

CLASS 202, DISTILLATION: APPARATUS**SECTION I - CLASS DEFINITION****GENERAL STATEMENT OF CLASS SUBJECT MATTER**

This class includes all apparatus except as noted herein below for distillation of either solids or liquids, and associations of distillation apparatus and other apparatus adapted to prepare material for distillation. For the purposes of this classification distillation is defined as the volatilization of a substance for the purpose of recovering material from the vapor produced by condensation or absorption. The product obtained by condensation must be a liquid. Generally the volatile material separated existed as a definite chemical entity in the substance, but in the case of thermolytic distillation it may be formed from other compounds during and by the heating. The absence from the claims of means for performing condensation or absorption in an apparatus patent does not exclude it from this class if it is disclosed, evident or well known that the apparatus is designed to be used in connection with such a step.

When all claims are generic and the disclosure indicates that the apparatus is of wide utility, the patent is classified here (class 202) and cross-referenced to the classes disclosed. When the patent includes generic claims and the disclosure is limited to a class other than Class 202, the patent is classified in the class disclosed. When a patent contains generic distillation apparatus claims and species claims including a Class 202 species, see Lines With Other Classes, below.

For classification purposes in this class three forms of distillation are recognized, defined as follows:

Autothermic distillation, in which the distilland, either by combustion of a portion of itself or by other chemical change, furnishes at least part of the heat for thermolysis and volatilization of either the inherent or thermolized volatile matter.

Separatory distillation, in which the substances separated pre-exist in the material subjected to distillation, called herein the distilland, and are recovered usually without chemical change of composition.

Thermolytic distillation, in which a compound or compounds found in the distilland undergo chemical decomposition, thermolysis, and form different chemical compounds, at least some of which are volatile at the temperature employed, and can be recovered by conden-

sation or absorption. In this are included coal, oil shale, peat, and wood distillation when the latter produces charcoal.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS**(A) DISTILLATION PROCESSES**

Patents claiming a distillation process and claiming distillation apparatus of general utility within the purview of Class 202 are classified in the appropriate distillation process class and cross-referenced to this Class (202). See References to Other Classes, below, for processes including a distillation operation.

(B) DISTILLATION APPARATUS

Patents claiming distillation apparatus of general utility are classified here unless otherwise provided for.

(1) Class 34, Drying and Gas Vapor Contact With Solids, is distinguished from Class 202 in that in Class 34 the combination of means for removing an extraneous liquid from a solid and means for condensing vapor produced must leave the solid chemically unchanged. In Class 202 apparatus is utilized to chemically alter the solid being treated.

(2) Class 48, Gas: Heating and Illuminating, takes apparatus for making heating and illuminating gases. The line between the apparatus in this class (202) for thermolytic distillation and the apparatus in Class 48 is that the apparatus in Class 48 has no solid carbonaceous material left in the material acted upon.

(3) Class 62, Refrigeration, takes apparatus for vaporizing a liquid mixture having a boiling point at atmospheric pressure below 0°C. (32°F.) and condensing the vapor except as otherwise provided in the Class Definition of Class 62. When a patent contains claims to Class 62 apparatus and Class 202 apparatus, the patent is classified in Class 62 and cross-referenced to Class 202.

(4) Class 134, Cleaning and Liquid Contact With Solids, takes processes and apparatus for contacting solids with liquids for cleaning or any purpose not provided for in other classes. The combination of means for contacting a solid with a liquid and means for distilling the liquid is in Class 134. The subcombination of distilling apparatus of general utility is classified here (202).

(5) Class 435, Chemistry: Molecular Biology and

Microbiology, takes processes for fermentation including a distillation operation and apparatus that is peculiar to, or specialized and designed for use in, processes classified in Class 435.

(6) Class 196, Mineral Oils: Apparatus, takes all patents drawn to apparatus for distilling mineral oil. When a patent contains claims to apparatus for distilling mineral oil and claims to apparatus for distilling within the purview of Class 202, the patent is classified in Class 202 and cross-referenced to Class 196.

(7) Class 266, Metallurgical Apparatus, takes apparatus for heating metalliferous material combined with means for condensing the vapor. The line between Class 202 and Class 266 is that Class 266 takes apparatus for distilling metals, such as mercury and zinc, from their ores.

(8) Class 588, Hazardous or Toxic Waste Destruction or Containment, a process class, subclass 900 for a cross-reference art collection of apparatus used in the destruction of hazardous or toxic waste.

C. EVAPORATING APPARATUS

Apparatus designed to heat material to remove vapor therefrom without condensing at least a portion of the vapor is excluded from Class 202. Some classes which provide for apparatus including means for concentrating or evaporating without necessarily including condensing means are listed in References to Other Classes, below.

SECTION III - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

- 23, Chemistry: Physical Processes, for processes including a distillation operation.
- 34, Drying and Gas or Vapor Contact With Solids, subclasses 73+, for apparatus for separating liquids from solids combined with means to condense vapors, subclasses 108+, for apparatus including a hollow drum rotating about an axis and subclasses 201+, for apparatus including a kiln; also see appropriate subclasses for processes including a distillation operation.
- 34, Drying and Gas or Vapor Contact With Solids, for apparatus including means for concentrating or evaporating without necessarily including condensing means
- 44, Fuel and Related Compositions, subclasses 629+ for an apparatus for making or treating a fuel composition.

- 48, Gas: Heating and Illuminating, subclasses 61+, for gas generators and subclasses 119+, for retorts for gasifying materials by heat.
- 48, Gas: Heating and Illuminating, for apparatus including means for concentrating or evaporating without necessarily including condensing means
- 62, Refrigeration, appropriate subclasses, for processes and apparatus peculiar to removing heat from a substance.
- 75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, appropriate subclasses, for a process of reducing an ore to the metallic state or refining molten metal involving distillation or for a sublimation process.
- 96, Gas Separation: Apparatus, for apparatus for gas separation. See particularly subclasses 155+ for degasifying means for liquid.
- 99, Foods and Beverages: Apparatus, subclasses 275+, for apparatus for preparing beverages.
- 99, Foods and Beverages: Apparatus, for apparatus including means for concentrating or evaporating without necessarily including condensing means
- 106, Compositions: Coating or Plastic, appropriate subclasses, for a coating composition which may be applied to surfaces of the distillation apparatus or utilized for making apparatus of a particular composition.
- 110, Furnaces, subclass 235, for a device for burning garbage or sewage, subclass 229, for a furnace having a special repository for fuel for eliminating the combustible gases and burning them before the coked fuel is fed to the fire and subclasses 101+, for a device for feeding fuel to a furnace. Under Class 110, Class Definition, Search Class, see Class 122, Liquid Heaters and Vaporizers, and for lines among these classes.
- 122, Liquid Heaters and Vaporizers, for apparatus and methods for heating liquids, generating vapors from liquids, treating the vapors generated and conserving the heat remaining in the liquid or vapor after part of the heat has been used. See particularly subclass 66, for devices containing a water cooled coking chamber for fuel.
- 127, Sugar, Starch, and Carbohydrates, subclasses 3+, for apparatus for extracting carbohydrates from solid material and subclass 16, for apparatus for evaporation to crystallization of sugar solutions.

- 127, Sugar, Starch, and Carbohydrates, for apparatus including means for concentrating or evaporating without necessarily including condensing means
- 134, Cleaning and Liquid Contact With Solids, appropriate subclasses for processes including a distillation operation.
- 134, Cleaning and Liquid Contact With Solids, for apparatus including means for concentrating or evaporating without necessarily including condensing means
- 159, Concentrating Evaporators, for apparatus and processes not more specifically provided for elsewhere, peculiar to the concentration of solids held in solution or suspension by evaporation of the liquid containing them. See particularly subclass 2.1, for a flash evaporator, subclasses 3+, for a spray evaporator and subclasses 5+, for a film type evaporator.
- 159, Concentrating Evaporators, for apparatus including means for concentrating or evaporating without necessarily including condensing means
- 165, Heat Exchange, appropriate subclasses for heat exchange devices, including surface condensers, per se.
- 201, Distillation: Processes. Thermolytic, appropriate subclasses for processes including a distillation operation.
- 203, Distillation: Processes, Separatory, appropriate subclasses for processes including a distillation operation.
- 208, Mineral Oils: Processes and Products, appropriate subclasses for processes including a distillation operation.
- 210, Liquid Purification or Separation, appropriate subclasses, for apparatus for purifying or separating any liquid by (1) filtration (2) sorption or ionic exchange, (3) liquid-liquid extraction, (4) destruction or conversion of a constituent thereof.
- 261, Gas and Liquid Contact Apparatus, appropriate subclasses, for apparatus adapted to produce an intimate contact between gases and liquids and see (2) Note under the class definition.
- 266, Metallurgical Apparatus, appropriate subclasses, for furnaces limited to the treatment of metals or metalliferous materials, particularly subclasses 148+, for apparatus for vaporizing metals and collecting the vapor.
- 366, Agitating, subclasses 219+ for apparatus for agitating a liquid or a particulate material by motion of the container, and subclasses 241+ for a fixed container with movable stirring apparatus, particularly subclasses 262+ for pump type stirrers.
- 406, Conveyors: Fluid Current, appropriate subclasses for conveying solid material in a current of air or other gas.
- 414, Material or Article Handling, subclasses 147+ for a chamber of a type utilized for a heating function and means for moving material to, into, within, out of, or from the chamber; also subclasses 586+ for a subcombination of subclasses 147+ subject matter.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclass 305 for apparatus for generating fumes.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, for concentrating or evaporating without necessarily including condensing means
- 426, Food or Edible Material: Processes, Compositions, and Products, subclasses 11+, for processes of preparing alcoholic beverages including distillation.
- 435, Chemistry: Molecular Biology and Microbiology, appropriate subclasses for processes including a distillation operation.

SECTION IV - GLOSSARY

CHAR

The generic term applied to the carbonaceous residue from a thermolytic distillation of any carbonaceous material. It encompasses such terms as bone black, charcoal and coke.

COKE

Strictly this is the amorphous, solid residue of coal after the volatile material has been distilled off in a thermolytic distillation. The term is also applied in the art to the solid, carbonaceous residue from the thermolytic distillation of such materials as oil shale, petroleum and pitch.

CONDENSATE

See distillate in the Class Definition.

DESTRUCTIVE DISTILLATION

See thermolytic distillation.

DISTILLAND

The material which is undergoing a distillation operation.

DISTILLATE

The liquid product condensed from vapor during the distillation operation.

