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(12) **United States Design Patent** (10) **Patent No.:** **US D877,098 S**
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(54) **HEAT SINK CLIP AND ATTACHMENT**

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

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(52) **U.S. Cl.**
USPC **D13/179**

(58) **Field of Classification Search**
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D26/152, 142
CPC ... H01L 23/4093; H01L 23/473; H01L 23/46;
H01L 23/467; H01L 23/4006; F21V
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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,329,426	A	7/1994	Villani
D376,349	S	12/1996	Campanella et al.
5,581,442	A	12/1996	Morosas
5,699,229	A	12/1997	Brownell
5,804,875	A	9/1998	Remsburg et al.
5,881,800	A	3/1999	Chung
6,153,932	A	11/2000	Liang
6,188,131	B1	2/2001	Nereng
6,239,974	B1	5/2001	Tseng
6,392,885	B1	5/2002	Lee et al.
6,396,695	B1	5/2002	Lee et al.

(Continued)

OTHER PUBLICATIONS

Digi-Key, "Advanced Thermal Solutions Inc. ATS-MG170-R0",
(<https://www.digikey.com/product-detail/en/ATS-MG170-R0/ATS1912-ND/5017820>) (Accessed Aug. 2018).

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Primary Examiner — April Rivas

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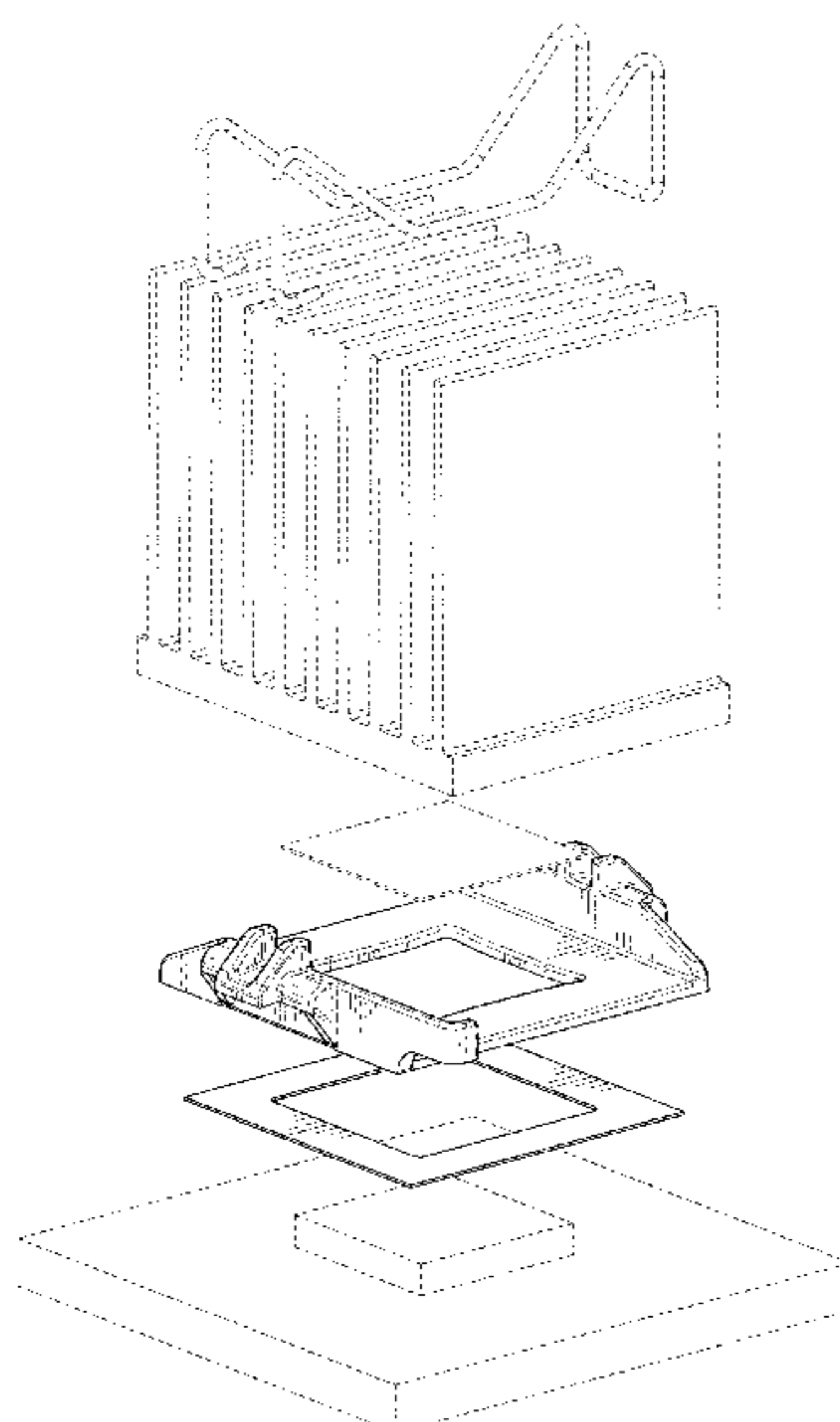
(57) **CLAIM**

The ornamental design for a heat sink clip and attachment,
as shown and described.

DESCRIPTION

FIG. 1 is a front perspective view of a heat sink clip and attachment showing our new design;
FIG. 2 is a bottom perspective view of the heat sink clip and attachment showing the new design;
FIG. 3 is a front view of the heat sink clip and attachment shown in FIG. 1;
FIG. 4 is a back view of FIG. 1;
FIG. 5 is a left side view of FIG. 1;
FIG. 6 is a right side view of FIG. 1;
FIG. 7 is a top view of FIG. 1;
FIG. 8 is a bottom view of FIG. 2;
FIG. 9 is an exploded parts view thereof showing the heat sink clip and attachment, the mounting shown in broken lines;
FIG. 10 is an assembled parts view thereof showing the heat sink clip and attachment, the mounting shown in broken lines.
FIG. 11 is a cross-sectional view along the line 11 of FIG. 7; and,
FIG. 12 is a partial and enlarged cross-sectional view of the detail 12 observed in dot-dash line(s) 12 of FIG. 11.
The broken lines illustrate the environmental mounting and form no part of the claimed design.

