

CLASS 196, MINERAL OILS: APPARATUS**SECTION I - CLASS DEFINITION**

This class relates to apparatus for treating, refining, or recovering mineral oils such as petroleum, coal tar, pitch, asphalt or related products, not elsewhere classified. Included specifically in this class are apparatus for dewaxing, solvent extraction or refining of such mineral oils as well as stills designed for mineral oil distillation and condensers peculiarly adapted and limited to the mineral oil art.

SECTION II - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

- 15, Brushing, Scrubbing, and General Cleaning, subclasses 104.011+, 104.02 and 104.03 for implements there provided for which are used for removing carbon and which are not claimed as being permanently associated with the vaporizing apparatus but may be applied to other chambers.
- 34, Drying and Gas or Vapor Contact With Solids, subclass 72 for apparatus therein provided for combined with means to recover vapors or other substances from gases.
- 48, Gas: Heating and Illuminating, appropriate subclass for apparatus for converting mineral oil to gases (e.g., by cracking).
- 62, Refrigeration, particularly subclasses 93, 272, and 900 for processes and apparatus for separating vapors from gases by refrigeration.
- 96, Gas Separation: Apparatus, for apparatus for gas separation, in general, even though disclosed or claimed for separating mineral oil vapors from hydrocarbon gases or combined with broadly recited means for recovering the mineral oil after separation.
- 100, Presses, appropriate subclasses for presses not elsewhere provided for and particularly subclass 104 for presses with drain means for expressed liquid.
- 110, Furnaces, for miscellaneous furnace structure.
- 122, Liquid Heaters and Vaporizers, appropriate subclass for liquid heaters and vaporizers of general application.
- 137, Fluid Handling, for fluid feeding and handling not elsewhere provided for, particularly subclass 386 for liquid level responsive flow control.

- 159, Concentrating Evaporators, for pertinent subclass(es) as determined by schedule review.
- 165, Heat Exchange, appropriate subclasses for a heat exchanger not limited to the mineral oil art.
- 166, Wells, appropriate subclass for apparatus for treating oil or oil bearing mineral while in the ground.
- 201, Distillation: Processes, Thermolytic, appropriate subclasses for a process of producing coke from solid carbonaceous material and a mineral oil distillate.
- 202, Distillation: Apparatus, appropriate subclass for apparatus involving distillation of general utility or which may be used to treat mineral oils among other materials. Also apparatus for distilling solid carbonaceous materials is found in Class 202.
- 203, Distillation: Processes, Separatory, appropriate subclass, for a process involving distillation of general utility or which may treat mineral oils among other materials.
- 204, Chemistry: Electrical and Wave Energy, appropriate subclass for apparatus for treating mineral oils involving more than the mere thermal effects of the electrical or wave energy.
- 208, Mineral Oils: Processes and Products, for processes of treating, refining or recovering mineral oils and for mineral oil products.
- 210, Liquid Purification or Separation, for processes and apparatus for separating liquids including mineral oils involving no chemical treatment of the mineral oil.
- 219, Electric Heating, for electric heaters which may be used for heating oil.
- 236, Automatic Temperature and Humidity Regulation, appropriate subclasses, for means for automatically maintaining desired temperatures or humidity.
- 366, Agitating, for means to cause fluid materials to be commingled.
- 261, Gas and Liquid Contact Apparatus, appropriate subclasses for gas-liquid scrubbing devices.
- 299, Mining or In Situ Disintegration of Hard Material, for a process or apparatus for treating oil or oil bearing minerals while in situ in a tunnel or excavation.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 256 and 261 for extracting apparatus; and subclasses 171, 177, 191, and 211 for catalytic apparatus.
- 431, Combustion, appropriate subclass for residual combustion apparatus.

- 435, Chemistry: Molecular Biology and Microbiology, appropriate subclass for apparatus specialized for use in making, separating, or purifying mineral oils or hydrocarbons by operations that include fermentations.
- 494, Imperforate Bowl: Centrifugal Separators, appropriate subclasses, for apparatus for breaking up a mixture of fluids or fluent substances into two or more components by centrifuging within a generally solid-walled, receptacle-like member.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 135+ for processes of or compositions for or subcombination compositions for the breaking of or inhibiting of emulsion colloid systems, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art, including breaking petroleum emulsion when there is no additional treatment of the petroleum.
- 585, Chemistry of Hydrocarbon Compounds, appropriate subclasses for processes of preparing, recovering or purifying hydrocarbons of known composition.

