

CLASS 127, SUGAR, STARCH, AND CARBOHYDRATES

SECTION I - CLASS DEFINITION

This class is designed to include apparatus and processes peculiar to the manufacture of carbohydrates and the products of such processes when not more specifically provided for elsewhere.

Inventions peculiar to the extraction, purification, and crystallization of sugars and the extraction, purification, and treatment of starch, as such, are found here, as well as the manufacture of sugars by hydrolysis of carbohydrates.

- (1) Note. For processes of liberating cellulosic fibers from natural sources which processes involve some chemical action, see References to other Classes, below for the class of Paper Making and Fiber Liberation.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

Processes generally for the hydrolysis of carbohydrates, including their conversion to sugar by other than biochemical hydrolysis, where the process either stops with such conversion or is followed by the steps of purification, concentration, or crystallization of the sugar or sugar solution thereby produced, are found in this class. Processes of hydrolysis of carbohydrates which include the action of diastase or other biochemical steps are for the most part in Class 435, Chemistry: Molecular Biology and Microbiology, subclasses 93, and 98-105, and are included here only when such hydrolysis is followed by steps of concentration, purification, or treatment (such as crystallization) to make a sugar or syrup. Hydrolysis of carbohydrates to sugar by any method when followed by alcoholic fermentation or when directed specially to preparation for alcoholic fermentation is in Class 435. The chemical manufacture or synthesis of sugar or carbohydrates by any other process than that of hydrolysis is not included in this class. Molecular rearrangement of one carbohydrate to form any other carbohydrate is excluded. For such processes search Class 260, Chemistry of Carbon Compounds.

Process of making sugar foods, per se, or the sugars combined with a preservative, including hydrolysis of starch to sugar, are placed in this class. Foods which contain sugars combined with nonsugars (other than a preservative) and processes of making them are in Class

426, Food or Edible Material: Processes, Compositions, and Products.

Mere processes of making, separating, or purifying sugars, starches, celluloses, or other carbohydrates, by operations that include fermentations, and compositions and apparatus that are specialized for use therein, and processes of making such compositions for such use, are classified in Class 435, Chemistry: Molecular Biology and Microbiology.

For electrical or wave energy methods for the preparation of sugars, starches, and carbohydrates involving chemical reactions other than those which result merely from the thermal effects of the electrical or wave energy, see Class 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, especially subclass 697 for electrolytic treatment of sugar and Class 204, Chemistry: Electrical and Wave Energy, especially subclasses 450+ for electrophoretic and electro-osmotic processes (e.g., separation of sugars, starches, and carbohydrates, etc.).

SECTION III - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

- 117, Single-Crystal, Oriented-Crystal, and Epitaxy Growth Processes; Non-Coating Apparatus Therefor, for processes and non-coating apparatus for growing therein-defined single-crystal of all types of materials, including sugar, starch, or carbohydrates.
- 162, Paper Making and Fiber Liberation, subclasses 1+ for processes of liberating cellulosic fibers from natural sources, which processes involve some chemical action.
- 165, Heat Exchange, appropriate subclass for heat exchange apparatus, per se.
- 209, Classifying, Separating, and Assorting, Solids, appropriate subclasses, for separating constituents of a mixture by liquid suspension, sifting, and stratifying.
- 210, Liquid Purification or Separation, appropriate subclasses for filtration or gravitational separation apparatus, especially subclasses 360.1+ for a centrifugal extractor.
- 241, Solid Material Comminution or Disintegration, appropriate subclasses, for processes and apparatus for comminuting sugar, starch, and carbohydrate bearing material. See section 10 of the main class definition of Class 241, for a statement of the line.

- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, for apparatus not provided for elsewhere, for carrying out a chemical or physical reaction or for performing an analysis involving a chemical or physical reaction.
- 424, and 514, Drug, Bio-Affecting and Body Treating Compositions, particularly Class 424, subclass 418, 461+, 479+, 488, 493+, and 499, Class 514 subclasses 777+ and 970 for a composition of that class containing a sugar, starch or carbohydrate.

