

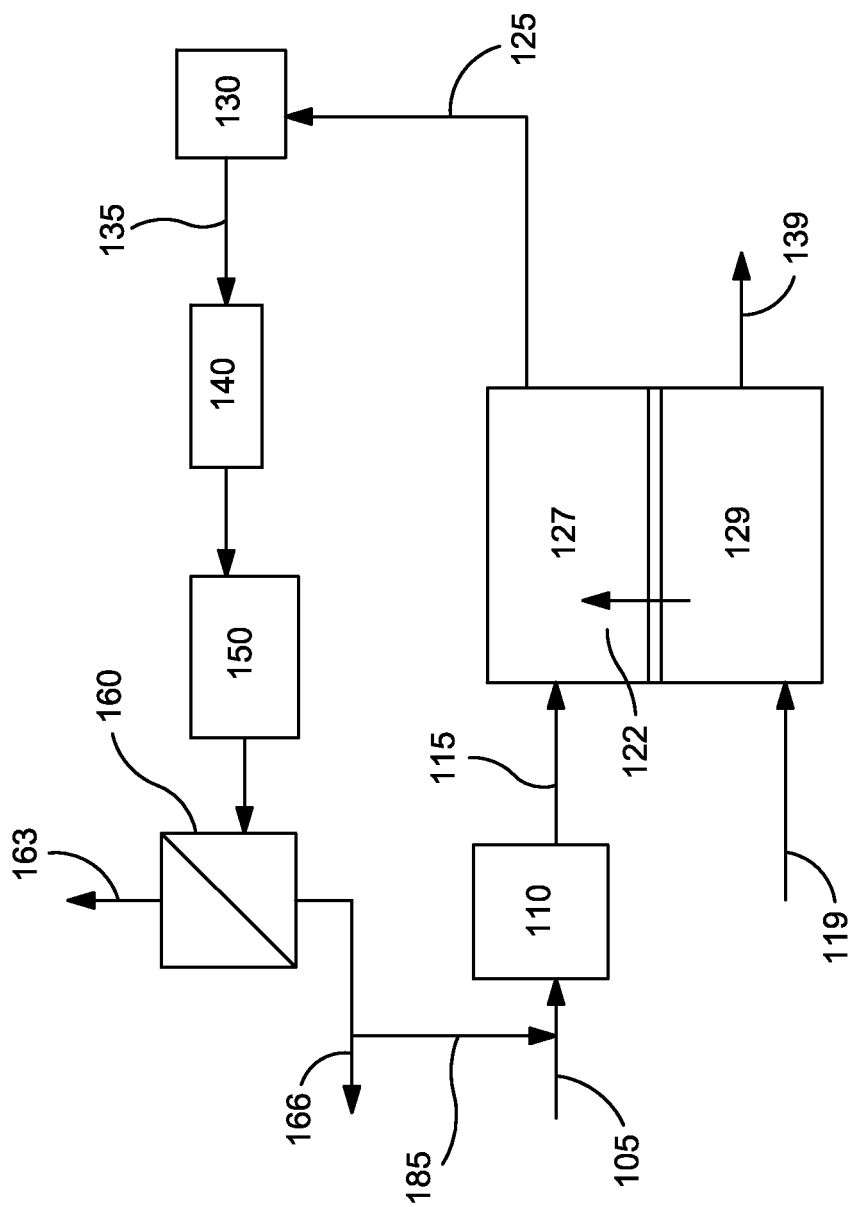


FIG. 1

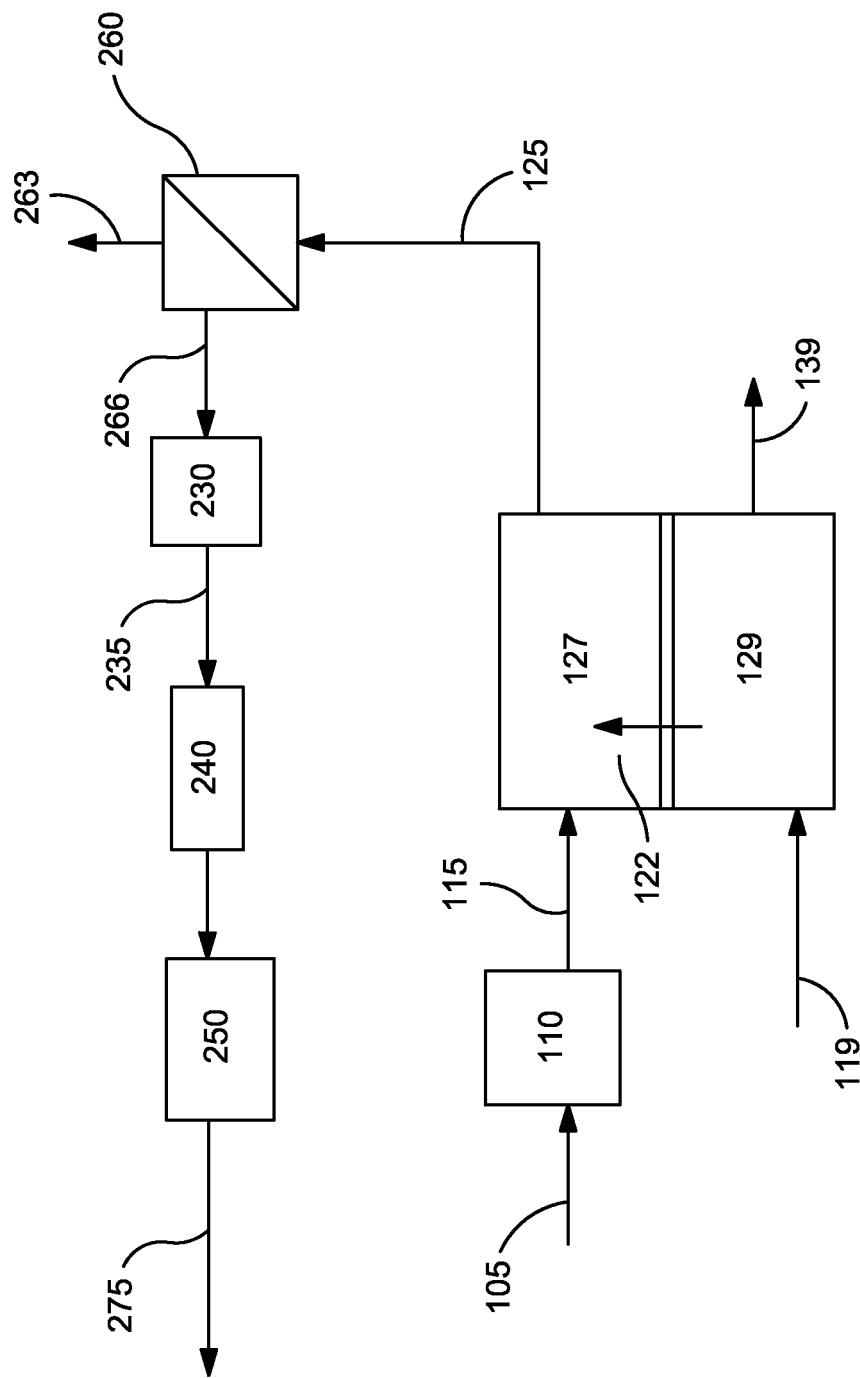


FIG. 2

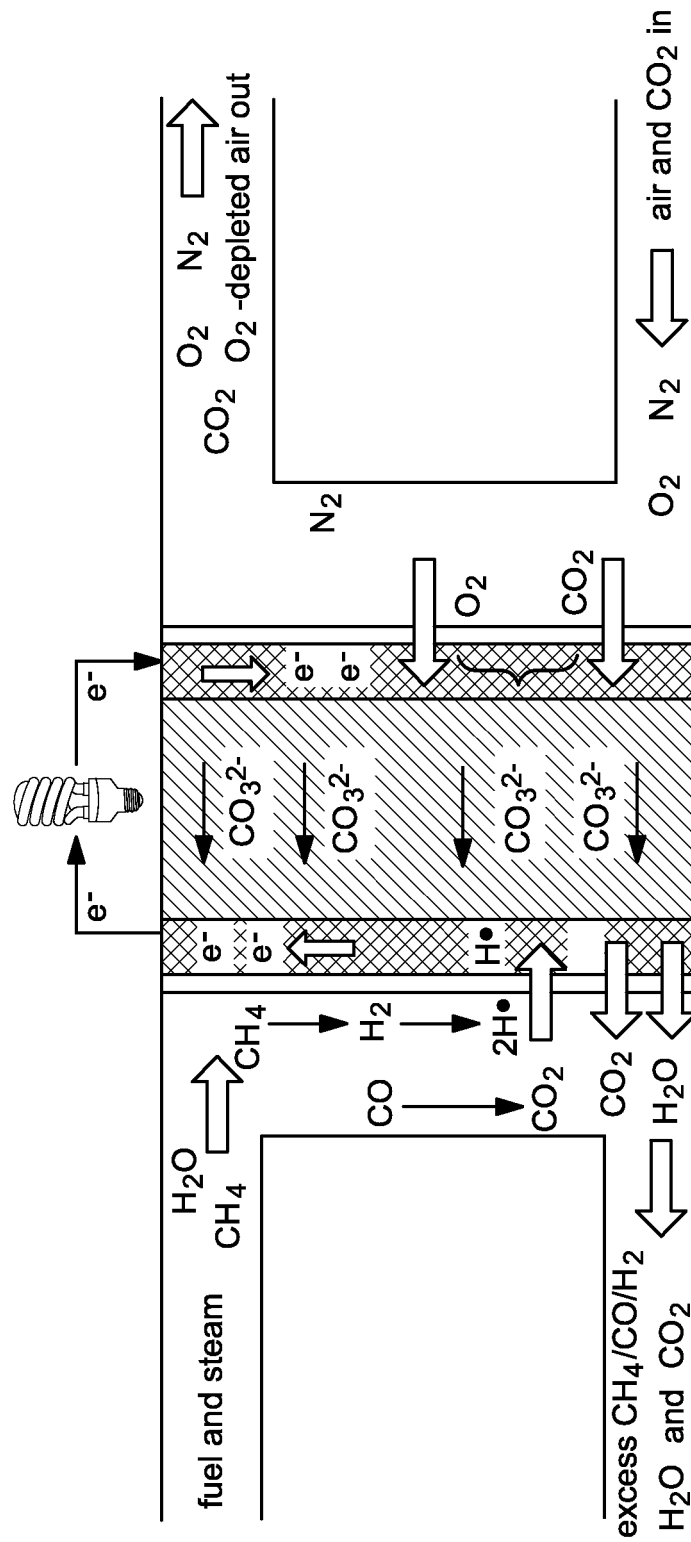


