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(12) **United States Design Patent** (10) **Patent No.:** **US D928,708 S**
Kato et al. (45) **Date of Patent:** **** Aug. 24, 2021**

(54) **SERVO AMPLIFIER**

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

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Related U.S. Application Data

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(30) **Foreign Application Priority Data**

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(51) **LOC (13) Cl.** **10-02**

(52) **U.S. Cl.**
USPC **D13/110**

(58) **Field of Classification Search**

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D13/109, 110, 118, 119, 184, 199;
D14/356, 432
CPC H02J 2001/008; H02J 3/32; H02J 3/008;
H02J 7/0027; H02J 7/0013; H02J 7/0054;
H02J 7/00; H02J 7/025; H02J 7/0042;
H02J 7/0044; H02J 7/0045; H02J 7/0003;
B60R 16/03; B60L 11/1809; B60L
11/1861; B60L 11/182; Y02E 60/12;
Y02E 60/122; Y02E 60/124; Y02E 60/50;
Y02E 10/50; Y02E 10/47; H01M 2/02;
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(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

D501,648 S ‡ 2/2005 Fiorentino G06F 1/188
D13/110
D510,319 S ‡ 10/2005 Tuomola D13/110
(Continued)

OTHER PUBLICATIONS

Servo Amplifiers. (Design—© Questel) orbit.com. [Online PDF compilation of references] 183 pgs. Print Dates Range Oct. 19, 2020-Sep. 27, 2020 [Retrieved Jun. 1, 2021].*

(Continued)

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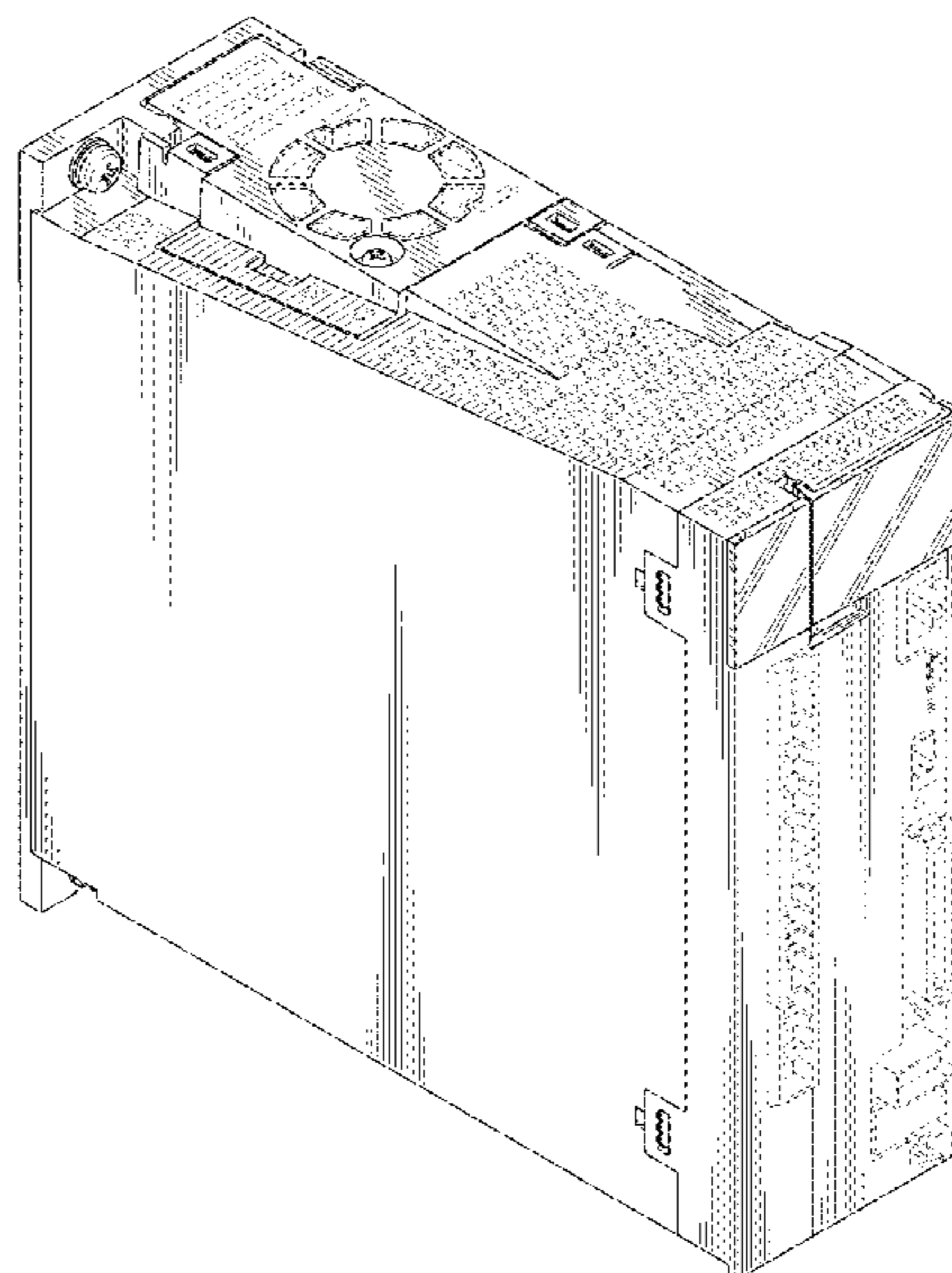
(57) **CLAIM**

