



US00D975155S

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

(10) **Patent No.:** **US D975,155 S**

(45) **Date of Patent:** **** Jan. 10, 2023**

(54) **ROBOT ARM APPARATUS**

(71) Applicant: **THK CO., LTD.**, Tokyo (JP)

(72) Inventors: **Yoshimasa Endo**, Tokyo (JP); **Kenji Hidaka**, Tokyo (JP); **Daisuke Kawabata**, Tokyo (JP)

(73) Assignee: **THK CO., LTD.**, Tokyo (JP)

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

(21) Appl. No.: **29/823,832**

(22) Filed: **Jan. 20, 2022**

Related U.S. Application Data

(62) Division of application No. 29/691,967, filed on May 21, 2019, now Pat. No. Des. 946,068.

(30) **Foreign Application Priority Data**

Dec. 27, 2018 (JP) 2018-028723
Dec. 27, 2018 (JP) 2018-028724

(51) **LOC (14) Cl.** **15-99**

(52) **U.S. Cl.**
USPC **D15/199**

(58) **Field of Classification Search**
USPC D15/199; D21/199, 578-583, 621, 622;
D32/21; D34/34
CPC B25J 9/042; B25J 9/046; B25J 9/06; H01L
21/67766
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,273,506 A 6/1981 Thomson et al.
4,351,553 A * 9/1982 Rovetta B25J 15/0009
294/106
4,766,775 A 8/1988 Hodge

D359,296 S * 6/1995 Witherspoon D15/199
D604,752 S * 11/2009 Haag D15/199
D616,908 S * 6/2010 Labak D15/199
D712,447 S * 9/2014 He D15/199
D749,223 S * 2/2016 Vargas D24/185
9,254,566 B2 * 2/2016 Hashimoto B25J 11/0095
D802,041 S * 11/2017 He D15/199
D812,122 S * 3/2018 Clerc D15/199
D843,427 S * 3/2019 Medal D15/199
D865,828 S * 11/2019 Bogart D15/199
D868,129 S * 11/2019 Bogart D15/199
D869,108 S * 12/2019 Williams D32/21
D877,222 S * 3/2020 Abe D15/199
D894,983 S * 9/2020 Okada D15/199
D895,709 S * 9/2020 Okada D15/199

(Continued)

FOREIGN PATENT DOCUMENTS

JP 6-254788 A 9/1994
JP 9-323281 A 12/1997

(Continued)

