The Waxes and Higher Aliphatic Alcohols in 1932

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A REVIEW of the journal and patent literature relating to the animal and vegetable waxes for the year just passed has been made. The scope of the review is limited to those references found in a page-by-page survey of Volume 26 of Chemical Abstracts, although in a few instances articles not usually abstracted are reported here. This scheme naturally includes much work published late in 1931 and omits a number of papers appearing in the latter part of 1932, but it at least serves as a record of recent progress on the subject.

The commercial interest attached to the higher aliphatic alcohols and the use of these compounds in the preparation of some of the newer synthetic waxes, has led to their inclusion in this review. Many of the alcohols are produced from wool wax, sperm oil and montan wax and are finding increased use in the manufacture of emulsifying, penetrating, scouring and wetting agents, particularly in the textile industry. The comparatively large number of reviews and patents relating to the higher aliphatic alcohols which appeared during the past year attest the interest in this rapidly growing branch of chemical technology.

ANIMAL WAXES

Beeswax

Bees secrete a resin with which they fasten down hive covers and spread over the inside of the frames. This is known as bees' resin, bee glue or propolis and its chemical composition was investigated by Jungkunz (1). This wax, when separated from balsam and resin, was found to differ from the beeswax in solubility and to contain no cholesterol which led to the conclusion that propolis is a mixture of resin and vegetable wax obtained by the bees from one common but yet unknown source.

The solubility of beeswax in a number of common solvents was determined by Deeney (2). The ratio of wax to solvent at which complete solution was had at 25° but congealing took place at 24° was made the basis of the solubility figures reported in tabular form.

Power and Hauber (3) called attention to the various methods for the determination of saponification number of beeswax which have been reported in the literature. Based on much experimental evidence they recommended the use of potassium hydroxide in absolute alcohol for the accurate determination of this characteristic in candle mixtures. They also described a method for acid number. By dividing the ester number of the candle by the ester number of beeswax, the percentage of beeswax in the candle was obtained. A few historical notes concerning the liturgical use of beeswax candles were given in this paper also.

To obtain waxes of high melting point Rabinovich and Kormer (4) heated beeswax for one-half to one hour at 220-230° in presence of PbO and Pb_3O_4. The resulting product melted at 78° and was darker and harder than the original wax. The preparation was stated to be satisfactory as a leather finishing material and was given the name "Karmorin."

A milk-potato-egg-peptone-beeswax medium was found by Petragnani (5) to be useful for isolating and diagnosing the bovine type of tubercle bacillus in pathological tissues.

The U. S. Department of Commerce (6) reported a consistent decline in importations of beeswax from overseas. Import figures for the years 1929, 1930, and 1931 were given. Beeswax exports from Madagascar for 1930 and 1931 were reported by the American Vice Consul at Tananarive (7).

In an article entitled "The Rise of Beekeeping," Bilsing (8) described the use of beeswax by the Ancients.

Wool Wax (Wool Fat, Wool Grease, Lanolin)

A review of modern agents for degreasing wool was made by Airoldi (9) with particular attention to the agent "Erioplyon." By using benzine, Hassel (10) was able to extract all but about 1% of the grease from raw wool after first washing the wool in warm water and drying in a high vacuum. The benzine extract was filtered through charcoal, dried with calcium chloride and the solvent removed by vacuum distillation. This process gave a product of high purity. By pressing through a cooled filter press the high-melting constitutents were separated from the low-melting. A process for the production of high grade lanolin was also described.

The recovery of grease from wool washing liquors and its subsequent preparation for market on an economical basis has always been a serious problem for the wool scourer. These liquors consist of an extremely stable emulsion of the grease in water, holding in suspension a considerable amount of dirt. The works of Cirolanum Ltd. in England are equipped to handle such liquors by the Barber Jet Process (11). The crude grease thus recovered is purified and distilled to produce industrially useful products known as "Cebacols," consisting mainly of wax alcohols. Cerotic and other acids are likewise prepared as well as several grades of pitch. A description of the improved Duhamel wool scouring bowl was given by Mullin (12).

Lanolin continues to receive attention in the pharmaceutical field. A formula for zinc oxide ointment containing anhydrous lanolin was suggested by Miller, Dekay and Lee (13) to overcome the stiffness of the U. S. P. X. preparation. Clarke (14) prepared a sterile, permanent emulsion of acriflavine with the aid of lanolin. A method for making a rubber adhesive surgical plaster with lanolin in the composition was described (15). Schmatolla (16) reviewed the modern ointment bases including those made with lanolin and the antiseptic value of phenol ointments containing this substance was studied by Husa and Radin (17).

Lanolin was chosen by Marsh and Mills (18) as having outstanding advantages as a temporary rust preventer. Its film characteristics, low cost, ease of application and removal and non-volatility made it superior to paraffin oils, mineral jellies, etc. A solution of lanolin in white spirit was recommended (19) for rust-proofing machinery.

Sanders (20) described a composition containing lanolin and Halowax suitable for the preservation of book bindings. The preparation was tested at the Baker Library of Dartmouth College and found to be very satisfactory.

The effect of adding moellon degras (wool grease) to cod oil in the fat-liquoring of chrome leather was studied by Theis and Hunt (21).

Many lubricants used for textile machinery produce stains on fabrics coming in contact with them. Hirst (22) investigated the effects of exposure to light, of scouring and dyeing, and of steaming and storing on wool stained with 70% wool grease olein and other lubricants. Sulfonation products of wool grease were mentioned by Lederer (23) as dispersing agents in the dyeing of wool with naphthol AS.

Lifschütz (24) stated that the "oxycholestenol" mentioned by Frick in German Patent 485,198 as a constituent of wool grease is identical with isocholesterol, melting at 137°.

In a study of the genesis of jaundice, Maeda (25) found that long-continued feeding of lanolin to rabbits increased the cholesterol content of the blood and at the same time decreased the power of the liver to excrete bilirubin. Leopold, Bernhard and Tow (26) investigated the change in lipide content in the blood of children after the application of anhydrous wool fat and exposure to ultra-violet radiation.

Sperm Oil and Spermaceti

The preferential wetting of water versus 26 liquids, including sperm oil, was studied by Davis and Curtis (27). The smoke, flash and fire points of this oil were found by Dickhart (28) to be: 130, 510 and 672° F., respectively. Jakeman and Barr (29) showed that sperm oil caused a sludge when used to lubricate high-lead bearing alloys. They also reported that alkali metal-lead alloys containing less than 2% Pb dissolve freely in this lubricant.

Last September a plea was made before the U. S. Tariff Commission for a lower duty on crude sperm oil. The case was reported in some detail in the Oil, Paint and Drug Reporter for September 26, 1932, and is of interest because the comparative costs of refining sperm oil and producing spermaceti in this country and Canada are discussed.

According to Mikó (30) good spermaceti should melt at 50° and solidify at 45°. The acid number should be less than 2, the iodine number 0 to 8 and the ester number 116 to 133.

Other Animal Waxes

The oil of the "castor oil fish" (*Ruvettus pretiosus*) was investigated by Cox and Reid (31) who classify it as a liquid wax. The alcohols identified in the unsaponifiable portion which comprised 48.5% of the oil were: oleyl, tetradecyl, cetyl and octadecyl. The acids present were stearic, oleic, gadoleic, hydroxoleic, erucic and traces of two others. A small quantity of cholesterol and traces of squalene and glycerol were also found. Leaper and Greene (88) called attention to the commercial possibilities of this product.

Octadecyl, cetyl and selachyl alcohols were reported to be present in the unsaponifiable portion of shark egg oil (from *Heptranchias deani,* Jordan and Starks) by Ono (32). An unknown higher alcohol was also detected.

