



US00D882657S

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

(10) **Patent No.:** **US D882,657 S**

(45) **Date of Patent:** **** Apr. 28, 2020**

(54) **JOINT DRIVING MEMBER FOR ROBOT**

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

(21) Appl. No.: **29/664,933**

(22) Filed: **Sep. 28, 2018**

(30) **Foreign Application Priority Data**

Mar. 29, 2018 (JP) 2018-006783

(51) **LOC (12) Cl.** **15-99**

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

(58) **Field of Classification Search**
USPC D15/199; D21/369, 578-583, 621, 622
CPC B25J 9/102; B25J 9/104; B25J 17/0241;
Y10T 74/20317; Y10T 74/20323
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

- 5,002,242 A * 3/1991 Nagai B25J 17/0241
248/49
- 5,099,707 A * 3/1992 Tori B25J 9/02
384/296
- 5,107,716 A * 4/1992 Torii B25J 9/02
384/296
- 5,119,753 A * 6/1992 Milad B23Q 1/5406
114/338

- 5,342,254 A * 8/1994 Sula B25J 9/102
475/223
- 5,593,293 A * 1/1997 Machino B25J 9/0009
414/729
- 5,740,699 A * 4/1998 Ballantyne B25J 17/0266
403/120
- 5,893,296 A * 4/1999 Rosheim G05G 5/03
74/490.03
- 6,151,981 A * 11/2000 Costa B25J 9/023
74/490.03
- 6,220,813 B1 * 4/2001 Launiere B23Q 1/50
198/468.6

(Continued)

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(57) **CLAIM**

The ornamental design for a joint driving member for robot, as shown and described.

DESCRIPTION

FIG. 1 is a first perspective view of the front, right, and top sides of a joint driving member for robot showing our new design;

FIG. 2 is a second perspective view of the front, right, and bottom sides thereof;

FIG. 3 is a third perspective view of the rear, left, and bottom sides thereof;

FIG. 4 is a front view thereof;

FIG. 5 is a rear view thereof;

FIG. 6 is a left side view thereof;

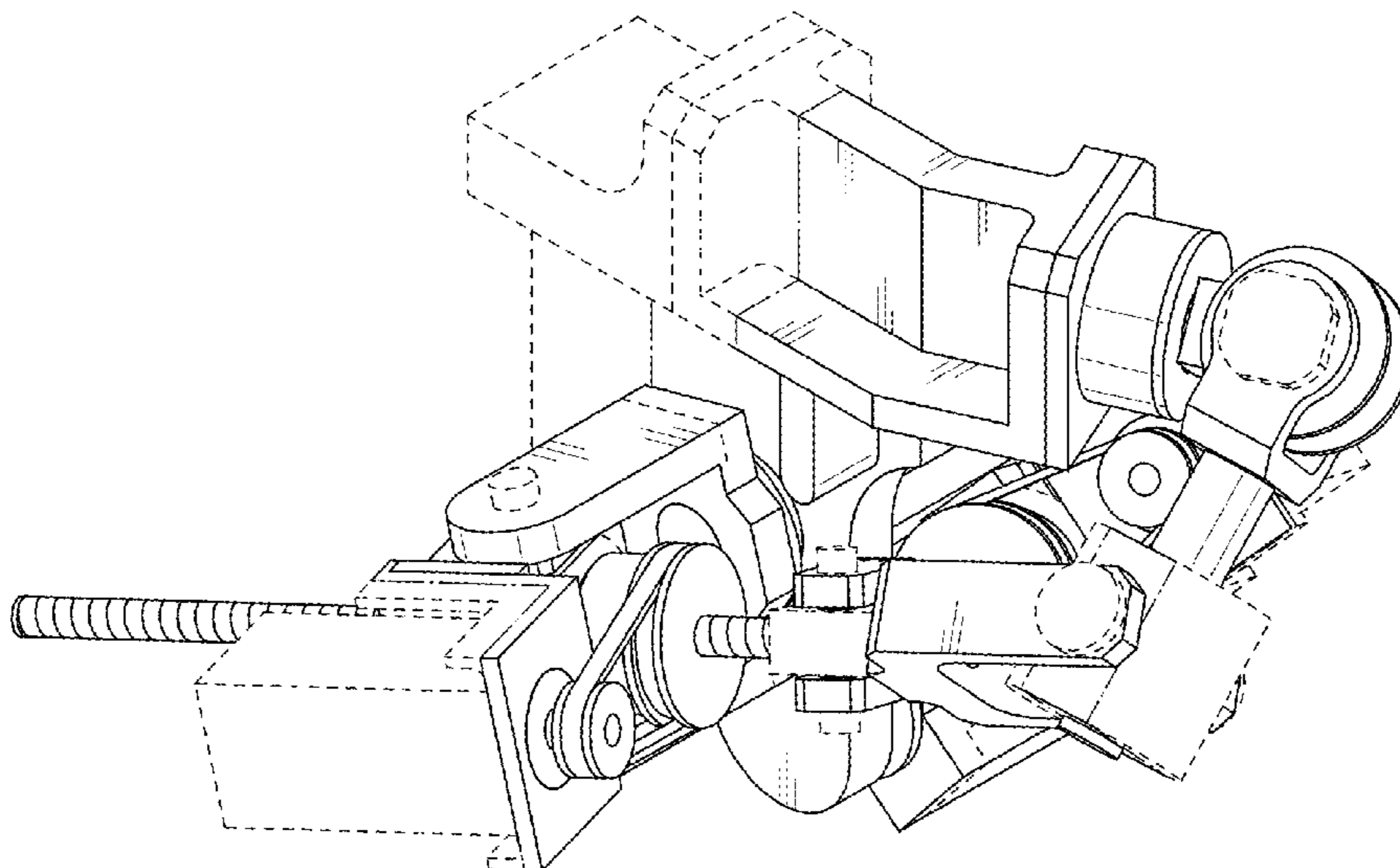
FIG. 7 is a right side view thereof;

FIG. 8 is a top plan view thereof; and,

FIG. 9 is a bottom plan view thereof.

