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(12) **United States Design Patent** (10) **Patent No.:** **US D856,897 S**
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(54) **VERTICAL TAKEOFF AND LANDING UNMANNED AERIAL VEHICLE**

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

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(52) **U.S. Cl.**
USPC **D12/326; D12/16.1**

(58) **Field of Classification Search**
USPC D12/16.1, 319-345; D21/436, 438, 441, D21/442, 443, 444, 447, 448, 449, 450, D21/451, 452, 454
CPC ... B64C 29/00; B64C 2201/141; B64C 27/24; B64C 27/30; B64C 39/04; B64C 29/0033; B64C 29/0025

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

D149,848 S *	6/1948	Struck	.....	D21/447
D172,465 S *	6/1954	Del Mar	.....	D12/333
D190,534 S *	6/1961	Smolinski	.....	D12/330
3,030,051 A *	4/1962	Kerry	.....	B64C 29/0075
				244/23 R
D194,445 S *	1/1963	Walker	.....	446/230
D198,881 S *	8/1964	King	.....	D12/320
3,369,771 A *	2/1968	Walley	.....	B64D 5/00
				244/159.3

D211,915 S *	8/1968	Raymes	.....	244/159.3
D213,510 S *	3/1969	Kukon	.....	D12/333
D219,042 S *	10/1970	King	.....	D21/448
D220,983 S *	6/1971	Webb	.....	244/155 R
D220,985 S *	6/1971	Webb	.....	244/155 R
3,625,459 A *	12/1971	Brown	.....	B64C 39/10
				244/35 R
D227,606 S *	7/1973	Rellis	.....	D12/333
D235,769 S *	7/1975	Sather	.....	D12/16.1
D237,291 S *	10/1975	Meffert	.....	D12/333
D244,265 S *	5/1977	Opfer	.....	D12/333

(Continued)

OTHER PUBLICATIONS

Google scraps VTOL design, back to the drawing board by Chris Anderson. dated Mar. 18, 2015. found online [Nov. 28, 2018] <https://diydrones.com/profiles/blogs/google-scraps-vtol-design-back-to-the-drawing-board>.*

(Continued)

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(57) **CLAIM**

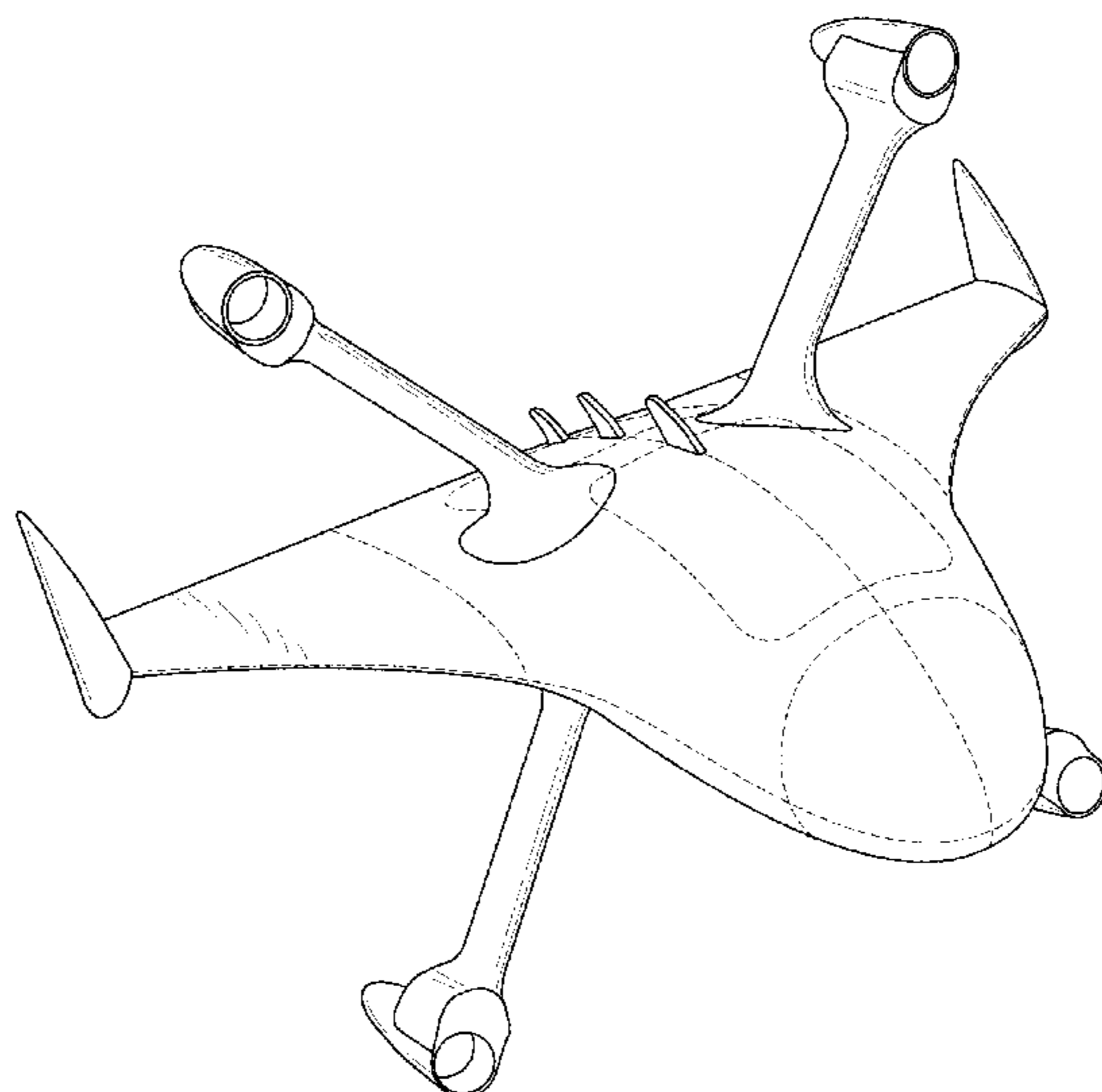
The design for a VTOL UAV, as shown and described.