1 Claim, 11 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

D496,006 S 9/2004 Tsai et al.
 6,856,511 B1 2/2005 Viernes et al.
 6,952,348 B2 10/2005 Wu
 6,962,192 B2* 11/2005 Lee H01L 23/4093
 165/67
 6,992,889 B1 1/2006 Kashiwagi et al.
 D514,529 S* 2/2006 Yu D13/179
 7,009,843 B2 3/2006 Lee et al.
 D555,109 S 11/2007 Lee et al.
 7,307,842 B1 12/2007 Liang
 7,498,673 B2 3/2009 Awad et al.
 7,518,875 B2 4/2009 Desrosiers et al.
 7,564,687 B2 7/2009 Liu
 7,606,032 B2 10/2009 Lin
 7,619,892 B2 11/2009 Liang
 D609,198 S* 2/2010 Hsu D13/179
 7,736,153 B2 6/2010 Cheng et al.
 D622,227 S 8/2010 Huang et al.
 7,768,786 B2 8/2010 Liang
 7,785,126 B2 8/2010 Peng et al.
 7,834,444 B2 11/2010 Awad et al.
 D638,807 S 5/2011 Chan et al.
 7,961,473 B1 6/2011 Bohannon et al.
 8,248,786 B2 8/2012 Cheng
 8,274,793 B2 9/2012 Wang et al.
 8,300,413 B2 10/2012 Chen
 8,780,563 B2 7/2014 Lostoski
 9,118,141 B2 8/2015 Yeh
 9,603,286 B2 3/2017 Carpenter et al.
 D804,434 S 12/2017 Lu et al.
 9,875,951 B2 1/2018 Glover et al.
 D835,590 S* 12/2018 Azar D13/179
 D837,753 S* 1/2019 Azar D13/179
 2007/0086170 A1 4/2007 Liang

2008/0128110 A1* 6/2008 Lai H01L 23/467
 165/80.3
 2008/0144289 A1* 6/2008 Desrosiers H01L 23/4093
 361/719
 2008/0174968 A1* 7/2008 Feng H01L 23/4093
 361/720
 2008/0197483 A1* 8/2008 Ouyang H01L 23/4006
 257/720
 2009/0021917 A1* 1/2009 Floyd H01L 23/4093
 361/719
 2009/0027858 A1* 1/2009 Lai H01L 23/4093
 361/709
 2009/0203245 A1* 8/2009 Chiang H01L 23/4006
 439/331
 2010/0029120 A1* 2/2010 Peng H01L 23/4093
 439/329
 2010/0120268 A1 5/2010 Yeh
 2010/0172105 A1* 7/2010 Liang H01L 23/4093
 361/719
 2010/0200206 A1* 8/2010 Mandrone H01L 23/4093
 165/185
 2011/0304979 A1* 12/2011 Peterson H01L 23/4006
 361/679.47
 2013/0146252 A1* 6/2013 Yang H01L 23/4006
 165/67
 2017/0006696 A1* 1/2017 Ma H01L 23/3672

OTHER PUBLICATIONS

Digi-Key, "Advanced Thermal Solutions Inc. ATS-X50150B-C1-R0", (<https://www.digikey.com/products/en?vendor=Advanced%20Thermal%20Solutions&keywords=ATS1944-ND>) (Accessed Aug. 2018).
 Radian, "EZ Snap Clip", (<https://radianheatsinks.com/ez-snap-clip>), 2018.