EXTRACTIVE DISTILLATION

A separatory distillation in which a generally less volatile substance, often referred to as a solvent, is added to the distillation column to preferentially remove some components of the vapor by dissolving it. The added substance and the dissolved component are removed below the point at which the less volatile substance is added to the distillation column.

FRACTIONAL DISTILLATION

A separatory distillation operation in which distillate is collected over specific temperature intervals.

SUBLIMATION

A process in which a solid passes into the vapor state without liquefaction and the vapor returns to the solid state without passing through the liquid phase.

EVAPORATION

The process of changing a solid or liquid into a vapor. This is the generic term for both sublimation and vaporization. It differs from "distillation" in that distillation includes the additional step of condensing vapor produced to a liquid.

VAPORIZATION

The process of changing a liquid into a vapor. See "Evaporation".

SUBCLASSES**81 APPARATUS:**

This subclass is indented under the class definition. Apparatus and devices relating to the art of distillation not provided for in the subclasses below.

(1) Note. For heating see Search Notes below.

SEE OR SEARCH CLASS:

- 62, Refrigeration, appropriate subclasses, for processes and apparatus involving compressing, cooling and expanding a fluid.
- 110, Furnaces, for furnaces.
- 122, Liquid Heaters and Vaporizers, for boilers.
- 126, Stoves and Furnaces, for heating.
- 137, Fluid Handling, for fluid handling apparatus.
- 159, Concentrating Evaporators, for evaporators.
- 201, Distillation: Processes, Thermolytic, appropriate subclass, for a process of thermolytically carbonizing a solid carbonaceous material.
- 203, Distillation: Processes, Separatory, appropriate subclass, for a process of separatory distillation.
- 219, Electric Heating, for heating.
- 432, Heating, for heating.

82 Systems:

This subclass is indented under subclass 81. Combinations and associations of apparatus not provided for in the subclasses indented hereunder.

83 Portably mounted:

This subclass is indented under subclass 82. Groupings of distilling apparatus mounted for moving from place to place as an entirety. This also includes patents claiming movable heating elements used in connection with distilling apparatus.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 213, for a kiln structure designed to be moved from place to place.

SEE OR SEARCH CLASS:

- 110, Furnaces, subclass 241 for a portable incinerator.

84 Separatory and thermolytic:

This subclass is indented under subclass 82. Systems of apparatus including kilns, retorts, or chambers in which the distilland is subjected

- to both separatory and thermolytic distillation. The two species of distillation may occur simultaneously in separate chambers or successively in a single chamber.
- 85 Thermolytic and autothermic:**
This subclass is indented under subclass 82. Associations of kilns, retorts, and/or chambers, in which thermolytic distillation occurs, part of the necessary heat being supplied by the combustion (or chemical change) of the distilland.
- 86 Retort and kiln:**
This subclass is indented under subclass 85. Assemblies of retorts in which material is distilled by externally-applied heat, and chambers or kilns in which material is distilled by combustion or a portion thereof. The retorts may be heated by other means or by the heat carried by the distillate from the kiln.
- SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclasses 76, 77 and 78, and indented subclasses.
110, Furnaces, subclass 242, for a closed retort for incinerating garbage.
201, Distillation: Processes, Thermolytic, subclasses 15+, for a process in which at least a part of the original material is burned.
- 87 Retort heated by combustion:**
This subclass is indented under subclass 86. The retort is heated by combustion of the gases from the kiln, which latter may be a producer.
- SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclasses 76, 77 and 78, and indented subclasses.
- 88 Kiln and directly heated chamber:**
This subclass is indented under subclass 85. Assemblies of kiln and chamber. The distillation gases and/or products of combustion from the kiln pass through the chamber in direct contact with its contents.
- SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclasses 76 and 203.
- 89 Interchangeable:**
This subclass is indented under subclass 88. The kiln and chamber are identical in construction and may interchange functions.
- 90 Chamber externally heated:**
This subclass is indented under subclass 88. The chamber in which distillation is performed by the direct action of the heated gas is also heated externally, frequently by combustion of a part of the gas coming from the kiln.
- 91 Autothermic:**
This subclass is indented under subclass 81. Systems in which the kilns or chambers in which the destructive distillation occurs are heated by chemical change (as combustion) of the distilland itself.
- 92 Open kiln:**
This subclass is indented under subclass 91. The distilland is placed in a structure without a top or is piled upon the ground or upon a platform and heated by means of the combustion of a part or its substance.
- 93 Closed kiln:**
This subclass is indented under subclass 91. The kiln is closed and partial combustion of its contents furnishes the heat to distill the remainder. This is the broad subclass for the beehive ovens.
- 94 With steam generator:**
This subclass is indented under subclass 93. The kiln is closed, and a steam generator of some form is associated in the system.
- SEE OR SEARCH CLASS:
122, Liquid Heaters and Vaporizers, subclass 7.
- 95 With residue quencher or cooler:**
This subclass is indented under subclass 93. A device for cooling the residue either by a liquid or a fluid or by preservation from air is associated with the system. The residue may be cooled within the kiln or after withdrawal therefrom.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
227+, for quenching apparatus.

SEE OR SEARCH CLASS:

201, Distillation: Processes, Thermolytic, subclass 39, for a thermolytic distillation process directed to cooling the residue by quenching with an inert medium.

96 Thermolytic:

This subclass is indented under subclass 81. Thermolytic systems in which thermolytic distillation occurs, not provided for in the subclasses indented hereunder.

- (1) Note. Apparatus for treating the vapor or condensate from thermolysis, unless provided for in the subclasses indented hereunder, is found in this class, subclasses 182 and 202 and indented subclasses.

SEE OR SEARCH CLASS:

110, Furnaces, subclasses 235+, for furnaces for incinerating garbage.
 201, Distillation: Processes, Thermolytic, appropriate subclass for a process of carbonizing solid carbonaceous material.
 208, Mineral Oils: Processes and Products, subclasses 390, 391 and 400-435, for a process of recovering mineral oils from solid natural material not otherwise classified.

97 Stalls:

This subclass is indented under subclass 96. Horizontal chambers having one end closed, the other closable, and heated either directly or indirectly, into which a receptacle containing a distilland may be run and withdrawn.

98 Tunnels:

This subclass is indented under subclass 97. The stall is openable and closable at both ends and not necessarily horizontal, and the receptacles are introduced at one end and withdrawn at the other. Heated directly or indirectly.

SEE OR SEARCH CLASS:

432, Heating, subclasses 121+, for a residual material heating furnace having means by which work is progressed or moved mechanically.

99 Directly heated chamber:

This subclass is indented under subclass 96. A chamber equipped with means introducing heat into its interior in direct contact with the distilland, either by means of heated solids or heated gaseous fluids.

SEE OR SEARCH THIS CLASS, SUBCLASS:

107,

SEE OR SEARCH CLASS:

48, Gas: Heating and Illuminating, subclasses 76 and 203.
 432, Heating, subclass 41, for a residual material heating furnace in which the material is heated by contact with combustion products.

100 Rotary chamber:

This subclass is indented under subclass 99. The directly heated chamber is arranged to be rotated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

131, 136, 216, and 218, for a rotary retort.

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, subclass 108, for a rotating hollow receptacle through which the material to be treated is carried and see (8) Note thereunder for related fields of search.
 110, Furnaces, subclass 246 for a rotary drum incinerator.
 432, Heating, subclasses 105+, for a residual rotary drum tumbler type furnace in which combustion products directly contact the material being heated.

101 Dome ovens:

This subclass is indented under subclass 96. The distilling chamber has the form of the beehive oven, but is heated from the outside through walls or floor, or both.

102 Hearths:

This subclass is indented under subclass 96. The distilling chamber is heated from the bottom. Heating flues in the lower portion of the side walls if auxiliary in function do not

exclude from this subclass. The chamber may have means also for the introduction of gas or vapor to assist the distillation or react with the distilland.

SEE OR SEARCH THIS CLASS, SUBCLASS:

124+, for a chamber having flues, subclasses 138+ and 220, for a retort having flues also subclasses 121, 129, and 134, for a retort with fluid injection means.

SEE OR SEARCH CLASS:

201, Distillation: Processes, Thermolytic, subclasses 31 and 38+, for a carbonization process in which fluid is passed into the carbonizing zone.

103 Distilland transferring:

This subclass is indented under subclass 102. The hearth has means for moving the distilland over and off its surface.

SEE OR SEARCH CLASS:

432, Heating, subclasses 153+, for a residual heating apparatus in which the work is pushed across a heating surface.

104 Vertical series:

This subclass is indented under subclass 103. The hearths lie in a vertical series.

SEE OR SEARCH CLASS:

432, Heating, subclass 132, for a residual material heating apparatus in which the material is moved across vertically spaced heated shelves and drops from shelf to shelf.

105 Retort:

This subclass is indented under subclass 96. Closed vessels of metal, clay, brick, or other material designed to contain the distilland and with means for external heating.

SEE OR SEARCH CLASS:

48, Gas: Heating and Illuminating, for pertinent subclass(es) as determined by schedule review.
110, Furnaces, subclass 242 for a closed retort incinerator.

266, Metallurgical Apparatus, subclasses 148+ especially subclass 153, for externally heated ore containing vessels combined with vapor condensing structure.

432, Heating, subclasses 120+, for a residual material heating chamber having heating means.

106 With steam generation:

This subclass is indented under subclass 105. The distilling vessel is heated from the outside and has associated with it, so as to be heated by the products of the combustion which heat the retort, or by other sources of waste heat, means for generation of steam.

SEE OR SEARCH CLASS:

122, Liquid Heaters and Vaporizers, subclass 7.

107 With digester:

This subclass is indented under subclass 105. The system contains a chamber in which the distilland is treated with a liquid which frees the material to be distilled.

SEE OR SEARCH THIS CLASS, SUBCLASS:

99, and indented subclass.

108 With direct heating:

This subclass is indented under subclass 105. The retort is also heated internally by direct contact of its contents with a heating medium.

SEE OR SEARCH CLASS:

201, Distillation: Processes, Thermolytic, subclasses 10+, for a thermolytic distillation process including the step of heating the retort internally by direct contact with a heating medium and subclasses 36+ for passing an extraneous gas through the carbonizing zone.

109 With cyclic volatile circulation:

This subclass is indented under subclass 105. The volatile matter distilled off is moved in a closed circuit through the retort, with or without intermediate purification.