DESCRIPTION

FIG. 1 is a front view of a VTOL UAV, showing the new design;
FIG. 2 is a side view of the design;
FIG. 3 is a rear view of the design;
FIG. 4 is a top view of the design;
FIG. 5 is an isometric view of the design;
FIG. 6 is an isometric view of the design; and,
FIG. 7 is a bottom view of the design.

The broken lines in the drawings represent seam lines of the vertical takeoff and landing unmanned aerial vehicle that form no part of the claimed design: all other broken lines are for environmental purposes and form no part of the claim.

1 Claim, 7 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

D248,745 S * 8/1978 Jager D12/333
 D277,976 S * 3/1985 Holloway D12/16.1
 D278,700 S * 5/1985 Powers D12/319
 D281,338 S * 11/1985 Gorick D21/449
 D281,680 S * 12/1985 Henderson D12/319
 D314,366 S * 2/1991 Waaland 244/36
 5,026,313 A * 6/1991 Meyer A63H 27/02
 446/64
 D319,041 S * 8/1991 Phillips 244/36
 5,090,636 A * 2/1992 Sadowski B64C 39/10
 244/16
 D326,081 S * 5/1992 Cathers D12/333
 D342,717 S * 12/1993 Mrdeza D12/319
 5,312,069 A * 5/1994 Bollinger F02K 3/068
 244/12.3
 5,407,150 A * 4/1995 Sadleir B64C 29/0025
 244/12.4
 D362,234 S * 9/1995 Urie, Jr. D12/320
 D363,696 S * 10/1995 Kroo D12/331
 D365,545 S * 12/1995 Wainfan D12/331
 D371,536 S * 7/1996 Jones D12/333
 D382,851 S * 8/1997 Knutson D12/319
 D394,039 S * 5/1998 Cummings D12/319
 D396,685 S * 8/1998 Baumgartner D12/320
 D396,842 S * 8/1998 Jones D12/333
 D417,639 S * 12/1999 Carichner D12/16.1
 D418,840 S * 1/2000 Cota D12/333
 D419,278 S * 1/2000 Knutson D21/448
 D428,381 S * 7/2000 Hartmann D12/332
 D460,126 S * 7/2002 Zweiback D21/398
 D467,217 S * 12/2002 Andreyko D12/319
 D468,255 S * 1/2003 Gopaldaswami D12/319
 D475,340 S * 6/2003 Arata D12/319
 D476,943 S * 7/2003 Reinhard D12/319
 D477,806 S * 7/2003 Gopaldaswami D12/319
 D486,775 S * 2/2004 Reinhard D12/319
 D486,776 S * 2/2004 Carr D12/319
 D488,426 S * 4/2004 Hall D12/319
 D489,315 S * 5/2004 Dauvergne D12/319
 D499,689 S * 12/2004 Han D12/319
 D501,178 S * 1/2005 Han D12/319
 D503,141 S * 3/2005 Schafroth D12/319
 6,908,360 B1 * 6/2005 Christensen A63B 65/08
 446/236
 D508,013 S * 8/2005 Rihn D12/319
 D526,951 S * 8/2006 Houck, II D12/319
 D543,494 S * 5/2007 Hall D12/319
 D559,761 S * 1/2008 Au D12/319
 D559,762 S * 1/2008 Au D12/319
 D583,295 S * 12/2008 Au D12/343
 D588,519 S * 3/2009 Westra D12/319
 D588,976 S * 3/2009 Westra D12/319