SUBCLASSES

- 1** Apparatus particularly designed for the treatment of carbohydrates with chemical reagents to effect hydrolysis of sugar.

SEE OR SEARCH CLASS:

- 435, Chemistry: Molecular Biology and Microbiology, subclass 93 and 98-105, for apparatus for hydrolyzing carbohydrates by diastatic mashings or other fermentations.

- 2** This subclass is indented under the class definition. Miscellaneous apparatus for treating sacchariferous material falling , but not within any of the subclasses indented hereunder.

- 3** Apparatus peculiarly designed for the separation of sugar from solid material by lixiviation, leaching, or diffusion.

SEE OR SEARCH CLASS:

- 100, Presses, subclasses 104+ for presses, not elsewhere provided for, having drain means for expressed liquids.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 261+ for leaching apparatus not peculiar to the extraction of sugar.

- 4** Having means for disintegrating the sacchariferous material.

- 5** Means is provided for positively moving the solid material with respect to the container for the leaching liquid.

- 6** The apparatus through which the solid material progresses comprises a plurality of containers connected in series for the leaching liquid.

- 7** The apparatus through which the sacchariferous solid material progresses is tubular.

- 8** The apparatus comprises a system or plurality of cells adapted to receive the material to be leached and connected for circulation of the liquid from cell to cell. No means is provided for moving the solid material with respect to the containers for the leaching liquid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 23, and 68, for apparatus and processes for steeping grain.

SEE OR SEARCH CLASS:

- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclass 261 for leaching apparatus not peculiar to the extraction of sugar.

- 9** Means particularly designed for the treatment of sugar-bearing solutions for purification or concentration or for separation of the sugar in solid form.

SEE OR SEARCH CLASS:

- 159, Concentrating Evaporators, for concentrating apparatus of general application.
- 165, Heat Exchange, appropriate subclasses for heat exchange apparatus of general utility.
- 210, Liquid Purification or Separation, subclasses 360.1+ for a filter of the centrifugal type.

- 10** Apparatus peculiarly adapted for the separation of impurities from sugar solutions by differential diffusion comprising a permeable membrane or partition forming a common wall to two chambers.

- 11** Apparatus peculiarly designed for the precipitation or separation of solid impurities from sugar solutions.

- 12** Apparatus in which the precipitation or separation of impurities from sugar solutions is caused or furthered by the introduction of gas.
- SEE OR SEARCH CLASS:
261, Gas and Liquid Contact Apparatus, appropriate subclasses for gas and liquid contact of general application.
- 13** Vessels particularly designed for permitting or promoting the separation or precipitation of solid impurities from sugar solutions.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
27, for starch-settling tanks.
- SEE OR SEARCH CLASS:
209, Classifying, Separating, and Assorting Solids, subclasses 155+ for separating tanks.
210, Liquid Purification or Separation, subclasses 294+ for a decanter and filter combination, subclasses 322+ for plural distinct decanters, and subclasses 513+ for a gravitational separator.
- 14** Vessels especially adapted for mixing sacchariferous solutions with other liquids or with solids (as chemicals).
- SEE OR SEARCH CLASS:
165, Heat Exchange, subclass 109 for a heat exchange vessel of general application with a stirring device.
366, Agitating, for mixing devices of general utility.
- 15** Apparatus peculiarly adapted for controlling or assisting the formation of crystals from a solution of sugar.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
18, 58-62.
- SEE OR SEARCH CLASS:
117, Single-Crystal, Oriented-Crystal, and Epitaxy Growth Processes; Non-Coating Apparatus Therefor, for processes and non-coating apparatus for growing therein-defined single-crystal
- of all types of materials, including sugar, starch, or carbohydrates.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 245.1+ for non-coating crystallizer apparatus having means for only a physical reaction not provided for elsewhere and subclasses 129+ for non-coating crystallizer apparatus providing means for a chemical reaction not provided for elsewhere.
- 16** Evaporating apparatus peculiarly designed to effect or control the evaporation to crystallization of sugar solutions.
- SEE OR SEARCH CLASS:
159, Concentrating Evaporators, appropriate subclasses, for concentrating apparatus generally.
- 17** Apparatus peculiarly designed for the treatment of sugar crystals.
- 18** Apparatus comprising a mold provided with means to effect the removal of adhering liquid.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
15, for vessels peculiarly designed to permit or promote crystallization of sugar.
- SEE OR SEARCH CLASS:
249, Static Molds, subclass 113 for mold with foraminous liner, and 141 for mold having auxiliary port.
- 19** The molds are mounted on a centrifugal apparatus and provided with outlets to permit the discharge by centrifugal force of the purging liquor or of the liquor adhering to the crystals.
- SEE OR SEARCH CLASS:
210, Liquid Purification or Separation, subclasses 360.1+ for centrifugal filters or strainers.
494, Imperforate Bowl: Centrifugal Separators, appropriate subclasses, for apparatus for breaking up a mixture of fluids or fluent substances into two or more components by centrifuging