* cited by examiner

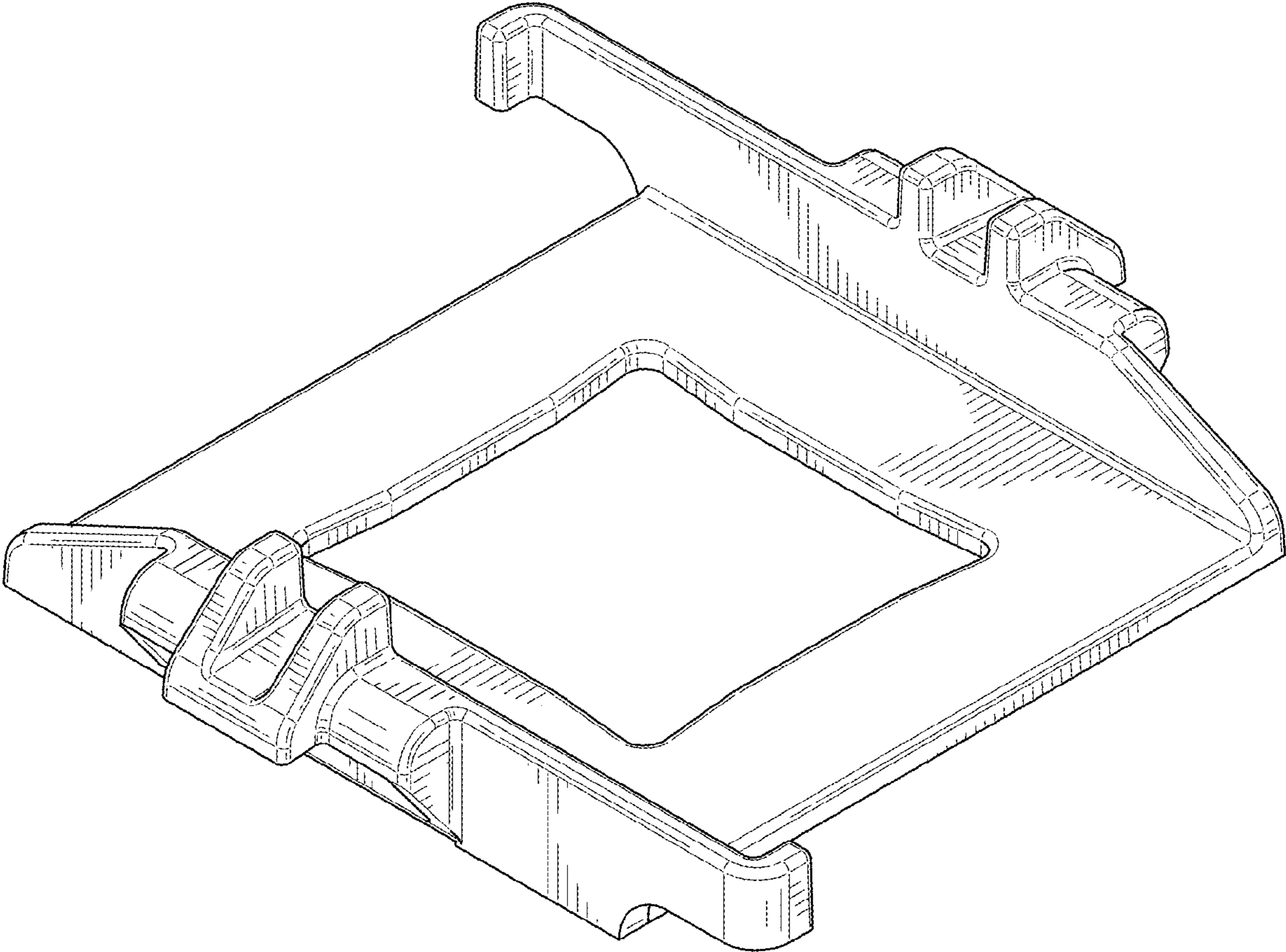


FIG. 1

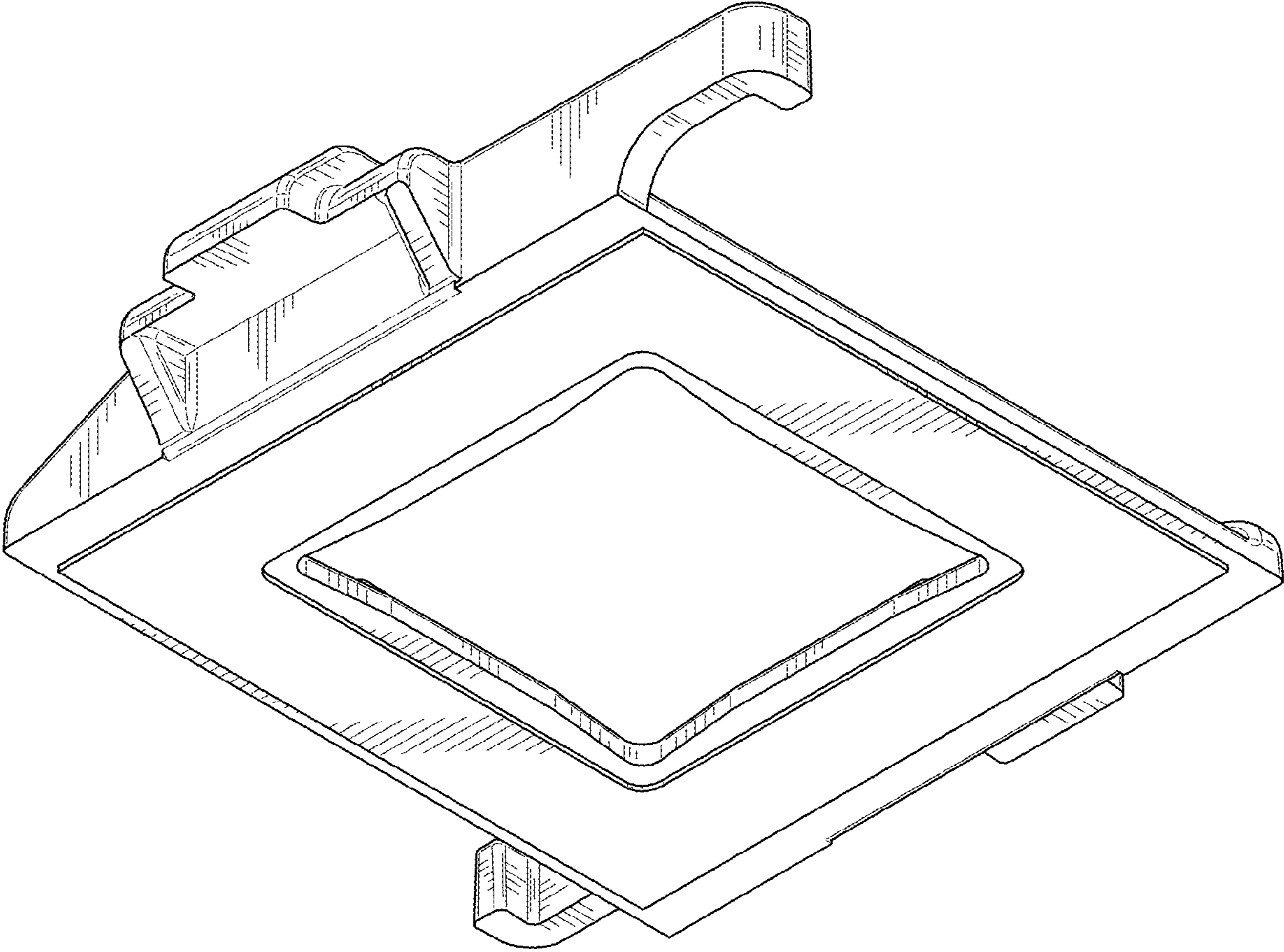


