

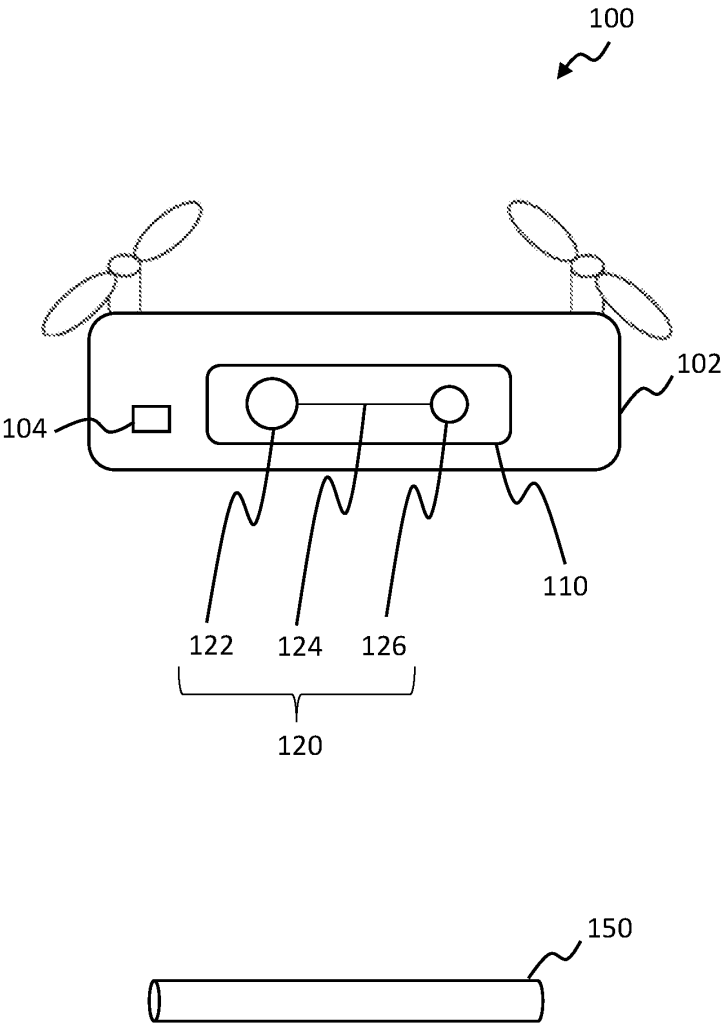


FIG. 1

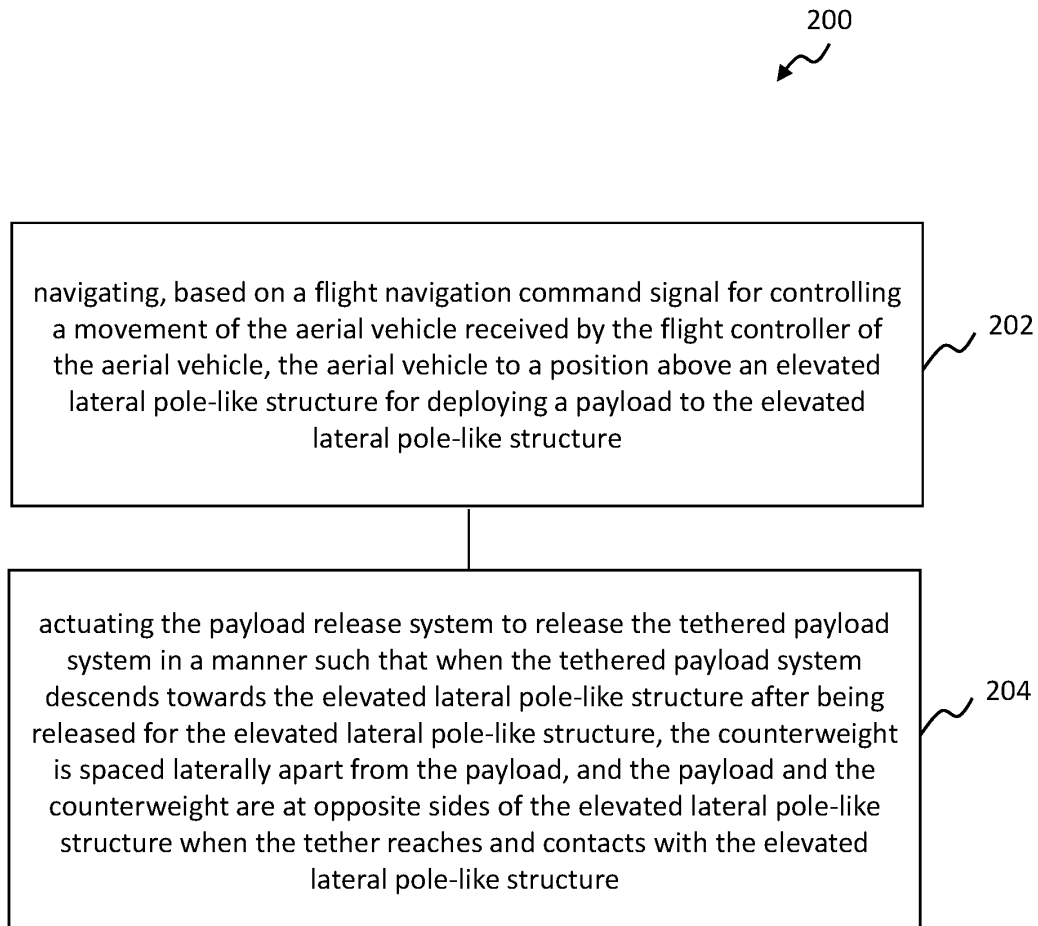


FIG. 2

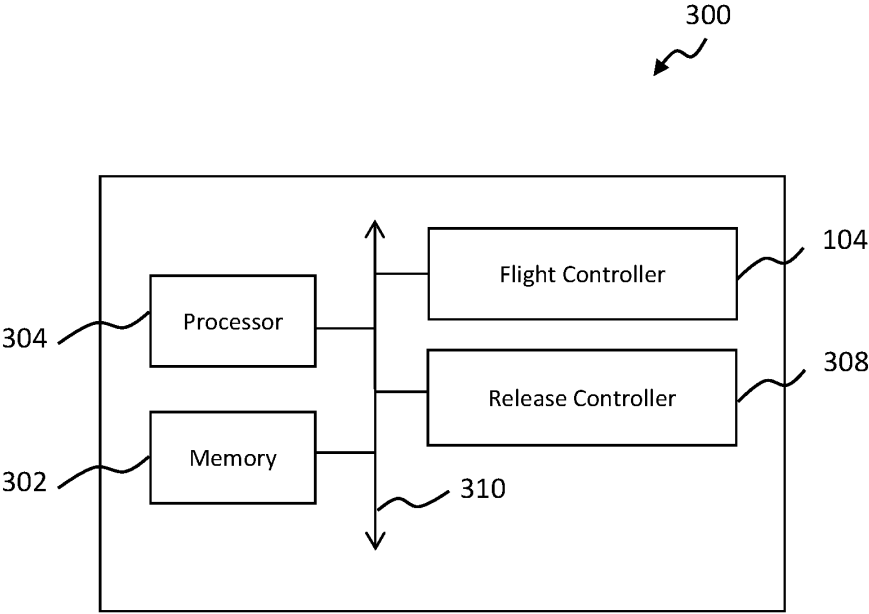


FIG. 3

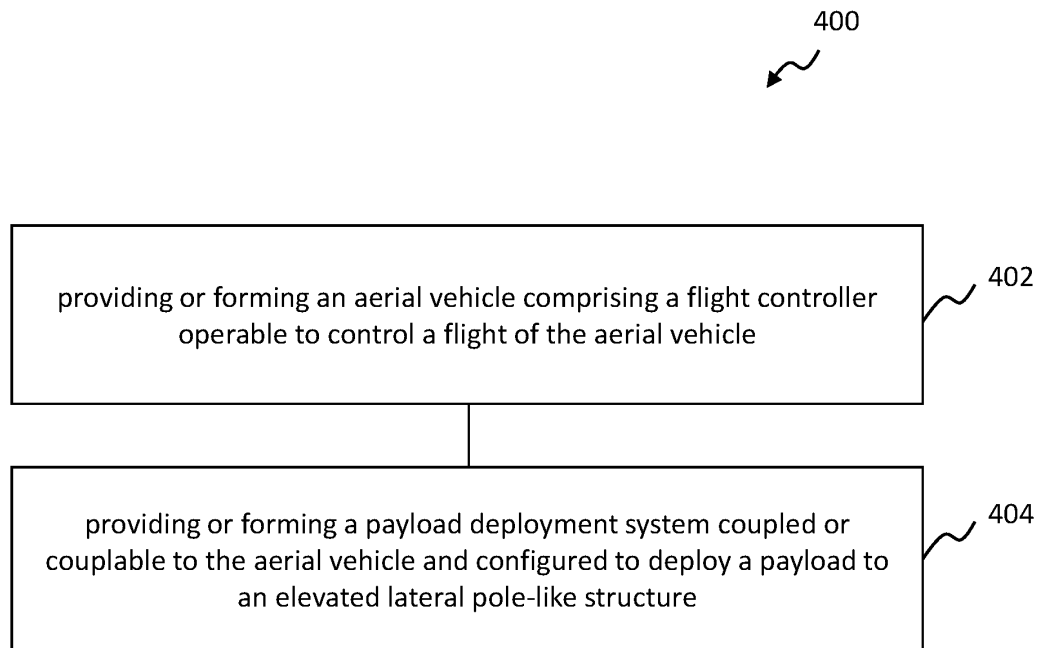


FIG. 4

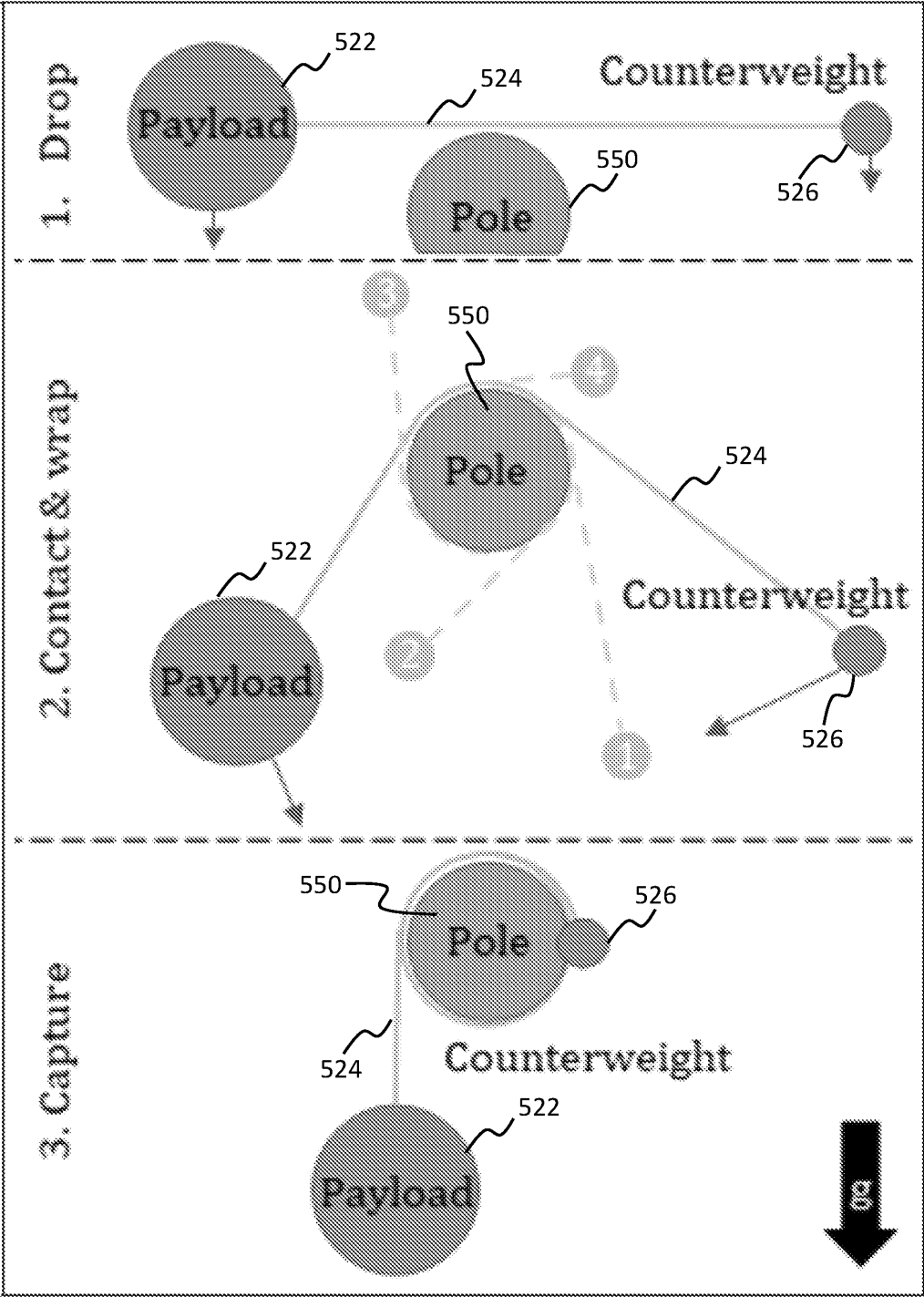


FIG. 5

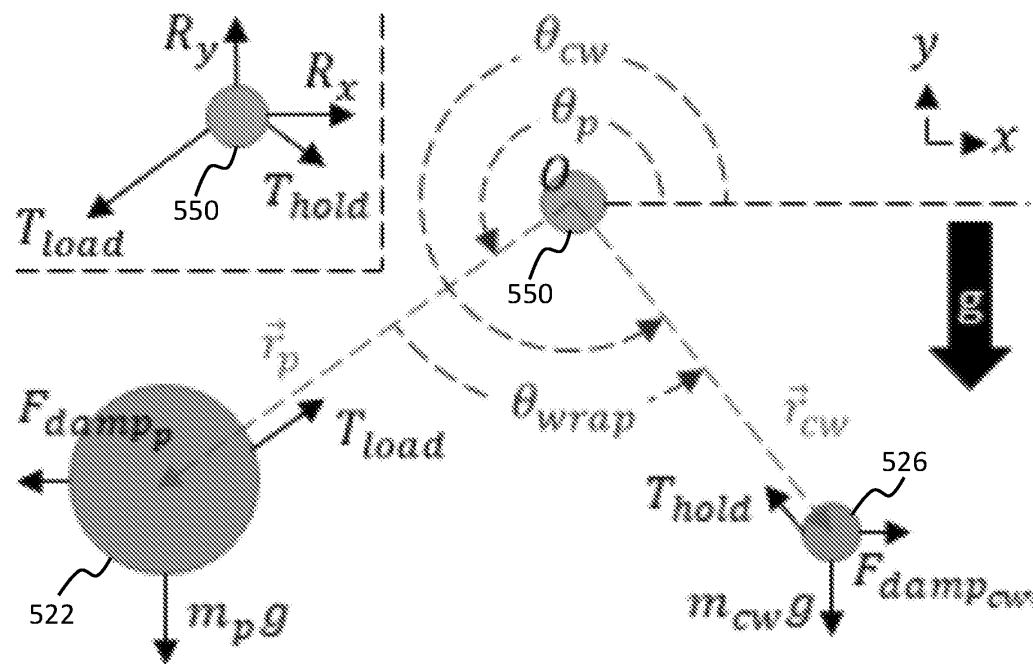


FIG. 6

TABLE I
SIMULATION CONSTANTS AND VARIABLES

Simulation constants		
Tether length, r_{total} (m)	1.5	
Friction coefficient, μ	0.3	
