1	SYNTHETIC DRYING OILS	424	.Specified procedure to improve separation of solids from
2 3	PHENOLIC OR TOXIC OILS		liquid product
3 4	OXIDATION OF MINERAL OILS	425	Including centrifugation,
	.To form asphalts, tars or pitches		filtering, flotation or vibration
5	In presence of soild contact material	426	.Including agglomeration, comminution or size-
6	Tar, pitch, or asphalt feed		classification of solids
7	.With cracking	427	.Including burning of feed or
390	TAR SAND TREATMENT WITH LIQUID	427	product
391	.Inorganic (only) liquid	428	.Including contact with
400	BY TREATMENT OF SOLID MINERAL,	420	extraneous additive other than
	E.G., COAL LIQUEFACTION, ETC.		hydrogen, e.g., solvent, etc.
401	.Including a test or measurement	429	Distinct addition zones
402	.Using electrical, magnetic or	430	Contact with additive, followed
	wave energy	450	by chemical conversion
403	.Chemical modification of solids	431	Specified hydrogen-donor
	before hydrogenation	131	solvent
404	.Using molten additive, e.g.,	432	With specified circulation
	heat carrier, etc.	152	procedure in contact zone
405	Molten catalyst	433	Simultaneous treatment with
406	Halide-containing	133	gaseous additive and liquid
407	.Specified agitation or		solvent
	circulation in gas contact	434	Additive is petroleum or
	zone		fraction from petroleum
408	Gas includes hydrogen		refining
409	Vertical gas upflow, e.g.,	435	Additive is specified catalyst
	fluidization, etc.		or liquid solvent or
410	Using solid heat carrier		dispersant
411	Using solid heat carrier	12	COLORNG TREATMENTS (INCLUDES
412	.Plural hydrogenation steps		FLUORESCENCE)
413	Solid catalyst in at least one	13	TREATMENT OF REFINING SLUDGE
	step	14	PRODUCTS AND COMPOSITIONS
414	.With hydrogen production from	15	.Fuels
	water	16	Gasolines
415	.Including contact of feed with	17	Admixtures
	liquid produced in the	18	.Lubricating oils
	process, i.e., recycle	19	Admixtures
416	With discrete hydrogenation of	20	.Waxes
44.5	recycle stream	21	Admixtures
417	Recycle of bottoms (resid)	22	.Asphalts, tars, pitches and
418	Including contact with hydrogen		resins
44.0	gas	23	Admixtures
419	.Using specifically added	24	PARAFFIN WAX; TREATMENT OR
400	catalyst during hydrogenation		RECOVERY
420	Dissolved or suspended-	25	.With ureas
	thermally-decomposable	26	.With sorption agents
	catalyst, component or	27	.Chemical treatment (refining or
101	precursor		modification except mere
421	Containing Group VI transition		solvent extraction)
400	metal	28	.Separation of paraffin from oil
422	And Group VIII metal		(e.g., dewaxing)
423	Containing Group VIII metal	29	Emulsion dewaxing

