



US00D575407S

(12) **United States Design Patent**  
**Treadwell et al.**(10) **Patent No.:** **US D575,407 S**  
(45) **Date of Patent:** **\*\* Aug. 19, 2008**(54) **PHOTOTHERAPY DEVICE**(75) Inventors: **Simon Treadwell**, Toronto (CA); **John Kennedy**, Guelph (CA)(73) Assignee: **Pharos Life Corporation**, Cambridge (CA)(\*\*) Term: **14 Years**(21) Appl. No.: **29/258,677**(22) Filed: **Apr. 26, 2006**(30) **Foreign Application Priority Data**

Oct. 26, 2005 (CA) ..... 113237

(51) LOC (8) Cl. ..... **28-03**(52) U.S. Cl. ..... **D24/209**(58) **Field of Classification Search** ..... D24/158,  
D24/200, 209, 210; 362/555, 545, 800, 294,  
362/249, 267; D26/28, 49, 67, 104; 606/2-4;  
607/89-90

See application file for complete search history.

(56) **References Cited**

## U.S. PATENT DOCUMENTS

2,183,726 A 2/1939 Sommer et al.

(Continued)

## FOREIGN PATENT DOCUMENTS

CA 2495005 A1 2/2004

(Continued)

## OTHER PUBLICATIONS

Cohen L.R., "What causes bad breath?", University of Toronto;  
webpage (printed before Nov. 2, 2004).

(Continued)

*Primary Examiner*—Ian Simmons  
*Assistant Examiner*—Melanie Levy(57) **CLAIM**

The ornamental design for a phototherapy device, as shown and described.

**DESCRIPTION**

FIG. 1 is a top perspective view of a phototherapy device showing my our new design;

FIG. 2 is a rear perspective view thereof;

FIG. 3 is a left side view thereof;

FIG. 4 is a front elevational view thereof;

FIG. 5 is a rear elevational view thereof;

FIG. 6 is a top plan view thereof;

FIG. 7 is a bottom plan view thereof;

FIG. 8 is a left side elevational view with the top shown in an open condition;

FIG. 9 is a left side elevational view shown with the top detached;

FIG. 10 is a right side elevational view shown with the rear compartment in an open condition;

FIG. 11 is a top perspective view shown in use;

FIG. 12 is a front perspective view of a second embodiment of a phototherapy device showing our new design;

FIG. 13 is a bottom perspective view thereof;

FIG. 14 is a left side elevational view thereof;

FIG. 15 is a front elevational view thereof;

FIG. 16 is a rear elevational view thereof;

FIG. 17 is a top plan view thereof;

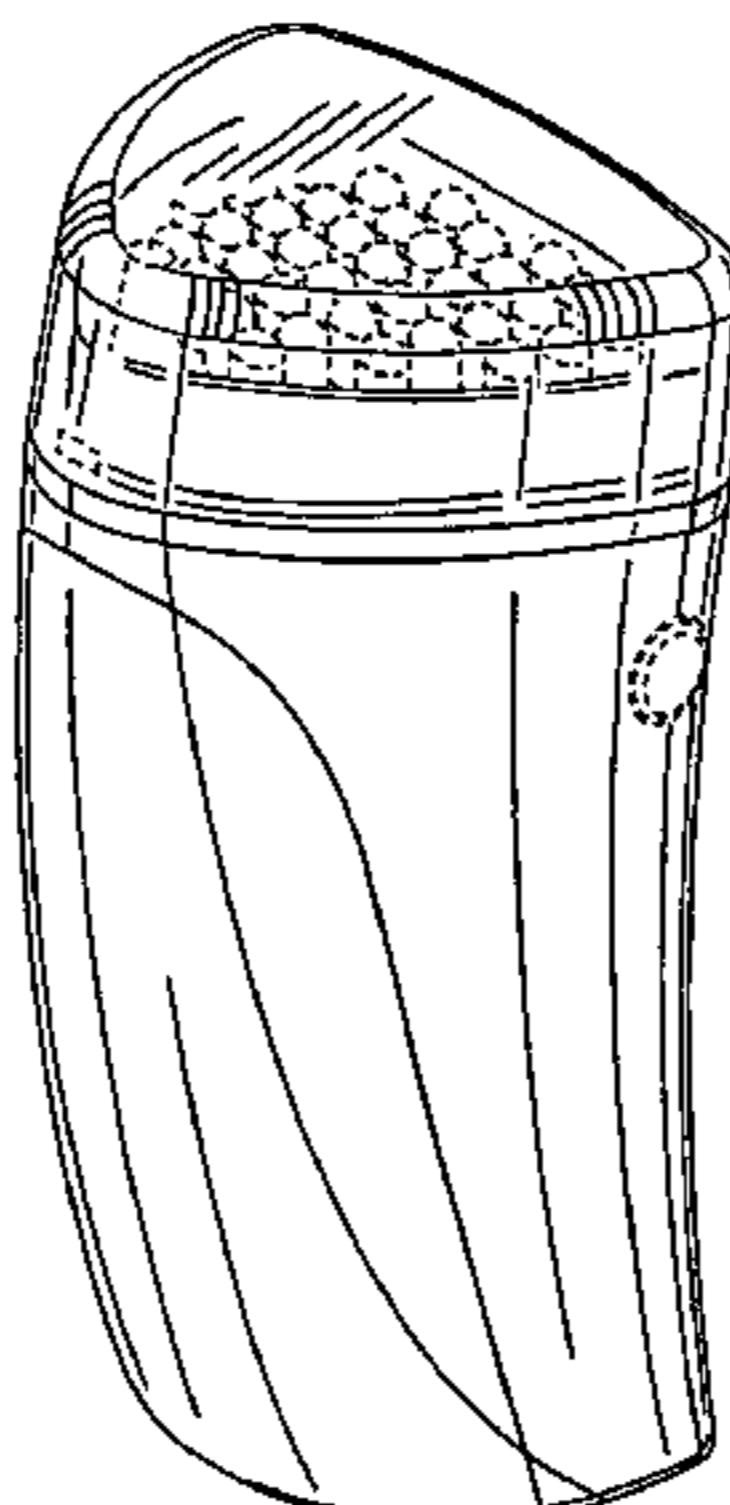
FIG. 18 is a bottom plan view thereof;

FIG. 19 is a left side elevation view with the top shown in an open condition;

FIG. 20 is a left side elevational view shown with the top detached; and,

FIG. 21 is a top perspective view shown in use.

The broken lines are for illustrative purposes only and form no part of the claimed design.

**1 Claim, 11 Drawing Sheets**

## U.S. PATENT DOCUMENTS

2,231,095 A	2/1941	Sommer et al.
D269,294 S	6/1983	Rakocy et al.
D271,015 S	10/1983	Geraets
D271,199 S	11/1983	Geraets
D274,462 S	6/1984	Rakocy et al.
4,553,936 A	11/1985	Wang
4,753,958 A	6/1988	Weinstein et al.
4,784,135 A	11/1988	Blum et al.
4,867,682 A	9/1989	Hammesfahr et al.
5,169,384 A	12/1992	Bosniak et al.
5,286,479 A	2/1994	Garlich et al.
5,316,473 A	5/1994	Hare
5,402,697 A	4/1995	Brooks
5,418,130 A	5/1995	Platz et al.
5,487,662 A	1/1996	Kipke et al.
5,521,392 A	5/1996	Kennedy et al.
5,611,793 A	3/1997	Wilson et al.
5,642,997 A	7/1997	Gregg et al.
5,658,148 A	8/1997	Neuberger et al.
5,698,866 A	12/1997	Doiron et al.
5,814,008 A	9/1998	Chen et al.
5,824,023 A	10/1998	Anderson
5,993,180 A	11/1999	Westerhof et al.
6,056,548 A	5/2000	Neuberger et al.
6,063,108 A	5/2000	Salansky et al.
6,080,127 A	6/2000	Li et al.
6,080,391 A	6/2000	Tsuchiya et al.
6,107,326 A	8/2000	Jori
6,132,701 A	10/2000	Perez et al.
6,190,609 B1	2/2001	Chapman et al.
6,191,110 B1	2/2001	Jaynes et al.
6,221,095 B1	4/2001	Van Zuylen et al.
6,231,593 B1	5/2001	Meserol
6,251,127 B1	6/2001	Biel
6,258,319 B1	7/2001	Hearst et al.
6,308,413 B1	10/2001	Westerhof et al.
6,343,400 B1	2/2002	Massholder et al.
6,343,933 B1	2/2002	Montgomery et al.
6,433,343 B1	8/2002	Cimino et al.
6,461,567 B1	10/2002	Hearst et al.
6,462,070 B1	10/2002	Hasan et al.
6,471,716 B1	10/2002	Pecukonis
6,487,447 B1	11/2002	Weimann et al.
6,493,940 B2	12/2002	Westerhof et al.
6,494,900 B1	12/2002	Salansky et al.
6,497,702 B1	12/2002	Bernaz
6,508,813 B1	1/2003	Altshuler
6,514,243 B1	2/2003	Eckhouse et al.
6,517,532 B1	2/2003	Altshuler et al.
6,533,775 B1	3/2003	Rizoiu
6,558,653 B2	5/2003	Andersen et al.
6,572,637 B1	6/2003	Yamazaki et al.
6,594,905 B2	7/2003	Furst et al.
6,602,245 B1	8/2003	Thiberg
6,612,819 B1	9/2003	Furst et al.
6,632,002 B1	10/2003	Chubb et al.
6,663,620 B2	12/2003	Altshuler et al.
6,676,655 B2	1/2004	McDaniel
D490,156 S	5/2004	Fischer et al.
D490,526 S	5/2004	Jonsen
6,780,838 B2	8/2004	Lipton et al.
RE38,643 E	11/2004	Sugaya et al.
6,887,260 B1	5/2005	McDaniel
D519,214 S *	4/2006	Lansohn .....
D520,143 S *	5/2006	Yoneda .....
D523,573 S *	6/2006	Lee .....
2002/0183245 A1	12/2002	Hasan et al.
2002/0198575 A1	12/2002	Sullivan
2003/0195494 A1	10/2003	Altshuler et al.
2003/0199946 A1	10/2003	Gutwein
2006/0235493 A1 *	10/2006	Dotson .....

