



US00D758453S

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

(10) **Patent No.:** **US D758,453 S**  
(45) **Date of Patent:** **\*\* Jun. 7, 2016**

(54) **NOZZLE APPARATUS**

(71) Applicants: **SATAKE CORPORATION**, Tokyo (JP); **MECHANO TRANSFORMER CORPORATION**, Chiyoda-ku, Tokyo (JP); **KURODA PNEUMATICS LTD.**, Asahi-shi, Chiba (JP)

(72) Inventors: **Takafumi Ito**, Hiroshima (JP); **Yoshinori Kawawa**, Asahi (JP); **Toshitada Hirata**, Asahi (JP); **Sze Keat Chee**, Tokyo (JP); **Toshiro Higuchi**, Tokyo (JP)

(73) Assignees: **Satake Corporation** (JP); **Mechano Transformer Corporation** (JP); **Kuroda Pneumatics Ltd.** (JP)

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

(21) Appl. No.: **29/527,219**

(22) Filed: **May 17, 2015**

(30) **Foreign Application Priority Data**

Nov. 21, 2014 (JP) ..... 2014-026100

(51) **LOC (10) Cl.** ..... **15-03**

(52) **U.S. Cl.**  
USPC ..... **D15/10**

(58) **Field of Classification Search**  
USPC ..... D23/233-250; 209/644, 44.2, 467, 469, 209/486, 498, 502, 552, 694, 441, 580, 509, 209/588, 557, 687, 172.5, 546, 564; 251/129.01, 129.06, 282, 129.04; D15/10-17; 348/91  
CPC .... B07C 5/3425; B07C 5/366; B07C 5/3422; B07C 5/365

See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

4,718,558 A \* 1/1988 Castaneda ..... B07C 5/3425  
209/546  
4,765,489 A \* 8/1988 Satake ..... B07B 13/113  
209/557

5,301,811 A \* 4/1994 Mueller ..... B07B 9/02  
209/44.2  
5,562,214 A \* 10/1996 Castaneda ..... B07C 5/366  
209/564  
8,421,856 B2 \* 4/2013 Sinram ..... B07C 5/342  
348/91  
D746,339 S \* 12/2015 Hodgkiss ..... D15/10  
2013/0118959 A1 \* 5/2013 Yamaguchi ..... B07C 5/3427  
209/644

(Continued)

*Primary Examiner* — Cynthia Ramirez

*Assistant Examiner* — Gino Colan

(74) *Attorney, Agent, or Firm* — Lerner, David, Littenberg, Krumholz & Mentlik, LLP

(57) **CLAIM**

We claim the ornamental design for a nozzle apparatus, as shown and described.

**DESCRIPTION**

FIG. 1 is a front elevational view of a nozzle apparatus showing our new design;

FIG. 2 is a rear elevational view thereof;

FIG. 3 is a left side view thereof;

FIG. 4 is a right side view thereof;

FIG. 5 top plan view thereof;

FIG. 6 is a bottom plan view thereof;

FIG. 7 is a rear right perspective view thereof;