Damping coefficient, c	0.2	
Pole radius, r_{pole} (m)	0.05	
Duration (s)	0.6	
Gravity constant (m/s^2)	9.81	
	Payload	Counterweight
Mass, m (kg)	0.281	0.051
Radial offset r_{pi}, r_{cwi} (m)	0.05 - 1.25	0.25 - 1.45
Angular offset $\theta_{pi}, \theta_{cwi}$ (rad)	π	$-\pi/2 - \pi/2$

FIG. 7

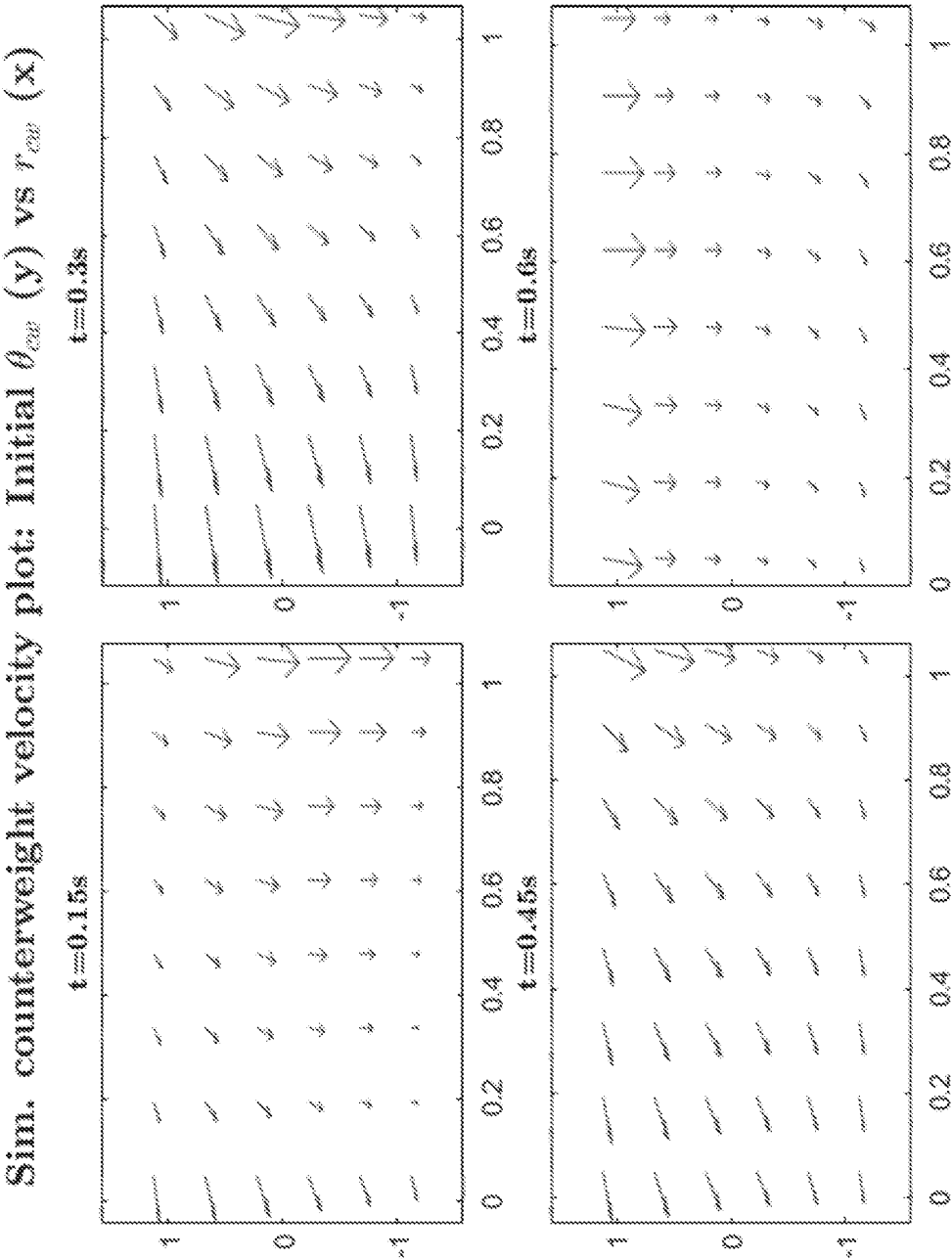
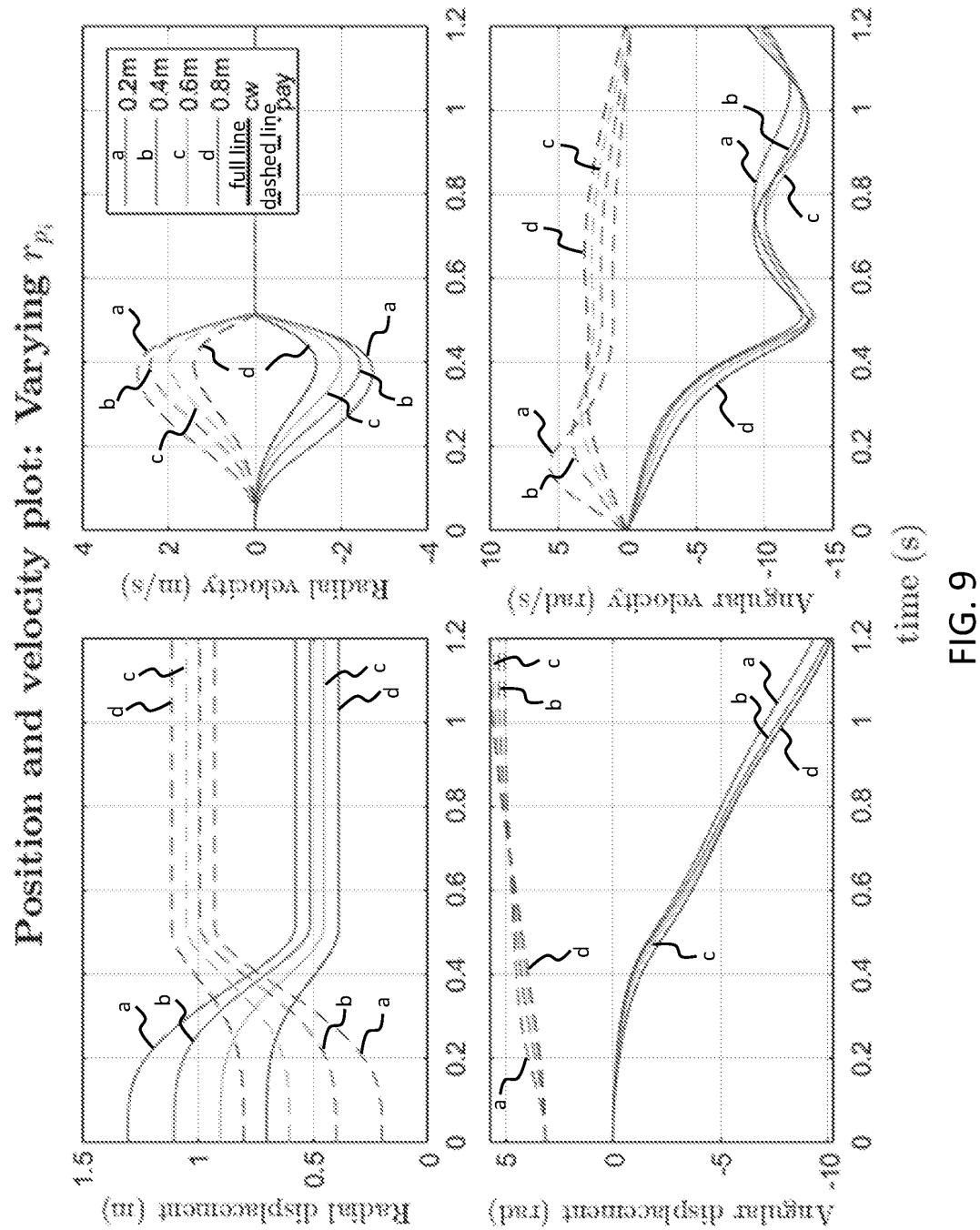
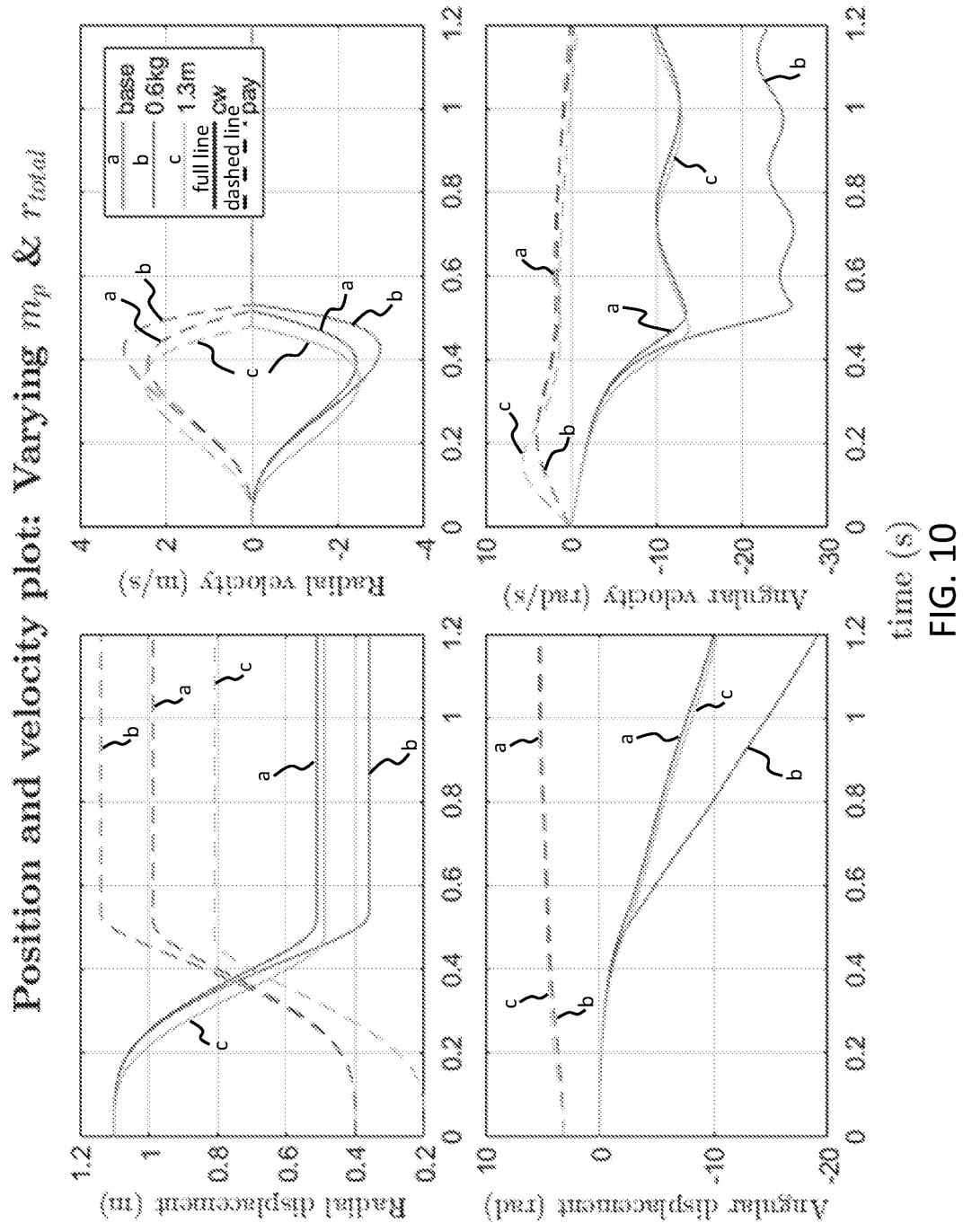