FIG. 3

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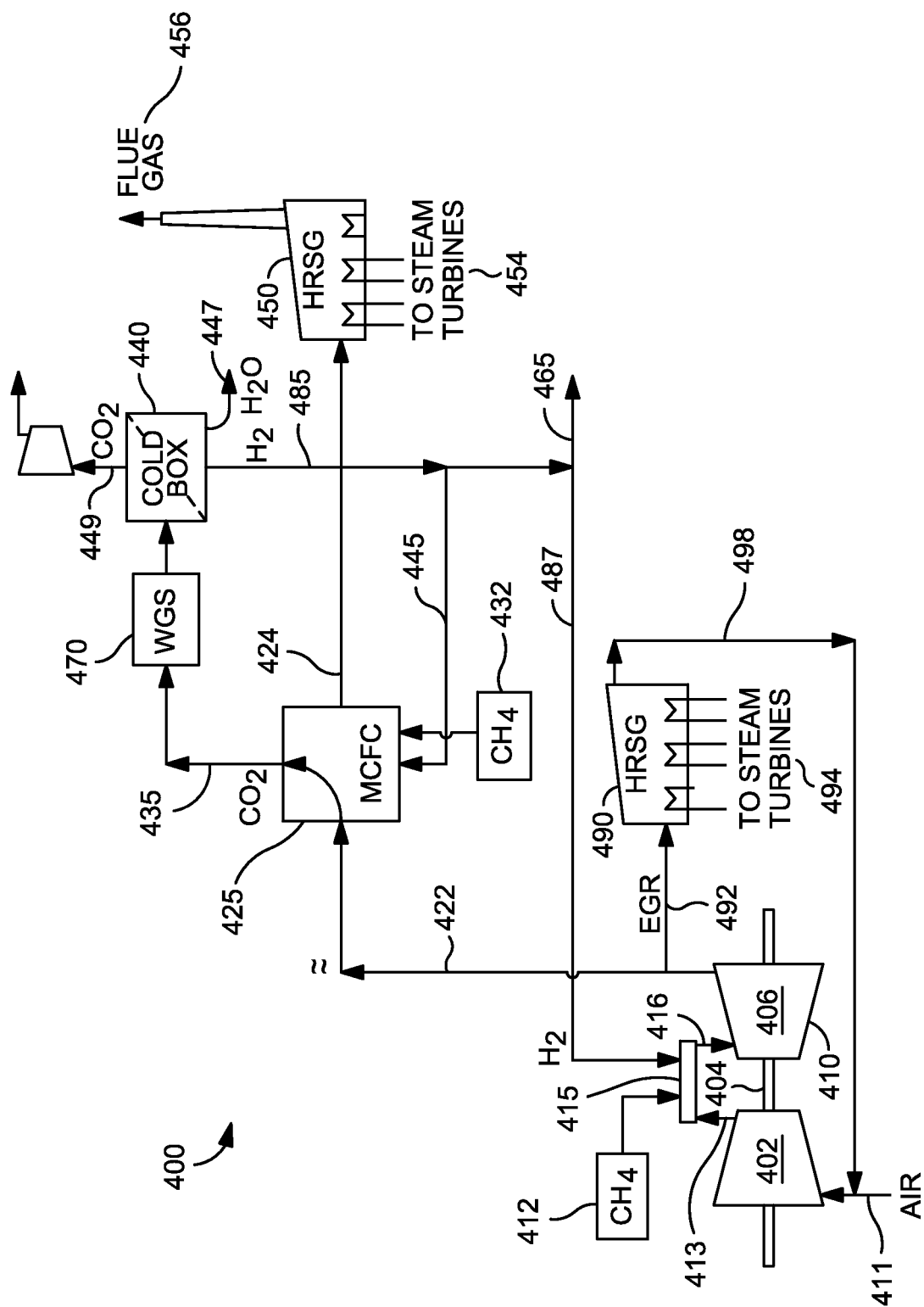