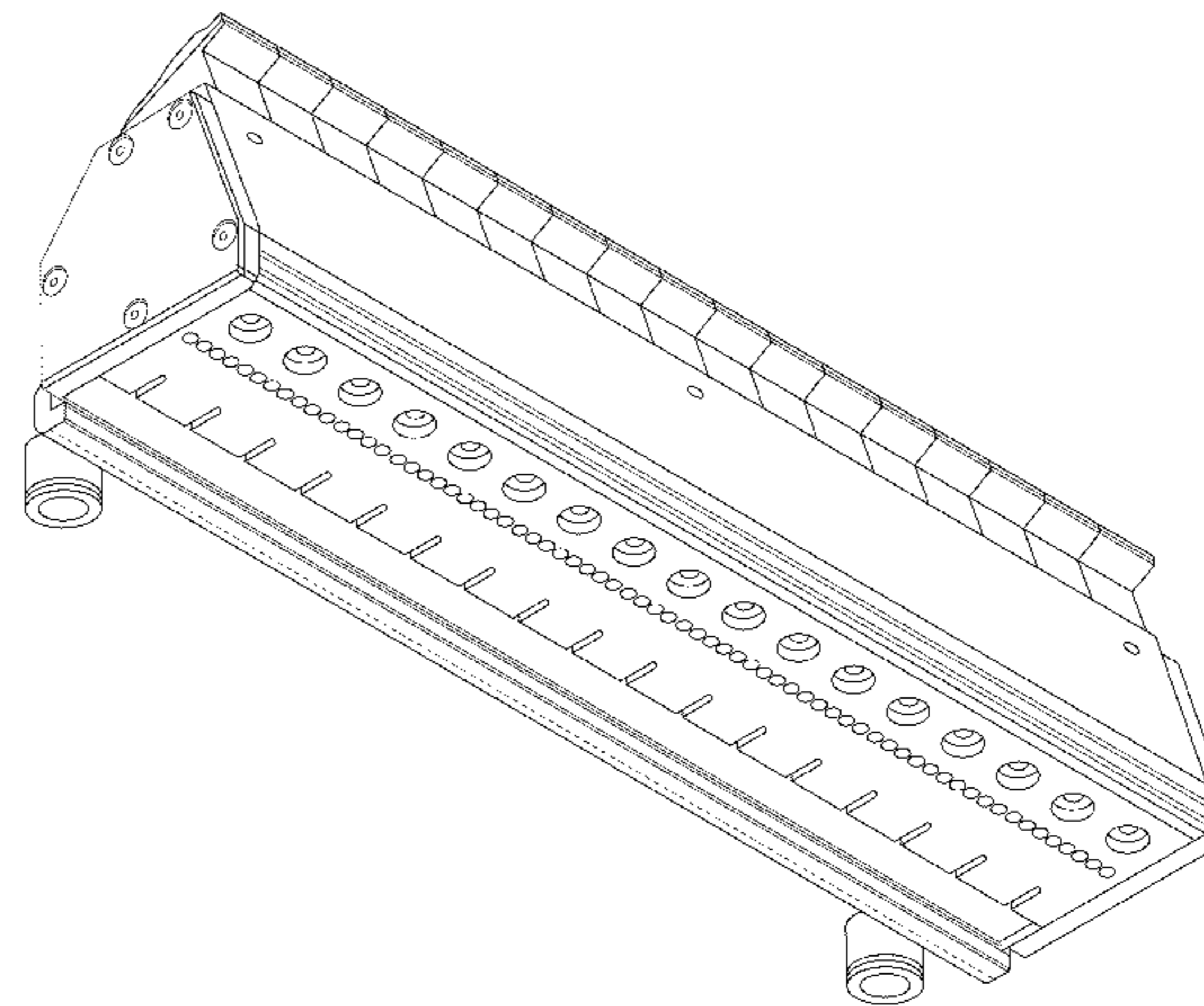
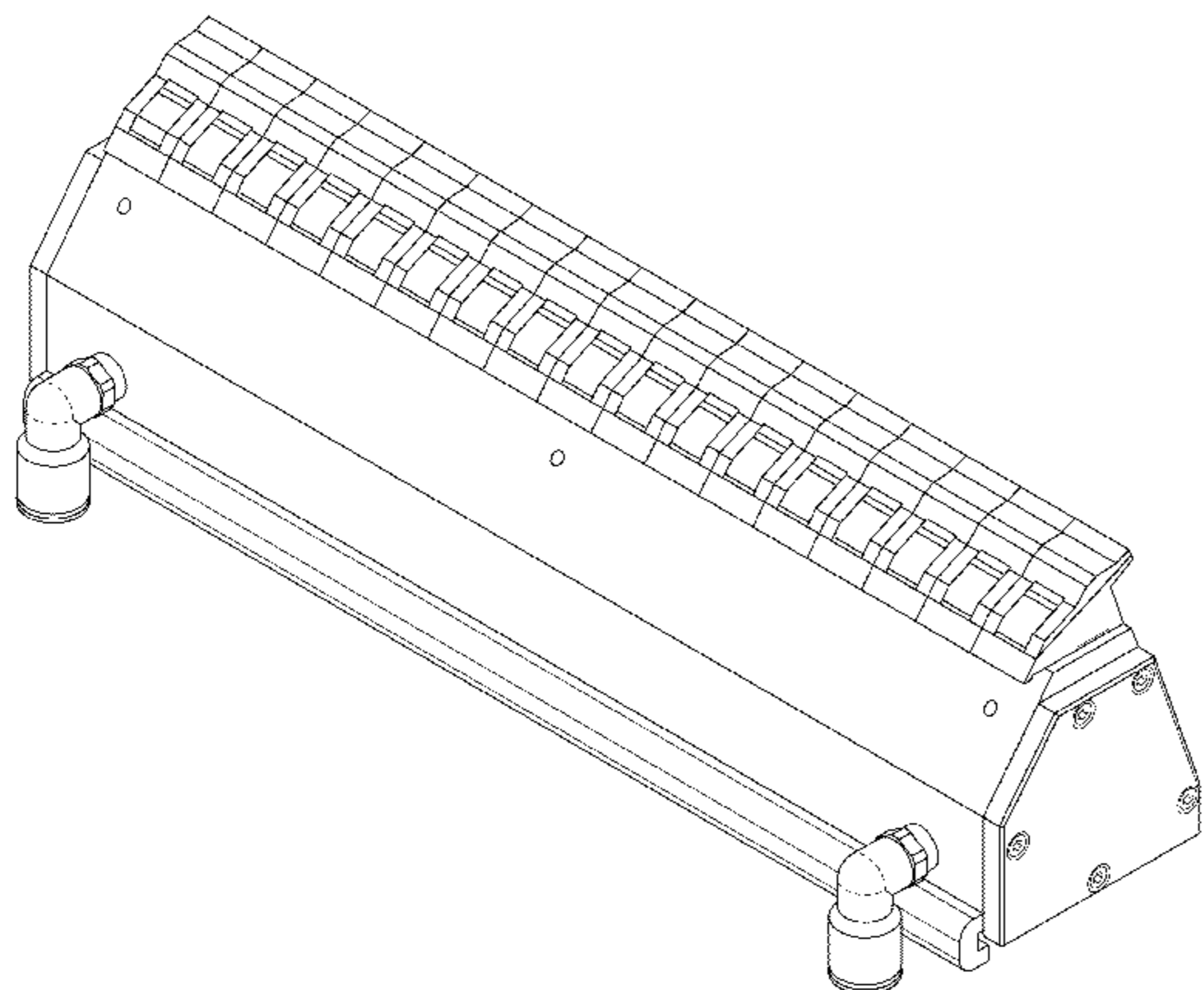
FIG. 8 is a front left perspective view thereof; and,

FIG. 9 is a bottom perspective view thereof.