SUBCLASSES

14.5 DEWAXING:

This subclass is indented under the class definition. Apparatus for separating wax from a petroleum oil to either recover the wax or purify the oil.

- (1) Note. Most of the patents in this subclass include apparatus for solvent treating the oil combined with some additional step such as chilling, or apparatus for sweating the oil out of the wax.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 14.52, for apparatus for separating mineral oils by solvent extraction. Apparatus for separation of wax from mineral oil by solvent extraction is in this subclass (14.5).
- 46, for apparatus for separating impurities or nonmineral materials from mineral oils.

SEE OR SEARCH CLASS:

- 62, Refrigeration, appropriate subclass, for refrigeration processes and apparatus even though employed for separating wax from mineral oil.
- 100, Presses, appropriate subclasses, for presses not elsewhere provided for. Note particularly subclass 104 for presses having a drain duct or channel for liquid expressed from the material pressed.
- 208, Mineral Oils: Processes and Products, subclass 24 for processes of separating paraffin waxes from mineral oils.
- 210, Liquid Purification or Separation, appropriate subclasses, especially subclasses 175 and 774 for separating processes and apparatus involving the use of heaters or coolers.
- 494, Imperforate Bowl: Centrifugal Separators, appropriate subclasses for a separator of that class, as explained is the search note to that class appearing in the definition of this class (196).

14.52 SOLVENT EXTRACTION:

This subclass is indented under the class definition. Apparatus especially adapted for the solvent extraction of mineral oils.

- (1) Note. The apparatus classified herein is adapted to the separation of mineral oils of natural origin into its component fractions as well as the separation of undesirable nonmineral oil components from mineral oils by use of solvents.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 14.52, for apparatus for dewaxing mineral oils which may be by solvent extraction.
- 46, for apparatus for refining mineral oils by reacting with chemicals to separate nonmineral oil components therefrom.

SEE OR SEARCH CLASS:

- 208, Mineral Oils: Processes and Products, subclass 311 for processes of extracting mineral oils with solvents.

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 255+ for extraction apparatus in general.

46 **REFINING:**

This subclass is indented under the class definition. Apparatus peculiarly adapted for the separation of impurities or nonmineral oil components from mineral oils.

- (1) Note. The apparatus classified herein provides for the most part for apparatus for treating mineral oils with chemicals to separate or remove nonmineral oil components therefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 14.5, for apparatus used to dewax mineral oils.
14.52, for apparatus specially adapted to extract mineral oils with solvents.

SEE OR SEARCH CLASS:

- 62, Refrigeration, appropriate subclass, for apparatus for refining by refrigeration alone.
96, Gas Separation: Apparatus, for apparatus for gas separation.
201, Distillation: Processes, Thermolytic, appropriate subclass, for a thermolytic distillation process including recovery of oil.
202, Distillation: Apparatus, for apparatus for separating components of a nonmineral oil mixture by distillation.
203, Distillation: Processes, Separatory, appropriate subclass, for a process of separating components of a nonmineral oil mixture by distillation.
208, Mineral Oils: Processes and Products, subclass 177 for processes of refining mineral oils.
210, Liquid Purification or Separation, appropriate subclass for processes and apparatus for purifying nonmineral oil liquids and for filters and decanting devices.
261, Gas and Liquid Contact Apparatus, appropriate subclass, for gas-liquid scrubbing devices.

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclass 252 for chemical apparatus in general.

494, Imperforate Bowl: Centrifugal Separators, appropriate subclasses, for a separator of that class, as explained in the search note to that class appearing in the definition of this class (196).

46.1 **With filtration:**

This subclass is indented under subclass 46. Apparatus which also includes filtering means.

SEE OR SEARCH CLASS:

- 210, Liquid Purification or Separation, for filters and for processes of filtering mineral oil, per se.

98 **COMBINED VAPORIZING AND CONDENSING:**

This subclass is indented under the class definition. Apparatus comprising the combination of a vaporizer and a condenser where that apparatus is peculiar to the art of mineral-oil distillation.

SEE OR SEARCH CLASS:

- 202, Distillation: Apparatus, for similar apparatus for distilling other materials.
208, Mineral Oils: Processes and Products, subclasses 92, 100 and 347 for mineral oil distillation processes.

99 **Condensate returned to vaporizer:**

This subclass is indented under subclass 98. The combination of a vaporizer with a condenser, usually a dephlegmator or fractionating column, provided with means for returning part or all of the condensate from the condenser to the vaporizer.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 139, for dephlegmator or fractionating columns alone.

