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|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 27 |The additional organic compound is an ethylenically unsaturated hydrocarbon monomer (e.g., butadiene, cyclopentadiene, styrene, etc.) | 47 |Containing -C(=O)O- group (e.g., carboxylic acid, ester, salt, etc.) |
| 28 | ...Inorganic material utilized | 48 |Additional carboxamide containing |
| 29 | ...Purification or recovery | 49 |The carboxamide nitrogen and a -S(=O)(=O)-O-X group attached to each other by an acyclic chain which consists of carbons, wherein X is hydrogen or a metal (e.g., taurides, etc.) |
| 30 | ...Esterification or molecular rearrangement (e.g., intra- or inter-esterification, etc.) | 50 |Sulfoxy in acid moiety |
| 31 | ...Dehydration or carbon to carbon unsaturation formation (e.g., dehydrating hydroxylated fatty acids or oils, forming conjugated unsaturation by dehydrogenation, dehalogenation, dehydrohalogenation, etc.) | 51 | ...Additional nitrogen containing |
| 32 | ...Heavy metal containing compound utilized (e.g., as catalyst, promoter, etc.) | 52 | ...Quaternary ammonium containing |
| 33 | ...Sulfur containing compound utilized | 53 | ...Amidino or guanidino containing |
| 34 | ...Group IA or IIA light metal containing compound utilized | 54 | ...Cyano or hydrazino containing |
| 35 | ..The carbonyl is part of a carboxamide group (i.e., fatty acid amides) | 55 | ...Halogen or additional oxygen containing (e.g., isocyanate containing, etc.) |
| 36 | ...Additional carbonyl in the acid moiety | 56 |Additional carboxamide group containing (e.g., carbamates, ureas, etc.) |
| 37 | ...Noncarbon atom bonded directly to the additional carbonyl | 57 |Plural additional carboxamide groups containing |
| 38 | ..Heavy metal or aluminum containing | 58 |Additional nitrogen or -C(=O)O- group containing |
| 39 | ...Boron, silicon, selenium, or tellurium containing | 59 |Containing -C(=O)O- group |
| 40 | ...Phosphorus containing | 60 |Nitro containing or plural oxyalkylene groups bonded directly to each other |
| 41 | ...Additional nitrogen containing | 61 | ...Additional oxygen containing (e.g., amides of ricinoleic acid, etc.) |
| 42 | ...Sulfur containing | 62 | ...Halogen containing |
| 43 | ...The sulfur is bonded directly to the carboxamide nitrogen or to an additional nitrogen (e.g., sulfonamide, sulfamic acid, etc.) | 63 | ...Containing -C(=O)O- group |
| 44 |Sulfoxy containing | 64 | ...Plural oxyalkylene groups bonded directly to each other |
| 45 |Ring bonded directly to the sulfoxy | 65 | ...Oxygen bonded directly to a ring |
| 46 |Additional nitrogen containing | 66 | ...Hydroxyalkyl substituent on the amido nitrogen |
| | | 67 | ...Halogen containing |
| | | 68 | ...Processes |
| | | 69 |Amidation |
| | | 70 |Purification or recovery |
| | | 71 | ..Heavy metal containing (e.g., As, Cr, Mn, Sb, V, etc.) |
| | | 72 | ...Titanium, zirconium, or cerium containing (Ti, Zr, or Ce) |
| | | 73 | ...Lead or tin containing (Pb or Sn) |

74	...Iron, cobalt, nickel, copper, silver, or gold containing (Fe, Co, Ni, Cu, Ag, or Au)	96	....Carbon bonded directly to -S(=O)(=O)OH or to -O-S(=O)(=O)OH, wherein H may be replaced by a cation or by an ester forming group (e.g., sulfonic acid sulfate monoester, etc.)
75	...Zinc, cadmium, or mercury containing (Zn, Cd, or Hg)		
76	..Aluminum containing		
77	..Boron, selenium, or silicon containing	97	....Metal salt
78	..Phosphorus containing	98	....Processes utilizing anhydrous sulfur trioxide (e.g., in gaseous form, in sulfur dioxide solution, etc.)
79	...Glycerophosphates (e.g., phosphatidic acids, phosphatidyl inositol, etc.)		
80	....Nitrogen containing (e.g., cephalins, lecithins, etc.)	99	....Processes of sulfonating in the presence of lower carboxylic acid, anhydride, acid halide, or phosphorus containing material
81	.....Halogen or sulfur containing		
82	....Processes of forming the compound	100	....Purification or recovery
83	.....Purification on recovery	101	...Thioether, thiol, or mercaptide containing
84	...Nitrogen containing	102	...Plural sulfurs containing
85	..Sulfur containing	103	..Nitrogen containing
86	...Processes utilizing sulfur chloride	104	...Plural nitrogens containing (e.g., guanidine, hydrazine, etc.)
87	...Processes utilizing elemental sulfur		
88	...Sulfoxy containing (e.g., sulfones, etc.)	105	...Additional oxygen containing
89	....Twitchell or Pfeilring reagent (i.e., product of sulfonation of fatty material in the presence of an aromatic hydrocarbon or phenol)	106	....The additional oxygen is in a carboxamide, carbamate, or urea group (e.g., chloramphenicol palmitate, etc.)
90	....The sulfoxy is in the alcohol moiety (e.g., sulfate esters of fatty acid monoglycerides, etc.)	107	....The additional oxygen is in a -C(=O)O- group
91	....Nitrogen bonded directly to carbon in the alcohol moiety	108	...Additional oxygen containing (e.g., hydroxy, ether, etc.)
92	....Having -S(=O)(=O)-O-X attached indirectly to the single bonded oxygen of the carboxyl group by a single carbon or a chain consisting of carbons, which chain or carbon may include a ring, wherein X is hydrogen or a cation (e.g., isethionates, etc.)	109	...Plural additional oxygens containing
93	....Purification or recovery	110	....The additional oxygens are in a -C(=O)O- group
94	....Nitrogen containing (e.g., sulfonamide containing, etc.)	111	....Nitro or carboxamide containing
95	....Carbocyclic ring in the acid moiety	112	...Carboxamide, cyano, or isocyanate containing
		113	...Cyano containing
		114	...Processes
		115	..Additional carbonyl in the acid moiety (e.g., oiticica oil, licanic acid, etc.)
		116	...Benzene ring in the acid moiety
		117	...Alicyclic ring in the acid moiety (e.g., prostaglandin analogs, etc.)

