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GEL INTERMEDIATE

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In the manufacture of chrome tanned leather and also in the employment or utilization of such leather in the industries there is produced and realized a considerable quantity of small pieces which may be referred to as scrap. Much of this scrap is in the form of shavings.

One object of this invention is to find a use for this otherwise relatively valueless material and to convert by chemical processes certain constituents of and derivable from the leather into valuable products useful in diverse commercial fields.

According to this invention the chrome tanned leather which is to provide the base material from the process, be it scrap in the form of cut pieces or scrap in the form of thin shavings, is preliminarily treated with a solution composed of or comprising an aqueous solution of hydrogen peroxide (H_2O_2) and soda ash (Na_2CO_3).

The preliminary treatment may be referred to as an alkalizing and bleaching step and by it there is effected a considerable bleaching of the leather being treated.

The preliminary bleaching step requires only a relatively short period of time and during this period there is a color conversion from a light greenish tinge to a light yellow or amber color. Some of this change of color may follow the oxidizing effect of the hydrogen peroxide and some of the change of color may be due to the chemical reaction more particularly as between the metallic constituents in the leather, viz., the chromium constituents on the one hand and the sodium constituents of the treating solution on the other hand.

The preliminary alkalizing and bleaching step is shortly followed or in effect continued by the adding of a certain quantity of water to the leather-chemical solution mixture and by the stirring of the water diluted mixture whereby uniform conditions are established and maintained throughout the mixture.

The water diluted mixture is continued for a relatively short but for a sufficient period of time during which there is realized a further bleaching of the leather within the mixture and also a substantial softening or plumping of the leather.

At the end of the bleaching period just mentioned there is an elimination of much of the solution from the mixture as by a straining or draining operation.

In due time after the draining operation the leather is subjected to repeated washings, until the wash water is clear and colorless, and from this there results the washed leather which is herein referred to as the bleached leather base.

By the operations or steps referred to above, there is also realized a releasing, yielding or elimination from the leather being treated of much but not all of the chrome content and of any other metallic content that may have been present in the leather undergoing treatment.

To the bleached leather base as a body while still containing a substantial quantity of liquid content carried thereby or entrained therein or therewith, there is next added and dispersed therethrough a quantity of sulfuric acid, to wit, in amount preferably to result in an ultimate neutral product or mixture having a pH value of 7 without any marked tendency toward either the alkaline or acid side.

The mixture of the bleached leather base and sulfuric acid is continuously stirred and individually heated with a steam heated kettle or other suitable receptacle to a maintained temperature range approaching but not quite reaching the boiling point of water at normal atmospheric pressures. This hot acid treatment is over quite an extended period of time as compared with the preliminary alkalizing and bleaching operations and is primarily carried out for the purpose of freeing and releasing the gelatinous matter from the leather base material.

The hot acid treatment may also effect a slight amount of bleaching if the previous bleachings had not completed the bleaching.

It will here be remarked that the past history of the chrome tanned leather is such that the gelatinous product thus derived, and which may be viewed as an animal protein product, is not contaminated with any substantial quantity of oils, fats, glycerine, or glycerides since such or the basis therefor do not exist in any substantial quantity in the leather base being treated.

Applicant is of the opinion and view that the hot acid treatment results in converting the metallic content remaining in the bleached leather base into the form of a soluble double salt that is dispersed throughout the dissolved or liquid gelatin, viz., specifically in the form of a double sulfate of sodium and chromium.

In this same general connection the inventor hereof ventures the suggestion and in fact believes that the metallic content within the chrome tanned leather shavings and more specifically the chrome content thereof is converted by the alkalizing and bleaching steps into a form which is or which approaches sodium bichromate $Na_2Cr_2O_7.2H_2O$ and which by the hot sulfuric acid treatment is converted into a liquid form which is or which approaches a sodium chromium

sulfate represented by the chemical formula $Cr_2(SO_4)_3.Na_2SO_4.24H_2O$.

Reverting now to the hot acid treatment, it is to be noted that this is preferably continued until much of the water, but not all of it, has been driven off.

The product at the end of the hot acid treatment still has therein a certain solids content that remains or continues as a solid residue which will not go into solution by the treatment mentioned and this solid remainder has to be separated from the liquid gelatinous material or portion by centrifugalizing or by filtering. The gelatinous material thus obtained contains a substantial quantity of the double salts dispersed throughout the same and from henceforth on they continue to constitute a part of the ultimate product.