30	Separation of residual oil from wax (i.e., deoiling)	61	With subsequent thermal or catalytic cracking
31	With solvent	62	First stage is reforming
32	Sweating	63	Reforming in all stages
33	Solvent dewaxing	64	Catalyst in at least one
34	With deasphalting treatment		stage
35	With chilling by evaporation	65	Noble metal containing
	of solvent		catalyst
36	With nondewaxing solvent	66	Catalytic
	extraction of oil	67	First stage is thermal or
37	Chilling		catalytic cracking
38	With filtering	68	With subsequent hydrocracking
39	ASPHALTS, TARS, PITCHES AND	69	With subsequent reforming
	RESINS; MAKING, TREATING AND	70	Catalytic reforming
	RECOVERY	71	With subsequent polymerization
40	.By chemical conversion of oil	72	Cracking in all stages
41	.By distillation	73	Catalyst in at least one
42	Tar feed		stage
43	By contact with hot gases	74	Catalyst in multiple stages
44	.Chemical modification of	75	With cracking of total
	asphalt, tar, pitch or resin		product from first stage
45	.Solvent extraction	76	With cracking of the first
46	CHEMICAL CONVERSION OF		stage bottoms
	HYDROCARBONS	77	With cracking of the first
47	.With prevention of corrosion or		stage intermediate fraction
	erosion in system	78	.Plural parallel stages of
48 R	.With prevention or removal of		chemical conversion
	deleterious carbon	79	At least one stage is reforming
	accumulations or equipment	80	Split feed
48 Q	Quench	81	.With contacting vapor porducts
48 AA	Antifoulant additive		with liquid feed (i.e.,
49	.Plural serial stages of chemical		product scrubbing and feed
	conversion		stripping)
50	Coking in at least one stage	82	Only selected fractions of
51	With reforming		product or feed are contacted
52 R	With both catalytic and	83	With subsequent fractionation
	thermal cracking	84	With added material (to
52 CT	Catalyst treatment to remove		scrubbing-stripping stage)
	metal contaminants	85	.With preliminary treatment of
53	First stage is coking		feed
54	Second stage is cracking	86	Deasphalting
55	Catalytic cracking	87	Solvent extraction
56	Hydrogen donor diluent cyclic	88	Refining
	processes	89	With hydrogen
57	First stage is an hydrogenation	90	With acids
	(saturation)	91	With solid absorbents
58	First stage is hydrocracking	92	Distillation
	(includes hydro-	93	With blending of products of
	desulfurization under cracking		distillation with each other
	conditions)		or with converted products
59	Hydrocracking in all stages	94	Plural stages of distillation
60	With subsequent reforming	95	.With subsequent treatment of
			products

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111.3With group VI metal or metal oxide (i.e., Cr, Mo, W, Po, or oxide thereof) 111.35With group VIII metal or metal oxide (i.e., iron, or platinum group metal, or oxide thereof) 112Metal or metal oxide catalyst 113CatalyticPhosphorus, boron or nitrogen 129Combustion gases Steam Soaking 131Soaking With heating in tubular confined stream Reforming (includes dehydrogenation, isomerization, cyclization, aromatization, alkylation, dealkylation reactions)			128	Vapors
Po, or oxide thereof) 131Soaking 111.35With group VIII metal or 132With heating in tubular confined stream platinum group metal, or oxide thereof) 133Reforming (includes dehydrogenation, isomerization, cyclization, aromatization, alkylation, dealkylation reactions)	111.3		129	Combustion gases
111.35With group VIII metal or metal oxide (i.e., iron, or platinum group metal, or oxide thereof) 12Metal or metal oxide catalyst 13Catalytic 14Phosphorus, boron or nitrogen 132With heating in tubular confined stream 133 .Reforming (includes dehydrogenation, isomerization, cyclization, aromatization, alkylation, dealkylation reactions)		metal oxide (i.e., Cr, Mo, W,	130	Steam
metal oxide (i.e., iron, or platinum group metal, or oxide thereof) 112Metal or metal oxide catalyst isomerization, cyclization, aromatization, alkylation, dealkylation reactions)		Po, or oxide thereof)	131	Soaking
platinum group metal, or oxide 133 .Reforming (includes thereof) dehydrogenation, 112Metal or metal oxide catalyst isomerization, cyclization, 113Catalytic aromatization, alkylation, 114Phosphorus, boron or nitrogen dealkylation reactions)	111.35	With group VIII metal or	132	With heating in tubular
thereof) dehydrogenation, 112Metal or metal oxide catalyst isomerization, cyclization, 113Catalytic aromatization, alkylation, 114Phosphorus, boron or nitrogen dealkylation reactions)		metal oxide (i.e., iron, or		confined stream
112Metal or metal oxide catalyst isomerization, cyclization, 113Catalytic aromatization, alkylation, 114Phosphorus, boron or nitrogen dealkylation reactions)		platinum group metal, or oxide	133	.Reforming (includes
113Catalytic aromatization, alkylation, 114Phosphorus, boron or nitrogen dealkylation reactions)		thereof)		dehydrogenation,
114Phosphorus, boron or nitrogen dealkylation reactions)		Metal or metal oxide catalyst		isomerization, cyclization,
		-		
containing catalyst 134Catalytic	114			
		containing catalyst	134	Catalytic