Thannhauser and Fränkel (33) separated a yellow wax from the so-called unsaponifiable matter of mammalian liver. This was purified by repeated crystallization and found to consist mostly of lignoceryl-sphingosine.

Methods for determining the wax content of shellac were described by Hartman (34) and by Olsen (35). The latter also found that the specific gravity of shellac wax at 15.5° was 1.028. Whitmore, Weinberger and Gardner (36), continuing their studies on the nature and constitution of shellac, tabulated the wax content of seven commercial grades of this material.

The unique occupation of wax-farming, carried on in China to provide the Chinese insect wax of commerce, was described in a popular manner by Beardsley (37).

Exports of "Lokombitsika" or ant wax from Madagascar were reported by the American Vice Consul at Tananarive (38). This material contains only 12% of true wax and the term "Madagascar shellac" is more appropriate than ant wax.

VEGETABLE WAXES

Carnauba Wax

Two new synthetic waxes, introduced by the I. G. Farbenindustrie A. -G. were described by Schneider and Folgner (39). They are intended to replace carnauba for hardening soft waxes.

A mixture of boiled linseed oil and carnauba wax was among several compositions investigated by Farkas (40) for sizing acetate rayon. The slipping property of the fiber was increased in highest degree by the wax sizing but there were several serious drawbacks to this mixture.

Including September, 1932, carnauba wax imports were running behind the same period of 1931 by about 1.5 million pounds, according to the U. S. Bureau of Foreign and Domestic Commerce (41).

Montan Wax

Various phases of the significance of waxes in the decomposition of plant remains and in the formation of coal, asphalt and petroleum were discussed by Fischer (42), Terres (43), Berl (44), Waksman and Gerretsen (45), Pichard (46), Berl, *et al* (47) and by Berl, Schmidt and Koch (48). In this connection the coalification of waxes and resins (including carnauba wax) which was reported by Berl and Schmidt (49) will be of interest.

In a study of the sterols of resin bitumens Ruhemann and Raud (50) investigated the composition of the wax-resin bitumen mixture extracted from mid-German brown coal. An elaborate report by Lander (51) on the tars and oils produced from coal included an investigation of the wax content of tars produced under different conditions. The waxes found in humic coals were discussed by Stadnikov (52) in connection with the fusibility and caking of bituminous coals.

The constituents and characteristics of two crude montan waxes were reported by Marcusson and Lederer (53). By esterifying montanyl alcohol with montanic acid the I. G. Farbenindustrie A. -G. has developed a number of synthetic waxes (Lanette Waxes). These were described by Justin-Mueller (54). Rakowski and Edelstein (55) extracted a wax from the peat of the Redkinski pit and Titov (56) investigated the wax fraction from a sphagnum peat.

Other Vegetable Waxes

A wax was found to be present in red beechwood by Runkel and Lange (57). Chilikin (58) described the removal of wax-like substances from flax with a strongly emulsifying cooking liquor and Köhler (59) discussed the influence of wax, etc. on the moisture content of raw cotton. The presence of ceryl alcohol in the barks of the mountain ash (*Sorbus aucuparia,* L.) and castanea (*Castanea sativa,* Mill.) was reported by Danoff and Zellner (60). The latter investigator also tabulated (61) the waxes, sugars, etc. occurring in the non-tannins of the bark from 26 species of

trees. Koepfli (62) extracted a waxy material from the bark of *Rauwolfia caffra,* Sonder.

Pollard, Chibnall and Piper (63), in an investigation of the wax constituents of forage grasses, found the chief constituent of cocksfoot wax to be hexacosanol, with a small amount of tetracosanol present. The former alcohol was also present in the constituents of perennial ryegrass wax. The wax metabolism in the leaves of Brussels sprouts was studied by Sahai and Chibnall (64) and the wax occurring on tobacco leaves was mentioned by Yamafuji (65).

A wax-like substance was extracted by Jermstad (66) from service berries (*Sorbus acuparia*) but its chemical nature was not reported. The chemical composition of apple cuticle wax was studied by Chibnall and co-workers (67) while Heim de Balsac (68) determined the fat and wax content of tow from the banana tree. Heinz (69) gave a method for separating wax in the analysis of hops and barley husks and Cortesi (70) found a small amount of wax in dry hop cones.

According to Spies and Drake (71) the plant *Parosela barbata* (Oerst.) Rydb. contains a small amount of montanyl alcohol. Chuang and Tien (72) found myricyl (melissyl) alcohol in the Chinese drug "lang-tu," and a wax was reported to be present in the peperina (*Bystropogon mollis,* Kth.) by Preioni (73). In the non-volatile residue from oil of sweet oranges grown in French Guinea, Naves (74) isolated ceryl alcohol and cerotic acid.

Continuing his study of the relation of the properties of plant substances to climate and habitat, McNair (75) reported a survey of 232 waxes, occurring in 84 plant families. The melting points, molecular weights and ultimate composition of hydrocarbons, acids, alcohols and esters were considered for each climatic group.

The yama-hazé, tsuta-urushi and yama-urushi waxes investigated by Tsujimoto (76) were obtained from sumach berries and are therefore fats instead of waxes in the true sense of the term.

Anderson (77) reviewed the chemistry of the tubercle bacilli lipoids and stated that the wax-like substance is not a wax as we understand the term but a complex phosphatide containing a large proportion of a polysaccharide in its molecule. Other studies concerning the bacillus waxes were made by the following: Burt and Anderson (78), Pangborn and Anderson (79), Uyei and Anderson (80) and by Chargaff (81).

The Higher Aliphatic Alcohols

Various reviews relating to these alcohols, their sulfonated products and lime-proof soaps made from them were published by Lederer (82), Briscoe (83), Kertess (84), Heuter (85), Pomeranz (86), Welwart (87) and by Leaper and Greene (88). In the latter article the preparation of sulfonated sperm oil on a factory scale is described. Janistyn (89) reviewed the properties of cetyl alcohol and the kiering of cotton fibers with the aid of a sulfonated fatty alcohol was related by Ullmann (90).

A number of physical constants of extremely pure cetyl alcohol were determined by Delcourt (91). According to Araki (92) the dry distillation of cetyl alcohol yielded volatile hydrocarbons and a residue consisting of unsaturated hydrocarbons.

By using copper chromate on kieselguhr as a catalyst, a temperature of 320° and a pressure averaging 200 atmospheres, Oda (93) was able to reduce fats to the corresponding alcohols. Stearic acid, ethyl stearate, soy bean oil, castor oil, olive oil and cacao fat were used, about 80% of the fat being reduced.

Further references to the preparation and uses of the higher alcohols will be found in the section on patents.

Use of Waxes in the Industries

Among other substances, waxes were discussed by Truax (94) in relation to the development of wood adhesives and gluing technic. Paffenbarger and Sweeny (95) described the use of inlay wax in dental casting practice. Ginsburg (96) investigated the possibility of using waxes as carriers of insecticides. He worked with spermaceti, candelilla and paraffin waxes and found that emulsions containing 1% of wax impregnated with pyrethrum or derris extracts were highly toxic to sucking and chewing insects.

The use of a wax such as beeswax in lithographic chalks, transfer inks and "wash-out solutions" was included by Tritton (97) in a discussion of the theory of lithographic printing.

Rabak (98) stated that the use of a combination of silica and wax improved the rancidity resistance of porous pulp boards. The wax sizes for paper described by Kumler (99) relate only to compositions containing rosin and paraffin wax. The uses of wax in the paper and textile industries was described by Geils (100).

Fireproof paints were classified by Rinova (101) and the use of waxes, among other things, to reduce the thermal conductivity of the paints was mentioned.