The ornamental design for a servo amplifier, as shown and described.

DESCRIPTION

FIG. 1 is a front perspective view of the front, left, and top sides of a servo amplifier showing our new design; FIG. 2 is a rear perspective view of the rear, right, and bottom sides thereof; FIG. 3 is a front view thereof; FIG. 4 is a rear view thereof; FIG. 5 is a top plan view thereof; FIG. 6 is a bottom plan view thereof; FIG. 7 is a right side view thereof; and, FIG. 8 is a left side view thereof. The broken lines shown represent portions of the servo amplifier and form no part of the claimed design.

1 Claim, 8 Drawing Sheets



- (58) **Field of Classification Search**
 CPC 2/0202; H01M 2/0207; H01M 2/0212;
 H01M 2/1061; H01M 2/1066; H01M
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 See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,163,048 B2 * 1/2007 Colosso G01F 23/20
 165/11.1
 D543,542 S * 5/2007 Ng D14/356
 D561,095 S † 2/2008 Sakai D13/110
 D581,867 S * 12/2008 Crawford D13/103
 7,560,188 B2 * 7/2009 Morishita H01M 10/345
 429/50
 D610,142 S * 2/2010 Klein D14/356
 D618,239 S * 6/2010 Chen D14/356
 D654,024 S † 2/2012 Choi D13/110
 D684,533 S † 6/2013 Nakahira D13/110
 D684,534 S † 6/2013 Nakahira D13/110
 D713,336 S † 9/2014 Perin D13/110
 D745,847 S † 12/2015 Ho D13/110
 D755,123 S † 5/2016 Ho D13/110
 D768,129 S * 10/2016 Chen D14/356
 D771,565 S † 11/2016 Saarivirta D13/110
 D771,566 S † 11/2016 Saarivirta D13/110
 D772,161 S † 11/2016 Saarivirta D13/110
 D772,162 S † 11/2016 Saarivirta D13/110
 D772,808 S * 11/2016 Walker D13/103
 9,543,613 B2 * 1/2017 Ihara H01M 10/486
 D784,920 S * 4/2017 Walker D13/103
 D786,863 S * 5/2017 Kim D14/356
 D796,431 S † 9/2017 Lau D13/107
 D808,387 S * 1/2018 Ootori D14/356
 D808,898 S * 1/2018 Walker D13/103
 D809,515 S * 2/2018 Nada D14/356
 D815,592 S † 4/2018 Lau D13/107
 D820,200 S * 6/2018 Takahashi D13/103
 D824,330 S * 7/2018 Hao D13/110
 D828,294 S † 9/2018 Lau D13/107
 10,070,559 B2 * 9/2018 Kim H01M 10/627