2008/0065056 A1 \* 3/2008 Powell et al. .... 606/9

## FOREIGN PATENT DOCUMENTS

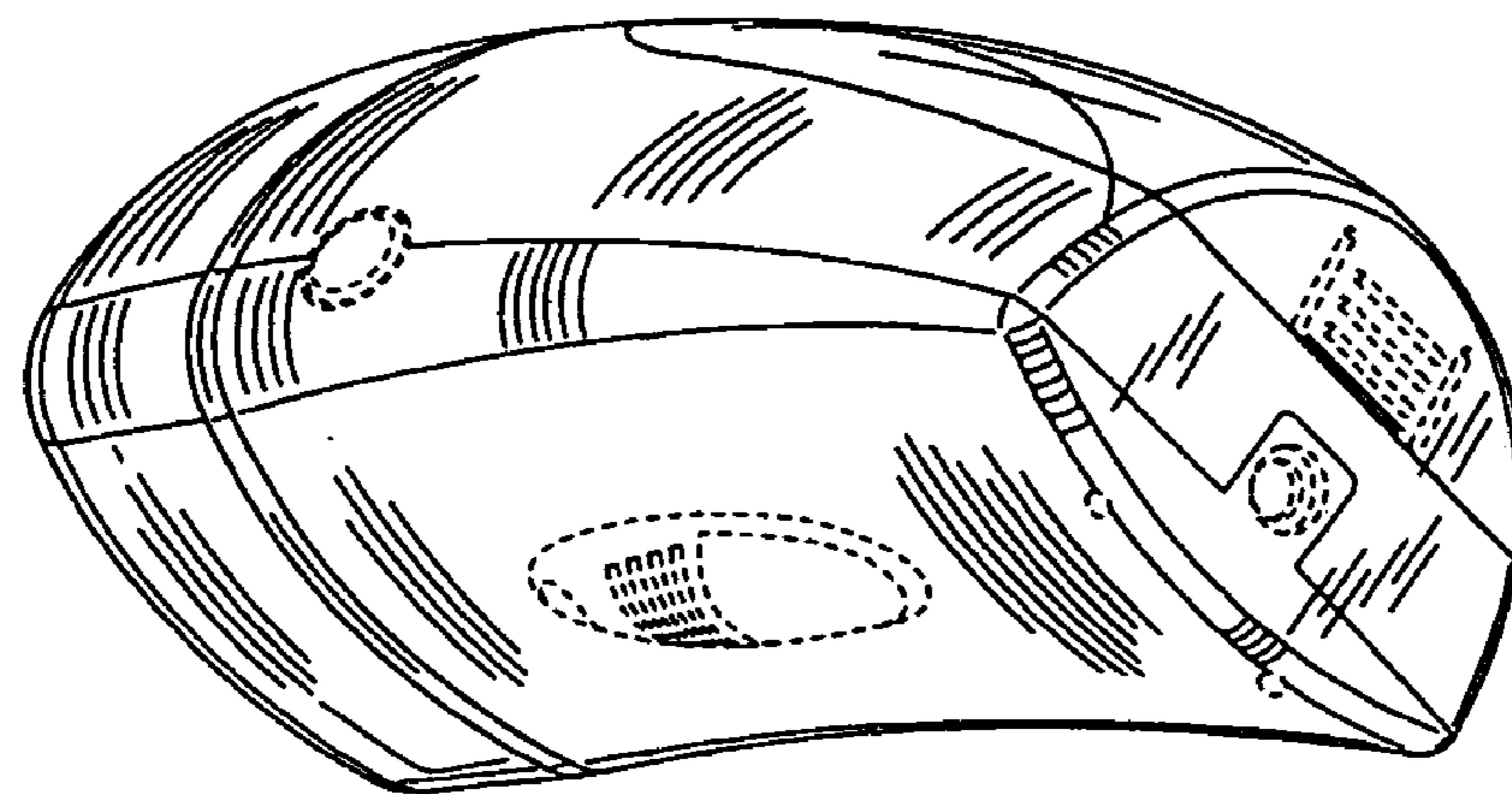
CN	1078383 A	11/1993
EP	0743029 B1	7/2002
EP	0824019 B1	11/2002
GB	2125986 A	8/1982
GB	2202442 A	9/1988
JP	04299998 A2	10/1992
JP	06113920 A2	4/1994
JP	11132843 A2	5/1999
JP	2003034630	2/2003
WO	WO 93/21992 A1	11/1993
WO	WO9909143 A1	2/1999
WO	WO02078644 A2	10/2002
WO	WO03039367 A1	5/2003

## OTHER PUBLICATIONS

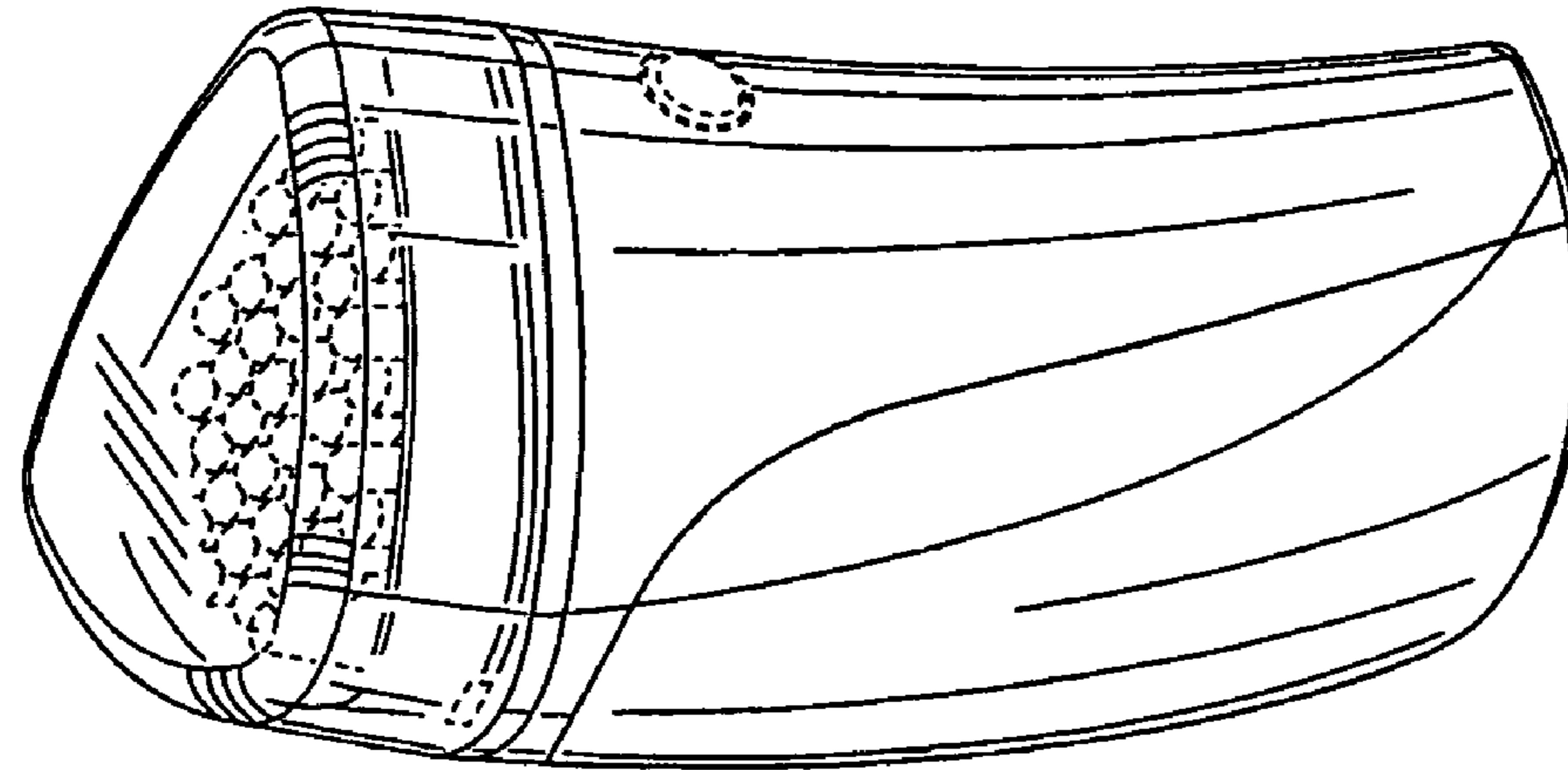
- Elman M. et al., "The effective treatment of acne vulgaris by a high-intensity, narrow bank 405—420 nm light source", Cosmetic & Laser Ther 2003; 5: 111-116.
- Friedberg J.S. et al., "Antibody-Targeted Photolysis Bacteriocidal Effects of Sn (IV) Chlorin e6-Dextran-Monoclonal Antibody Conjugates", Annals New York Academy of Sciences 618:383-393, 1991.
- Greenstein G., Full-mouth therapy versus individual quadrant root planning: a critical commentary, J Periodontol Jul. 2002;73(7):797-812 (Abstract).
- Matevski D. et al., "Lethal photosensitization of periodontal pathogens by a red-filtered Xenon lamp in invitro", J. Periodont. Res. 2003, 38:428-435.
- Matevski D. et al., "Sensitivity of Porphyromonas gingivalis to Light-Activated Toluidine Blue O", University of Toronto, Faculty of Dentistry; Slide presentation (presented before Nov. 15, 2002).
- Morton C.A. et al., An open study to determine the efficacy of blue light in the treatment of mild to moderate acne: preliminary data (publication status unknown).
- Wainwright M., Photodynamic antimicrobial chemotherapy (PACT), Journal of Antimicrobial Chemotherapy (1998) 42, 13-28.
- Ondine Biopharma web page—printed Oct. 15, 2002.
- Quirynen, M. et al., "The intra-oral translocation of periodontopathogens jeopardises the outcome of periodontal therapy", Journal of Clinical Periodontology, Jun. 2001, vol. 28, Issue 6, p. 499 (Abstract).
- De Soete, M. et al., "One-stage full-mouth disinfection. Long-term microbiological results analyzed by checker board DNA-DNA hybridization", J Periodontol Mar. 2001; 72(3):374-82 (Abstract).
- Bollen, CM. et al., "The effect of a one-stage full-mouth disinfection on different intra-oral niches. Clinical and microbiological observations", J Clin Periodontol Jan. 1998;25(1):56-66 (Abstract).
- Bollen, CM. et al., "Full-versus partial-mouth disinfection in the treatment of periodontal infections. A pilot study: long-term microbiological observations", J Clin Periodontol Oct. 1996;23(10):960-70 (Abstract).
- Hamblin, M. et al., "Rapid Control of Wound Infections by Targeted Photodynamic Therapy Monitored by In Vivo Bioluminescence Imaging", Photochemistry and Photobiology, 2002, 75(1): 51-57.
- Malik, Z., et al., "New Trends in Photobiology (Invited Review) Bactericidal Effects of Photoactivated Porphyrins—An Alternative Approach to Antimicrobial Drugs", Journal of Photochemistry and Photobiology, B: Biology, 5 (1990) 281-293.
- Mongardini, C. et al., "One stage full- versus partial-mouth disinfection in the treatment of chronic adult or generalized early-onset periodontitis. I. Long-term clinical observations", J Periodontol Jun. 1999;70(6):632-45 (Abstract).
- Quirynen, M. et al., "The role of chlorhexidine in the one-stage full-mouth disinfection treatment of patients with advanced adult periodontitis. Long-term clinical and microbiological observations", J Clin Periodontol Aug. 2000;27(8):579-89 (Abstract).
- Quirynen, M. et al., "One stage full- versus partial-mouth disinfection in the treatment of chronic adult or generalized early-onset periodontitis. II. Long-term impact on microbial load", J Periodontol Jun. 1999;70(6):646-56 (Abstract).