SEE OR SEARCH CLASS:

- 201, Distillation: Processes, Thermolytic subclass 29, for a thermolytic distillation process including the step of returning a volatile to the carbonization zone.

- 202, Distillation: Apparatus, subclass 152, for separatory distillation apparatus including the combination of a vaporizer, a condenser and means for returning at least a part of the condensate from the condenser to the vaporizer.
- 203, Distillation: Processes, Separatory, subclasses 75, 78, 82, 84, 93, 97, and 98, for a separatory distillation process including the step of returning a condensate to a distillation zone.
- 100 Columns:**
This subclass is indented under subclass 99. Fractionating columns provided with heating means for causing vaporization of the liquid-mineral-oil- feeding stock.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
139, for columns which are heated merely by hot vapors that are treated and which are generated in a separate vaporizer.
- SEE OR SEARCH CLASS:
202, Distillation: Apparatus, appropriate subclasses, particularly subclass 153, for separatory distillation apparatus including association of still and fractionating column.
260, Chemistry of Carbon Compounds, appropriate subclasses.
- 102 Condenser or collector in vaporizer:**
This subclass is indented under subclass 98. Vaporizing apparatus containing some means for causing condensation within the vaporizer or for collecting condensate formed within the condenser.
- 103 Heads:**
This subclass is indented under subclass 98. Vaporizing apparatus having heads or domes that are provided with means for condensing, filtering, or otherwise treating vapors from the vaporizer.
- SEE OR SEARCH CLASS:
122, Liquid Heaters and Vaporizers, subclass 508.
159, Concentrating Evaporators, subclass 31.
- 165, Heat Exchange, appropriate subclasses for a heat exchanger not limited to the mineral oil art.
- 104 VAPORIZING:**
This subclass is indented under the class definition. Vaporizing apparatus peculiarly designed for use in the distillation of mineral oils.
- SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, for pertinent subclass(es) as determined by schedule review.
122, Liquid Heaters and Vaporizers, for pertinent subclass(es) as determined by schedule review.
159, Concentrating Evaporators, 165, Heat Exchange, appropriate subclasses, for a heat exchanger of general application.
202, Distillation: Apparatus, subclass 152 and 232, for distillation apparatus in which the distilland is vaporized.
203, Distillation: Processes, Separatory, appropriate subclasses for a process of vaporizing a liquid.
- 105 Systems:**
This subclass is indented under subclass 104. A plurality of interconnected mineral-oil vaporizers.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
111, for vaporizers provided with baffles.
- 106 Series stills:**
This subclass is indented under subclass 105. A plurality of mineral-oil vaporizers connected in series, so that the oil being distilled passes from one vaporizer to the next.
- SEE OR SEARCH CLASS:
159, Concentrating Evaporators, subclass 17.1.
202, Distillation: Apparatus, subclass 173, for a separatory distillation system having a plurality of stills in series.
203, Distillation: Processes, Separatory, subclass 71, for a separatory distillation process including a series of distillation steps.

