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(12) **United States Design Patent** (10) **Patent No.:** **US D951,867 S**
Kato et al. (45) **Date of Patent:** **** May 17, 2022**

(54) **SERVO AMPLIFIER**(71) Applicant: **Mitsubishi Electric Corporation,**
Tokyo (JP)(72) Inventors: **Hiroyuki Kato,** Tokyo (JP); **Shinichi Kato,** Tokyo (JP); **Asuna Osawa,** Tokyo (JP); **Tsutomu Tanaka,** Tokyo (JP); **Masaaki Kadoyanagi,** Tokyo (JP); **Shotaro Hirako,** Tokyo (JP); **Takahiro Yamatani,** Tokyo (JP)(73) Assignee: **Mitsubishi Electric Corporation,**
Tokyo (JP)(**) Term: **15 Years**(21) Appl. No.: **29/722,556**(22) Filed: **Jan. 30, 2020**(30) **Foreign Application Priority Data**

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(51) **LOC (13) Cl.** **13-03**(52) **U.S. Cl.**
USPC **D13/123; D13/110**(58) **Field of Classification Search**USPC D12/190, 192, 195; D14/155–159,
D14/160–173, 187–188, 189–198,
D14/203.1–203.8, 204–216, 217–222,
D14/225–229, 257–258, 496, 498–506;
D13/110, 123, 133–135, 162; D25/113,
D25/114, 115, 118, 119; D21/471, 483,
D21/484, 486CPC H04R 1/02; H04R 1/021; H04R 1/025;
H04R 1/026; H04R 1/028; H04R 1/06;
H04R 1/105; H04R 1/323; H04R 1/403;

(Continued)

(56) **References Cited****U.S. PATENT DOCUMENTS**1,298,025 A * 3/1919 Ferguson 52/572
2,278,327 A * 3/1942 Magnus A63H 33/108
446/124

(Continued)

FOREIGN PATENT DOCUMENTSCN 303248453 * 6/2015
CN 306093007 * 10/2020

(Continued)

OTHER PUBLICATIONSMitsubishi MR-J2S-40A Melservo, date first available: Nov. 30, 2019, [retrieved Dec. 29, 2021], Retrieved from Internet, URL: <<https://www.amazon.com/MITSUBISHI-MR-J2S-40A-MR-PWCNK1-3M-DISCONTINUED-MANUFACTURER/dp/B082S6WZRX>> (Year: 2019).*

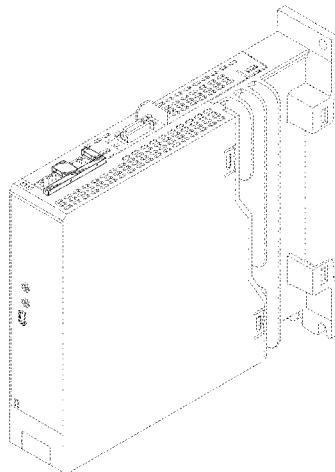
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Primary Examiner — Barbara Fox*Assistant Examiner* — Aram Kwon(74) *Attorney, Agent, or Firm* — Studebaker & Brackett
PC(57) **CLAIM**

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

DESCRIPTIONFIG. 1. is a front perspective view of the front, right, and top sides of a servo amplifier showing our new design;
FIG. 2. is a front view thereof;
FIG. 3. is a rear view thereof;
FIG. 4. is a top plan view thereof;
FIG. 5. is a bottom plan view thereof;
FIG. 6. is a right side view thereof; and,
FIG. 7. is a left side view thereof.

The broken lines shown in the figures depict portions of the servo amplifier that form no part of the claimed design.

1 Claim, 7 Drawing Sheets

(58) **Field of Classification Search**

CPC H04R 1/2803; H04R 1/2834; B60R 11/02;
B60K 37/04; B60K 37/06

See application file for complete search history.