The broken lines shown represent portions of the joint driving member for robot and form no part of the claimed design. The dash-dot lines represent the boundary between the claimed design and unclaimed design and form no part of the claimed design.

1 Claim, 9 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

6,240,799	B1 *	6/2001	Yau	.....	B23Q 1/5462	74/479.01	2012/0011956	A1 *	1/2012	Lundberg	.....	B25J 9/04
7,013,750	B1 *	3/2006	Kazami	.....	B25J 9/08	74/490.03	2012/0048047	A1 *	3/2012	Zhang	.....	B25J 9/046
9,512,912	B1 *	12/2016	Edsinger	.....	F16H 48/12		2012/0067150	A1 *	3/2012	Zhang	.....	B25J 9/102
9,568,074	B2 *	2/2017	Gosselin	.....	B25J 9/102		2012/0204670	A1 *	8/2012	Ryland	.....	B08B 9/045
9,849,925	B2 *	12/2017	Outa	.....	B62D 53/02		2012/0271207	A1 *	10/2012	Schoen	.....	A61F 5/0102
10,040,206	B2 *	1/2018	Jeong et al.				2012/0291582	A1 *	11/2012	Kang	.....	B25J 19/0016
D810,801	S *	2/2018	Hsu et al.				2013/0104676	A1 *	5/2013	Yang	.....	B25J 9/06
10,144,464	B1 *	12/2018	Buerger et al.				2013/0282174	A1 *	10/2013	Xi	.....	B25J 9/1682
D847,238	S *	4/2019	Kawaguchi	.....	D15/199		2013/0296746	A1 *	11/2013	Herr	.....	A61H 3/00
D847,239	S *	4/2019	Kawaguchi	.....	D15/199		2014/0007730	A1 *	1/2014	DeLouis	.....	B25J 15/0009
D847,240	S *	4/2019	Kawaguchi	.....	D15/199		2014/0123800	A1 *	5/2014	Choi	.....	F16H 48/10
D847,241	S *	4/2019	Kawaguchi	.....	D15/199		2014/0213409	A1 *	7/2014	Yoon	.....	F16H 1/203
D847,242	S *	4/2019	Kawaguchi	.....	D15/199		2015/0114163	A1 *	4/2015	Rosheim	.....	B25J 9/0045
2002/0078778	A1 *	6/2002	Grover	.....	B25J 9/042	74/490.03	2015/0122071	A1 *	5/2015	Lee	.....	B25J 9/06
2005/0275367	A1 *	12/2005	Buehler	.....	B25J 9/102	318/568.12	2015/0190246	A1 *	7/2015	Ryu	.....	G06F 3/011
2007/0062321	A1 *	3/2007	Chablat	.....	B23Q 1/5462	74/479.01	2015/0272811	A1 *	10/2015	Choi	.....	B25J 17/00
2009/0308188	A1 *	12/2009	Yang	.....	B25J 9/104	74/89.27	2016/0038313	A1 *	2/2016	Kim	.....	B25J 9/102
2010/0122602	A1 *	5/2010	Marcroft	.....	B25J 17/0216	74/490.03	2016/0114479	A1 *	4/2016	Rosheim	.....	B25J 9/0075
2010/0162846	A1 *	7/2010	Lee	.....	B25J 9/1045	74/490.04	2016/0288319	A1 *	10/2016	Kfoury	.....	B25J 9/104
2010/0170357	A1 *	7/2010	Kim	.....	B25J 9/102	74/89.32	2017/0120453	A1 *	5/2017	Roy	.....	B25J 5/04
2011/0048158	A1 *	3/2011	Maisonnier	.....	B25J 17/0275	74/490.03	2017/0297197	A1 *	10/2017	King	.....	B25J 9/126
2011/0056321	A1 *	3/2011	Sim	.....	B25J 9/1025	74/490.04	2017/0319421	A1 *	11/2017	Julin	.....	A61H 3/00
2011/0067518	A1 *	3/2011	Park	.....	B25J 9/102	74/490.04	2017/0348852	A1 *	12/2017	Sarh	.....	B25J 9/106
2011/0113914	A1 *	5/2011	Zhang	.....	B25J 9/107	74/490.01	2018/0009116	A1 *	1/2018	Jeong et al.		
2011/0126651	A1 *	6/2011	Pan	.....	B25J 9/102	74/89.2	2018/0079084	A1 *	3/2018	Woo et al.		
2011/0137423	A1 *	6/2011	Ouyang	.....	B25J 9/102	623/18.11	2018/0133894	A1 *	5/2018	Choi et al.		
2011/0214524	A1 *	9/2011	Jacobsen	.....	A61F 2/68	74/490.04	2018/0140441	A1 *	5/2018	Poi Rters		
2011/0314949	A1 *	12/2011	Long	.....	B25J 19/0029	74/490.04	2018/0193172	A1 *	7/2018	Smith et al.		
							2018/0236655	A1 *	8/2018	Nakanishi		