FIG. 8





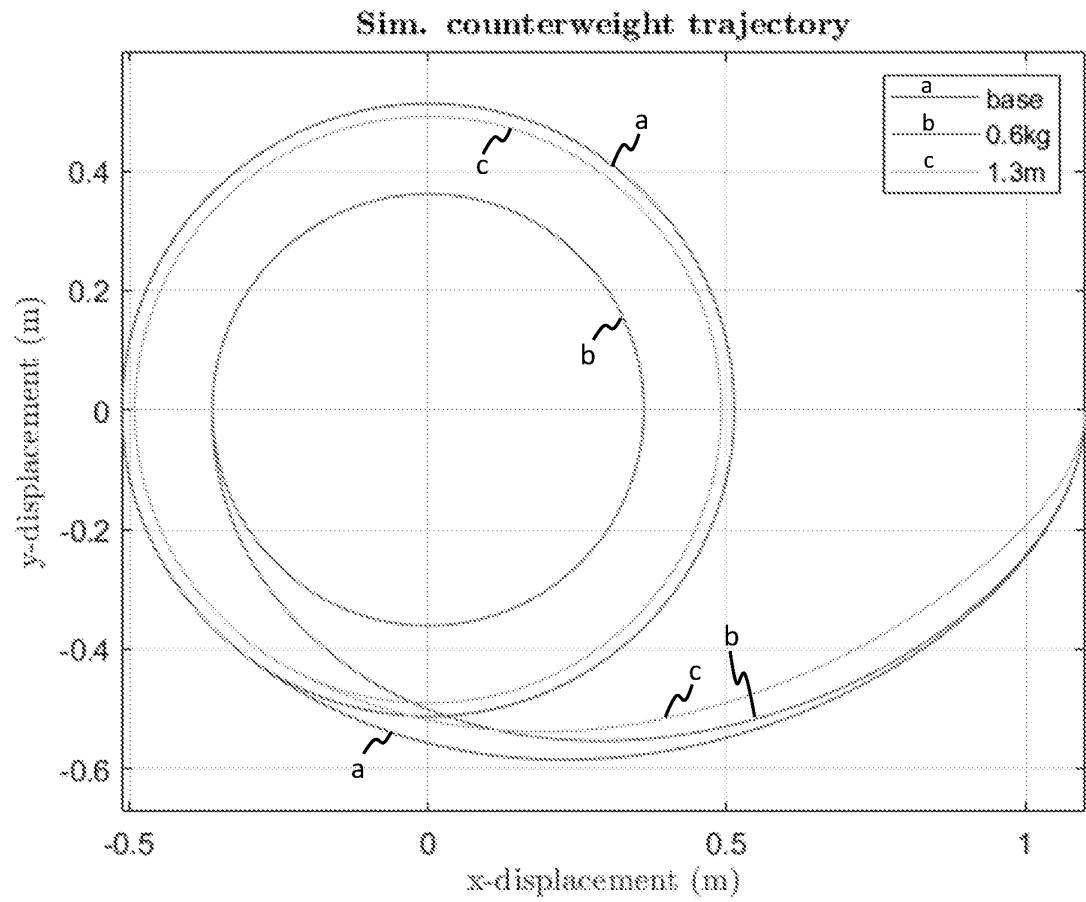


FIG. 11

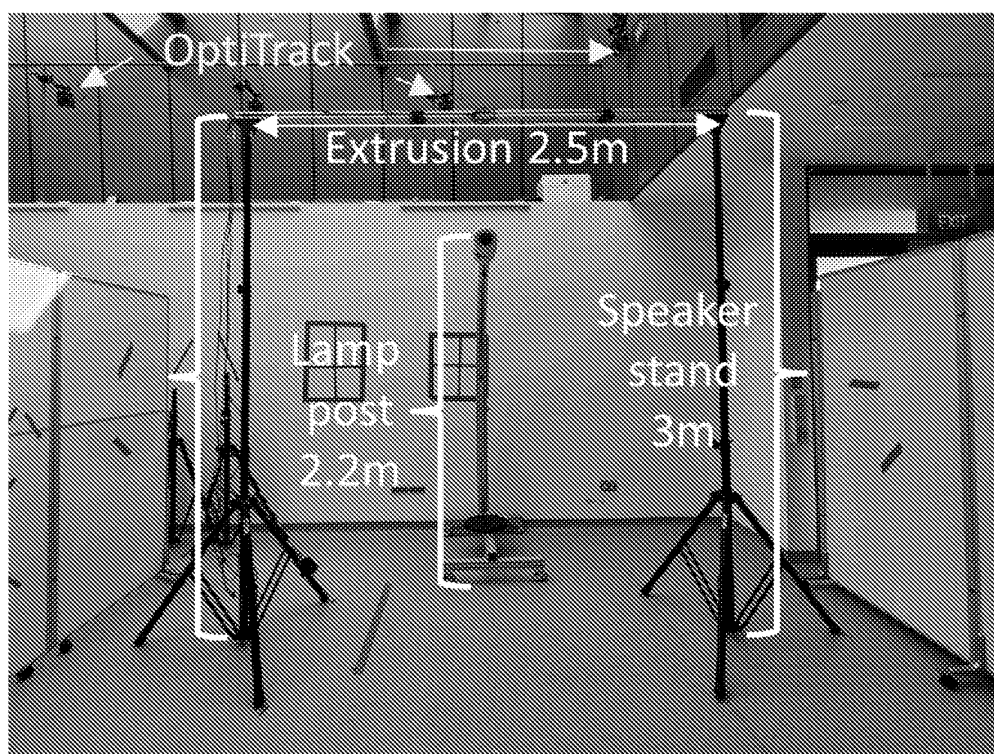


FIG. 12

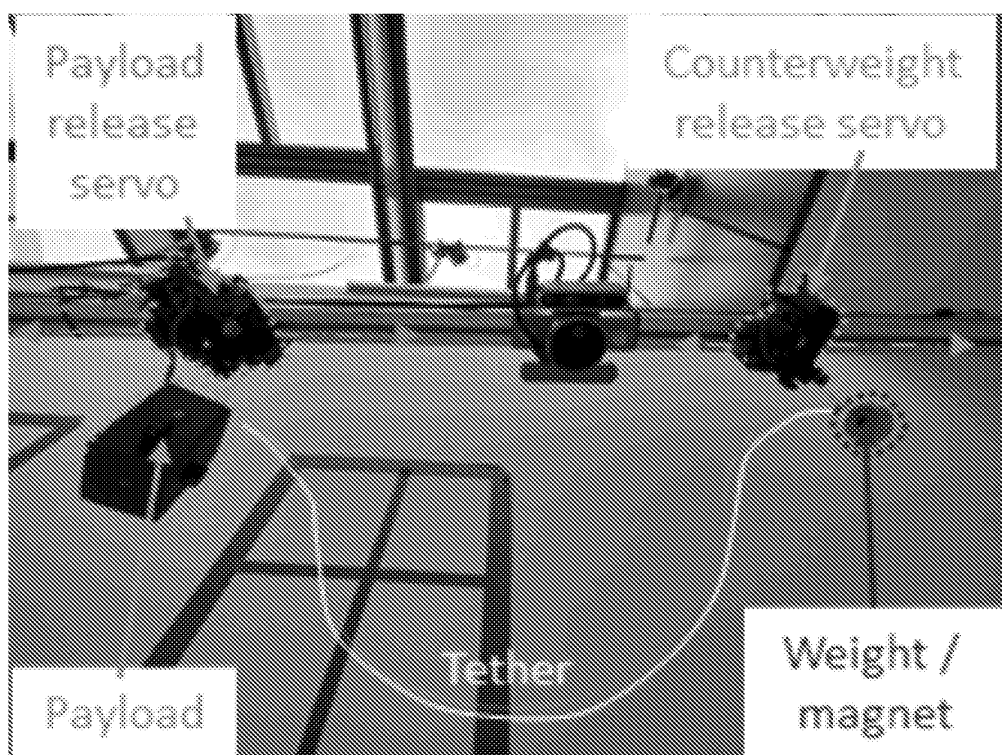


FIG. 13

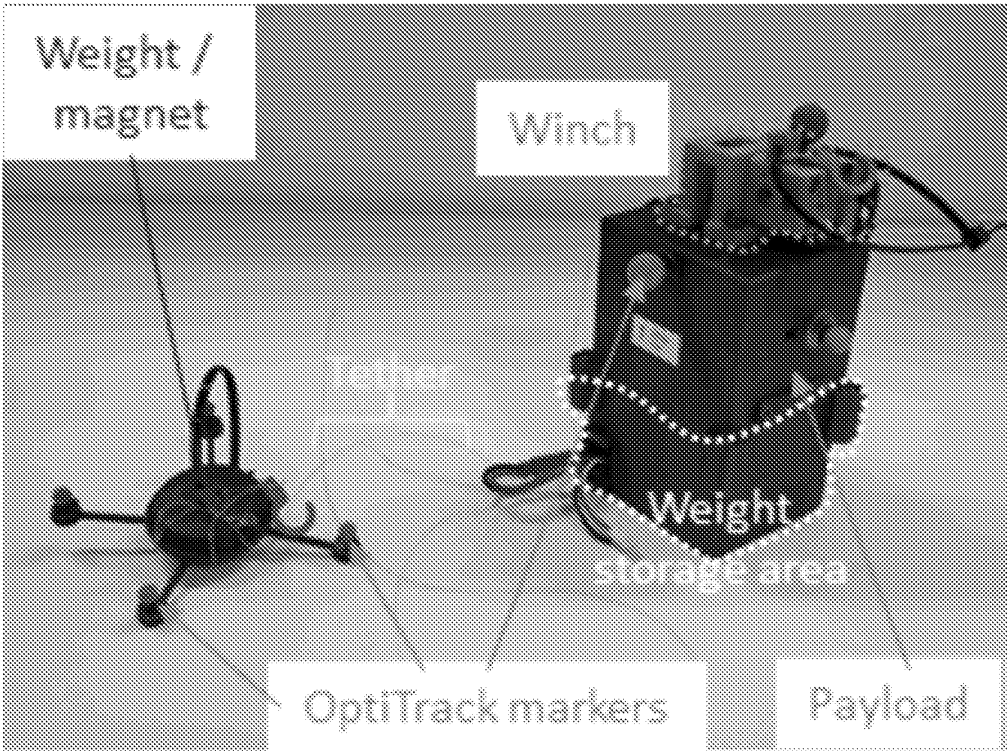


FIG. 14

TABLE II
LIST AND RANGE OF EXPERIMENTAL VARIABLES.

Experimental variables	
Payload mass, m_p (g)	284 - 607
Counterweight mass (non-magnetic), m_{cw} (g)	36 - 66
Counterweight mass (magnetic), m_{cw} (g)	51
Tether length, r_{total} (m)	1.2 - 2.0
Payload offset, r_{p_i} (m)	0.1 - 0.8
Drop height to pole, h (m)	0.7 - 0.8

FIG. 15

Expt. group 10, position & velocity plot: Sim. params.

