

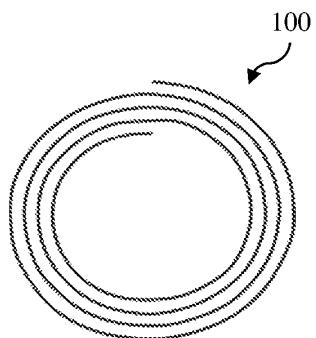


FIG. 1A

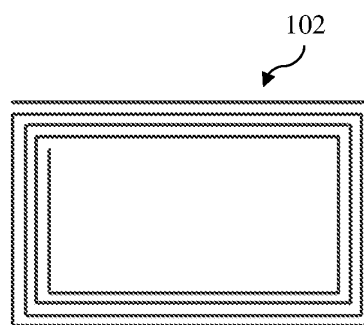


FIG. 1B

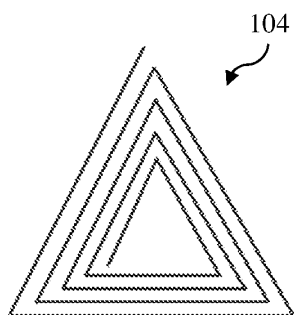


FIG. 1C

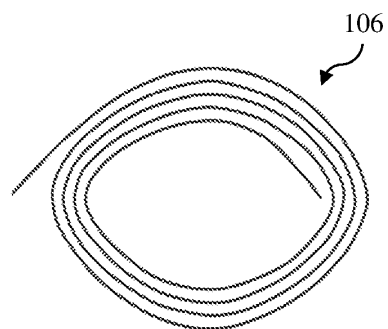


FIG. 1D

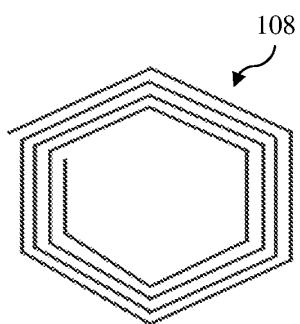


FIG. 1E

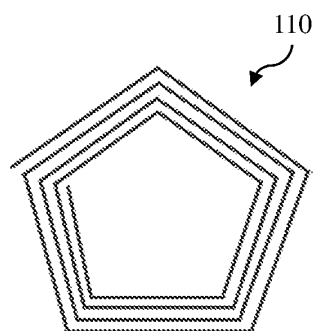


FIG. 1F

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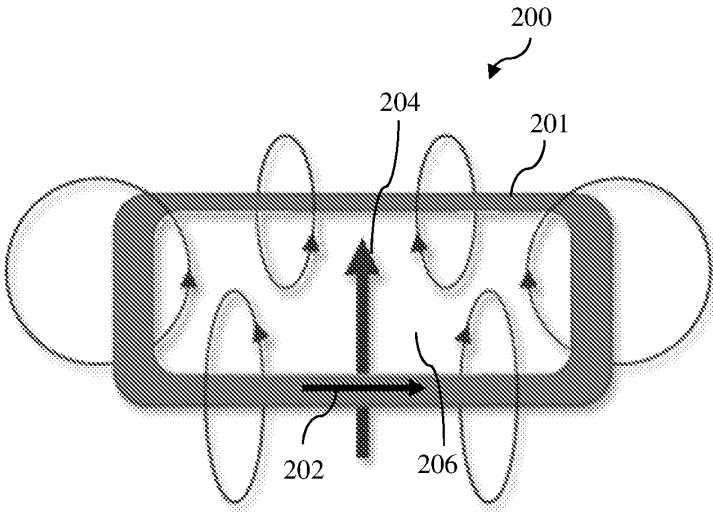


FIG. 2A

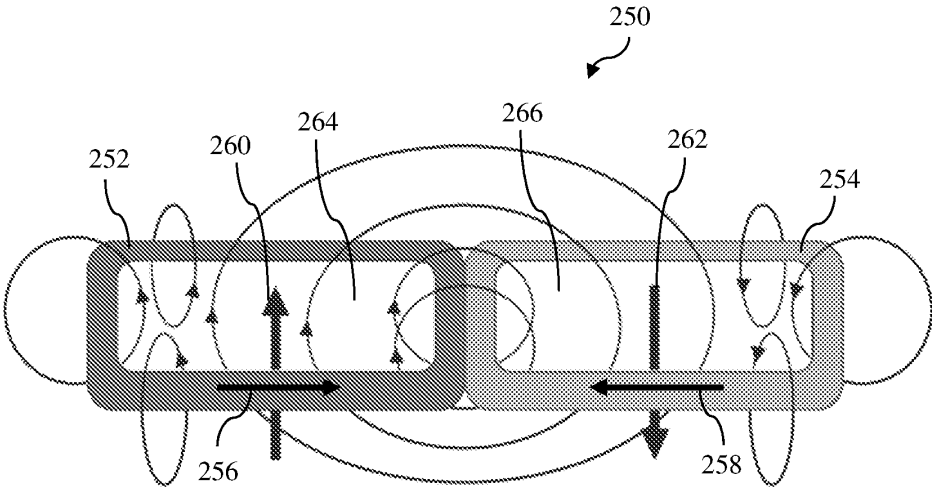
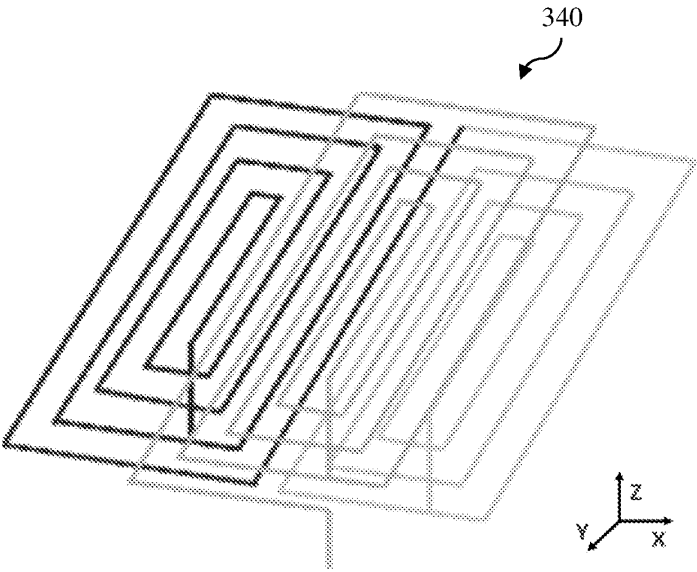
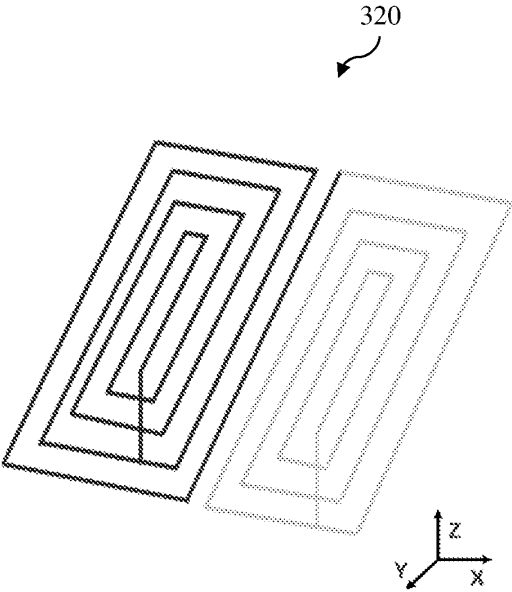
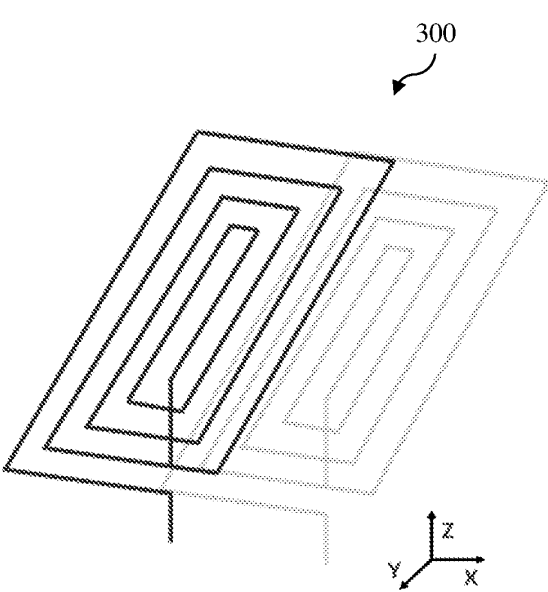