- SEE OR SEARCH CLASS:
201, Distillation: Processes, Thermolytic, subclasses 28+, for a process of thermolytic distillation including removing, treating and recycling a product and subclass 43, for a digest of heating by cyclically circulating a hot, extraneous, inert gas.
- 110 With distilland pressure:**
This subclass is indented under subclass 105. The retort system is provided with means for maintaining the distilland under pressure during distillation.
- SEE OR SEARCH CLASS:
201, Distillation: Processes, Thermolytic, subclass 35, for a thermolytic distillation process in which the carbonizing zone is under pneumatic pressure.
203, Distillation: Processes, Separatory, subclasses 73+ and 91+, for a separatory distillation process under pressure.
- 111 With recuperators and regenerators:**
This subclass is indented under subclass 105. The retort system has both double and single surface air and/or gas heaters heated by the heat carried off by the products of combustion. The double-surface heaters are in this class called recuperators, the single surface, regenerators.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
122, 123, 130, 132, 140, 141, and indented subclasses, 146 and 148.
- SEE OR SEARCH CLASS:
201, Distillation: Processes, Thermolytic, subclasses 15+, for a carbonizing process including burning a product of the carbonizing step and recovering heat from a product by indirect heat exchange, and subclass 37, for a process in which externally produced combustion gases are passed through the retort.
- 112 With distillate fixing chamber:**
This subclass is indented under subclass 105. The distillate is passed through tubes or chambers in which it is subjected to high temperature in order to crack the higher boiling portions thereof.
- SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclasses 93, 94, 109, 110, and 112, and indented subclasses.
- 113 Plural:**
This subclass is indented under subclass 105. A plurality of retorts are associated. The arrangement may be either series or parallel.
- SEE OR SEARCH CLASS:
110, Furnaces, subclasses 208+ and 295+, for a plurality of interconnected furnaces.
201, Distillation: Processes, Thermolytic, subclass 26, for a thermolytic distillation process of carbonizing a plurality of charges in series or parallel.
- 114 Common heating furnace:**
This subclass is indented under subclass 113. A plurality of retorts arranged to be heated by a single furnace.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
147, and indented subclasses.
- SEE OR SEARCH CLASS:
110, Furnaces, subclasses 230+ for a solid fuel furnace provided with coking means.
432, Heating, subclasses 207+, for a residual material heating apparatus including a plurality of structurally related retorts.
- 115 Annularly arranged:**
This subclass is indented under subclass 113. The retorts are arranged in a closed chain which is not necessarily circular.
- 116 Vertical and horizontal or inclined:**
The retorts are arranged in cooperating pairs of vertical and inclined or horizontal units.

117 Conveying:

This subclass is indented under subclass 105. The retort has means for moving the distilland through it. It may be fed at top or bottom or end.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

120+, for distillation apparatus so arranged that the distilland passes through it in a vertical direction and subclass 136, for a horizontal retort having a rotary motion.

SEE OR SEARCH CLASS:

110, Furnaces, subclasses 186+, 227+, 255+, and 267+ for refuse incinerators or solid fuel furnaces provided with conveying means.

198, Conveyors: Power-Driven, appropriate subclass, for conveying means.

201, Distillation: Processes, Thermolytic, subclasses 32+, for a thermolytic distillation process in which the distilland passes through the retort.

432, Heating, subclasses 121+, for a residual work heating chamber having heating means and means by which the work is progressed or moved mechanically.

118 Screw:

This subclass is indented under subclass 117. The conveying means comprises one or more screws.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclasses 476.1, 513, 548, 550.6, 550.10, 582, 608, 611, 625, and 657+, for screw conveying means.

119 Reciprocating:

This subclass is indented under subclass 117. The conveyor is reciprocating and may be a reciprocating floor or plunger.

SEE OR SEARCH CLASS:

110, Furnaces, subclasses 109 and 114.

198, Conveyors: Power-Driven, subclasses 602, 614, and 736+, for a reciprocating conveyor.

120 Vertical:

This subclass is indented under subclass 105. The retort is so arranged that the distilland passes through it in a vertical direction.

SEE OR SEARCH CLASS:

201, Distillation: Processes, Thermolytic, subclass 34, for a thermolytic distillation process of a gravitating bed type.

121 With fluid injection:

This subclass is indented under subclass 120. Means are provided for injection of fluid, including oil, into the retort before or after or during the distillation.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

108, 129, 134, and 149.

SEE OR SEARCH CLASS:

48, Gas: Heating and Illuminating, subclasses 63+, 75, 78+, 93, 94, 95, 102+, 108+, and 111+.

201, Distillation: Processes, Thermolytic, subclass 31, for a process utilizing a fluidized bed and subclasses 36+, for a thermolytic distillation process including passing an extraneous gas through the carbonizing zone.

122 With recuperator:

This subclass is indented under subclass 120. The retorts are vertical, and the air and/or gas for combustion is heated by the waste products of combustion through double surface heaters.

SEE OR SEARCH CLASS:

201, Distillation: Processes, Thermolytic, subclasses 15+, for a carbonizing process including burning a product of the carbonizing step and recovering heat from a product by indirect heat exchange and subclass 37, for a process in which externally produced combustion gases are passed through the retort.

123 With regenerator:

This subclass is indented under subclass 120. The retorts are vertical, and the air and/or gas for combustion is heated by the waste products of combustion through single surface heaters.

SEE OR SEARCH CLASS:

201, Distillation: Processes, Thermolytic, subclasses 15+, for a carbonizing process including burning a product of the carbonizing step and recovering heat from a product by indirect heat exchange and subclass 37, for a process in which externally produced combustion gases are passed through the retort.

124 With heating chamber:

This subclass is indented under subclass 120. The vertical retorts are inclosed in a chamber through which the heating gases pass. The chamber may have baffles to control the direction of flow of the gas.

125 Alternate reverse flow flues:

This subclass is indented under subclass 124. The heating chamber is divided into vertical flues, alternate ones of which carry flames and products of combustion in opposite directions.

126 Vertical flues:

This subclass is indented under subclass 124. The heating chamber is divided into flues which are in the vertical position, the flames or heating gases passing in either direction.

127 Circumvallate flues:

This subclass is indented under subclass 124. The flues carry the products of combustion or heating gases around the retort.

128 Inclined:

This subclass is indented under subclass 105. The retorts are inclined and may pass through a heating chamber, with or without flues.

SEE OR SEARCH CLASS:

110, Furnaces, subclasses 230+ for a solid fuel furnace provided with coking means.

129 With fluid injection:

This subclass is indented under subclass 128. The inclined retort has provisions for injection of fluid into the distilland.

SEE OR SEARCH THIS CLASS, SUBCLASS:

108, 121, 134, and 149.

SEE OR SEARCH CLASS:

201, Distillation: Processes, Thermolytic, subclasses 36+, for a thermolytic distillation process including passing an extraneous gas through the carbonizing zone.

130 With regenerator or recuperator:

This subclass is indented under subclass 128. The retorts are inclined and associated with single or double surface air and/or gas heaters which are heated by the waste products of combustion.

SEE OR SEARCH THIS CLASS, SUBCLASS:

111, 122, 123, 132, 140, 141, and indented subclasses 146 and 148.

SEE OR SEARCH CLASS:

201, Distillation: Processes, Thermolytic, subclasses 15+ for a carbonizing process including indirectly heating the carbonaceous material by burning a product of the carbonizing step and subclass 37 for a carbonizing process in which combustion gases are passed into the retort.

131 Rotary:

This subclass is indented under subclass 128. The retort is arranged to rotate around its longer axis, and thus carry the distilland forward. It may have spiral vanes or other means to assist the movement of the distilland.

SEE OR SEARCH THIS CLASS, SUBCLASS:

136, for a thermolytic distillation system including rotary horizontal retort, subclass 216, for a rotary directly heated chamber and subclass 218, for a rotary thermolytic retort.

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, subclasses 108+, for a receptacle rotating about an axis through which receptacle the material being treated is carried.

110, Furnaces, subclass 246 for a rotary drum incinerator for carbonizing and burning garbage.

- 201, Distillation: Processes, Thermolytic, subclasses 32+, for a thermolytic distillation process in which the distilland moves through the apparatus.
- 366, Agitating, subclasses 219+ for movably mounted mixing chamber of general utility.
- 373, Industrial Electric Heating Furnaces, subclasses 84 and 85+ for a rotating electric arc furnace and subclasses 115 and 116, for a rotating electric resistance furnace.
- 432, Heating, subclasses 103+, for a residual tumbler type rotary drum furnace.
- 132 Gas bench:**
This subclass is indented under subclass 128. The retorts are of the well-known gas-bench retort form and placed in inclined position within the ordinary gas retort furnace.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
147, and indented subclasses.
- SEE OR SEARCH CLASS:
110, Furnaces, subclasses 230+ for a solid fuel furnace provided with coking means.
- 201, Distillation: Processes, Thermolytic, subclasses 15+, for a carbonizing process including burning a product of the carbonizing step and recovering heat from a product by indirect heat exchange and subclass 37, for a process in which externally produced combustion gases are passed through the retort.
- 133 Horizontal:**
This subclass is indented under subclass 105. The retort or retorts are so arranged that the distilland passes through them in a horizontal direction.
- SEE OR SEARCH CLASS:
110, Furnaces, subclasses 230+ for a solid fuel furnace provided with coking means.
- 134 With fluid injection to retort:**
This subclass is indented under subclass 133. The retorts have provisions for injection of fluid, either to react with the distillate or for convective separation of the distillate.
- SEE OR SEARCH CLASS:
201, Distillation: Processes, Thermolytic, subclasses 36+, for a thermolytic distillation process including injecting a fluid into the carbonizing zone.
- 203, Distillation: Processes, Separatory, subclass 49, for a process of convective distillation.
- 135 Plural gas and/or air admission:**
This subclass is indented under subclass 133. At least one of the fluids necessary for combustion in the heating chamber or flues is admitted at separate points in the path of the flame to lengthen the flame or to preserve a regulated temperature.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
108, and 109.
- 136 Rotary:**
This subclass is indented under subclass 133. The horizontal retort has a rotary motion.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
131, for a thermolytic distillation system including a rotary inclined retort, subclass 216, for a rotary directly heated chamber and subclass 218, for a rotary thermolytic retort.
- SEE OR SEARCH CLASS:
34, Drying and Gas or Vapor Contact With Solids, subclasses 108+, for a hollow drum rotating about an axis through which the material to be treated is carried.
- 366, Agitating, subclasses 219+ for movably mounted mixing chamber of general utility.
- 373, Industrial Electric Heating Furnaces, subclasses 84 and 85+, for a rotating electric arc furnace and subclasses 115 and 116, for a rotating electric resistance furnace.

137 With heating chamber:

This subclass is indented under subclass 133. The retorts, either singly or in groups, are inclosed in a chamber in which combustion takes place to heat them.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
135,

138 With flues:

This subclass is indented under subclass 133. The retort is heated by combustion in flues.