- Quirynen, M. et al., "The effect of a 1-stage full-mouth disinfection on oral malodor and microbial colonization of the tongue in periodontitis. A pilot study", *J Periodontol* Mar. 1998;69(3):374-82 (Abstract).
- Quirynen, M. et al. "Full- vs. partial-mouth disinfection in the treatment of periodontal infections: short-term clinical and microbiological observations", *J Dent Res* Aug. 1995;74(8):1459-67 (Abstract).
- Spire Awarded Contract for Ear Surgery Laser—Press Release Aug. 23, 2002.
- Vandekerckhove, BN. et al., "Full- versus partial-mouth disinfection in the treatment of periodontal infections. Long-term clinical observations of a pilot study", *J Periodontol* Dec. 1996;67(12):1251-9 (Abstract).
- Coventry et al. (2000) "ABC of oral health: Periodontal disease" *British Medical Journal*, 321, 36-39.
- Krespi, et al. (2005) "Lethal photosensitization of oral pathogens via red-filtered halogen lamp" *Oral Diseases*, 11(S1), 92-95.
- Komerik et al. (2003) "In vivo killing of *Porphyromonas gingivalis* by toluidine blue-mediated photosensitization in an animal model" *Antimicrobial Agents and Chemotherapy*, 47(3), 932-940.
- Meisel et al. (2005) "Photodynamic therapy for periodontal diseases: State of the art", *J. Photochem. Photobiol.*, 79, 159-170.
- Nakano et al. (2002) "Correlation between oral malodor and periodontal bacteria" *Microbes Infect.*, 4(6), 679-683.
- Sanz et al. (2001) "Fundamentals of breath malodour" *Journal of Contemporary Dental Practice*, 2(4), 1-13.
- Sarkar et al. (1993) "Lethal photosensitization of bacteria in subgingival plaque from patients with chronic periodontitis" *J. Periodont. Res.*, 28, 204-210.
- Soukos et al. (1998) "Targeted antimicrobial photochemotherapy", *Antimicrobial Agents and Chemotherapy* 42(10), 2595-2601.
- Wilson et al. (1995) "Bacteria in supragingival plaque samples can be killed by low-power laser light in the presence of a photosensitizer" *J. Appl. Bacteriol.*, 78, 569-574.
- Wilson (2005) "Lethal photosensitisation of oral bacteria and its potential application in the photodynamic therapy of oral infection" *Photochem. Photobiol. Sci.*, 3, 412-418.
- Wood, et al. (1999) "An in vitro study of the use of photodynamic therapy for the treatment of natural oral plaque biofilms formed in vivo" *J. Photochem. Photobiol. B: Biol.*, 50, 1-7.

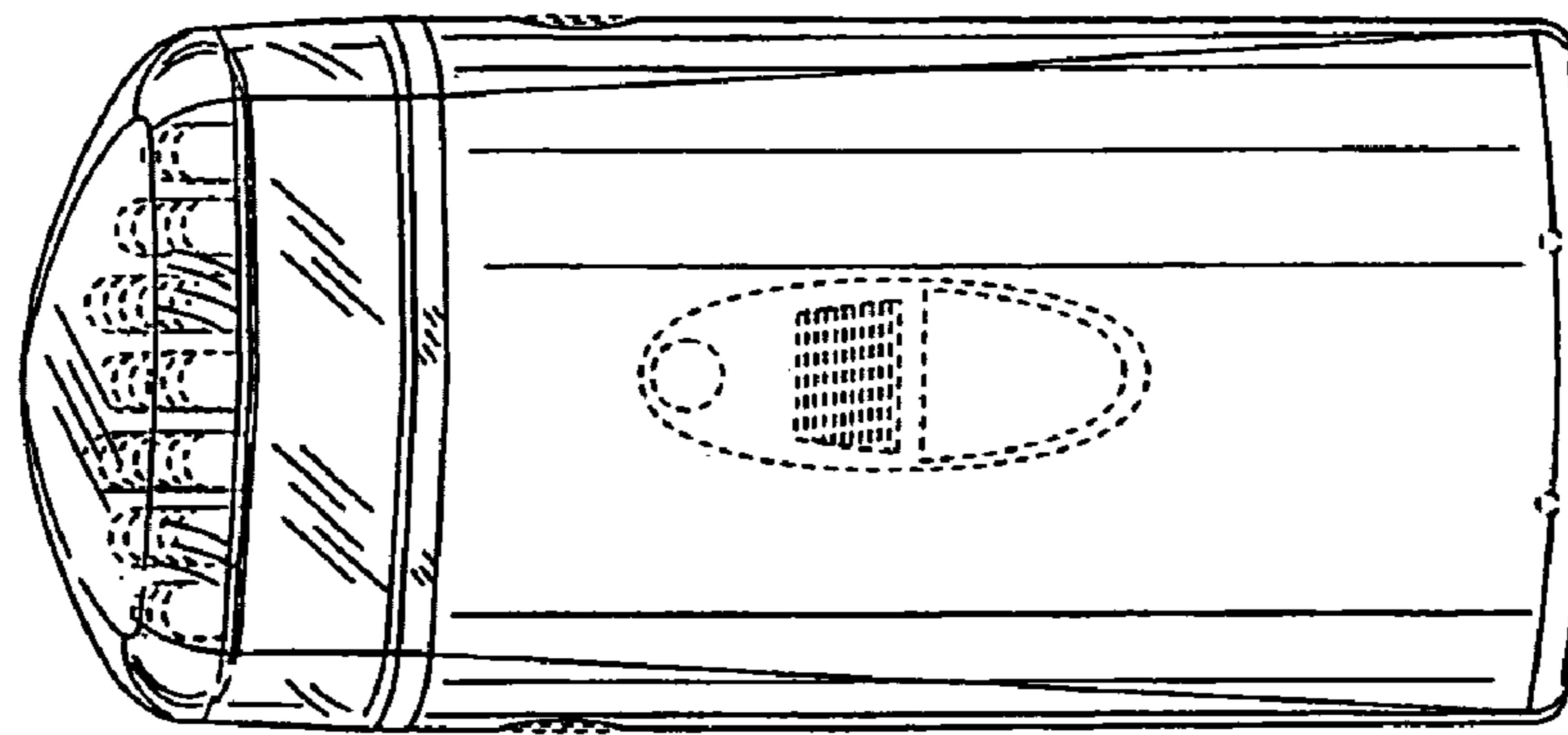
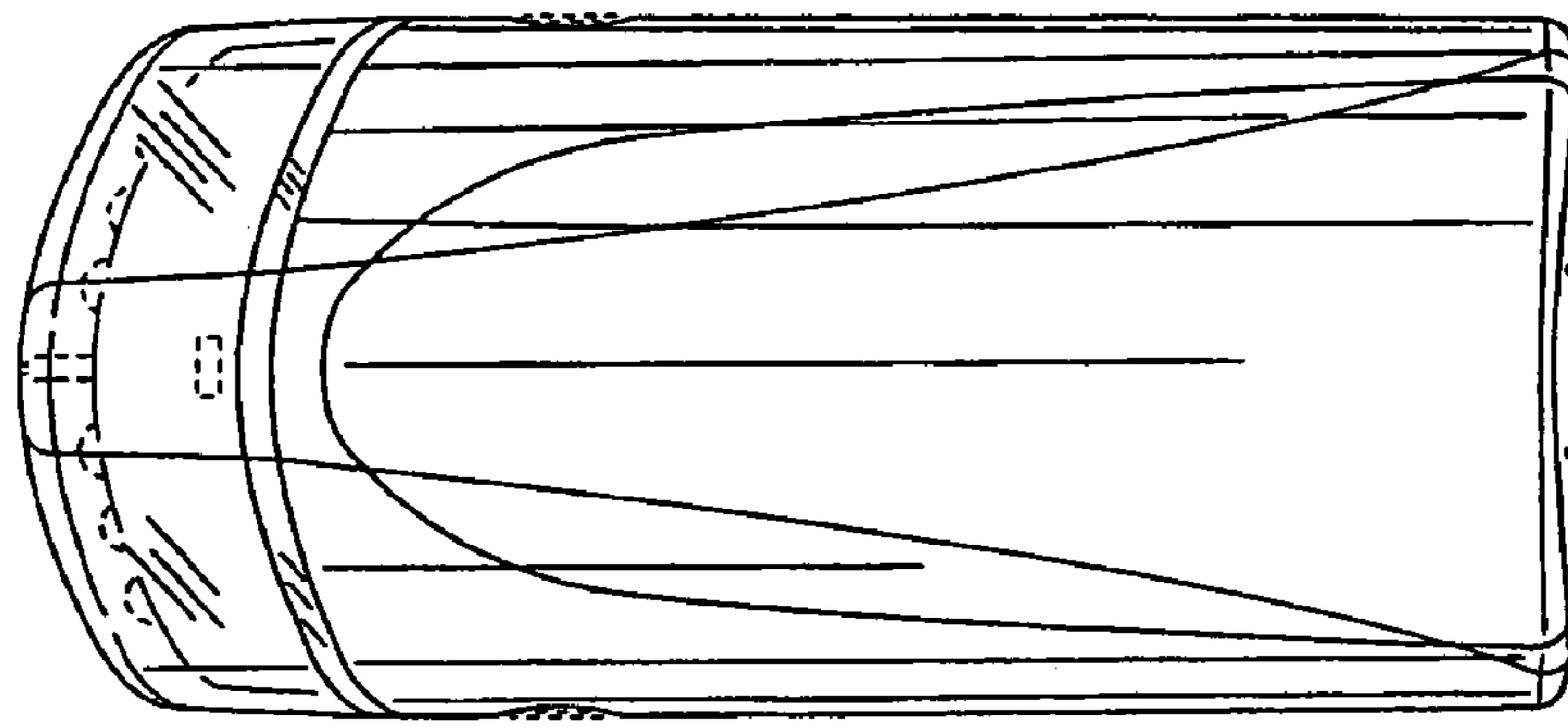
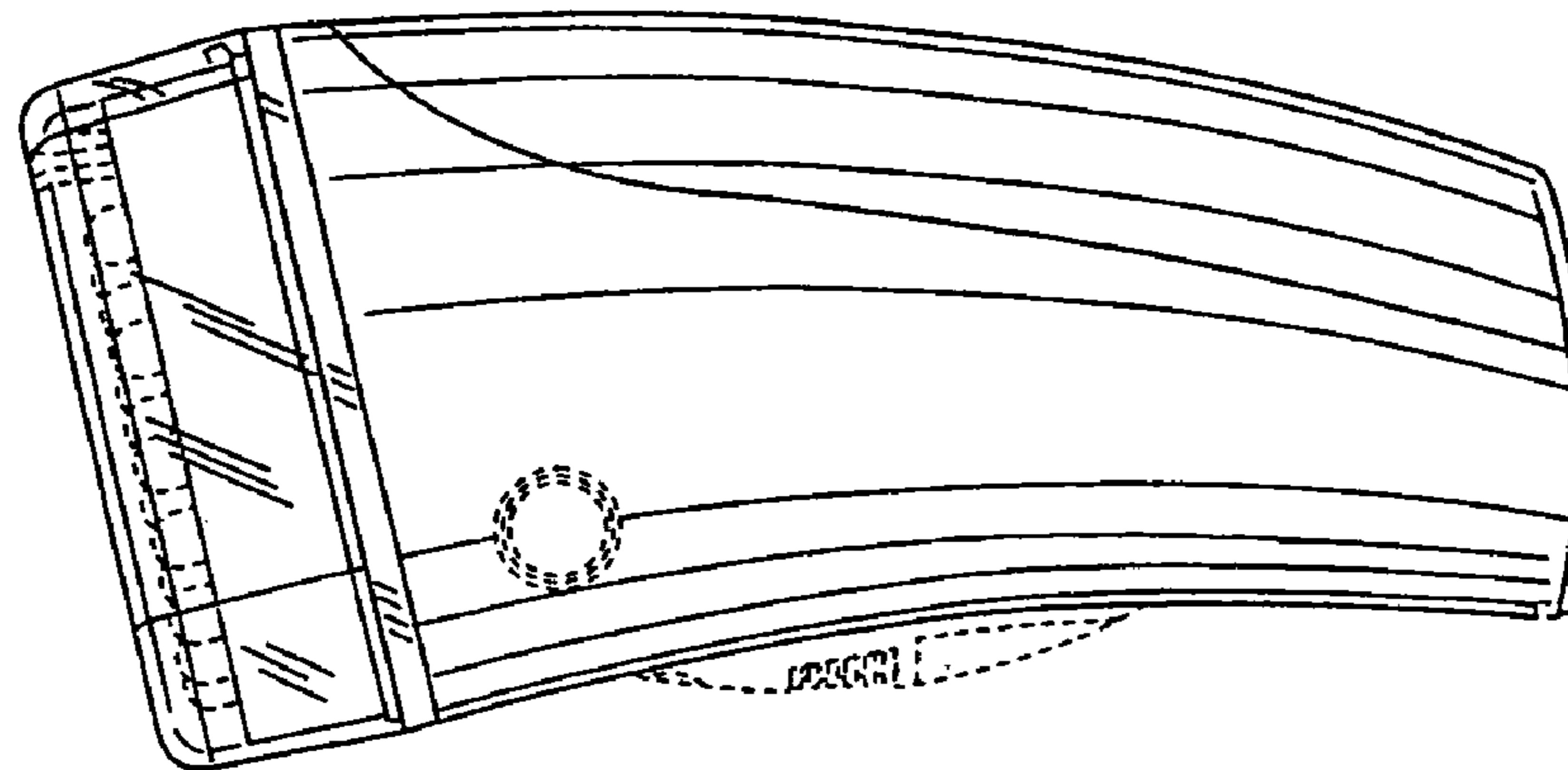
\* cited by examiner