FIG. 4

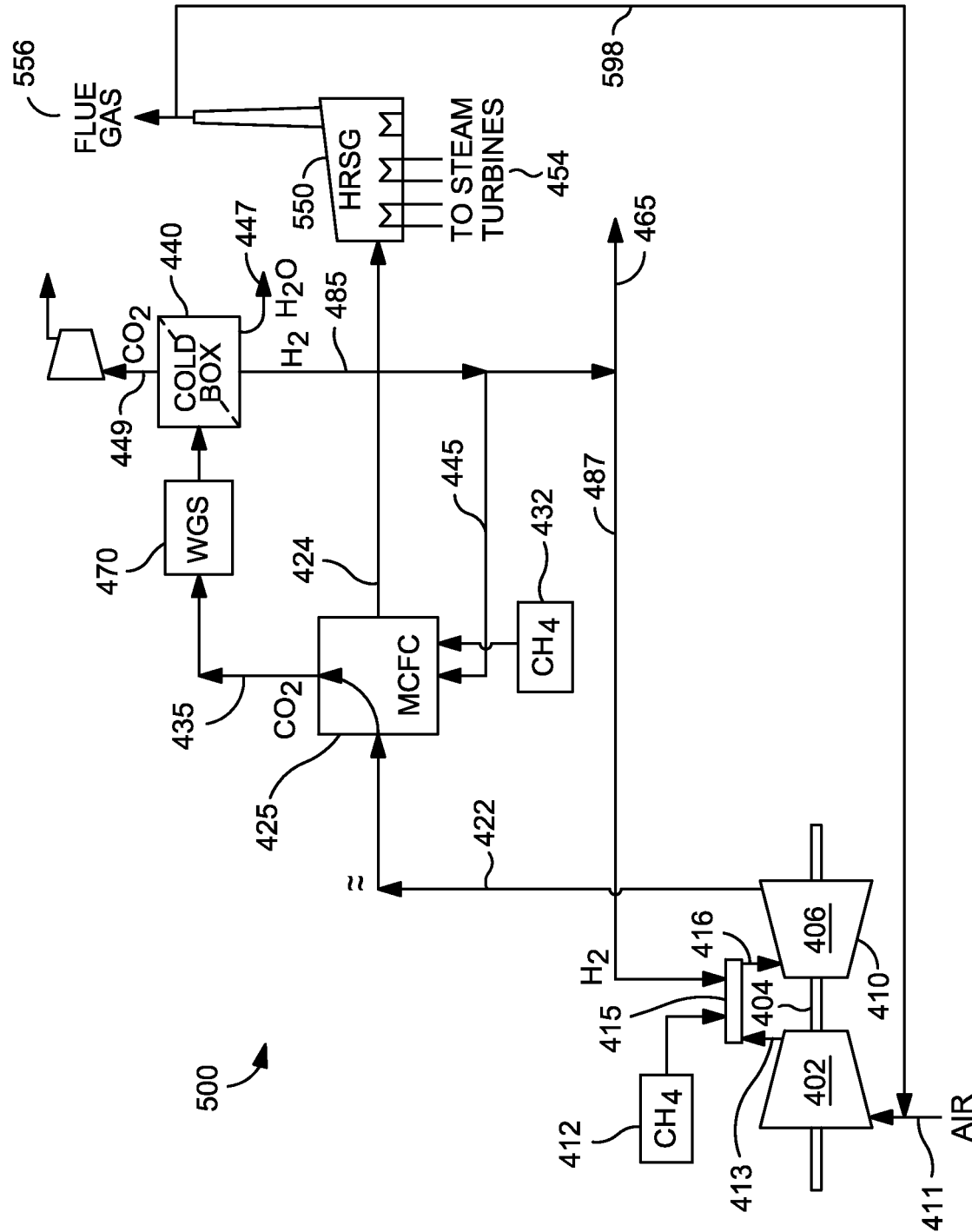


FIG. 5

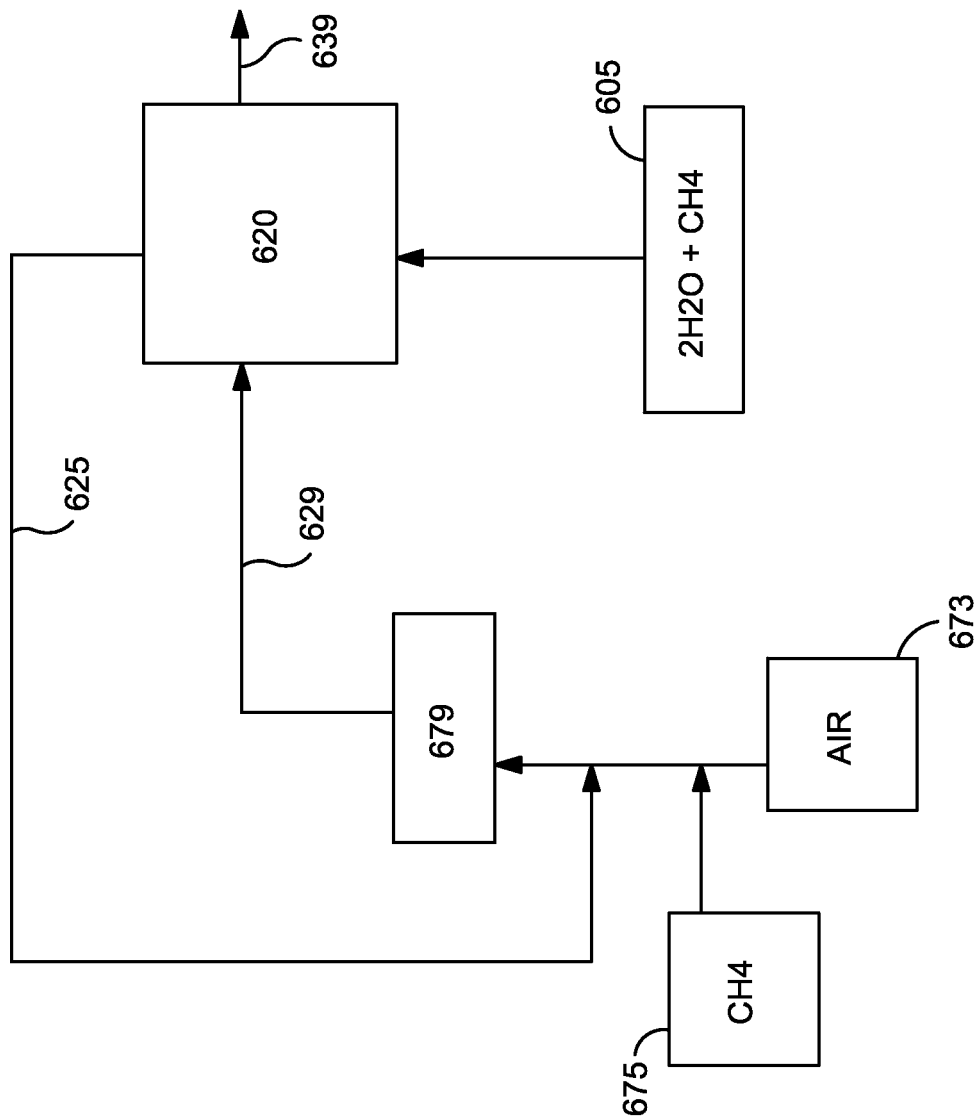


FIG. 6

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1	Anode inlet CH4	mole/s	10.3	11.5	12.7	14.6	17.2	21.6
2	Anode inlet H2	mole/s	0.0	0.0	0.0	0.0	0.0	0.0
3	Fuel	Anode outlet unreformed fuel	mole/s	0.0	0.0	0.3	1.1	2.8
4	Molar	Anode outlet CO / H2	mole/s	3.1	4.8	6.2	7.5	8.8
5	Values	H2 Reacted	mole/s	7.2	8.1	7.6	7.3	6.9
6		Reformed H2 reacted	%	70%	60%	50%	40%	30%
7		Excess Reform. Fuel	%	43%	67%	100%	149%	232%
8	Anode inlet CH4	MWth	2.06	2.30	2.54	2.92	3.44	4.32
9	Fuel	Anode inlet H2	MWth	0.00	0.00	0.00	0.00	0.00
10	LHV	Anode outlet unreformed fuel	MWth	0.00	0.00	0.06	0.22	0.60
11	Values	Anode outlet H2	MWth	0.78	0.86	1.20	1.53	1.86
12		H2 Reacted	MWth	1.3	1.4	1.3	1.2	1.0
13		Reformed H2 reacted	%	62%	62%	50%	40%	29%
14		Excess Reform. Fuel	%	61%	61%	98%	150%	241%
15	Reformable Fuel Surplus Ratio		1.61	1.61	1.98	2.50	3.41	4.91
16	Uf	%	70%	70%	60%	50%	40%	30%
17	Fuel Cell Power	MWe	1.00	1.12	1.05	1.01	0.96	0.90
18	Voltage	V	0.72	0.72	0.72	0.72	0.72	0.72
19	Current Density	A/m2	1317	1478	1401	1344	1263	1192
20	Area	m2	1057	1051	1049	1048	1052	1049
21	Tin	C	536	538	536	536	536	536
22	MCFC	Tout	C	616	608	582	554	532
23	Temps	Tavg	C	576	589	572	559	534
24	Delta T	C	80	102	72	46	18	-4
25	Fresh to Burner	MWth	0.00	0.78	0.78	0.78	0.78	0.78
26	Fuel	Fresh to Anode	MWth	2.06	2.30	2.54	2.92	3.44
27	Balance	Anode Fuel - All	MWth	2.06	2.30	2.54	2.92	3.44

FIG. 7

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802		804		806		808		810		812		814		816		818		820	
30	1	Reformable Fuel - Molar	Anode Inlet - Non CO/H ₂ - H ₂ Equiv.	mole/s		10.3		11.5		12.7		14.6		17.2		21.6		27.7	
	2		Anode Inlet - CO/H ₂	mole/s		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	3		Anode Outlet - Non CO/H ₂ - H ₂ Equiv	mole/s		0.0		0.0		0.3		1.1		2.8		6.3		7.2	