FIG. 2

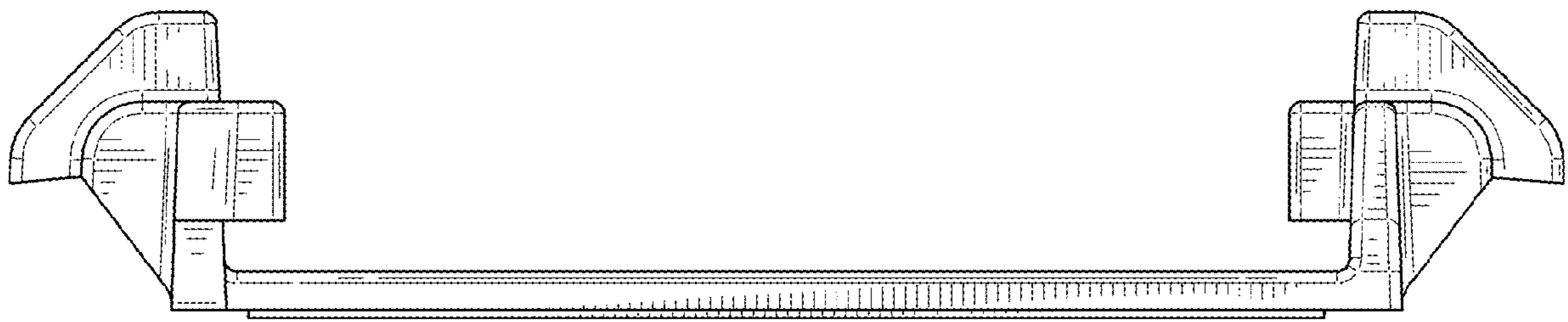


FIG. 3

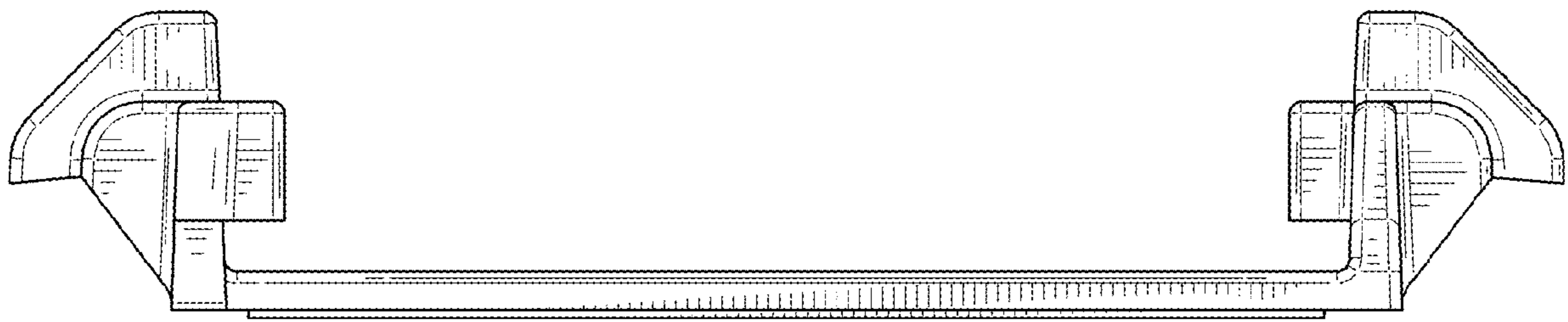