FIG. 2B



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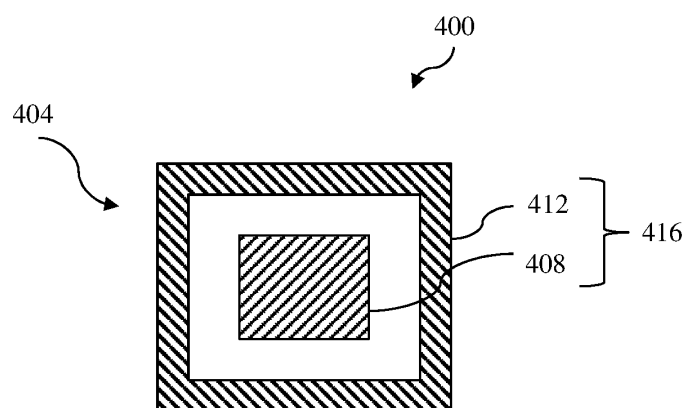


FIG. 4

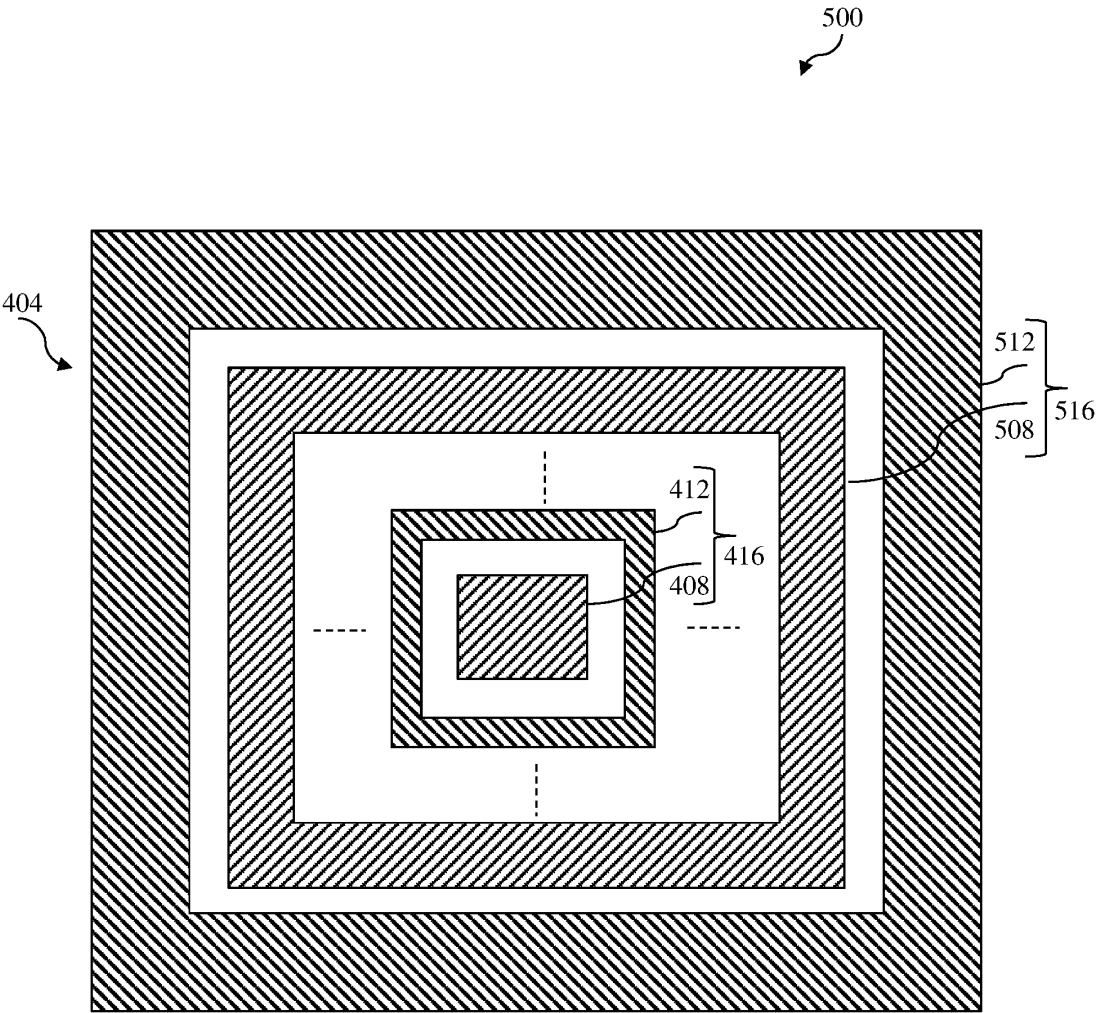


FIG. 5

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