	4		Anode Outlet - CO/H ₂	mole/s		3.1		3.4		4.8		6.2		7.5		8.8		12.2	
	5		H ₂ Oxid'd	mole/s		7.2		8.1		7.6		7.3		6.9		6.5		8.3	
	6		Reform. H ₂ Oxid'd	%		70%		70%		60%		50%		40%		30%		30%	
	7		Excess Reform. Fuel	%		43%		42%		67%		100%		149%		232%		234%	
32	8	Reformable Fuel - LHV	Anode Inlet - Non CO/H ₂ - H ₂ Equiv.	MWth		2.06		2.30		2.54		2.92		3.44		4.32		5.53	
	9		Anode Inlet - CO/H ₂	MWth		0.00		0.00		0.00		0.00		0.0		0.0		0.0	
	10		Anode Outlet - Non CO/H ₂ - H ₂ Equiv	MWth		0.00		0.01		0.06		0.22		0.6		1.3		1.4	
	11		Anode Outlet - CO/H ₂	MWth		0.78		0.86		1.20		1.53		1.86		2.18		3.01	
	12		H ₂ Oxid'd	MWth		1.3		1.4		1.3		1.2		1.0		0.9		1.1	
	13		Reform. LHV Oxidized	%		62%		62%		50%		40%		29%		20%		20%	
	14		Excess Reform. Fuel	%		61%		61%		98%		150%		241%		391%		407%	
15			Reformable Fuel Surplus Ratio			1.61		1.61		1.98		2.50		3.41		4.91		5.07	
34	16	Fuel Cell Parameters	Uf	%		70%		70%		60%		50%		40%		30%		30%	
	17		Power	MWe (DC)		1.00		1.12		1.05		1.01		0.96		0.90		1.04	
	18		Voltage (V)	V		0.72		0.72		0.72		0.72		0.72		0.72		0.65	
	19		Current Density (j)	A/m ²		1317		1478		1401		1344		1263		1192		1524	
	20		Power Density (= V * j)	W/m ²		948		1064		1009		968		909		858		991	
	21		Area	m ²		1057		1051		1049		1048		1052		1049		1050	
	22		Tin	C		536		536		536		536		536		536		536	
36	23	MCFC Temperatures	Tout	C		616		640		608		582		554		532		549	
	24		Tavg	C		576		588		572		559		545		534		543	
	25		Delta T	C		80		104		72		46		18		-4		13	
	25		Fresh to Burner	MWth		0.00		0.78		0.78		0.78		0.78		0.78		0.78	
38	26	Fuel Balance	Fresh to Anode	MWth		2.06		2.30		2.54		2.92		3.44		4.32		5.53	
	27		Recycle to Anode	MWth		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	28		Anode Fuel - All	MWth		2.06		2.30		2.54		2.92		3.44		4.32		5.53	