The broken lines in the drawings are included for the purpose of illustrating portions of the nozzle apparatus and form no part of the claimed design.

As shown in FIG. 1, the nozzle apparatus employing the claimed design has a plurality of nozzles aligned along the long side of a single manifold, each nozzle being detachably attachable to the manifold. Electromagnetic valves (piezo valves) for the nozzles are mounted on the bottom of the manifold in a 1:1 ratio to the nozzles and together form an ejector incorporated into a color sorting machine that uses color to sort out selected grains from a large quantity of grains and other particulate matter.

**1 Claim, 7 Drawing Sheets**



# US D758,453 S

Page 2

---

(56)

## References Cited

### U.S. PATENT DOCUMENTS

2015/0336135 A1*	11/2015	Corak	.....	G01N 21/5907 209/509
2015/0375270 A1*	12/2015	Ishizu	.....	B07C 5/3425 209/580
2015/0076042 A1*	3/2015	Miyamoto	.....	B07C 5/342 209/580

\* cited by examiner

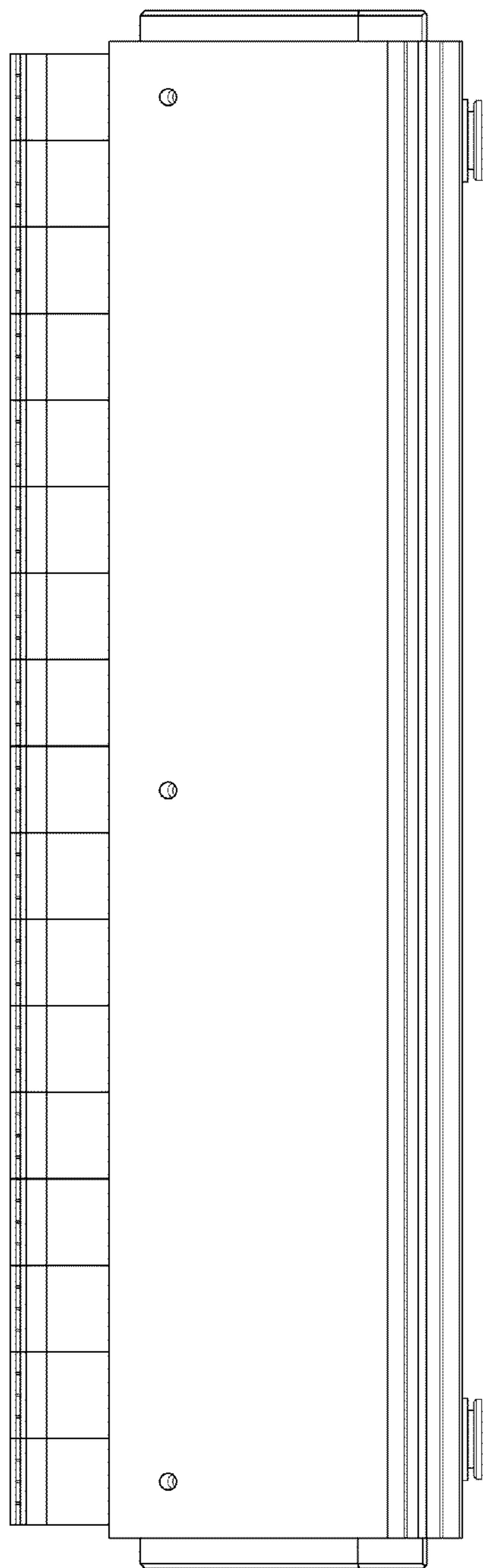


FIG. 1

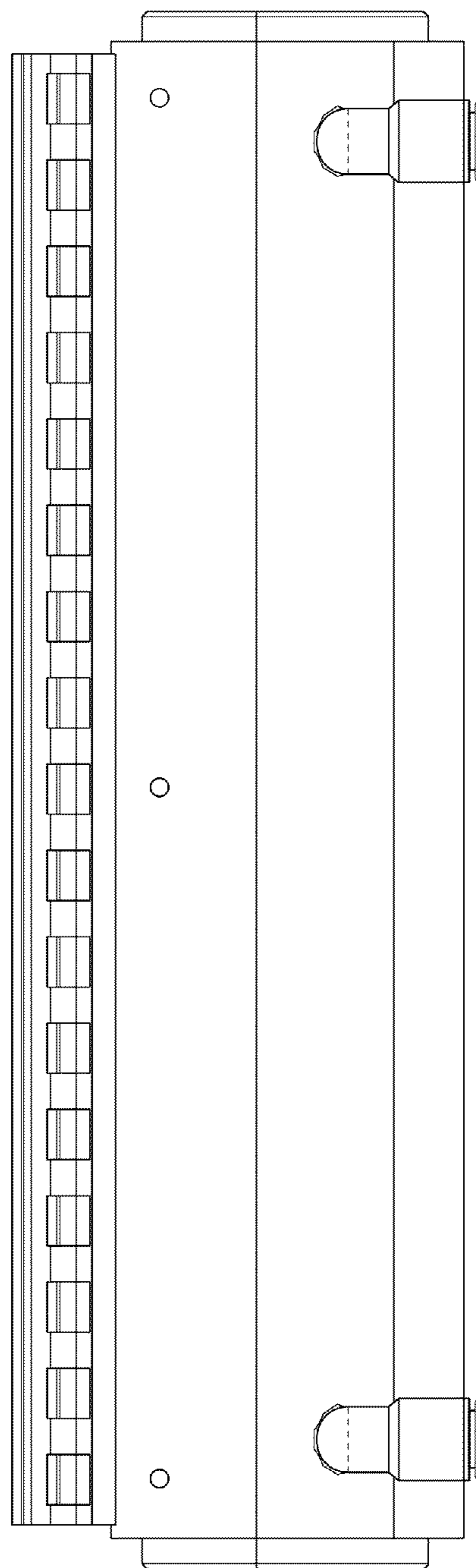


FIG. 2

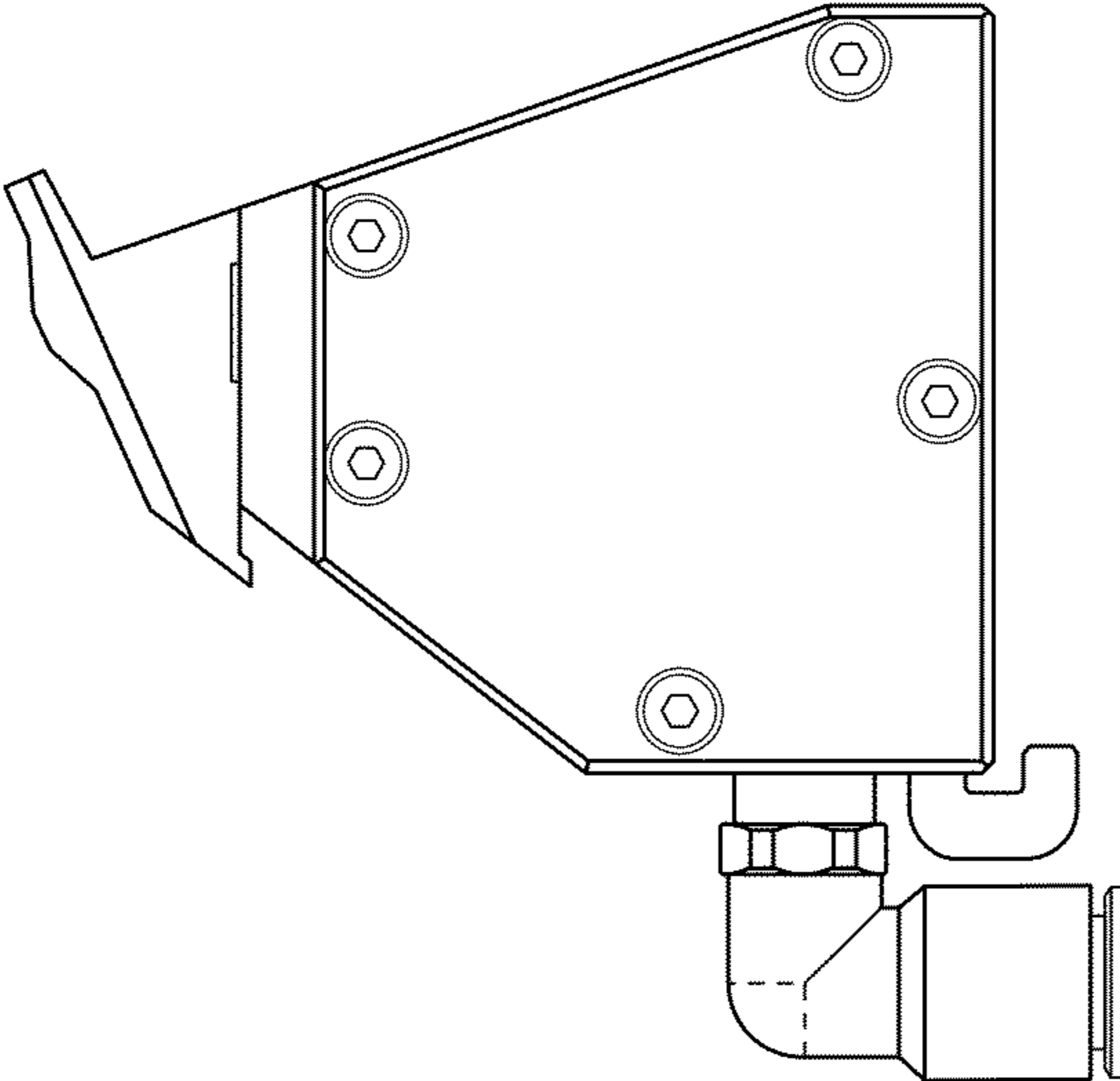


FIG. 3

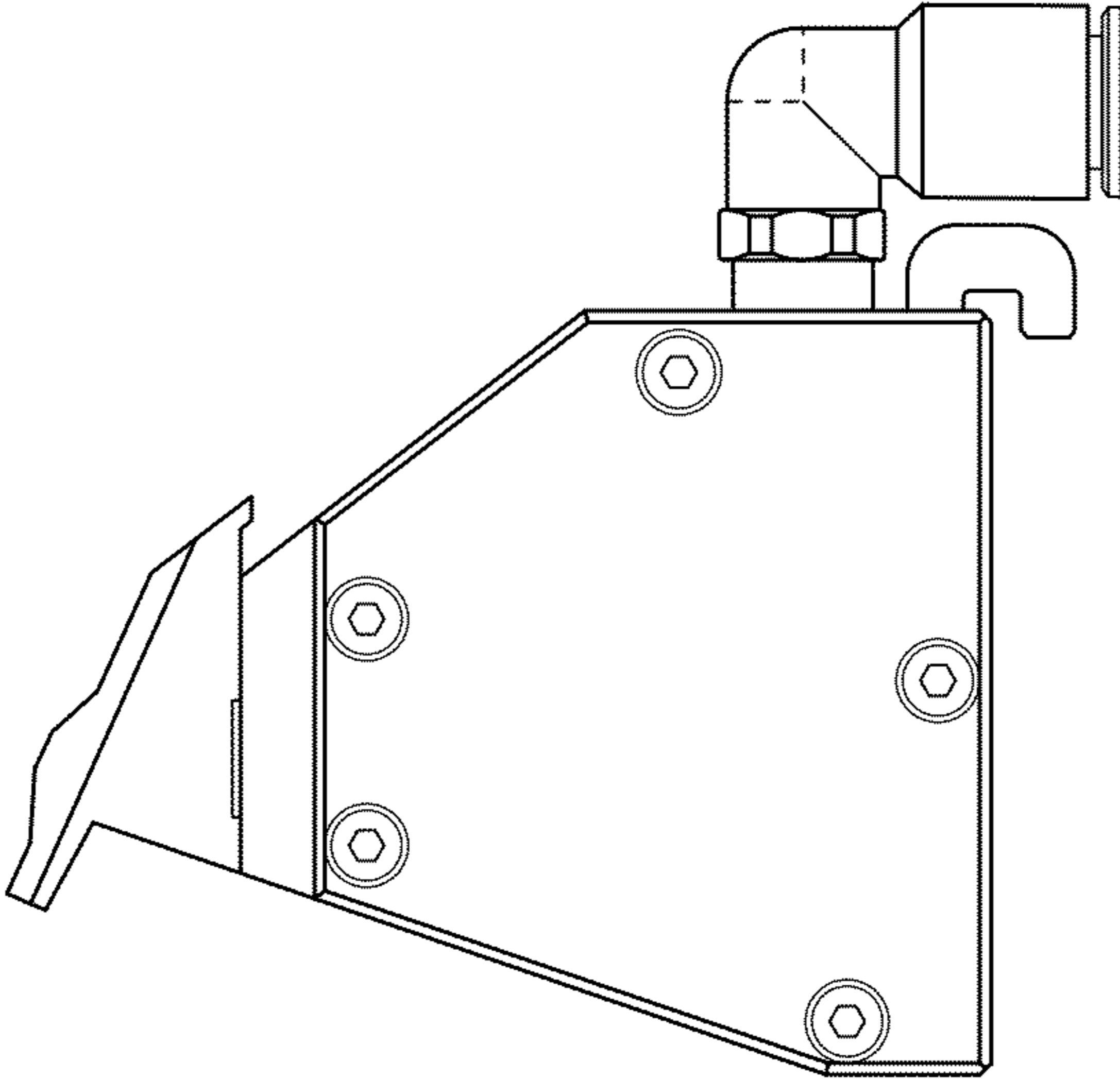


FIG. 4