Primary Examiner — Patricia A Palasik

(74) *Attorney, Agent, or Firm* — WHDA, LLP

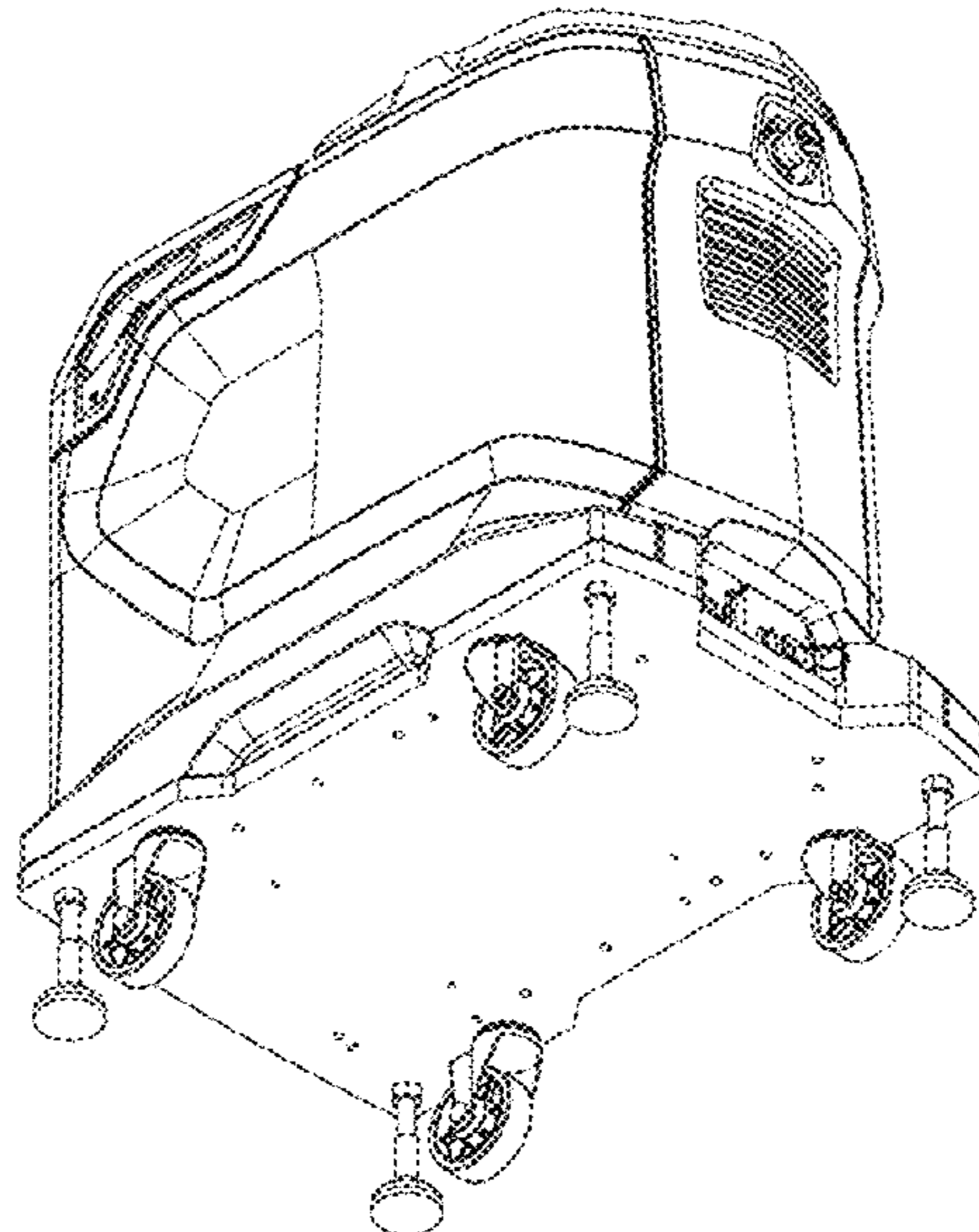
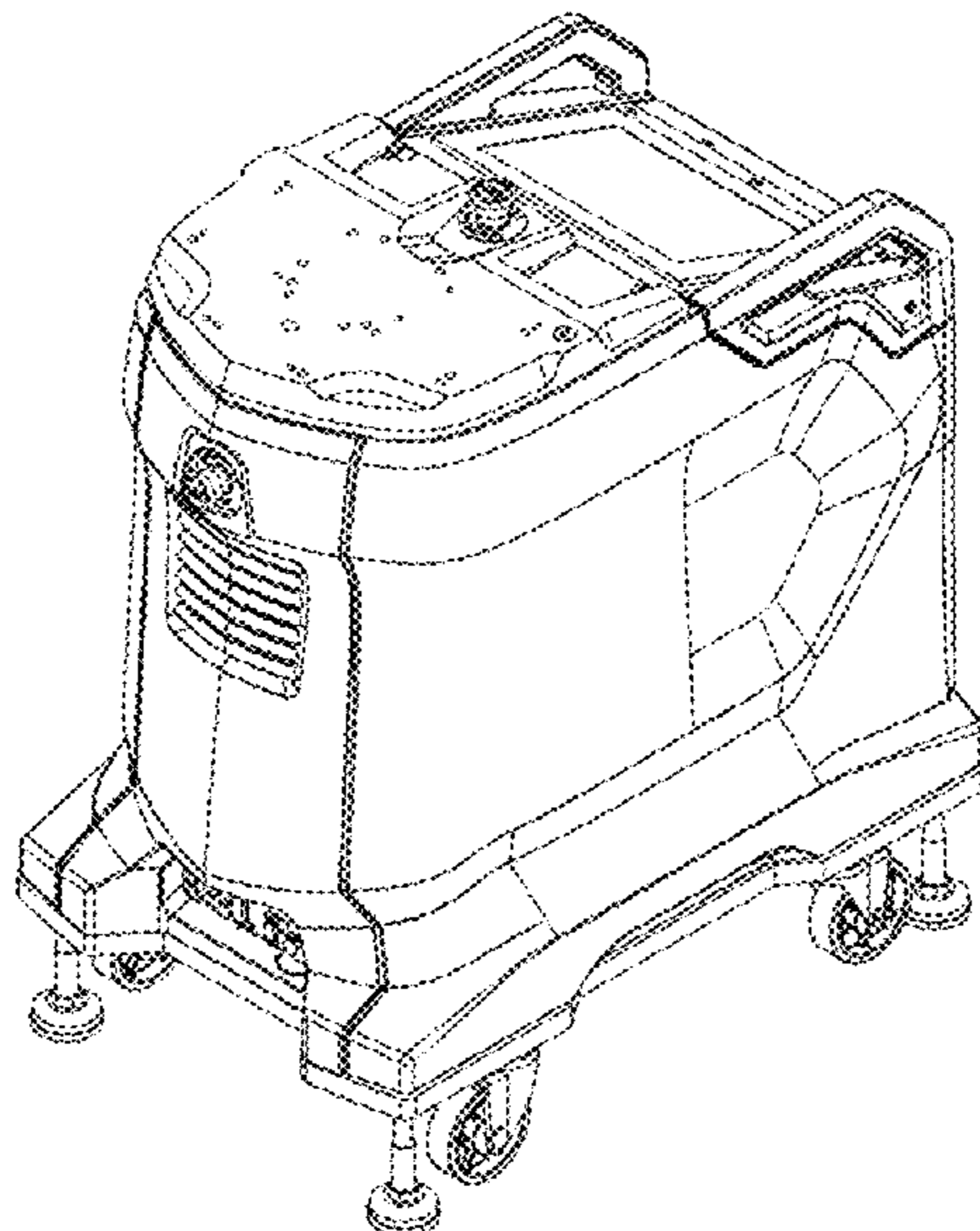
(57) **CLAIM**

The ornamental design for a robot arm apparatus, as shown and described.

DESCRIPTION

FIG. 1 is a perspective elevational view from a top-front-right direction of the robot arm apparatus;
FIG. 2 is a perspective elevational view from a bottom-front-left direction thereof;
FIG. 3 is a front elevational view thereof;
FIG. 4 is a rear elevational view thereof;
FIG. 5 is a top plan elevational view thereof;
FIG. 6 is a bottom elevational view thereof;
FIG. 7 is a right side elevational view thereof; and,
FIG. 8 is a left side elevational view thereof.