10,074,844 B2 † 9/2018 Wada B60L 58/21
 D831,655 S * 10/2018 Jhun D14/432
 D840,335 S † 2/2019 Gleave D13/110
 D862,386 S † 10/2019 Beer D13/110
 D864,962 S * 10/2019 Jhun D14/432
 D876,349 S † 2/2020 Nagano D13/110
 10,593,916 B2 * 3/2020 Yoon H01M 50/20
 10,683,851 B2 * 6/2020 Pedretti H02K 7/025
 D902,852 S * 11/2020 Lin D13/108
 D906,962 S * 1/2021 Kato D13/110
 D906,963 S * 1/2021 Kato D13/110
 10,897,147 B2 * 1/2021 Stenger H02J 7/0029
 D913,920 S * 3/2021 Tachibana D13/110
 D913,922 S * 3/2021 You D13/110
 D916,655 S * 4/2021 Fang D13/108
 10,978,902 B2 * 4/2021 Ker H02J 50/005
 D920,229 S * 5/2021 Fonzo D13/103
 11,005,279 B2 * 5/2021 Miller H02J 7/0042

OTHER PUBLICATIONS

“Fanuc A06b-6079-H106 Revision H.” Jul. 7, 2015. Amazon.
https://www.amazon.com/Fanuc-A06b-6079-H106-Revision-Amplifier-283-325V/dp/B0115H2QMG/ref=sr_1_14?dchild=1&keywords=Servo+amplifier&qid=1622581323&sr=8-14#descriptionAnd-Details (Year: 2015).
 “OSD Audio 6 Zone 12-Channel Digital Amplifier.” Mar. 14, 2011. Amazon. https://www.amazon.com/OSD-Audio-MX1260-Universal-selectable/dp/B004S3PY9M/ref=sr_1_9?dchild=1&keywords=a06b-6132-h002+servo+amplifier+ecotech&qid=1622582105&s=electronics&sr=1-9 (Year: 2011).
 “4 Multi-Zone Stereo Amplifier Pyle PT8000CH.” Sep. 14, 2004. Amazon. https://www.amazon.com/dp/B092RV39W3/ref=sspa_dk_detail_3?psc=1&pd_rd_i=B092RV39W3&pd_rd_w=ohTJx&pf_rd_p=d99b04de-2aba-431e-aaa5-cb34a6a19561&pd_rd_wg=oxFIN&pf_rd_r=FZ8FHTQ0WA7M2BAX17NK&pd_rd (Year: 2004).
 An Office Action by the Korean Intellectual Property Office dated Oct. 14, 2019, which corresponds to Korean Design Application No. 2019-0027574 and is related to Design U.S. Appl. No. 29/695,141. †