118	....Oxygen double bonded directly to the ring (i.e., the carbon of the additional carbonyl is part of the ring; e.g., homo prostaglandins, etc.)	142	....Including esterification or inter-esterification (e.g., prior to, simultaneously with, or after hydrogenation, etc.)
119	....Additional oxygen bonded directly to the ring	143	....Conversion of a functional group in the course of hydrogenation (e.g., hydrogenolysis, etc.)
120	..Hydrogen bonded directly to the additional carbonyl (i.e., aldehyde containing)	144	....Plural hydrogenation steps or continuous hydrogenation process
121	..The additional carbonyl is in a -C(=O)O- group	145	....Selective hydrogenation (e.g., of polyunsaturated to monounsaturated, of acetylenic to ethylenic compound, etc.)
122	....Plural additional carbonyls in the acid moiety	146	....Plural heavy metal containing materials utilized
123	..Halogen or plural additional carbonyls in the acid moiety	147	....Additional treating agent utilized (e.g., as catalyst carrier or promoter, oil deodorizer, oil solvent, pretreatment agent, oil filtering aid, etc.)
124	..Processes of forming the compound	148	..Oxygen containing hetero ring reactant (e.g., succinic anhydride, etc.)
125	..Geometric isomer formation (e.g., cis-trans, syn-anti, etc.)	149	....Oxirane containing reactant
126	..Double bond shift (e.g., conjugation, etc.)	150	..Organic halogen containing reactant
127	..Forming carbon to carbon unsaturation (i.e., forming a double or triple bond)	151	....The reactant contains carbonyl bonded directly to the halogen
128	..Carbonylation, carbonation, or hydroformylation	152	....Another reactant is a carboxylic acid salt
129	....Phosphorus or sulfur containing material utilized	153	....Metal containing material utilized (e.g., Grignard reagent, Friedel Crafts catalyst, etc.)
130	....Halogen containing material utilized	154	..Nitrogen, phosphorus, or sulfur containing reactant
131	....Group VIII metal containing material utilized	155	....Inorganic sulfur containing reactant (e.g., utilizing sulfuric acid to decompose soap, etc.)
132	..Oxidation	156	..Group IA or IIA metal containing reactant (e.g., forming a soap from fat and alkali, i.e., saponification, etc.)
133	....Ozone utilized	157	....Organic material, in addition to a fatty material, utilized or plural diverse fatty materials utilized (e.g., as solvent, reaction promoter, etc.)
134	....Molecular oxygen utilized as oxidizing agent		
135	....Heavy metal containing catalyst utilized		
136	.....Cobalt containing catalyst		
137	.....Manganese containing catalyst		
138	....Peroxy containing material utilized as oxidizing agent		
139	....Nitric acid utilized as oxidizing agent		
140	....Chromium containing compound utilized as oxidizing agent (e.g., chromic acid, chromosulfuric acid, etc.)		
141	..Catalytic hydrogenation		