FIG. 4

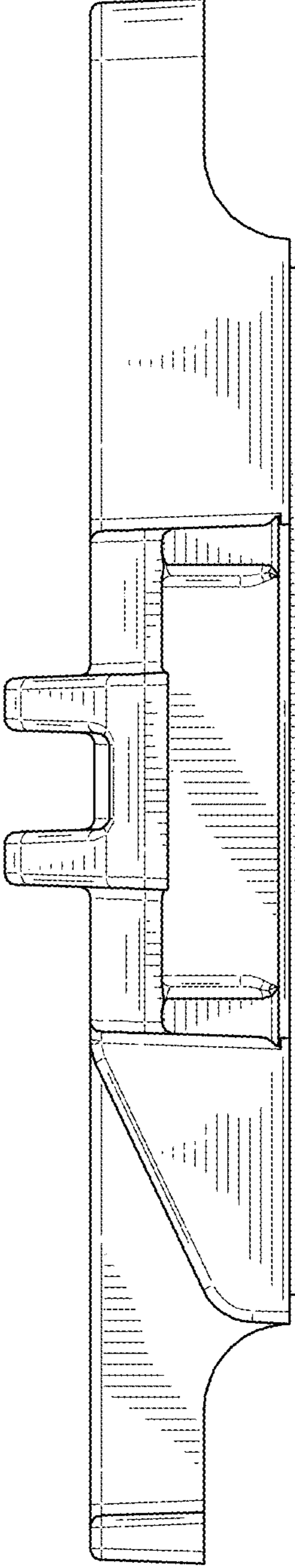


FIG. 5

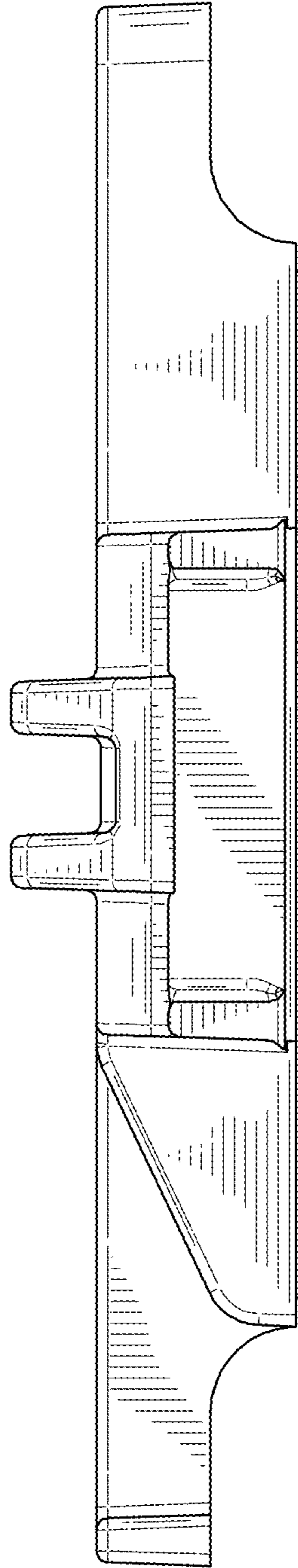