- 208, Mineral Oils: Processes and Products, subclass 49 and subclass 350 for processes including plural serial stages of mineral oil conversions or distillations, respectively.
- 107 Tube and drum:**
This subclass is indented under subclass 104. Vaporizing compressing heating tubes or coils for heating the mineral-oil and a drum or expansion chamber connected to the tube or drum. An expansion valve may or may not be placed between the tube and drum, and the drum may or may not be heated.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
110, for tubular vaporizers.
- SEE OR SEARCH CLASS:
122, Liquid Heaters and Vaporizers, subclasses 40 and 235.11+.
159, Concentrating Evaporators, subclasses 2.1 through 2.3 .
208, Minerals Oils: Processes and Products, subclass 131 for processes of cracking mineral oils employing this type of apparatus.
- 108 Cyclic circulation:**
This subclass is indented under subclass 107. Vaporizers, having a means for returning the oil from the drum back to the tube for retreatment.
- 109 Drum above tube:**
This subclass is indented under subclass 108. Vaporizers, wherein a part at least of the drum is placed vertically above a part of the tube.
- 110 Tubular:**
This subclass is indented under subclass 104. Vaporizers, for mineral-oil distillation that are tubular and usually of comparatively small cross section.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
107, for tube and drum type of vaporizer.
- 111 With partitions:**
This subclass is indented under subclass 104. Vaporizers having therein one or more partitions or baffles either placed in the vapor space
- to separate it into a plurality of chambers or placed in the liquid space to cause the liquid oil to follow a tortuous path through the vaporizer.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
128, for vaporizers having baffles to cause the oil to flow in films.
- 112 Rotary:**
This subclass is indented under subclass 104. Vaporizers mounted so as to permit their rotation.
- SEE OR SEARCH CLASS:
122, Liquid Heaters and Vaporizers, subclasses 11 and 12.
159, Concentrating Evaporators, subclass 6.1.
202, Distillation: Apparatus, subclass 238, for separatory distillation apparatus in which the still is mounted upon an axis and rotated or tilted during distillation.
- 114 Vacuum:**
This subclass is indented under subclass 104. Vaporizers adapted for the distillation of mineral-oils under reduced pressure.
- SEE OR SEARCH CLASS:
159, Concentrating Evaporators, subclass 17.1.
208, Mineral Oils: Processes and Products, subclasses 357 and 366 for processes of distilling mineral oil under reduced pressure.
- 115 Special shapes:**
This subclass is indented under subclass 104. Vaporizers having peculiar or nonconventional shapes.
- 116 Furnaces and flues:**
This subclass is indented under subclass 104. The combination of a furnace with a mineral-oil vaporizer where the combination is designed to solve a problem peculiar to the art of mineral-oil distillation.
- SEE OR SEARCH CLASS:
110, Furnaces, for miscellaneous furnace structure alone.

- 122, Liquid Heaters and Vaporizers, for the combination of furnace with a closed liquid heater and vaporizer of general application.
- 126, Stoves and Furnaces, subclasses 344 through 363.1 for a liquid heater that may include a kettle, a steam generator, stove pipe for use with a stove, a domestic water heater or boiler (e.g., kitchen boiler, range boiler, etc.) for use with a stove or furnace.
- 264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclass 30 for furnace lining formation or repair and see the notes thereto.
- 117 Internal flues:**
This subclass is indented under subclass 116. The combination of furnace with mineral-oil vaporizer having flues for combustion gases passing through the vaporizer.
- SEE OR SEARCH CLASS:
122, Liquid Heaters and Vaporizers, subclasses 44.1 and 135.1.
159, Concentrating Evaporators, subclasses 28.1+ and 40.
- 118 Liquid baths:**
This subclass is indented under subclass 104. Mineral-oil vaporizers having therein baths that are liquid, but substantially nonvolatile at the vaporizing temperature employed. Such material may be metal, fusible salts, or heavy hydrocarbons.
- SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclass 92.
- 119 Jackets:**
This subclass is indented under subclass 104. Mineral-oil vaporizers that are provided with jackets around at least part of their periphery. These jackets may be for the purpose of heating, cooling, or heat insulating the vaporizer.
- 120 Special means for heating:**
This subclass is indented under subclass 104. Mineral-oil vaporizers provided with heating means other than furnaces, liquid baths, jackets, or other conventional heating means.
- SEE OR SEARCH CLASS:
165, Heat Exchange, appropriate subclasses for a heat exchanger, per se.
- 121 Electric:**
This subclass is indented under subclass 120. Mineral-oil vaporizers heated in part at least by electric heaters.
- SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclasses 65 and 103.
392, Electric Resistance Heating Devices, subclasses 386+ for electrically heated vaporizer structure.
- 122 Carbon removers:**
This subclass is indented under subclass 104. Mineral-oil vaporizers provided with means for removing carbon from the oil or from the vaporizer.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
124, for vaporizers with mechanical agitators or circulators.
- SEE OR SEARCH CLASS:
15, Brushing, Scrubbing, and General Cleaning, subclasses 104.011+, 104.02 and 104.03, or Class 414, Material or Article Handling, subclass 291, and other appropriate subclasses, for carbon removing devices which are not claimed as being permanently associated with the vaporizing apparatus but may be applied to other chambers.
122, Liquid Heaters and Vaporizers, subclass 379.
201, Distillation: Processes, Thermolytic, subclass 2, for a thermolytic distillation process including the step of removing adhering carbon from the apparatus.
202, Distillation: Apparatus, subclass 241, for distilling apparatus including means for cleaning and decarbonizing or preventing the fouling of the retort or still or the tubes of the heating system therefore.
208, Mineral Oils: Processes and Products, subclass 48.