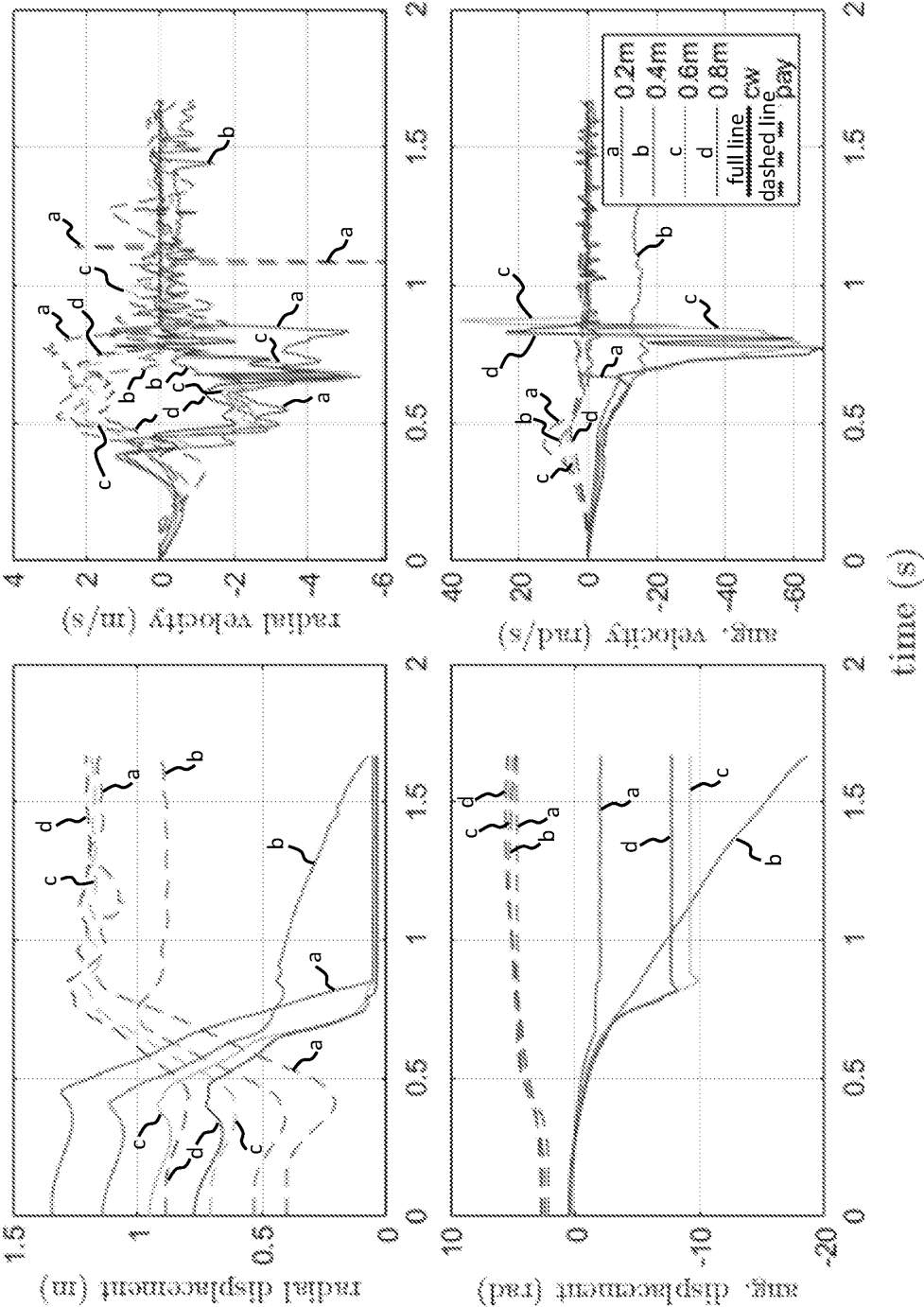


FIG. 16

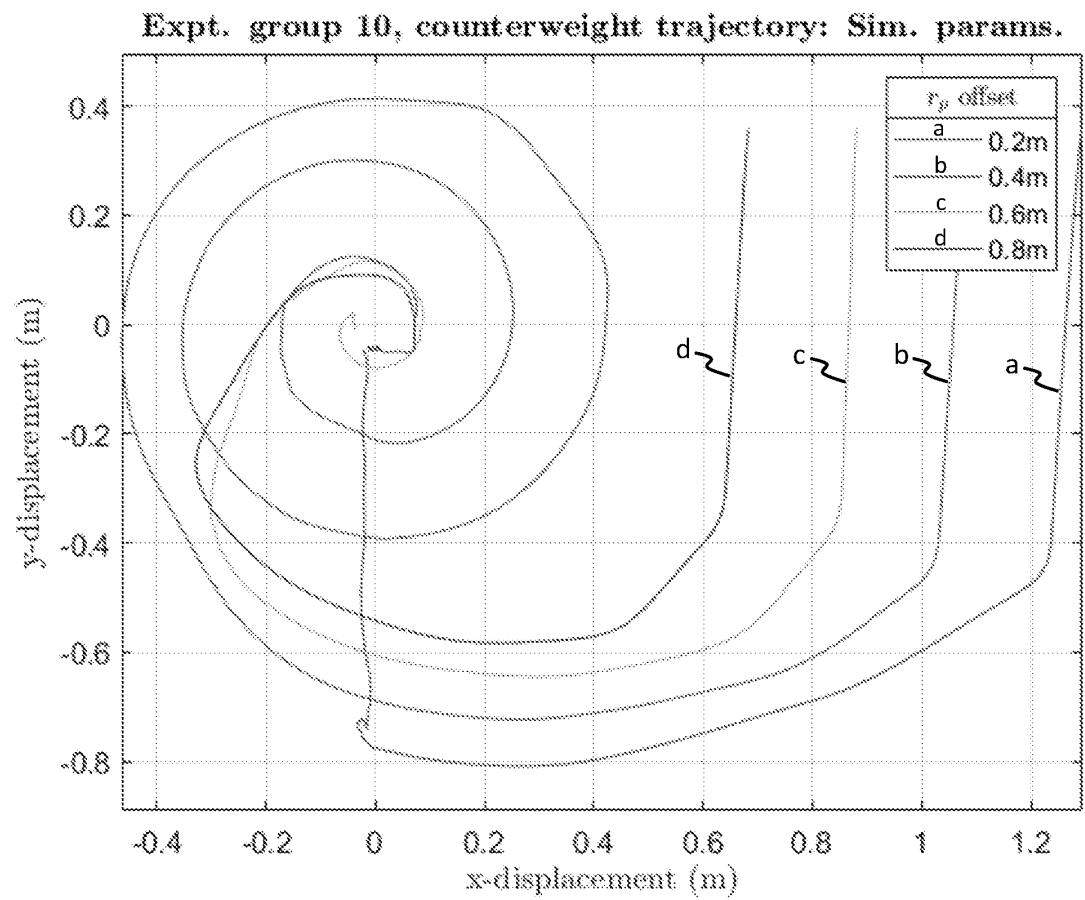
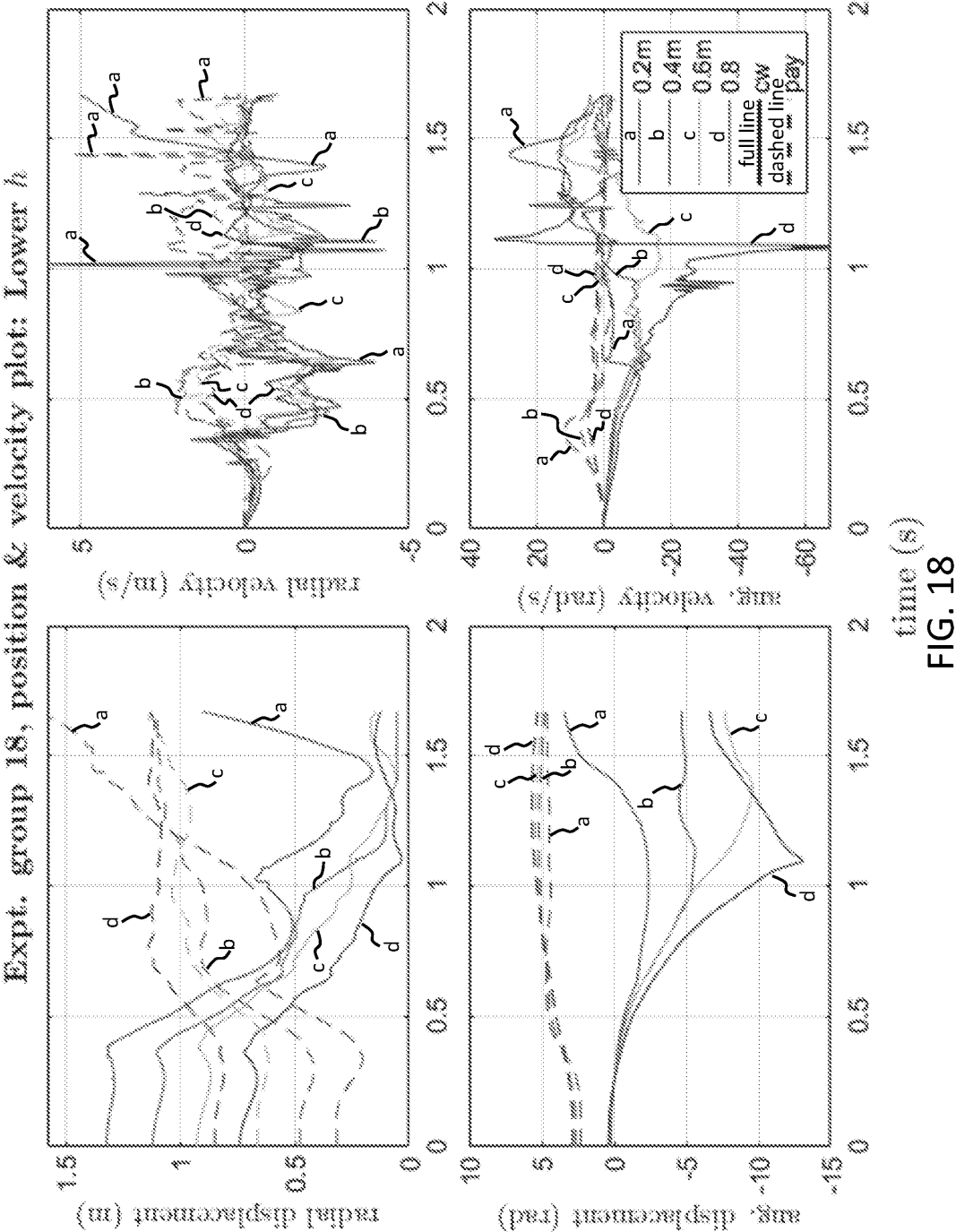


