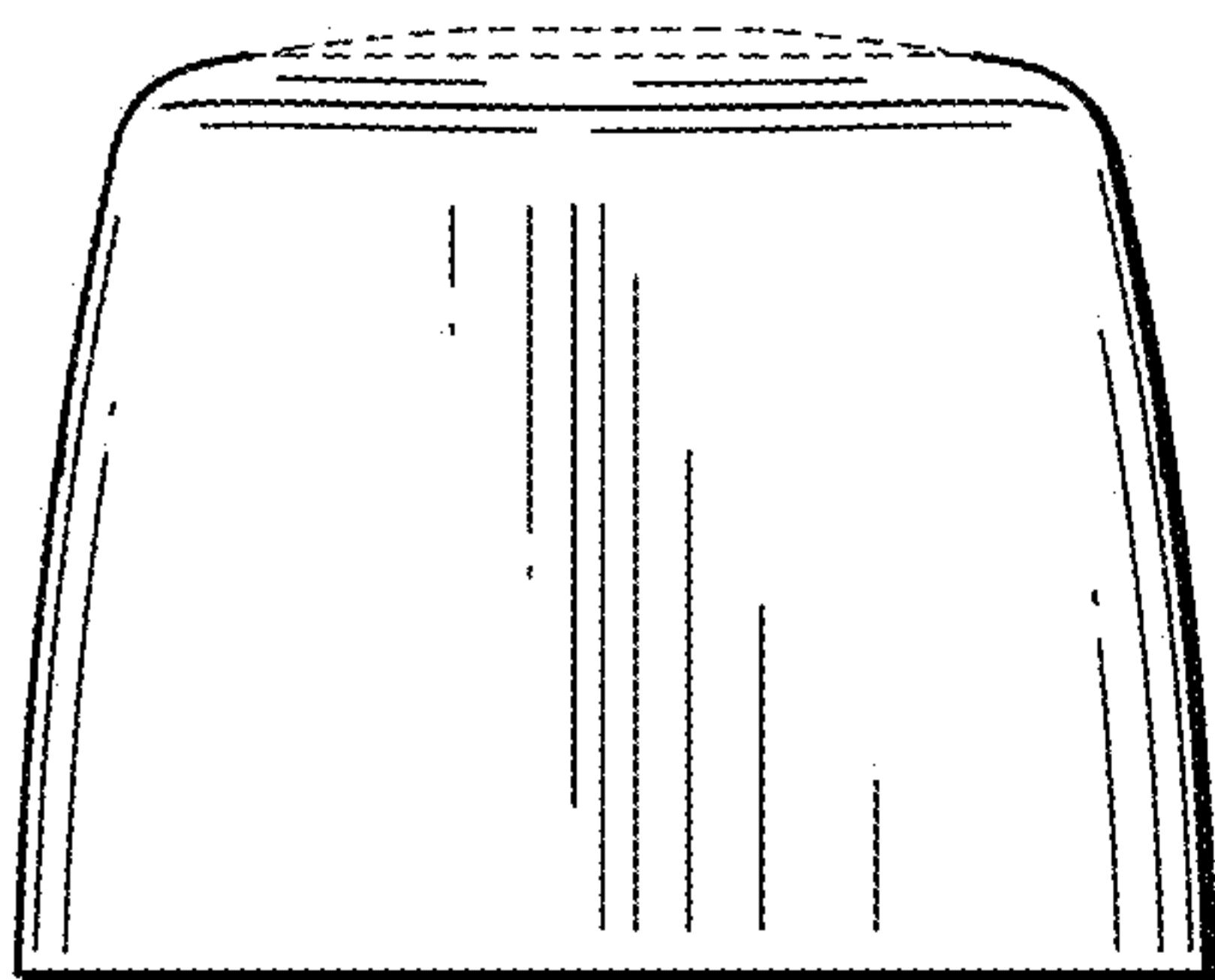
*FIG. 2*