FOREIGN PATENT DOCUMENTS

CN	306141211	* 10/2020
JP	D1671654	* 11/2020
WO	WOD207118-006	* 9/2020

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,413,122	B2 *	7/2002	Fujioka	.....	H01R 13/6453	361/796
D476,306	S *	6/2003	Abe	.....	D14/188	
D478,061	S *	8/2003	Abe	.....	D14/188	
D479,219	S *	9/2003	Abe	.....	D14/188	
D700,716	S *	3/2014	Harter	.....	D25/113	
D724,051	S *	3/2015	Nakahira	.....	D14/188	
D724,052	S *	3/2015	Nakahira	.....	D14/188	
D737,242	S *	8/2015	Nakahira	.....	D14/188	
D765,797	S *	9/2016	Banik	.....	D21/484	
D812,019	S *	3/2018	Kato	.....	D13/162	
D829,181	S *	9/2018	Kato	.....	D13/162	
D829,672	S *	10/2018	Kato	.....	D13/162	
D866,798	S *	11/2019	Amrein	.....	D25/113	
D897,308	S *	9/2020	Kato	.....	D14/188	
D905,638	S *	12/2020	Kato	.....	D13/110	
D906,960	S *	1/2021	Kato	.....	D13/110	
D906,961	S *	1/2021	Kato	.....	D13/110	
D906,962	S *	1/2021	Kato	.....	D13/110	
D906,963	S *	1/2021	Kato	.....	D13/110	
D908,657	S *	1/2021	Kato	.....	D14/188	
D912,007	S *	3/2021	Kato	.....	D14/188	
D918,857	S *	5/2021	Kato	.....	D14/188	
D927,447	S *	8/2021	Kato	.....	D14/188	
D928,708	S *	8/2021	Kato	.....	D13/110	
D929,940	S *	9/2021	Kato	.....	D13/110	

OTHER PUBLICATIONS

PMC PS6A24 25A/10KW, date not available, [retrieved Dec. 29, 2021], Retrieved from Internet, URL: <<https://www.pilz.com/en-INT/eshop/Drive-technology/Servo-amplifier/PMC-SC6-PMC-SI6-servo-drives/PMC-SI6/PMC-PS6A24-25A-10KW/p/8C000001>> (Year: 2021).*

Servoamplifiers SD4S, date not available, [retrieved Dec. 29, 2021], Retrieved from Internet, URL: <<https://www.sieb-meyer.com/products/servo-amplifiers/servo-amplifiers-sd4s>> (Year: 2021).*

ALPHA5 Smart I Servo Amplifier I VV type, date not available, [retrieved Dec. 29, 2021], Retrieved from Internet, URL: <<https://www.fujielectric.com/products/servo/alpha5smart/amplifier/>> (Year: 2021).*

Big building blocks, date not available, [retrieved Dec. 30, 2021], Retrieved from Internet, URL: <https://gd-tseng.en.alibaba.com/product/60512980067-802881171/Big_building_blocks_toy_connecting_blocks_interlocking_blocks_educational_toys_kids_plastic_building_blocks.html> (Year: 2021).*

Solid Quality Interlocking Blocks, product added on: Sep. 19, 2020, [retrieved Dec. 30, 2021], Retrieved from Internet, URL: <<https://www.tradeindia.com/products/solid-quality-interlocking-blocks-6549268.html>> (Year: 2020).*