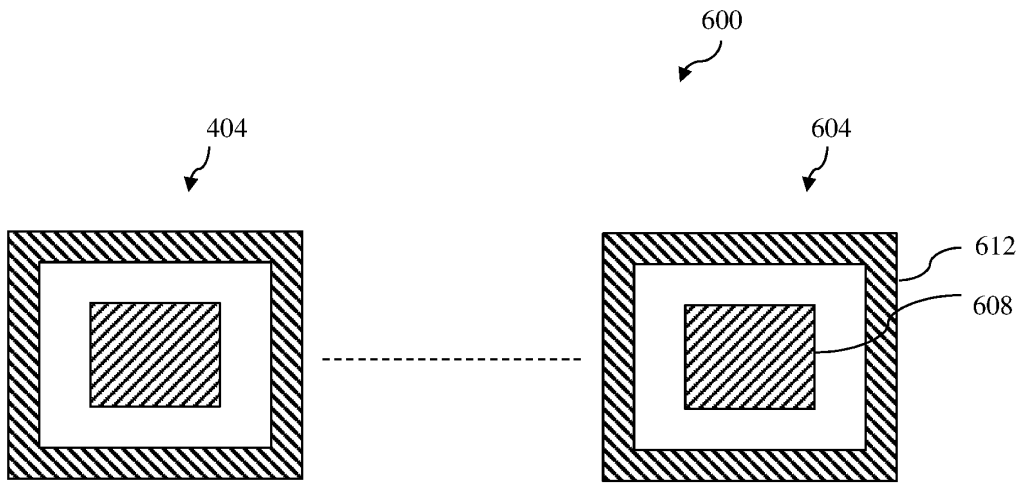


FIG. 6

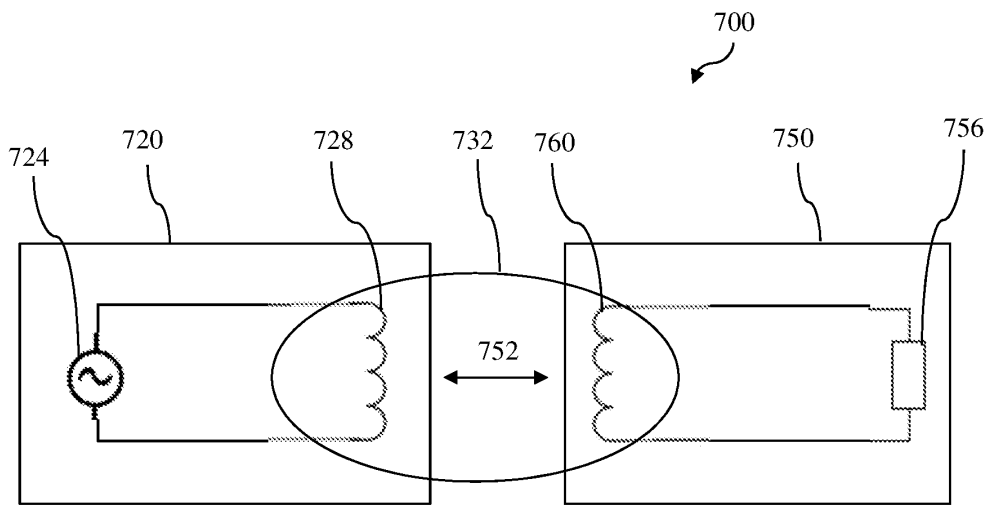
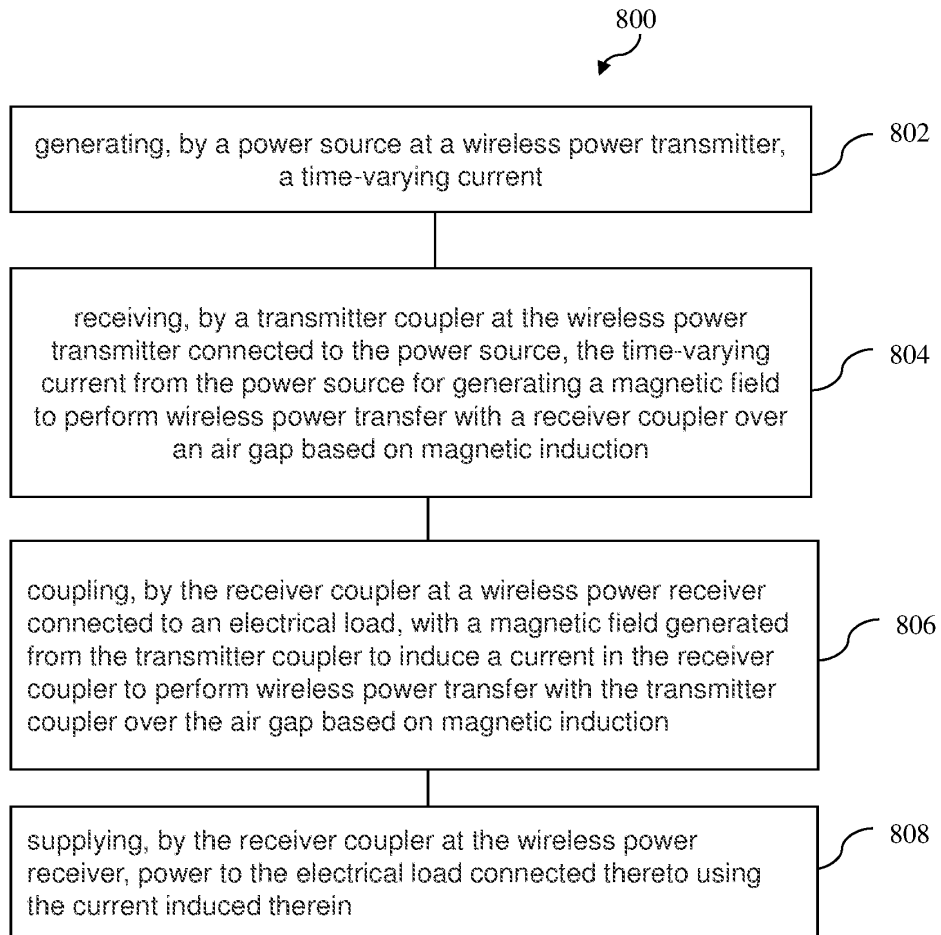
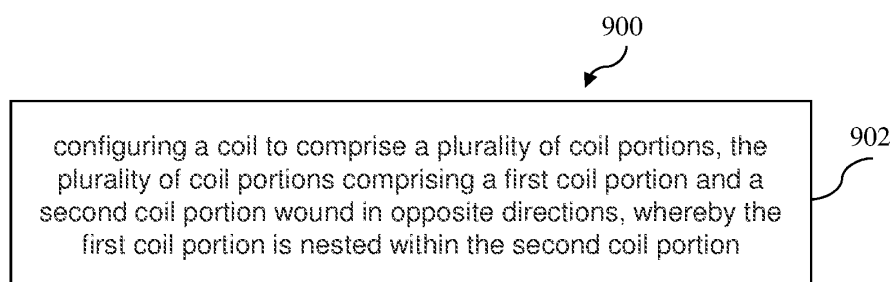