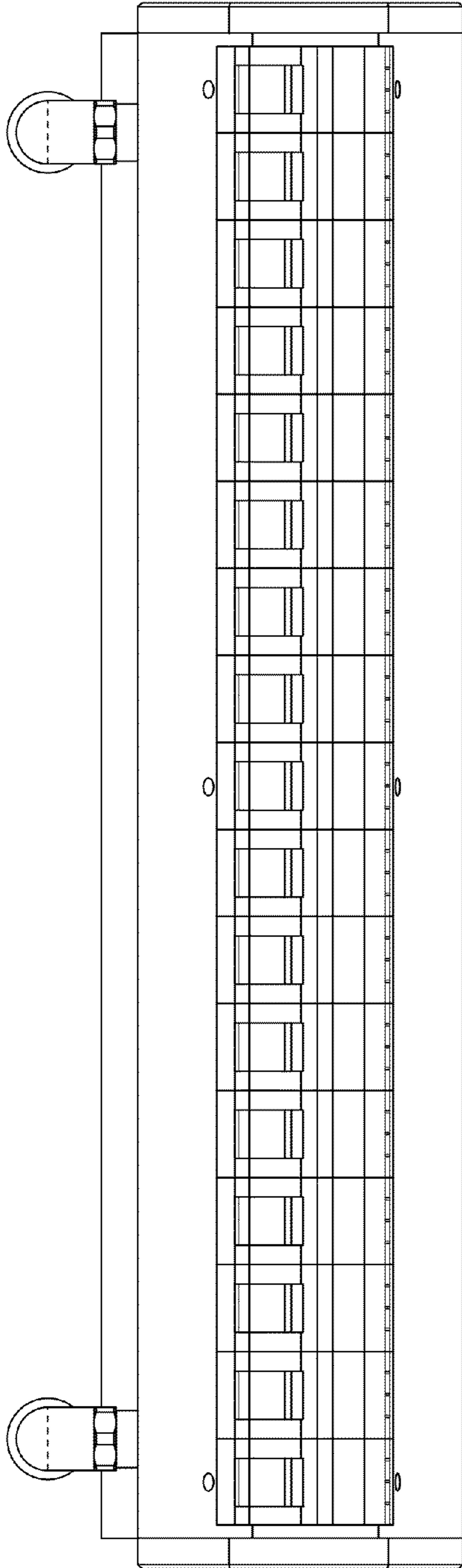


FIG. 5

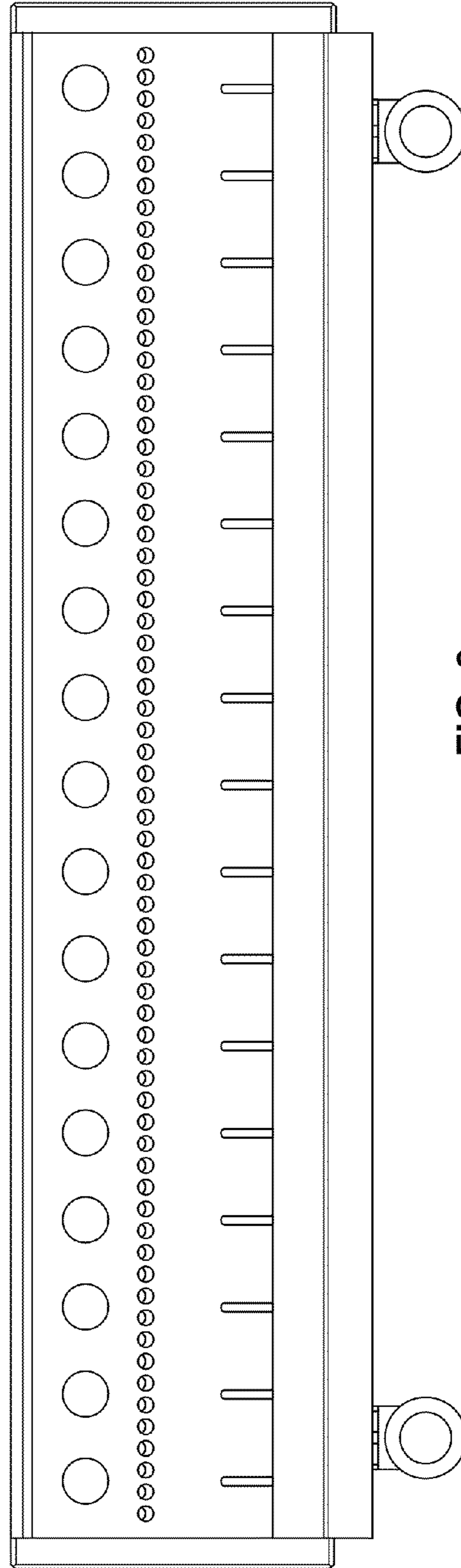


FIG. 6

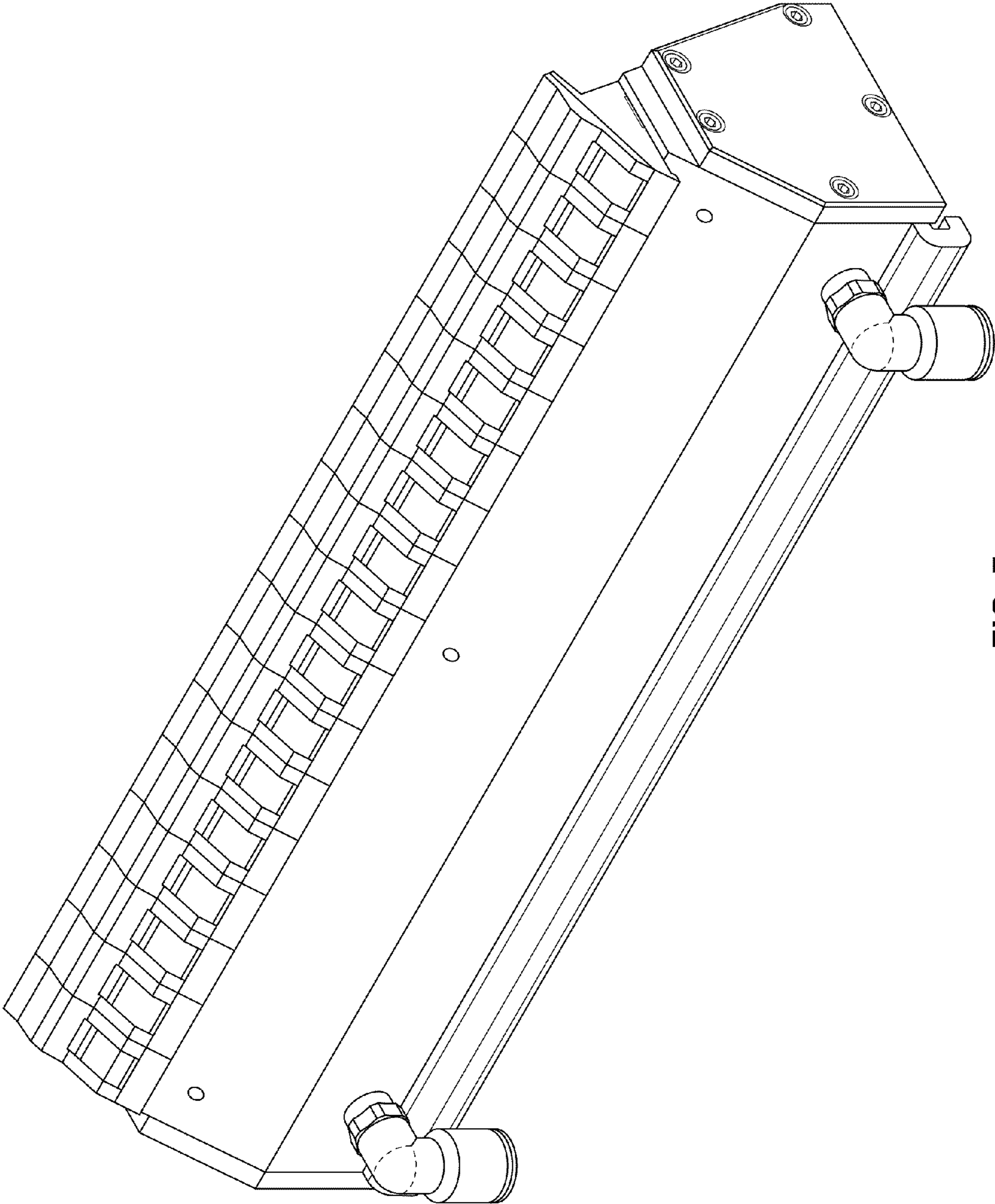


FIG. 7

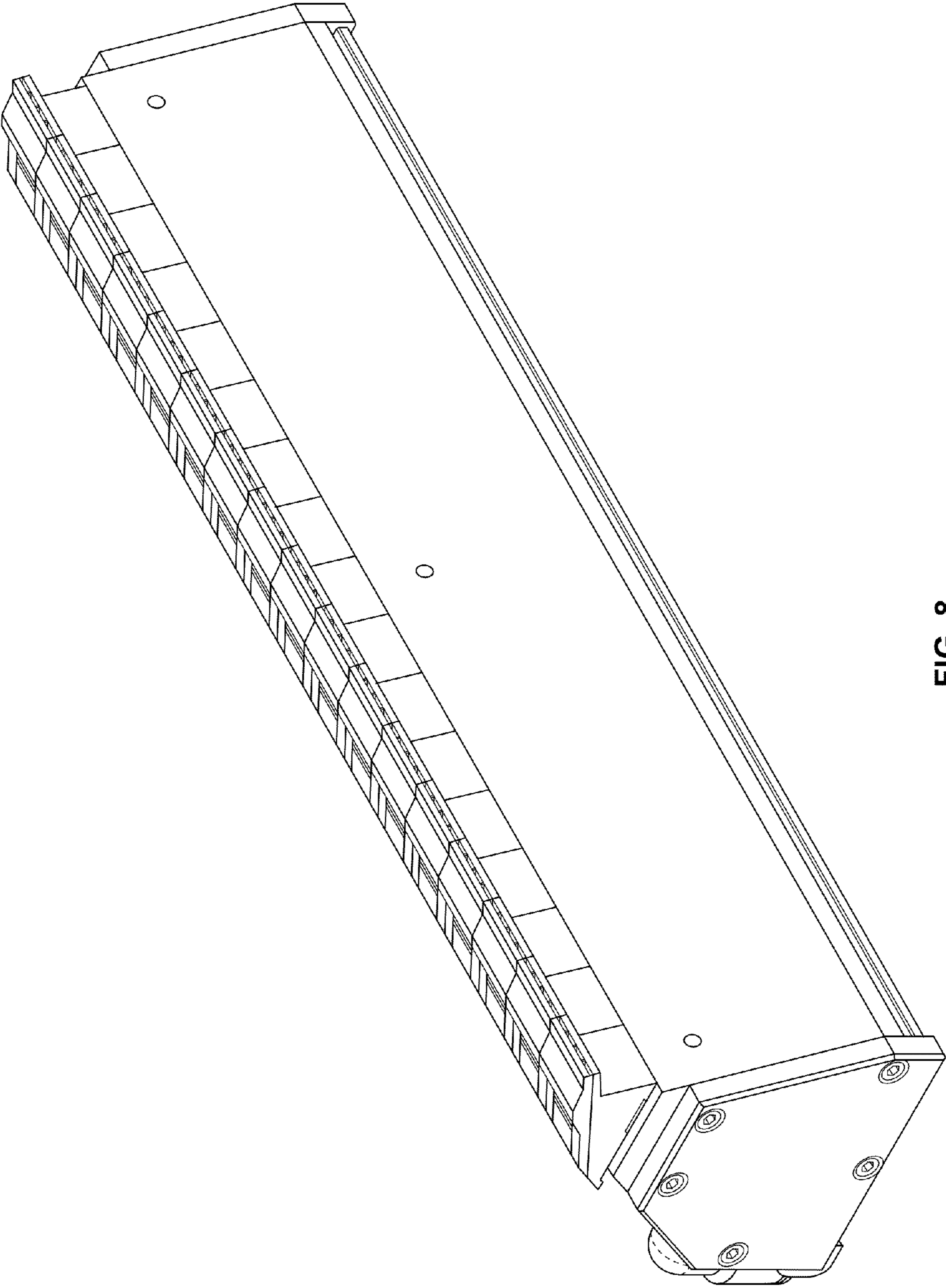


FIG. 8



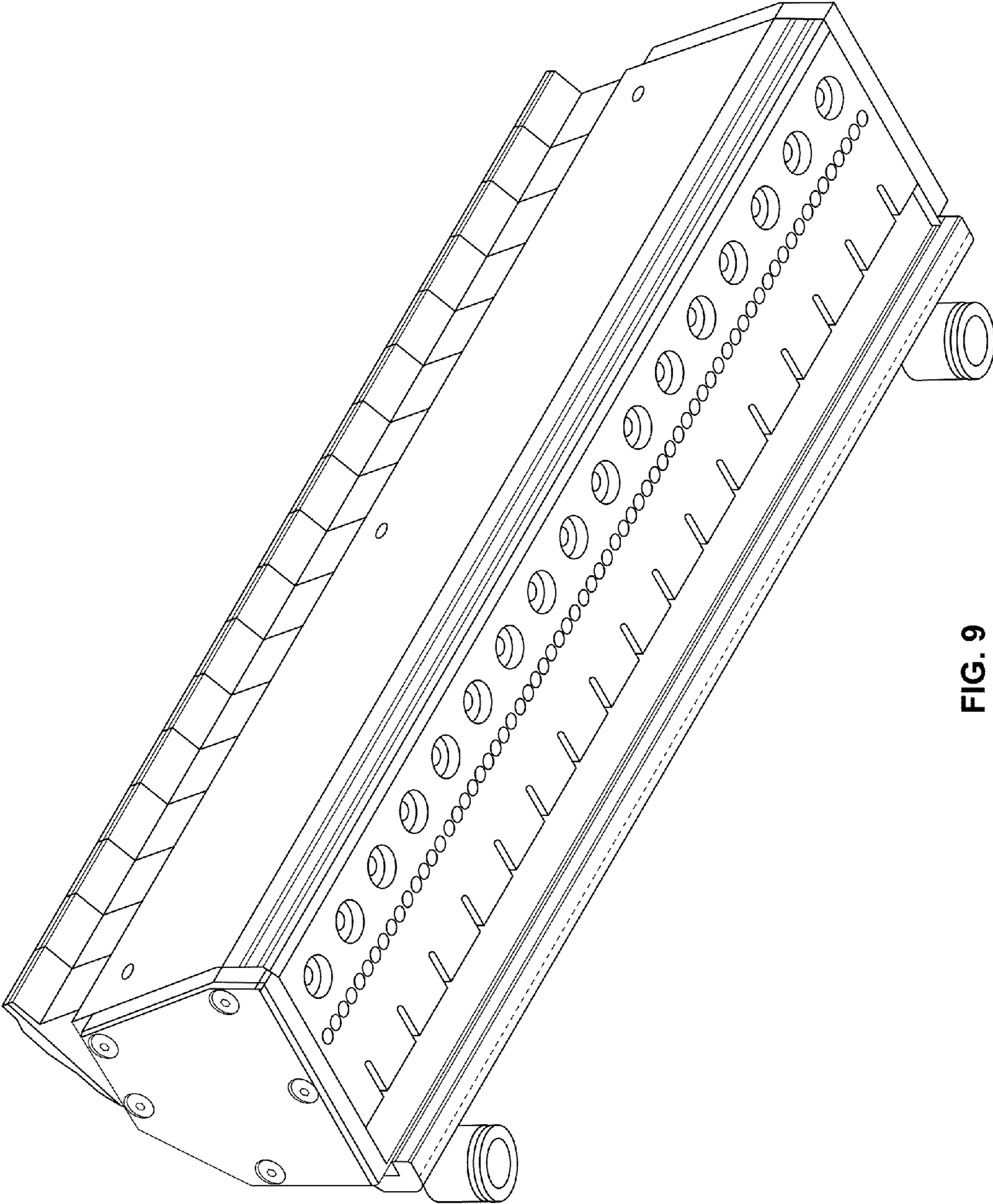


FIG. 9