D597,472 S * 8/2009 Cazals D12/319
 D616,352 S * 5/2010 Schafroth D12/319
 D616,804 S * 6/2010 Manley D12/319
 D616,805 S * 6/2010 Zha D12/343
 D626,490 S * 11/2010 Imel D12/319
 D627,404 S * 11/2010 Suzuki D12/319
 D635,083 S * 3/2011 DeLaurier D12/319
 D677,613 S * 3/2013 Luther D12/319
 D697,019 S * 1/2014 Friesel D12/319
 D708,563 S * 7/2014 Colten D12/319
 D709,430 S * 7/2014 Schwaiger D12/16.1
 D734,402 S * 7/2015 Reznik D12/16.1
 D738,438 S * 9/2015 Cummings D21/447
 D763,733 S * 8/2016 Gattelli D12/16.1
 D783,453 S * 4/2017 Klick D12/16.1
 D787,983 S * 5/2017 Fargeau D12/16.1
 D795,160 S * 8/2017 Koppenwallner D12/343
 D799,402 S * 10/2017 Cummings D12/327
 D801,856 S * 11/2017 Zhou D12/16.1
 D803,724 S * 11/2017 Zhou D12/16.1
 D807,809 S * 1/2018 Suzuki D12/344
 D807,966 S * 1/2018 Manzoni D21/447
 D808,328 S * 1/2018 Ivans D12/328
 9,878,788 B2 * 1/2018 Blue B64C 3/38
 D810,621 S * 2/2018 Sadek D12/16.1
 D810,653 S * 2/2018 Hu D12/327
 D813,143 S * 3/2018 Belik D12/326
 D813,956 S * 3/2018 McConville D21/447
 2015/0053824 A1 * 2/2015 De Smet B64C 39/00
 244/175
 2015/0225079 A1 * 8/2015 Starck B64D 27/16
 244/12.5
 2018/0039272 A1 * 2/2018 Seydoux B64C 39/024

OTHER PUBLICATIONS

Design of a multi-rotor VTOL UAV and docking station for automated aerial by Bart Theys.(inventor) dated Jul. 14, 2014. found online [Jan. 28, 2018] <https://diydrones.com/profiles/blogs/design-of-a-multi-rotor-vtol-uav-and-docking-station-for?id=705844%3ABlogPost%3A1722000&page=5>.*

VertiKUL 2 our second generation of transitioning VTOL UAV by Bart Theys (inventor). dated Sep. 25, 2015. found online [Nov. 28, 2018] <https://diydrones.com/profiles/blogs/vertikul-2-our-second-generation-of-transitioning-vtol-uav-for>.*

CargoCopter by Bart Theys (inventor). website 2018. found online [Nov. 28, 2018] <http://cargocopter.be/index.html>.*

Meet CargoCopter: our latest generation of high-speed, long-range drones by Bart Theys. (inventor) dated May 29, 2017. found online [Dec. 10, 2018] <https://diydrones.com/profiles/blogs/meet-cargocopter-our-latest-generation-of-high-speed-long-range>.*