135	With Group III metal or metal	171	Uniform solids withdrawal
126	oxide containing catalyst	172	Preheating or quenching with
136	With Group VI metal or metal oxide	173	solidsSolids transferring
137	With Group VIII metal or	174	By pneumatic lifting
137	metal oxide	175	Compact type
138	Noble metal or oxide thereof	176	Solids moving processes
139	With halogen containing	177	REFINING
133	additive	178	.With reagent feed control
140	With recovery or	179	.Purifying used oil
140	reactivation of catalyst	180	With added organic material
141	Feed of specific composition	181	Plural treating agents
142	.Hydrogenation (saturation)	101	(sequential or simultaneous)
143	Catalytic	182	One is a solid contact
144	Feed of specific composition	102	material
145	With added source of hydrogen	183	With acid or alkali
113	(includes hydrogen donor)	184	Distillation or degassing
146	.Solids contacting and mixing	185	With gaseous treating agent
147	Separate contiguous, dissimilar	186	With solid-liquid separation
11	function, contacting zones	187	with solid-liquid separation .Water removal (dehydration)
148	Combined gravitating bed and	188	With treating agent
110	suspension zones	189	. Sweetening
149	Solids of dissimilar	190	With hypochlorites
	composition	191	With copper compounds
150	Purging	192	With preliminary treatment of
151	Plural stages	192	oil
152	Solids replenishment, or	193	With subsequent treatment of
102	selective discard	193	the sweet oil
153	Suspension system	194	Separation or recovery of
154	Start-up and shut down	エンユ	copper compound
	procedures	195	Copper chloride and free
155	Plural zones of similar	199	oxygen containing gas
	function	196	With peroxides
156	Solids and contacting fluids	197	With lead compounds
	are both in series	198	Lead sulfide
157	Liquid feed	199	Sodium plumbite
158	With augmented turbulence (in	200	With preliminary treatment of
	addition to normal mixing in	200	the oil
	bed)	201	With subsequent treatment of
159	With temperature regulation		the sweet oil
160	By solids circulation to	202	Organic treating agent
	external heat exchange and	203	With alkali metal hydroxide or
	return to same zone		carbonate
161	Separation of entrained fines	204	With added oxygen containing
	from effluents		organic compound
162	In presence of a liquid	205	Acyclic alcohol
163	Fluidized dense bed	206	With added nitrogen containing
164	Solids transferring		compound
165	Gravitating compact beds	207	Nitrogen containing compound
166	Liquid feeding	208 R	.Sulfur removal (free or combined
167	Solids curtain type		sulfur)
168	Solids-vapor disengagement	209	With hydrogen
169	Plural zones of similar	210	Plural stage treatments with
	function (same chamber)		hydrogen
170	\ldots Size stratification prevention		

211	With preliminary treatment of feed	245	With silicon or compound thereof
212	With subsequent treatment of	246	With Group IB metal or compound
	product	247	With Group IIB metal or
213	With solid catalyst or		compound
	absorbent	248	With Group III metal or
214	With hydrogen yielding		compound
	material (H donor)	249	With Group IV, V, VII metal or
215	With heavy metal sulfide		compound
216 R	With group VI metal or	250	Solids contacting and mixing
	compound	208 M	Using free alkali metal
216 PP	With specific porosity or	251 R	.Metal contaminant removal
	pore volume	252	With acid
217	With Group VIII metal or	253	With metal or metal compound
	compound	251 Н	Employing hydrogen
218	Split treatment	254 R	.Nitrogen contaminant removal
219	With acids	254 Н	Employing hydrogen
220	Plural stages of sulfur	255	.Gum or gum former removal
	removal	256	With acid
221	With preliminary treatment of	257	With metal or metal compound
	feed	258	Alkali metal
222	With subsequent treatment of	259	Alkali or alkali earth metal
	product		compound (except clays)
223	Inorganic acid	260	Clay type or alumina
224	Sulfuric acid	261	Vapor phase treatment
225	Hydrochloric acid	262.1	.Halogen contaminant removal
226	With alkali or alkali earth	262.5	Polychorinated biphenyl (PCB)
	metal compound (except clays)	263	.Organic acid or phenol
227	Plural stages of sulfur		contaminant removal
	removal	264	.With hydrogen
228	With preliminary treatment of	265	.With acids
	feed	266	Sulfuric acid
229	With subsequent treatment of	267	With fluid rotation or
0.2.0	product		agitation
230	Alkali metal compound	268	White oil making
231	With added oxygen containing	269	Split treatment
222	organic compound	270	Plural stages of acid
232	Alcohol containing		treatment
233	With other organic compound	271	With preliminary treatment of
234	With regeneration of		the oil
225	treating agent	272	Fractionation
235	With regeneration of treating	273	With subsequent treatment of
236	agent	0.7.4	the oil
230	With nitrogen containing treating reagent	274	Organic treating agent
237	With organic reagent	275	Solid absorbent
238	Hydrocarbon containing	276	With nonwater additive
239	Heavy metal soap containing	277	Organic compound
240	Oxygen containing	278	Solid contact material
240	With free halogen or nonmetal	279	Phosphorus containing acid
747	halide containing reagent	280	Halogen containing acid
242	With sulfur oxides	281	Hydrochloric acid
242	With Group VI metal or compound	282	Organic acid
244	With Group VIII metal or	283	.With alkali or alkali earth
217	compound		metal compound (except clays)