FIG. 17



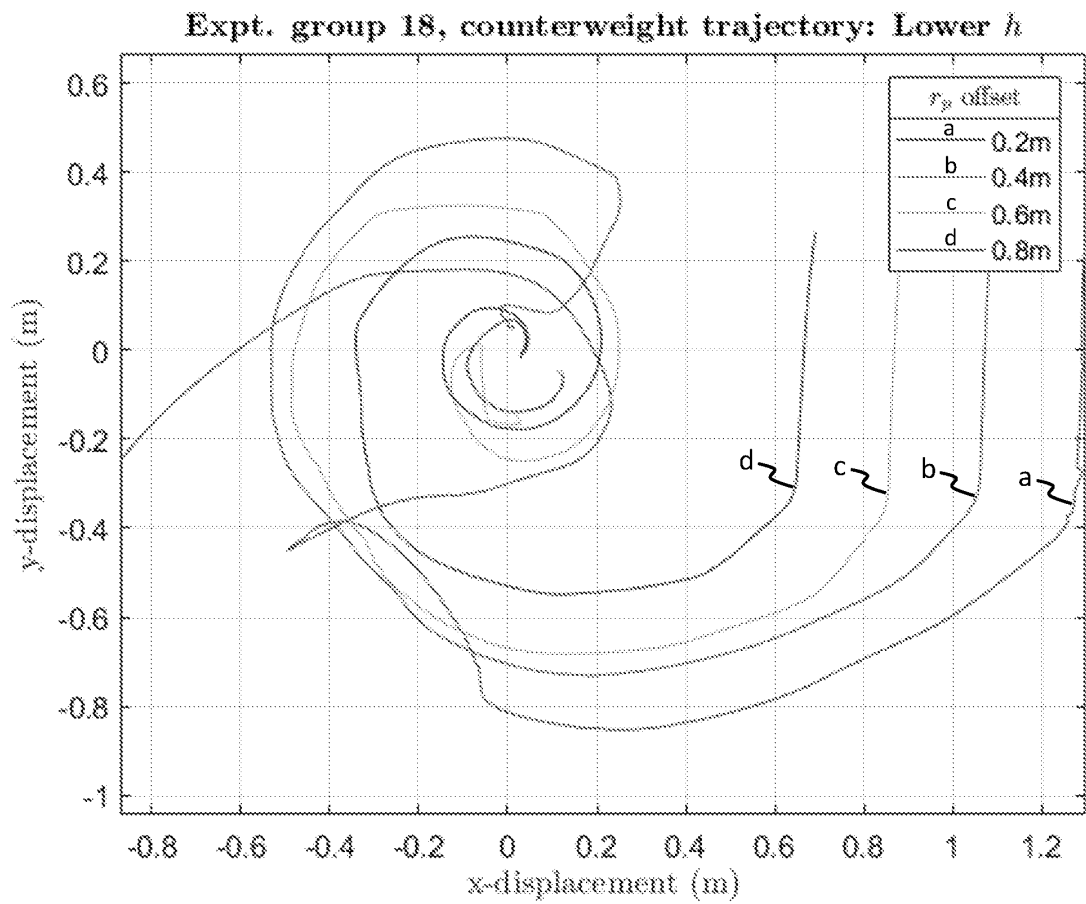


FIG. 19

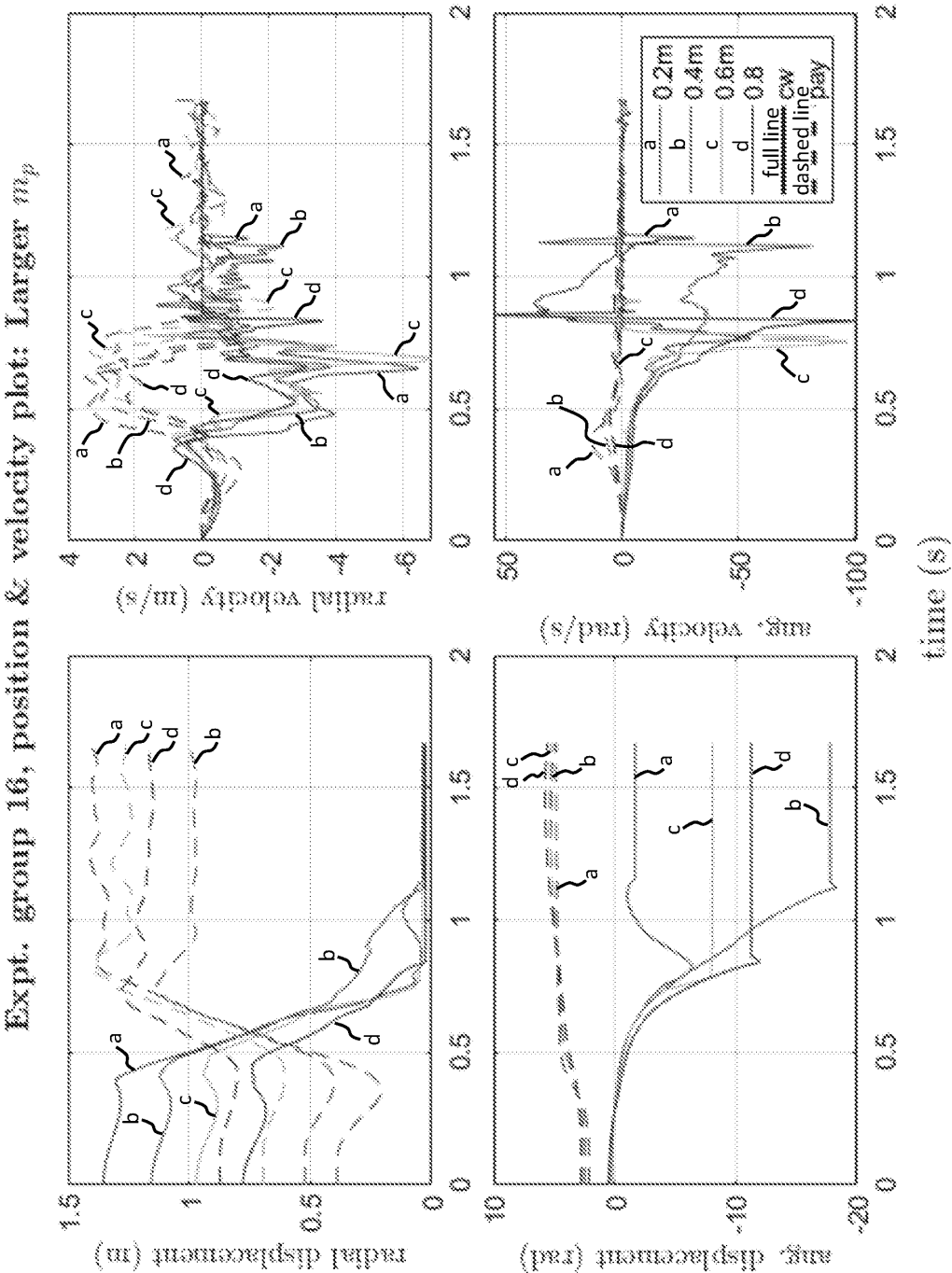


FIG. 20

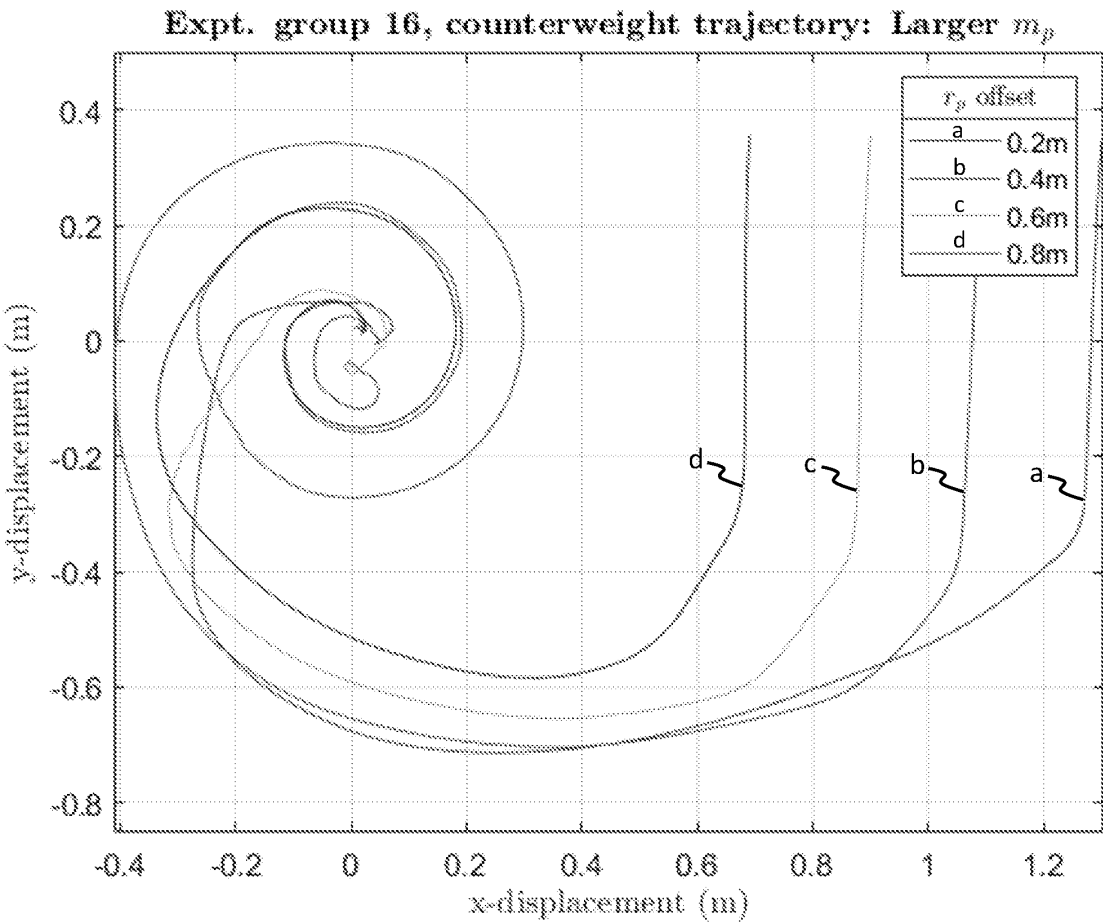


FIG. 21

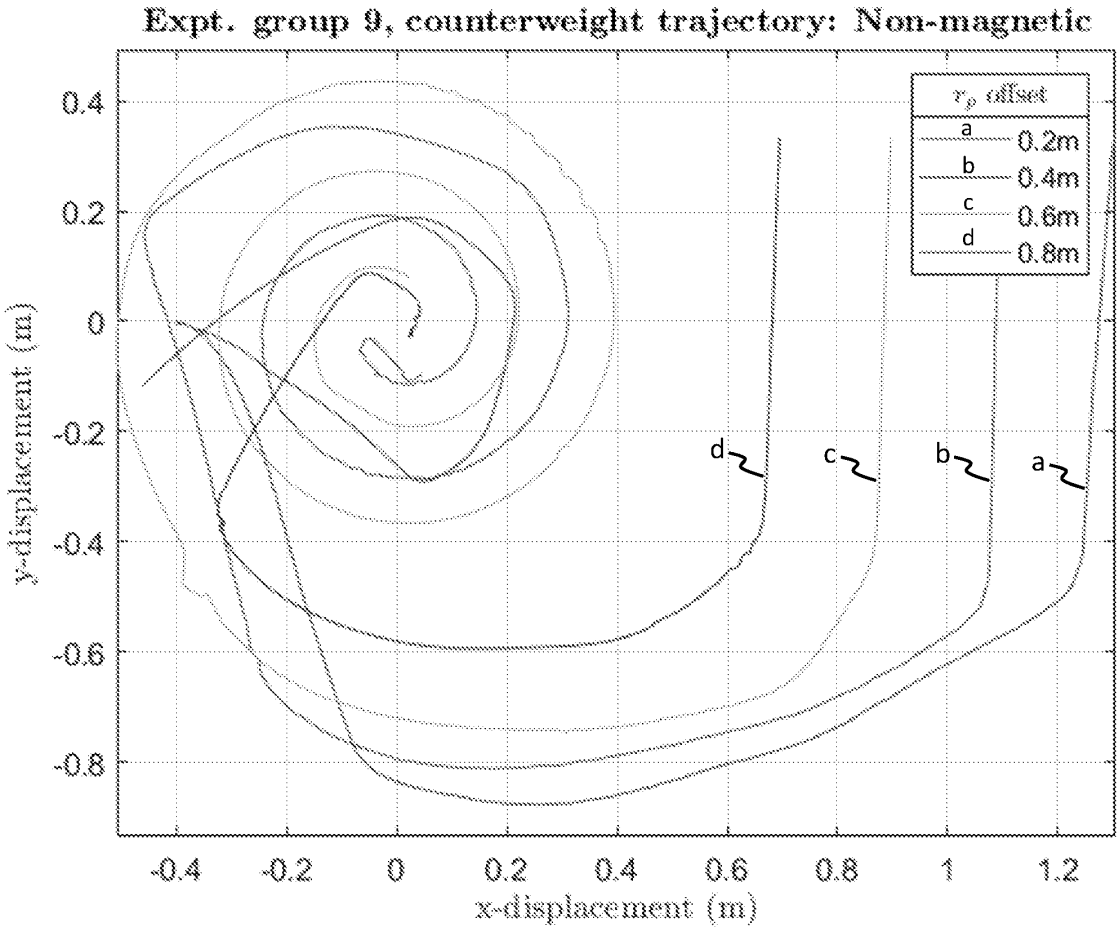


FIG. 22

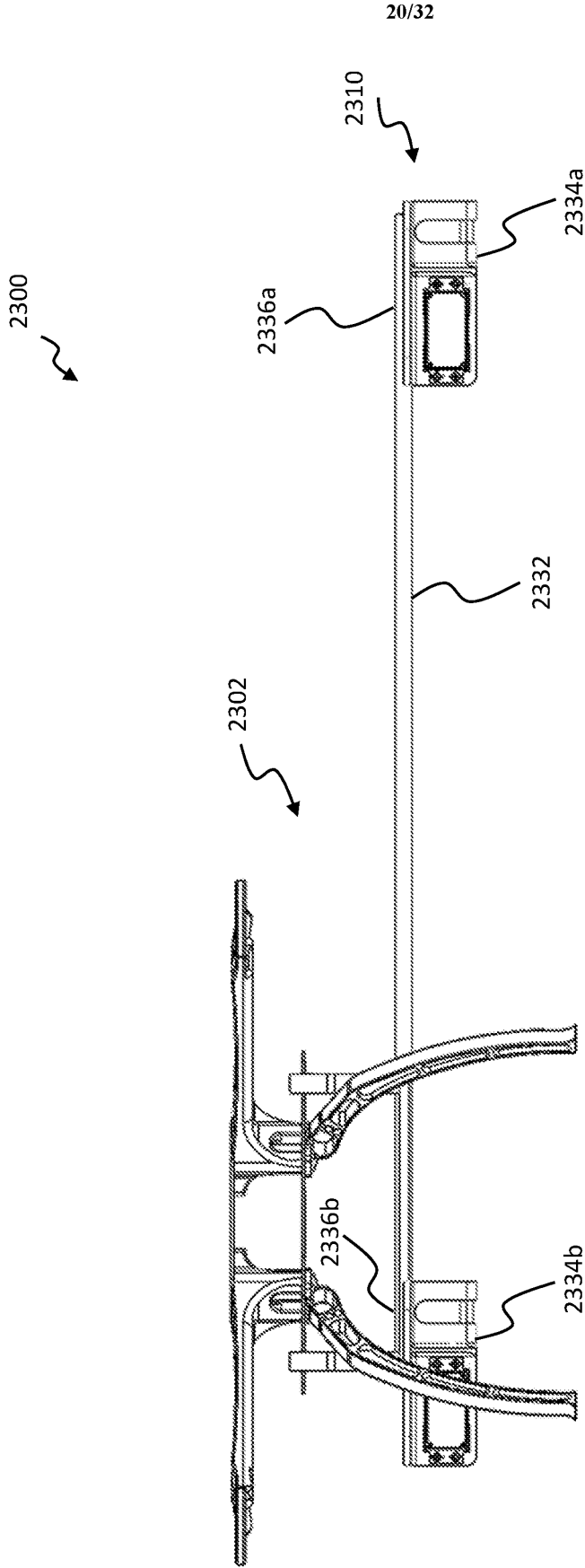


FIG. 23A