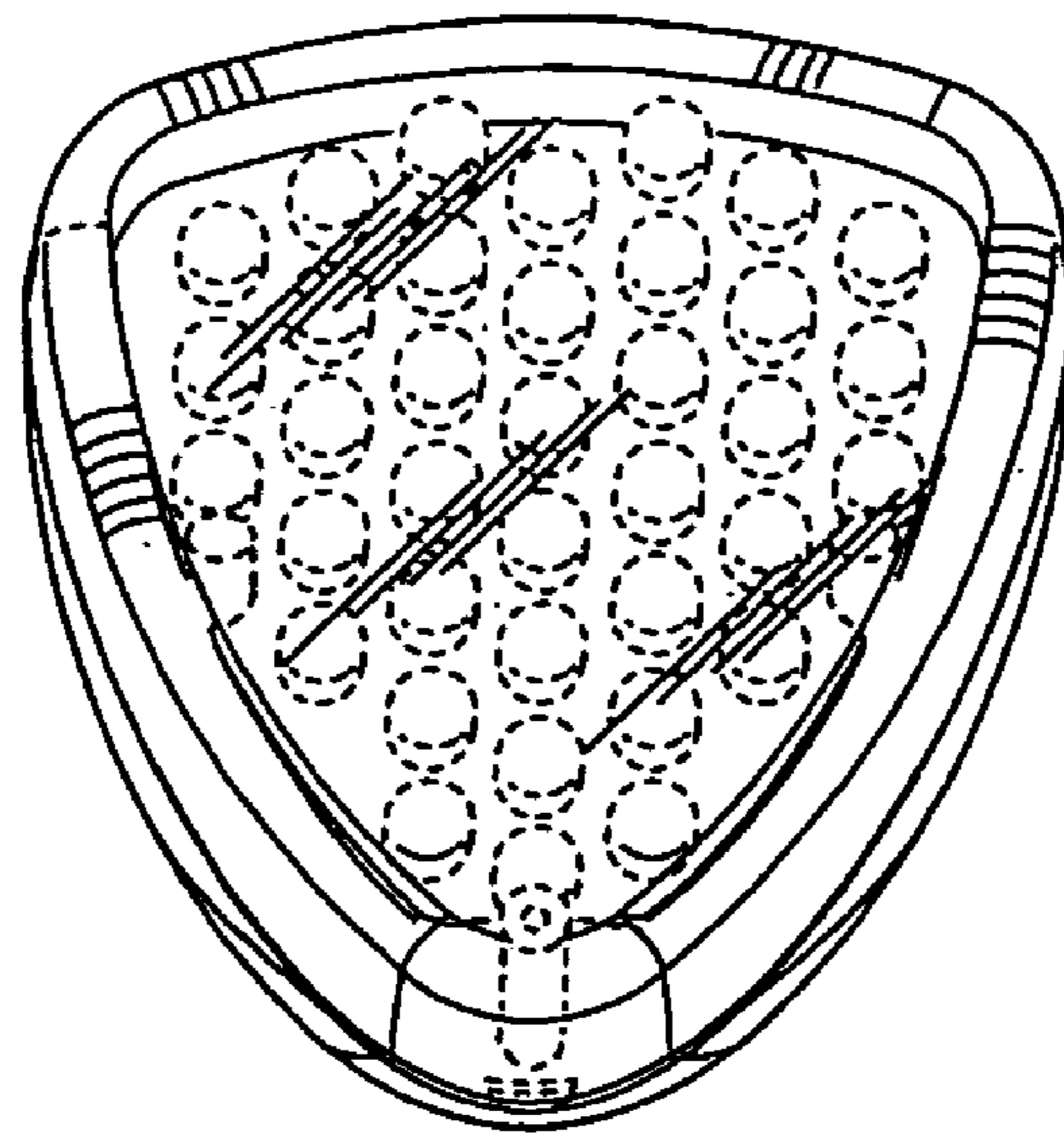


**FIG. 2**

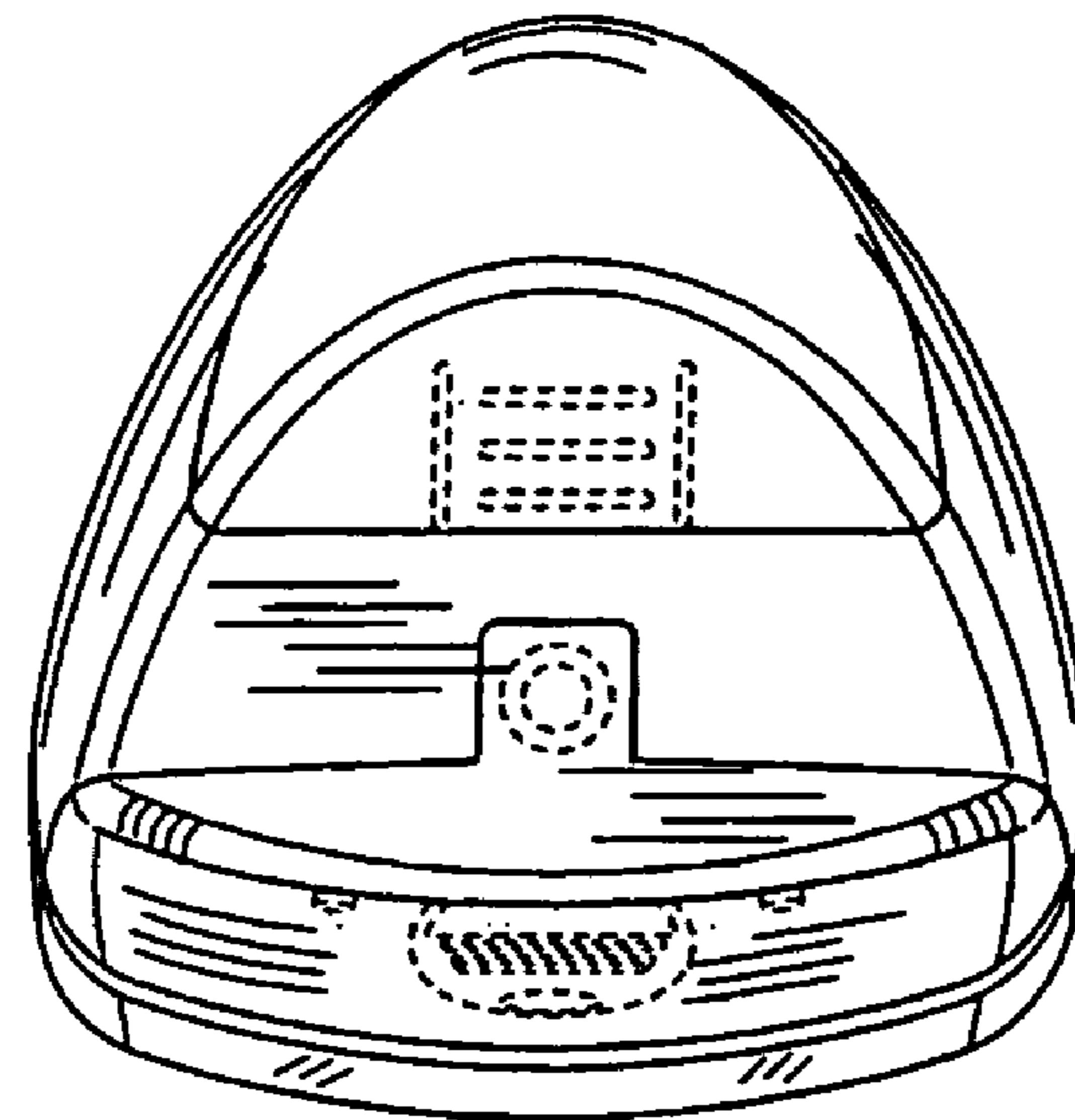


**FIG. 1**

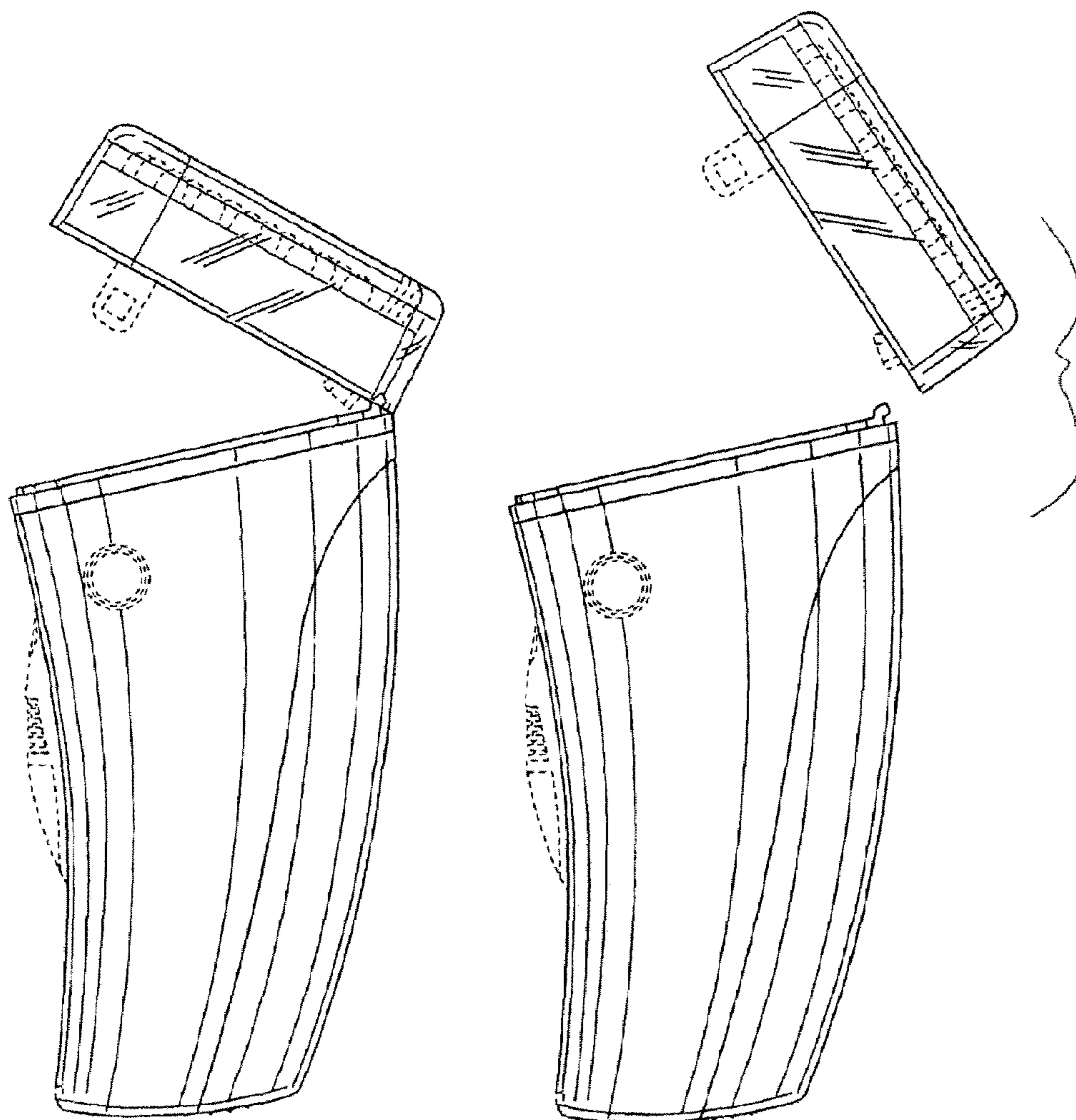