FIG. 7

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**FIG. 8****FIG. 9**

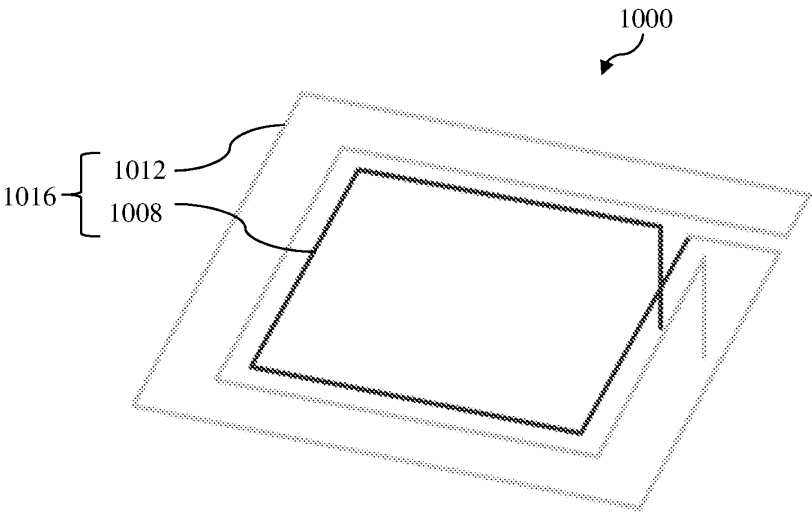


FIG. 10A

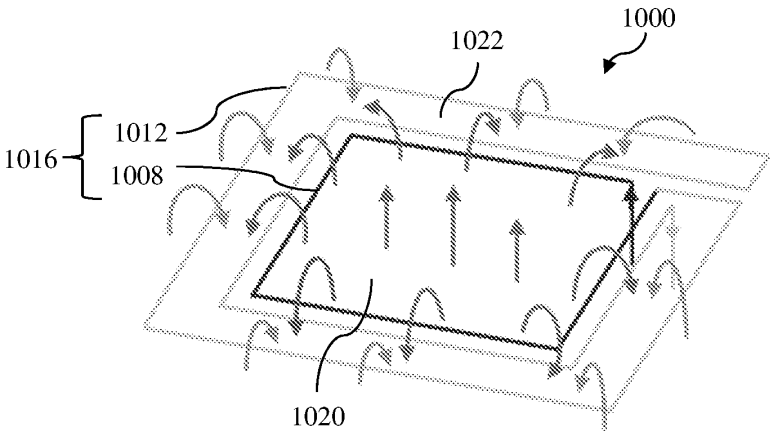


FIG. 10B

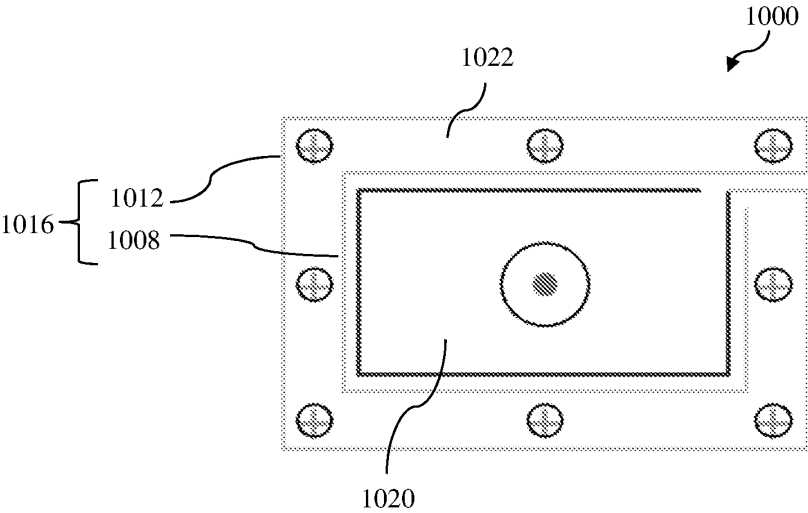


FIG. 10C

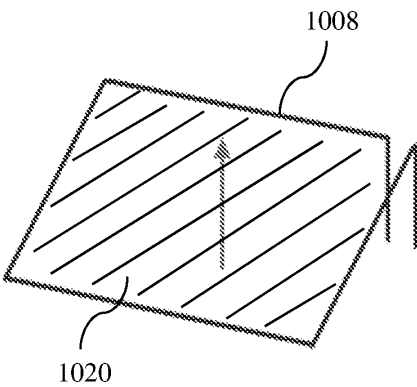


FIG. 10D

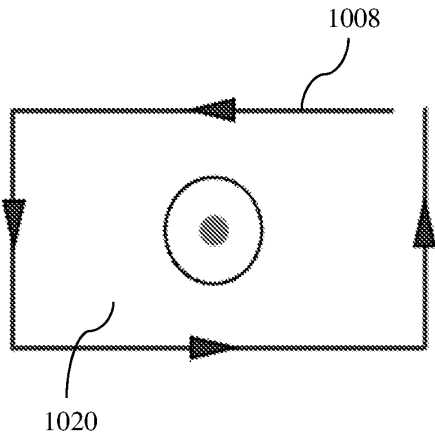


FIG. 10E

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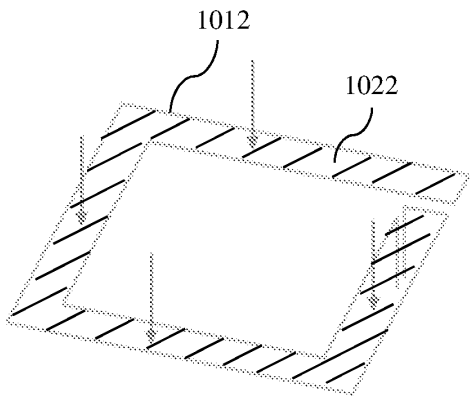