SEE OR SEARCH CLASS:

122, Liquid Heaters and Vaporizers, subclasses 135.1+, for a boiler having one or more fire tubes or flues wholly or partly surrounded by the water space.

139 Vertical:

This subclass is indented under subclass 138. The flues are vertical.

140 With recuperators:

This subclass is indented under subclass 139. The products of combustion as they leave the system heat the air and/or gas in double-surface heaters.

SEE OR SEARCH CLASS:

110, Furnaces, subclasses 230+ for a solid fuel furnace provided with coking means.
201, Distillation: Processes, Thermolytic, subclasses 15+, for a carbonizing process including burning a product of the carbonizing step and recovering heat from a product by indirect heat exchange and subclass 37, for a process in which externally produced combustion gases are passed through the retort.

141 With reversible regenerators:

This subclass is indented under subclass 139. The system contains chambers usually filled with refractory material checkerwork through which hot products pass to the flues in alternating periods, whereby the incoming combustible material is heated.

SEE OR SEARCH CLASS:

110, Furnaces, subclasses 230+ for a solid fuel furnace provided with coking means.
201, Distillation: Processes, Thermolytic, subclasses 15+, for a carbonizing process including burning a product of the carbonizing step and recovering heat from a product by indirect heat exchange and subclass 37, for a process in which externally produced combustion gases are passed through the retort.

142 Alternatively poor and/or rich gas fuel:

This subclass is indented under subclass 141. Apparatus coming, in which the currents of combustible material and those of air and/or gas are periodically reversed and the latter heated. If rich gas is used, the heating of gas may be omitted. There may be dilution of rich gas fuel with nitrogen, air, or products of combustion.

143 Regenerators reversing along the system:

This subclass is indented under subclass 141. The flues may be in distinct groups which may lie either along or across the heating wall in which they are contained or across the retort, the flame ascending in the flues of one group and descending in those of another group, all the flues in which the flame ascends in one wall or section of a wall being in connection with one regenerator or regenerator group, and the flues in which the flame descends connected with another regenerator or regenerator group, these regenerators being at right angles to the system and reversal taking place along the system.

144 Regenerators reversing across the system:

This subclass is indented under subclass 141. The regenerators may be in groups and stand parallel or transverse to the axis of the system, but in either case their reversal occurs across that axis.

145 Horizontal:

This subclass is indented under subclass 138. The heating flues are horizontal.

146 With regenerators:

This subclass is indented under subclass 145. The air and/or gas for combustion is heated by the waste products of combustion by means of single-surface heaters.

SEE OR SEARCH CLASS:

201, Distillation: Processes, Thermolytic, subclasses 13+, for a thermolytic distillation process including the step of heating the combustion gas or air by indirect heat exchange with the products of the carbonizing step.

147 Gas bench:

This subclass is indented under subclass 133. The retorts are of the well-known gas-retort forms and inclosed in the ordinary gas-bench furnace structure.

148 With recuperator:

This subclass is indented under subclass 147. The system is provided with means for heating the gas and/or air for combustion by the waste products of combustion through double surface heaters.

SEE OR SEARCH THIS CLASS, SUBCLASS:

111, 122, 130, 140, and 141.

SEE OR SEARCH CLASS:

110, Furnaces, subclasses 230+ for a solid fuel furnace provided with coking means.
201, Distillation: Processes, Thermolytic, subclasses 15+, for a carbonizing process including burning a product of the carbonizing step and recovering heat from a product by indirect heat exchange and subclass 37, for a process in which externally produced combustion gases are passed through the retort.

149 With fluid injection:

This subclass is indented under subclass 147. Provisions are made for injection of fluid into the retort.

150 Preheating:

This subclass is indented under subclass 105. The retort has means for preheating the distilland.

SEE OR SEARCH CLASS:

196, Mineral Oils: Apparatus, subclass 134, for apparatus for vaporizing mineral oils including means for heat recovery from the vapor or residuum.
201, Distillation: Processes, Thermolytic, subclasses 13+, for a thermolytic distillation process including recovering heat from a product by indirect heat exchange.
203, Distillation: Processes, Separatory, subclasses 21+, for a separatory distillation process including recovering heat by indirect heat exchange.

151 Combustion control devices:

This subclass is indented under subclass 105. Devices for controlling the flow of fuel gases and waste gases. Burners, dampers, gas and air pipes, and reversing valves when claimed in combination with the ovens are classified herein.

SEE OR SEARCH CLASS:

126, Stoves and Furnaces, subclass 285, and appropriate indented subclasses, for specific dampers and operating devices.
137, Fluid Handling, for fluid handling in general including flow control, e.g., for air or gas.
251, Valves and Valve Actuation, for damper and valve structure, per se.
431, Combustion, appropriate subclass for residual apparatus specialized to combustion.

152 Separatory:

This subclass is indented under subclass 82. Systems and parts of apparatus directed to separation of substances preexisting in the distilland where not provided for in subclasses below.

SEE OR SEARCH CLASS:

196, Mineral Oils: Apparatus, subclasses 98+, for apparatus for treating mineral oils including vaporizing and con-

densing means and subclasses 104+, for apparatus including vaporizing means.

- 203, Distillation: Processes, Separatory, appropriate subclass, for a separatory distillation process.

153 Still and column:

This subclass is indented under subclass 152. Associations of still and fractionating column, either as separate or integral structures.

- (1) Note. A still is defined for purposes of this class as a vessel having a tube leading therefrom for the purpose of carrying vapors generated within it to a condenser or a vessel adapted and designed and used in connection with a condenser, which latter is not necessarily shown or claimed. The vessel is to be heated only to a temperature below that which would produce chemical change in the distilland. For definition of "column" see subclass 158 below.

SEE OR SEARCH CLASS:

- 196, Mineral Oils: Apparatus, subclass 100, for a mineral oil distilling system including a fractionating column and subclass 139, for a condensing apparatus including a fractionating column.

154 Plural columns:

This subclass is indented under subclass 153. Systems embracing a plurality of fractionating columns with a single still or a plurality of stills.

SEE OR SEARCH CLASS:

- 203, Distillation: Processes, Separatory, subclasses 71+, for a distillation process including a plurality of vaporization and condensation steps.

155 Plural stills:

This subclass is indented under subclass 153. A plurality of stills associated with a fractionating column.

156 Parallel:

This subclass is indented under subclass 155. The plurality of stills are so related that each delivers its vapor direct to the column or col-

umns. The stills may be used alternatively as single stills or in groups.

158 Column:

This subclass is indented under subclass 152. A system of separatory distillation apparatus comprising a device arranged to conduct a liquid and a vapor derived therefrom by distillation in counter-current direct contact. At any plane in the column the liquid has a greater concentration of low-boiling substances and the vapor of high-boiling ones than that necessary to maintain equilibrium as to these substances between the vapor and liquid passing that plane, whereby the liquid becomes progressively richer as to high-boiling substances and the vapor as to low-boiling ones. The column, per se, is a gas and liquid contact apparatus and is only classed herein when heating and/or cooling elements are recited in the claims.

SEE OR SEARCH CLASS:

- 196, Mineral Oils: Apparatus, subclasses 100, 105 and 139.
261, Gas and Liquid Contact Apparatus, subclasses 75+ for specific contact elements or structures, and subclass 148 for columns with heating or cooling means for the trays.

159 With preheater:

This subclass is indented under subclass 158. The distilland entering the system is passed through a device in which it is heated previous to admission. The heat may be derived from an extraneous source or from exchange with the outgoing hot waste liquor (slop), or from condensation of the vapors, or from both the latter sources.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 150, and 177+.

SEE OR SEARCH CLASS:

- 196, Mineral Oils: Apparatus, subclasses 100, 134 and 139.
203, Distillation: Processes, Separatory, subclasses 22+, for a distillation process in which the feed is preheated by indirect recovery of heat.

160 Automatic temperature and/or pressure control:

This subclass is indented under subclass 158. The column is provided with means for controlling its temperature or pressure automatically.

SEE OR SEARCH THIS CLASS, SUBCLASS:

151, 183, 184, and 206.

SEE OR SEARCH CLASS:

- 73, Measuring and Testing, subclasses 700+, for a device for the direct measurement of pressure.
- 137, Fluid Handling, subclasses 505+, for a device for regulating the pressure of a fluid in a line.
- 196, Mineral Oils: Apparatus, subclasses 132 and 141.
- 203, Distillation: Processes, Separatory, subclass 2, for a distillation process including the step of measuring the temperature.
- 236, Automatic Temperature and Humidity Regulation, subclasses 24.5 and 32.
- 361, Electricity: Electrical Systems and Devices, subclasses 160+ for electrical systems not otherwise classified and see "SEARCH CLASS" under the class definition for various types of electrical systems.
- 374, Thermal Measuring and Testing, subclasses 100+ for a device for quantitatively determining temperature.

161 Partial reflux condenser:

This subclass is indented under subclass 158. The final condensate is divided into two portions, one of which returns to the column, the other being withdrawn either as a finished product or to be conducted to some other part of the system.

SEE OR SEARCH CLASS:

- 196, Mineral Oils: Apparatus, subclass 99.
- 203, Distillation: Processes, Separatory, subclasses 75 and 82, for a plural distillation process including returning a part of the condensate to a prior distillation zone and subclasses 93, 94, 97, and 98, for a single distillation pro-

cess in which part of the condensate is returned to the distillation zone.

162 Vapor-element by-pass:

This subclass is indented under subclass 158. The vapors may be passed around the dephlegmator, the column, or a like element of the vapor system.

SEE OR SEARCH CLASS:

261, Gas and Liquid Contact Apparatus, subclass 63.

163 Still:

This subclass is indented under subclass 152. Miscellaneous organizations and parts of a separatory distilling system not provided for below.

SEE OR SEARCH CLASS:

- 159, Concentrating Evaporators, subclass 22, and appropriate indented subclasses.
- 196, Mineral Oils: Apparatus, subclass 105.

164 Recovery from containers:

This subclass is indented under subclass 163. Special arrangements and devices in apparatus for recovering residues and waste from barrels, casks, and other containers by vaporization.

165 Still and stove:

This subclass is indented under subclass 163. Associations of still and stove. The connection may be by way of a water back.

SEE OR SEARCH CLASS:

- 126, Stoves and Furnaces, subclasses 34 and 35 for a cooking stove having a water back, subclasses 53 and 54 for a fluid fueled cooking stove having a water back, subclass 364.1 for a liquid heater and stovepipe, or subclasses 513 and 514 for a fireplace with a liquid heater.