within a generally solid-walled, receptacle-like member.

- 20** Apparatus peculiarly designed to free sugar crystals of impurities by draining or washing without destroying the crystals.

SEE OR SEARCH CLASS:

- 100, Presses, subclasses 104+ for presses, not elsewhere provided for, having drain means for expressed liquids.
210, Liquid Purification or Separation, subclasses 348+ for apparatus to separate liquid and solid by filtration or draining.

- 21** Apparatus comprising a mixing device and peculiarly designed to dry or size the sugar grains after they are formed.

SEE OR SEARCH CLASS:

- 34, Drying and Gas or Vapor Contact With Solids, appropriate subclasses, for the drying process or apparatus subcombination.
241, Solid Material Comminution or Disintegration, appropriate subclasses for comminuting apparatus.

- 22** Apparatus peculiarly adapted to liquefying crystalline sugars whether by heating or dissolving.

SEE OR SEARCH CLASS:

- 239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 310+ for dissolvers and mixers for discharging the solution or mixture through a terminal nozzle element.
422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 256+ and 261+ for leaching, dissolving, and extracting apparatus.

- 23** Apparatus peculiarly designed for the separation or purification of starch or the treatment of pure starch.

- 24** Apparatus peculiarly designed for the separation of starch from starch-bearing raw material or for the treatment and purification of starch-containing substances.

SEE OR SEARCH CLASS:

- 209, Classifying, Separating, and Assorting Solids, appropriate subclasses, for apparatus for separating and purifying grain.
241, Solid Material Comminution or Disintegration, appropriate subclasses for grain comminutors.

- 25** Apparatus designed particularly for the bolting or washing of starch-bearing material to separate impurities, as the hulls and chaff of the grain, from the starch or starch liquor.

- 26** Apparatus comprising an inclined plane or a run adapted to receive the starch deposited thereon from the starch liquor as it flows thereover.

SEE OR SEARCH CLASS:

- 209, Classifying, Separating, and Assorting, Solids, subclass 458, and indented subclasses, for stationary troughs and tables.

- 27** Vessels particularly designed for permitting or promoting the separation by gravity of starch from liquid or solid impurities.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 13, for vessels adapted to separate solid impurities from sugar solutions.

SEE OR SEARCH CLASS:

- 210, Liquid Purification or Separation, subclasses 294+ for a decanter and filter combination, subclasses 322+ for plural distinct decanters, and subclasses 513+ for a gravitational separator.

- 28** Apparatus peculiarly designed to cook or cook and prepare starch.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 1, for hydrolyzing apparatus.

- 29** Sugars, starches, dextrines, and miscellaneous carbohydrates, not provided for in the subclasses indented hereunder, together with processes peculiarly directed to their production.