FIG. 10F

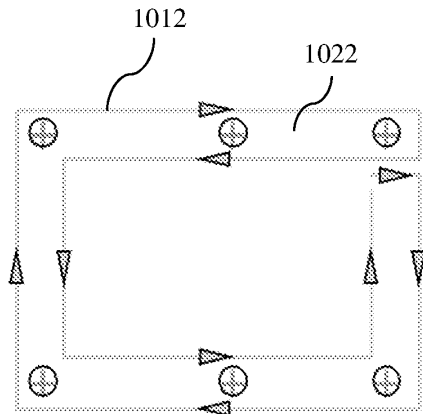


FIG. 10G

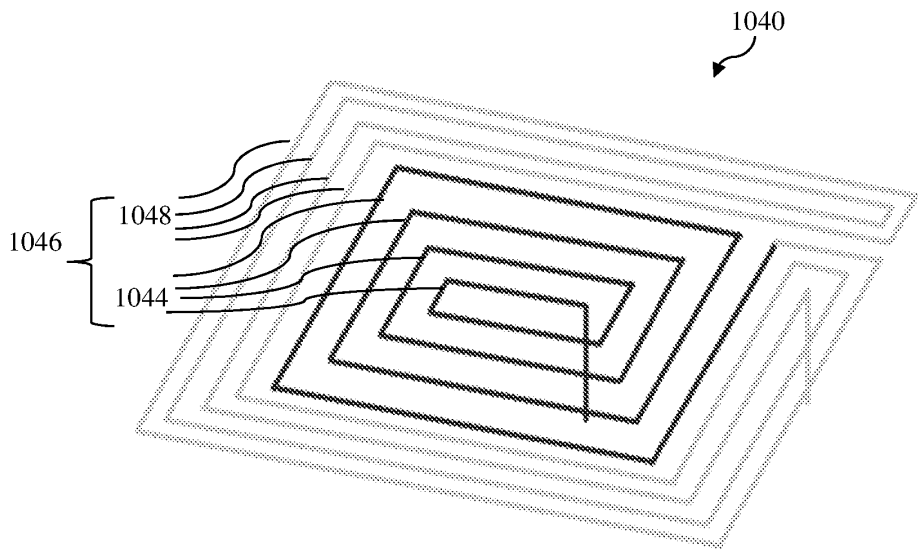


FIG. 10H

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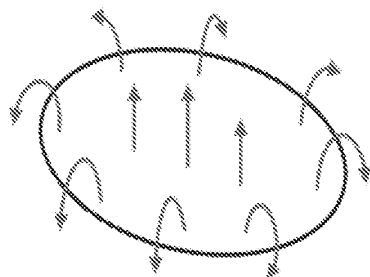