FIG. 8

		902		904		906		908		910		912		914		916		918		920		922		924	
0	1	Anode Inlet - Non CO/H2 - H2 Equiv.			mole/s	10.3		13.1	16	20.2	26.4	30.7	33.8	40.7	36.4										
	2	Anode Inlet - CO/H2			mole/s	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0										
	3	Anode Outlet - Non CO/H2 - H2 Equiv			mole/s	0.0		0.0	0.0	0.1	0.3	0.6	0.7	0.8	1.0										
	4	Anode Outlet - CO/H2			mole/s	3.1		3.9	6.4	10	15.5	19.4	21.3	25.6	24.5										
	5	H2 Oxid'd			mole/s	7.2		9.2	9.6	10.1	10.6	10.7	11.8	14.3	10.9										
	6	Reform. H2 Oxid'd			%	70%		70%	60%	50%	40%	35%	35%	35%	30%										
	7	Excess Reform. Fuel			%	43%		42%	67%	100%	149%	187%	186%	185%	234%										
2	8	Anode Inlet - Non CO/H2 - H2 Equiv.			MWth	2.06		2.62	3.20	4.04	5.27	6.14	6.75	8.13	7.28										
	9	Anode Inlet - CO/H2			MWth	0.00		0.00	0.00	0.02	0.0	0.0	0.0	0.0	0.0										
	10	Anode Outlet - Non CO/H2 - H2 Equiv			MWth	0.00		0.00	0.01	0.00	0.1	0.1	0.1	0.2	0.2										
	11	Anode Outlet - CO/H2			MWth	0.78		1.00	1.62	2.53	3.9	4.88	5.34	6.44	6.13										
	12	H2 Oxid'd			MWth	1.3		1.6	1.6	1.5	1.3	1.2	1.3	1.5	0.9										
	13	Reform. LHV Oxidized			%	62%		62%	49%	38%	25%	19%	19%	19%	13%										
	14	Excess Reform. Fuel			%	61%		62%	104%	165%	305%	434%	431%	431%	674%										
15	Reformable Fuel Surplus Ratio				1.61		1.62	2.04	2.65	4.05	5.34	5.31	5.31	7.74											
4	16	Uf			%	70%		70%	60%	50%	40%	35%	35%	35%	30%										
	17	Power			MWe (DC)	1.00		1.27	1.33	1.40	1.46	1.49	1.60	1.79	1.52										
	18	Voltage (V)			V	0.72		0.72	0.72	0.72	0.72	0.72	0.70	0.65	0.72										
	19	Current Density (j)			A/m2	1317		1690	1768	1854	1939	1977	2172	2613	2009										
	20	Power Density (= V *j)			W/m2	948		1217	1273	1335	1396	1423	1520	1698	1446										
	21	Area			m2	1057		1047	1048	1052	1049	1049	1049	1051	1049										
	22	Tin			C	536		597	613	637	671	693	689	677	717										
6	23	Tout			C	616		705	686	662	629	607	611	622	581										
	24	Tavg			C	576		651	650	650	650	650	650	650	649										
	25	Delta T			C	80		108	73	25	-42	-86	-78	-55	-136										
	26	Fresh to Burner			MWth	0.00		0.94	1.00	1.08	1.18	1.25	1.27	1.30	1.33										
8	27	Fresh to Anode			MWth	2.06		2.62	3.20	4.04	5.27	6.14	6.75	8.13	7.28										
	28	Recycle to Anode			MWth	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
	29	Anode Fuel - All			MWth	2.06		2.62	3.20	4.04	5.27	6.14	6.75	8.13	7.28										