* cited by examiner

FIG. 1

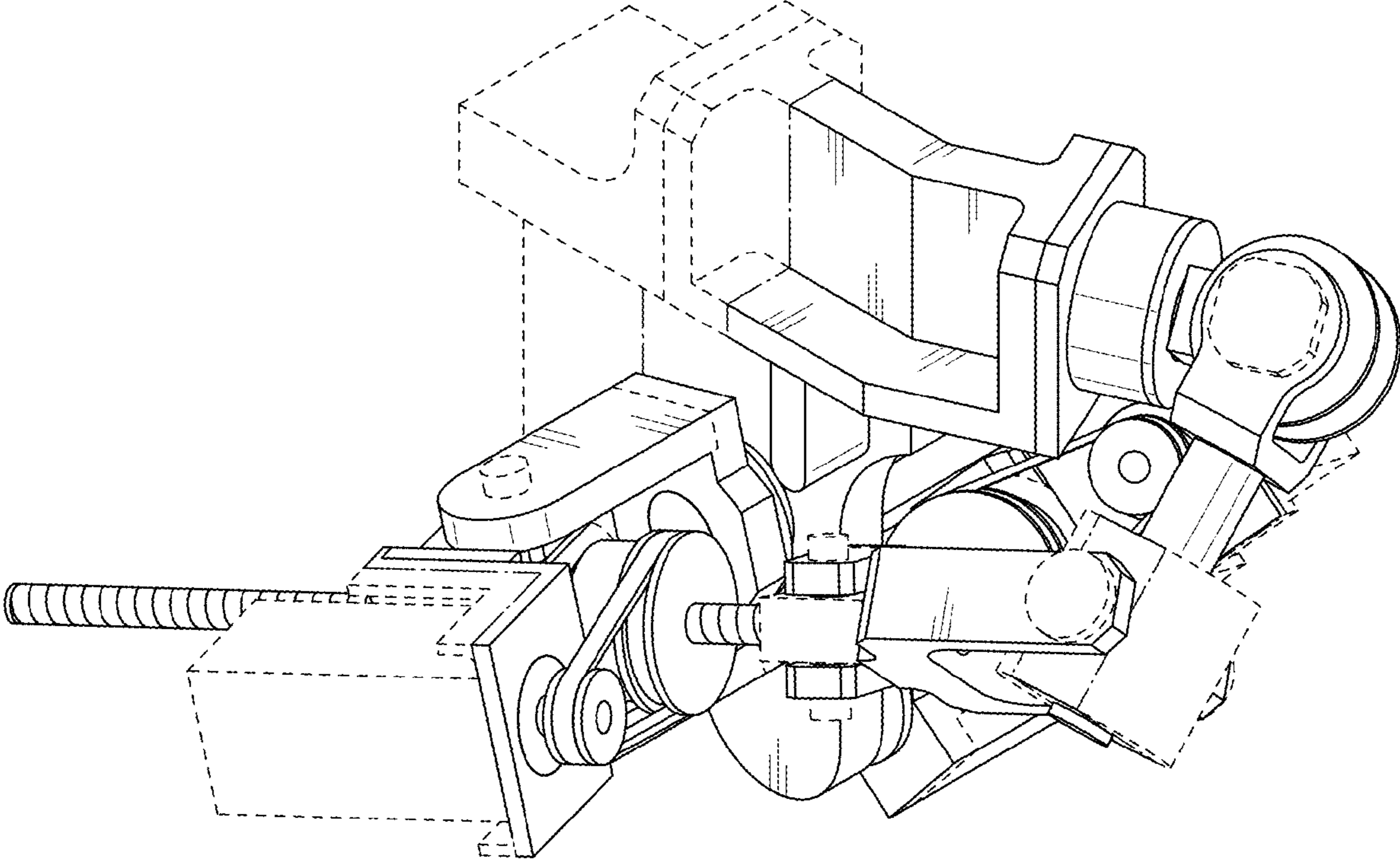


