

## PCT Recordation of Search History

Case/PCT Application Number: PCT/US19/64278

CLIN Number/Technical Field of PCT Application: 008 Chemical

Date During Which the Search was Conducted: 23 January 2020

Date of Completion of Recordation of Search History Form: 23 January 2020

Research Analyst Initials: JGH

Search Approval Official (SAO) Initials: DGF

### Field of Search/Classification Information:

IPC(8) Classifications: A61B 5/08, 5/097; A61M 16/00, 16/10, 16/12, G01N 1/22, 33/00, 33/497 (2020.01)

CPC Classifications: A61B 5/08, 5/082, 5/097; A61M 16/00, 16/10, 16/1005, 2016/102, 16/12, 16/161; G01N 1/22, 2205/33, 1/2247, 33/00, 33/497

### Databases Searched (Patent and Non-Patent Literature (NPL), Including Sub-Databases and Files Searched) and Search Terms Used:

PatSeer (US, EP, WO, JP, DE, GB, CN, FR, KR, ES, AU, IN, CA, INPADOC Data); EBSCO; Google; Google Scholar:

Gas, sensor, module, therapeutic, hot swap, replaceable, potentiation, voltage, storage, calibration

## Database Search String Recordation, Including Dates of Searches:

## Patent Database Search Strategy/Results:

PatSeer:

ID	Search String	Records	Date
L39	TAC:(electric* W7 potent* W7 sensor) AND AC:(A61B5/08 OR A61B5/082 OR A61B5/097 OR A61M16/00 OR A61M16/10 OR A61M16/1005 OR A61M2016/102 OR A61M16/12 OR A61M16/161 OR G01N1/22 OR G01N2205/33 OR G01N1/2247 OR G01N33/00 OR G01N33/497*) AND TACD:((Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) W5 sensor)	53	23-Jan-20
L38	TAC:(electric* W7 potent* W7 sensor) AND AC:(A61B5/08 OR A61B5/082 OR A61B5/097 OR A61M16/00 OR A61M16/10 OR A61M16/1005 OR A61M2016/102 OR A61M16/12 OR A61M16/161 OR G01N1/22 OR G01N2205/33 OR G01N1/2247 OR G01N33/00 OR G01N33/497*)	79	23-Jan-20
L37	TAC:(electric* W7 potent* W7 sensor) AND ASN:(MALLINCKRODT HOSPITAL)	0	23-Jan-20
L36	TAC:(electric* W7 potent* W7 sensor) AND ASN:((ACKER w2 (J OR Jaron)) OR (CLARK w2 (P OR Peter)) OR (ASSAMBO w2 (C OR Cedric)) OR (MCATAMNEY w2 (M OR Michael)) OR (KLAUS w2 (J OR John)) OR (ROEHL w2 (R OR Robin)))	0	23-Jan-20
L35	TAC:((electric* W3 potent*) WP sensor) AND ASN:((ACKER w2 (J OR Jaron)) OR (CLARK w2 (P OR Peter)) OR (ASSAMBO w2 (C OR Cedric)) OR (MCATAMNEY w2 (M OR Michael)) OR (KLAUS w2 (J OR John)) OR (ROEHL w2 (R OR Robin)))	0	23-Jan-20
L34	TAC:((electric* W3 potent*) WP sensor) AND ASN:(MALLINCKRODT HOSPITAL)	0	23-Jan-20
L33	L32 AND (L1 OR L2)	0	23-Jan-20
L32	TACD:(sensor W7 electr* W7 potential W7 calibration) AND TACD:((Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) W5 sensor)	17	23-Jan-20
L31	TACD:(sensor W7 electr* W7 potential W7 calibration) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*)) AND TACD:((Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) W5 sensor)	0	23-Jan-20
L30	TACD:(sensor W7 electr* W7 potential W7 calibration) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*)) AND TAC:((Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) W5 sensor)	0	23-Jan-20
L29	TACD:(sensor W7 potential W7 calibration) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND	24	23-Jan-20

	module AND (Therap* OR Breath*))		
L28	TACD:(nafion W5 tube) AND TACD:((Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) W5 sensor) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	17	23-Jan-20
L27	TACD:(nafion W5 tube) AND TACD:((Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) W5 sensor) AND TAC:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	1	23-Jan-20
L26	TACD:(nafion W5 tube) AND TACD:((Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) W5 sensor)	134	23-Jan-20
L25	TACD:(sensor W5 (shelf W5 stable)) AND TACD:((Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) W5 sensor)	2	23-Jan-20
L24	TACD:(sensor W5 (shelf W5 stable)) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	1	23-Jan-20
L23	TACD:(sensor W5 (storable OR stable)) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*)) AND TACD:((sensor W5 (precalibrat* OR pre-calibrat*)))	2	23-Jan-20
L22	TACD:(sensor W5 (storable OR stable)) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*)) AND TACD:(((sensor W3 module) W5 (precalibrat* OR pre-calibrat*)))	0	23-Jan-20
L21	TACD:(sensor W5 (storable OR stable)) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	760	23-Jan-20
L20	TACD:(sensor W5 ((storable OR stable) W5 shelf)) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	1	23-Jan-20
L19	TACD:((sensor W3 module) W5 ((storable OR stable) W5 shelf)) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	0	23-Jan-20
L18	TACD:((sensor W3 module) W5 (storable OR stable OR month OR days OR shelf)) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	57	23-Jan-20
L17	TACD:((sensor W3 module) W5 (precalibrat* OR pre-calibrat*)) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR	1	23-Jan-20

	Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*)) AND TACD:((sensor W3 module) W5 (storage OR stable OR month OR days))		
L16	TACD:((sensor W3 module) W5 (precalibrat* OR pre-calibrat*)) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	6	23-Jan-20
L15	TACD:((sensor W3 module) AND ((sensor OR module) W5 (Replac* OR Swap*)) AND (hot W5 swap*)) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	46	23-Jan-20
L14	TAC:((sensor W3 module) AND ((sensor OR module) W5 (Replac* OR Swap*)) AND (hot W5 swap*)) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	3	23-Jan-20
L13	TAC:((sensor W3 module) AND ((sensor OR module) W5 (Replac* OR Swap*))) AND TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	105	23-Jan-20
L12	TAC:((sensor W3 module) AND ((sensor OR module) W5 (Replac* OR Swap*))) AND TAC:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	24	23-Jan-20
L11	L3 AND L7	3530	23-Jan-20
L10	L3 AND L6	87	23-Jan-20
L9	(L1 OR L2 OR L3) AND L6	87	23-Jan-20
L8	L1 AND L2 AND L3 AND L7	5	23-Jan-20
L7	TACD:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	55828	23-Jan-20
L6	TAC:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	402	23-Jan-20
L5	TA:((Replac* OR Swap*) AND (Gas OR NO2 OR O2 OR Oxygen OR oxide OR Nitrogen OR Nitrous OR Nitric OR dioxide) AND sensor AND module AND (Therap* OR Breath*))	6	23-Jan-20
L4	L1 AND L2 AND L3	131	23-Jan-20
L3	( CPC:(A61B5/08 OR A61B5/082 OR A61B5/097 OR A61M16/00 OR A61M16/10 OR A61M16/1005 OR A61M2016/102 OR A61M16/12 OR A61M16/161 OR G01N1/22 OR G01N2205/33 OR G01N1/2247 OR G01N33/00 OR G01N33/497) OR IC:(A61B5/08 OR A61B5/097 OR A61M16/00 OR A61M16/10 OR A61M16/12 OR G01N1/22 OR G01N33/00 OR G01N33/497) )	120787	23-Jan-20
L2	INV:((ACKER w2 (J OR Jaron)) OR (CLARK w2 (P OR Peter)) OR (ASSAMBO w2 (C OR Cedric)) OR (MCATAMNEY w2 (M OR Michael)) OR (KLAUS w2 (J OR John)) OR (ROEHL w2 (R OR Robin)))	1771	23-Jan-20

L1	ASN:(MALLINCKRODT HOSPITAL)	61	23-Jan-20
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### Non-Patent Literature (NPL) Search Strategy/Results:

EBSCO: 23 January 2020

Search ID#	Search Terms	Actions
S12	gas sensor storage voltage	View Results (122,481)
S11	electrical potential across gas sensor to maintain calibration storage	View Results (51,133)
S10	therapeutic gas sensor hot swap	View Results (8,008)
S9	replaceable gas sensor module therapeutic gas delivery	View Results (2,707)
S8	replaceable gas sensor module	View Results (10,179)
S7	ROEHL Robin gas sensor	View Results (2,344)
S6	KLAUS John gas sensor	View Results (71,905)
S5	MCATAMNEY Michael gas sensor	View Results (257)
S4	ASSAMBO Cedric gas sensor	View Results (2)
S3	CLARK Peter gas sensor	View Results (73,688)
S2	ACKER Jaron gas sensor	View Results (535)
S1	MALLINCKRODT gas sensor	View Results (5,458)

Google: 23 January 2020

replaceable gas sensor module	About 959,000 results
replaceable gas sensor module therapeutic gas delivery	About 3,180,000 results
therapeutic gas sensor hot swap	About 1,330,000 results
(therapeutic) (gas sensor) (hot swap)	
electrical potential across gas sensor to maintain calibration storage	About 17,900,000 results

Google Scholar: 23 January 2020

replaceable gas sensor module	About 935,000 results
replaceable gas sensor module therapeutic gas delivery	About 738,000 results
therapeutic gas sensor hot swap	About 1,340,000 results
(therapeutic) (gas sensor) (hot swap)	
electrical potential across gas sensor to maintain calibration storage	About 724,000 results