FIG. 11A

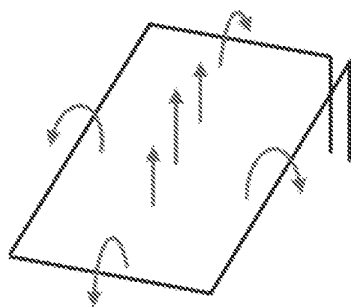


FIG. 11B

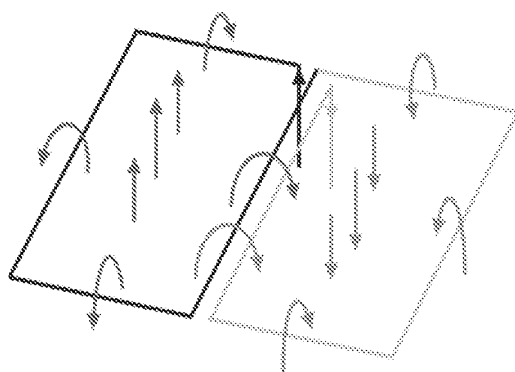


FIG. 11C

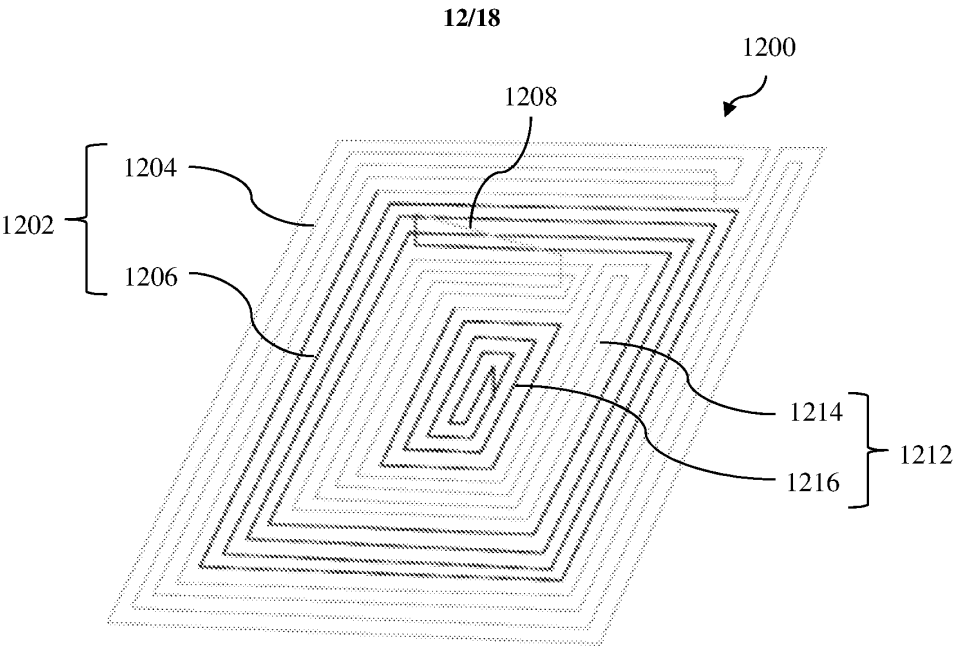


FIG. 12A

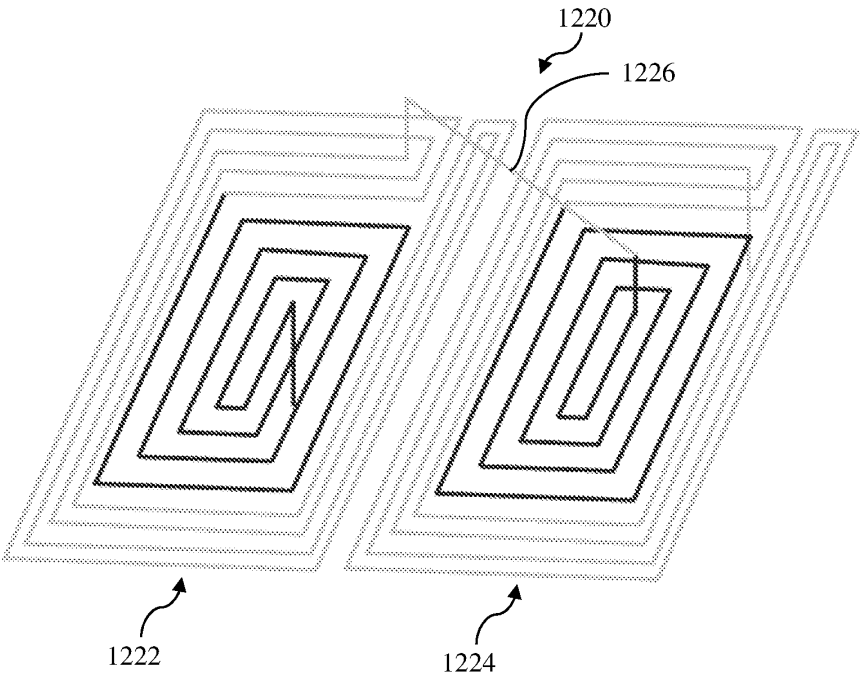


FIG. 12B

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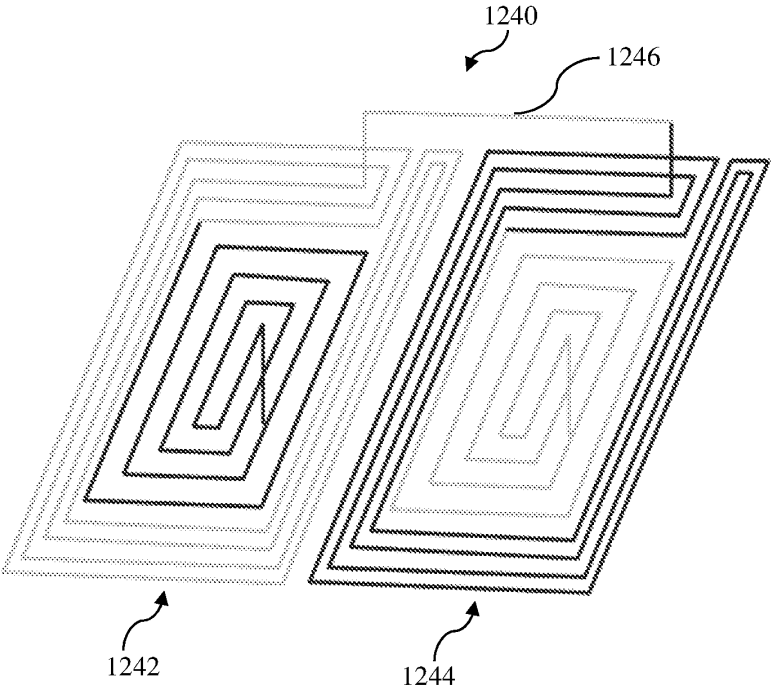