166 Still and stand boiler:

This subclass is indented under subclass 163. Associations of still and stand boiler.

SEE OR SEARCH CLASS:

122, Liquid Heaters and Vaporizers, subclasses 13.01 through 19.2 for a stand boiler (e.g., water heater, etc.) that provides hot water for domestic or household use (e.g., cooking, cleaning, washing, bathing, space heating, etc.) that may be in other than a house or home (e.g., apartment building, office building, restaurant, laundry, recreational vehicle, etc.).

126, Stoves and Furnaces, subclasses 361.1 through 363.1 for a boiler receiving hot liquid or steam from a stove or furnace (e.g., kitchen boiler, range boiler, etc.).

167 Still and feed-water heater:

This subclass is indented under subclass 163. Associations of still and means for heating the water to be fed to a steam boiler.

SEE OR SEARCH CLASS:

122, Liquid Heaters and Vaporizers, subclasses 441 and 442.

201, Distillation: Processes, Thermolytic, subclasses 13+, for a thermolytic distillation process in which heat in the process is recovered by indirect heat exchange.

203, Distillation: Processes, Separatory, subclasses 21+, for a separatory distillation process in which heat in the process is recovered by indirect heat exchange and subclasses 10+, for a distillation process of purifying water.

168 Still and extractor:

This subclass is indented under subclass 163. Associations of a still and a vessel in which a substance is removed from material by a solvent. The extract is then run into the still and distilled. Either the solvent or substance dissolved, or both, may be volatile.

SEE OR SEARCH THIS CLASS, SUBCLASS:

107, and 170.

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, appropriate subclass, for the separation of a liquid from a solid.

47, Plant Husbandry, subclass 10, for plant source extraction of rosin or turpentine.

127, Sugar, Starch, and Carbohydrates, subclasses 3+, for apparatus for leaching sacchariferous material.

196, Mineral Oils: Apparatus, subclass 14.52.

208, Mineral Oils: Processes and Products, subclasses 311+.

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

169 Continuous extraction:

This subclass is indented under subclass 168. Apparatus coming for continuously extracting and distilling. A condenser frequently returns its condensate upon the material within the extractor at short intervals, which condensate is a solvent of the material to be extracted, and passes it through to the still. Final separation of the solvent and volatile is usually in the same still assembly.

170 Still extractor:

This subclass is indented under subclass 163. Devices in which extraction and separation by distilling occur in the same vessel.

SEE OR SEARCH CLASS:

134, Cleaning and Liquid Contact With Solids, subclass 11, for a cleaning process including the step exposing the work to a gaseous or vapor treating agent.

172 Plural:

This subclass is indented under subclass 163. The system includes more than one still with or without individual condensers and arranged to be used either in parallel or to be used alternately.

SEE OR SEARCH THIS CLASS, SUBCLASS:

155+.

SEE OR SEARCH CLASS:

196, Mineral Oils: Apparatus, subclass 105.

173 Series:

This subclass is indented under subclass 172. A plurality of stills so connected that either the vapor or the residue of one flows into the other.

- (1) Note. When the vapor flows from one still to another in this subclass, it enters into the still itself, and is not simply carried through in pipes, which structure is found in the next subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
155,

SEE OR SEARCH CLASS:

- 196, Mineral Oils: Apparatus, subclass 106.
203, Distillation: Processes, Separatory, subclasses 71+, for a separatory distillation process in which the vapor or residue of a distillation operation is the distilland in a subsequent distillation operation.

174 Multiple effect:

This subclass is indented under subclass 173. The vapor from one still is carried through the distilland of another in heat-interchange relation, but not in direct contact.

SEE OR SEARCH CLASS:

- 159, Concentrating Evaporators, subclasses 17.1+.
201, Distillation: Processes, Thermolytic, subclasses 14+, for a process directed to using a conversion product as an indirect source of heat to heat the carbonaceous material.
203, Distillation: Processes, Separatory, subclasses 25+, for a process in which the distillation zone is indirectly heated by recovered waste heat.

175 With agitator:

This subclass is indented under subclass 163. Means are provided for setting the distilland in motion within the still as a part of the system.

SEE OR SEARCH CLASS:

- 159, Concentrating Evaporators, subclasses 6.1+, 16.1+ and 25.1+.

- 196, Mineral Oils: Apparatus, subclasses 123, 124 and 125.
203, Distillation: Processes, Separatory, subclasses 72 and 89, for a filming distillation process in which the film is agitated.
366, Agitating, appropriate subclass for agitators in general, particularly subclasses 241+ for movable stirrers.

176 With distilland treating devices:

This subclass is indented under subclass 163. Systems provided with means for treating the distilland before or during distillation. This may include filtering, decanting, aeration, pre-heating, or other treatment of the distilland.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 107, 159 and 168+.

SEE OR SEARCH CLASS:

- 99, Foods and Beverages: Apparatus, subclasses 277.1 and 277.2.
201, Distillation: Processes, Thermolytic, appropriate subclass for a process directed to treating a solid, carbonaceous distilland before or during distillation.
203, Distillation: Processes, Separatory, appropriate subclass for a distillation process directed to treating a distilland before or during distillation, particularly subclasses 28+ for a process including a chemical reaction, subclasses 39+ for a process including a disparate physical separation step and subclasses 50+, for a process including adding a substance to alter the relative volatility of the components of the distilland.

177 Preheater:

This subclass is indented under subclass 176. Systems coming under the preceding subclass in which the distilland is preheated. The pre-heating may be with agitation and by the distilling residue.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 150,

SEE OR SEARCH CLASS:

- 196, Mineral Oils: Apparatus, subclass 134.
- 201, Distillation: Processes, Thermolytic, subclasses 14+ and 32+, for a process directed to preheating a solid carbonaceous distilland.
- 203, Distillation: Processes, Separatory, subclasses 22+, 88 and 90, for a process directed to preheating a distilland.
- 208, Mineral Oils: Processes and Products, subclasses 353 and 364+.

178 Straining:

This subclass is indented under subclass 177. The preheater has a straining device.

179 Dephlegmating:

This subclass is indented under subclass 177. The distilland enters a device for heat exchange with the distillate vapors, from which it condenses the high-boiling-point constituents.

SEE OR SEARCH CLASS:

- 196, Mineral Oils: Apparatus, subclass 139, for condensing apparatus in which the vapor is partially condensed.
- 203, Distillation: Processes, Separatory, subclasses 22+, for a distillation process in which the feed is heated by indirect heat exchange with the distillate vapor and subclass 87, for a process of fractional condensation of the vapor.

180 Condensing:

This subclass is indented under subclass 177. The distilland before it enters the still is used as the cooling fluid in the condenser.

SEE OR SEARCH THIS CLASS, SUBCLASS:

195+,

SEE OR SEARCH CLASS:

- 196, Mineral Oils: Apparatus, subclass 134.
- 203, Distillation: Processes, Separatory, subclasses 10+, for a process of purifying water by distillation in which

the feed water is used as the cooling fluid in the condenser.

- 208, Mineral Oils: Processes and Products, subclasses 353 and 364+.

181 Level control:

This subclass is indented under subclass 176. Automatic means for controlling the level of the distilland or rate of feeding the still are provided.

SEE OR SEARCH THIS CLASS, SUBCLASS:

193, and 196.

SEE OR SEARCH CLASS:

- 137, Fluid Handling, subclasses 386+, for a liquid level responsive or maintaining system.
- 196, Mineral Oils: Apparatus, for pertinent subclass(es) as determined by schedule review.

182 With vapor-treating devices:

This subclass is indented under subclass 163. Patents for apparatus directed to physical treatment of the distillate, such as filtering, dephlegmating, washing, absorbing, or condensing, when in combination with the elements of or limited to being a part of a distilling system. Apparatus for treatment of the volatiles from thermolytic distilling, unless provided for under thermolytic apparatus, is included here.

- (1) Note. For filters, see Search Notes below.
- (2) Note. For condensers see Search Notes below.
- (3) Note. For washers see Search Notes below.

SEE OR SEARCH CLASS:

- 55, Gas Separation, subclasses following subclass 474 for filters.
- 196, Mineral Oils: Apparatus, subclass 146 for washers; subclass 46.1 for filters; subclasses 138+, for condensers;
- 210, Liquid Purification or Separation, subclasses 348+ for filters.

261, Gas and Liquid Contact Apparatus, subclasses 19 and 75 for washers; subclasses 76, 78.1 and 115, for condensers.

183 Still and absorber:

This subclass is indented under subclass 182. System comprises a still and a second vessel in which the vapor undergoes absorption either with or without intermediate physical treatment.

SEE OR SEARCH CLASS:

62, Refrigeration, subclasses 101+, 141+ and 476+ for sorption type refrigeration producing processes and apparatus.
 96, Gas Separation: Apparatus, subclasses 108+ for solid sorbent apparatus for gas separation.
 196, Mineral Oils: Apparatus, subclasses 104+.
 203, Distillation: Processes, Separatory, subclasses 41 and 42, for a distillation process including a sorption operation.
 208, Mineral Oils: Processes and Products, subclasses 341+ and 348.

184 Still absorber:

This subclass is indented under subclass 183. Comprises a still which is heated to remove volatile material from a distilland, then along with its contained residue, cooled and the volatile material returned to the still and allowed to absorb in the residue, either with or without intermediate physical treatment.

SEE OR SEARCH CLASS:

62, Refrigeration, subclasses 101+, 141+ and 476+ for sorption type refrigeration producing processes and apparatus.

185.1 Condenser:

This subclass is indented under subclass 182. Subject matter comprising the association of a still and a device for condensing the vapors produced by the still to the liquid state.

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, subclasses 73+ for apparatus having means for condensing vapor.
 62, Refrigeration, subclasses 80+, 91+, 93+, 150+, and 272+ for refrigeration processes and apparatus involving atmospheric condensate handling.
 99, Foods and Beverages: Apparatus, subclass 347 for cooking apparatus having means for condensing vapors and returning the condensate to the material being cooked.
 165, Heat Exchange, subclasses 110+ for a heat exchanger having a first holder or collector in a flow path to a second fluid.
 196, Mineral Oils: Apparatus, subclasses 138+ for mineral oil treating apparatus including a still and condenser.

185.2 Direct contact:

This subclass is indented under subclass 185.1. Subject matter in which the vapors to be condensed are cooled by being mingled with a cooler gas or liquid.

185.3 Air condensers:

This subclass is indented under subclass 185.1. Subject matter in which the cooling or the vapor is effected by air at a lower temperature than the vapor on the outer surface of the vapor container.