123 Circulators or agitators:

This subclass is indented under subclass 104. Mineral-oil vaporizers provided with means for causing or directing the circulation or agitation of the oil.

SEE OR SEARCH CLASS:

- 122, Liquid Heaters and Vaporizers, subclasses 379 and 406.1.
- 165, Heat Exchange, subclass 108 for a heat exchanger with means directing recirculation, and subclass 109.1 for a heat exchanger with an agitator.
- 208, Mineral Oils: Processes and Products, subclass 367 for distillation processes with agitation.
- 366, Agitating, appropriate subclasses.

124 Mechanical:

This subclass is indented under subclass 123. Mineral-oil vaporizers provided with moving or rotating mechanical means for causing or directing the circulation or agitation of the oil.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 122, for means for removing carbon combined with vaporizer.

125 Baffles:

This subclass is indented under subclass 123. Mineral-oil vaporizer provided with baffles to cause the oil to cyclically circulate in a definite path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 111, for baffles or partitions to cause the oil to pass through the vaporizer in a tortuous path.

126 Fluid injectors:

This subclass is indented under subclass 123. Mineral-oil vaporizers provided with means for injecting a gas, vapor, or liquid to cause circulation or agitation of the oil in a definite predetermined manner.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 127, for fluid injectors not designed or placed primarily to cause a definite path of circulation or agitation.

127 Fluid injectors:

This subclass is indented under subclass 104. Mineral-oil vaporizers provided with means for injecting gas, vapor, or liquid into the oil being distilled.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 126, for fluid injectors which cause a definite circulation or agitation of the oil.

SEE OR SEARCH CLASS:

- 122, Liquid Heaters and Vaporizers, subclasses 5.51+.
- 159, Concentrating Evaporators, subclass 16.1.
- 208, Mineral Oils: Processes and Products, subclasses 125, 128, 356 and 362 for processes for mineral oil treatment involving injecting a gas, vapor or liquid.
- 261, Gas and Liquid Contact Apparatus, appropriate subclass.

128 Films or sprays:

This subclass is indented under subclass 104. Mineral-oil vaporizers having means for causing the oil being distilled to assume the form of a film or spray.

SEE OR SEARCH CLASS:

- 122, Liquid Heaters and Vaporizers, subclass 39, and subclass 501.
- 159, Concentrating Evaporators, subclasses 3 and 5.
- 239, Fluid Sprinkling, Spraying, and Diffusing, appropriate subclasses for nozzle devices, per se, especially subclass 193 for weir type discharge means discharging a film or curtain or fluid.

129 Depending legs or spur tubes:

This subclass is indented under subclass 104. Mineral-oil vaporizers having tubes or legs projecting from the main body of the vaporizer down into the furnace, the ends of the tubes so projecting being closed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 107, for heating tubes one end of which is connected with a vaporizer and the other end of which is connected either

- with a source of supply of oil or with the vaporizer.
- 110, for vaporizers consisting entirely of tubular elements.
- 130 Bottoms:**
This subclass is indented under subclass 129. Mineral-oil vaporizers that have bottoms of peculiar shape, construction, or position.
- 131 Unheated:**
This subclass is indented under subclass 129. Mineral-oil vaporizers whose bottoms are not subjected to the direct heating action of the furnace or other heating means, usually for the purpose of avoiding the caking of precipitated carbon.
- 132 Automatic control:**
This subclass is indented under subclass 104. Mineral-oil vaporizers provided with means for automatically maintaining desired conditions, usually the temperature, constant within the vaporizer.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
141, for condensing apparatus with similar automatic means.
- SEE OR SEARCH CLASS:
122, Liquid Heaters and Vaporizers, subclasses 448.1 and 449.
165, Heat Exchange, subclasses 200+ for automatic control of a heat exchanger of general utility.
201, Distillation: Processes, Thermolytic, subclass 1 for a thermolytic distillation process combined with the positive step of determining some characteristic of the distilland, vapor, residue or condensate.
202, Distillation: Apparatus, subclass 160 for a column having automatic temperature and/or pressure control.
203, Distillation: Processes, Separatory, subclass 1, for a separatory distillation process including determining a characteristic or condition in the system.
236, Automatic Temperature and Humidity Regulation, appropriate subclasses.
- 133 Special features of construction:**
This subclass is indented under subclass 104. Mineral-oil vaporizers having some special feature of construction not otherwise provided for.
- SEE OR SEARCH CLASS:
52, Static Structures (e.g., Buildings), subclass 192 for an in situ constructed type container or hopper, per se, having a material port.
- 134 Heat recovery from vapor or residuum:**
This subclass is indented under subclass 104. Mineral-oil vaporizers having means for preheating the incoming oil by the heat of the vapors or the unvaporized residue of distillation.
- SEE OR SEARCH CLASS:
159, Concentrating Evaporators, subclasses 24.1 and 46.
165, Heat Exchange, subclass 66 for apparatus for exchanging heat between the supply and exhaust lines of a heated or cooled vessel.
201, Distillation: Processes, Thermolytic, subclass 14 for heating the carbonaceous material by indirect heat exchange with a conversion product of the carbonization step.
202, Distillation: Apparatus, subclasses 150, 159 and 177, for distillation apparatus combined with a preheater.
203, Distillation: Processes, Separatory, in which the feed is indirectly heated by recovered heat.
- 135 Feeders:**
This subclass is indented under subclass 104. Special means for feeding the oil to the vaporizer.
- SEE OR SEARCH CLASS:
137, Fluid Handling, for fluid feeding and handling not otherwise provided for, particularly subclass 386 for liquid level responsive flow control.
159, Concentrating Evaporators, subclass 43.1.