FIG. 12C

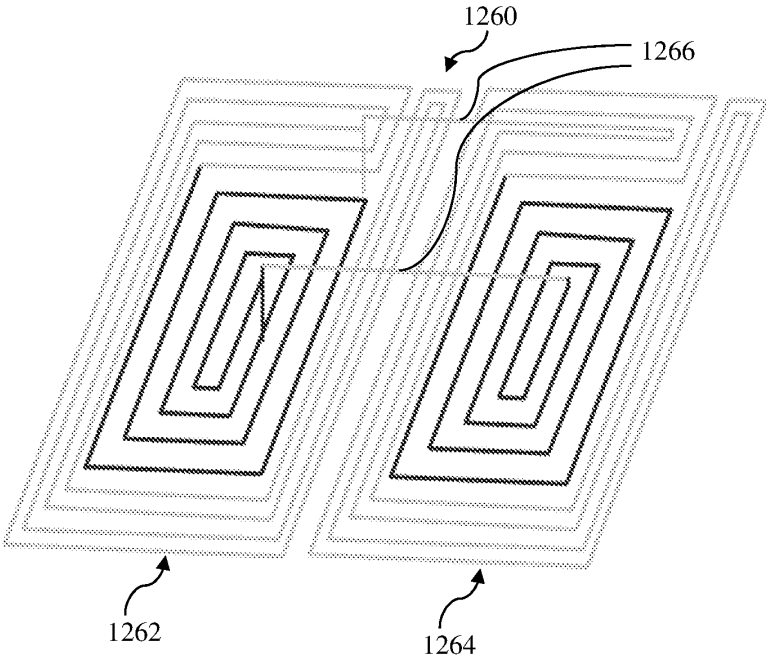


FIG. 12D

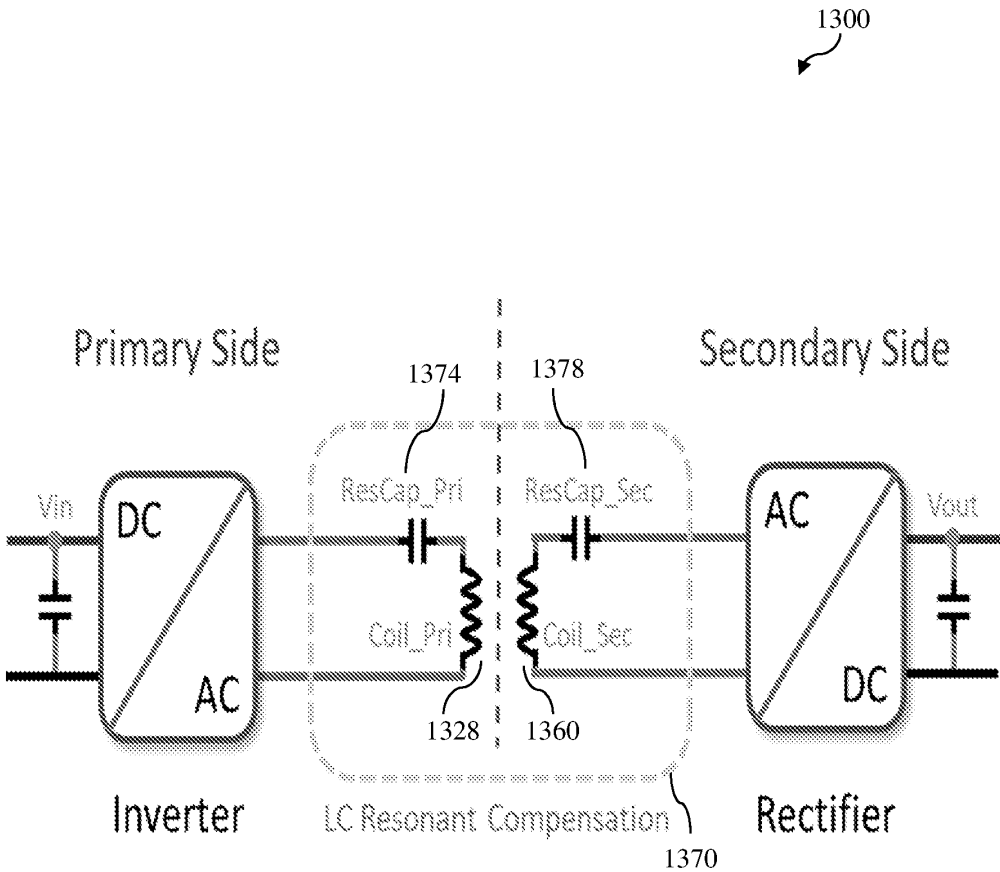


FIG. 13

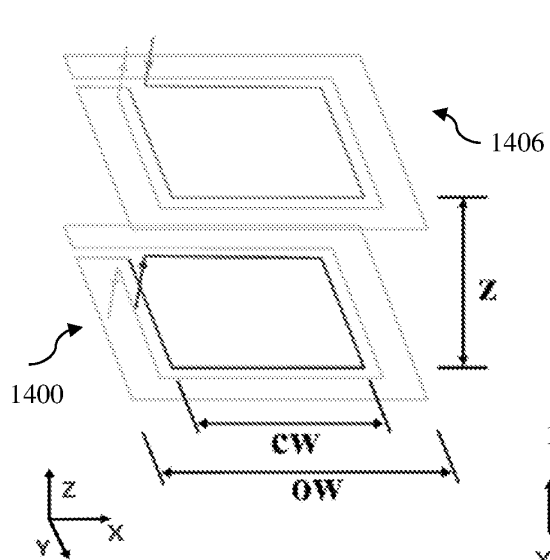


FIG. 14A

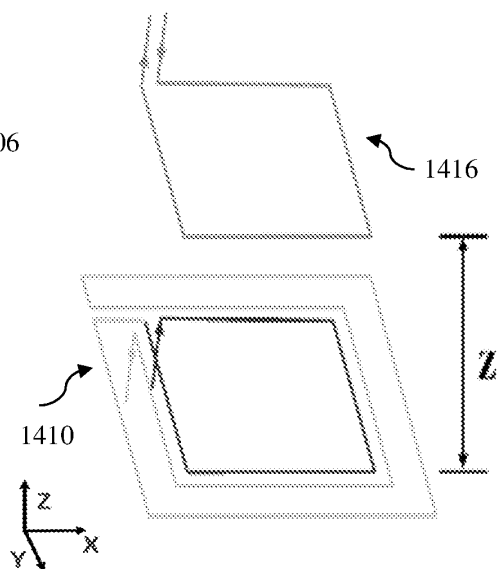


FIG. 14B

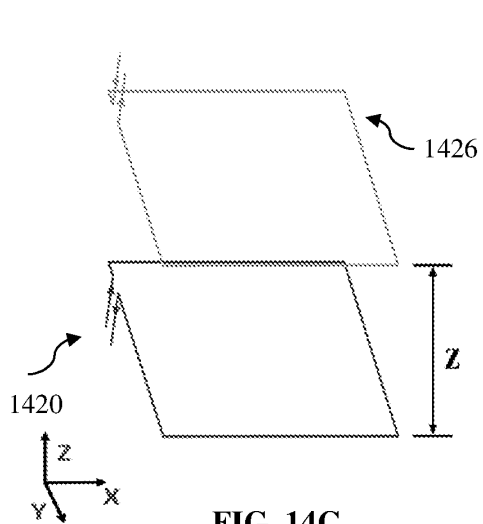


FIG. 14C

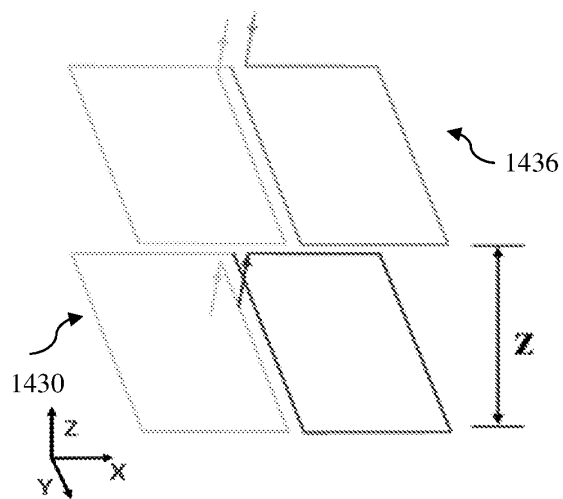


FIG. 14D

Coil Topology		X-Coil										Square	DD
Primary Coil	Dimensions (mm)	400 × 400										500 × 500	400 × 400
	CW-OW	30:70		50:50		70:30		80:20		80:20		~	~
	DD	~		~		~		~		~		~	~
Secondary Coil	Coil Topology	X-Coil	Square	X-Coil	Square	X-Coil	Square	X-Coil	Square	X-Coil	Square	Square	DD
	Dimensions (mm)	400 × 400	120 × 120	400 × 400	200 × 200	400 × 400	200 × 200	400 × 400	200 × 200	400 × 400	320 × 320	400 × 400	400 × 400
	CW-OW	30:70		50:50		70:30		80:20		80:20		~	~
Air Gap Distance 75 mm													
X-Axis Distance (mm)		Normalized Leakage Flux at z = 37.5 mm											
50	113.51	90.30	111.89	95.41	73.68	64.74	47.69	43.58	30.10	27.02	84.11		
100	53.05	41.32	32.77	41.16	32.58	72.19	59.74	55.83	38.28	34.04	67.58		
150	69.21	59.44	39.44	57.25	52.15	48.56	57.93	57.55	52.75	47.65	65.07		
200	18.60	41.16	53.84	42.65	55.96	47.98	64.64	48.74	21.45	8.37	17.80		
250	26.75	18.03	19.14	14.24	5.65	10.13	11.57	15.69	55.60	32.73	36.95		
300	15.09	8.02	11.66	5.41	4.51	2.68	4.96	7.42	15.41	18.28	15.77		
350	8.48	4.01	6.23	2.51	2.48	0.85	2.56	3.78	6.76	9.79	8.20		
400	4.52	2.12	3.35	1.36	1.41	0.26	1.37	2.09	3.51	5.58	4.48		
450	2.55	1.26	1.86	0.73	0.76	0.11	0.75	1.22	2.06	2.95	2.53		
500	1.41	0.71	1.08	0.43	0.48	0.05	0.41	0.68	1.11	1.76	1.45		
550	0.95	0.47	0.70	0.30	0.30	0.04	0.27	0.49	0.78	1.18	0.91		
600	0.83	0.42	0.60	0.22	0.26	0.04	0.22	0.40	0.62	1.00	0.87		
Coupling Coefficient (k)		0.076	0.026	0.070	0.048	0.057	0.061	0.048	0.069	0.076	0.112		
Pri Inductance (μH)		3.005	2.979	3.601	3.383	3.958	3.950	3.715	3.703	5.101	1.771	2.723	
Mutual Inductance (μH)		0.228	0.035	0.252	0.083	0.225	0.128	0.179	0.158	0.230	0.210	0.304	
Sec Inductance (μH)		2.999	0.526	3.603	0.839	3.940	1.144	3.712	1.593	1.773	1.775	2.721	

FIG. 15

Coil Topology		X-Coil										Square	DD		
Primary Coil	Dimensions (mm)	400 × 400										300 × 300	400 × 400		
	CW:OW	30:70			50:50			70:30			80:20			~	~
	Coil Topology	X-Coil	Square	X-Coil	X-Coil	Square	X-Coil	X-Coil	Square	X-Coil	X-Coil	Square	Square	DD	
Secondary Coil	Dimensions (mm)	400 × 400										320 × 320	400 × 400		
	CW:OW	30:70			50:50			70:30			80:20			~	~
	Coil Topology	X-Coil	Square	X-Coil	X-Coil	Square	X-Coil	X-Coil	Square	X-Coil	X-Coil	Square	Square	DD	
Air Gap Distance 50 mm															
Normalized Leakage Flux at z = 25 mm															