FIG. 6

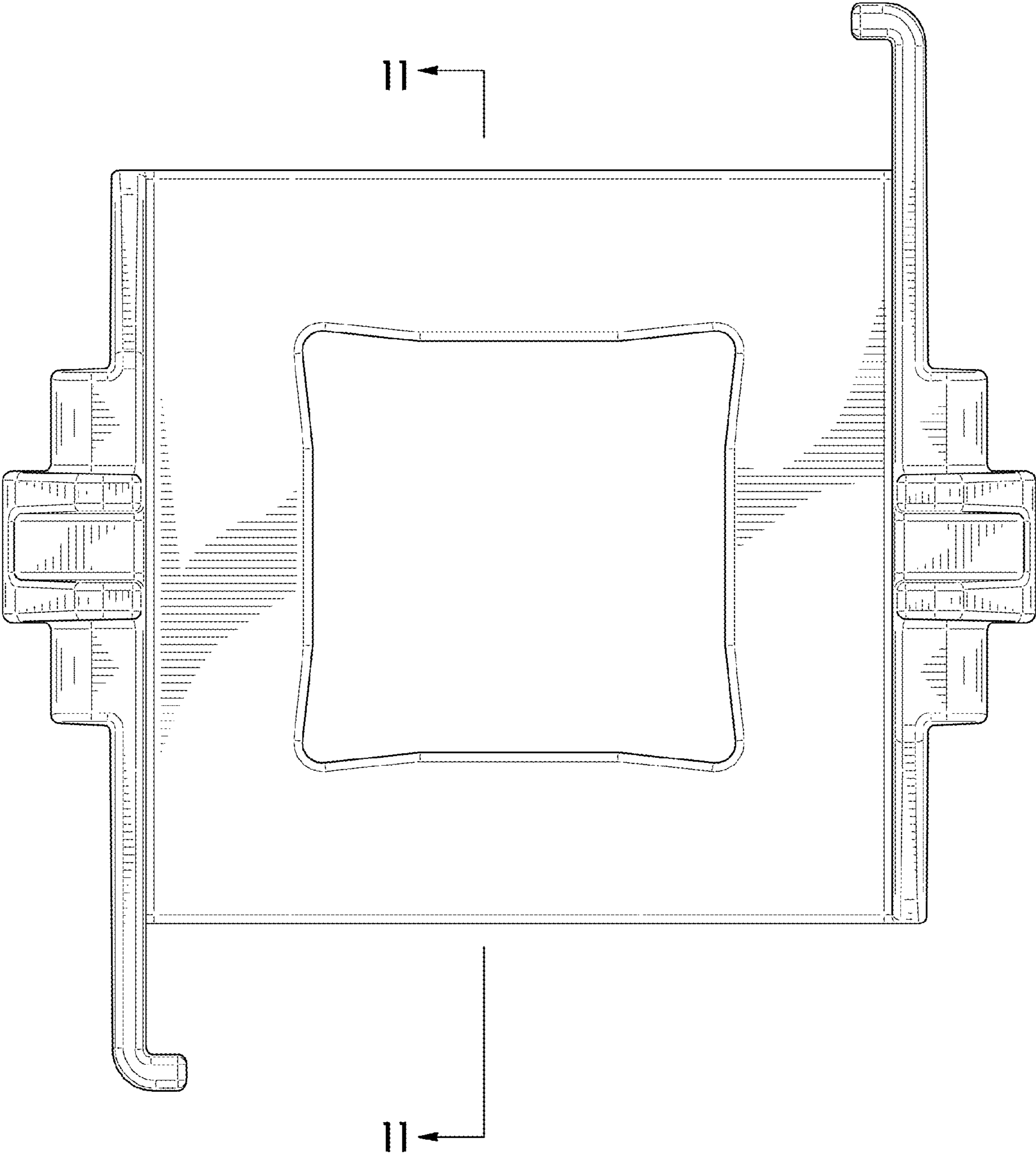


FIG. 7

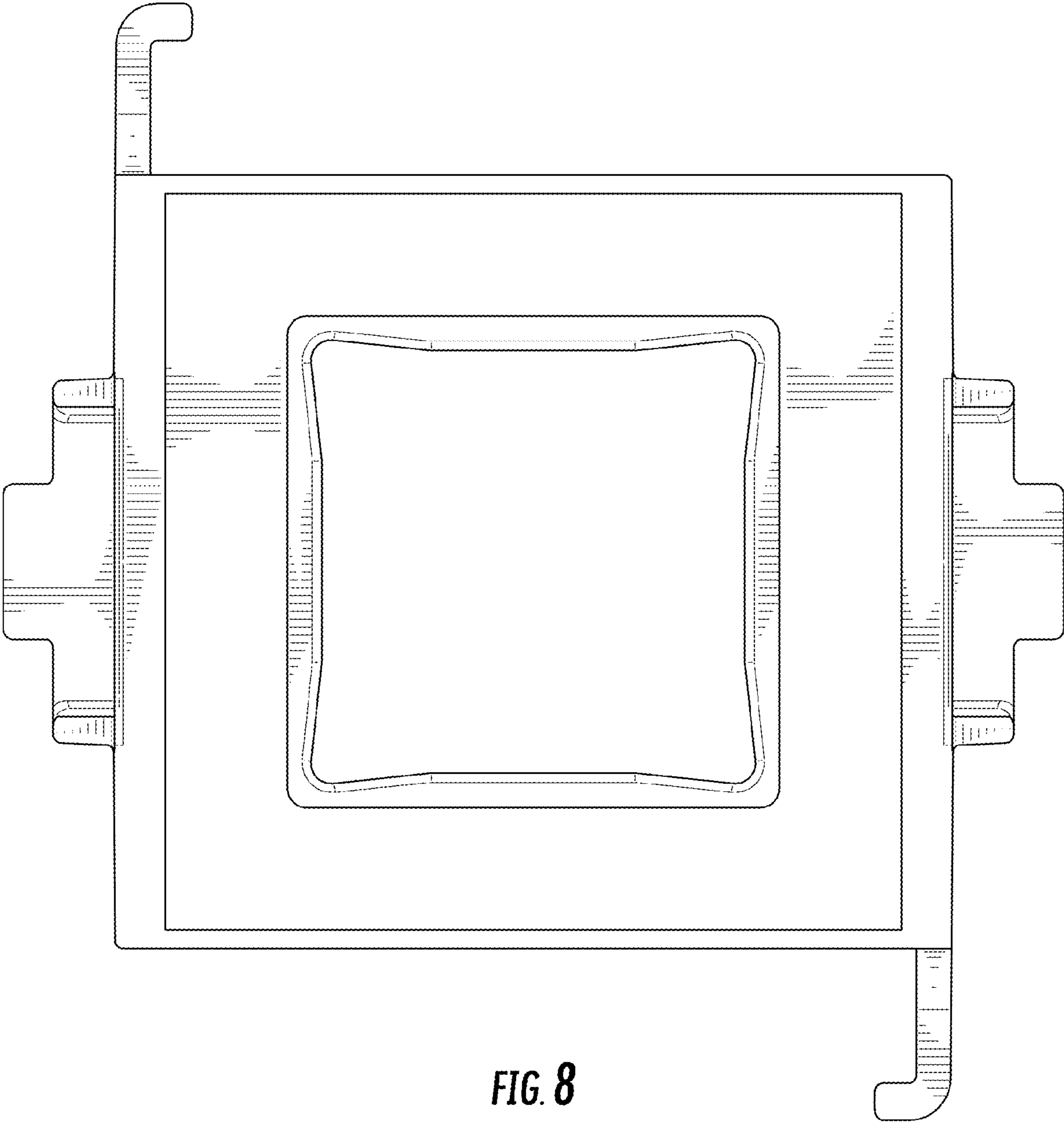