- (1) Note. Processes when claimed or disclosed as having a more general character than the production of a special product are cross-referenced into the process subclasses below.
- (2) Note. For electrical or wave energy methods for the preparation of sugars, starches, and carbohydrates involving chemical reactions other than those which result merely from the thermal effects of the electrical or wave energy, see Class 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, especially subclass 697 for electrolytic treatment of sugar and Class 204, Chemistry: Electrical and Wave Energy, especially subclasses 450+ for electrophoretic and electro-osmotic processes (e.g., separation of sugars, starches, and carbohydrates, etc.).
- SEE OR SEARCH THIS CLASS, SUBCLASS:
30, 31, 32, and 33, see also subclass 71 for processes of treating starch.
- SEE OR SEARCH CLASS:
106, Compositions: Coating or Plastic, appropriate subclasses, particularly subclass 5, 31.24, 31.26, 31.68, 31.94, 123.12, 124.51, 124.61, 124.81, 125.1+, 135.1+, and 162.1+, 617, 674, 687, 726, 729+, 779+, 804+, for carbohydrate containing coating or plastic compositions.
426, Food or Edible Material: Processes Compositions, and Products, subclasses 70+ especially 103, and 213+ for edible products containing sugars, carbohydrates, admixed with other substances.
536, Organic Compounds, subclasses 1.11+ and indented subclasses for carbohydrate derivatives which are not carbohydrates.
- 30** Pure sugar products and processes peculiar to their manufacture. Includes mixtures of pure sugars.
- 31** Milk sugar and processes peculiar to its manufacture.
- 32** Starches which have been chemically modified or incipiently hydrolyzed either by the action of added reagents or by cooking or special heat treatments, but which still give a blue or violet reaction with iodine, and processes of making them.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
38, and indented subclasses, for hydrolysis of starch where it is carried to a point where the blue or violet reaction with iodine is no longer obtained.
- 33** Starches which have been chemically modified or hydrolyzed by the action of added reagents, but which give a blue or violet reaction with iodine and processes of making them.
- SEE OR SEARCH CLASS:
106, Compositions: Coating or Plastic, appropriate subclasses 145.1+, 162.51, 162.81, and 206.1+, for starch containing coating or plastic compositions.
- 34** Processes peculiar to the extraction, purification, and treatment of carbohydrates.
- SEE OR SEARCH CLASS:
162, Paper Making and Fiber Liberation, subclasses 1+ for the chemical extraction or purification of cellulose fiber.
260, Chemistry of Carbon Compounds, for synthetic manufacture of carbohydrates and for molecular rearrangement of one carbohydrate to form another.
435, Chemistry: Molecular Biology and Microbiology, subclasses 277+ for purification or separation of cellulose and subclass 276 for purifying or separating dextrine by processes that include fermentations.
- 36** Designed to include processes broadly for the hydrolysis of carbohydrates by nonbiochemical methods where the process either stops with such hydrolysis or is combined with steps of

- purification concentration, or crystallization of the sugar or sugar solution thereby produced.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
1, for apparatus for hydrolysis, and subclasses 32 and 33, for partial hydrolysis directed to making modified starch.
- SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclass 93 for diastatic hydrolysis of carbohydrates, and subclasses 98-105 for other fermentative hydrolysis of carbohydrates.
- 37** Processes directed toward the manufacture of sugar products from cellulose or cellulose-containing substances by hydrolysis of the cellulose.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
38, 41.
- SEE OR SEARCH CLASS:
162, Paper Making and Fiber Liberation, subclasses 1+ for the chemical extraction or purification of cellulose fiber.
- 38** Processes directed toward the manufacture of conversion products from starch or starch-bearing substances by hydrolysis of the starch.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
32, 33.
- 39** The starch is separated from the other constituents of the amylaceous material before hydrolysis. The resulting sugar may be purified.
- (1) Note. Actual separation of the starch is effected, not merely preliminary treatments, as mashing or disrupting cells.
- SEE OR SEARCH CLASS:
209, Classifying, Separating, and Assorting Solids, appropriate subclasses.
- 40** The amylaceous material is treated for hydrolysis without purification or separation of the starch, and the resulting sacchariferous product is purified.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
38, 39, 42, and indented subclasses for sugar purification.
- 41** Processes directed toward the manufacture of invert sugar by the inversion or hydrolysis of sucrose.
- 42** Processes peculiar to the treatment of sacchariferous material and to the extraction, purification, and crystallization of sugar.
- SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclass 276 for purifying or separating sugars by processes that include fermentations.
- 43** Processes peculiar to the separation or lixiviation of sugar from solid material, as plants.
- SEE OR SEARCH CLASS:
100, Presses, subclasses 35+ for methods of pressing, not elsewhere classified, and particularly subclass 37 for such methods involving the separation of expressed liquid from the material compacted.
- 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 255+ for leaching apparatus.
- 44** A chemical reagent is present during the separation or lixiviation.
- 45** The solid material under treatment and the leaching or lixiviating liquid are moved in opposite directions.
- 46.1** **Treatment of sacchariferous solutions:**
This subclass is indented under subclass 42. Processes for treating sugar solutions for purification or crystallization.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
40, for the hydrolysis of starch to sugar and purifying sugar solutions.