* cited by examiner

FIG. 1

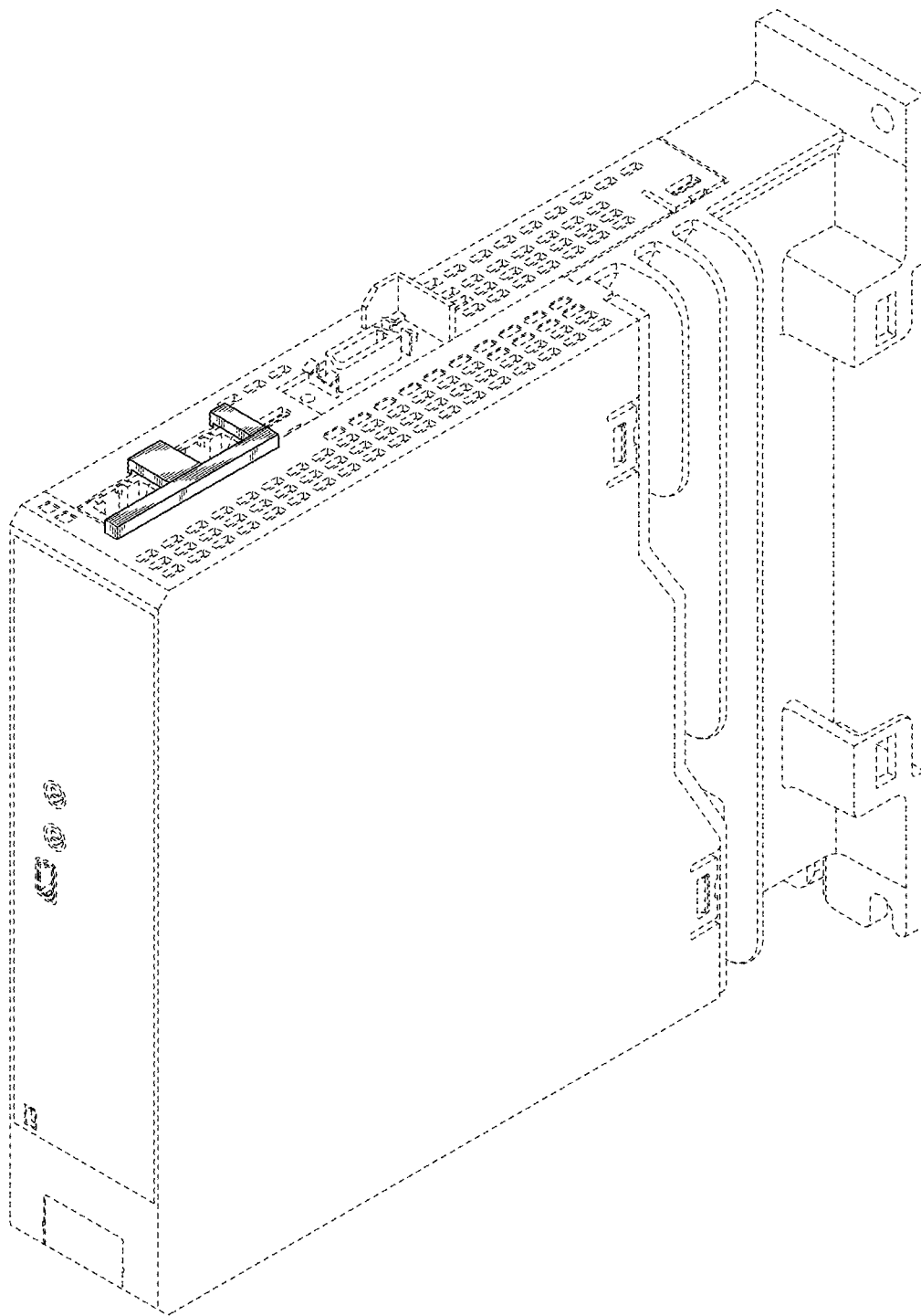


FIG. 2

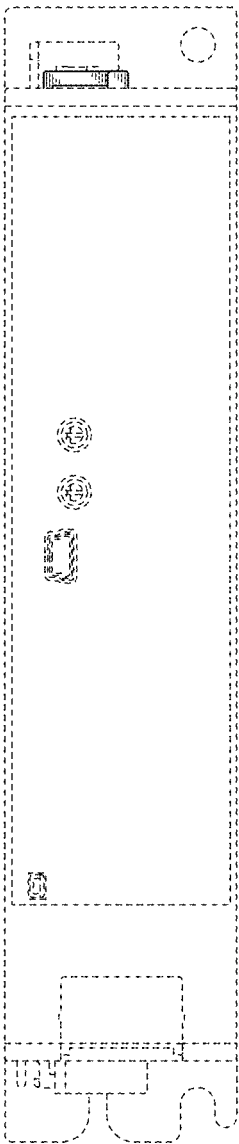


FIG. 3

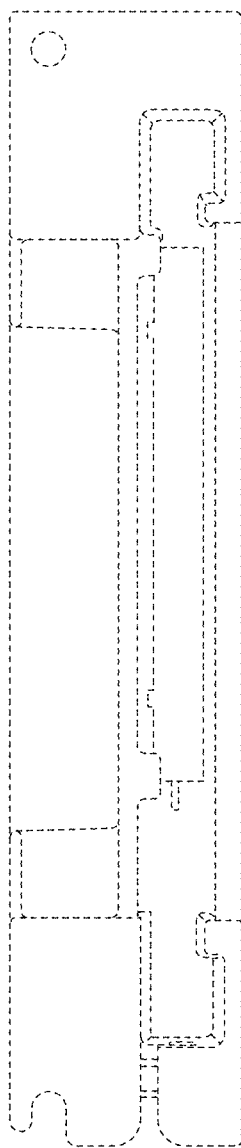