* cited by examiner
 † imported from a related application

FIG. 1

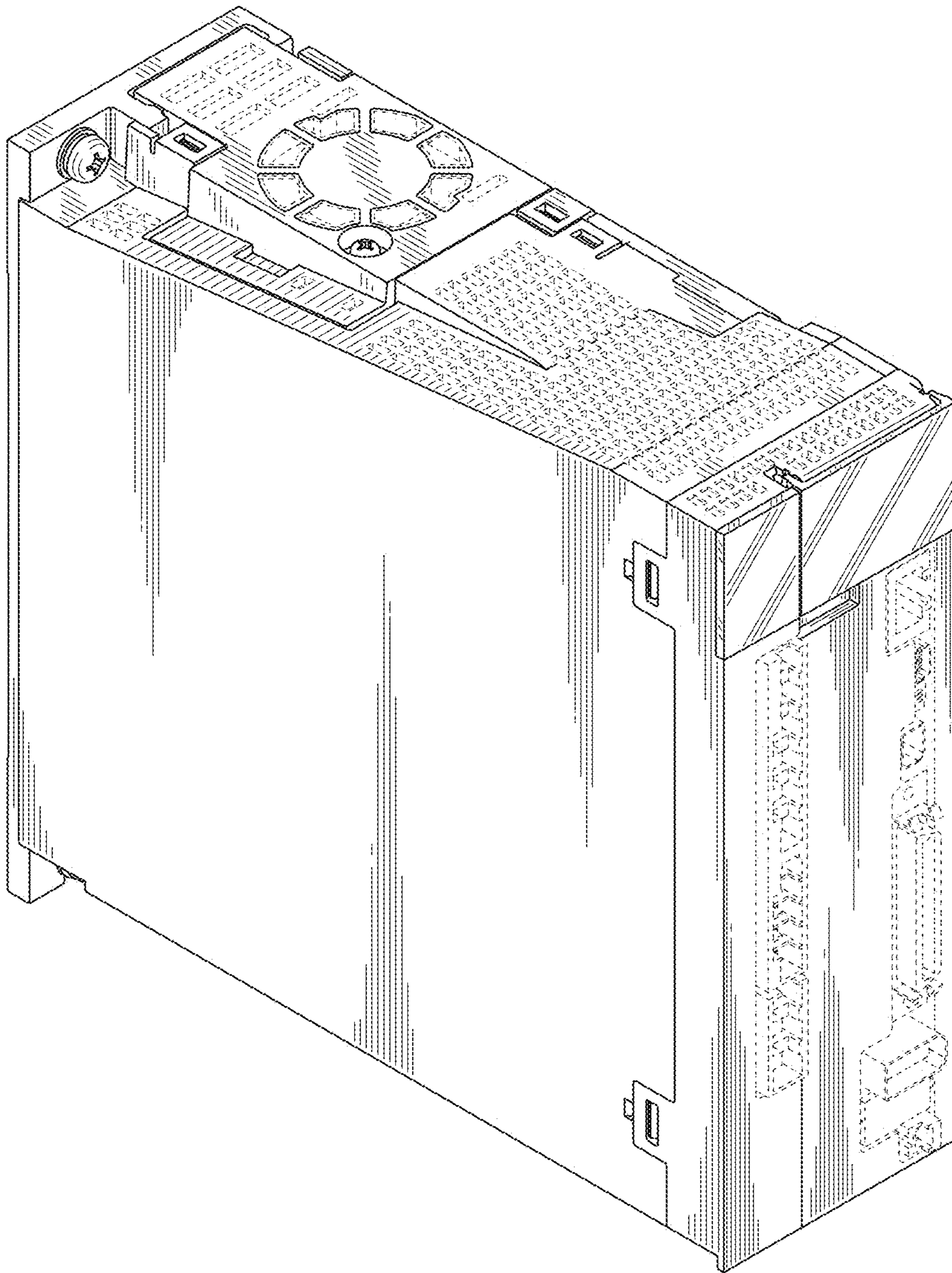