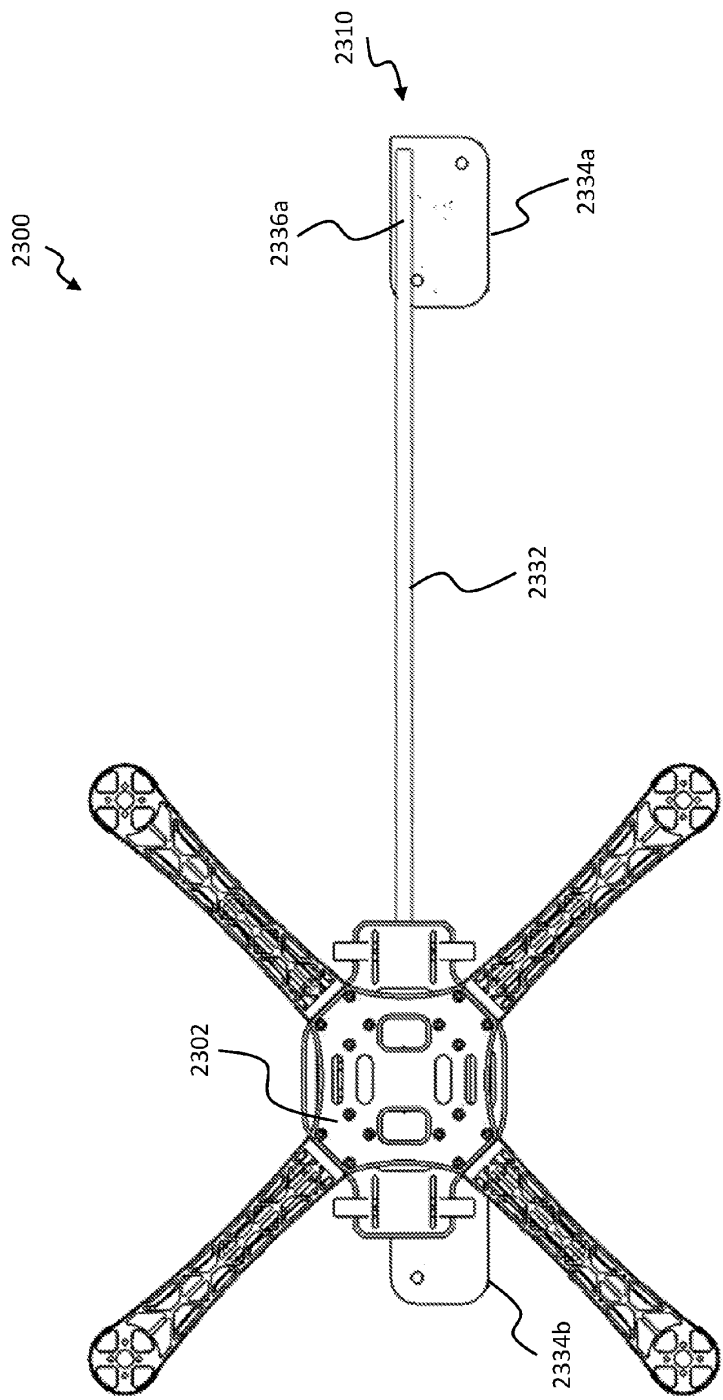


FIG. 23B

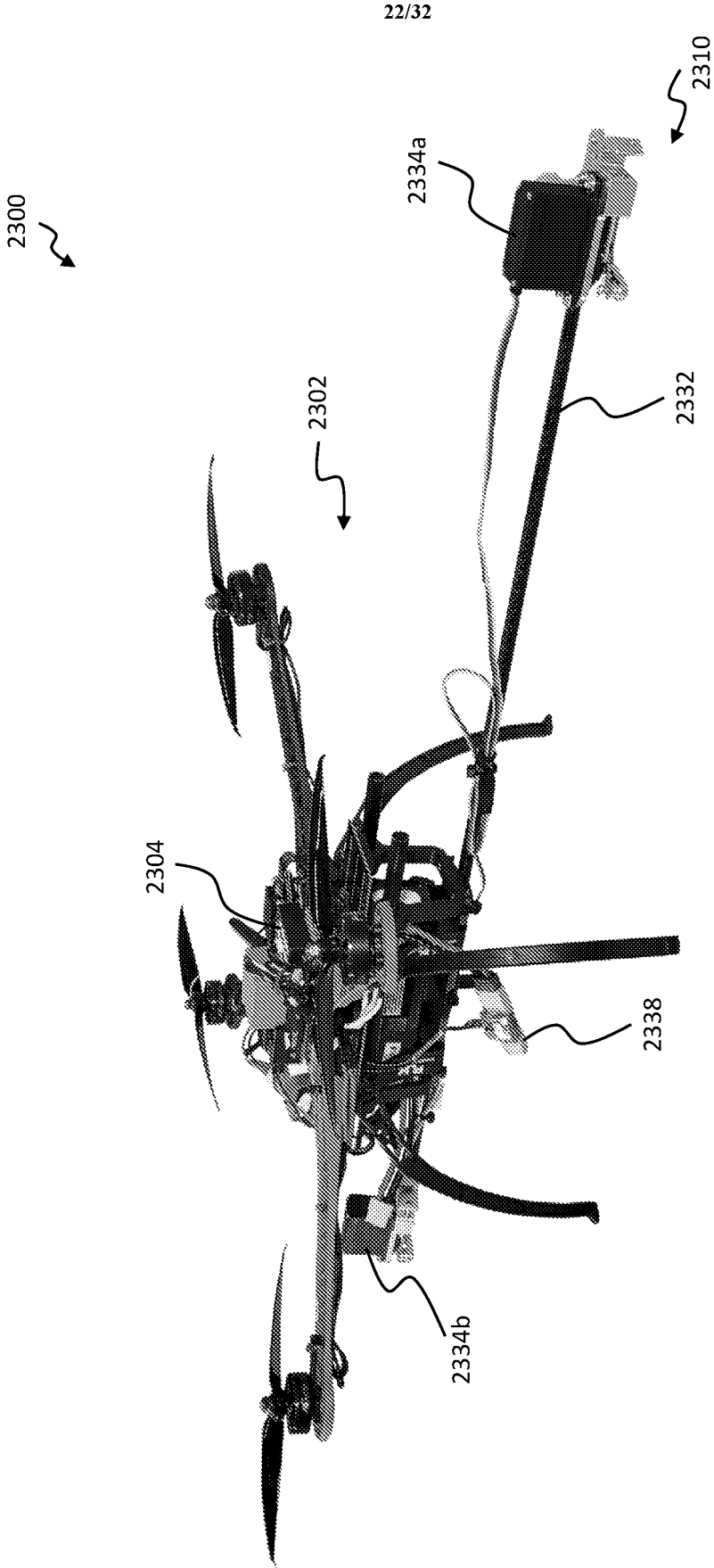


FIG. 23C

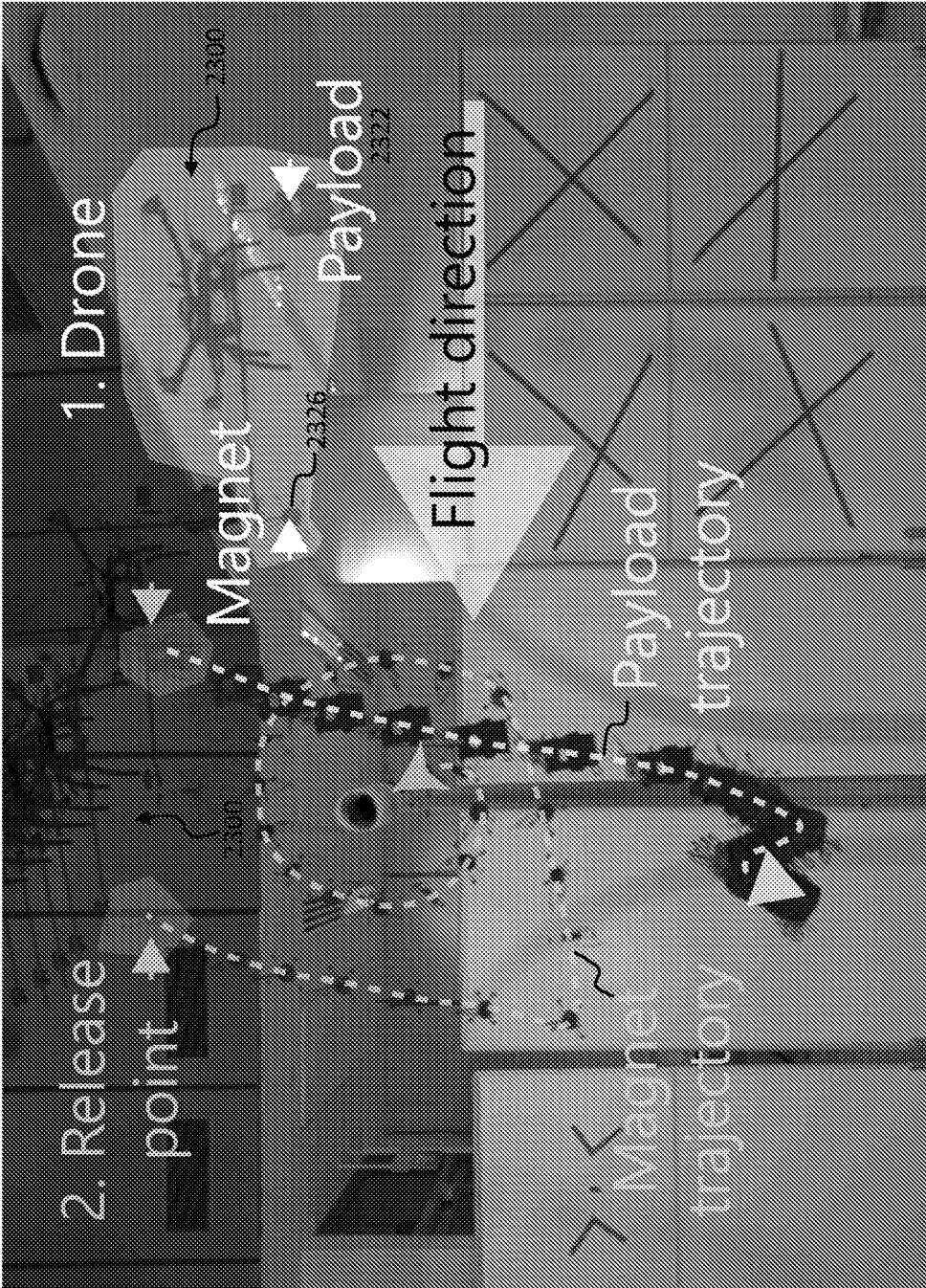


FIG. 24

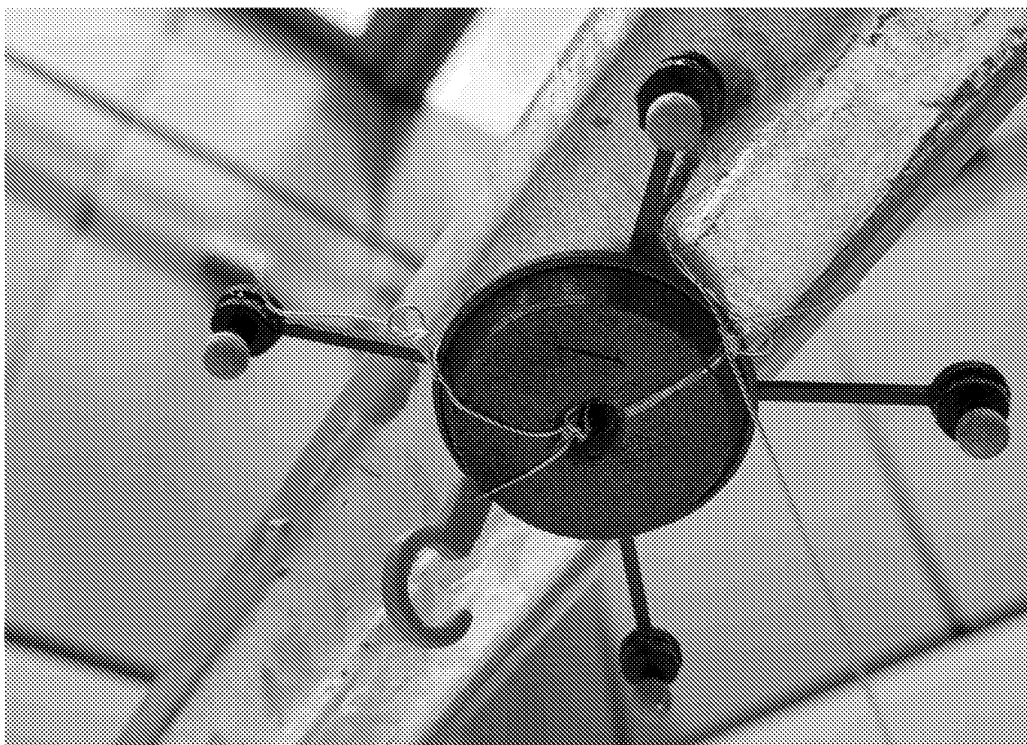


FIG. 25

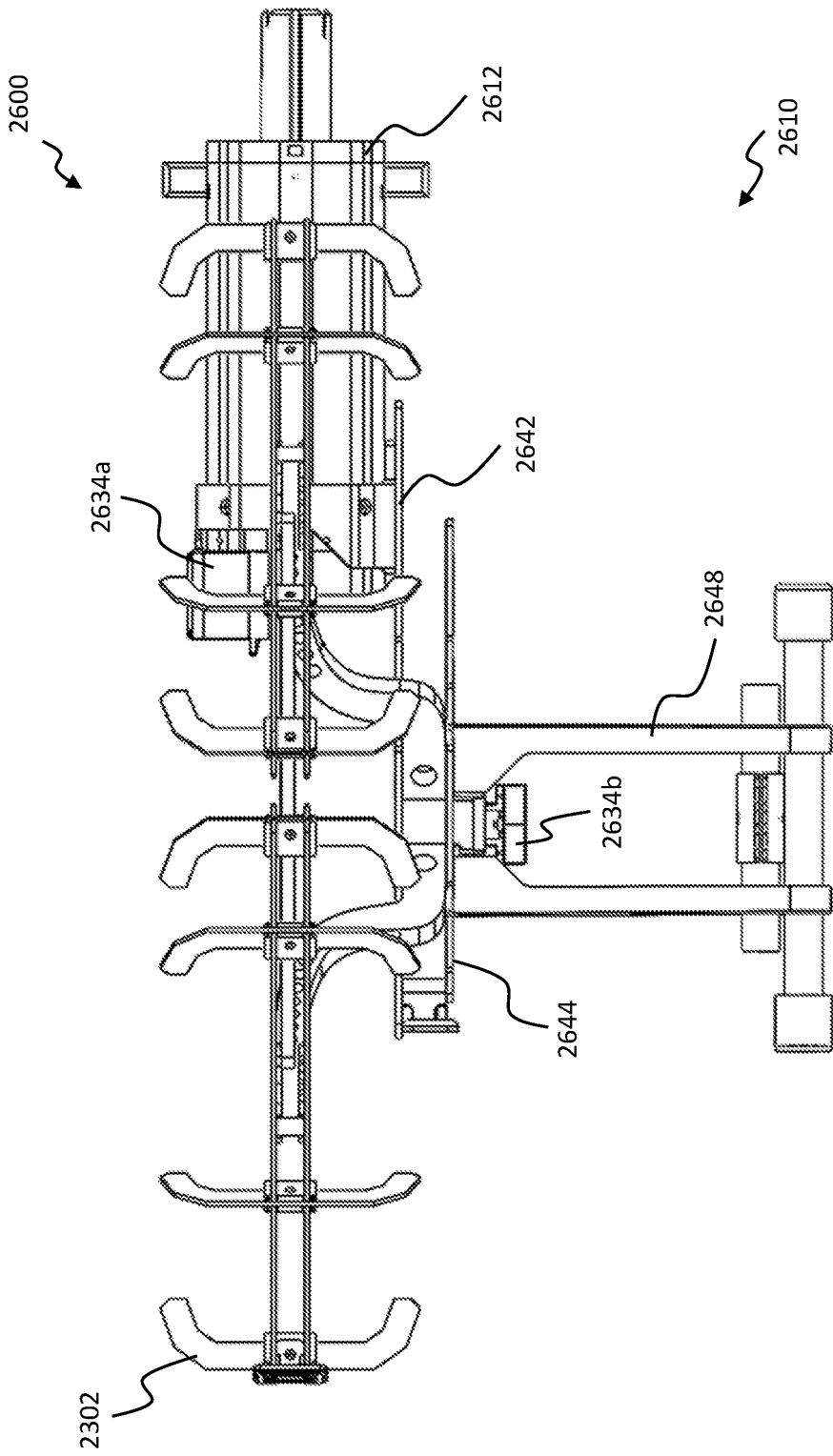


FIG. 26A

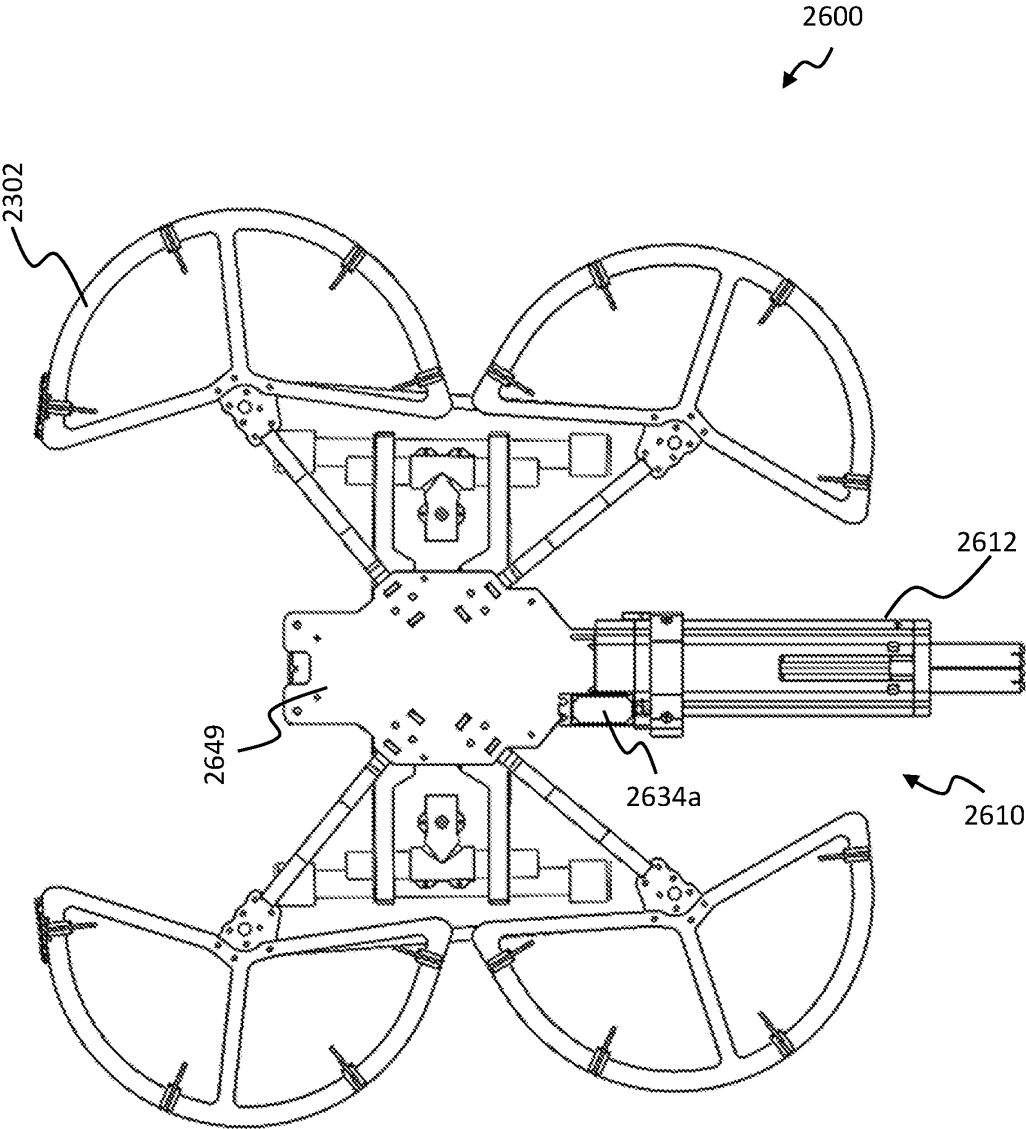


FIG. 26B