* cited by examiner

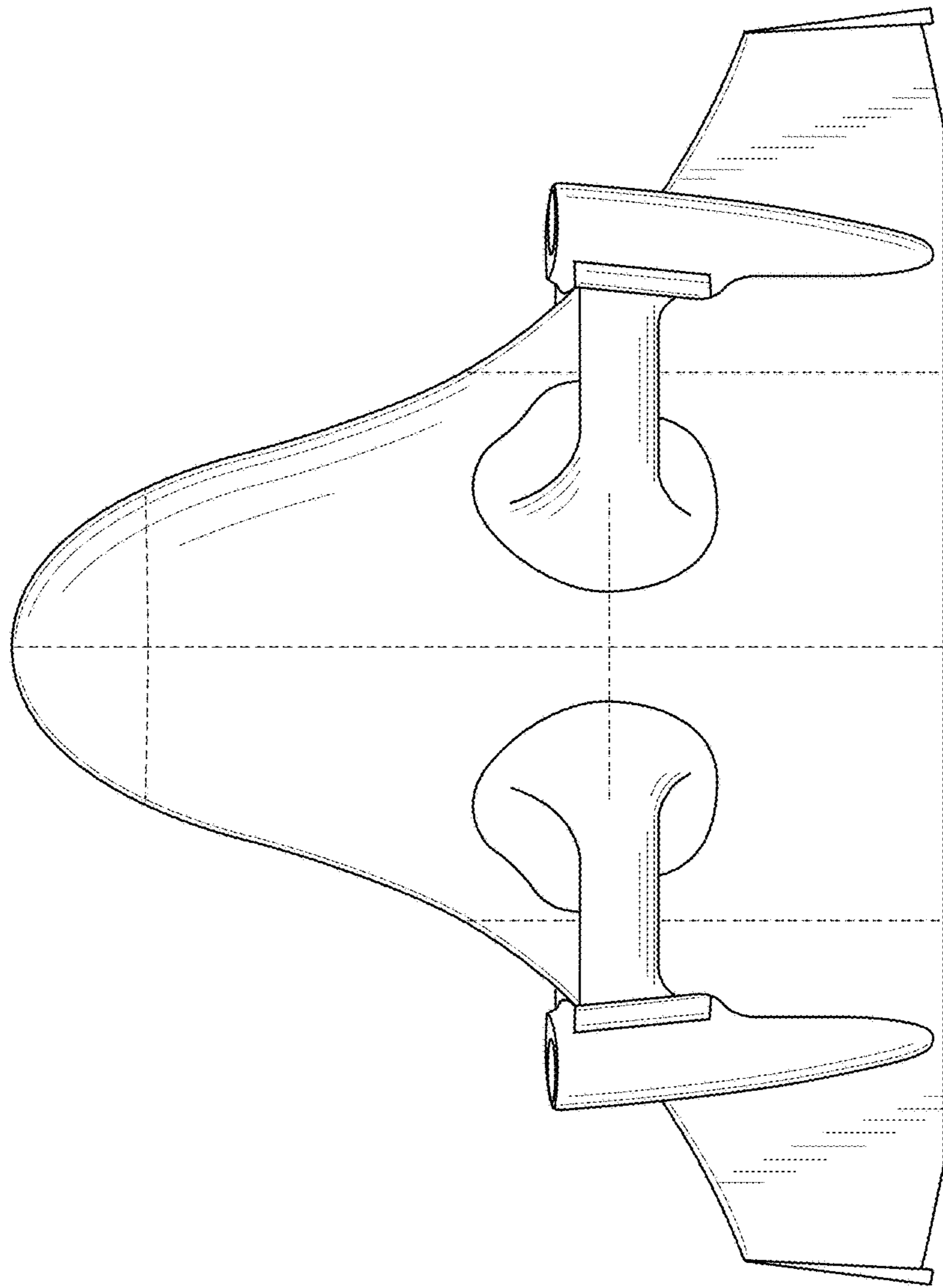


FIG. 1