SEE OR SEARCH CLASS:

- 204, Chemistry: Electrical and Wave Energy, especially subclasses 450+ for electrophoretic and electro-osmotic processes (e.g., separation of sugars, starches, and carbohydrates, etc.).
- 205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, especially subclass 697 for electrolytic treatment of sugar.

46.2 Involving ion manipulation, e.g., ion exchange, etc.:

This subclass is indented under subclass 46.1. Processes involving use of ion exchange material or other ion manipulation material to treat the solution.

46.3 For ion exclusion:

This subclass is indented under subclass 46.2. Processes wherein the material functions to hold back the sugars and passes ionic species.

47 The sucrose is precipitated from the solution in chemical combination, e.g., saccharate.

48 Processes peculiar to the precipitation of impurities from solutions containing sugars. Precipitation may be effected by heat or by added reagents provided a rearrangement of molecules is effected.

49 The precipitation of the impurities is effected by the addition of an absorbent for impurities, the absorbent being impregnated with the precipitating reagent.

50 The impurities are precipitated by the addition of a reagent to a solution previously treated with an alkali or with a reagent having an alkaline reaction.

51 The precipitation of impurities is effected by the addition of a precipitating reagent to a solution previously treated with an acid or with a reagent having an acid reaction.

52 The precipitation of impurities involves the addition of a reagent in gaseous form.

53 Processes directed to the separation of impurities from sugar solutions by mechanical processes.

54 The separation of impurities from the sugar solution is effected by differential diffusion through a permeable membrane or partition.

- (1) Note. When the membrane is the cellular plant structure. Search this class, subclass 43, and indented subclasses.

SEE OR SEARCH CLASS:

204, Chemistry: Electrical and Wave Energy, subclasses 518+ for electrophoretic or electro-osmotic barrier separation (e.g., electro-dialysis of sugars, starches, or carbohydrates, etc.).

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, appropriate subclasses for electrolytic treatment involving the use of a membrane, especially subclass 697 for electrolytic treatment of sugar.

55 Filtering or sorption:

This subclass is indented under subclass 53. Processes for separating impurities from solutions by filtration or selective sorption, or both, which are peculiar to sugar.

SEE OR SEARCH CLASS:

204, Chemistry: Electrical and Wave Energy, subclasses 518+ for electrophoretic or electro-osmotic barrier separation (e.g., electro-dialysis of sugars, starches, or carbohydrates, etc.).

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, appropriate subclasses for electrolytic treatment involving the use of a membrane, especially subclass 697 for electrolytic treatment of sugar.

210, Liquid Purification or Separation, subclasses 660+ for a process of purification by ion exchange or sorption, subclasses 702+ for a purification process including precipitation, and subclasses 767+ for a purification process