After the separation or elimination of the solids residue from the rest of the liquid products as by centrifugalizing or filtering the gelatinous metallic salt product may be subjected to further treatment, as, for example, to further heating in order to further dehydrate or to complete dehydration thereof.

A complete dehydration of the gelatinous metallic salt product would result in a solid mass unless a cutting or diluting agent were applied or added in order to maintain a liquid condition before the full dehydration had been completed. A cutting agent suitable for such purpose is typified by acetone, methyl acetone, methyl alcohol or the equivalent thereof and the quantity of such cutting agent which would be employed at this juncture would be dependent upon the degree of viscosity desired for the products produced by the steps and operations above outlined.

The product or products produced as above described is frequently referred to herein as a gel intermediate because it is in fact an intermediate form of product that yields and leads to any one of several types of ultimate use therefor and this statement applies regardless as to whether the intermediate product is in a solid form resulting from complete dehydration or whether the liquid or viscous characteristics have been retained, maintained, or acquired by or because of the use of a diluting or cutting agent of the type mentioned.

When a gel intermediate is made as outlined it is relatively clear, transparent, colorless, has a relatively high viscosity or can be caused to exist as a solid transparent mass much resembling glass in appearance.

The gel intermediate produced by the invention hereof tends with proper treatment or manipulative operations to the receiving and embodiment therein of coloring, solid filling, plasticizing or other fixing or conditioning material.

It readily receives and accepts plasticizing materials such as diethylene glycol and triethanolamine. With proper manipulative precautions being taken it will receive and accept formaldehyde which can be employed and relied upon to serve as a gelatin fixing agent and to impart waterproofing and non-inflammable characteristics to the ultimate product.

When the dissolving or cutting agents have been evaporated, as by air drying or otherwise, so as to leave the resulting solid product just referred to it will be found to have properties rendering it a good electrical insulating material, as well as being non-inflammable.

If in solid form, the gel intermediate can be dissolved by acetone or chemically-equivalent cutting agent and likewise as already indicated if in a too heavy or high viscous form, it can be readily thinned by such agents.

It will therefore be noted and appreciated that from the gel intermediate and with the following of appropriate treatment one can produce mouldable plastics, solids in any suitable form such as blocks, sheets, films, viscous or liquid solutions applied as by painting, spraying, dipping, pouring, or otherwise and functioning so that when dried and solidified after application, the applied material can serve as a decorative, protecting, fireproofing, waterproofing or electrical insulating coating or means.

It will also be apparent from the specification hereof that the several products can be made transparent so as to resemble ordinary window glass, can be made transparent but so as to have tinted or colored appearance, can be made with solids dispersed therethrough as filling material, can be made with plasticizer embodied thus to impart flexible and yielding qualities in order to avoid or resist cracking or disrupting incident to flexing or use. If desired products derived from the gel intermediate may be employed due to sticky filamentaceous characteristics thereof as a binding or cementing agent, or even for the production of threads or filaments serving as fibers for use in the textile industry.

The gelatinous intermediate product or gel intermediate as derived is relatively free of oils, fats, glycerine and glycerides because of the past history of the chrome leather base material and therefore are not encountered in the ultimate product as objectionable factors therein.

The gelatinous intermediate product essentially embodies therein the double salts resulting from the process and it is believed that such salts exist as uncrystallized sodium chromium sulfate uniformly dispersed within and throughout the gel.

Important objects and aspects of this invention therefore relate to and revolve about the several intermediate, usable and ultimate products produced from the chrome tanned leather pieces or shavings as the base material.

The invention will now be referred to more in detail.

A specific mode of producing the gel intermediate

First create an intimate mixture of (*a*) chromium leather waste (100 lbs.)—such as leather shavings or relatively fine cuttings—(*b*) soda ash Na_2CO_3 as an alkalizing agent, 32 lbs. dry form and hydrogen peroxide H_2O_2 as an oxidizing and bleaching agent, 70 lbs. liquid form of the 3% technical solution. In this connection one would not ordinarily use the concentrated 30% technical solution.