FIG. 2

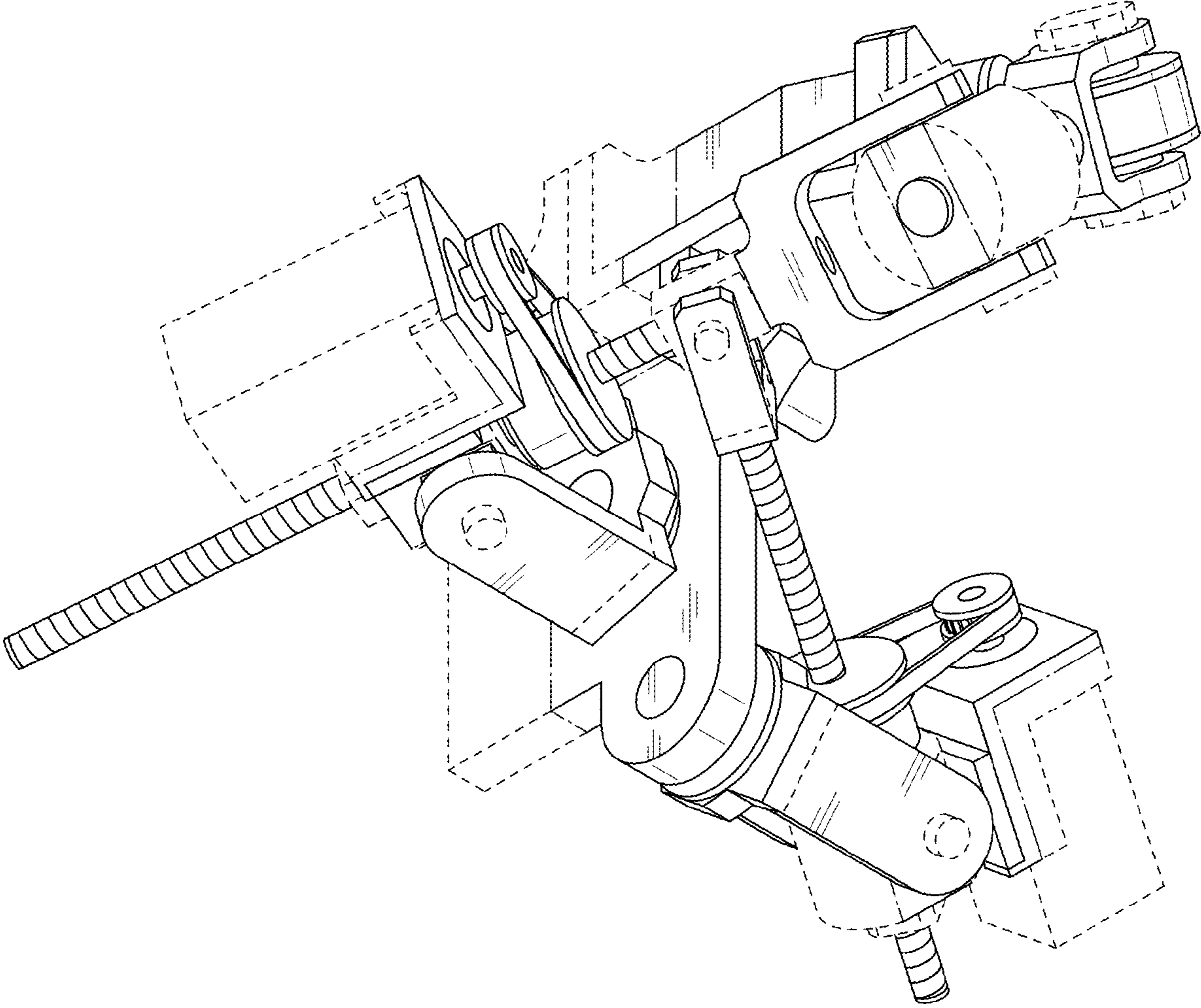


FIG. 3