- including separating, especially subclasses 781+ and 787+ for centrifugal extraction.
- 502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, for a composition comprising a catalyst or sorbent, per se.
- 56** Processes peculiar to the separation of impurities from sugar solutions of greater or less specific gravity than the impurities by centrifugal force.
- SEE OR SEARCH CLASS:
- 210, Liquid Purification or Separation, subclasses 781+ and 787+ for a purification process comprising centrifugal extraction.
- 494, Imperforate Bowl: Centrifugal Separators, subclass 37 for a process for breaking up a mixture of fluids or fluent substances into two or more components by centrifuging within a generally solid-walled, receptacle like member.
- 57** Processes peculiar to the separation of impurities from sugar solutions of greater or less specific gravity than the impurities by the action of gravity.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 13, 27 and 69.
- SEE OR SEARCH CLASS:
- 209, Classifying, Separating, and Assorting Solids, appropriate subclasses indented under subclass 155.
- 210, Liquid Purification or Separation, subclasses 800+ for a purification process involving gravitational force.
- 58** Processes peculiar to the treatment of sugar solutions to effect crystallization or solidification of the contained sugars.
- SEE OR SEARCH CLASS:
- 23, Chemistry: Physical Processes, subclass 295 and indented subclasses for crystallization of inorganic chemicals.
- 117, Single-Crystal, Oriented-Crystal, and Epitaxy Growth Processes; Non-Coating Apparatus Therefor, for processes and non-coating apparatus for growing therein-defined single-crystal of all types of materials, including sugar, starch, or carbohydrates.
- 532, through 570 Series of Classes, Organic Compounds, appropriate subclasses for the crystallization of a specific organic compound.
- 59** Processes directed to the crystallization of sugar in molds.
- 60** Sugar crystallizing processes in which the crystallization is promoted or controlled by the addition to the solution under treatment of crystals from another solution.
- 61** Processes in which the crystallization of the sugar is effected or promoted by the concentration of the sugar in solution by evaporation.
- 62** Processes directed to the systematic treatment of sugar solutions to effect crystallization by evaporation in which a product separated at an intermediate stage of the process is returned into the process at either an earlier or a later stage.
- 63** Processes peculiar to the treatment of crystallized sugar.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 15, and 16.
- SEE OR SEARCH CLASS:
- 23, Chemistry: Physical Processes, subclasses 295+ for processes of crystallizing in general.
- 209, Classifying, Separating, and Assorting Solids, subclasses indented under subclass 233 for sifting apparatus.
- 241, Solid Material Comminution or Disintegration, appropriate process subclasses, for processes of comminuting sugar.
- 64** Processes peculiar to the freeing of sugar crystals of impurities or adhering liquid or to the bleaching of sugar crystals.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
17+,
- SEE OR SEARCH CLASS:
210, Liquid Purification or Separation, subclasses 781+ and 787+ for a purification process comprising centrifugal extraction, and subclasses 360.1+ for centrifugal extractors.
- 65** Processes peculiar to the treatment of amylaceous material and to the extraction, purification, and preparation of starch.
- SEE OR SEARCH CLASS:
435, Chemistry: Molecular Biology and Microbiology, subclass 275 for purifying or separating starch by processes that include fermentations.
- 66** Processes peculiar to the extraction of starch from plant roots or tubers.
- 67** Processes peculiar to the treatment of material having starch as one of its constituents and designed to effect or to expedite the extraction of the starch. The material treated may be the plant itself or grain or may be an intermediate.
- SEE OR SEARCH CLASS:
241, Solid Material Comminution or Disintegration, subclasses 6+ for processes involving comminution of grain and the like.
426, Food or Edible Material: Processes, Compositions, and Products, appropriate subclasses, especially 288, and 482+, for processes of removing husks from grain.
- 68** Processes involving the cooking or softening of grain or amylaceous plant material by liquid or steam treatment. The liquid may or may not contain an added chemical.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
28,
- SEE OR SEARCH CLASS:
426, Food or Edible Material: Processes, Compositions, and Products, appropriate subclasses, especially 506+ for processes involving the treatment of an edible material with an aqueous material.
435, Chemistry: Molecular Biology and Microbiology, subclass 435 for processes that include steeping seeds or grain.
- 69** Processes peculiar to the treatment of liquids containing starch or starchy matter for the recovery or purification of the starch.
- 70** The treatment of the starch containing liquid involves the addition of a chemical or involves some chemical action.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
42, and indented subclasses, for purification and treatment of sugar solutions.
- 71** Processes peculiar to the treatment of starch which fall short of chemical modification.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
32, and 33, for modified starches and processes of making, including cooking, and 36, and indented subclasses for treatments of starch for conversion to nonstarch products.
- SEE OR SEARCH CLASS:
34, Drying and Gas or Vapor Contact With Solids.

END