The chrome leather at the start of the process has a greenish tint—light greenish. As soon as the soda ash and the hydrogen peroxide start to react in the presence of the leather, there follows a gradual change in the color characteristics of the leather toward a light yellow or amber. During the treating of the leather by the chemicals in the mixture there is a constant stirring in order to attain and maintain an intimate mixture in which the leather particles or shavings are thoroughly dispersed throughout the liquid of the mixture. This stirring is for a period of approximately 5 minutes, or as otherwise expressed, until the leather (all of the leather in the mixture) is properly converted into the form

desired, that is, until all of the leather has taken the uniform and developed light color and the liquid has taken on a decidedly light yellow or amber color. Another purpose of this early or preliminary operation is to eliminate, yield or release a large proportion of the chrome constituents (be it in the form of a salt or otherwise) from the leather or any other metallic constituents residing or embodied in the leather after the tanning. This preliminary alkalizing and bleaching operation does not remove all of the metallic constituents.

Chrome leather shavings with which this invention or the process of this invention starts has at the outset at the most only a very small amount of fat and hence immediately following the steps already described, there is added to the material constituting the batch or mixture a relatively limited quantity of water, for example, approximately 64 lbs. of water and there is further carried out a continued stirring of the batch for about ten minutes more and thereafter the liquid content is quite considerably eliminated as by straining, draining or other manipulative dewatering operation. The continued operation of stirring the added water into the batch prior to the dewatering operation just referred to serves to continue or further and to make more uniform the leather bleaching operation and this statement applies even though the bleaching liquid has been much diluted by the added water. The added water aids in softening or plumping the leather. The diluted solution additionally serves in the washing off and removing of metallic solids from the treated leather shavings. As a matter of fact during the operations above described, there is a sampling of the batch by removing and testing portions thereof to see if the initial bleaching or color conditioning treatment has been carried to the desired point and likewise after the adding of the water there is a sampling of shavings from the batch to determine as to whether the bleaching ultimately desired for this step has been attained.

Now bearing in mind that much of the liquid from the continued bleaching operation has been eliminated, it is to be noted that further and repeated washings of the solids of the batch are carried out by supplies of clear or relatively pure water until there is no substantial discoloration of the wash water as it leaves the batch. If a particularly white product is desired there may be added a 5% solution of sulfuric acid 66 Baumè. For example, about 1 lb. of such solution is added to the last batch or lot of wash water. It will also be noted that at the end of this washing chromium in the form of an oxide or sodium compound is still present in a substantial amount, for example, in an amount approximately up to 0.2% in the leather shavings which have thus far been treated.

The foregoing may be viewed as the preparation steps applied to the basic leather material, to wit, to the chrome leather shavings and the resulting product from the preparation or pretreatment operations just described will be referred to as the pre-treated chrome leather base material, or as otherwise expressed, as the washed bleached leather base, or even as the bleached leather base.

The body of the pre-treated chrome leather base material which has been washed and from which much of the wash water has been eliminated by draining, decanting or otherwise still holds a certain quantity of water embodied therein and entrained therewith even after the decanting or straining operations and it is promptly placed in a steam-jacketed kettle provided with a mechanical agitating means functioning therein and thereto there are added 42 lbs. of a 10% solution of commercial sulfuric acid, to wit, 66 Baumè. The liquid-solids content now constituting the charge or batch within the kettle is maintained at temperatures within an approximate range of between 190° to 195° F., the temperature of the charge or batch should never rise to the boiling point viz., to 212° F. Material constituting this batch or charge is heated for a period of approximately between 1 hour and 1 hour and a half and is continuously stirred in a manner to avoid hardening on the sides of the kettle. If the heating and stirring were carried out inside of a vacuum kettle, or a kettle wherein the vapor pressures were maintained substantially below atmospheric pressure, then the temperature ranges for heating can be correspondingly reduced.

The sulfuric acid and heating treatment just referred to is for the dual purpose of extracting, releasing or yielding the gelatinous matter from the bleached leather base and also for evaporating off a substantial quantity of the water content.

The amount of sulfuric acid used for a batch of the size stated is as previously indicated about 42 lbs. of the 10% commercial sulfuric acid, or an adjusted amount of sulfuric acid if an acid of different strength is used. As a matter of fact other acids might be employed for extracting the gelatinous matter, for example, such as acetic acid or lactic acid but in general the sulfuric acid is preferable. As a measure or indication of the quantity of acid that should be supplied to the kettle charge, one should bear in mind that the ultimate product should be neutral, viz., have a pH value of 7.