X-Axis Distance (mm)		600	0.75	0.31	0.50	0.21	0.23	0.04	0.15	0.26	0.45	0.71	0.68		
Coupling Coefficient			0.128	0.053	0.123	0.086	0.104	0.099	0.080	0.106	0.114	0.168	0.170		
Pri Inductance (μH)			3.011	2.997	3.656	3.564	3.973	3.937	3.709	3.702	3.140	1.753	2.726		
Mutual Inductance (μH)			0.386	0.068	0.451	0.148	0.414	0.211	0.298	0.240	0.346	0.294	0.463		
Sec Inductance (μH)			3.015	0.534	3.645	0.829	3.977	1.145	3.720	1.388	1.778	1.790	2.730		
Air Gap Distance 100 mm															
Normalized Leakage Flux at z = 50 mm															
X-Axis Distance (mm)		600	1.11	0.47	0.69	0.30	0.29	0.05	0.28	0.49	0.76	1.25	0.95		
Coupling Coefficient			0.048	0.012	0.041	0.028	0.034	0.039	0.032	0.049	0.055	0.088	0.076		
Pri Inductance (μH)			3.005	3.004	3.622	3.568	3.928	3.916	3.740	3.730	5.092	1.783	2.738		
Mutual Inductance (μH)			0.143	0.015	0.147	0.048	0.133	0.083	0.119	0.111	0.164	0.158	0.208		
Sec Inductance (μH)			3.013	0.535	3.619	0.832	3.938	1.143	3.740	1.401	1.763	1.790	2.742		

FIG. 16

Coil Topology	X-Coil		Square	DD	X-Coil		Square	DD
Primary Coil	Dimensions (mm)		400 × 400	500 × 500	400 × 400	400 × 400	500 × 500	400 × 400
	30:70	80:20	~	~	30:70	80:20	~	~
	CW:OW							
Secondary Coil	Dimensions (mm)		400 × 400	400 × 400	400 × 400	400 × 400	400 × 400	400 × 400
	30:70	80:20	~	~	30:70	80:20	~	~
	CW:OW							
Displacement x-axis = 100 mm								
Coupling Coefficient	0.024	0.024	0.041	0.047	0.032	0.025	0.041	0.047
Pri Inductance (μH)	3.000	3.730	3.699	5.123	1.759	3.008	3.715	5.093
Mutual Inductance (μH)	0.072	0.091	0.092	0.140	0.144	0.068	0.093	0.094
Sec Inductance (μH)	3.729	3.729	1.393	1.773	1.752	3.008	3.712	1.414
Displacement x-axis = 200 mm								
Coupling Coefficient	0.011	0.006	0.012	0.023	0.043	-0.063	0.010	0.007
Pri Inductance (μH)	3.011	3.734	3.711	5.059	1.767	2.696	3.003	3.728
Mutual Inductance (μH)	0.032	0.022	0.027	0.068	0.075	-0.170	0.029	0.026
Sec Inductance (μH)	3.012	3.737	1.395	1.753	1.758	2.693	3.002	3.731
Displacement x-axis = 100 mm and y-axis = 100 mm								
Coupling Coefficient	-0.004	0.009	0.021	0.024	0.052	0.019	-0.001	-0.003
Pri Inductance (μH)	2.999	3.724	3.707	5.123	1.780	2.718	2.983	3.733
Mutual Inductance (μH)	-0.012	0.034	0.048	0.074	0.092	0.033	-0.003	-0.012
Sec Inductance (μH)	2.997	3.726	1.391	1.775	1.772	2.735	2.982	3.736
Displacement x-axis = 200 mm and y-axis = 200 mm								
Coupling Coefficient	-0.001	-0.003	-0.003	0.001	0.007	-0.033	-0.001	-0.003
Pri Inductance (μH)	2.983	3.733	3.711	5.040	1.770	2.723	2.983	3.733
Mutual Inductance (μH)	-0.003	-0.012	-0.008	0.003	0.012	-0.091	-0.003	-0.012
Sec Inductance (μH)	2.982	3.736	1.396	1.749	1.774	2.735	2.982	3.736

FIG. 17