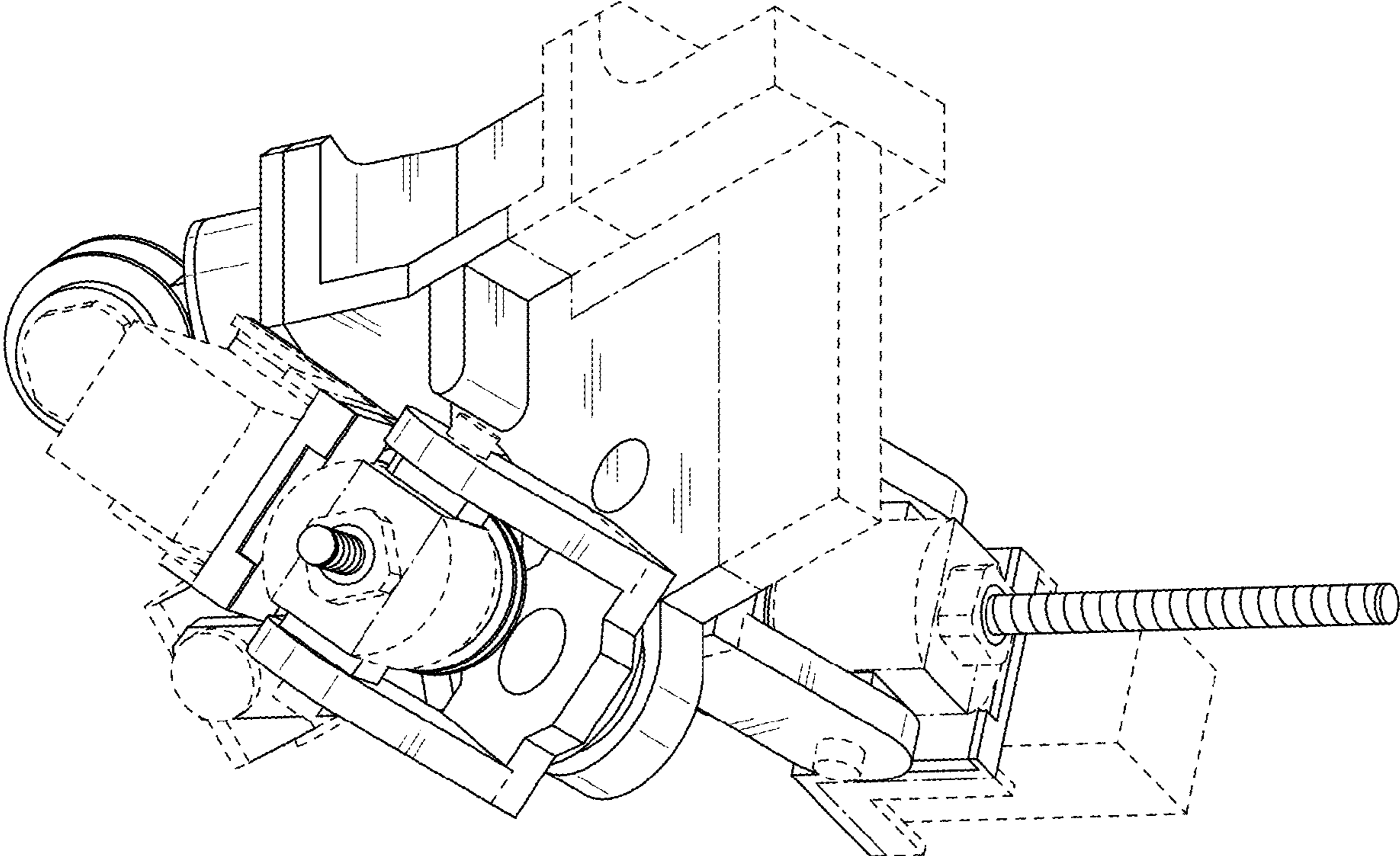


FIG. 4

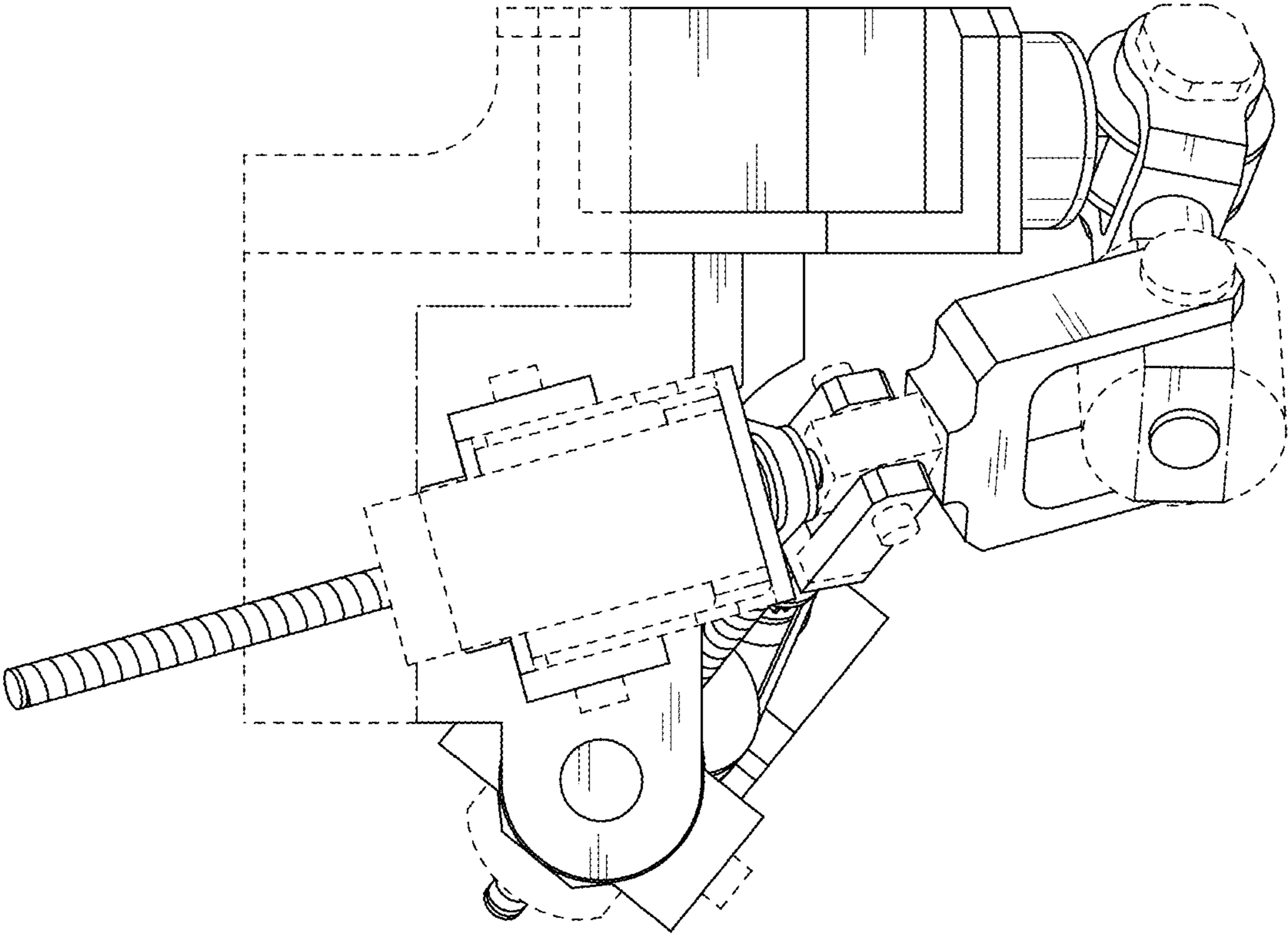