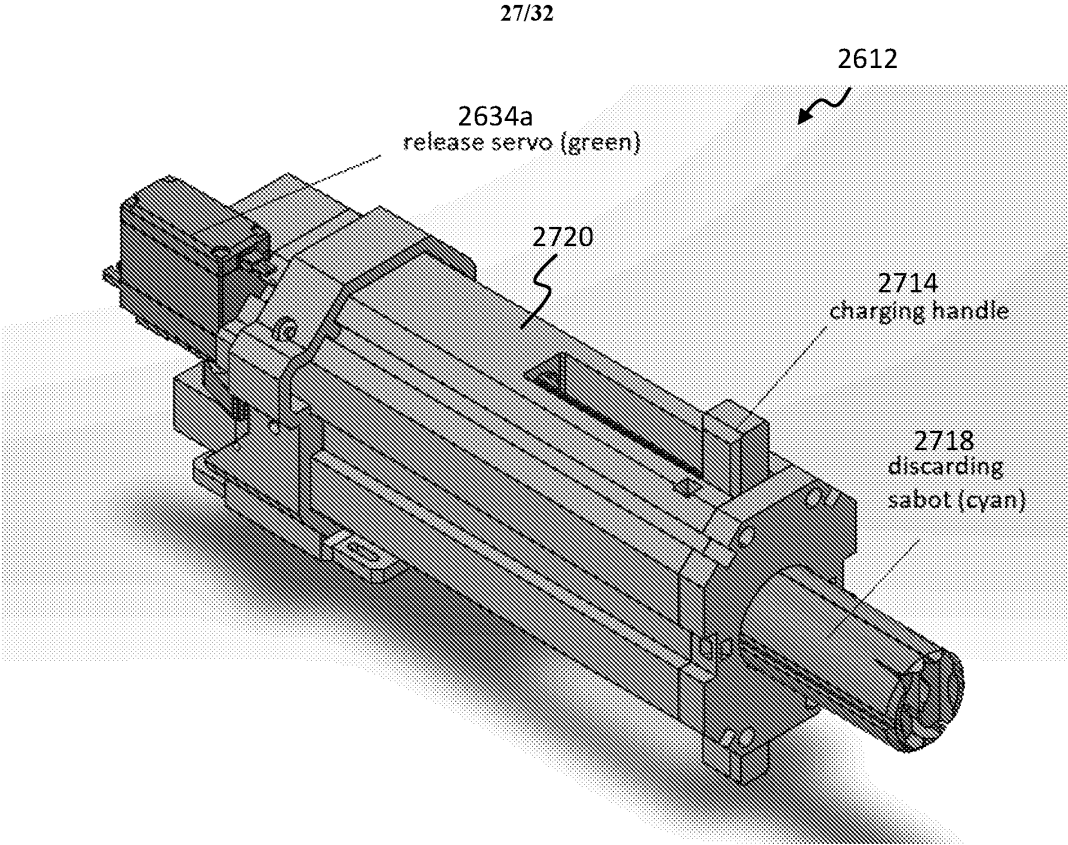


FIG. 27A

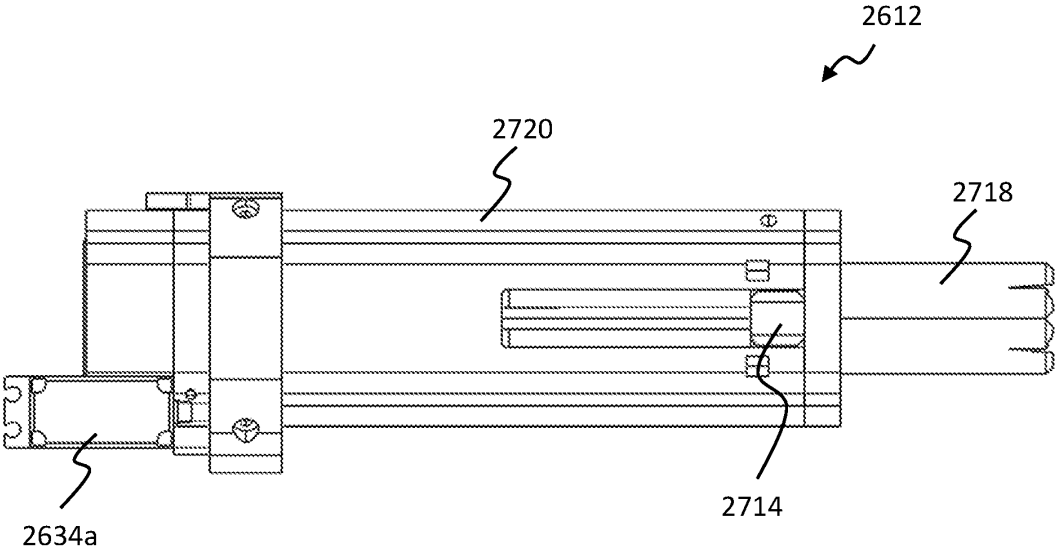


FIG. 27B

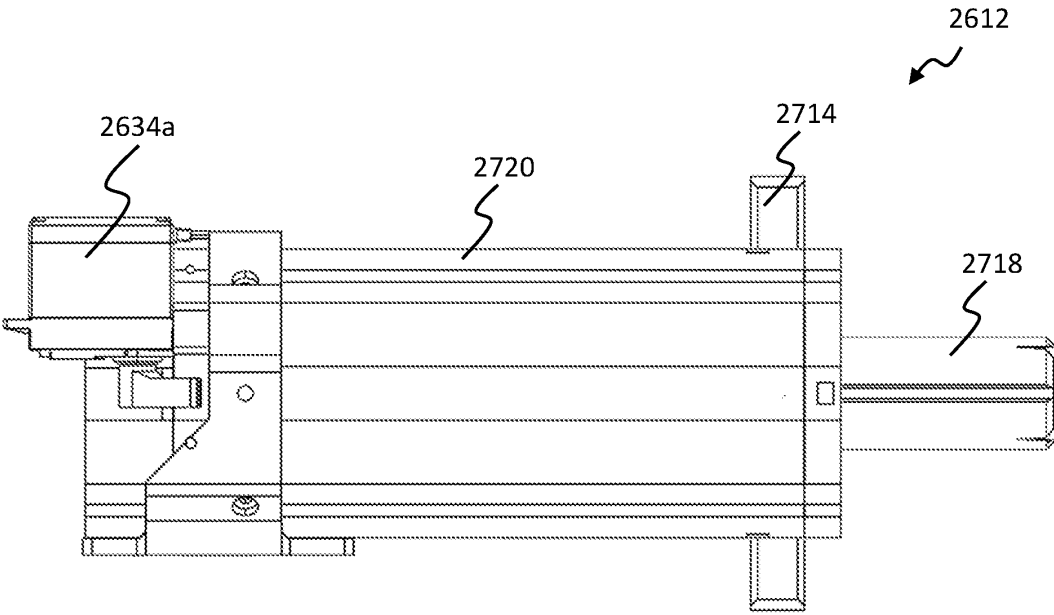


FIG. 27C

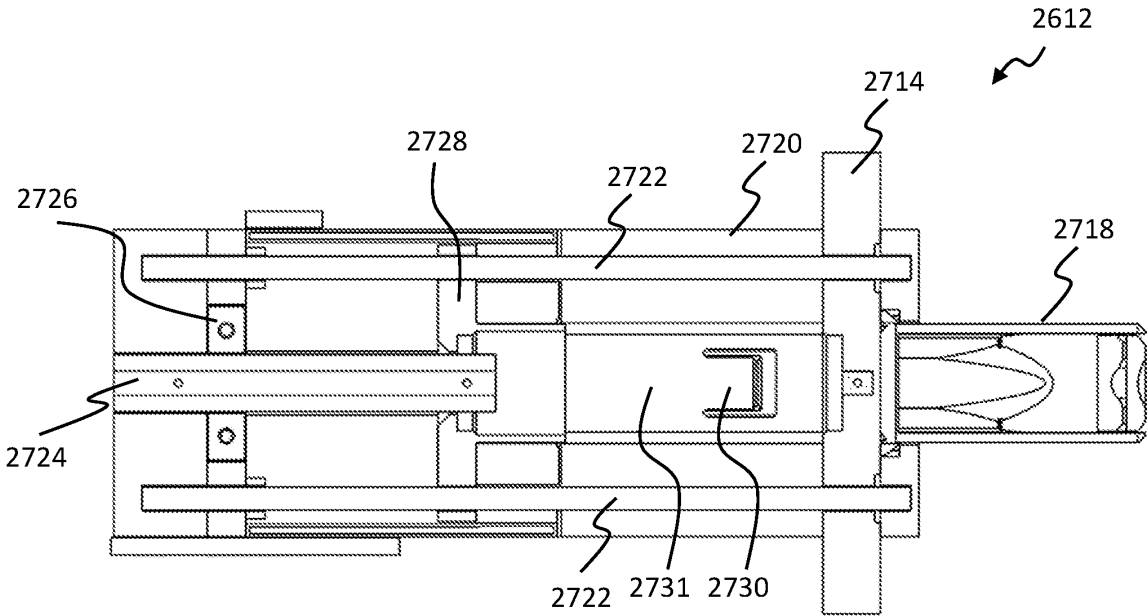


FIG. 27D

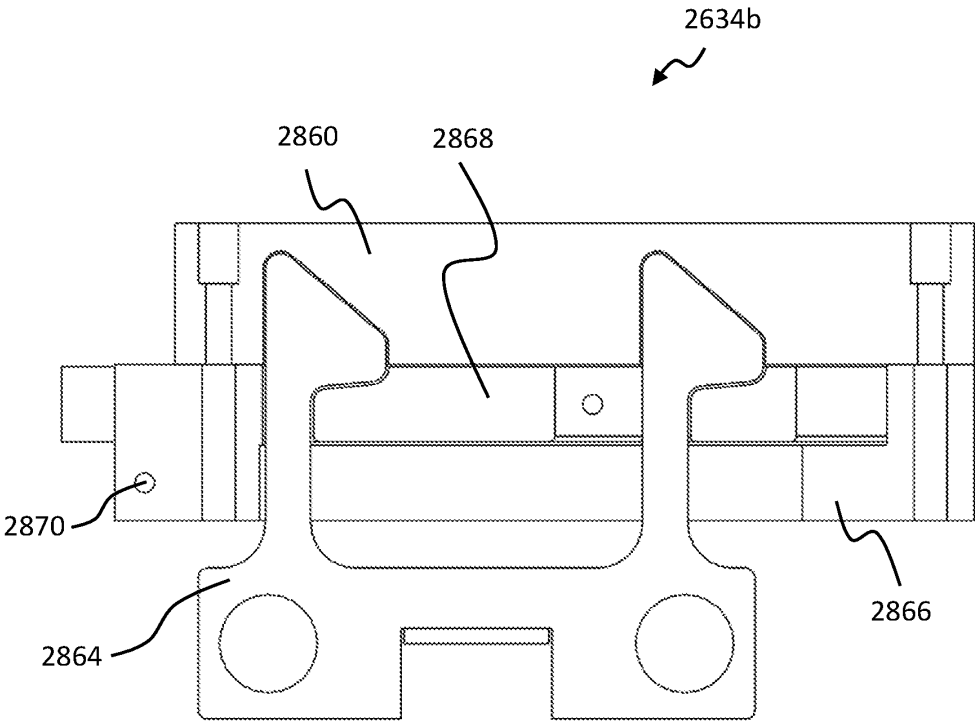


FIG. 28

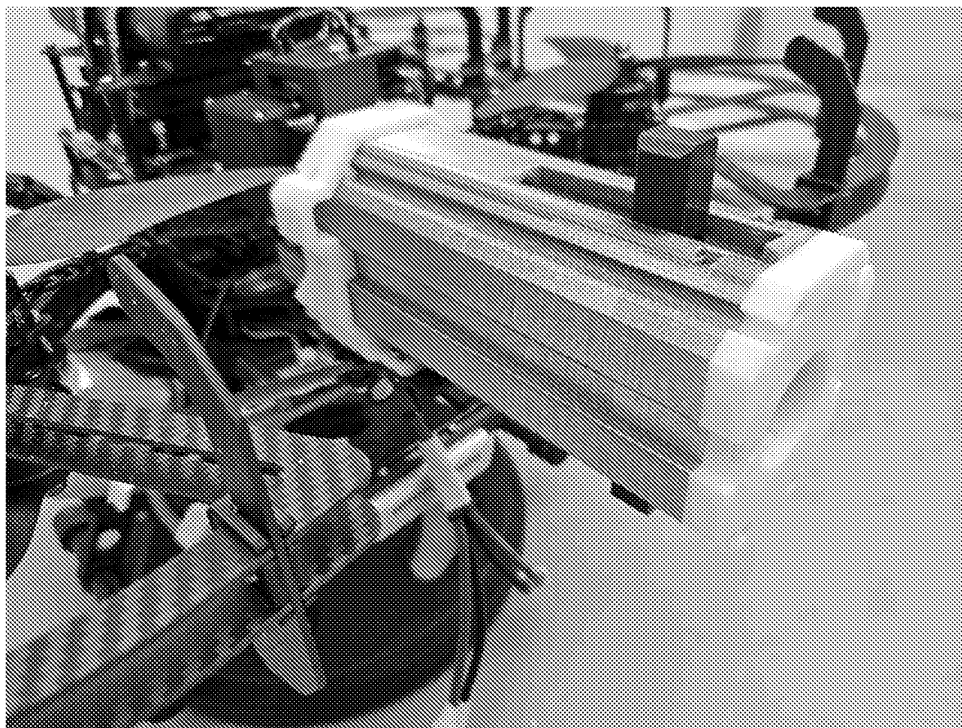