This acid treatment is followed by a relatively quick separating of the liquid of the batch from the solid residues that may exist therein, this separating is carried out preferably while the batch is still hot, either by a centrifugal operation or by a filtering operation. The product sought from this treatment is a relatively clear one having a high viscosity; when warm it may be described as in the form of a relatively light gel of low viscosity and when cold it may be described as a relatively heavy gel of high viscosity. It still contains a substantial quantity of metallic content mostly, if not entirely, in the form of a double salt, to wit, in the form of a sodium chromium sulfate.

For the purpose of having a name which can be employed as a typifying name for the product just mentioned, be it warm in a light gel form, or cold in a heavy gel form, or even in a solid form, it may be and herein is referred to as a gel intermediate.

General comments regarding the gel intermediate and the uses therefor

This intermediate as has been previously indicated is used as a foundation material from which any one of several more specific forms of products can be produced by appropriate processes that may be employed. From the gel intermediate one is enabled to produce as has heretofore been pointed out many ultimate products for sale over the counter, or for use in other industries, to wit, products ranging from and

including those having a thin liquid phase of low viscosity through those having liquid phases of high viscosity, through those having mouldable plastic phases and ultimately to and including those having a solid phase, for example, in the form of a solid sheet or block.

As just indicated the gel intermediate serves as the foundation for ultimate usable liquid products having what may be referred to as low or high viscosity. As an example of such liquid products there may be mentioned solutions serving as lacquers or paints, solutions for applications to other products in order to provide a fireproofing, an electrical insulating, or a waterproof coating or the like, which solutions may be applied as by spraying, brushing, or dipping operations.

Liquid products or solutions having low viscosity may be produced from the gel intermediate by taking a quantity of the gel intermediate produced as above outlined and thinning it or cutting it by mixing therewith a diluting or cutting agent such as acetone or methyl acetone or methyl alcohol, or the equivalent thereof.

Examples as to mode of employing or adapting the gel intermediate for certain specific products

As typifying a liquid product or solution having a low viscosity, reference is made to one embodying 70% by weight of the gel intermediate and 30% by weight of acetone or chemically-equivalent diluting or cutting agent. This solution is warmed to a temperature of about 135° F. and when at the approximate temperature just mentioned there is added 3% of di-ethyleneglycol which is stirred or mixed by agitation into and throughout the solution. Thereafter the solution is cooled to a 90° F. To the cooled solution about one-half of 1% of formaldehyde (40% solution) is slowly added or introduced as by spraying and is thoroughly dispersed within and throughout the solution. It will be remarked that if the introduction of the formaldehyde is not slow, in small quantities and gradual that insoluble lumps will be formed which would have to be separated out as by straining. The di-ethyleneglycol is served as a plasticizer; the formaldehyde functions to insure the waterproofing and non-inflammable characteristics. If a colored product or if what is known in the trade as a filled or weighted product is desired then suitable materials could now be added and dispersed throughout the solution for accomplishing that purpose. Such a solution as that just described will shortly after its application to the object with which it is used and upon air drying or other evaporating operation result in a solid coating because the diluent solvents therein are of a character whereby they readily evaporate. The time for this drying in air is approximately one-half hour.

When the gel intermediate is to be converted into a liquid product or solution having high viscosity for use, for example, as a binder in the manufacture of safety glass or even for wide sheet or narrow strip material, then a quantity of the gel intermediate has mixed therewith a solvent in the form of a diluting or cutting agent such as has been mentioned herein. For example, a typical solution having high viscosity is one made up of or comprising 95% of gel intermediate and approximately 5% of the methyl acetone or its derivatives but in this connection it will be noted that any of the other diluents or cutting agents could serve this purpose. This mixture is warmed to approximately 135° F., and is simultaneously stirred for about five minutes so that the resulting solution is relatively uniform throughout and while still warm there is added about 4% of triethanolamine. The solution is stirred while the last mentioned chemical is being added and this operation takes about two minutes. Thereafter the solution is cooled to about 90° F., and there is added about one-half of 1% of formaldehyde (40% solution). The triethanolamine is added as a plasticizer where a particularly clear and transparent sheet is desired.