- 158Inorganic boron, halogen, phosphorus, silicon, sulfur, elemental metal, or additional metal containing compound utilized (e.g., utilizing inorganic agent for "salting out", bleaching, purifying, etc.)
- 159 ...Inorganic halogen containing reactant
- 160 ...Hydrolyzing fatty material with water only
- 161 ...Reactant contains -C(=O)O- group (e.g., carboxylic acid, salt, anhydride, etc.)
- 162Bonding a hydrocarbyl group to the -C(=O)O- containing reactant
- 163The -C(=O)O- is part of an ester group
- 164Another reactant is a carboxylic acid anhydride (i.e., contains -C(=O)-O-C(=O)-)
- 165Another reactant is a carboxylic acid
- 166Polycarboxylic or hydroxy acid (i.e., containing additional -C(=O)OH or an -OH group)
- 167Another reactant contains alcoholic or phenolic hydroxy (e.g., methy ricinoleate, etc.)
- 168Plural alcoholic or phenolic hydroxys (e.g., glycerol, castor oil, etc.)
- 169Molecular rearrangement of the acid moieties of glyceride esters (e.g., random or directed low temperature intra- or inter-esterification of fats, oils, etc.)
- 170Another reactant contains alcoholic or phenolic hydroxy
- 171Ring in the hydroxy containing reactant
- 172Plural hydroxys in the hydroxy containing reactant
- 173Glycerol
- 174 ..Esterification of fatty material to reduce the amount of free fatty acid or to facilitate separation of constituents
- 175 ..Purification, recovery, deodorizing, decolorizing or color stabilizing
- 176 ...Metal containing contaminant removal (e.g., of colloidal elemental metal catalyst, of metal ions, etc.)
- 177 ...Recovering from industrial waste materials (e.g., foots, textile treating liquors, spent sorbents, filter cake, sewage, sludge, soapstock, etc.)
- 178Metal oxide, hydroxide, carbonate, or bicarbonate treating agent
- 179Organic or inorganic acid or anhydride treating agent (e.g., carbon dioxide, sulfur dioxide, etc.)
- 180Hydrocarbon or halohydrocarbon treating agent
- 181 ...Oxidation of impurities
- 182Peroxy containing treating agent
- 183Air, gaseous oxygen, or halogen containing treating agent
- 184 ..Nitrogen containing compound treating agent
- 185The treating agent is organic
- 186Urea or nitro group containing
- 187 ...Sulfur containing treating agent
- 188Sulfuric or sulfurous acid treating agent
- 189The treating agent is inorganic
- 190 ...Boron or phosphorus containing treating agent
- 191 ...Sorbent material utilized (e.g., activated carbon, decolorizing clay, bentonite, synthetic resin, etc.)
- 192 ...And utilizing Group IA or IIA metal oxide, hydroxide, or carbonate treating agent (e.g., saponification, neutralization, etc.)
- 193Removal of fatty material from the sorbent or solvent utilized
- 194 ..Heavy metal or aluminum containing treating agent

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| 195 | ...Group IA or IIA light metal containing treating agent (i.e., Li, Na, K, Rb, Cs, or Be, Mg, Ca, Sr, Ba) [e.g., carbonates, etc.] | 217 | ...Plural oxygens bonded directly to the ring |
| 196 | ...Silicon containing treating agent (e.g., sodium silicate, etc.) | 218 | ...Benzene ring in the acid moiety |
| 197 | ...Inorganic halogen containing treating agent | 219 | ...Acyclic carbon-to-carbon unsaturation in the acid moiety (e.g., ricinoleic acid, castor oil, etc.) |
| 198 | ...Organic treating agent added to or included with fatty material | 220 | ..Benzene ring in the acid moiety |
| 199 |The organic treating agent contains oxygen | 221 | ..Alicyclic ring in the acid moiety |
| 200 |The treating agent is a carboxylic acid, anhydride, or salt thereof | 222 | ...The alicyclic ring is five-membered |
| 201 | ...Water or steam added | 223 | ..Acyclic carbon-to-carbon unsaturation in the acid moiety |
| 202 | ...The treating agent is a metal oxide or hydroxide (e.g., lye, lime, caustic alkali, etc.) | 224 | ...Plural carbon-to-carbon unsaturation in the acid moiety (e.g., polyunsaturated fatty acids, etc.) |
| 203 |Centrifugal separation | 225 | ..Halogen in the acid moiety |
| 204 | ...Carboxylic acid, anhydride, or acid halide treating agent | 226 | ...Plural halogens in the acid moiety |
| 205 | ...Gas or vapor treating agent (e.g., steam, carbon dioxide, hydrocarbon vapors, etc.) | 227 | ..Plural oxy groups in the alcohol moiety (e.g., triglycerides, ethylene glycol monostearate, 2-methoxy ethyl laurate, etc.) |
| 206 | ...Organic solvent utilized | 228 | ...Ring in the alcohol moiety |
| 207 | ...Water utilized (e.g., solvent-solvent extraction, etc.) | 229 | ..Ring in the alcohol moiety |
| 208 | ...With crystallization or precipitation (e.g., separation according to degree of saturation, etc.) | 230 | ..Acyclic carbon-to-carbon unsaturation in the alcohol moiety |
| 209 |Halogen containing or hydrocarbon solvent | 231 | ..Halogen in the alcohol moiety |
| 210 |Halogen containing or hydrocarbon solvent | | |
| 211 | ...Crystallization or precipitation (e.g., separation according to degree of saturation, etc.) | | |
| 212 | ...Organic treating agent | | |
| 213 | ..Additional oxygen in the acid moiety (e.g., hydroxystearic acid, etc.) | | |
| 214 | ...Alicyclic ring in the acid moiety (e.g., prostaglandin analog, etc.) | | |
| 215 | ...Benzene ring in the acid moiety | | |
| 216 |Plural oxygens bonded directly to the alicyclic ring | | |

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