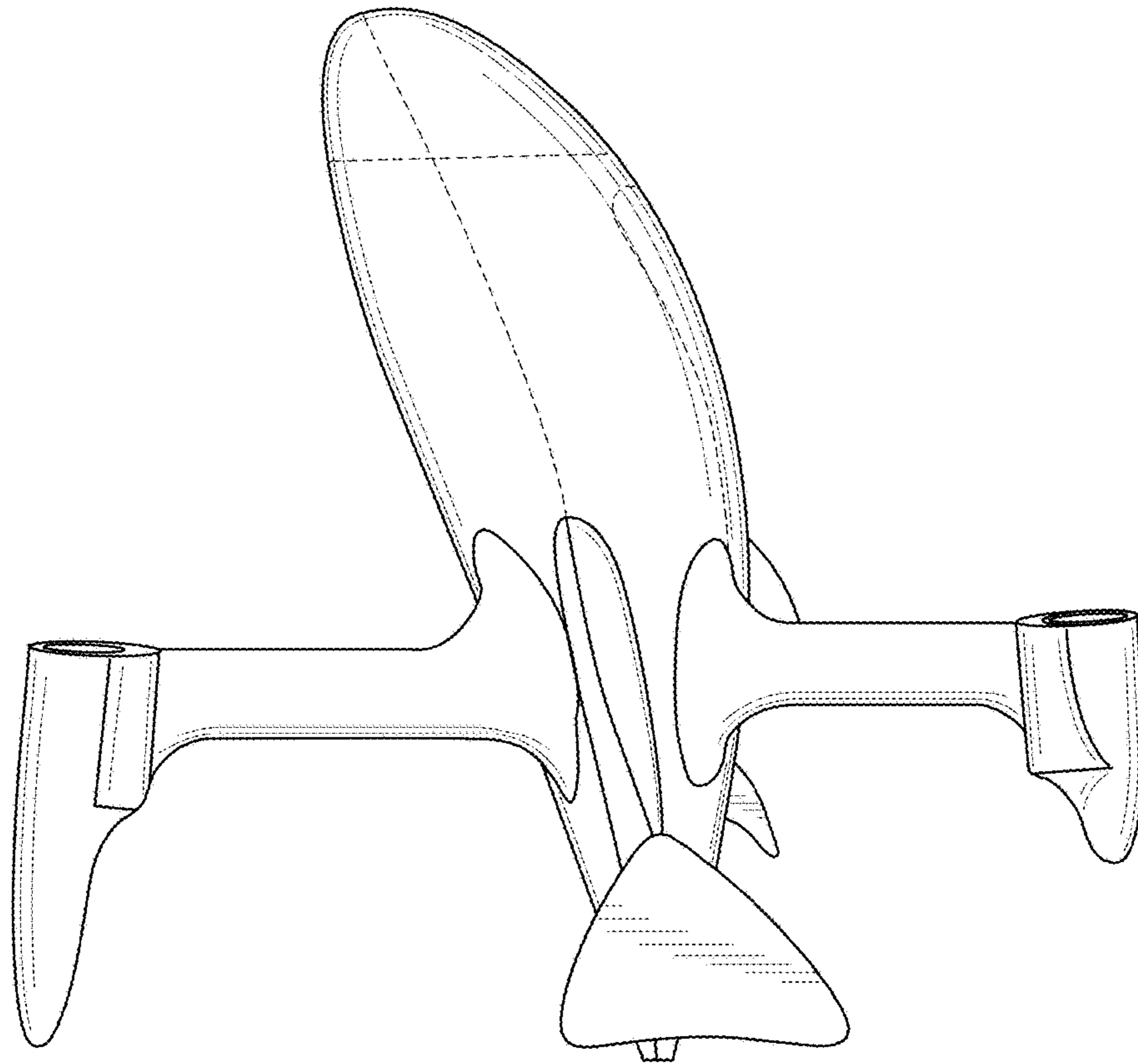


FIG. 2

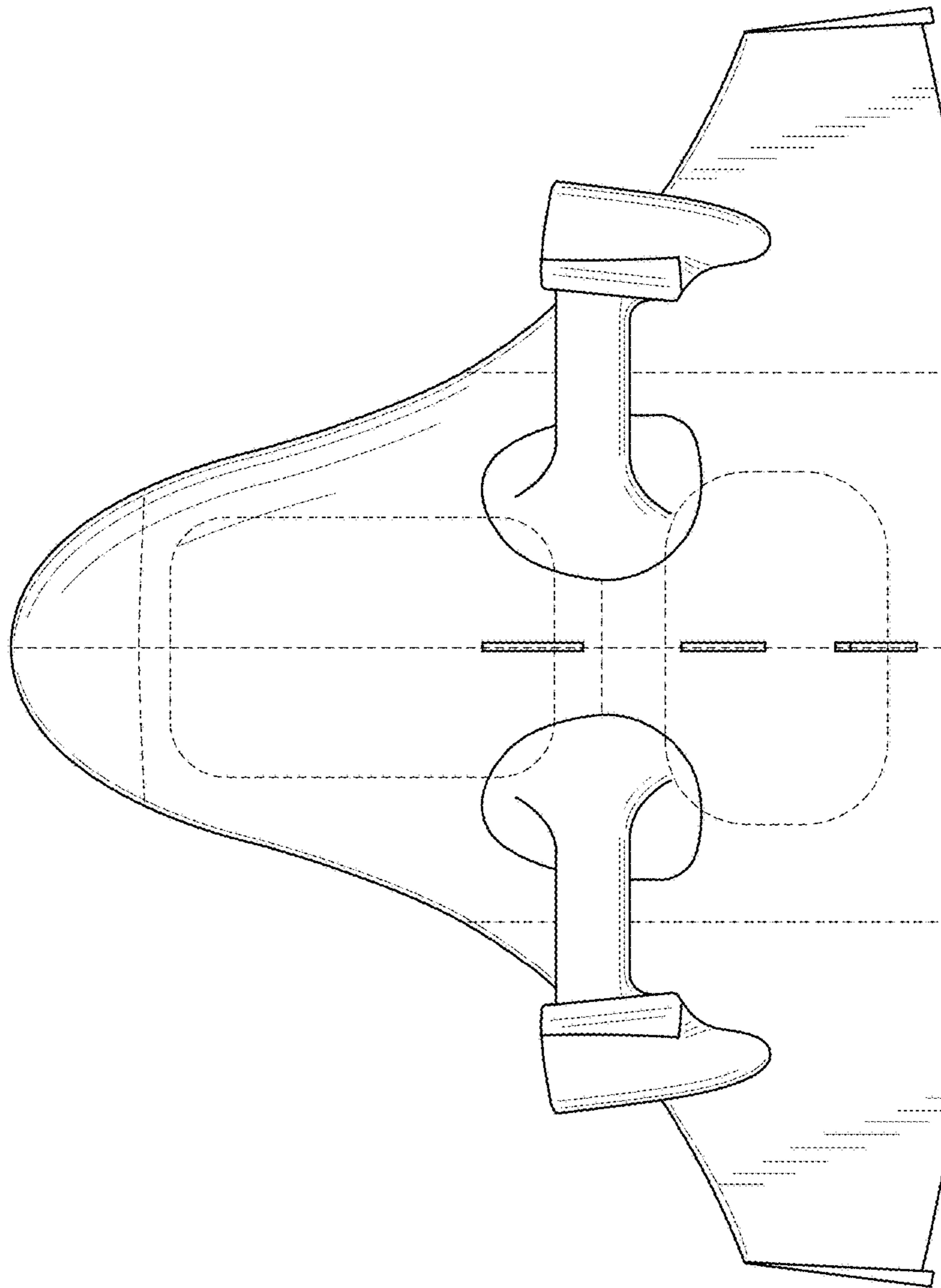