Fig. 9

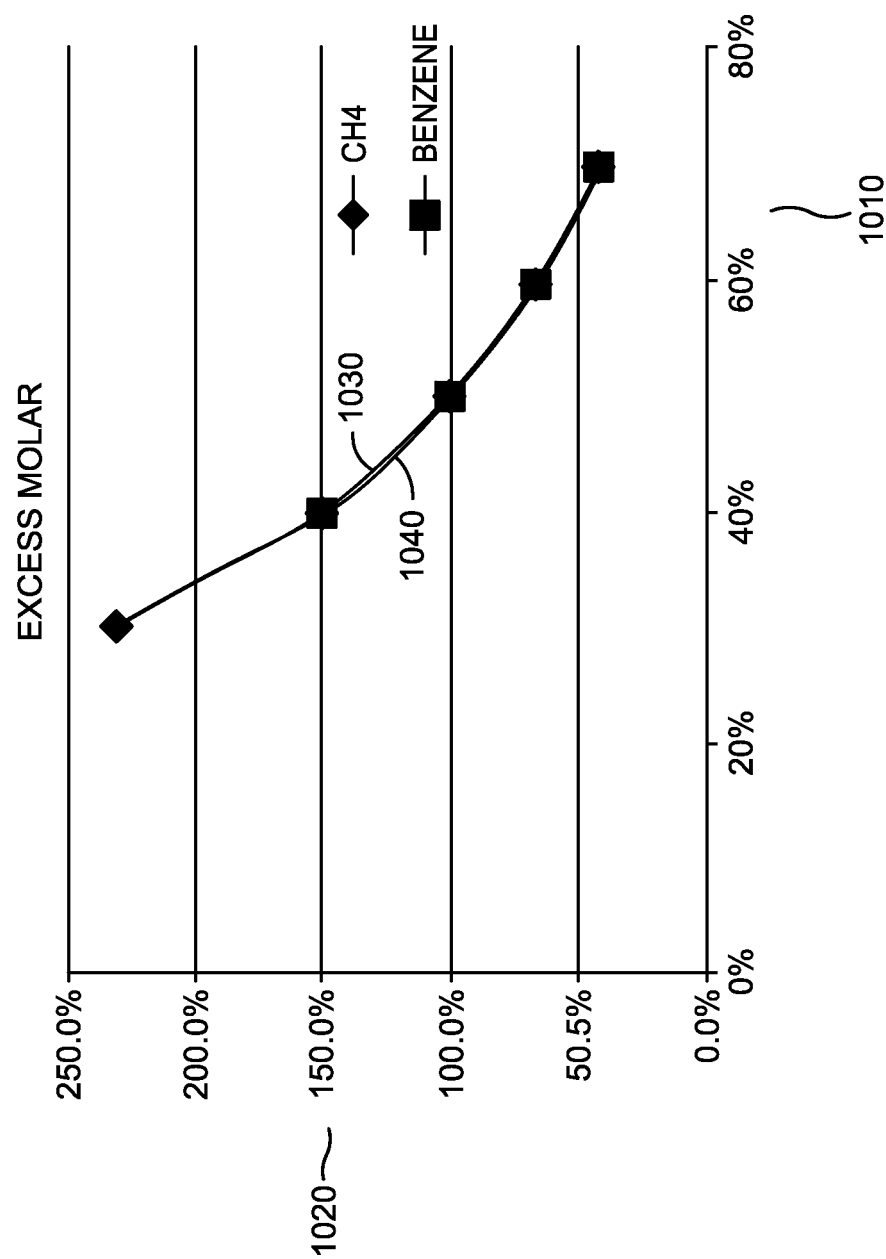


FIG. 10