The fats, oils and waxes of the British Pharmacopoeia, 1932, were described by Parry (102) and a comparative study of the cerates, pomades and ointments of the Belgian Pharmacopoeias III and IV was reported by Hublet (103).

Analysis

A method for determining the softening and melting points of special waxes was worked out by Glickman (104) who reported data for carnauba and paraffin waxes in comparison with Gelowax. Pycnometers and graduated cylinders were employed by Rakuzin (105) to find the specific gravity of solid fats and waxes. The determination of hydroxyl number of oils, fats and waxes (carnauba and beeswax) was investigated by Roberts and Schuette (106).

Csipke (107) published a scheme for the analysis of salve bases whereby the wax, lanolin or spermaceti content could be determined. The appearance of waxes of the D. A.-B when viewed under the analytical quartz lamp was related by Peyer (108).

General

In order to identify the acids with 20 to 30 carbon atoms isolated from peanut oil, beeswax, montan wax and Chinese insect wax, Bleyberg and Ulrich (109) found it necessary to synthesize the corresponding normal acids. The methods employed were described and the melting points, densities and refractive indices of the acids and their corresponding ethyl esters, alcohols, iodides and anhydrides reported.

In a completely hydrogenated wax there is little difference between the melting and freezing points, according to Ueno, Inagaki and Tsuchikawa (110). They also observed that the melting point of the fatty acids is one to two degrees higher than the freezing point while the latter is 7 to 8° lower than the melting point of the wax before hydrogenation.

Kadmer (111) made a general survey of three-phase colloidal systems of oils, fats, waxes and resins. Problems in the chemistry of fats and waxes were considered in an address by Bauer (112) and a method for bleaching waxes with benzoyl peroxide was given by Caberti (113).

A comprehensive investigation of the retention of solvent by various waxes was made by Ivanovsky (114).

The waxes included were crude and bleached montan, Japan, carnauba, beeswax, refined ozocerite, paraffin and a number of mixtures. Under standardized conditions it was shown that the solvent retention of specific waxes is constant within narrow limits and numerically characteristic. This property can be used as a criterion of identity and purity.

BOOKS

Fabrication des Cirages et Produits d'Entretien by A. M. Villon. Paris: E. Malfere. F. 20.

The book describes the manufacture of various polishes for floors, shoes, leather, metals, etc. The preparation of solid, liquid and paste wax polishes is given in detail.

Taschenbuch für die Wachs-Industrie by E. J. Better and J. Davidsohn. (Edited by Carl Lüdecke.) Stuttgart: Wissenschaftliche Verlagsgesellschaft m.b.H. RM. 12.50.

This "pocketbook" treats the subject of waxes from the industrial point of view. Not only are the true animal and vegetable waxes considered, but those wax-like substances such as tallow, stearin, Japan wax, ozocerite and paraffin are included. A chapter is devoted to the chemicals used in the wax industry and is followed by others on the manufacture and control of wax products, bleaching, etc. Polishes, shoe creams, molded articles, emulsions and the like are described with numerous formulas. There is also a collection of recent patent abstracts and a bibliography.

Chemical Patents Index. 1915-1924. *Volume II. C, D and E.*, by Edward Chauncy Worden. New York: Chemical Catalog Co. 1,190 pp.

The second volume of Worden lists 77 patents referring to carnauba wax, 14 to candelilla, 7 to Chinese insect wax and a number of others concerning such subjects as cerotic acid, cetyl alcohol, cotton wax, dammar wax, cable wax, wax candles, etc.

PATENTS

United States

1,823,869. (9-15-31). Bauer. A mixture of ester gum, "ricinic wax varnish" and a powdered metal is used in a process for coating iron plates or strips.

1,824,428. (9-22-31). Fisher. Specifies a composition of montan wax, heavy oil, clay and a preservative salt for impregnating timber.

1,825,248. (9-29-31). Pungs and Behringer. Bleached montan wax is heated with a fatty acid and a polyhydroxy compound such as ethylene glycol to form products resembling natural waxes.

1,825,249. (9-29-31). Pungs and Behringer. Same as preceding but specifying an acid such as ricinoleic.

1,825,342. (9-29-31). Dreyfus, Whitehead and Platt. A dye dispersed in a wax is employed in a process for embossing and printing on cellulose acetate fabrics.

1,825,785. (10-6-31). Finn. Pigments mixed with wax are used to produce colored coatings on candles.

1,826,696. (10-6-31). Charch and Prindle. A composition for forming wrapping films is composed of a cellulose derivative, a high melting point wax and suitable solvents. Patents 1,826,697 to 1,826,699 inclusive relate to applications of this composition.

1,826,900. (10-31-31). Schraeder. Emulsifiers for waxes, etc., are prepared from polyhydric alcohols and fatty acids, such as stearic acid. (See French 690, 330; Chem. Abs. **25**, 1038.)

1,827,737. (10-20-31). Coolidge. A composition of montan wax, paraffin and lubricating oil is specified for bearings.

1,829,611. (10-27-31). Ryan. A cloth finishing composition is made from stearic acid, "sol wax," tapioca flour, etc.

1,829,998. (11-3-31). Martell. Relates to a rubber composition for submarine cables, containing montan wax.

1,830,502. (11-3-31). Barnes. Lanolin is treated with a mixture of ethyl acetate and alcohol. The undissolved material is separated and the solvent evaporated to recover an emulsifying agent for use in ointments, cold creams, etc.

1,832,660. (11-17-31). Sadtler. A design of wax on a paper base is used as a transfer sheet for ornamenting or marking fabrics.

1,834,056. (12-1-31). Guthke and Pungs. A portion of the carboxyl groups of the free acids present in bleached montan wax is esterified to produce a wax free from any tendency to crystallize.

1,834,865. (12-1-31). Pungs and Behringer. Bleached montan wax is melted and treated with air at 160-180° C. for a short time to give a product resembling beeswax.

1,834,866. (12-1-31). Pungs and Behringer. A current of gas containing free oxygen is passed through montan wax at 120-220° C. in presence of a small amount of oxalic acid to obtain a pale, soft wax. (See 1,825,248-9).

1,836,020. (12-15-31). Freytag. Treatment with ethyl alcohol under elevated temperature and pressure is used to purify montan wax.

1,838,707. (12-29-31). Rutzler, Kokatnur and Rollhaus. Waxes, etc., are bleached with a substance such as benzoyl peroxide in presence of calcium hydroxide.

1,838,908. (12-29-31). Ellis. A wax-conditioned paint and varnish remover contains a monocyclic hydrocarbon which is a good wax solvent.

1,839,868. (1-5-32). Damarin and Harper. Relates to an oil for impregnating wax-filled insulation.

1,839,974. (1-5-32). Lazier. Fatty acids, such as lauric and stearic, are hydrogenated to produce higher alcohols and acids.

1,839,996. (1-5-32). Rose and Cude. Cotton fiber is treated to remove waxes, etc., before coating with rubber.

1,840,349. (1-12-32). Bertsch. Oleyl alcohol is employed in a process for fat cleavage.

1,841,070. (1-12-32). Story. About 0.5% of cetyl alcohol is added to transformer oil to inhibit formation of sludge.

1,841,944. (1-19-32). Geere. In the production of carbon dioxide an acid salt is coated with a fat or wax before mixing with carbonate. (See 1,863,157).

1,842,002. (1-19-32). Zschoch and Rodrian. Carnauba wax is refined by dissolving in hot acetic ester and treating the resulting solution with activated charcoal.

1,842,893. (1-26-32). Baker and Weaver. A wax is employed in an adhesive composition designed for laying linoleum and tile.