1 Claim, 8 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

D897,537	S	*	9/2020	Hulford	.....	D24/170
D899,531	S	*	10/2020	Lee	.....	D21/578
D903,214	S	*	11/2020	Williams	.....	D32/21
D912,115	S	*	3/2021	Rembisz	.....	D15/199
D912,119	S	*	3/2021	Rembisz	.....	D15/199
D914,780	S	*	3/2021	Hammers	.....	D15/199
D915,487	S	*	4/2021	Sell	.....	D15/199
D946,068	S	*	3/2022	Endo	.....	D15/199
2002/0060465	A1	*	5/2002	Laliberte	.....	B25J 15/0009 294/106
2016/0052137	A1	*	2/2016	Hyde	.....	A61G 5/047 701/24
2016/0107317	A1	*	4/2016	Hashimoto	.....	B25J 15/0014 414/744.2
2016/0327383	A1	*	11/2016	Becker	.....	G01B 11/005
2016/0332303	A1	*	11/2016	Kirihara	.....	B25J 9/1694
2017/0065355	A1	*	3/2017	Ross	.....	A61B 50/13

FOREIGN PATENT DOCUMENTS

JP	2006-102920	A	4/2006
JP	2010064155	A	3/2010
JP	2012-55999	A	3/2012
JP	2018-192612	A	12/2018
JP	2019-531908	A	11/2019