FIG. 3

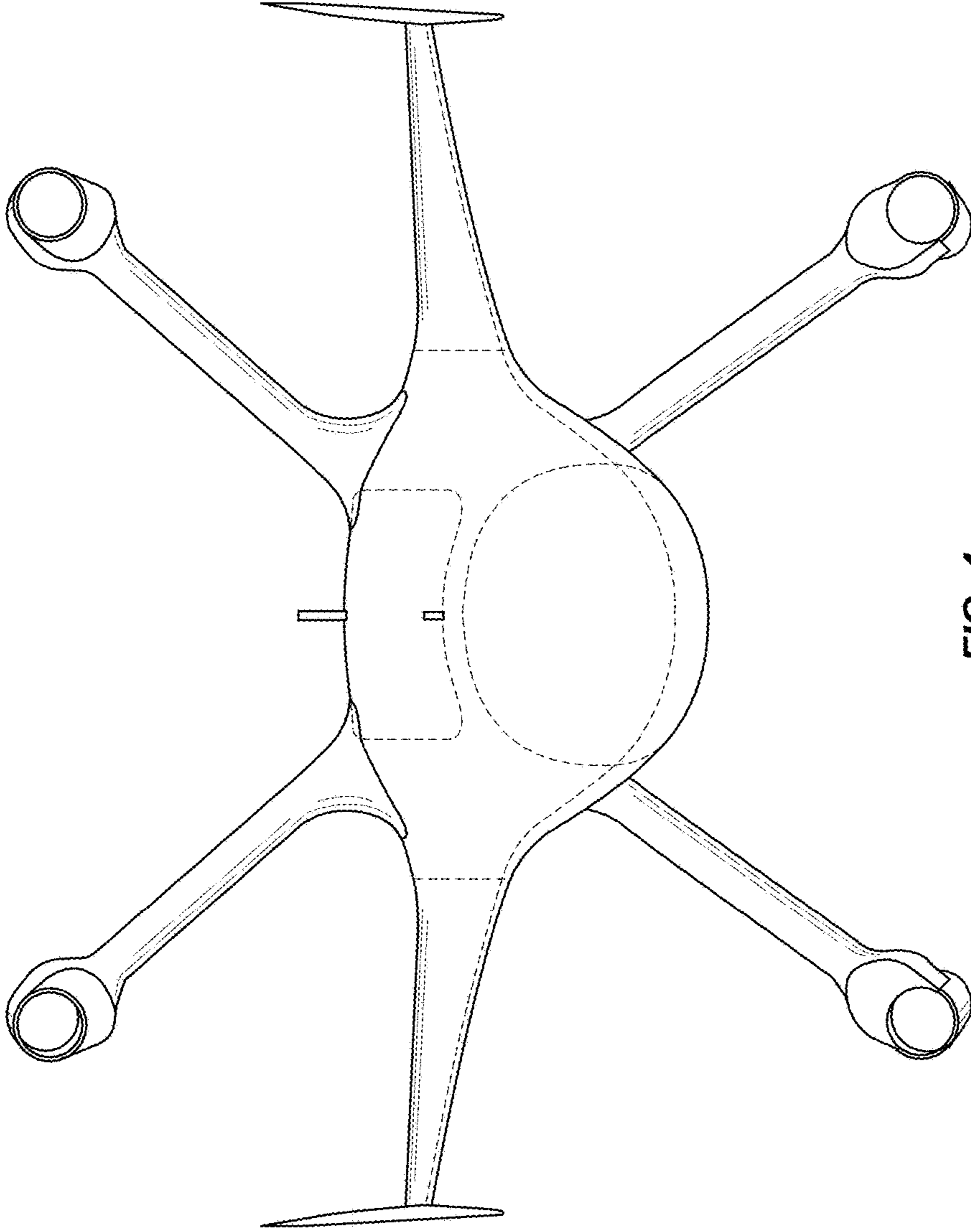


FIG. 4