1,843,428. (2-2-32). Günther, et al. An aromatic sulfonic acid containing alkyl groups mixed with a protective colloid is used as an emulsifying agent for oils, fats and waxes.

1,844,835. (2-9-32). Abbott. A leather substitute is prepared from a mixture of carnauba wax, shellac-borax solution and soap applied to a fibrous base.

1,845,250. (2-16-32). Driscoll. A mixture of potassium soap, wax, paraffin oil, glycerol, water and an abrasive is used for grinding valves.

1,846,143. (2-23-32). Rice. Carnauba wax is employed in a process for artificially coloring citrous fruits.

1,846,346. (2-23-32). Mellorio and Lund. A thermoplastic mixture of rosin and montan wax is used as a shoe-stiffening material.

1,847,197. (3-1-32). Shaw and Scott. Electric insulators are formed by mixing ceramic substances with a high melting point wax, such as carnauba.

1,847,629. (3-1-32). Skinner. A leather dressing consisting of beef tallow, petroleum jelly, soap, resin and beeswax.

1,847,796. (3-1-32). Thurston. Metallic packing for stuffing boxes of machinery is composed of PbO, graphite, and wool grease.

1,848,686. (3-8-32). Arnold. A composition of cellulose nitrate, wax or metal stearate, or both, is used in the production of a washable wall paper.

1,850,600. (3-22-32). Morehouse. A heat-sensitive recording sheet is coated with acids or acid salts and a wax film.

1,853,699. (4-12-32). Rahmann. A yellowish wax and a resin are produced by distilling mineral coal-tar pitch in presence of a catalyst.

1,853,871. (4-12-32). Mertens. Neutral grease is extracted from wool-scouring water by separating the grease in a churn and heating it under pressure.

1,854,237. (4-19-32). Teeple. A lubricant for gasoline pumps consists of blown castor oil, glycerol, carnauba wax and graphite

1,855,872. (4-26-32). Shaw. Sperm oil and naphtha are specified as a detergent for removing grease and tar from the skin.

1,860,244. (5-24-32). Grant. Paper bags for lime and fertilizers are coated with wax and printing ink.

1,860,466. (5-31-32). Landt and Becher. Montan wax is used with rag fiber, wood pulp or bagasse to form molded pulp board.

1,863,157. (6-14-32). Geere. NaH_2PO_4 or other crystalline acid substance is coated with an oil, fat or wax and then caused to react with a carbonate to produce carbon dioxide. (See 1,841,944).

1,863,867. (6-21-32). Maze. An aqueous dispersion of paraffin or other wax and a light mineral oil is used to treat paper pulp for the production of water-resistant paper.

1,865,708. (7-5-32). Sherman and Metzner. A coating of hard wax is used to prevent smudging on duplicating record sheets.

1,865,799. (7-5-32). Stowie. Beeswax is employed in a composition to remove enamel from automobiles, furniture, etc.

1,866,025. (7-5-32). Geller. Glycerol or chlorohydrin is used with beeswax to prevent candles from sticking in the molds.

1,870,110. (8-2-32). Hall. A mulch paper for agricultural use contains a decomposable weatherproofing agent such as "wood wax."

1,870,806. (8-9-32). Geller. Relates to a dye suitable for coloring waxes, etc.

1,870,901. (8-9-32). Derby. An apparatus is described which is suitable for distilling waxes, etc.

1,871,187. (8-9-32). Lindsay. A wax polish is prepared by mixing a wax in mechanically comminuted form with a liquid hydrocarbon material such as kerosene.

1,871,456. (8-16-32). Kivley. Montan wax is used in a process for weatherproofing fabric insulation or electrical conductors.

1,871,864. (8-16-32). Sullivan and Arveson. Montan wax is combined with cottonseed foots, mineral oil, lime, caustic alkali and water to form a solid lubricant for large journal bearings.

1,874,376. (8-30-32). Staley. The bottom of a cylindrical dry cell cathode core is coated with a waxy substance such as beeswax or paraffin.

1,875,001. (8-30-32). Hoel. An emulsifiable oil for use in the textile industry or as a cutting oil, is prepared from saponified sulfonated sperm oil and mineral oil.

Austrian

125,943. (7-15-31). Glaessner. Waxes are used in a composition for coating pills, etc.

126,434. (4-15-30). Schaefer. A mixture of resin, soda, beeswax and water is boiled until a sample solidifies on cooling. The product is used as a resin size for paper.

128,798. (2-15-32). Kangler. Oils, fats or waxes are mixed with paper ash and emery to form a composition for cleaning iron and steel.

129,323. (3-15-32). Nowak. Relates to the impregnation of wood with paraffin or other wax.

Belgian

373,313. (10-31-30). Plonskier. The fats, soaps and other ingredients of wool scouring liquors are precipitated and the product saponified with caustic. The mixture of soap, higher alcohols and sludge is distilled to recover the alcohols.

374,148. (11-30-30). Collard. A composition for the upkeep of painted or lacquered surfaces is made by heating a wax with an oil, such as linseed, and adding this to a second mixture consisting of an abrasive suspended in turpentine.

378,353. (4-30-31). de Vreese. Wool scouring liquors are cooled and subjected to vacuum to recover the fat.

380,859. (7-31-31). Plonskier and Ritoff. Crude wool grease and waxes in general are refined by heating with caustic soda and reducing or oxidizing agents. The product is then washed, bleached and dried in a current of hot gas.

British

341,246. (12-27-29). Cowper-Coles. A solution of beeswax in turpentine containing a small quantity of carbon disulfide is used to coat mandrels to facilitate removal of electrolytically deposited metals.

343,567. (12-20-28). Malm. Hard waxes are optional ingredients of a rubber composition for insulating cables.

344,833. (10-5-28). Wolff & Co., Kommandit-Ges. auf Actien and Czapek. Waxes may be added to increase the water resistance of lacquers to be used on material for wrapping textiles, etc.

345,184. (7-19-29). I. G. Farbenind. A.-G. Emulsions for use in paint and waterproofing compositions are made with beeswax dissolved in p-cymene containing a cellulose derivative.

345,453. (2-26-30). Friedlander and Spicers, Ltd. Coating compositions are prepared from montan wax pitch, brown coal wax pitch, or other pitch residues obtained from wax-containing materials, with or without the addition of "cable wax," saponified waxes, etc.

345,993. (12-29-28). Grant. Relates to a toilet cream base prepared from beeswax, lanolin, petrolatum, etc., and a terpene derivative.

346,415. (12-11-28). Bregi. Low temperature tars from the distillation of lignite are subjected to a process of pressing, solvent extraction and filtering to separately recover crystalline and amorphous wax.

346,438. (1-10-30). I. G. Farbenind. A-G. Natural or artificial waxes are caused to react with alkylene oxides to produce waxes suitable for use in polishes.

346,738. (10-15-28). Norman and Boldemann. Waxes are optional ingredients in a non-slippery composition for wood floors.

348,040. (10-26-29). I. G. Farbenind. A.-G. Alcohols containing more than 6 C atoms are esterified with aliphatic carboxylic acids of more than 10 C atoms to form wetting and dispersing agents. An example is the esterification of hexahydrosalicylic acid with octadecyl alcohol, the resulting product being sulfonated.

348,743. (2-27-30). Breda-Visada, Ltd., and Jones. Lanolin, sperm oil, carnauba wax or beeswax may be added to a viscose solution before spinning to give products of reduced lustre.

348,910. (6-6-30). N.-V. Hollandsche Kunstzijde Industrie. A wax is emulsified with viscose by the aid of a product made by heating ricinoleic acid to produce a "dulling" agent.