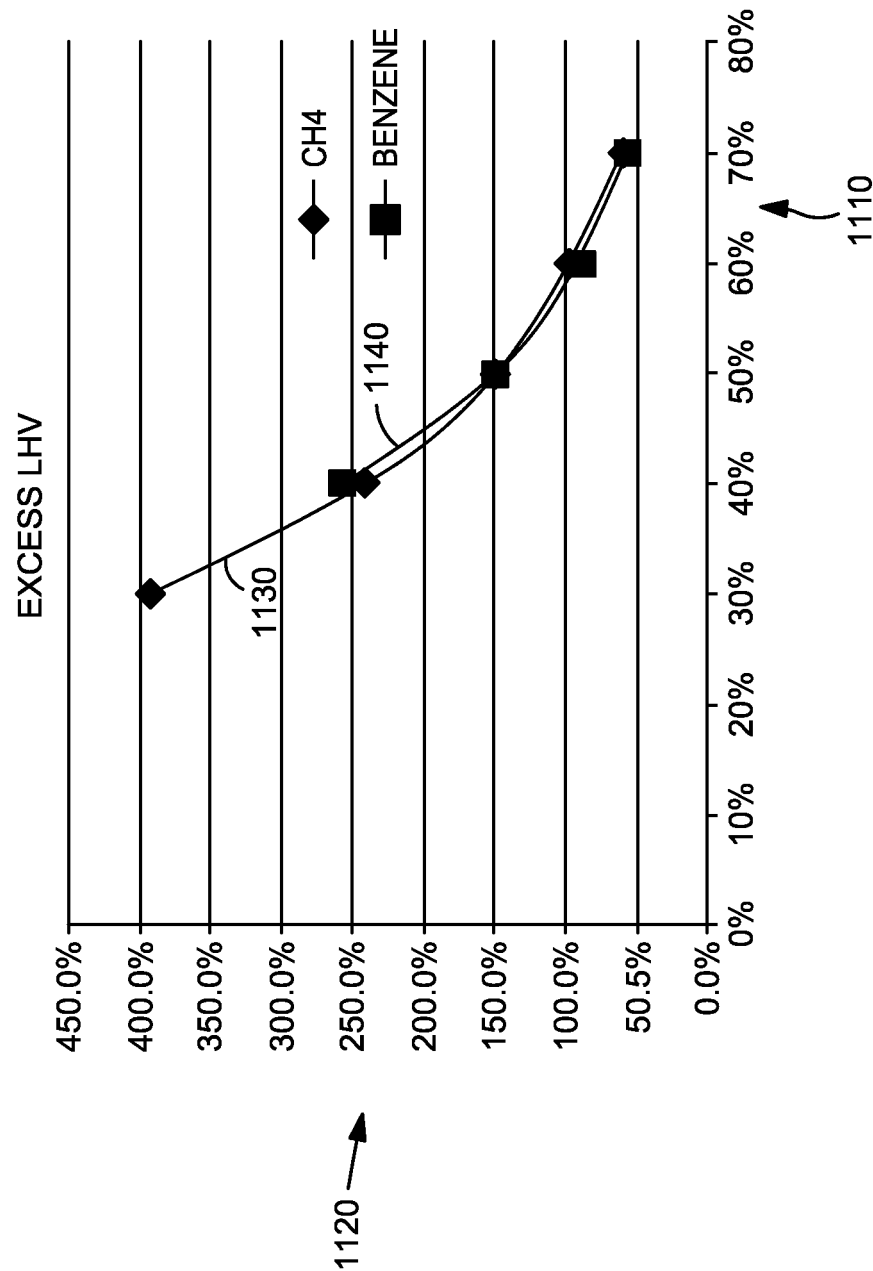


FIG. 11

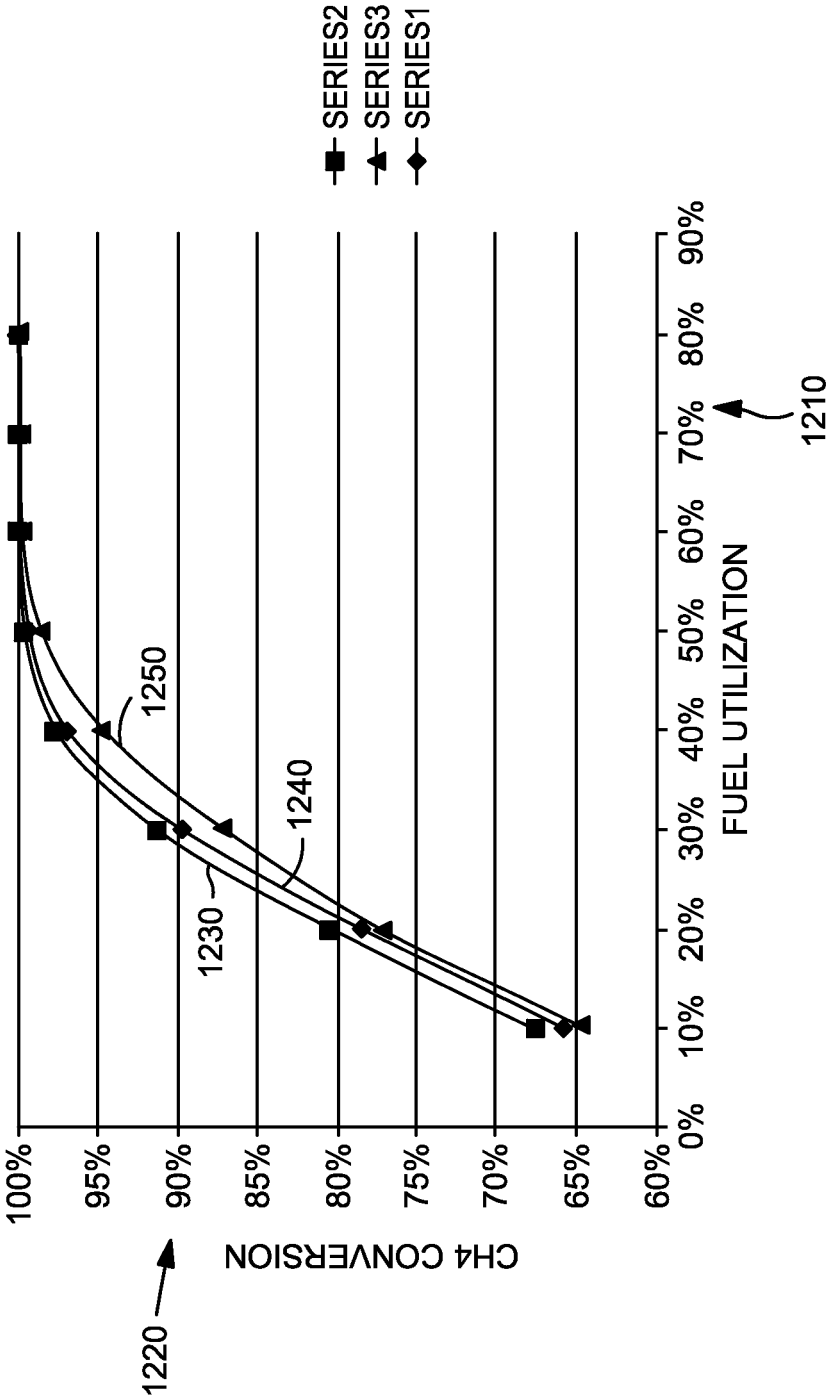