FIG. 5

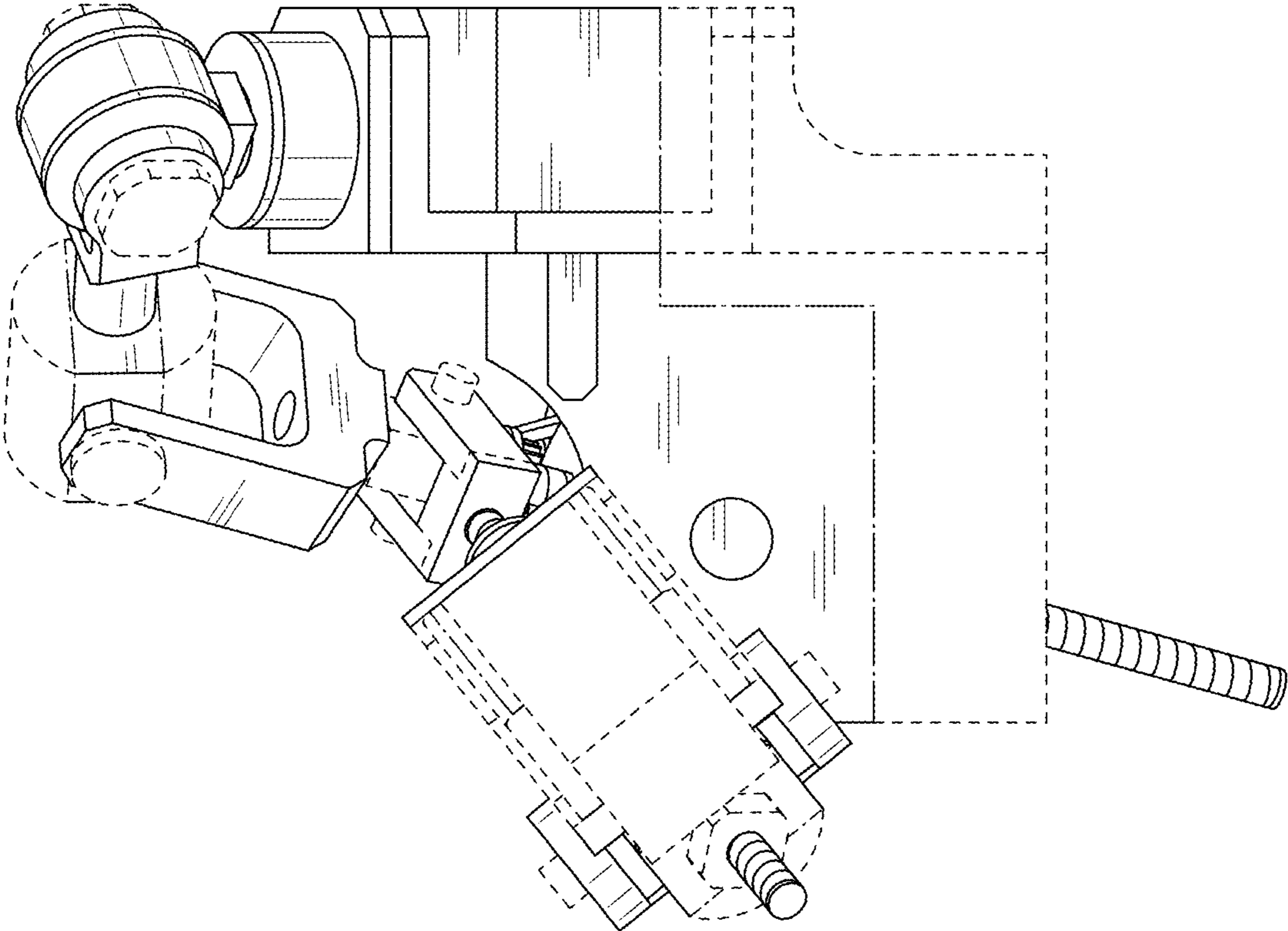


FIG. 6