FIG. 2

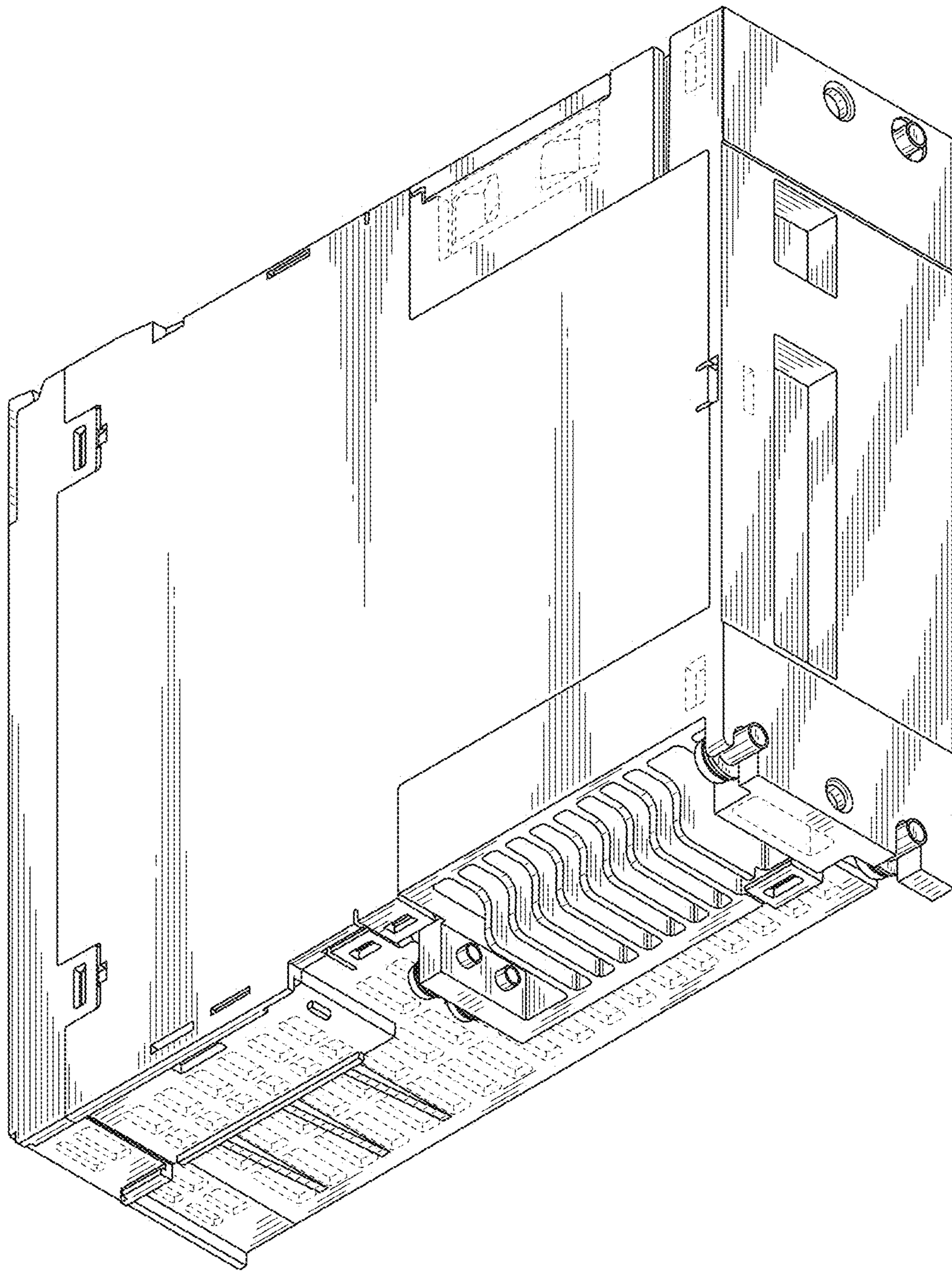


FIG. 3

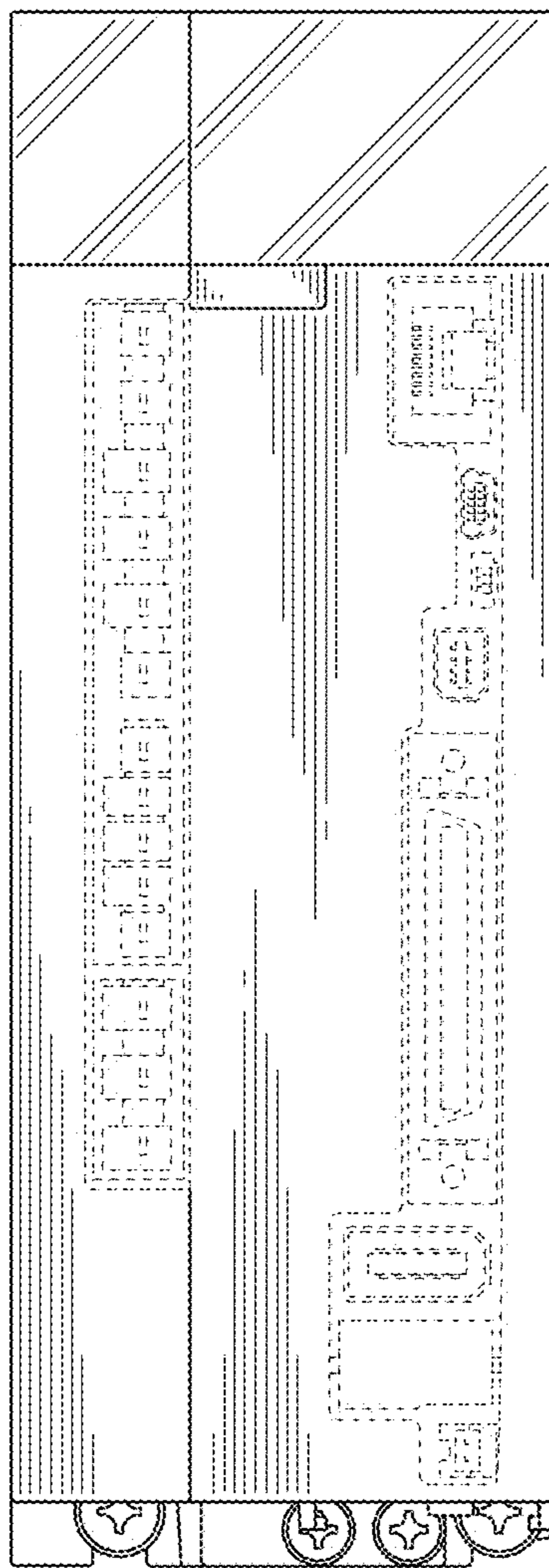