**FIG. 5****FIG. 4****FIG. 3**



**FIG. 6**

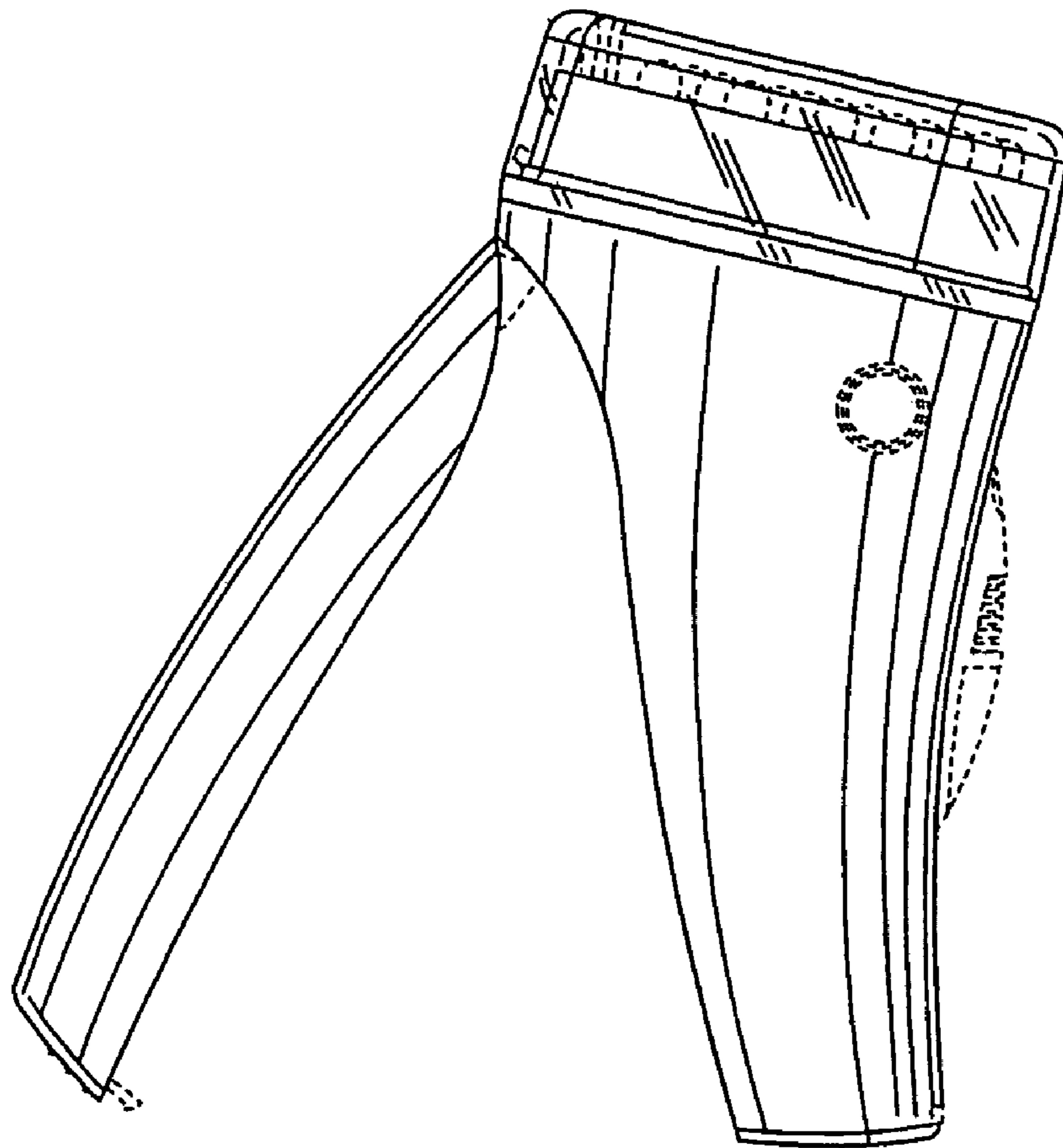


**FIG. 7**

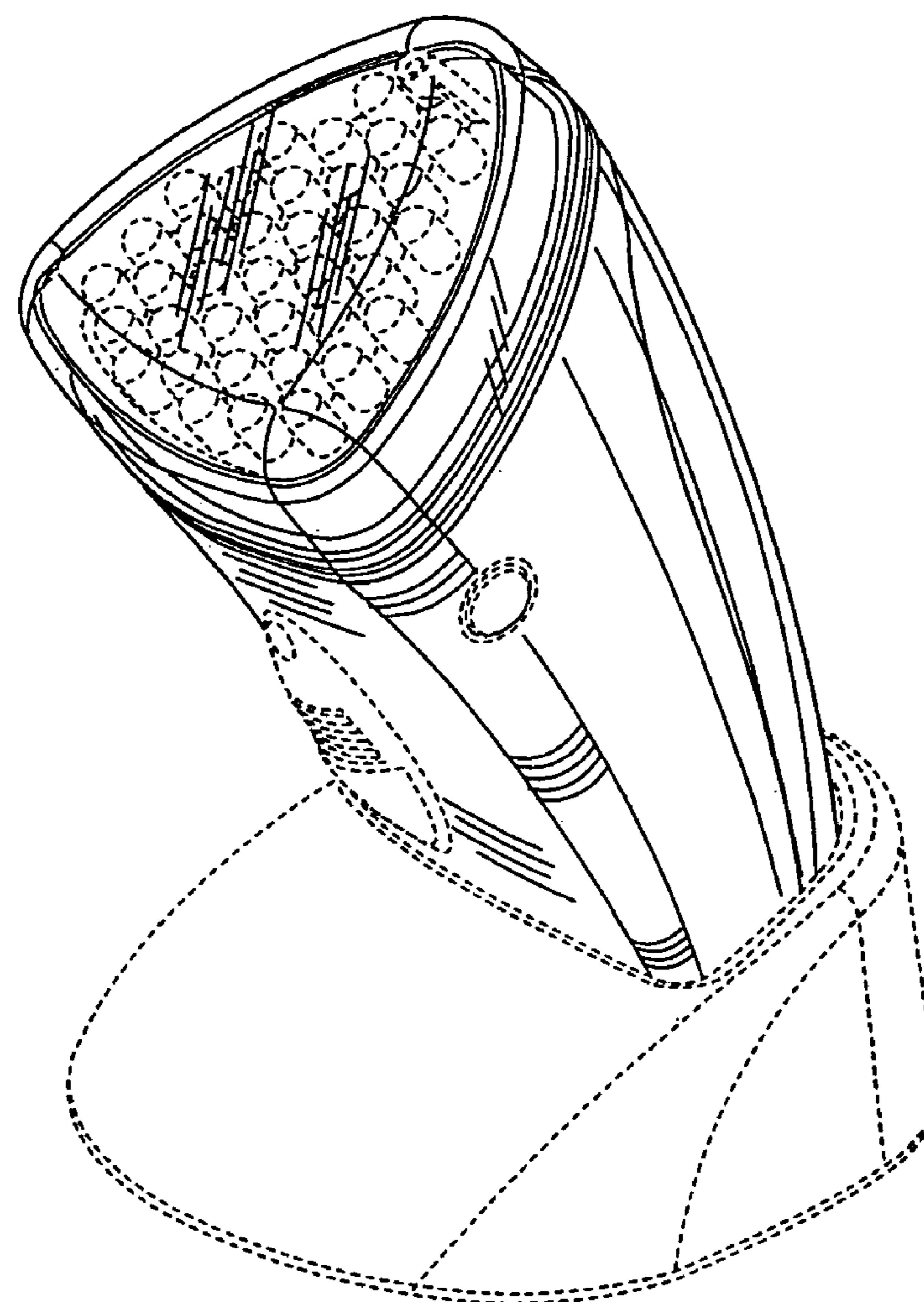


**FIG. 8**

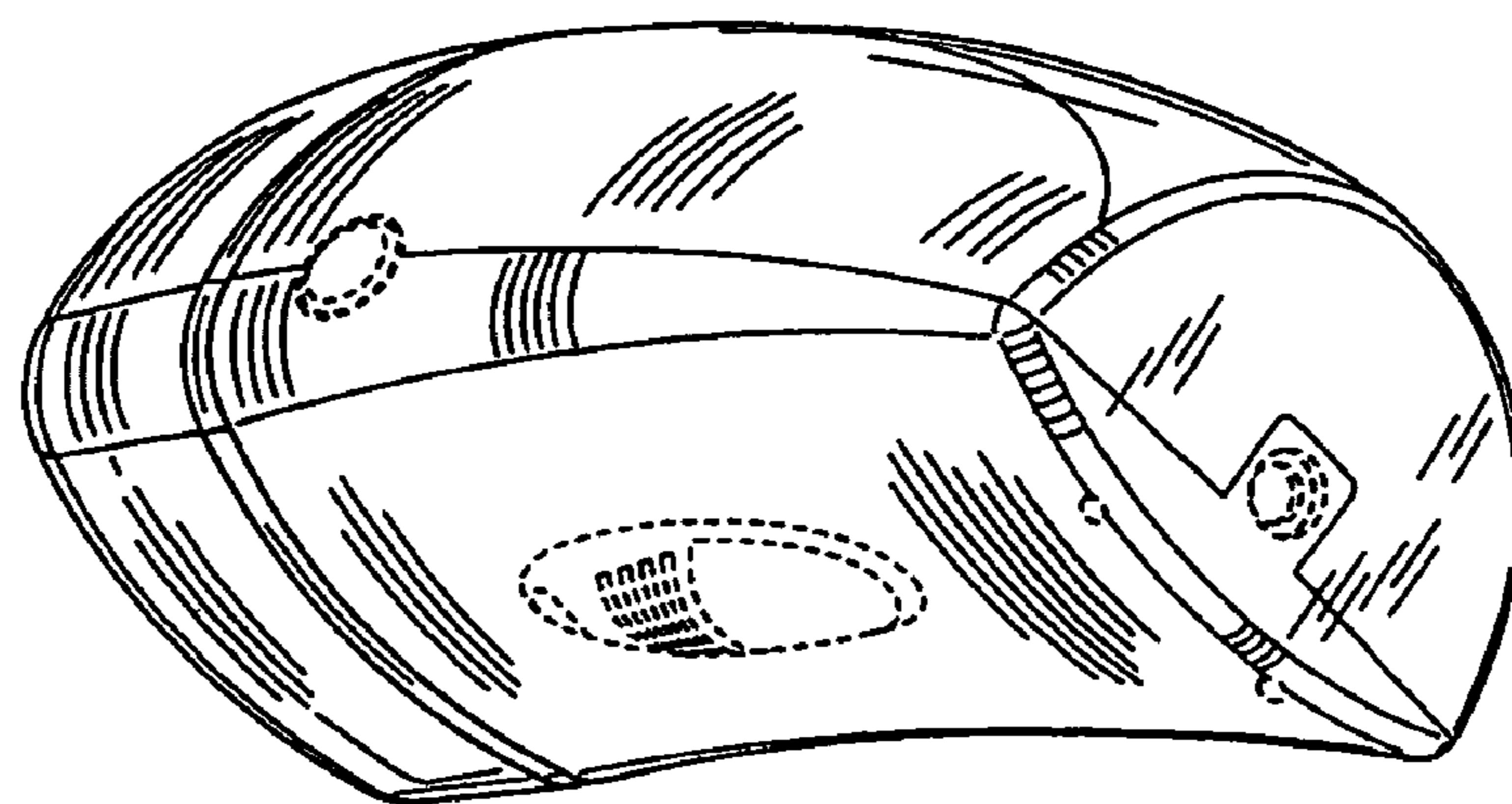