185.4 Circulating coolant in cap or top closure:

This subclass is indented under subclass 185.1. Subject matter in which the condenser comprises means for circulating a coolant substance which is located in the topmost part of the still in the top cap or closure thereof or a pipe connects the top of the still with the condenser unit.

185.5 Helical coil for vapor stream:

This subclass is indented under subclass 185.1. Subject matter in which the vapors to be condensed are passed through a helical coil which is surrounded by a lower temperature gas or liquid.

185.6 Helical coil for coolant:

This subclass is indented under subclass 185.1. Subject matter in which the lower temperature gas or liquid coolant is passed through a helical coil which is surrounded by the warmer vapors which are to be condensed.

186 Plural:

This subclass is indented under subclass 185.1. The system contains more than a single condenser.

187 Concentric with still:

This subclass is indented under subclass 185.1. The still and condenser are concentric.

188 Still supporting:

This subclass is indented under subclass 185.1. The still and condenser are so arranged that the still is supported by the condenser.

189 Still supported:

This subclass is indented under subclass 185.1. The condenser is supported by the still.

190 Cap (or closure):

This subclass is indented under subclass 189. The condenser forms a cap or closure for the still.

SEE OR SEARCH CLASS:

99, Foods and Beverages: Apparatus, subclass 293, and indented subclass, for condenser type beverage infusers.
126, Stoves and Furnaces, subclasses 381.1 and 382.1 for an open-top liquid heating vessel that may include a lid having a condenser for steam from the vessel.

191 Jacketed:

This subclass is indented under subclass 190. The condenser forms the cap of the still and is surrounded or surmounted by a jacket to contain a cooling fluid.

192 Still feeding:

This subclass is indented under subclass 191. The cooling liquid in the cap condenser passes to the still and is distilled.

193 Distilland-level control:

This subclass is indented under subclass 192. Means is provided for controlling the height of the distilland in the still as it passes from the condenser.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

181, and 196.

SEE OR SEARCH CLASS:

122, Liquid Heaters and Vaporizers, subclass 451, and appropriate indented subclasses.
137, Fluid Handling, subclasses 386+, for a liquid level responsive or maintaining system.
159, Concentrating Evaporators, subclasses 43.1+.
196, Mineral Oils: Apparatus, subclass 135.

194 Still feeding:

This subclass is indented under subclass 189. The condenser is supported by or upon the still and the cooling fluid therefrom passes into the still.

195 Still feeding:

This subclass is indented under subclass 185.1. The cooling liquid from the condenser passes into the still, at least in part.

196 Distilland-level control:

This subclass is indented under subclass 195. The amount of liquid entering the still from the condenser is automatically limited to that which will keep the level of the distilland constant.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

181, and 193.

SEE OR SEARCH CLASS:

137, Fluid Handling, subclasses 386+, for a liquid level responsive or maintaining system.

197 With separator:

This subclass is indented under subclass 182. The vapors from the still pass through a vessel or chamber in which they deposit the particles

of liquid and of solids entrained within them. These vapors do not pass through condensed liquids, nor is there condensation except incidental.

SEE OR SEARCH CLASS:

- 122, Liquid Heaters and Vaporizers, subclasses 489 and 492.
- 201, Distillation: Processes, Thermolytic, subclass 4, for a thermolytic distillation process including separating a solid by-product from a gas or vapor.
- 203, Distillation: Processes, Separatory, subclass 40, for a separatory distillation process including the step of removing entrained particles from a gas or vapor.

198 Dephlegmator:

This subclass is indented under subclass 182. The vapors from the column or still pass through a condenser in which the higher-boiling fractions are condensed and returned directly to the column or still.

SEE OR SEARCH CLASS:

- 196, Mineral Oils: Apparatus, subclass 139.

199 Doubler:

This subclass is indented under subclass 182. The vapor from the still or column is passed through a condensate from itself to which it surrenders its high-boiling constituents and from which it evaporates its low-boiling constituents.

SEE OR SEARCH CLASS:

- 196, Mineral Oils: Apparatus, subclass 140.
- 201, Distillation: Processes, Thermolytic, subclass 30, for a thermolytic distillation process of fractionally condensing the removed vapor.
- 203, Distillation: Processes, Separatory, subclass 42, for a distillation process including sorption of a component of a removed vapor in a liquid and subclass 87, for a process including fractional condensation of the removed vapor.

200 Filter:

This subclass is indented under subclass 182. The vapor from the still or column is passed through porous material or other filter which removes from it entrained particles of liquid and solids. The filtering material in some instances may have a chemical effect.

SEE OR SEARCH CLASS:

- 55, Gas Separation, subclasses following 474 for filter structure for gas.
- 203, Distillation: Processes, Separatory, subclass 40, for a distillation process including removing entrained particles from a gas or vapor and subclass 41, for a distillation process including utilizing a solid sorbent.
- 208, Mineral Oils: Processes and Products, subclasses 347+.

201 Aerator:

This subclass is indented under subclass 182. Means are provided for admitting or injecting air or other gas into the vapor element of the system.

SEE OR SEARCH CLASS:

- 208, Mineral Oils: Processes and Products, subclasses 356 and 362+.

202 With condensate-treating devices:

This subclass is indented under subclass 163. Patents for apparatus or parts directed to physical treatment of the condensate, such as filtering, decanting, aerating or reboiling, when in combination with the elements of the still or limited to the distilling art. Treatment of the condensate of thermolytic distillation is here unless provided for in the thermolytic subclasses.

SEE OR SEARCH CLASS:

- 122, Liquid Heaters and Vaporizers, subclasses 441 and 448.1 for feed-water reboilers.
- 208, Mineral Oils: Processes and Products, subclasses 188 and 349.
- 210, Liquid Purification or Separation, appropriate subclasses, particularly subclasses 294+ for diverse separators, subclasses 348+ for filters and subclasses 513+ for gravitational separators.

203 Aeration:

This subclass is indented under subclass 202. Air or other gas is passed through the condensate for purification, flavoring, preserving, or other purpose.

SEE OR SEARCH CLASS:

261, Gas and Liquid Contact Apparatus, for structure of gas and liquid contact apparatus.

204 Decanter:

This subclass is indented under subclass 202. The condensate consisting of immiscible liquid is passed into a vessel where it is allowed to separate into two or more layers, one of which may be removed separately from the others.

SEE OR SEARCH CLASS:

210, Liquid Purification or Separation, appropriate subclasses, particularly subclasses 294+ for diverse separators, and subclasses 513+ for gravitational separators.

205 Vacuum:

This subclass is indented under subclass 163. The system is provided with means for producing a vacuum therein.

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, subclass 92, for apparatus for contacting solids with a gas under vacuum.

159, Concentrating Evaporators, subclasses 21 and 22+.

196, Mineral Oils: Apparatus, subclass 114.

201, Distillation: Processes, Thermolytic, subclass 35, for a process for applying differential pressure to the carbonizing zone.

203, Distillation: Processes, Separatory, subclasses 73+ and 91+, for a separatory distillation process utilizing a vacuum and see "SEARCH CLASS" thereunder.

373, Industrial Electric Heating Furnaces, subclasses 54, 63, 110+, and 140+, for an electric furnace which is operated under pressure or vacuum.

206 Automatic heat control:

This subclass is indented under subclass 163. Means for automatically controlling or cutting off the heat from the still when any conditions making it desirable are found in the system.

SEE OR SEARCH THIS CLASS, SUBCLASS:

160,

SEE OR SEARCH CLASS:

122, Liquid Heaters and Vaporizers, subclasses 447 and 448.1.

196, Mineral Oils: Apparatus, subclasses 132 and 141.

236, Automatic Temperature and Humidity Regulation, appropriate subclass for regulating-apparatus combinations.

Apparatus, Types:

This group is directed to the structure of the still, chamber, kiln, heap, or retort which may be incorporated into the system rather than to the system in which it is incorporated.

207 Stump stills:

This subclass is indented under the unnumbered subclass, Separatory and thermolytic. A portable chamber designed to be placed over a stump and heated from the outside, with means for carrying off the vapors, the temperature being so controlled that first separatory, then thermolytic, distillation occurs.

208 Directly heated chamber:

This subclass is indented under the unnumbered subclass, Separatory and thermolytic. A single chamber which is heated internally by heating medium passed therethrough directly in contact with the distilland.

209 Still retort:

This subclass is indented under the unnumbered subclass, Separatory and thermolytic. A chamber heated either externally or by internal tubes or furnace in such a way that first separatory, then thermolytic, distillation occurs.

(1) Note. The two heating stages here are distinct and do not refer to the periods of gradual increase in temperature involved in heating up a retort.

- 210 Heap:**
This subclass is indented under the unnumbered subclass, Autothermic. Arrangements of wood or other carbonaceous material in piles covered with material to exclude air, mainly used in charcoal burning.
- 211 Kiln:**
This subclass is indented under the unnumbered subclass, Autothermic. Structures in which carbonaceous material is to be placed and carbonized by combustion of a part of its own substance. It may also have flues in its walls and floors inside by means of which it is heated, in addition to the heat of combustion of its contents. Many beehive ovens are here.
- SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclass 76.
266, Metallurgical Apparatus, subclasses 171+, for ore treating furnaces.
- 212 Arched:**
This subclass is indented under subclass 211. The kiln has an arched top and greater length than breadth, i.e., is noncircular in horizontal section.
- 213 Partable and/or knockdown:**
This subclass is indented under subclass 211. Kiln structures designed to be moved from place to place and needing no base on which to place the carbonaceous material or having a new base constructed at each new location. The kiln may be constricted so as to be moved as a whole or in sections or parts to be separated and reassembled in a new location.
- 214 Bottom discharge:**
This subclass is indented under subclass 211. The kiln is discharged at the bottom, which may either rotate, and thus dump the residue, or have other provision for discharge.
- SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclasses 62, 69 and 76.
266, Metallurgical Apparatus, subclasses 195+ and 236+, for furnaces and other vessels which have material discharges means associated therewith.
- 215 Directly heated chamber:**
This subclass is indented under the unnumbered subclass, Autothermic. A chamber arranged with means for introducing hot gaseous substances into direct contact with the distilland. It may have auxiliary external heating.
- SEE OR SEARCH CLASS:
44, Fuel and Related Compositions, subclass 492.
48, Gas: Heating and Illuminating, subclass 63, and indented subclass, and 94.
266, Metallurgical Apparatus, subclasses 186+, for a furnace having fluid feeding means associated therewith.
- 216 Rotary:**
This subclass is indented under subclass 215. The directly-heated chamber is arranged for rotation.
- SEE OR SEARCH CLASS:
34, Drying and Gas or Vapor Contact With Solids, subclasses 108+ for a receptacle rotating about an axis through which receptacle the material being treated is carried.
266, Metallurgical Apparatus, subclass 145, for fume handling structure associated with a rotary furnace, see the search notes associated with this subclass.
432, Heating, subclasses 105+ for a residual rotary work heating furnace heating the work by direct contact with combustion products.
- 217 Retort:**
This subclass is indented under the unnumbered subclass, Autothermic. The structure of the closed vessel constituting the retort. It is heated externally, but may also have auxiliary means for indirect heating.
- SEE OR SEARCH CLASS:
110, Furnaces, subclass 242 for a refuse incinerator in the form of a closed retort.
122, Liquid Heaters and Vaporizers, appropriate subclasses, for a closed liquid container apparatus in which heat is