349,004. (11-12-29). I. G. Farbenind. A.-G. An organic sulfide is mixed with yellow wax and the resulting product added to a regular polishing composition.

349,051. (11-27-28). Goldschmidt A.-G. In order to deodorize wool grease the material is heated under pressure with sulfur dioxide.

349,311. (6-5-29). Brogden and Trowbridge. Fruits and vegetables are preserved with a thin film obtained by applying a mixture containing Chinese insect, carnauba, paraffin and Japan waxes.

349,638. (3-3-30). I. G. Farbenind. A.-G. Waxes are optional ingredients of polymerization products suitable for use as wood fillers, etc.

350,064. (3-17-30). Thorns. A "hair restorer" ointment consists of vaseline, beeswax, olive oil and essential oils.

350,080. (4-27-29). H. T. Böhme A.-G. Sulfonated stearyl or lauryl alcohols are used in emulsifying, cleansing and dust-binding agents.

350,388. (3-6-30). Deutsche Gasolin A.-G. Montan wax is separated from its solutions in distillates by adding a substance such as naphthalene, anthracene, phenanthrene, and the like, removing the solvent by chilling and filtering and then steam distilling the residue.

350,409. (12-18-29). H. T. Böhme A.-G. Waxes and higher aliphatic alcohols or their sulfonated products are among the materials which may be used in compositions for dyeing and sizing cotton and rayon.

350,432. (3-6-29). H. T. Böhme A.-G. Sulfonated lauryl and myristyl alcohols are employed as wetting and dispersing agents.

350,699. (5-22-30). Horii. Relates to compositions made from esters of polysaccharides and sperm oil for use on stencil sheets.

351,171. (5-6-29). Clark. The addition of 0.5 to 1% of phenyl α-naphthylamine prevents the oxidation and sludging of oils and waxes used in electric insulation.

351,403. (4-5-29). H. T. Böhme A.-G. Sulfonated lauryl alcohol is employed in dispersing and emulsifying cleansing agents.

351,452. (3-20-29). H. T. Böhme A.-G. Relates to the use of sulfonated lauryl and myristyl alcohols as emulsifying, cleansing and dust-binding agents. (See Brit. 350,432; 351,403).

351,680. (5-21-29). Reimann. Hard waxes and rubber may be added to a composition for roads.

352,058. (4-2-29). British Celanese, Ltd. Waxes may be added to compositions for indicating safe ironing temperatures of fabrics containing cellulose esters.

352,279. (8-27-29). Norddeutsche Wollkammerei & Kammgarnsspinnerei. Wool fat is recovered from raw wool by the use of trichlorethylene.

352,460. (4-8-30). Ditto, Inc. Modifying and tempering agents such as waxes are added to coatings for stencil sheets.

352,503. (4-11-29). Fabre. Describes an apparatus for degreasing wool with solvents such as trichlorethylene.

353,493. (5-13-29). Rose and Hill. Waxes are among the optional ingredients of friction material for brake shoes, etc.

353,926. (1-31-30). I. G. Farbenind. A.-G. Viscous or solid polymerization products of ethylene oxide are used to disperse waxes.

354,217. (2-5-30). I. G. Farbenind. A.-G. Emulsifying agents are prepared by sulfonating spermaceti, beeswax or wool fat in the presence of an inert solvent such as carbon tetrachloride.

354,334. (3-3-30). I. G. Farbenind. A.-G. The removal of resins from crude montan wax by the use of two or more solvents is described.

354,775. (3-7-30). I. G. Farbenind. A.-G. In order to refine crude beeswax, shellac wax or wool fat these materials are mixed with absorptive carbon and the mixture then treated with an organic solvent.

354,782. (5-6-30). I. G. Farbenind. A.-G. A process for producing wax polishes consists of mixing animal, vegetable or mineral waxes with ethanolamine or its derivatives, an organic solvent and coloring matter.

354,851. (6-17-29). H. T. Böhme A.-G. Sulfonated fatty alcohols are mixed with sulfuric, acetic, lactic or formic acids to form wetting agents for use in felting wool.

355,484. (8-3-29). Deutsche Hydrierwerke A.-G. Sperm oil, carnauba wax, beeswax, ocotilla wax or wool fat are hydrogenated and then saponified with NaOH. The resulting product is dried and extracted with trichlorethylene to recover cetyl and octadecyl alcohols. Fatty acids are obtained by treating the soap with sulfuric acid.

355,801. (7-3-29). Elektrochemische Werke München A.-G. An aqueous emulsion of mineral or vegetable wax is added to paints or varnishes.

355,857. (6-12-29). I. G. Farbenind. A.-G. Beeswax or shellac wax are bleached by dissolving the wax in ethyl alcohol, butyl alcohol or ethyl acetate and treating the solution at its boiling point with activated charcoal.

356,606. (1-27-30). H. T. Böhme A.-G. Esters such as ethyl laurate are hydrogenated at elevated temperature and pressure in the presence of finely divided copper to produce higher alcohols. The products may be sulfonated and used in textile finishing. (See French 718,394).

356,731. (3-1-30). I. G. Farbenind. A.-G. Aliphatic acids are hydrogenated at elevated temperature in the presence of a metallic catalyst. The products may be employed for the esterification of montanic acid to produce synthetic waxes.

357,112. (3-12-29). Fabrique de soie artificielle de Tomaszow Soc. anon. Fats, fatty acids, monohydric alcohols, etc., may be used for delustering rayon.

357,594. (6-27-29). Rostock, Baerlocher and Walter. Montan wax is employed in the form of an emulsion for lining concrete fermentation tanks.

358,508. (6-24-30). I. G. Farbenind. A.-G. Wool fat, wax, etc., is employed with bis(dichloro-4-hydroxyphenyl)ether in the preparation of disinfectants, fungicides, insecticides, polishes and the like.

358,474. (6-7-30). Junghanel and Gross. Wax is used in compositions for stereotype matrices.

358,612 (8-22-29). H. T. Böhme A.-G. The product formed by treating stearyl alcohol with chlorsulfonic acid in presence of trichlorethylene is neutralized with ammonia to form emulsifying agents.

358,869. (7-18-30). H. T. Böhme A.-G. (See French 718,394.)

Canadian

318,381. (12-29-31). Killer. Precious metals are recovered by coating stamp mills, rockers and other mining equipment with a paste consisting of beeswax, rosin, asphalt, plumbago and oil.

322,965. (6-7-32). Brown. Relates in part to the de-inking of printed waxed paper.

323,861. (7-5-32). Neitzke. An emulsified asphalt is prepared with the aid of montan wax.

French

38,048. (3-5-30). H. T. Böhme A.-G. Sulfonated lauryl and myristyl alcohols are employed as wetting, penetrating, dispersing and foam-producing agents. (See British 350,080; 350,432; 351,403). Addition to French, 679,186; Chem. Abs. **24**, 3911.

38,628. (6-4-30). H. T. Böhme A.-G. Addition to 679,186. Refers to the use of sulfonated products of the higher aliphatic alcohols as wetting, etc., agents. (See preceding patents and other references.)

39,709. (2-3-31). I. G. Farbenind. A.-G. Addition to 689,713; Chem. Abs. **25**, 966. Waxes and wax-like products are obtained by hydrogenating carboxylic acid esters containing at least two carbon atoms or their derivatives.

705,852. (11-18-30). I. G. Farbenind. A.-G. Relates to the use of polymerization products of alkylene oxides as suppling agents for waxes. (See British 353,926.)

705,894. (11-19-30). Mertens. Fats are recovered from wool washing waters by a process of heating under pressure.