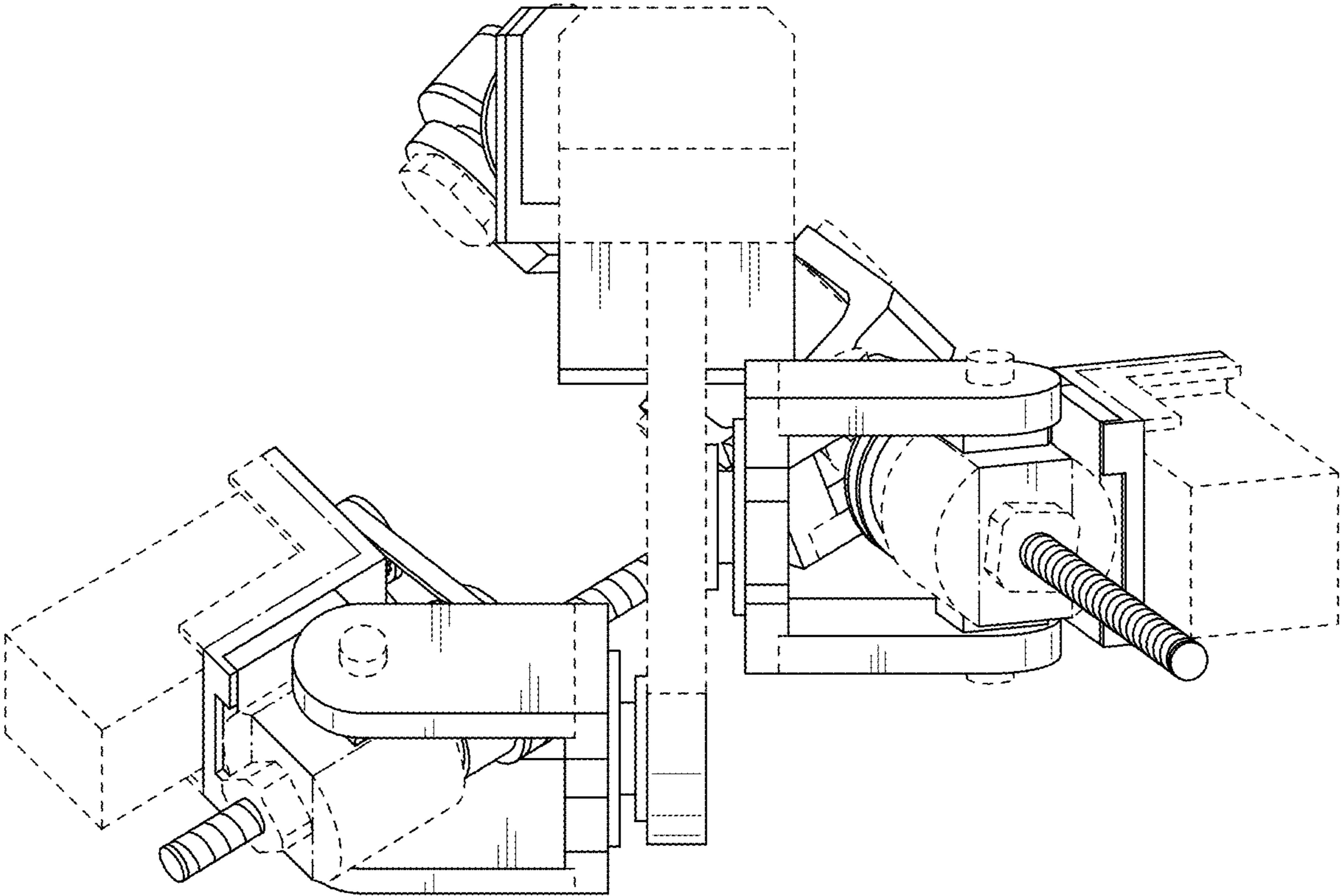


FIG. 7

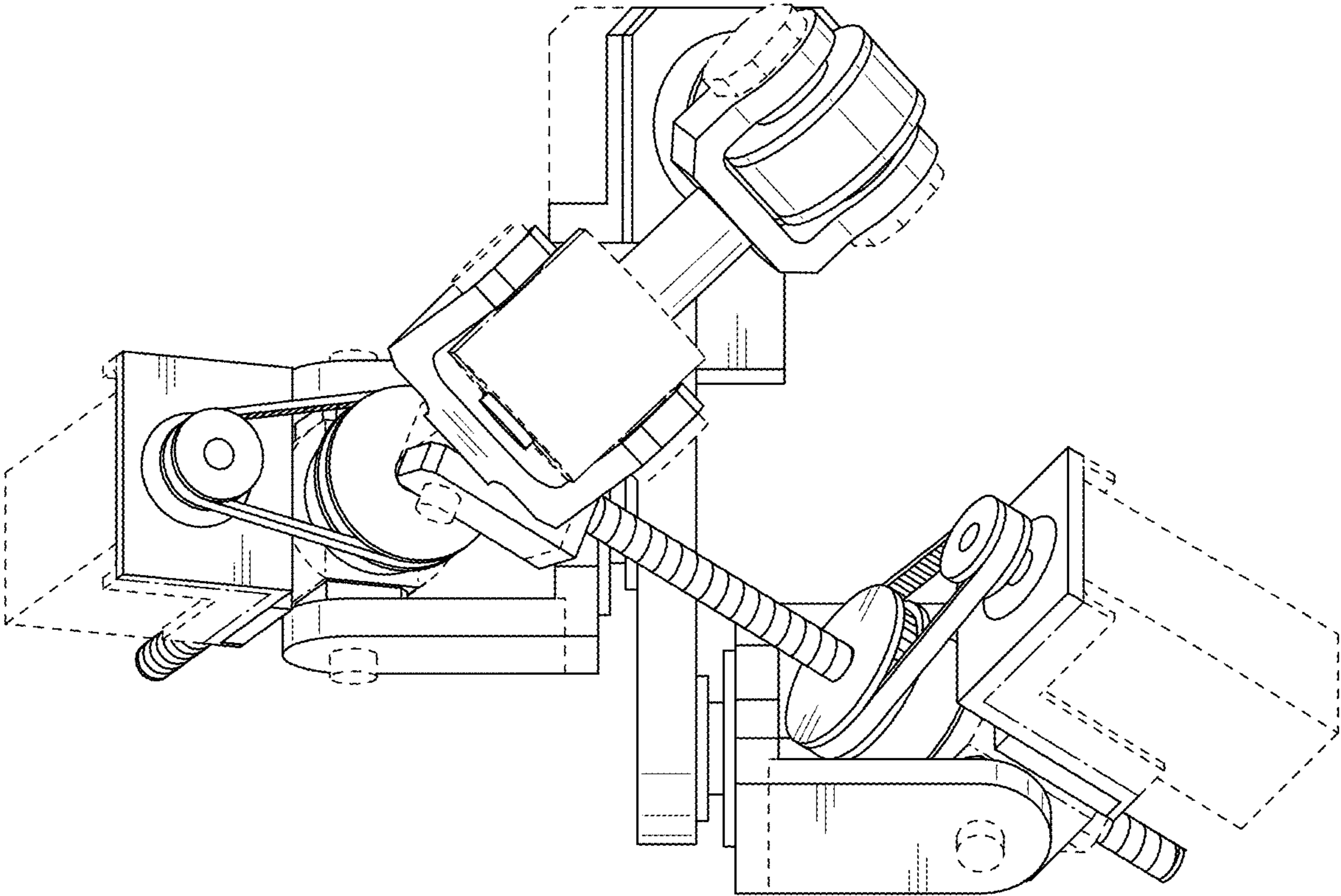