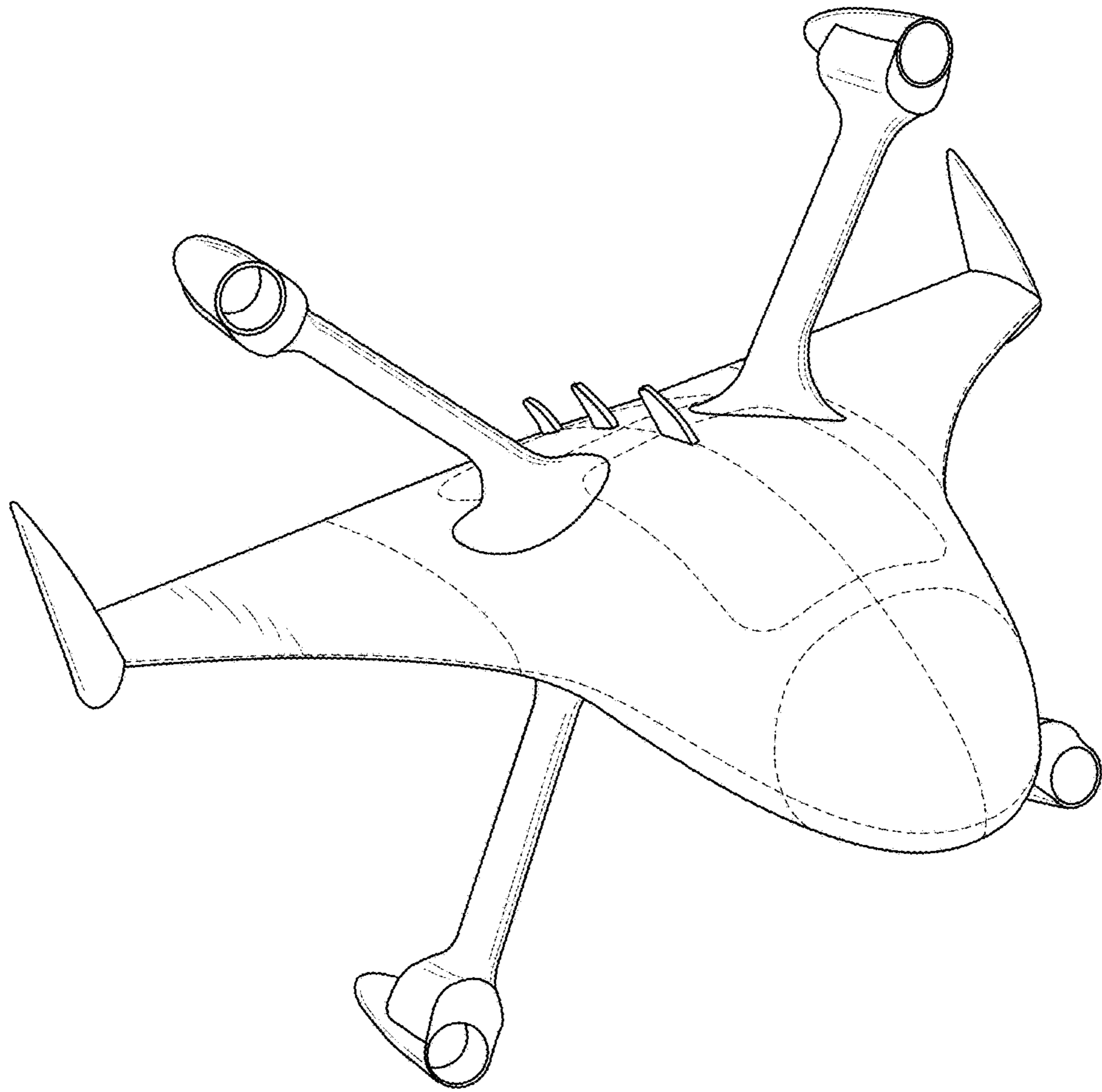


FIG. 5

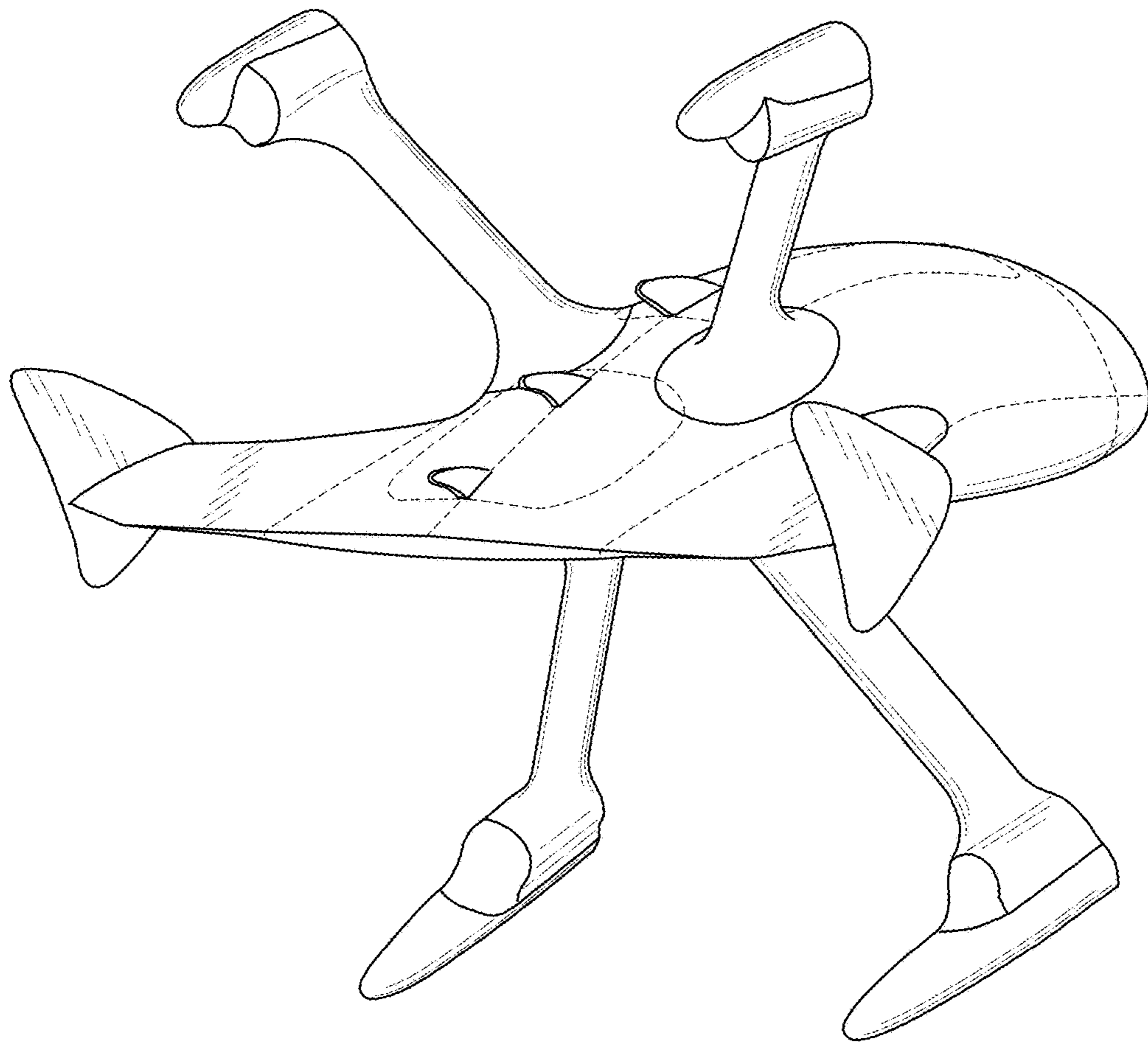