136 Vapor outlets:

This subclass is indented under subclass 104. Special constructions for vapor outlets.

137 Attachments:

This subclass is indented under subclass 104. Miscellaneous attachments for mineral-oil vaporizers.

138 CONDENSING:

This subclass is indented under the class definition. Apparatus for condensing mineral-oil vapors which by construction and operation is peculiar to this art.

SEE OR SEARCH CLASS:

- 165, Heat Exchange, appropriate subclasses, for a heat exchanger not specialized to condensing mineral-oil vapor.
- 202, Distillation: Apparatus, appropriate subclasses, for distillation apparatus particularly subclass 185.1.
- 208, Mineral Oils: Processes and Products, subclass 347 for distillation of mineral oils.

139 Dephlegmators or fractionating columns:

This subclass is indented under subclass 138. Condensing apparatus, peculiar to this art, generally known in the art as dephlegmators or fractionating columns, where the condensate formed in cooler zone is reheated and partially revaporized by vapors in a hotter zone.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 100, for similar devices combined with combined condensing and vaporizing apparatus.

SEE OR SEARCH CLASS:

- 201, Distillation: Processes, Thermolytic, appropriate subclasses, particularly subclass 30, for a process of fractionally condensing removed vapor.
- 202, Distillation: Apparatus, subclasses 153 and 158, for distillation apparatus including a fractionating column, and subclasses 179 and 198 for distillation apparatus including a dephlegmator.

- 203, Distillation: Processes, Separatory, subclasses 22 and 87, for a distillation process in which the distillation process in which the vapor is in indirect heat exchange with the feed or the vapor is fractionally condensed.

- 260, Chemistry of Carbon Compounds, appropriate subclasses.

- 261, Gas and Liquid Contact Apparatus, appropriate subclasses.

140 Contact with cooling fluid:

This subclass is indented under subclass 138. Condensing apparatus peculiar to this art where the vapors are brought in direct contact with a cooling liquid, usually water.

SEE OR SEARCH CLASS:

- 261, Gas and Liquid Contact Apparatus, appropriate subclasses.

141 Automatically controlled temperature:

This subclass is indented under subclass 138. Apparatus for condensing mineral-oil vapors provided with means for automatically controlling the temperature of condensation.

SEE OR SEARCH CLASS:

- 165, Heat Exchange, subclasses 281+; and subclasses 287+ for heat exchange means with automatic temperature or pressure control.
- 236, Automatic Temperature and Humidity Regulation, appropriate subclasses.

155 MISCELLANEOUS:

This subclass is indented under the class definition. Apparatus not provided for specifically above.

- (1) Note. Many of the patents classified in this subclass are for apparatus for recovering mineral oils from natural or converted gases.

SEE OR SEARCH CLASS:

- 62, Refrigeration, appropriate subclasses, for processes and apparatus for separating vapors from gases by refrigeration (e.g., liquefaction, gas compression).
- 96, Gas Separation: Apparatus, for apparatus for gas separation where the recovery of the mineral oil after separa-

ration is not included or is recited only broadly.

- 208, Mineral Oils: Processes and Products, subclass 340 for processes of separating mineral oils from natural or converted gases including specific recovery of the mineral oil vapor.

END