FIG. 12

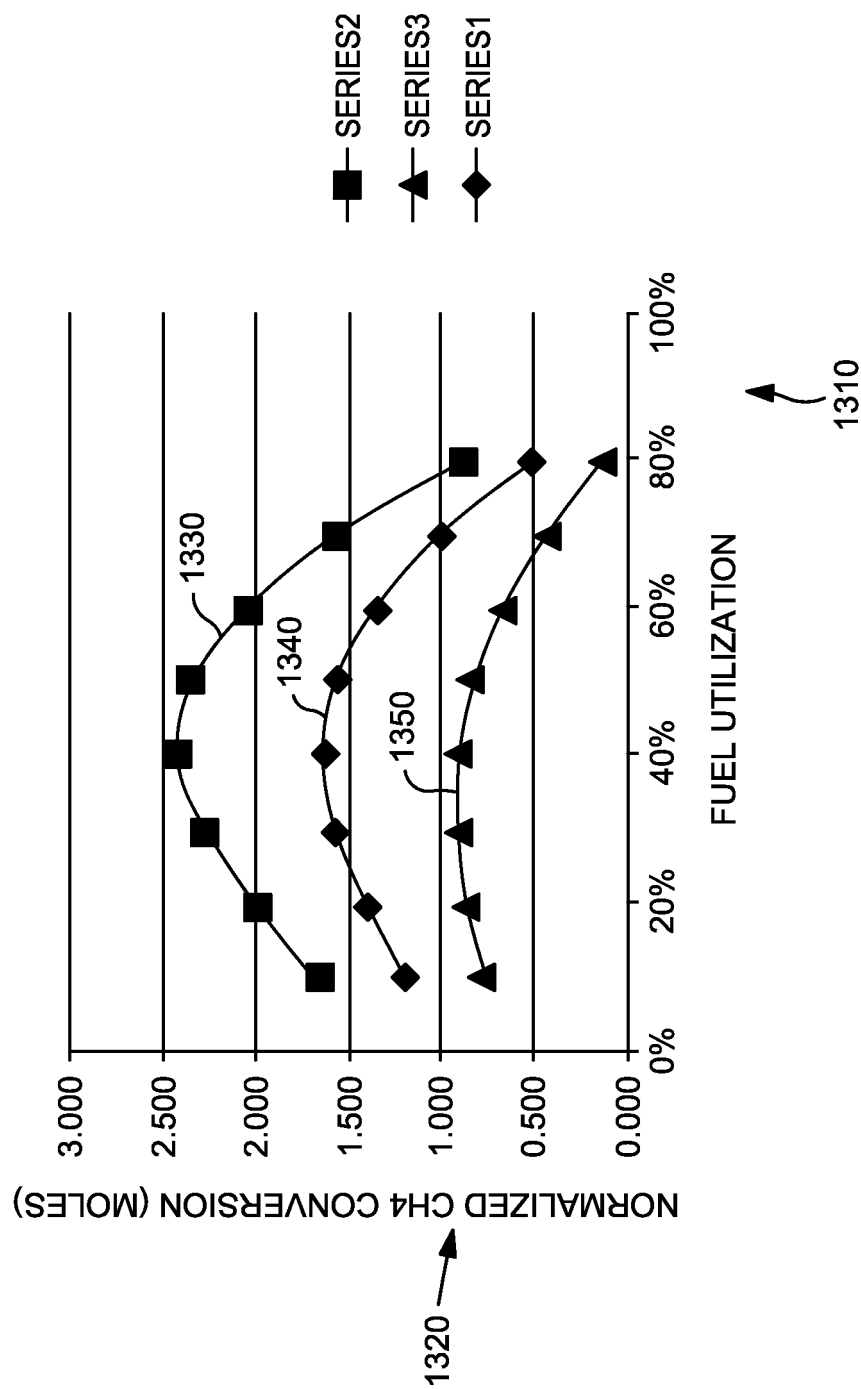


FIG. 13