FIG. 4

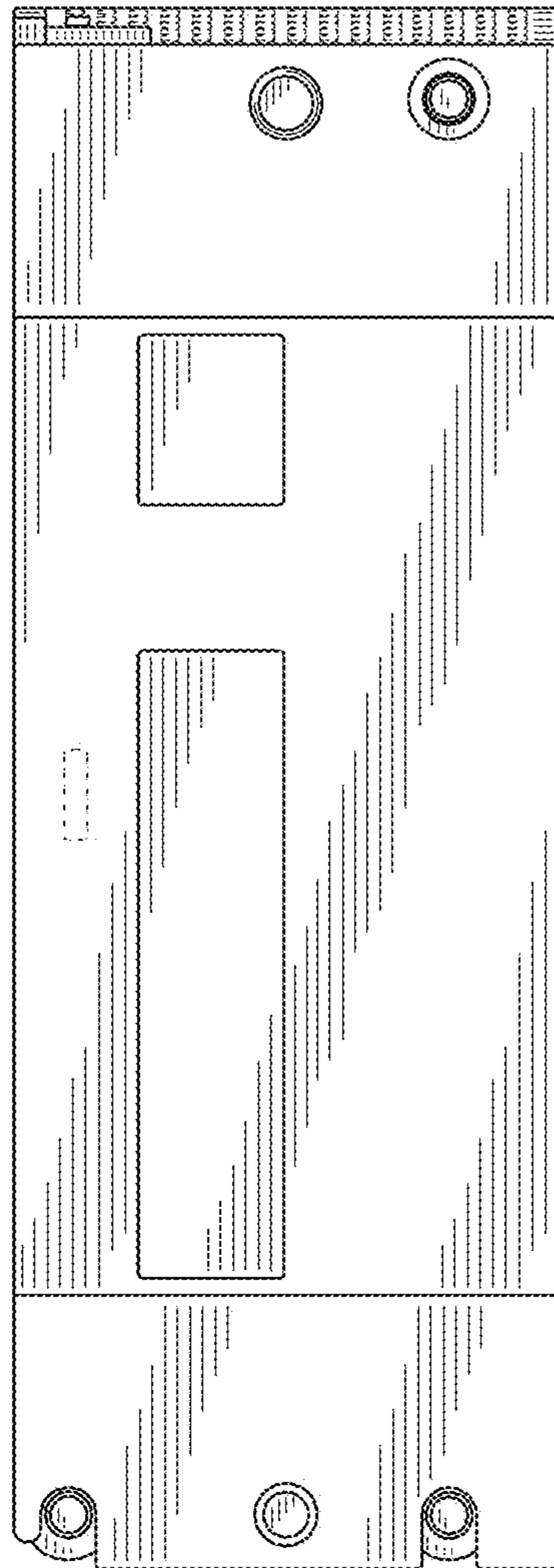


FIG. 5