- applied directly or indirectly to the walls.
- 266, Metallurgical Apparatus, subclass 153, for furnaces having retort condenser units and subclasses 171+ for furnaces having retorts.
- 218 Rotary and/or tilting:**
This subclass is indented under subclass 217. The retort is arranged for rotation, usually on its longer axis, or for tilting or pivoting to empty.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
131, and 136, for a thermolytic distillation system including a rotary retort.
- SEE OR SEARCH CLASS:
34, Drying and Gas or Vapor Contact With Solids, subclasses 108+ for a receptacle rotating about an axis through which receptacle the material being treated is carried.
110, Furnaces, subclass 246 for a refuse incinerator in the form of a rotary drum.
196, Mineral Oils: Apparatus, subclass 112.
266, Metallurgical Apparatus, subclasses 195+ and 236+ for furnaces and other vessels having material discharge means associated therewith and 243+ for pivotally mounted Bessemer type treating vessels.
366, Agitating, subclasses 219+ for movably mounted mixing chambers.
373, Industrial Electric Heating Furnaces, subclasses 84 and 85+ for an electric arc furnace including means for rotating the furnace chamber and subclasses 115 and 116.
- 219 Molten bath:**
This subclass is indented under subclass 217. The retort is surrounded by or contains a mass of fusible substance through which the heat is conveyed to the retort.
- SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclass 92.
196, Mineral Oils: Apparatus, subclasses 118 and 120.
- 201, Distillation: Processes, Thermolytic, subclass 11 for a thermolytic distillation in which the distilland is heated by a molten metal bath.
- 220 Flued:**
This subclass is indented under subclass 217. The retort is constructed with flues or pipes either internal to it or a part of its wall.
- 221 Vertical:**
This subclass is indented under subclass 217. Retorts designed to be charged at the top and discharged at the bottom and to occupy the vertical position. The retort may be of ring shape and may have jalousie walls.
- SEE OR SEARCH CLASS:
34, Drying and Gas or Vapor Contact With Solids, subclasses 165+ for apparatus for vapor contact with solids in which the material being treated is fed in at an elevated level and flows generally downward through the treating zone.
- 222 Structural features:**
This subclass is indented under subclass 217. The claims are directed to features of retort structure or shape.
- 223 Wall:**
This subclass is indented under subclass 222. Patents disclosing the structure of the retort, oven, or kiln walls.
- SEE OR SEARCH CLASS:
432, Heating, subclasses 247+ for the chamber structure of a residual, material heating furnace.
- 224 Shields:**
This subclass is indented under subclass 222. The retort is coated with protective material over a whole or part of its surface or has a baffle or refractory substance shielding it from the flame.
- SEE OR SEARCH CLASS:
432, Heating, subclass 248 for residual heating chamber structure including a protected, lined or reinforced melt holding section.

225 Cores:

This subclass is indented under subclass 222. Structures to be inserted within the retorts to subdivide the charge. The core may have channels for removal of volatile material and may be removed with the residue or remain in the retort.

226 Residue treatment:

This subclass is indented under subclass 217. The distilling retorts are associated with devices for crushing, grinding, or compressing or otherwise treating the residue.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
95, 227+, 261, and 262+.

SEE OR SEARCH CLASS:

- 44, Fuel and Related Compositions, subclass 492.
- 201, Distillation: Processes, Thermolytic, subclasses 5, 7 and 39 for a process directed to treating a distillation residue.
- 203, Distillation: Processes, Separatory, subclasses 47+ for a process in which a solid is removed from a liquid.

227 Quencher:

This subclass is indented under the unnumbered subclass, Autothermic. Miscellaneous means for quenching or cooling the residue of distillation. It may consist of an open or a closed chamber attached to or separate from the retort in which the residue is cooled by gas or liquid or merely held to cool.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
95, and 253.

SEE OR SEARCH CLASS:

- 110, Furnaces, subclasses 165+ for a device for receiving and removing ashes when furnace structure is included.
- 201, Distillation: Processes, Thermolytic, subclass 39, for a thermolytic distillation process directed to quenching char with an inert material.

266, Metallurgical Apparatus, subclass 122, for means for contacting a heated ore with a cooling liquid.

432, Heating, subclasses 77+ for a residual material heating furnace having work cooling structure.

228 Gas or vapor circulating:

This subclass is indented under subclass 227. Receivers for hot distillation residue arranged to cool or quench the residue by circulation through or over it of neutral gas or by generation and/or circulation of steam or other vapor.

SEE OR SEARCH CLASS:

110, Furnaces, subclasses 229+ for a solid fuel furnace provided with means to release a gas from the fuel.

229 Submersible chamber:

This subclass is indented under subclass 227. A chamber or holder arranged to be lowered into a tank of quenching liquid after filling with hot residue.

230 Conveyer type:

This subclass is indented under subclass 227. A conveyer upon which the residue is held while it is being quenched or cooled. The conveyer may itself be submerged in the liquid.

SEE OR SEARCH CLASS:

110, Furnaces, subclass 165.
198, Conveyors: Power Driven, for the Conveyer structure, per se.

Apparatus, Types, Separatory:

Structure and form of stills and other parts peculiar to separatory distillation and not provided for in the system subclasses.

232 Still:

This subclass is indented under the unnumbered subclass, Separatory. This group of subclasses is restricted to the structure or shape of the still itself and to the means associated therewith for heating it and other characteristic features of the still, apart from the system in which it is used.

SEE OR SEARCH CLASS:

159, Concentrating Evaporators, subclass 22 and subclasses 23-28.1+, indented thereunder.

- 165, Heat Exchange, appropriate subclasses, for means for modifying temperature not provided for in other classes and note "Search Class" under the class definition for related fields of search.
- 196, Mineral Oils: Apparatus, subclass 104, and appropriate indented subclasses.
- 233 Directly and indirectly heated:**
This subclass is indented under subclass 232. Single stills with heating furnace, tube, jacket, or other means of heating its contents without contact of heating fluid and contents and also means for introducing heating fluid directly to the interior of the still.
- 234 Directly heated:**
This subclass is indented under subclass 232. The distilland is heated by a heating fluid directly in contact with it, by radiant heat (as by the sun, etc.), by electric elements immersed in the distilland, or in contact therewith.
- SEE OR SEARCH CLASS:
159, Concentrating Evaporators, subclasses 4.1+, 8 and 16.1.
196, Mineral Oils: Apparatus, subclasses 126 and 127.
201, Distillation: Processes, Thermolytic, subclass 19 for a thermolytic distillation process in which electrical energy is applied directly to the distilland.
203, Distillation: Processes, Separatory, subclasses 10+ for a process of solar distillation of water and subclass 100 for a collection of methods of heating in a separatory distillation process.
- 235 Indirectly heated:**
This subclass is indented under subclass 232. Stills heated by fluids carried in or through or around them, in coils, pipes, or jackets, or in superficial contact, the fluids being held from contact with the distilland.
- SEE OR SEARCH CLASS:
201, Distillation: Processes, Thermolytic, subclasses 14+ for a process directed to thermolytic distillation in which a conversion product is used as an indirect source of heat.
- 203, Distillation: Processes, Separatory, subclasses 25+ and 27 for a process in which the vaporization zone is indirectly heated by a product of the process.
- 236 Spray forming and filming:**
This subclass is indented under subclass 232. The still has means for introducing the distilland in the form of a spray or for forming a spray after its introduction, or the distilland flows into or through the still in the form of a film.
- SEE OR SEARCH CLASS:
159, Concentrating Evaporators, subclasses 3+ for a spray evaporator and subclasses 5+ for a film evaporator.
196, Mineral Oils: Apparatus, subclass 128.
203, Distillation: Processes, Separatory, subclass 90 for a distillation process of spraying the distilland into the distillation zone and subclasses 72 and 89 for distillation utilizing filming.
- 237 Tubular:**
This subclass is indented under subclass 232. The still is composed of a tube or tubes in which the distilland is subjected to distillation.
- SEE OR SEARCH CLASS:
196, Mineral Oils: Apparatus, subclass 110.
- 238 Rotary and/or tiltable:**
This subclass is indented under subclass 232. The still is mounted upon an axis and rotated or tilted during distillation or to discharge.
- SEE OR SEARCH CLASS:
34, Drying and Gas or Vapor Contact With Solids, subclasses 108+ for a receptacle rotating about an axis through which receptacle the material being treated is carried.
196, Mineral Oils: Apparatus, subclass 112.
373, Industrial Electric Heating Furnaces, subclasses 84 and 85+ for an electric arc furnace including means for tilting or rotating the furnace.

239 Elements:

This subclass is indented under subclass 81. Elements used in connection with stills, retorts, or the like, not constituting a type of distilling apparatus, and not provided for in other classes.

241 Cleaning and decarbonizing:

This subclass is indented under subclass 239. Means for cleaning and decarbonizing or preventing the fouling of the retort or still or the tubes of the heating system therefor.

- (1) Note. The means herein are either mechanical, as scrapers, or chemical, as the introduction of air to unite with the carbon.

SEE OR SEARCH CLASS:

- 15, Brushing, Scrubbing, and General Cleaning, subclasses 104.001+ and subclass 246.5 for tank cleaner attachments, 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 retort or still but may be applied to other chambers.
- 122, Liquid Heaters and Vaporizers, subclasses 379+.
- 134, Cleaning and Liquid Contact With Solids, appropriate subclasses, for apparatus for cleaning in which a solid is contacted with a liquid.
- 196, Mineral Oils: Apparatus, subclass 122.
- 201, Distillation: Processes, Thermolytic, subclass 2 for a thermolytic distillation process including the step of cleaning the apparatus.
- 208, Mineral Oils: Processes and Products, subclass 48 for processes of removing deleterious carbon accumulations formed on the equipment during a chemical conversion of the mineral oil.
- 252, Compositions, for pertinent subclass(es) as determined by schedule review.
- 432, Heating, subclass 75 for a furnace including means peculiarly adapted for cleaning the furnace.