**FIG. 9**



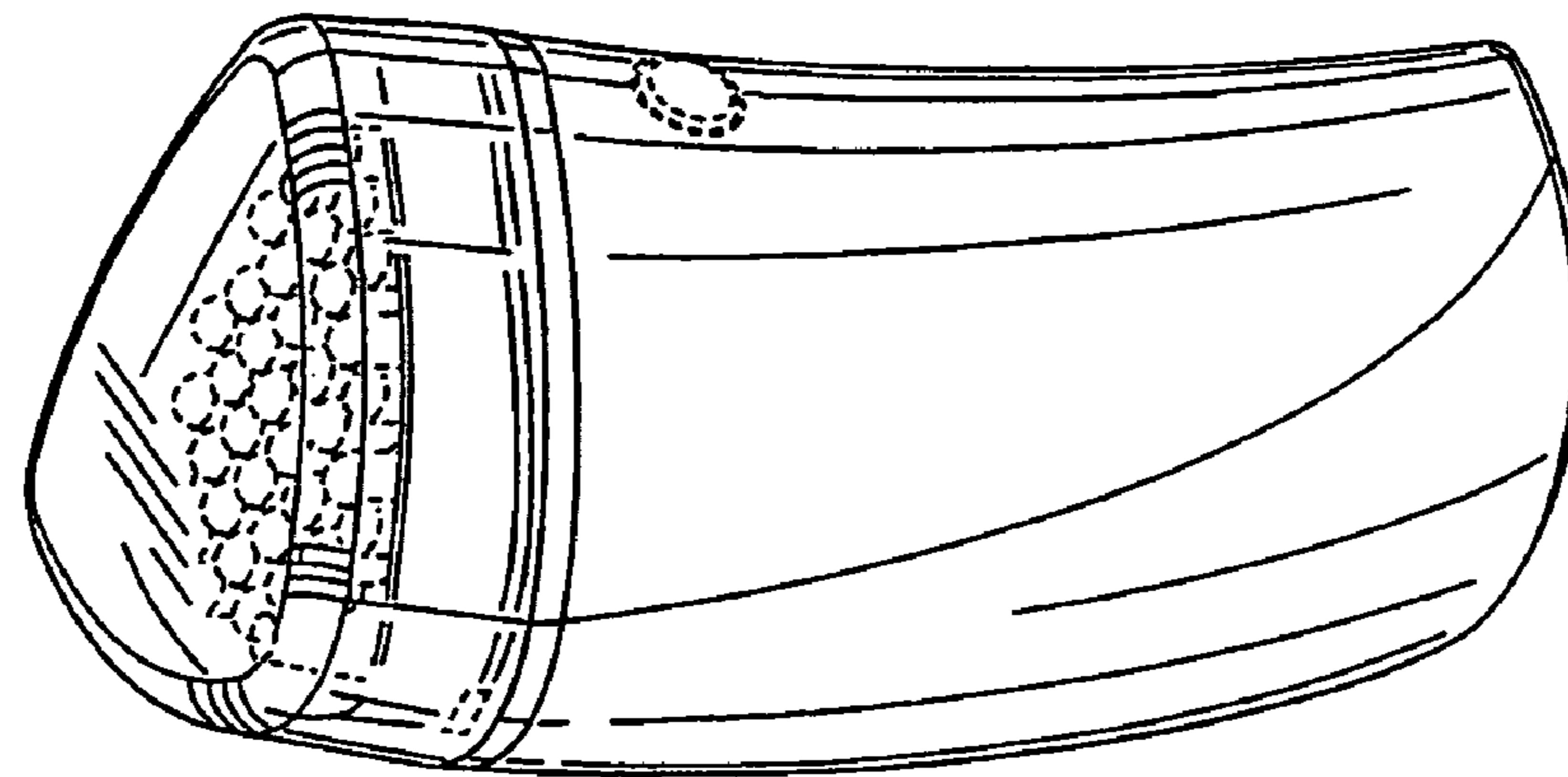
**FIG. 10**



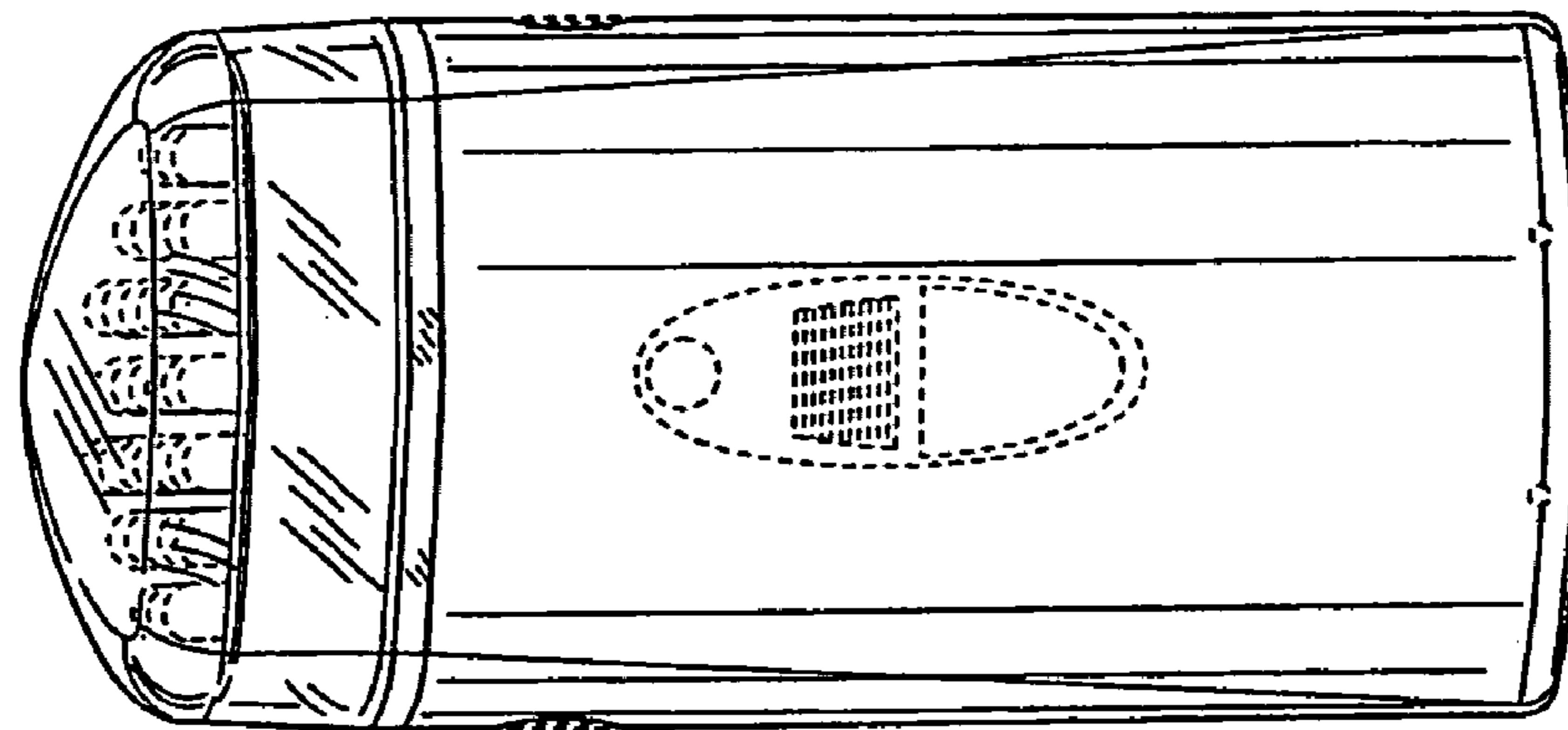
**FIG. 11**



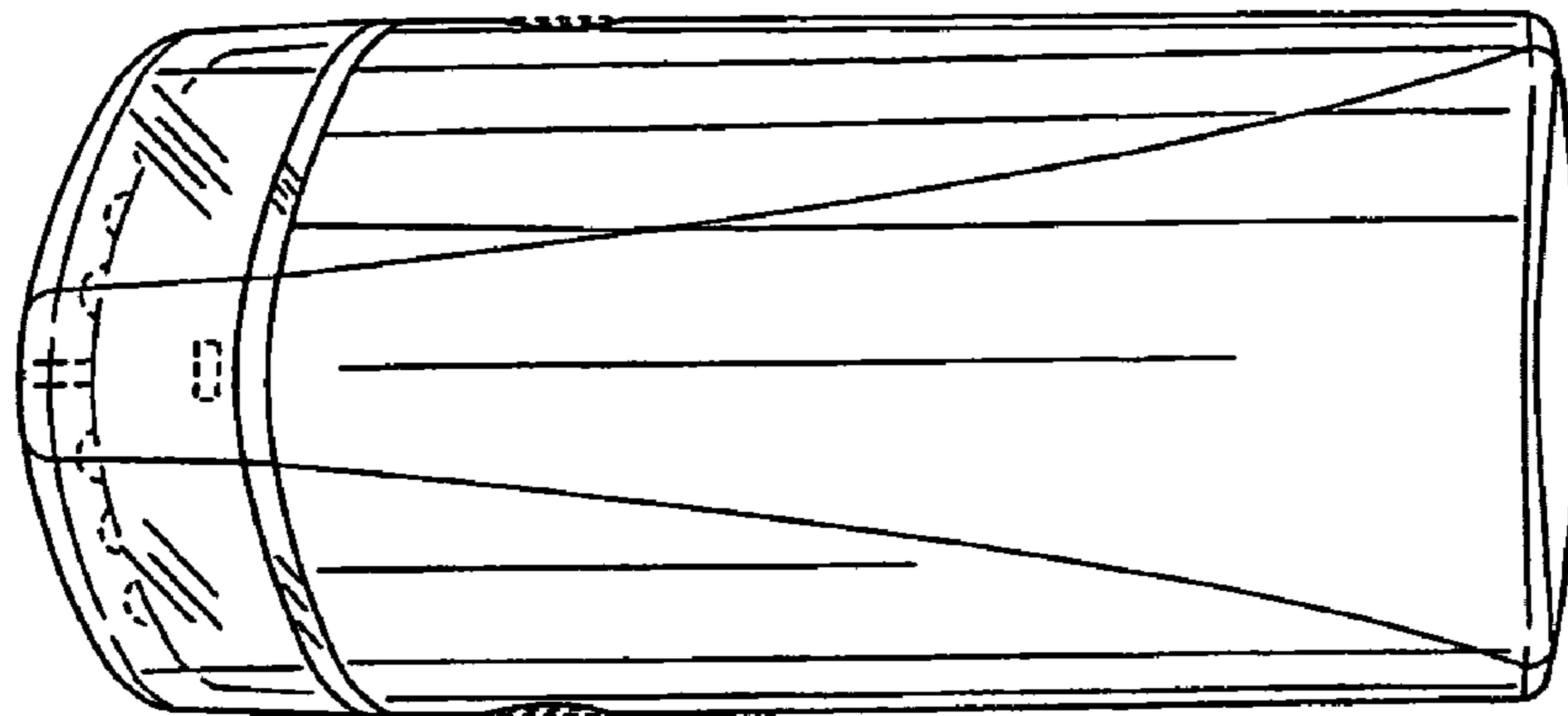