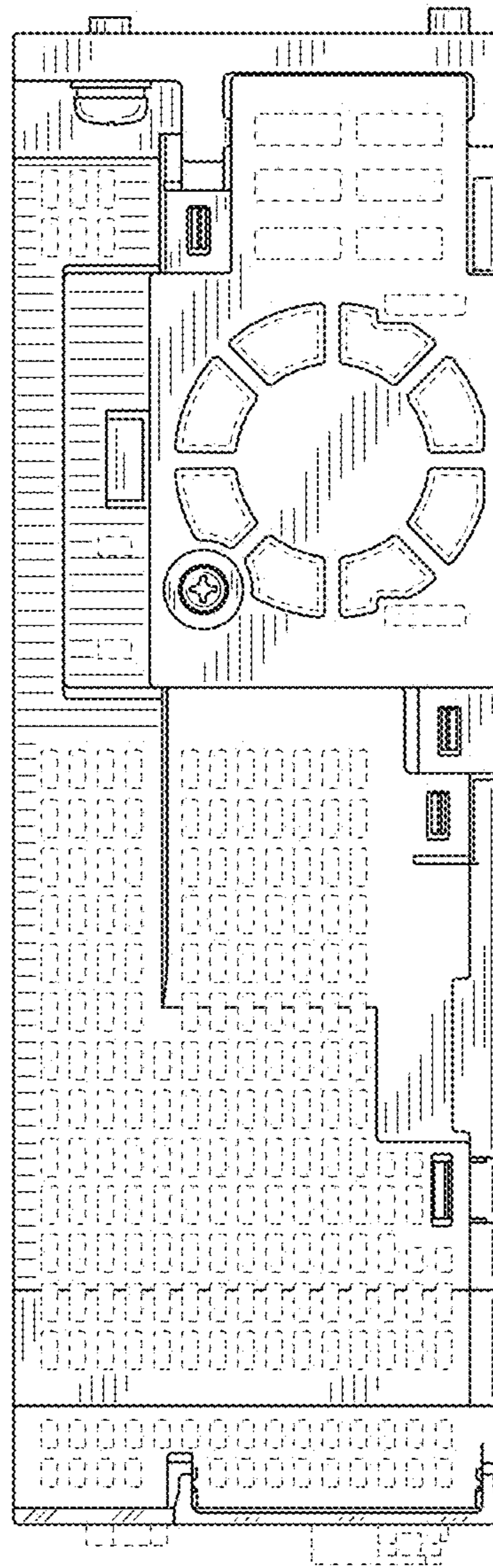


FIG. 6

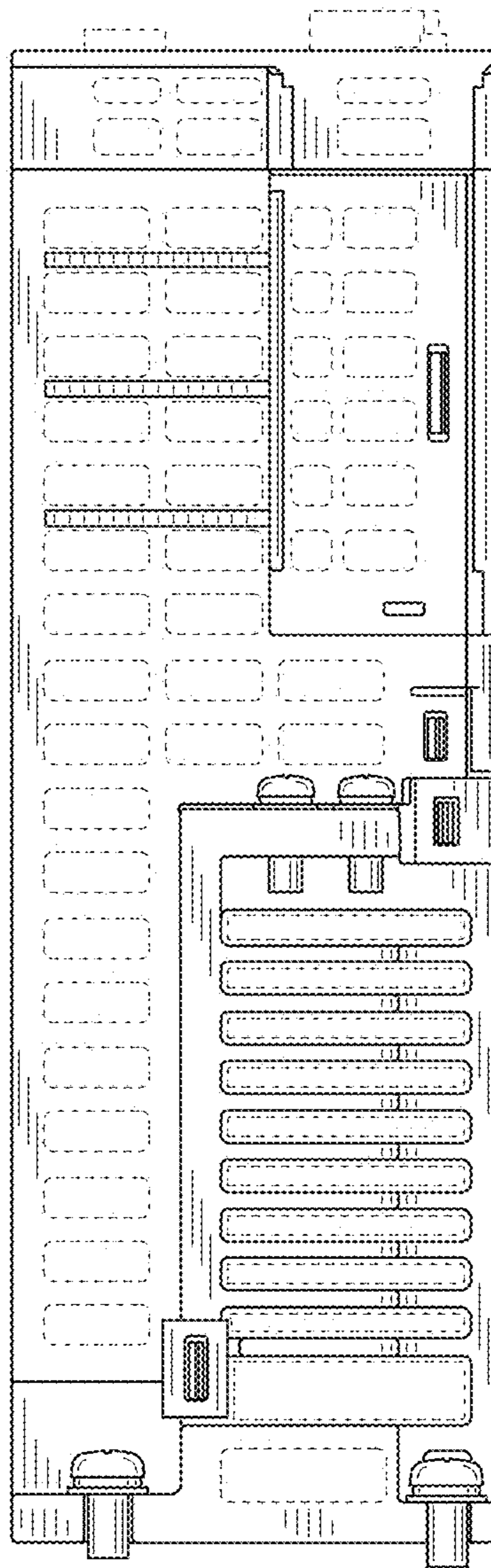


FIG. 7



FIG. 8