706,105. (11-21-30). I. G. Farbenind. A.-G. Polymerization products described in British 353,926 are used as dispersing agents for waxes. (See French 705,852.)

706,131. (11-21-30). Dreyfus. Naphthalene is caused to react with higher alcohols and the products sulfonated to produce emulsifying agents.

706,182. (11-24-30). I. G. Farbenind. A.-G. Cleaning agents for wool, etc., are prepared from acid esters of phosphoric acid and higher aliphatic alcohols.

706,705. (11-29-30). Rütgerswerke-A.-G. Mineral wax is used in a method for producing permanent emulsions of tar.

707,928. (12-18-30). Dümling. Waxes or paraffin are added to a non-inflammable solvent to give a composition suitable for removing paint, etc.

709,514. (1-15-31). Georg Schicht A.-G. Relates to the use of salts of sulfuric esters of the higher alcohols for cleansing the hair.

709,590. (1-17-31). I. G. Farbenind. A.-G. The sulfuric ester of cetyl alcohol is added to a bath for dyeing wool.

710,228. (12-29-30). Diamalt A.-G. Waxes are employed as a protective colloid when using latex for dulling artificial silk.

710,229. (12-30-30). Deutsche Hydrierwerke A.-G. Xanthates of fatty alcohols, prepared by the action of carbon disulfide on alcohols having more than 8 carbon atoms, are used as wetting agents.

710,306. (1-30-31). H. T. Böhme A.-G. Describes the formation of alcohols from higher aliphatic acids and their subsequent sulfonation to produce wetting agents.

710,580. (2-2-31). I. G. Farbenind. A.-G. Lignite wax or acids obtained therefrom are employed in compositions for lubricating machinery.

710,755. (5-8-30). Lièvre and Leclère. A powdered polish is composed of carnauba wax, rosin and paraffin.

711,210. (12-30-30). Deutsche Hydrierwerke A.-G. The alcohols obtained from natural waxes or from neutral fats are converted to their mineral acid esters, which are then treated with neutral sulfites to form wetting and emulsifying agents.

711,211. (12-30-30). Deutsche Hydrierwerke A.-G. The glycol or glycerol esters of 12-hydroxystearic acid are treated with keto or hydroxy compounds to form products resembling carnauba wax.

711,332. (2-16-31). I. G. Farbenind. A.-G. Carnauba wax is saponified with calcium oxide and the calcium salts decomposed with sulfuric acid. After removing the mineral acid and salts a product is obtained which dries to a hard, easily emulsified wax. Other crude or treated waxes may be used.

711,477. (12-30-30). Deutsche Hydrierwerke A.-G. Octadecyl, cetyl and oleyl alcohols are transformed to xanthates to produce agents for use in treating and finishing textiles. (See 710,229.)

711,789. (2-23-31). I. G. Farbenind. A.-G. A method of fractional distillation in vacuo in presence of solvent vapors is proposed for the isolation of the higher alcohols.

712,122. (2-26-31). I. G. Farbenind. A.-G. Octadecyl or other alcohol is sulfonated in the presence of paraformaldehyde to give wetting and emulsifying agents. Other aldehydes, ketones or both may be employed.

712,913. (3-9-31). I. G. Farbenind. A.-G. Relates to the manufacture of soaps involving the use of sulfonated higher alcohols (such as cetyl alcohol).

713,383. (3-17-31). I. G. Farbenind. A.-G. A process for deodorizing the acids formed by oxidizing lignite wax with nitric acid or the oxides of nitrogen, consists of removing the nitrogen with alkalies or other known means.

713,451. (3-18-31). I. G. Farbenind. A.-G. Raw wool is washed with derivatives of the higher alcohols, such as the sulfuric acid ester of cetyl alcohol.

714,000. (3-28-31). I. G. Farbenind. A.-G. Waxes are sulfonated with SO_3 to form wetting, etc., agents.

714,853. (4-7-31). Hubmajer. Describes stable emulsions of waxes, etc., prepared with substances which affect the surface tension.

715,322. (4-15-31). Aktiebolaget Separator. Waters from washing wool are processed by passing through an automatic screen and then by means of a high-speed centrifuge.

715,334. (5-24-30). Blumenfeld and Ourisson. Higher alcohols are dissociated by means of various radiations or electrical discharges to produce chemical substances.

715,585. (4-17-31). I. G. Farbenind. A.-G. Beeswax is heated with carbyl sulfate to form wetting, emulsifying and dispersing agents.

715,884. (4-23-31). Deutsche Hydrierwerke A.-G. Relates to the saponification of spermaceti or spermaceti oil at elevated temperature to produce a soap.

717,413. (5-21-31). I. G. Farbenind. A.-G. The acids obtained from crude or deresinified lignite wax are converted into their methyl or ethyl esters and these in turn to the corresponding alcohols. By esterifying the alcohols so formed with palmitic acid or lignite wax acids synthetic waxes are produced.

717,837. (5-27-31). Seltzer. Metarabic acid is used as an emulsifying agent for waxes, etc.

718,394. (6-8-31). H. T. Böhme A.-G. Higher aliphatic alcohols are prepared by hydrogenating the corresponding acids at elevated pressure and temperature in presence of a suitable catalyst. (See Brit. 356,606.)

718,395. (6-8-31). H. T. Böhme A.-G. Describes the sulfonation of the alcohols from cocoanut or palm oils in the dry state.

718,440. (6-9-31). Du Pont Cellophane Co. Resins, waxes and plasticizers are used to produce waterproofing agents which are free from stickiness.

718,503. (6-11-31). I. G. Farbenind. A.-G. The naturally occurring alcohol radicals in waxes are substituted by other mono- or polyhydric alcohol radicals to form cleaning and polishing agents. The products may also be sulfonated for use as wetting agents.

719,006. (6-23-31). I. G. Farbenind. A.-G. Candles contain at least 20% of solid aliphatic alcohols.

719,266. (6-29-31). Chemische Fabriken Joachim Wiernik & Co. A.-G. Evaporation preventers such as waxes, paraffins or greases are added to the usual paint remover compositions. Rubber, cellulose esters and factis are employed as thickeners.

719,328. (7-1-31). I. G. Farbenind. A.-G. By sulfonating the hydroxy acids and amides found in the mixed fatty acids resulting from the oxidation or distillation of lignite wax, wetting, cleansing and dispersing agents are formed. The process is also applicable to the higher alcohols and their derivatives.

719,828. (10-13-30). Floresco. Alcoholic solutions of gums, waxes or resins are added to finishing compositions for textiles.

720,590. (7-24-31). I. G. Farbenind. A.-G. The alkali salts of the ether of dodecyl alcohol and hydroxyethane-sulfonic acid are added to liquids for washing textiles.

721,399. (11-7-30). Soc. nouvelle des mines de Saint-Champ. A leather preservative contains vaseline, wax, lanolin, a sulfur-containing oil and neatsfoot oil.

722,021. (8-28-31). I. G. Farbenind. A.-G. A mixture of 25% crude or deresinified lignite wax and 75% oxidized lignite wax is partially esterified with glycols to produce waxes suitable for use in shoe creams.

723,119. (9-2-31). Cronquist. Relates to the addition of unsaponified fats or waxes (of the same nature as those naturally produced in the skin) to soaps for toilet use.

723,459. (9-29-31). Budo-Werke Schwenningen a./N. Christian Bürk. Preservatives for wood floors contain waxes, disinfectants and liquid fatty acids or drying oils.

723,775. (10-1-31). H. T. Böhme A.-G. Sulfuric acid esters of higher aliphatic alcohols are mixed with soap.

725,111. (11-4-30). H. T. Böhme A.-G. Sulfonated higher alcohols are added to textile treating liquids to prevent the formation of calcium and magnesium soaps.