**FIG. 13**



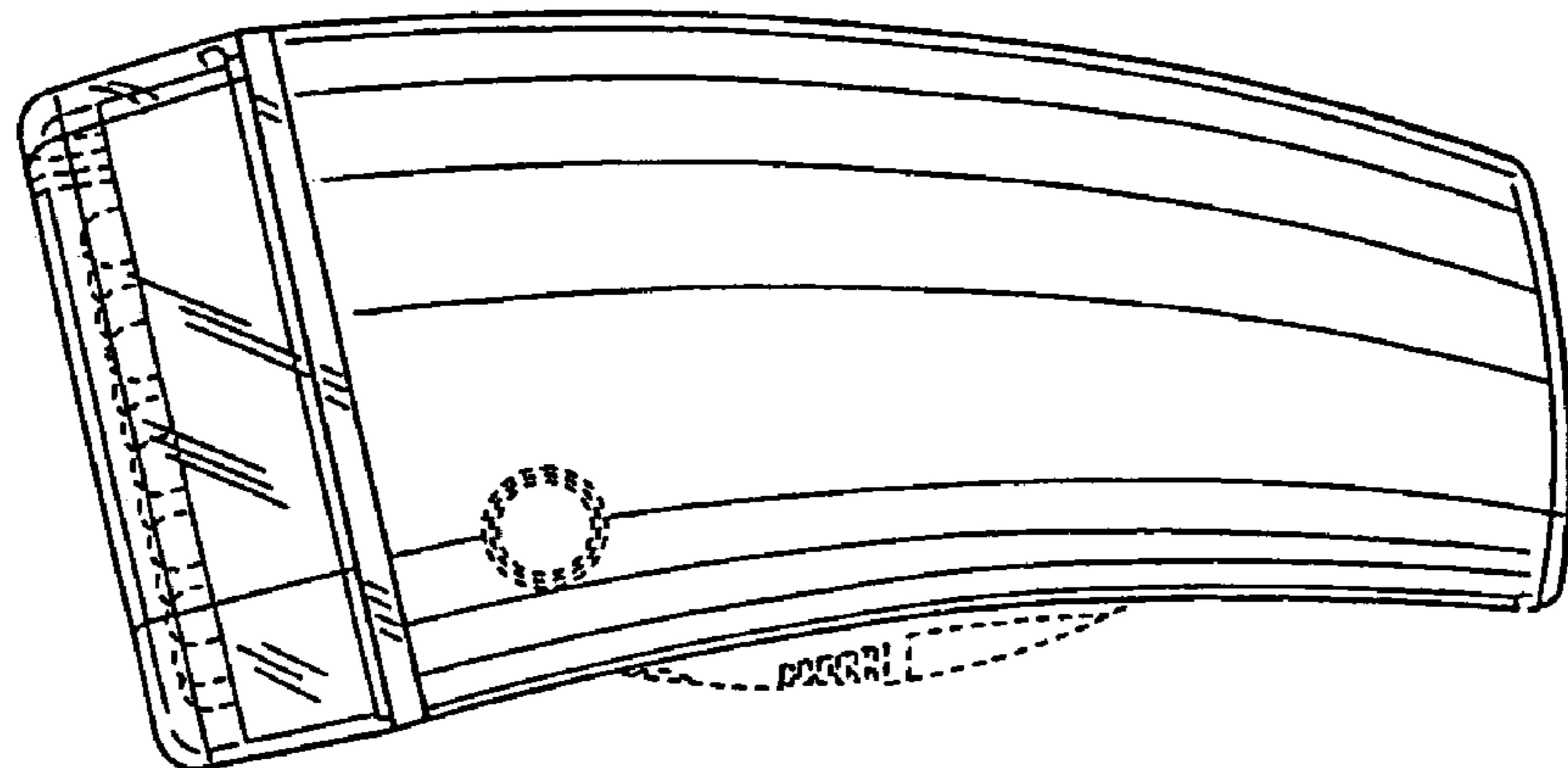
**FIG. 12**



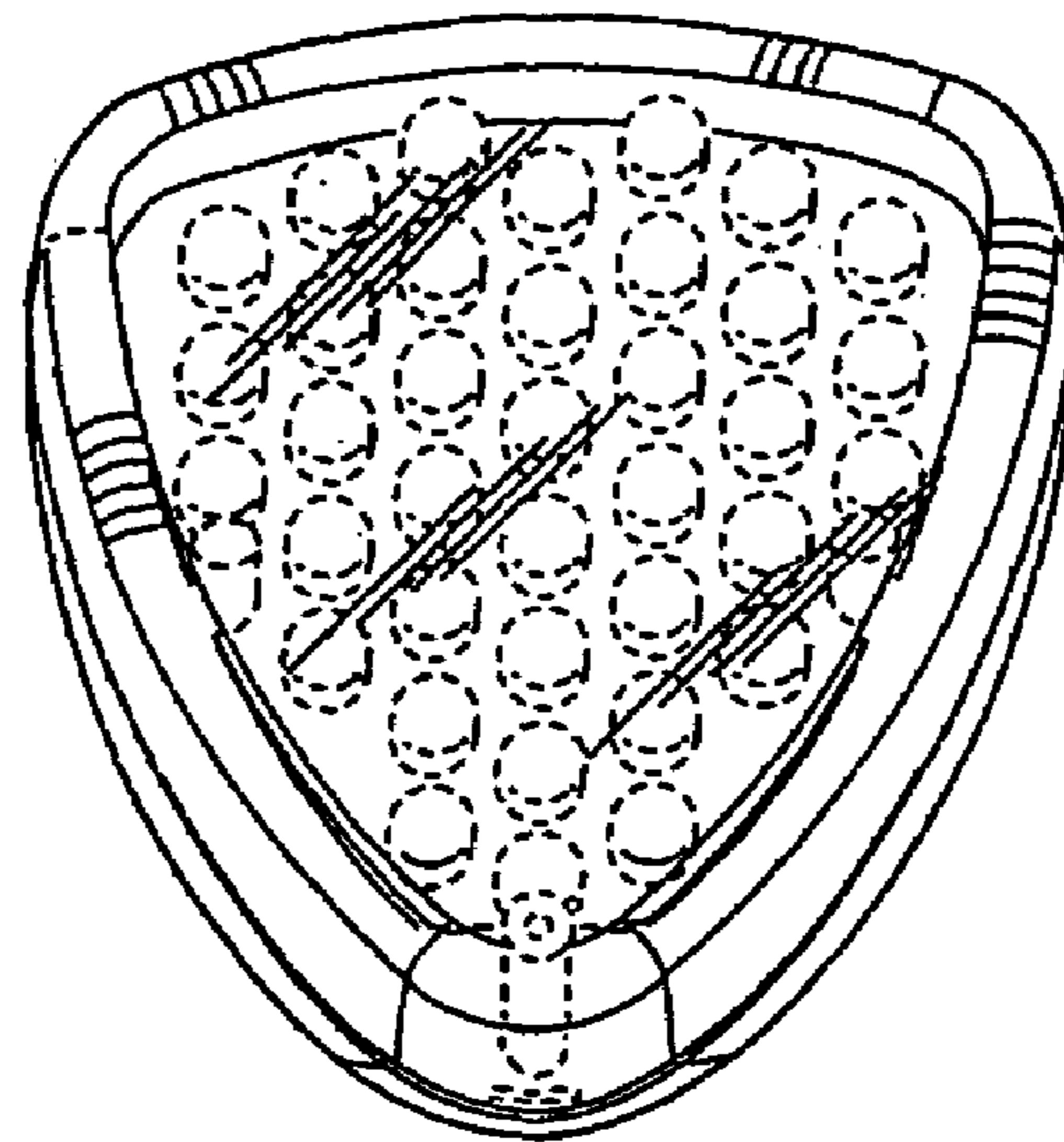
**FIG. 16**



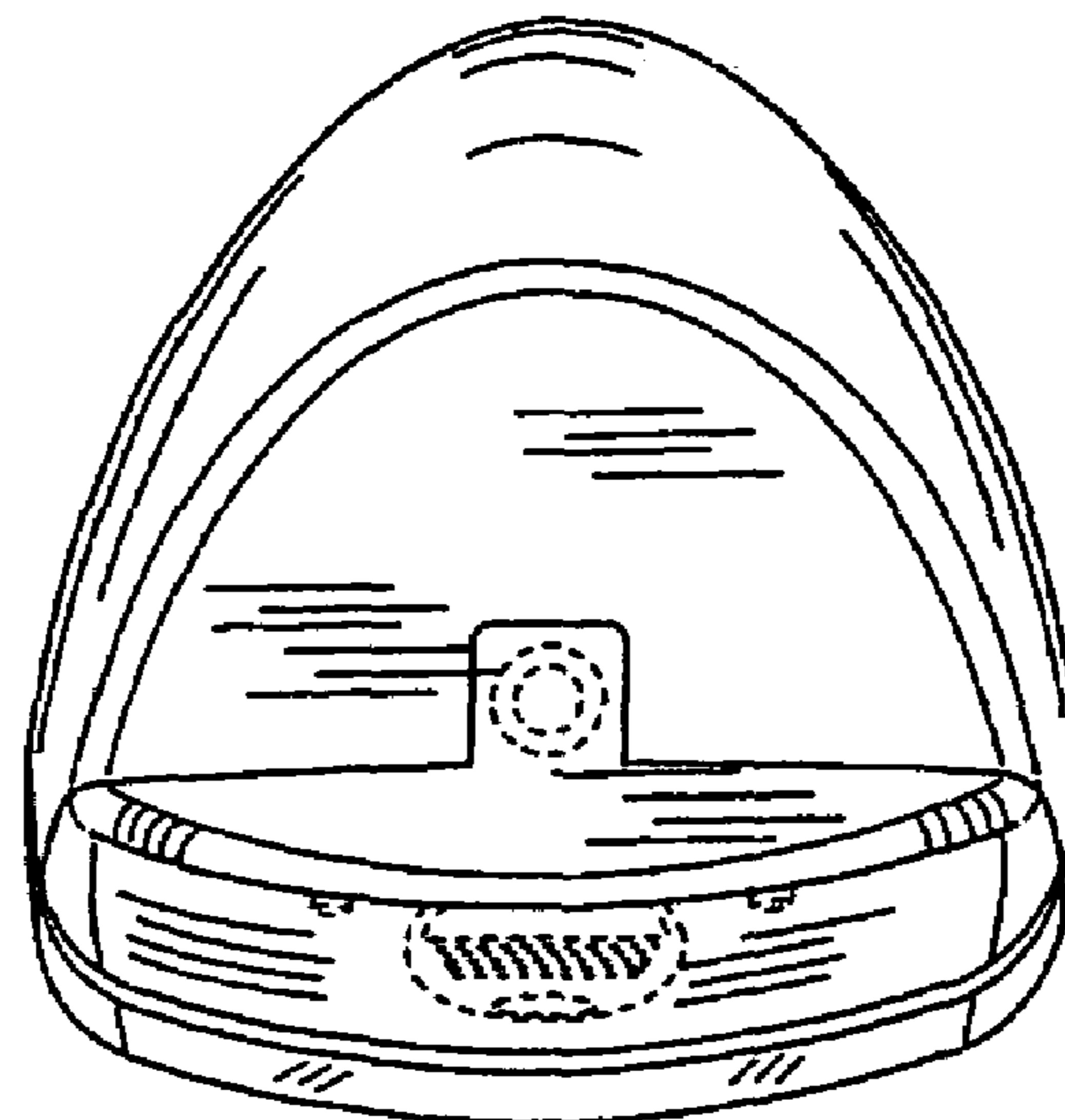