* cited by examiner

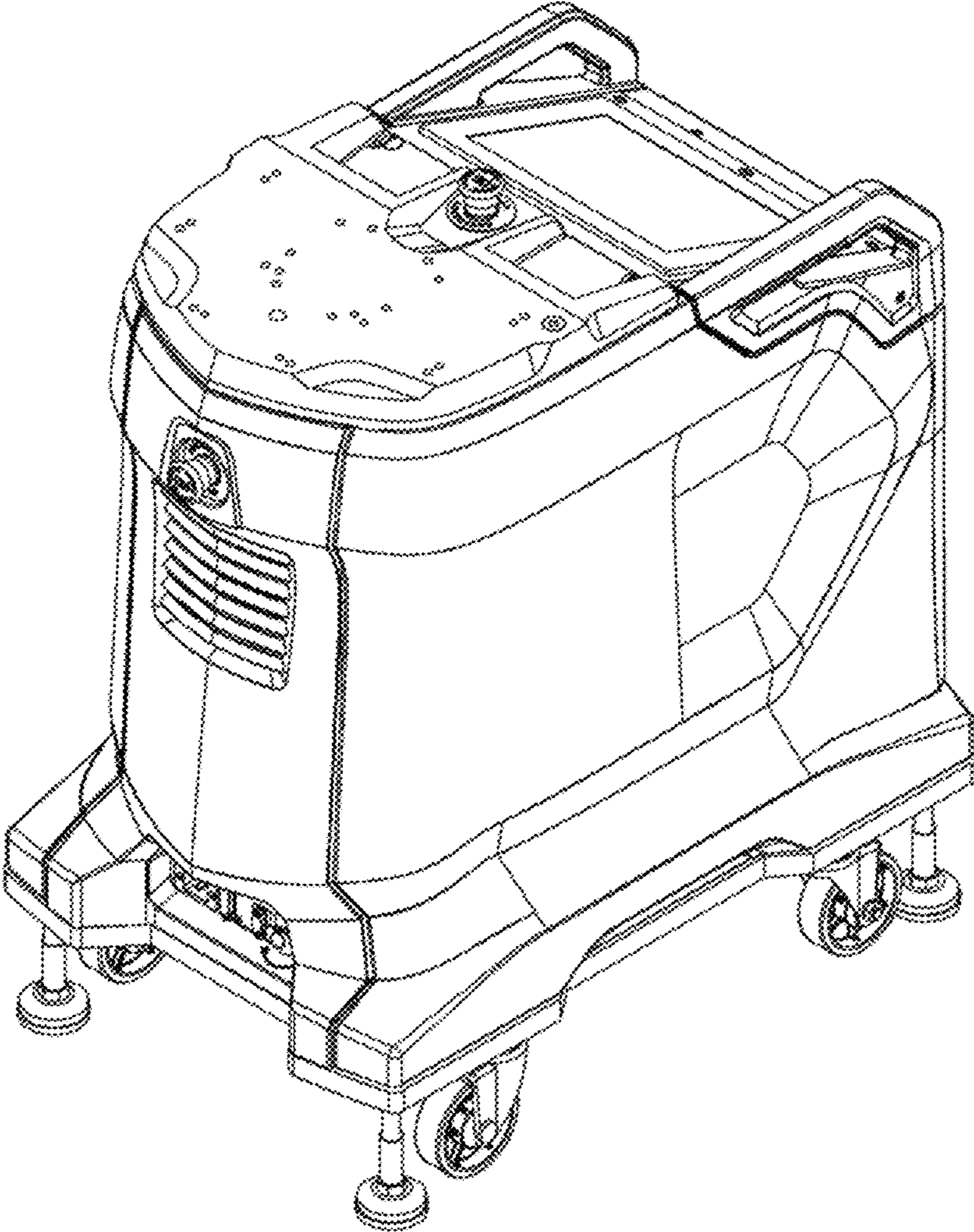


FIG. 1

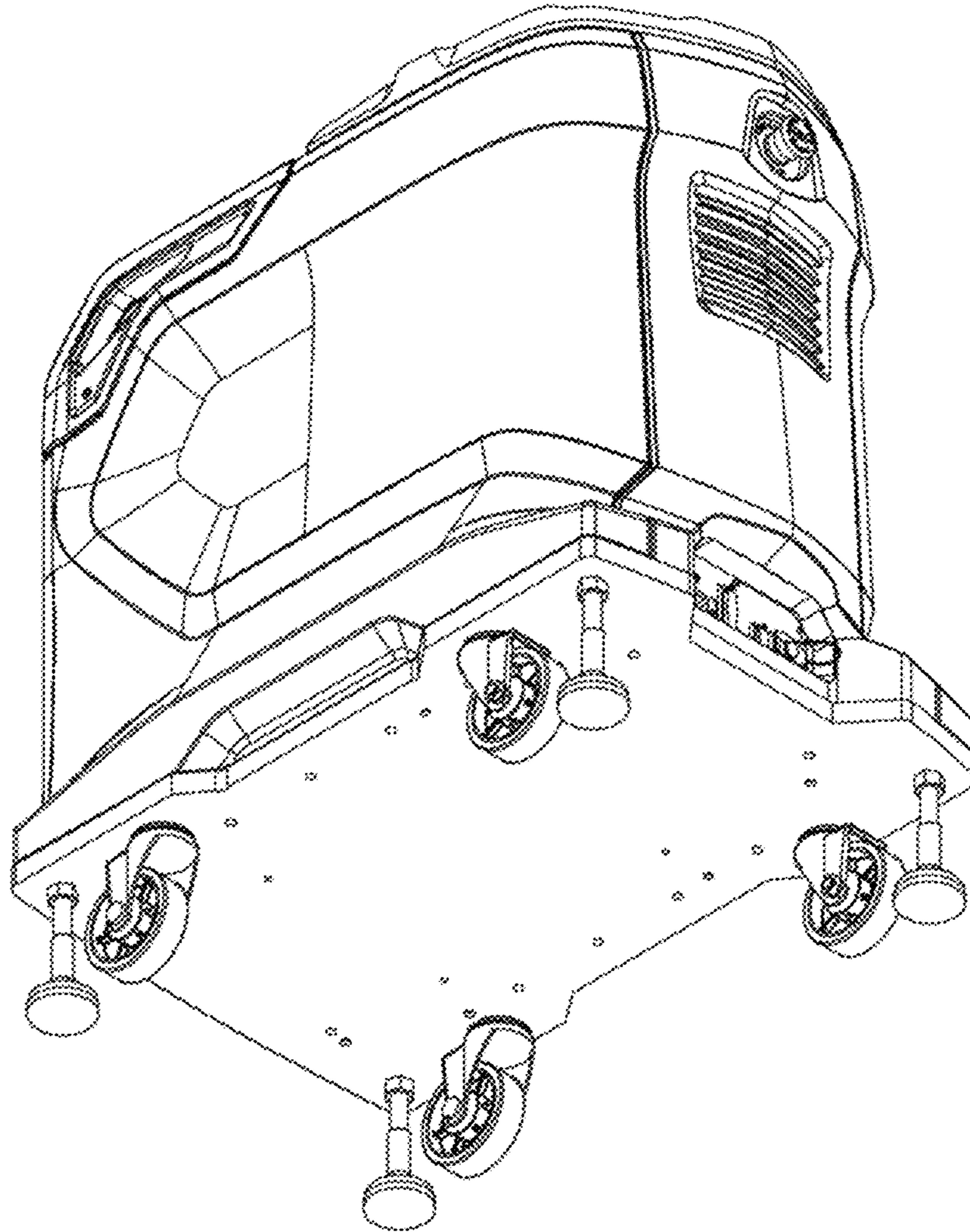


FIG. 2

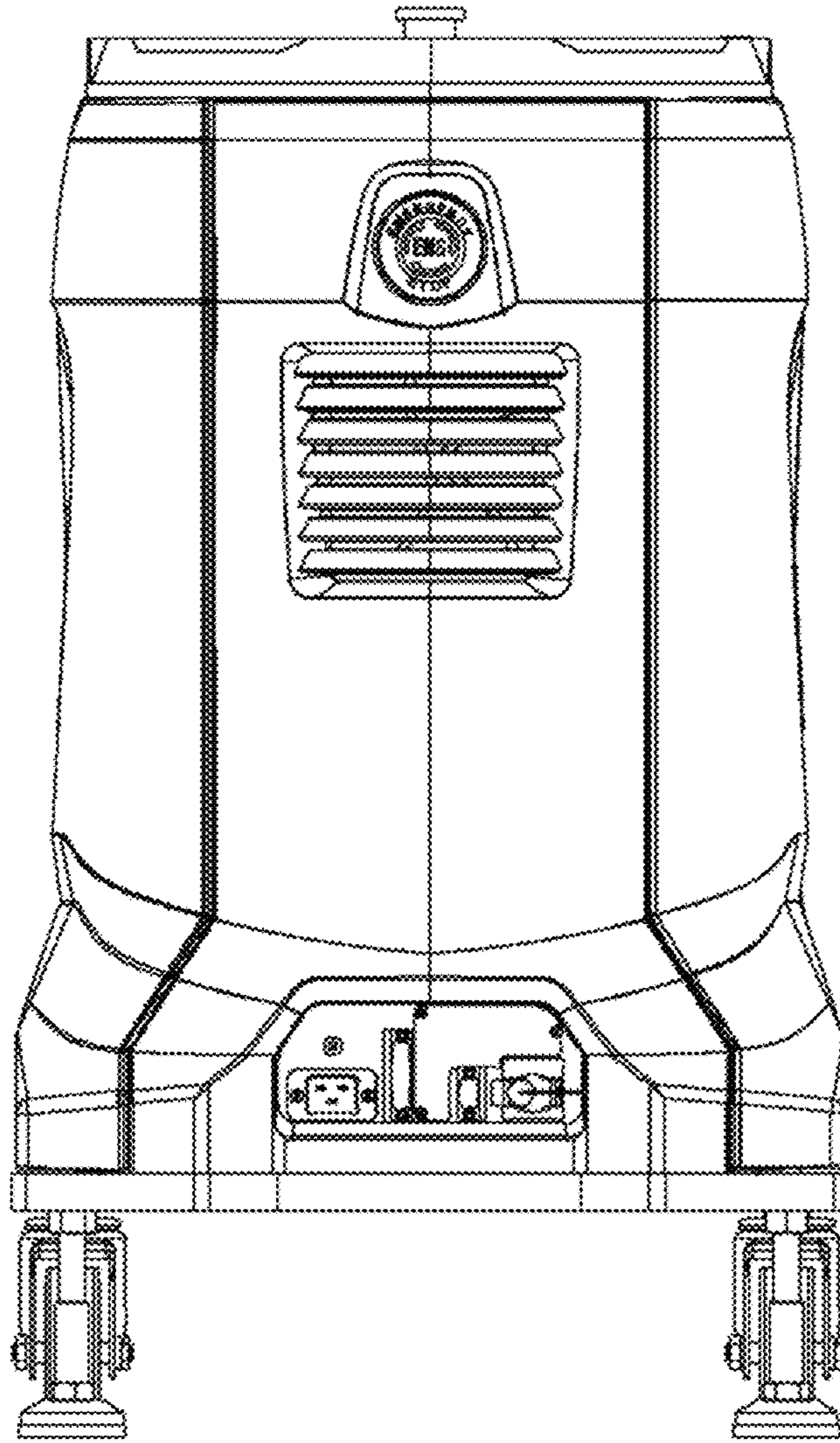


FIG. 3

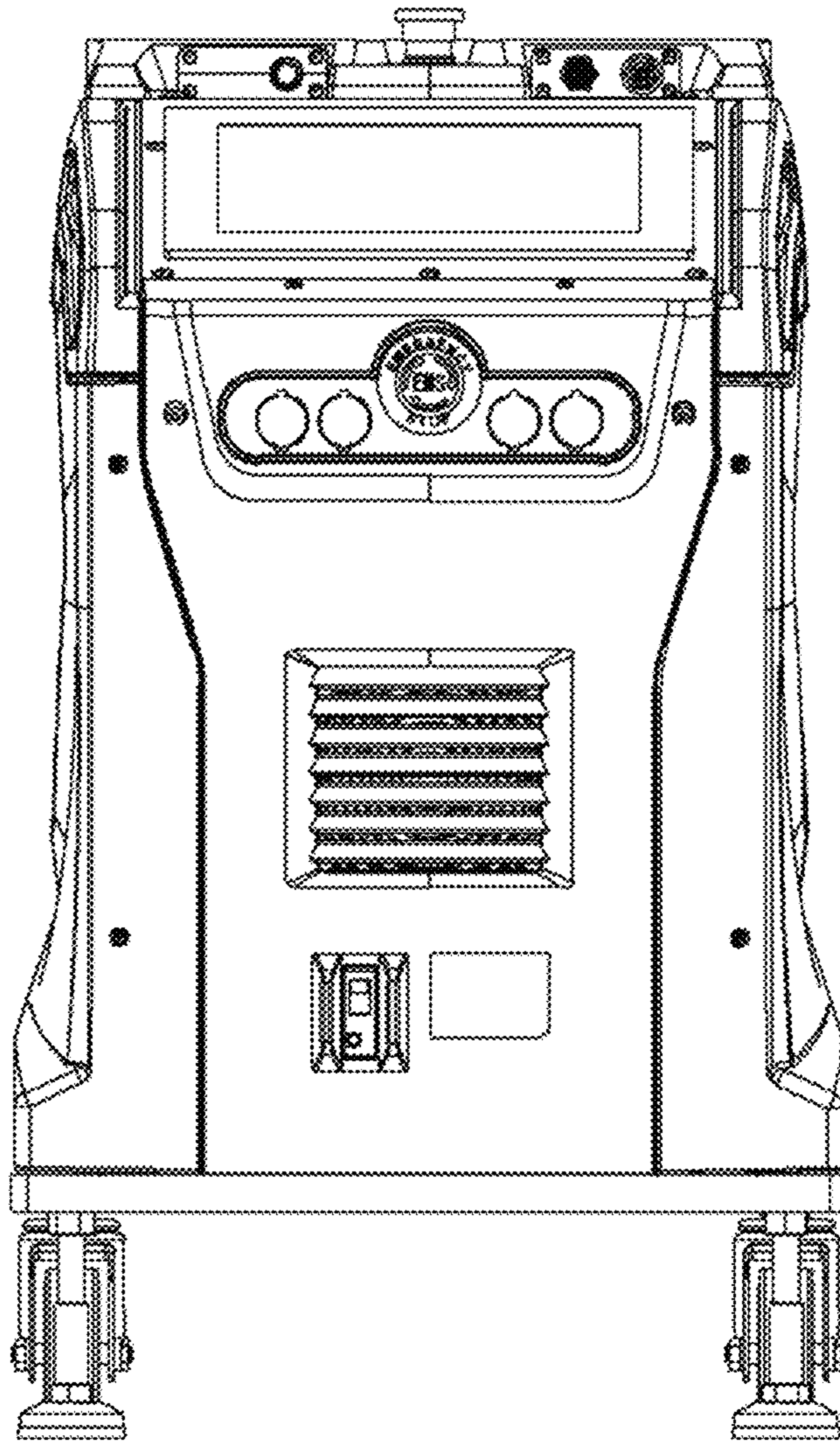