Where the gel intermediate is employed to produce a product to be used as mouldable plastic then there may be required primarily only the addition of coloring or filling material and this may be introduced by kneading the same into a mass of the gel intermediate while the latter is warm. If it is desired to facilitate the flowing and to further the moulding characteristics of the ultimate product to be used as a mouldable plastic, it may be advisable to introduce a quantity of plasticizer into the batch before the introduction of the loading or coloring material and in some instances it may be still further advisable to introduce a diluting or cutting agent even before introducing the plasticizer by performing steps in a manner the same or analogous to those heretofore described.

Where the gel intermediate is employed to make lacquers especially and particularly useful for coating the surfaces of wood or metallic objects, it may be advisable to impart more lustre and heavier body characteristics than would otherwise be the case and to that end there may be employed gum dammar or copal.

To produce such a lacquer the gel intermediate is preferably thinned by the addition of any one of the diluting or cutting agents mentioned as, for example, methyl acetone. This addition is made while the mixture or solution is warm and while it is being agitated. While the mixture is still warm preferably at the approximate temperature of 135° F., the desired amount of plasticizer is introduced as, for example, either di-ethyleneglycol or triethanolamine, and there is also added a quantity of gum dammar or copal. The amount of the latter to be added varies considerably according to the particular characteristics and use desired. The resulting mixture may be composed of 70% of the plasticized gel intermediate, and 30% of a solution containing the gum dammar or copal dissolved in acetone, methyl acetone or other alcoholic derivative. The gum dammar or copal solution just referred to may be one made up, for example, from a pound of gum dammar dissolved in a pound of acetone or the like but in this connection it will be noted that a considerable variation in proportions can be resorted to and the desired results can be readily obtained.

A lacquer made from the gel intermediate has been actually applied by dipping a fabric covered electric cable into a bath of the lacquer and shortly after air drying such cable well withstood the heat from the flame of a Bunson burner applied directly thereto.

The inventor realizes and believes that he has discovered and invented (*a*) a process involving a novel series of chemical steps and operations for obtaining from chrome tanned leather waste a gel intermediate or gel intermediates of broad and general application; (*b*) a gel intermediate

which is, or gel intermediates which are new and novel; and (c) employment of such novel gel intermediate or intermediates, resulting in novel and useful products and while he intends to claim as his invention such novel process, intermediate products, and novel ultimate usable products, nevertheless, he believes he has invented or discovered a more fundamental and far-reaching subject matter of patentable invention or improvement than that involving the mere treating of chrome leather waste and the products derivable therefrom.

Applicant believes he is the first to produce from suitable gelatine-yielding or gelatin-providing stock or base material, a gel intermediate that is substantially free of contaminating constituents such as fats and oils but which contains and embodies intimately combined a substantially fat-free or substantially oil-free gelatin base or starting material and a double salt of chromium typified and identified as a double sulfate of sodium and chromium. Applicant believes he is the first to make and to use such a novel gel intermediate in the production of ultimate products as herein described and he hereby sets forth and declares his intention to claim broadly such novel gel and also its broad, as well as its specific uses, as herein outlined or indicated.

The invention possesses other objects and features of advantage, some of which have been set forth and enumerated in the description and some of which are further indicated by the claims hereof. In the description and in the claims, parts are identified by specific names for convenience. In this specification there have been described certain of the best embodiments of and the modes for realizing the invention known to me, but such disclosure is to be regarded as typical only of and indicative of many other possible modes or realizations of the invention and the invention is not to be limited by the specific disclosure hereof.

The novel features considered characteristic of my invention are set forth with particularity in the appended claims. The invention itself, however, both as to its manner of realization and its method of operation, together with additional objects and advantages thereof, will best be understood from the description herein of the specific disclosure when read in connection with the amplifying statement appearing in this specification.

The gel intermediates can be diluted or cut and the solid ultimate products realized from drying the viscous gel products can be partially dissolved or completely dissolved by employing the cutting and diluting agents mentioned. Sheeted material made from the intermediates can be softened by applying suitable cutting or diluting agent and this characteristic can be employed where overlapping edge portions are to be cemented. The gel intermediates and products made therefrom are water repellent. Ultimate products typified by sheets, resulting coating layers, strips, films and blocks of material in solid form are waterproof and are not detrimentally affected by water or moisture and are stable against atmospheric conditions or changes and they can be made, if proper plasticizing materials are employed, both flexible and tough so that they will not readily fracture. The resulting ultimate products will not splinter and they are non-odorous, non-toxic and strong.