**FIG. 15**



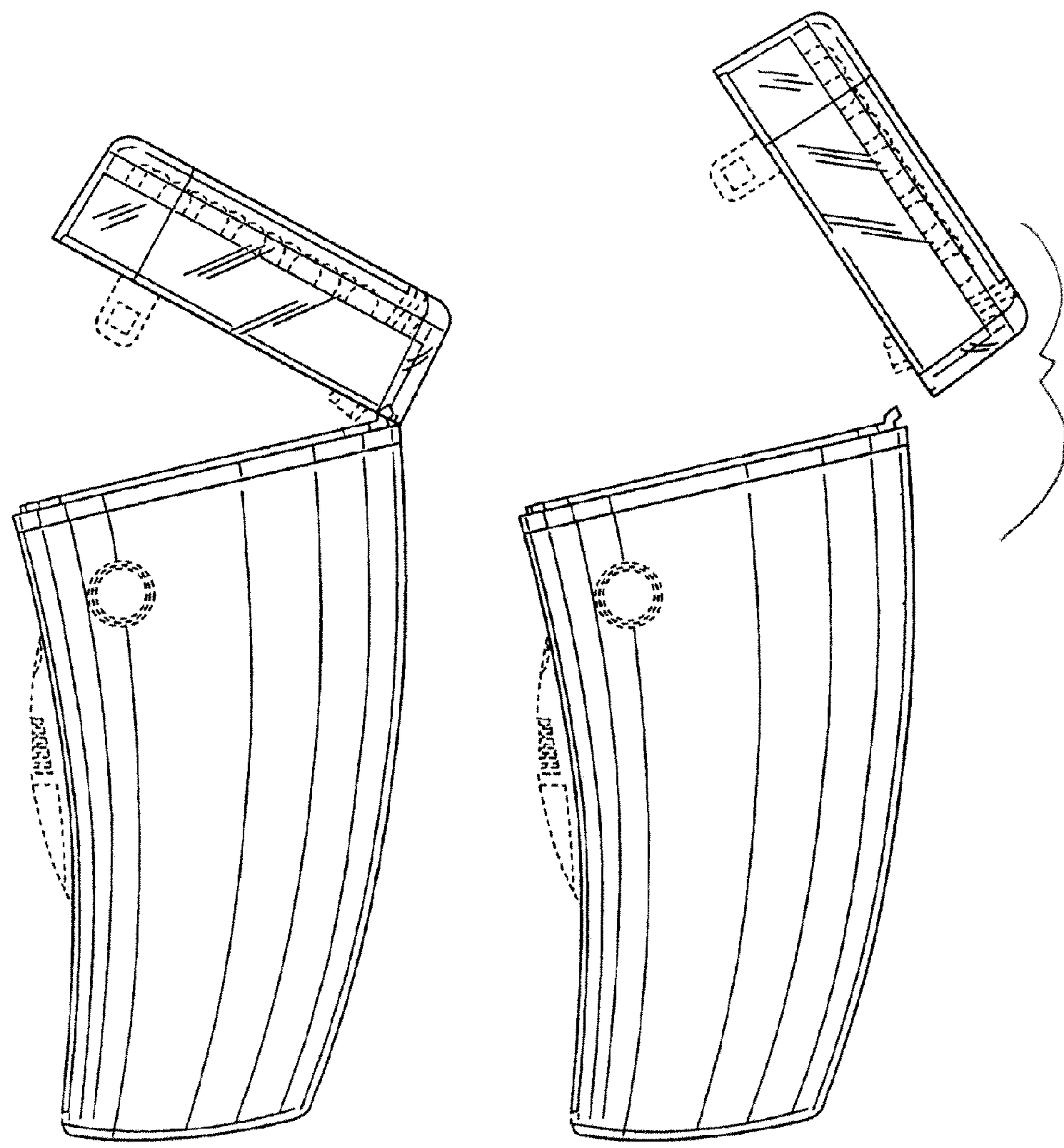
**FIG. 14**



**FIG. 17**

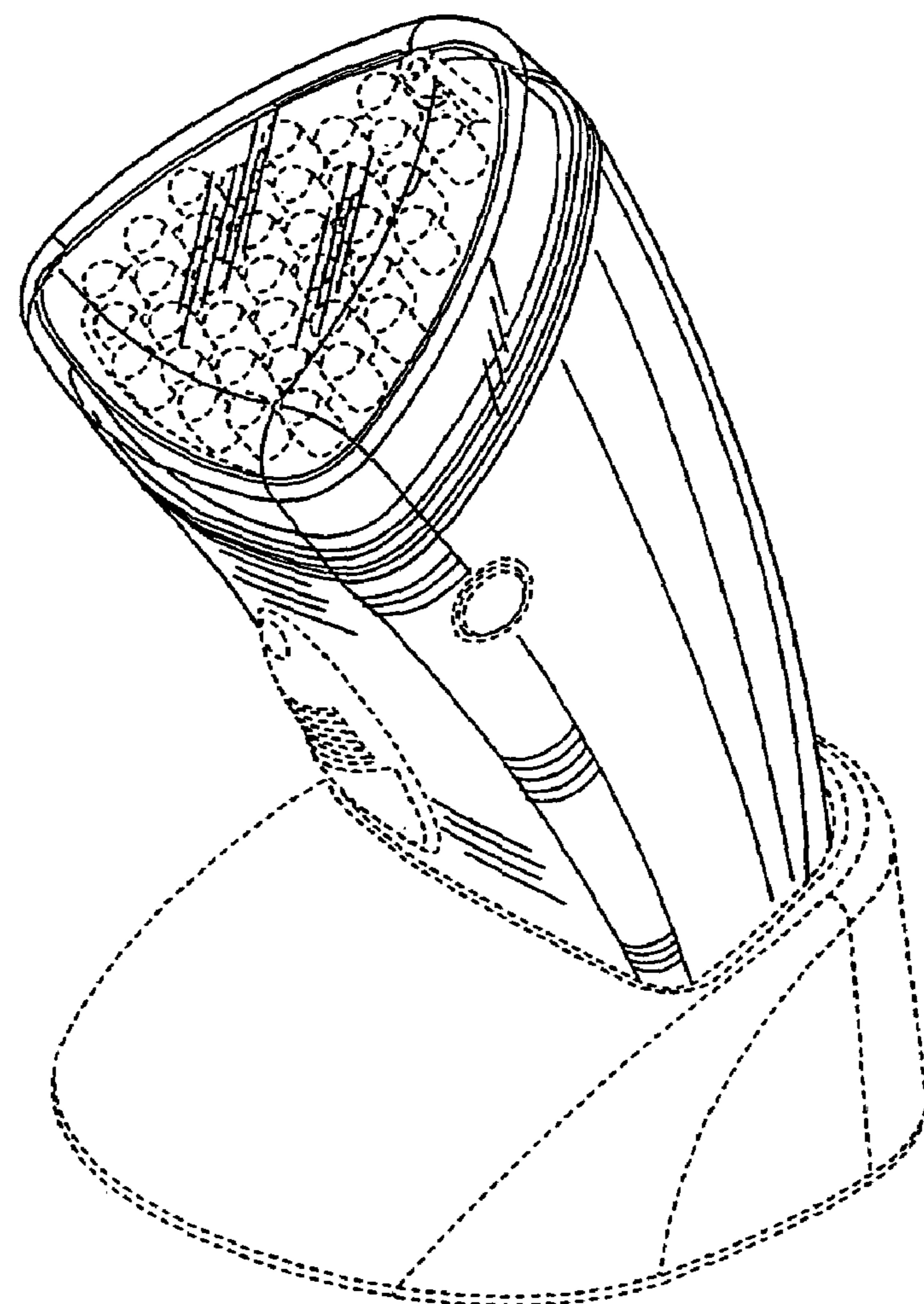


**FIG. 18**



**FIG. 19**

**FIG. 20**



**FIG. 21**