725,649. (10-21-31). Deutsche Hydrierwerke A.-G. Sulfonated spermaceti or spermaceti oil is saponified with caustic in the usual manner to produce soaps. (See 715,884.)

726,338. (11-17-31). H. T. Böhme A.-G. Aliphatic alcohols or their sulfonation products are added to the solution before spinning in the production of rayon.

726,650. (11-23-31). Aceta G.m.b.H. Waxes are among the optional ingredients of emulsions for sizing fibrous materials.

726,773. (11-13-31). I. G. Farbenind. A.-G. Pertains to the preparation of moldable materials from hard waxes and finely divided inert materials melting above 100°.

726,856. (1-26-31). Raysz. Fatty materials are recovered from wool scouring waters by the addition of electrolytes and other materials to break the emulsion.

726,888. (11-25-31). Henkel & Co. G.m.b.H. Relates to polishes containing a large proportion of free unsaponified cerotic acid.

727,202. (11-26-31). I. G. Farbenind. A.-G. Mixed aliphatic alcohols obtained by the hydrogenation of fats or oils are combined with ethylene oxide to obtain wetting agents suitable for washing wool.

727,632. (12-3-31). I. G. Farbenind. A.-G. Esters of the higher aliphatic alcohols are employed as wetting, softening, swelling, gelatinizing or solvent agents. Examples are dodecyl or octodecyl acetate and the distearic ester of octodecanediol.

727,684. (2-13-31). Sébastien Ges-Novell and Montserrat Ges-Novell née Mauri-Canela. A mixture of resin, beeswax, red sealing wax, pitch and glue is used as a depilatory.

728,415. (12-18-31). I. G. Farbenind. A.-G. This patent describes a number of products formed by sulfonating mixtures of hydroxylated amines with the chloroformic esters of the higher aliphatic alcohols. They are intended for use as wetting, cleansing and dispersing agents.

728,652. (12-21-31). Jeanprêtre. An aqueous emulsion of beeswax or other wax with dextrin is employed for sizing rayon.

728,893. (12-28-31). H. T. Böhme A.-G. Ethyl laurate is reduced to lauryl alcohol with atomic hydrogen produced by electric waves, an electric arc or a mercury vapor lamp.

729,357. (1-7-32). Raney. Relates to the formation of catalysts to be used in the hydrogenation of oils, fats and waxes.

German

528,766. (10-15-29). Gottesmann. In order to coat a wax object with metal it is immersed in an alkaline solution of the metal salt at a temperature below 40°. For instance, wax at 15° is immersed in an ammoniacal solution of silver nitrate at 8°.

530,507. (1-30-30). I. G. Farbenind. A.-G. Paraffin, montan or carnauba wax are treated with triethanolamine to produce technically useful products.

530,515. (7-31-26). Gebrüder de Trey A.-G. Finely divided wax, fat, resin and rubber are added to a jelly-like aqueous extract of seaweed to form plastic compositions.

530,734. (9-16-28). Baer. Describes the formation of a wax-like product by the action of a dilute solution of ammonium sulfide on dihalo derivatives of the $C_nH_{2n\ plus\ 2}$ series of hydrocarbons. As an example ethylene dichloride is treated with dilute ammonium sulfide.

532,212. (5-12-27). A. Riebeck'sche Montanwerke A.-G. The resin is separated from crude montan wax by dissolving the latter in *iso*-butyl alcohol or in a mixture of benzene and ethyl alcohol which is subsequently chilled to deposit the wax.

532,258. (11-21-30). Mertens. Wool fat is recovered from the sludge obtained from wool-scouring waters by heating under pressure in presence of an inert gas. (See French 705,894.)

532,298. (3-2-27). von Grätzel. A process for bleaching waxes consists of heating solutions of these substances in the presence of bleaching earth or carbon under pressure.

533,275. (6-15-30). Norddeutsche Wollkämmeri & Kammgarnspinnerei. Neutral wool fat is saponified and the sodium soap is converted to a soap of a drying or siccative metal such as manganese, lead or cobalt. The products, which may contain wool fat alcohols as well as the soaps, are used as driers for lacquers and varnishes.

533,276. (3-6-28). Scheiber. Salts of Ca, Sr, Ba, Mg, Al or the rare earth metals with the acids obtained from waxes are used as pore-filling ingredients in paints and varnishes. Wax alcohols may also be employed.

533,800. (7-4-28). I. G. Farbenind. A.-G. A rubber substitute is prepared by splitting off water from the oxidation products of waxes, etc.

533,845. (12-18-26). I. G. Farbenind. A.-G. Sulfonated fatty acids from wool grease are used for stabilizing solutions of 2, 3-hydroxynaphthoic acid arylides in the preparation of a dye liquor.

535,338. (10-6-28). Deutsche Hydrierwerke A.-G. Washing, wetting and emulsifying agents are prepared by esterifying the higher alcohols derived from fats and waxes with aromatic alcohols, phenols or naphthols and sulfonating the products.

535,436. (11-21-25). Oranienburger Chem. Fab. A.-G. and Lindner. Higher aliphatic alcohols may be added to neutral or acid baths for dyeing and printing.

535,444. (3-3-29). I. G. Farbenind. A.-G. Pertains to a method for extracting acids and esters from montan wax with a solvent under pressure.

536,100. (4-11-24). Rhenania-Ossag Mineralölwerke A.-G. Wax may be added to emulsified oils to produce lubricants especially suited for wagon axles.

536,191. (1-28-30). Chemische und Pharmazeutische Fabrikation Georg Henning. Solid higher alcohols, such as cetyl, are employed for the recovery of hormones.

536,566. (10-30-27). Linebarger. Describes an apparatus for making cakes of stearic acid, carnauba wax, etc.

537,531. (2-16-30). F. Kripke G.m.b.H. A mixture of calcium carbonate, ammonium sulfate and carnauba wax is used as a mold powder for forming metal molds.

538,188. (8-3-28). Schering-Kahlbaum A.-G. A resin, fat or wax is saponified in an aqueous suspension of an insecticide.

538,386. (4-28-31). Norddeutsche Wollkämmerei & Kammgarnspinnerei. Relates to a lubricant made from wool fat, naphthalene and mineral oil.

538,388. (8-14-30). Deutsche Hydrierwerke A.-G. Hydrogenated sperm oil is fused with excess alkali to form washing and cleaning compositions.

538,646. (6-6-30). I. G. Farbenind. A.-G. Relates to the separation of unsaponifiable constituents from waxes treated with sulfuric or phosphoric acids.

539,165. (4-5-28). Chemische Fabriken Kurt Albert G.m.b.H. An emulsion of bitumen, resin, wax, etc., and a mineral filler is specified as a road-making material.

539,265. (8-26-27). Deutsche Hydrierwerke A.-G. Higher aliphatic alcohols are mixed with liquid fatty acids for oiling wool prior to spinning.

539,391. (3-3-25). Montan, Inc. Fused montan wax, with or without creosote, is forced into wood under pressure to make it proof against animal or vegetable pests or moisture.

539,625. (2-8-28). I. G. Farbenind. A.-G. The fatty acids of wool fat are first oxidized at 100-130° and then sulfonated as described in German 531,296; Chem. Abs. **25**, 5588.

540,247. (3-2-27). I. G. Farbenind. A.-G. Sulfonation of crude or neutral wool fat is carried out in presence of phenol with or without the addition of an inert solvent. The products are readily emulsifiable.