FIG. 4

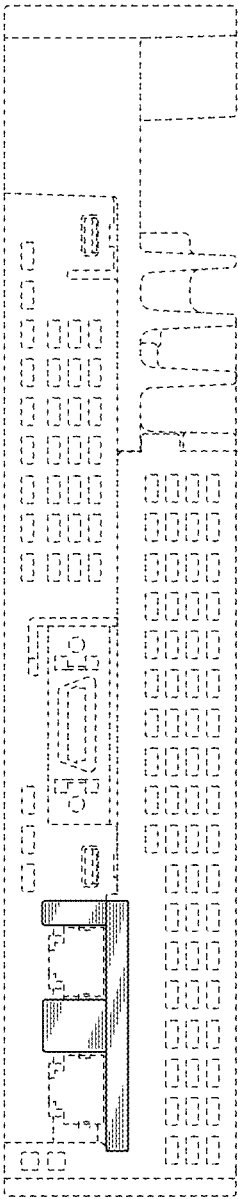


FIG. 5

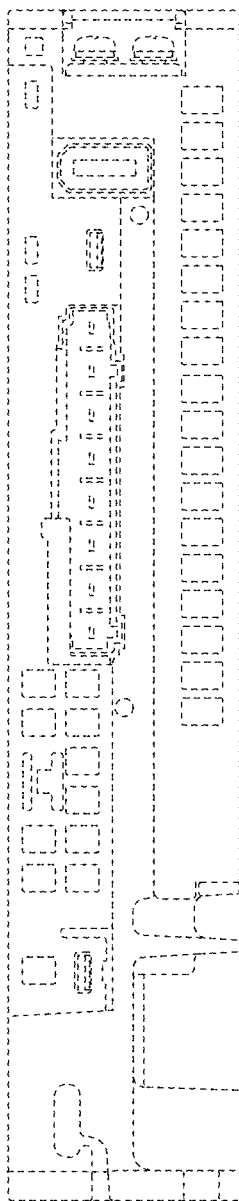


FIG. 6

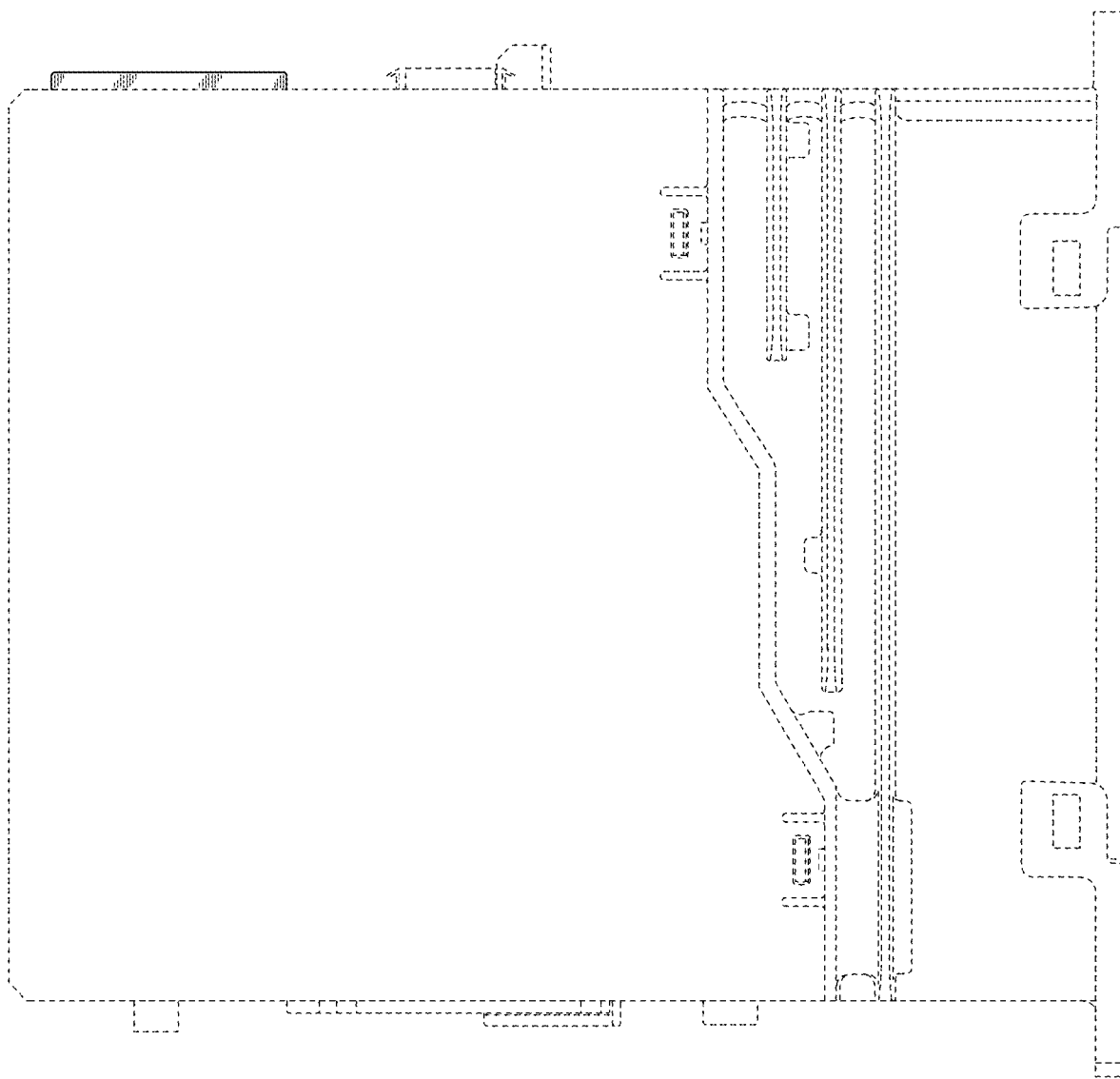


FIG. 7