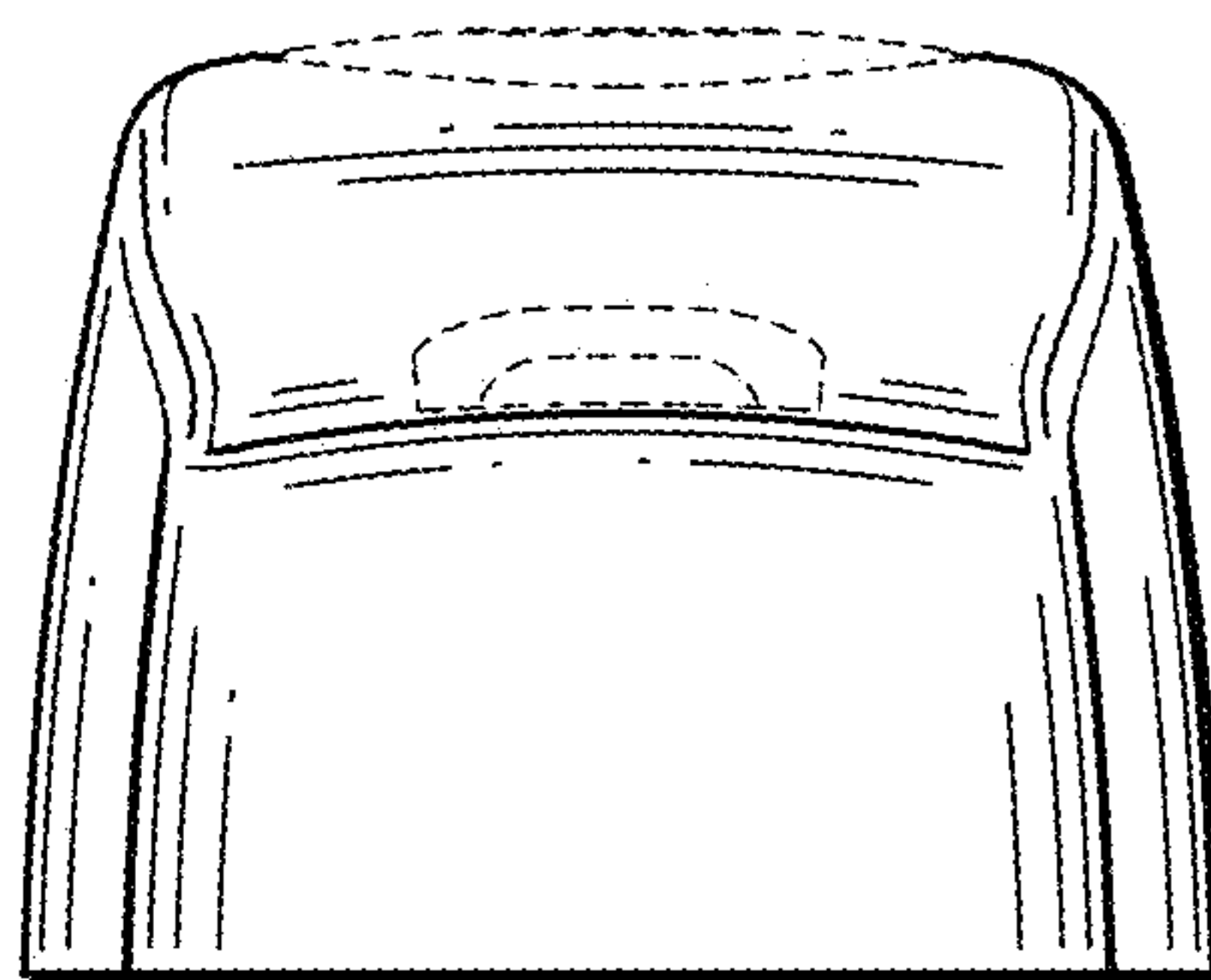
*FIG. 3*



*FIG. 4*



*FIG. 5*



*FIG. 6*