540,361. (1-10-28). I. G. Farbenind. A.-G. A fused mixture of bleached montan wax and o-cresol formaldehyde condensation product is treated with sodium bisulfate and heated at 240° for 10 hours in an atmosphere of CO_2. A synthetic wax is thus produced.

540,389. (5-5-26). Duhamel and Comp. générale des industries textiles. A process and apparatus are described for washing wool in baths containing suint.

541,048. (2-18-27). I. G. Farbenind. A.-G. Montan wax is bleached with an acid solution of chromic oxide.

541,315. (9-8-28). I. G. Farbenind. A.-G. Relates to a process for oxidizing paraffin hydrocarbons, waxes, etc. (Addition to 524,354; Chem. Abs. **25**, 3664.)

541,909. (1-15-28). I. G. Farbenind. A.-G. Beeswax, montan wax, wool fat and other waxes are saponified and the resulting powdered soap dried with a hot inert gas.

541,910. (4-15-28). I. G. Farbenind, A.-G. Describes the purification of fatty acids obtained by the oxidation of paraffin hydrocarbons, waxes, etc.

542,605. (12-10-26). Ges. für Teerstrassenbau m.b.H. In order to produce bitumen emulsions a saponified wax is reduced to solid concentrated form and mixed with the bitumen and kieselguhr.

543,612. (6-24-28). I. G. Farbenind. A.-G. Addition to 540,361. The products previously described are rendered infusible and insoluble by prolonged heating. The solvent resistance is further increased by treatment with trioxymethylene.

543,788. (5-4-28). I. G. Farbenind. A.-G. Refined products from wool fat are obtained by heating this material with nitrogenous bases, such as aniline.

544,088. (12-13-28). I. G. Farbenind. A.-G. Addition to 541,910. Relates to a modification of the process described in the earlier patent.

544,315. (8-10-29). Kappelhöfer. Wax is used in compositions designed for use as water paints.

545,094. (4-28-28). I. G. Farbenind. A.-G. The use of oxidation products from paraffin hydrocarbons, waxes, etc., to form emulsifying agents is described.

546,231. (4-14-29). Mertens. Wool fat is recovered from wool scouring waters by first producing a foam, separating the foam and heating in an autoclave.

546,681. (6-8-30). Deutsche Hydrierwerke A.-G. (See French 725,649.)

547,109. (5-24-29). I. G. Farbenind. A.-G. Pertains to a process for oxidizing solid or liquid hydrocarbons and waxes.

548,458. (8-4-29). I. G. Farbenind. A.-G. Addition to German 490,249; Chem. Abs. **24**, 2137. Describes another method for oxidizing hydrocarbons and waxes. (See preceding patent.)

549,667. (12-18-30). I. G. Farbenind. A.-G. Crude wool is defatted with the aid of a wetting agent prepared from 7, 18-stearyleneglycol.

550,239. (8-7-28). I. G. Farbenind. A.-G. Water is split off from the oxidation products of hydrocarbons and waxes to form a substitute for olein in the textile industry.

550,324. (7-6-28). I. G. Farbenind. A.-G. Mixed wax acids of high molecular weight are esterified with a polyhydric alcohol to form synthetic waxes. The wax acids may be obtained from montan wax by the methods described in British 308,996. (Chem. Abs. **24**, 491) and 320,854 (Chem. Abs. **24**, 2582).

550,780. (2-12-27). Oranienburger Chemische Fabrik A.-G., Lindner and Zickermann. By sulfonating a mixture of oleic acid, or wool fat and anthracene, with chlorsulfonic acid products are obtained which may be used for stabilizing organic colloids.

550,961. (12-21-30). I. G. Farbenind. A.-G. The montanic ester of sodium 1-hydroxy propane-3-sulfonate is mixed with a copper spray for plant protection.

551,681. (12-13-28). I. G. Farbenind. A.-G. A washable distemper is prepared by mixing a pigment with montan wax saponified with ammonia and an aqueous emulsion of a modified glyptal resin.

552,091. (2-12-27). Oranienburger Chemische Fabrik A.-G., Lindner and Zickermann. Addition to 550,780. Further products, including sulfonated wool fat, for stabilizing colloids are described.

552,624. (12-14-28). I. G. Farbenind. A.-G. Emulsions of pigments are obtained by the use of saponified waxes, such as montan wax saponified with ammonium hydroxide. (See 551,681.)

552,758. (12-28-30). I. G. Farbenind. A.-G. Wetting, purifying and dispersing agents are prepared by sulfonating urethans of the higher aliphatic alcohols.

552,830. (11-1-28). Kröper. A process for the preparation of wool fat alcohols consists of first saponifying lanolin with alcohol and KOH and then adding calcium chloride and alcohol to precipitate the alcohols.

553,038. (4-14-27). I. G. Farbenind. A.-G. Products resembling carnauba wax are obtained by treating montan wax at 100-125° with a mineral acid containing chromic oxide.

554,092. (11-5-30). Chem. und. Pharmazeutische Fabrikation Georg Henning. Spermaceti, cetyl alcohol and other solid higher alcohols are used to recover the male sexual hormone. (See 536,191.)

554,372. (2-16-30). Deutsche Hydrierwerke A.-G. A mixture of hardened castor oil and behenone is proposed as a substitute for carnauba wax in shoe polishes, polishing waxes, etc. (See 555,326.)

554,520. (3-21-29). H. T. Böhme A.-G. Mixtures of sodium bicarbonate with sulfonated lauryl alcohol, or Glauber's salt with sulfonated oleyl or stearyl alcohols, are used as fire-extinguishing agents.

554,573. (7-13-28). I. G. Farbenind. A.-G. A process for the oxidation of paraffin, montan wax or beeswax is described. (See 547,109.)

554,891. (12-11-28). Deutsche Hydrierwerke A.-G. Derivatives of the higher aliphatic alcohols are used for cleaning and preventing rust on metal surfaces.

554,892. (1-30-31). Schlenker. Relates to a process for separating the saponifiable from the unsaponifiable constituents of fats and waxes.

555,326. (3-26-30). Deutsche Hydrierwerke A.-G. The carnauba wax substitutes described in 554,372 are treated to form emulsions suitable for polishing wood, leather, etc.

556,150. (4-5-27). A. Riebeck'sche Montanwerke A.-G. Crude or deresinified montan wax is bleached by dissolving in a solvent and treating with hydrogen peroxide or potassium permanganate.

556,250. (5-5-28). Deutsche Erdöl-A.-G. Montan wax, free from montanyl alcohol, is used in preparing mineral oil emulsions.

556,395. (6-26-28). I. G. Farbenind. A.-G. Phenol is condensed with formaldehyde or its polymers in the presence of an alkaline emulsion of beeswax, carnauba wax, montan wax or wax acids. The products described in 540,361 and 543,612 may also be used.

556,407. (4-14-29). A. Riebeck'sche Montanwerke A.-G. Addition to 532,212. Describes another method for separating the resin from crude montan wax.

Japanese

91,022. (4-10-31). Kozima. White wax is used in a composition to be employed as a paste for textiles.

91,049. (4-15-31). Siobara. A mixture of asphalt, fish-oil pitch, rubber, mineral oil, hardened fish oil, wax and graphite is used as a lubricant.

91,181. (4-24-31). Ikari. Vegetable wax (probably Japan wax) is among the ingredients of a waterproofing composition for cement.

91,380. (5-12-31). Tukata. An antiseptic tape for covering iron tubes, wood posts consists of a cotton tape coated with a composition containing white wax.

91,496. (5-21-31). Kobayasi. A waterproof cloth or paper is prepared with a mixture containing vegetable wax.

Swiss

145,646. (6-19-30). Euböolithwerke A.-G. Wax may be added to an emulsion suitable for use on floor coverings.

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