FIG. 8

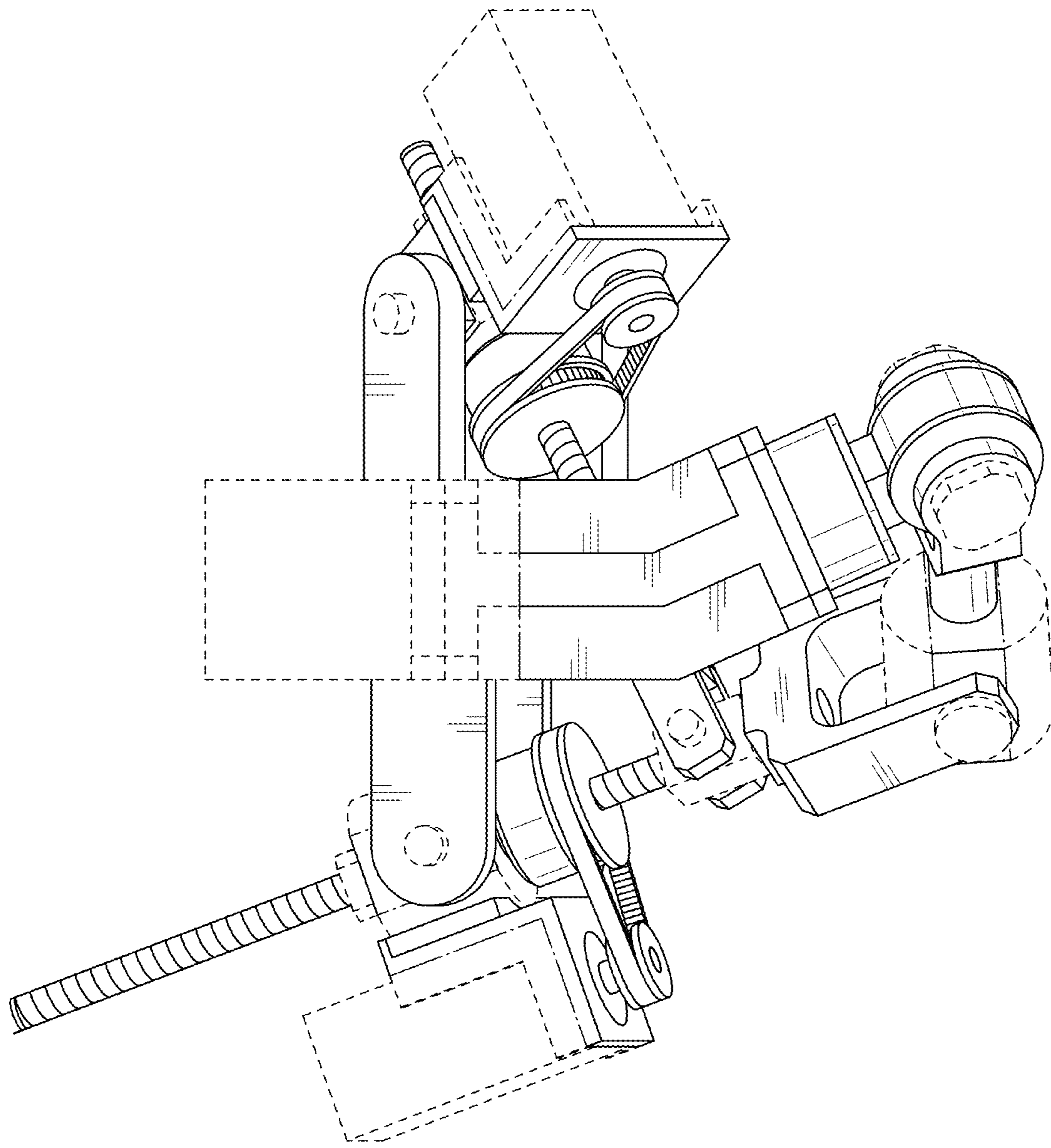


FIG. 9