FIG. 29A

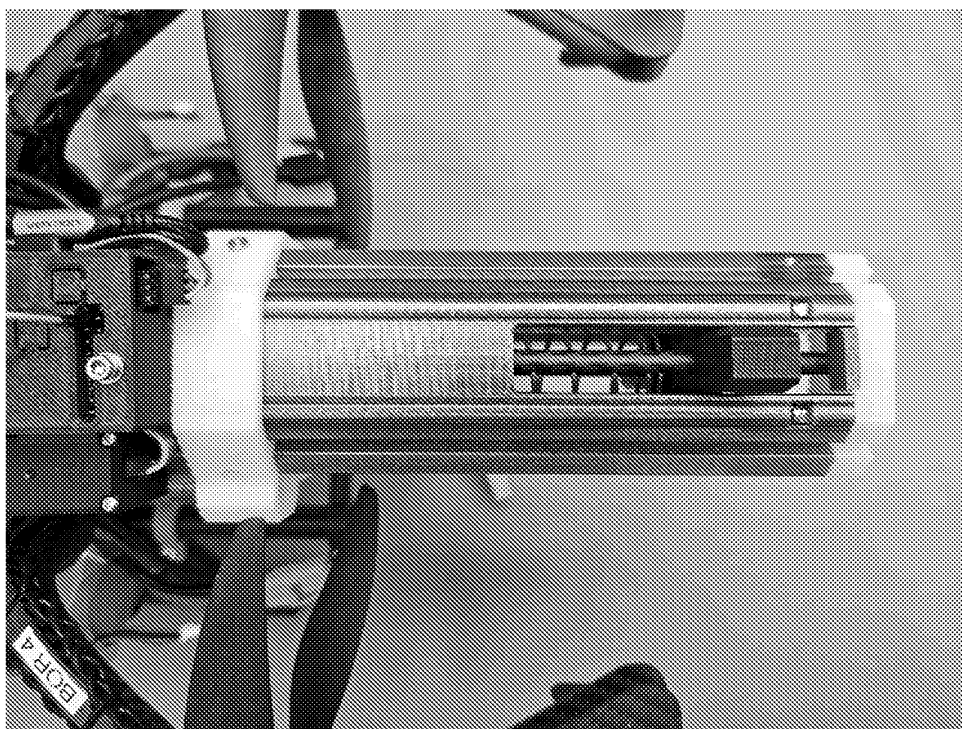


FIG. 29B

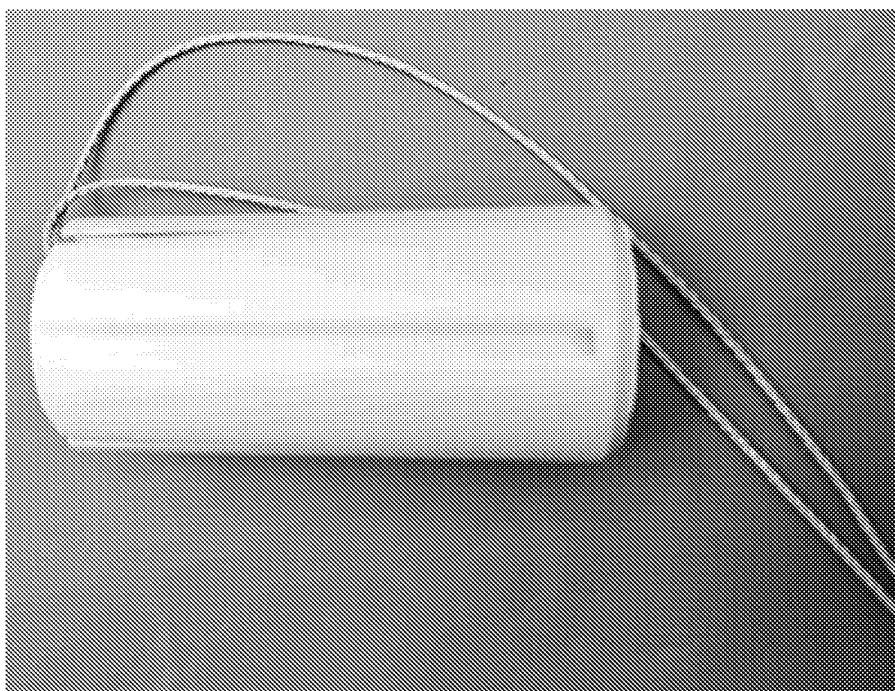


FIG. 30B

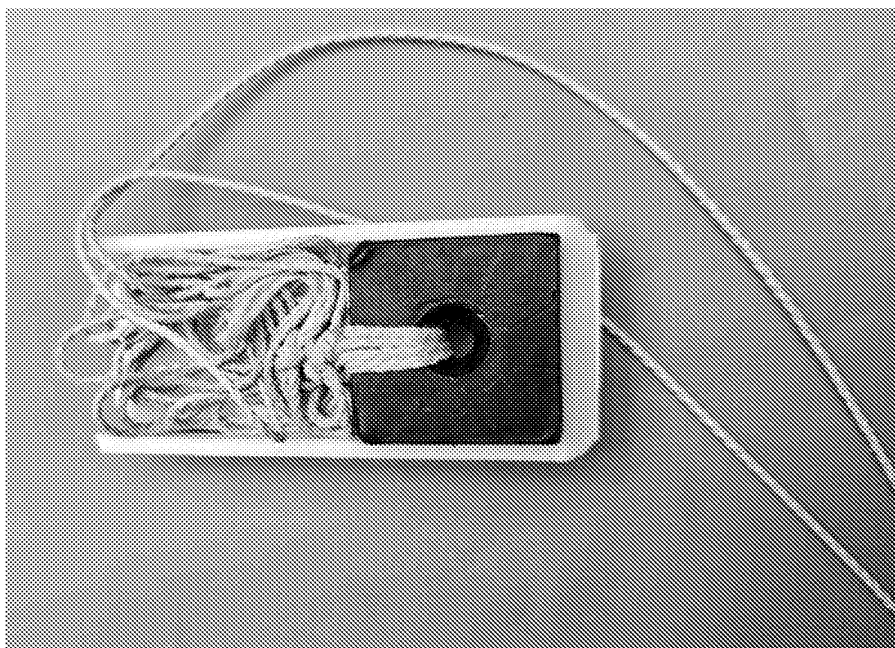


FIG. 30A

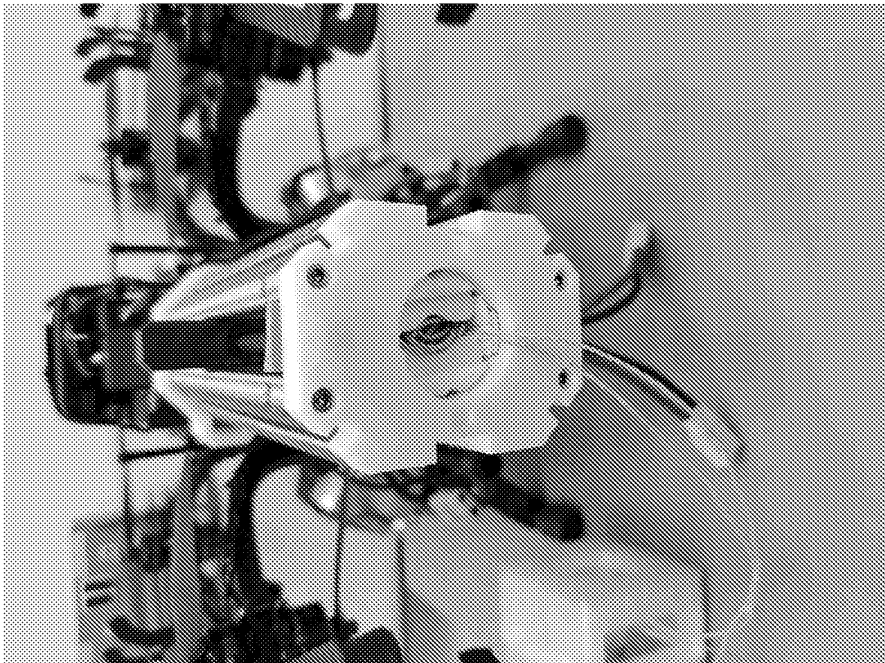


FIG. 31B

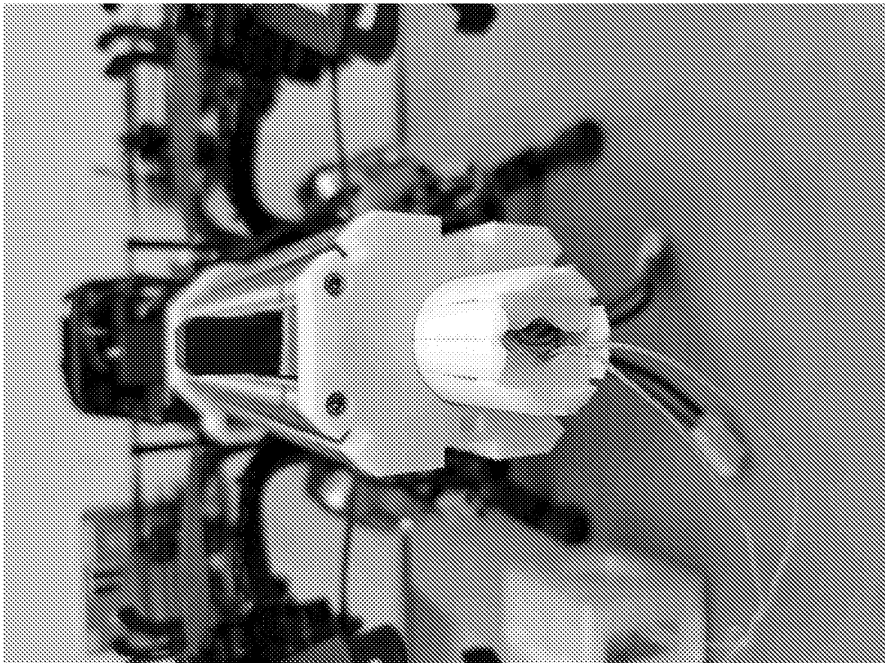


FIG. 31A