FIG. 4

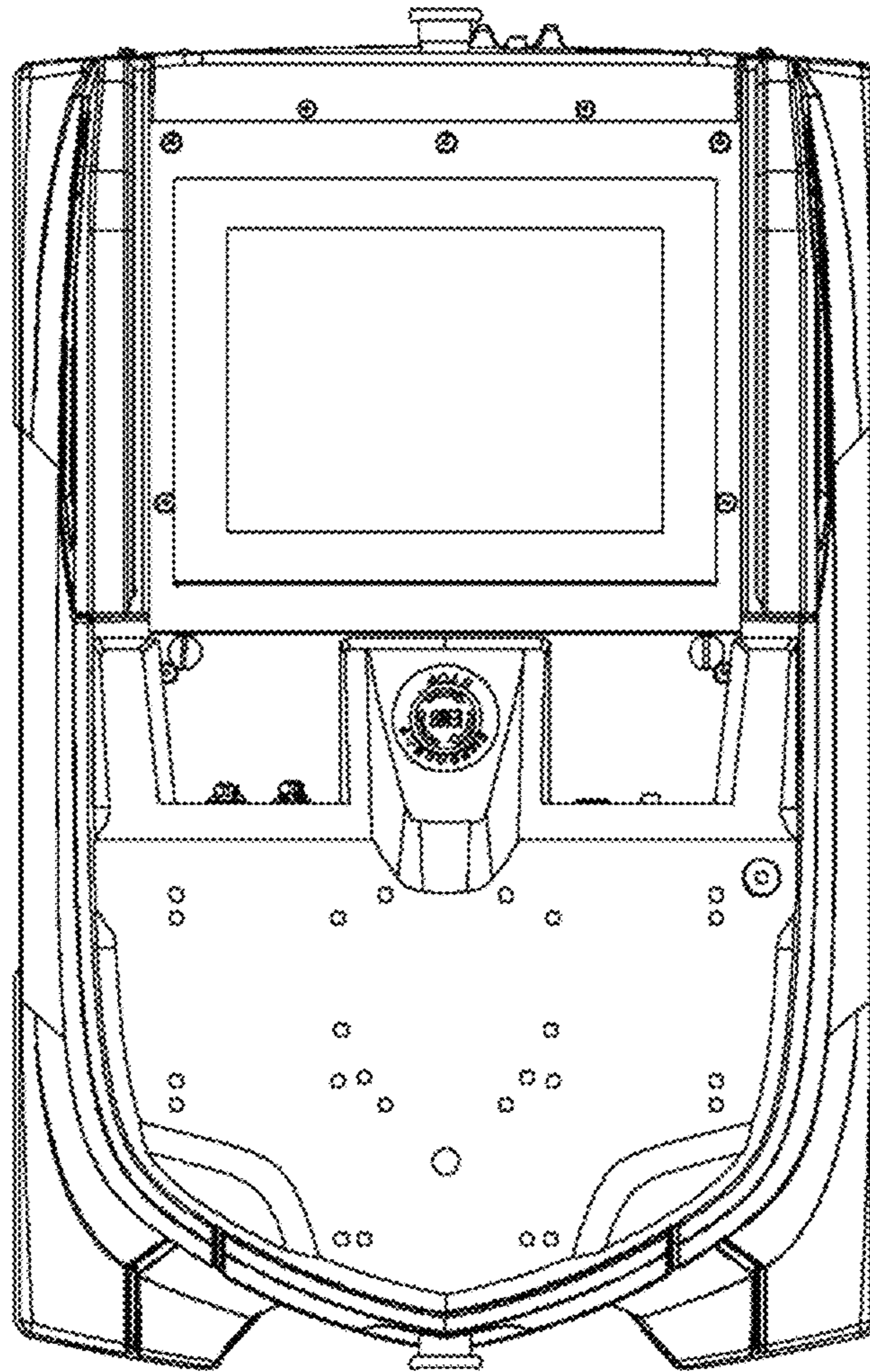


FIG. 5

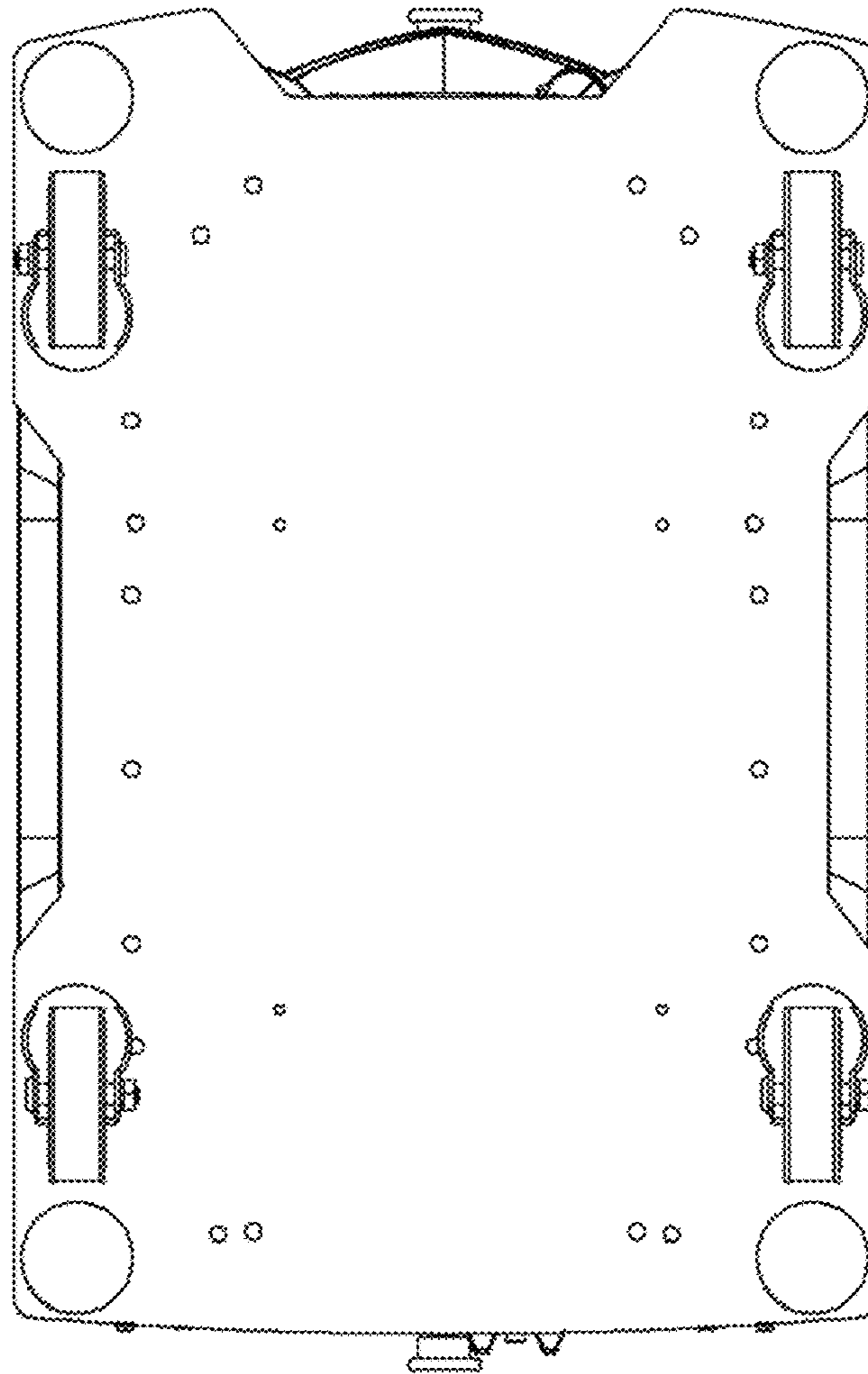


FIG. 6

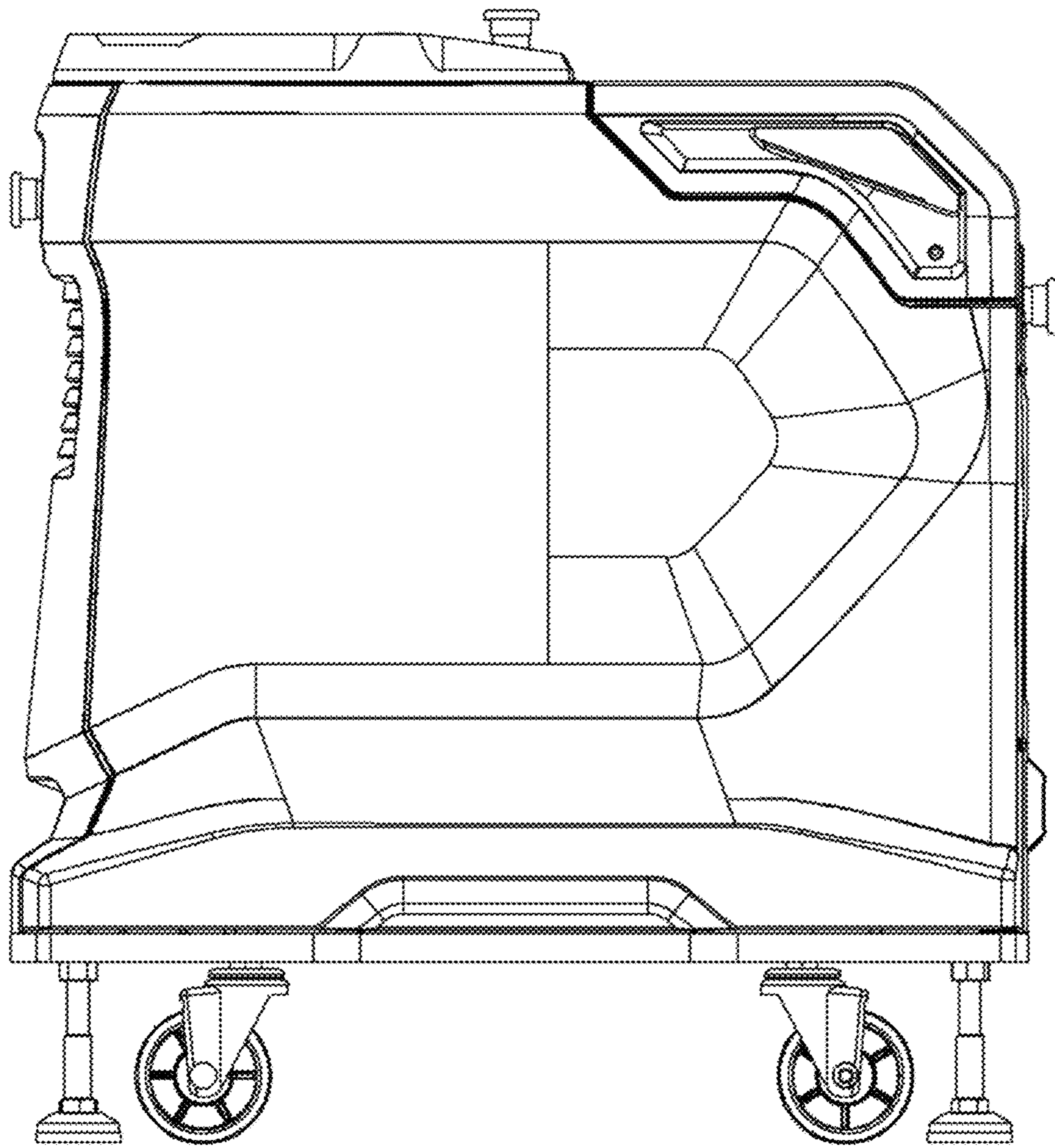


FIG. 7

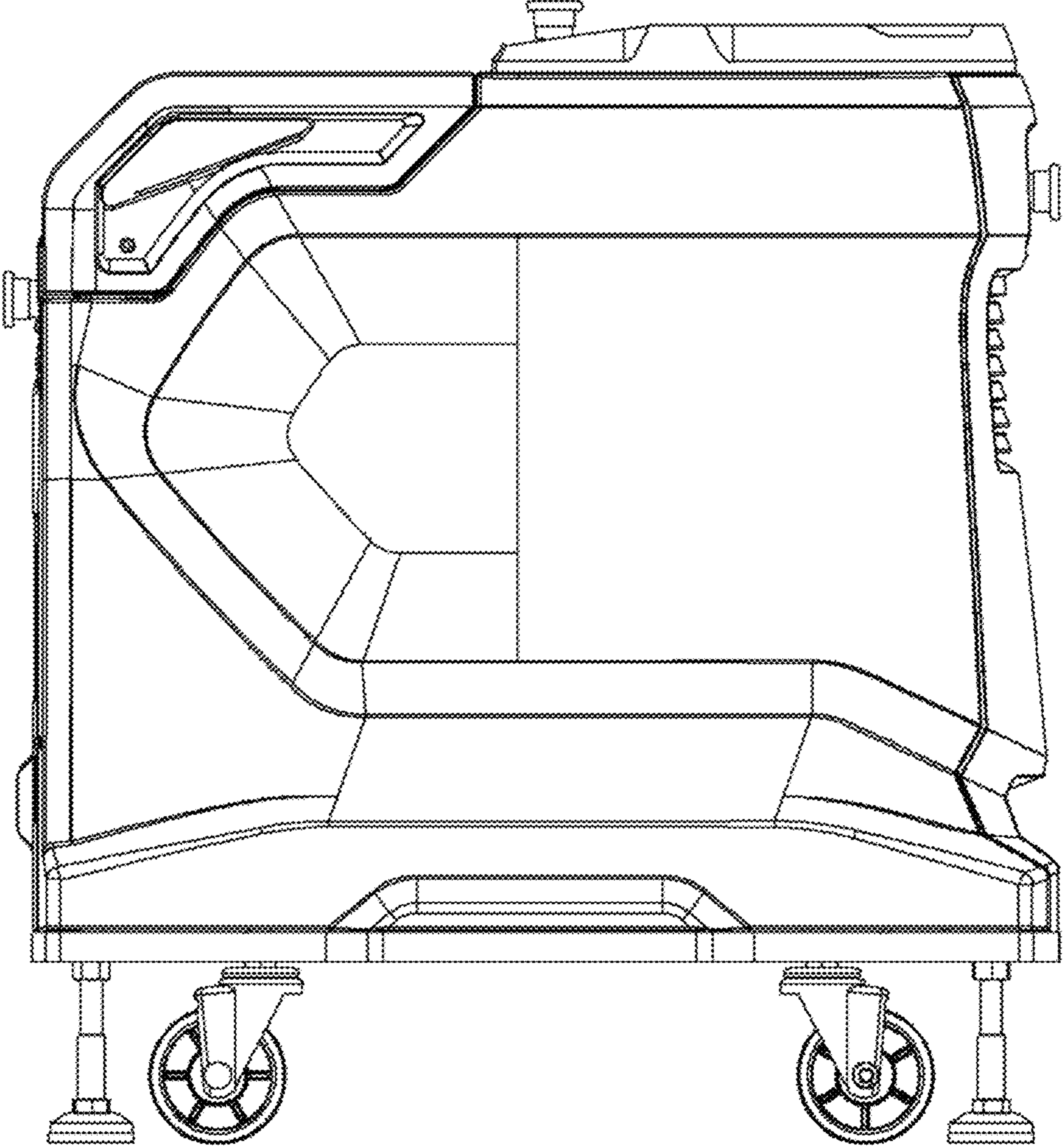


FIG. 8