284	Alkali metal compound	316	Difference is mere change in
285	With preliminary treatment of		proportions of solvents
	the oil	317	Counter current multistage
286	With subsequent treatment of	31,	extraction
200	the oil	318	
207			With recycle of oil
287	With solid carrier	319	With pressure variation
288	With added material	320	With temperature gradient in
289	.With nitrogen containing		extraction zone or between
	compound		extraction zones
290	.With organic compound	321	With solvent rehabilitation
291	Oxygen containing	322	Organic solvent containing
292	.With boron, phosphorus, arsenic,	323	With added solvent or solvent
	antimony or bismuth containing		modifier
	treating agent	324	Inorganic
293	.With sulfur containing treating	325	Heterocyclic
233	agent	326	Hetero-N-containing
294	.With free metal	327	Furfural and derivatives
294		_	
293	.With Group IV, V, VI, VII or	328	Nonoxo carbonylic
006	VIII metal compound	329	Carboxylic esters
296	.With Group IB or IIB metal	330	Nitrogen-containing solvent
	compound	331	Amino compound
297	.With Group III metal compound	332	Oxo compound containing
	(except clays)	333	Oxy compound
298	.With liquid treating agent	334	Ethers
	(includes slurries of solids)	335	Aromatic
299	.With solid catalyst or absorbent	336	Halogen containing
300	Of particular physical shape or	337	Hydrocarbon
	structure	338	Liquid sulfur dioxide
301	With preliminary treatment of	339	Liquid-liquid contacting
	the oil	340	Recovery of mineral oil from
302	With subsequent treatment of		natural or converted gases
	the oil	341	By absorption and vaporization
303	Plural treating stages	342	With fractional condensation
304	Processes including downward	312	prior to absorption
	movement of particles	343	Indirect heat exchange between
305	Solids rehabilitation	243	lean and rich absorbent
306	Composite or plural treating	211	
500	agents	344	Plural absorption stages
307	Silicon or carbon containing	345	At least one stage is under
307	_		pressure
200	treating agent	346	Absorption stage is under
308	FRACTIONATION		pressure
309	.Deasphalting	347	.Distillation
310 R	.Adsorption	348	With nonvapor compound added
310 Z	Zeolite adsorbent		prior to or during
311	.Liquid extraction with solvents		vaporization
312	With blending of separated	349	With nonvaporization treatment
	fractions with each other or		of liquid condensate or
	with feed		residue
313	Extractive distillation	350	Rectification
314	Plural stages with different	351	C1-C4 alkane removal
	oil miscible solvents	352	Flash vaporizaton
315	With recycle of product of	353	With heat recovery by indirect
	later extraction to earlier		heat exchange
	extraction stage	354	Plural or combined with
		•	additional distillation

355	With product recycle between		
	distillation zones		
356	With added gas or vapor (e.g.,		
	steam)		
357	Vacuum or pressure		
358	With liquid product recycle to		
	rectification zone		
359	Spraying		
360	Filming		
361	Flash vaporization		
362	With added gas or vapor		
363	Steam		
364	Plural stages of vaporization		
365	With heat recovery by indirect		
	heat exchange		
366	Vacuum or pressure		
367	With agitation of distilland		
368	Condensatin by direct heat		
	exchange		
369	Volatile treatment other than		
	condensation		
370	MISCELLANEOUS		

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