242 Closures:

This subclass is indented under subclass 239. Miscellaneous closures for retorts and stills not provided for below.

SEE OR SEARCH CLASS:

- 34, Drying and Gas or Vapor Contact With Solids, subclass 201 for enclosing apparatus which may be open on one side, and see "(6) Note" for related fields of search.
- 48, Gas: Heating and Illuminating, subclass 124 for a retort having a lid.
- 49, Movable or Removable Closures, appropriate subclasses, for closures of the type provided for and see the search notes in section IV of Class 49 for the loci of closures in other classes.
- 110, Furnaces, subclasses 173+.
- 122, Liquid Heaters and Vaporizers, subclass 498 for water-cooled furnace doors.
- 138, Pipes and Tubular Conduits, subclasses 89+ for closures and or plugs for pipes.
- 220, Receptacles, subclasses 200+ for receptacle closures.

243 Fluid cooled:

This subclass is indented under subclass 242. The doors, lids, or other closures are cooled by a fluid within or flowing through them.

SEE OR SEARCH CLASS:

- 110, Furnaces, subclasses 179 and 180.
- 165, Heat Exchange, subclasses 73+ for a heat exchanger having a cover which is cooled by a liquid passing through it.

244 Tunnel heads and lids:

This subclass is indented under the unnumbered subclass, Dome ovens. Patents showing the structure of the openings for charging dome ovens, the air and gas flues surrounding these, the castings or other devices inserted for their protection, and the lids closing the charging holes.

- 245 Removable:**
This subclass is indented under the unnumbered subclass, Dome ovens. Doors so mounted as to be removable by other than a hinged motion.
- SEE OR SEARCH CLASS:
110, Furnaces, subclass 173.
126, Stoves and Furnaces, subclass 190.
- 246 Hinged:**
This subclass is indented under the unnumbered subclass, Dome ovens. Closures supported and turnable on hinges at either their side, top or bottom.
- SEE OR SEARCH CLASS:
126, Stoves and Furnaces, subclass 194.
220, Receptacles, subclasses 810+.
- 247 Horizontal retort:**
This subclass is indented under subclass 242. Closures for retorts occupying the horizontal position. This includes doors, lids, mouthpieces and securing devices.
- SEE OR SEARCH CLASS:
110, Furnaces, subclass 173.
122, Liquid Heaters and Vaporizers, subclass 498.
126, Stoves and Furnaces, subclasses 190, 191 and 192.
- 248 Coke-oven type:**
This subclass is indented under subclass 247. Doors and devices for handling them when claimed in combination, which close the horizontal retorts of coke ovens.
- SEE OR SEARCH CLASS:
110, Furnaces, subclasses 173, 175, 176, and 177.
122, Liquid Heaters and Vaporizers, subclass 498.
126, Stoves and Furnaces, subclasses 191 and 192.
- 249 Rotary retort:**
This subclass is indented under subclass 247. Patents disclosing means for closing and charging or discharging rotary cylinders which claim means for other functions than merely charging the distilland or discharging the residue.
- 250 Top:**
This subclass is indented under subclass 242. Devices to close the tops of vertical retorts, ovens or stills.
- SEE OR SEARCH CLASS:
48, Gas: Heating and Illuminating, subclass 76.
266, Metallurgical Apparatus, subclass 184, for furnaces having bell and hopper type charging structure and subclass 199, for shaft furnaces having specific top structure.
- 251 Charging:**
This subclass is indented under subclass 250. Closures having devices for feeding the charge into the distilling receptacle. The feeding device may be a simple magazine or means for forcing the material into the retort and may have preheating means in the top.
- SEE OR SEARCH CLASS:
126, Stoves and Furnaces, subclass 73.
196, Mineral Oils: Apparatus, subclass 135.
266, Metallurgical Apparatus, subclasses 176+, for ore treating furnaces having means to feed a charge of solid material thereto.
- 252 Bottom:**
This subclass is indented under subclass 242. Devices for closing the bottoms of retorts, kilns or stills.
- SEE OR SEARCH CLASS:
196, Mineral Oils: Apparatus, subclasses 130+.
- 253 Cooling or quenching:**
This subclass is indented under subclass 252. The closure has means for cooling or quenching the residue before discharging it from the retort.
- SEE OR SEARCH CLASS:
239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 750+ for devices disclosed as useful for moving coke through a fluid treating zone for quenching the coke.

- 266, Metallurgical Apparatus, subclass 197, for shaft furnaces having specific bottom structure.
- 254 Offtakes:**
This subclass is indented under subclass 239. Tubes or pipes for carrying off the vapors from distilling chambers.
- (1) Note. If claimed in combination with hydraulic main or its equivalent, the patent is to be classified in this class, subclasses 255 and 256.
- SEE OR SEARCH CLASS:
196, Mineral Oils: Apparatus, subclass 136.
266, Metallurgical Apparatus, subclasses 144+ for treating vessels having means to handle gases evolved therein.
- 255 Dip pipes and mains:**
This subclass is indented under subclass 254. Hydraulic mains and gas pipes extending there into leading from the gas generator. The mains may be provided with means for maintaining a liquid seal for the pipes.
- 256 Valved:**
This subclass is indented under subclass 255. Dip pipes having valves for closing the pipe or by-passing the seal.
- 257 Plural:**
This subclass is indented under subclass 254. The retort or still is fitted with a plurality of tubes for removal of the distillate. The removal may be from more than one point.
- 258 Valved:**
This subclass is indented under subclass 254. The offtake or offtakes are valved.
- 259 Jacketed:**
This subclass is indented under subclass 254. The pipe through which the distillate is removed from the retort or still is jacketed to contain either a heating or cooling agent.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
153+, and 158+, for distillation systems including a column and 185.1+ for a system including a condenser.
- 260 Cooled:**
This subclass is indented under subclass 254. The offtake is cooled.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
259,
- 261 Residue offtakes:**
This subclass is indented under subclass 254. Means for discharging the residue.
- 262 Feeding and discharging:**
This subclass is indented under subclass 239. The still or retort is associated with means for introducing material into it or for removing residue.
- SEE OR SEARCH CLASS:
110, Furnaces, subclasses 101+ for devices for feeding fuel to a furnace.
193, Conveyors, Chutes, Skids, Guides, and Ways, subclasses 2+ for chutes of particular structure or use.
198, Conveyors: Power-Driven, subclasses 602, 614 and 736+ for a reciprocating pushing bar.
221, Article Dispensing, subclasses 208+, for apparatus having means to affirmatively segregate, separate or move articles from a supply source toward a point of egress.
366, Agitating, subclasses 150.1+ and 185+.
373, Industrial Electric Heating Furnaces, subclasses 33+, 79+, 115, and 142+ for charging and discharging devices for electric furnaces.
414, Material or Article Handling, subclasses 147+ and 586+ as explained in Part V of the definition of this class (202).

263 Smoke escapes:

This subclass is indented under subclass 262. Means for disposing of the smoke and fumes produced while charging or discharging hot distilling chambers.

SEE OR SEARCH CLASS:

266, Metallurgical Apparatus, subclasses 144+, for miscellaneous metallurgical apparatus including means for arresting the fumes from the gases produced in the metallurgical operation.

264 Foam control:

This subclass is indented under subclass 239. Means is associated with the still for preventing foam formation or for breaking foam already formed.

SEE OR SEARCH CLASS:

96, Gas Separation: Apparatus, subclasses 155+ for degasifying means for liquid.
 201, Distillation: Processes, Thermolytic, subclass 9, for a process directed to treating a solid distilland to inhibit foaming.
 203, Distillation: Processes, Separatory, subclass 20, for a process directed to inhibiting foaming of a distilland.
 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 115+ for processes of or compositions for or subcombination compositions for the breaking of or inhibiting of foam colloid systems, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

265 Agitating:

This subclass is indented under subclass 239. The retort or still is provided with means to rock, shake, or otherwise agitate it and the contained distilland or has agitating means provided internally thereof for the same purpose.

SEE OR SEARCH THIS CLASS, SUBCLASS:

175, for means for setting the distilland in motion as a part of the system.

SEE OR SEARCH CLASS:

99, Foods and Beverages: Apparatus, subclasses 277.1 and 277.2.
 159, Concentrating Evaporators, subclass 25.1+
 196, Mineral Oils: Apparatus, subclasses 123 and 124.
 201, Distillation: Processes, Thermolytic, subclasses 31 and 32, for a process directed to agitating the distilland.
 366, Agitating, for specific agitators.

266 Distilland supports and containers:

This subclass is indented under subclass 239. The still or retort is furnished with supports upon or in which the distilland rests. The container may be removable.

SEE OR SEARCH CLASS:

220, Receptacles, subclasses 628+.

267.1 Materials of construction:

This subclass is indented under subclass 239. Subject matter claiming the materials of which the structures classified in this class are constructed.

SEE OR SEARCH CLASS:

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclass 301 for a furnace lining which reacts with the charge.
 201, Distillation: Processes, Thermolytic, subclass 18 for a thermolytic distillation process including utilizing apparatus of a particular composition.
 203, Distillation: Processes, Separatory, subclass 86 for separatory distillation process including reciting apparatus or an element in terms of its composition.
 264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclass 30 for forming or repairing furnace lining and see, "SEARCH CLASS" thereunder for related fields of search.
 373, Industrial Electric Heating Furnaces, appropriate subclasses for electric furnace linings and processes for making.

267.2 Corrugate walls:

This subclass is indented under subclass 267.1. Subject matter wherein the walls of the structure display alternately ridges and groves or furrows.

268 Expansion provisions:

This subclass is indented under subclass 239. The distilling assembly has provision for expansion and contraction as the structure is heated and cooled. This may be in the form of sliding or other joints or devices for allowing expansion and forcing contraction.

SEE OR SEARCH CLASS:

249, Static Molds, subclass 82, wherein molding means is provided to adjust the volume of the apparatus during the molding operation to compensate for change in volume of the material.

269 Air and gas seals:

This subclass is indented under subclass 239. Miscellaneous devices for preventing access or exit of air or gas to the chambers and pipes of the apparatus.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

255+,

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, subclass 242, for drying apparatus having means to seal an opening against gas or vapor leakage and providing for feeding material through the opening.

220, Receptacles, subclass 228.

270 Accessories and details:

This subclass is indented under subclass 81. Miscellaneous group of details of apparatus not provided for above and devices accessory to the operation of the distilling apparatus not otherwise provided for.

END