FIG. 6

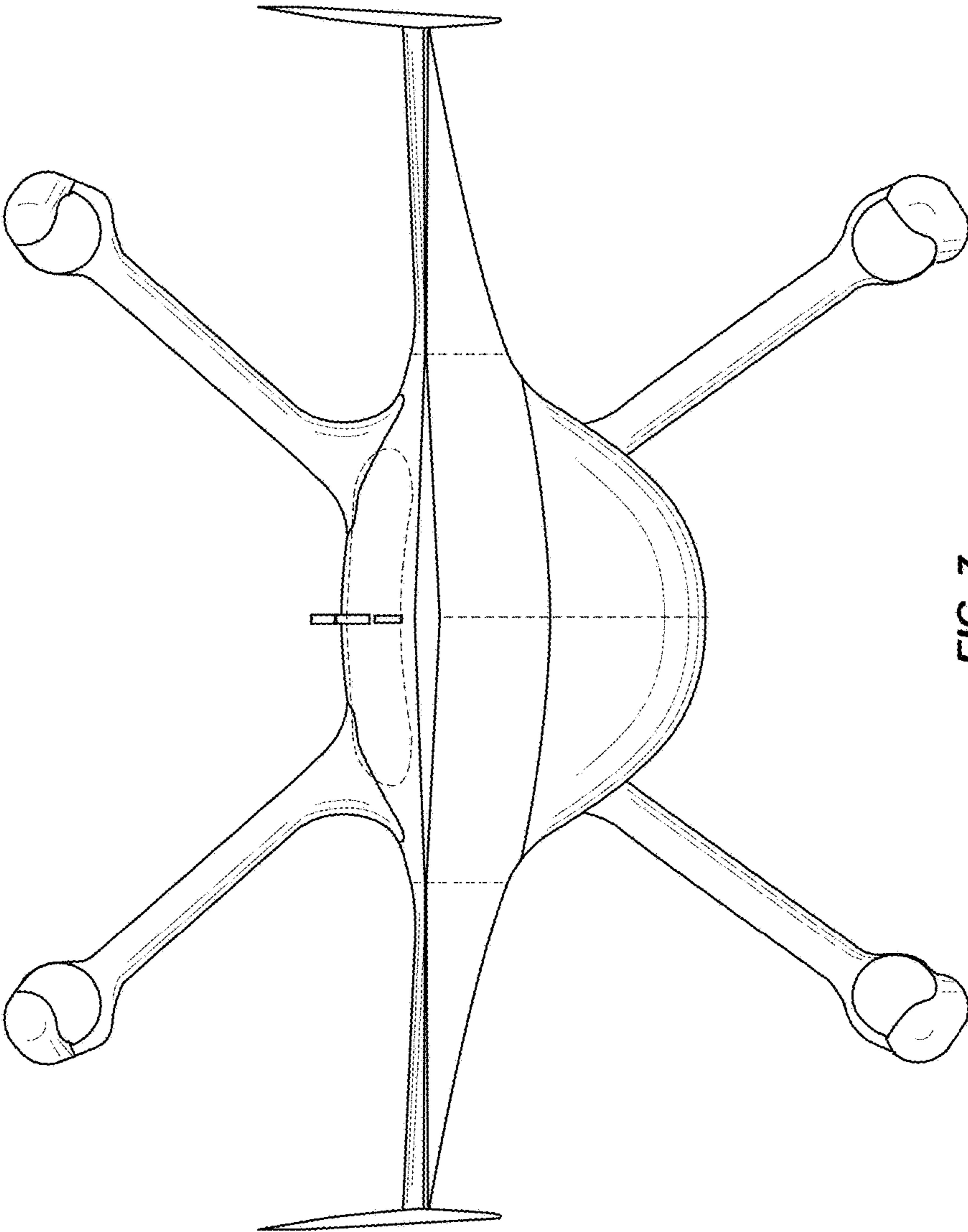


FIG. 7