FIG. 8

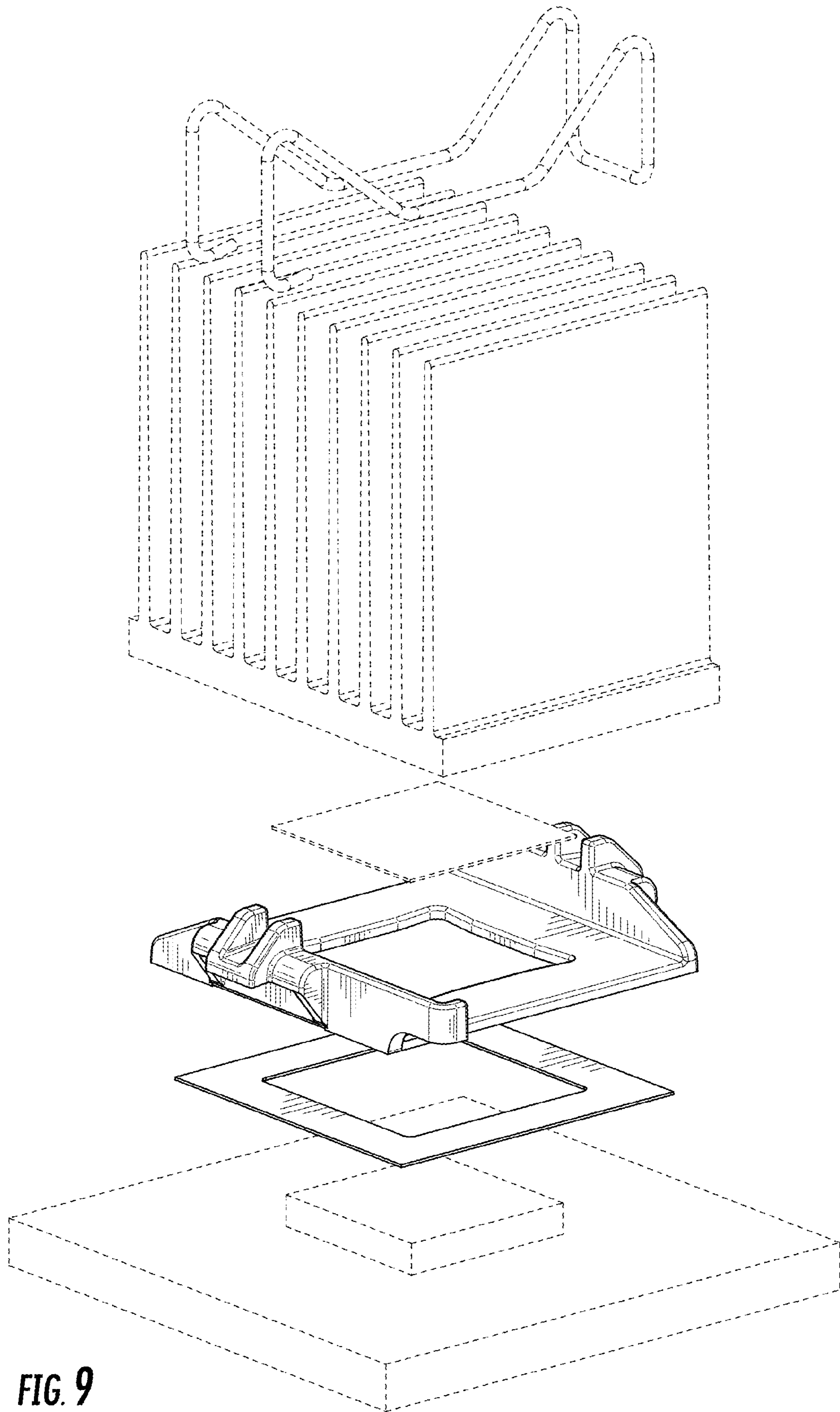


FIG. 9

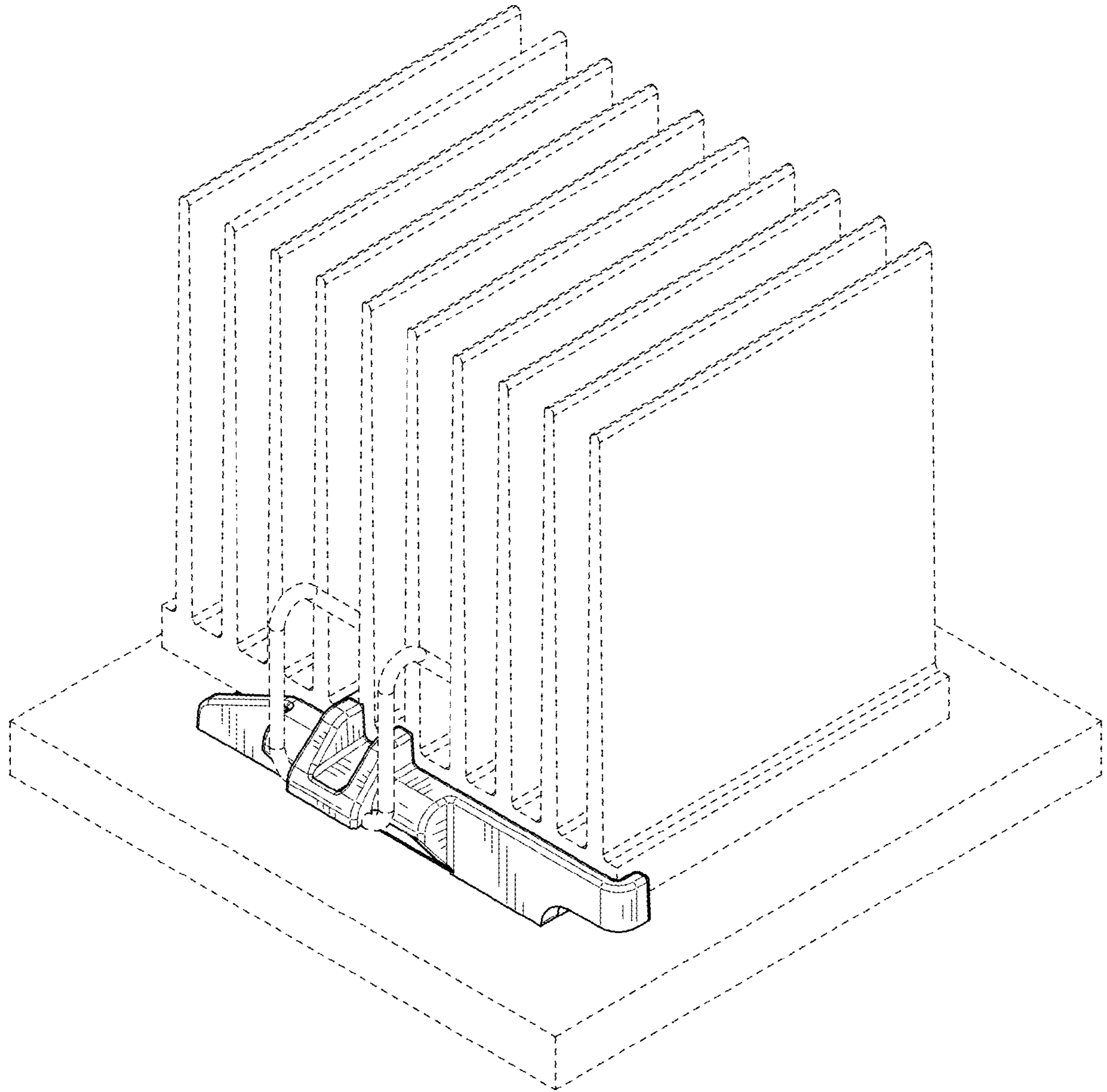