The foregoing observations are in harmony with and in general should be manifest from that which has preceded.

Where one desires to produce a particularly high grade grease-proof product then this may be realized as follows:

First step.—Take 100 pounds of the gel intermediate produced as already described and which has been evaporated to one half its weight, approximately to 50 pounds, but so as to leave therein a small water content which may be, by way of example, of approximately from 5 to 8%.

Second step.—Take 5 pounds of vinylite resin A having viscosity 15 to which there has been added 2 pounds of concentrated acid (not acetic anhydride) whereby the weight of the resulting mixture of the resin and the added acid is approximately 7 pounds. The adding of concentrated acid to the vinylite A must be accompanied by constant stirring until there is obtained an emulsion.

Third step.—Take 5 pounds of acetone and add this to the acetic mixture of the second step. The acetone which is added to the emulsified mixture from the second step is constantly stirred into the emulsion, that is to say into the mixture of vinylite A and the concentrated acetic acid, until they are in solution and until a sample placed on a glass plate shows clear.

Fourth step.—The mixture of vinylite A and concentrated acetic acid and acetone, namely, from the third step is added slowly to the gel intermediate of the first step. This addition must be slow and must be accompanied with very rapid stirring so as to insure no separation or lumps in the final product.

When the steps are carried out as above outlined there is realizable a solution sufficiently viscous to be applied as a coating agent to a sheet, fabric, carton or the like. The vinylite resin A functions in this mixture to serve as a spreading agent filling any pores that might otherwise tend to form. This mixture or resulting liquid or viscous product responds readily to quick drying and evaporation. A coating made therefrom is both grease-proof and water-proof and is sufficiently flexible to entirely or substantially eliminate cracking of the coating in ordinary use. Thinning agents, plasticizing agents and the like may be used to meet the required results.

What is claimed is:

1. The method of producing a gel intermediate of the class described including employing chrome tanned leather as a base material relatively free of oil and fat impurities, subjecting such base material to the reactive effects of an aqueous alkalizing and bleaching solution essentially comprising an alkaline sodium compound and an oxidizing agent, removing a quantity of the solution from the solid material after a substantial bleach has been realized therefor, thereafter washing the solid material with water and removing a substantial quantity of the liquid from the washed solid material, introducing a quantity of sulfuric acid into the partially dewatered washed solid material and subjecting the same to a heat treatment within an approximate temperature range of 190° to 195° F. for a period of time of approximately 1 hour to 1½ hours duration, thereafter removing solids constituting impurities from the resulting liquid-form product, which resulting product still contains water therein, and ultimately eliminating the water content and incorporating a diluting and cutting agent whereby the product thereby

obtained is a viscous solution adapted for various modes of employment.

2. In the production of a gel intermediate as described herein, the process comprising treating of chrome tanned leather scraps by a process including subjecting the leather scraps to an aqueous alkalizing and bleaching solution essentially comprising an alkaline sodium compound and an oxidizing agent, removing a quantity of the bleaching solution from the mass of bleached solid material, washing the bleached mass, exposing the washed bleached mass to an aqueous solution of sulfuric acid while heating and agitating the same under conditions favorable to the release and derivation of gelatinous matter from the bleached base material whereby the gelatinous matter which is in liquid phase can be readily separated from the residue matter in solid phase, separating the matter in solid phase and the gelatinous matter in liquid phase, heating the thus obtained gelatinous matter in liquid phase so as to eliminate a substantial quantity of the water content thereof and also adding and dispersing throughout the hot solution a liquid cutting and diluting agent, and ultimately eliminating the remainder of the water content but under conditions whereby the resulting gel intermediate is in the form of a viscous fluid because of the continued existence therein of at least a substantial quantity of the cutting and diluting agent.

3. The utilization of a gel intermediate produced as defined in and by the claim last preceding and according to which another employable product is produced from the gel intermediate by intimately dispersing a plasticizing agent while the gel intermediate is at a temperature of approximately 135° F.

4. The utilization of a gel intermediate produced as defined in and by claim 2 and according to which another employable product is produced by dispersing a plasticizing agent within and throughout the gel intermediate while the latter is at temperatures approximating 135° F., by cooling the resulting solution to approximately 90° F., and by gradually adding a gelatin-fixing and waterproofing agent to the cooled solution while stirring the same.