FIG. 10

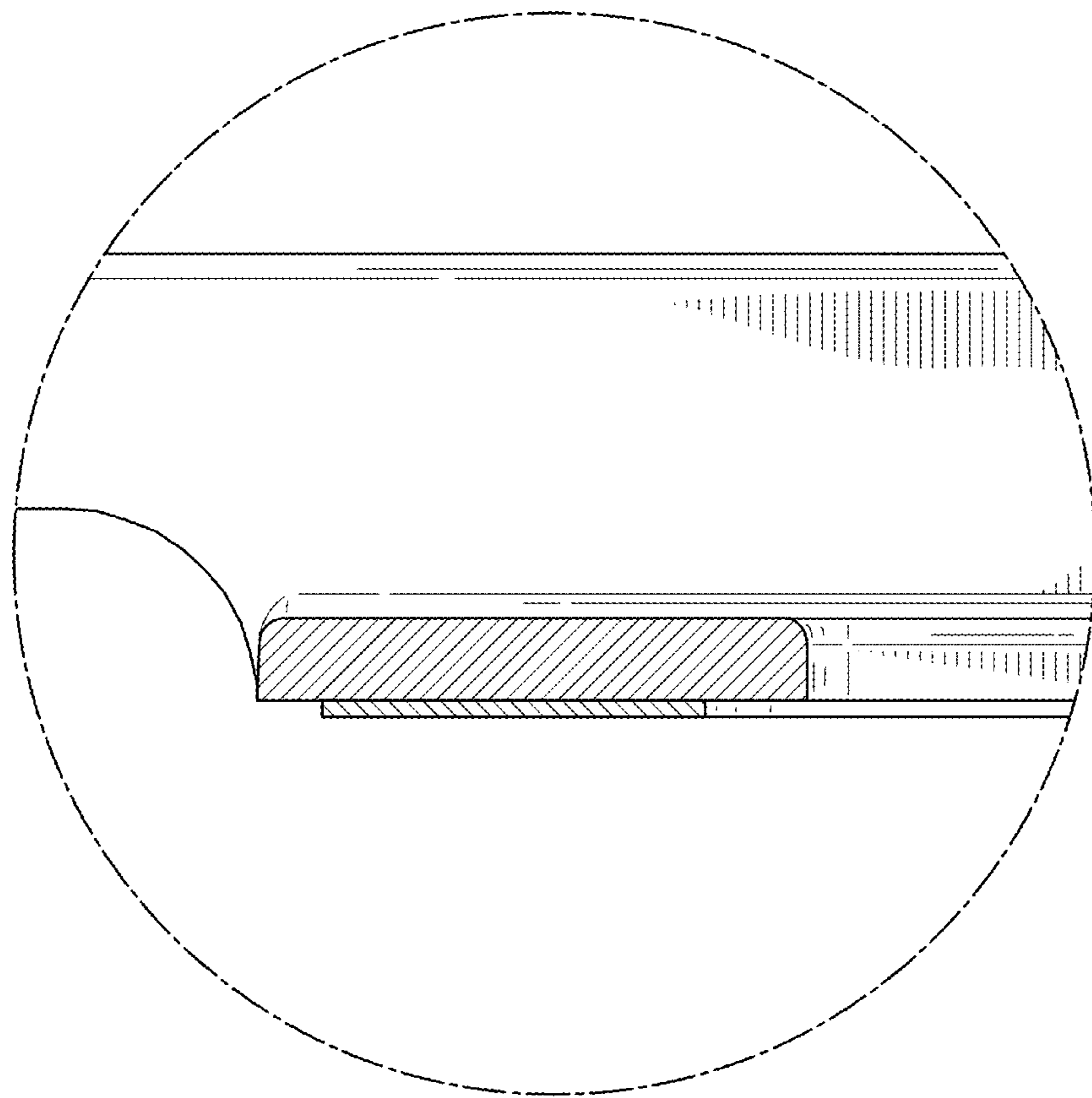
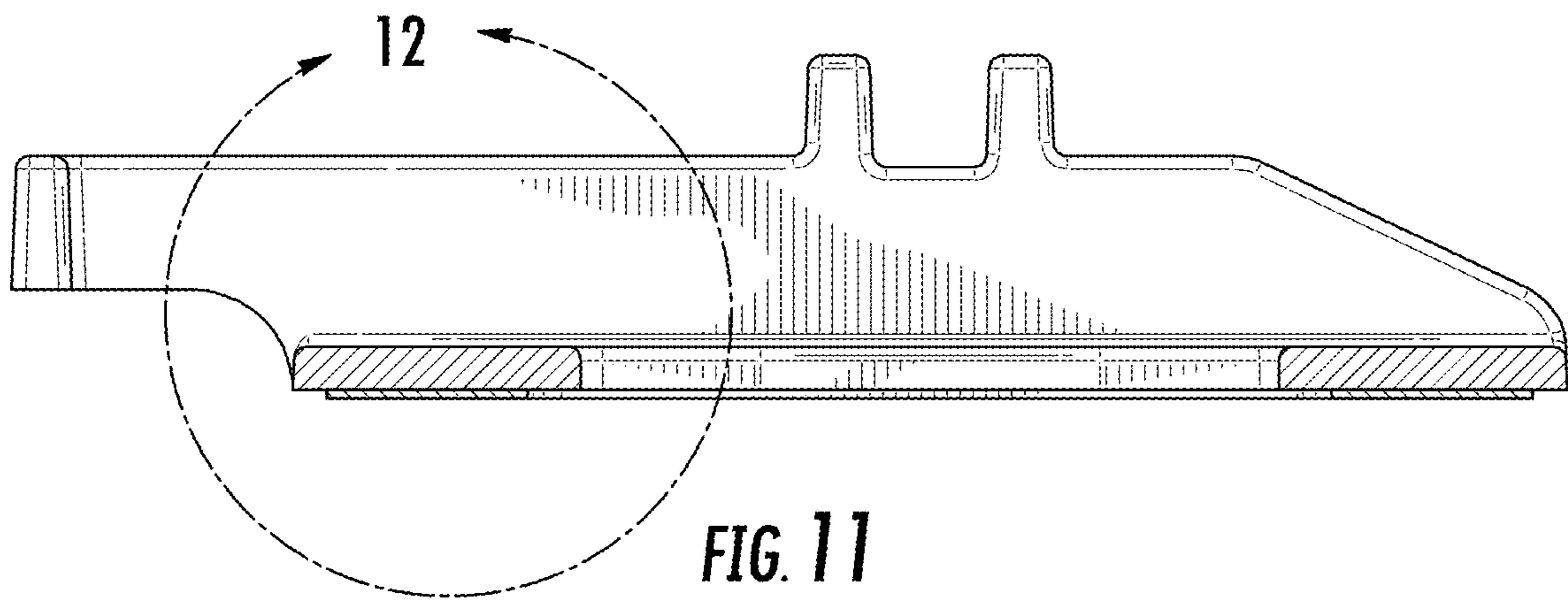


FIG. 12