5. A product which is substantially identical with the product made from chrome tanned leather waste as a base material therefor by a process including initially alkalizing, bleaching and plumping the base material by subjecting it to the action of soda ash and hydrogen peroxide in an aqueous solution, eliminating a substantial quantity of the liquid content of the mixture and thereafter subjecting the bleached base material to repeated washings, eliminating from the washed bleached base material a quantity but not all of the liquid content, thereafter adding and ultimately dispersing sulfuric acid to and throughout the washed bleached base material and heating the resulting menstruum thus formed to within a temperature range of approximately between 190° to 195° F., and continuously stirring the same and until the gelatinous matter and resulting sodium chromium sulfate are yielded in liquid form permitting the separation thereof from the residual solid portions of the leather, thereafter separating the liquid matter from the solid residue for thereby obtaining a product essentially comprising a gelatinous material with a sodium chromium sulfate salt dispersed therein.

6. A method as defined in and by claim 1 and in which there are successive applications of wash water to the bleached mass of solid material and in which a quantity of sulfuric acid is added to the wash water employed immediately ahead of the hot sulfuric acid treatment.

7. A product which is substantially identical with the product produced by steps essentially comprising subjecting a mass of chrome tanned leather as a gelatin-yielding base material that is substantially oil and fat free and having a chromate containing radical therein to an aqueous alkalizing and bleaching treatment by intimately mixing with and throughout the same a solution essentially comprising an alkaline sodium compound and an oxidizing agent, thereafter removing a substantial quantity of the liquid content of the mass, washing with water the thus bleached solids content of the mass, removing liquid content from the mass and thereby leaving the solids content of the mass with a relatively small quantity of liquid content dispersed throughout the same, thereafter mixing with the washed solids of the mass aqueous sulfuric acid in quantities sufficient to further the release and derivation of gelatinous matter from the mass of bleached solids, heating and simultaneously agitating the mass to which the sulphuric acid has been added until the gelatin-yielding material of the mass has been converted into liquid phase, and thereafter separating any remaining residue as impurities from the resulting liquid phase product whereby the latter is obtained as relatively clear product but in which there is included a certain quantity of water content.

8. The method of producing a gel intermediate of the class described including employing a mass of chrome tanned leather as a base material relatively free of oil and fat impurities, subjecting such base material to the reactive effects of an aqueous alkalizing solution essentially comprising an alkaline sodium compound, removing a quantity of the solution from the mass of solid material after a substantial alkalizing reaction has been realized therefor, thereafter washing the alkalized mass of base material with water and removing a substantial quantity of the liquid from the washed mass, introducing a quantity of sulfuric acid into the partial dewatered washed mass and subjecting the same to a heat treatment within an approximated temperature range of 190 to 195° F. for a period of time of approximately 1 hour to 1½ hours duration, thereafter removing solids constituting impurities from the resulting liquid-form product, which resulting product still contains water therein, and ultimately eliminating the water content and incorporating a diluting and cutting agent whereby the product thereby obtained is a viscous solution adapted for various modes of ultimate employment.

9. A product for use in diverse manners and substantially identical with the product produced from chrome tanned leather waste as a base material therefor by a process including initially alkalizing and plumping such waste base material by subjecting it to the action of soda ash in an aqueous solution, eliminating a substantial quantity of the liquid content of the mixture and thereafter subjecting the plumped leather waste to repeated washings, eliminating from the washed plumped waste a quantity but not all of the liquid content, thereafter adding and ultimately dispersing sulfuric acid to and throughout the washed plumped leather waste and heating

the resulting menstruum thus formed to within a temperature range of approximately between 190° to 195° F., and continuously stirring the same and until the gelatinous matter and resulting sodium sulfate are yielded in liquid form permitting the separation thereof from the residual solid portions of the leather, thereafter separating the liquid matter from the solid residue for thereby obtaining a gel intermediate essentially comprising a gelatinous material with sodium sulfate salt dispersed therein.

10. A product which is substantially identical with the product produced by steps comprising subjecting chrome tanned leather as a gelatin-yielding base material that is substantially oil and fat free and having a chromate containing radical therein to an aqueous alkalizing and bleaching treatment by intermittently mixing with and throughout said base material a solution essentially comprising an alkaline sodium compound and an oxidizing agent, thereafter removing a substantial quantity of the liquid content of the resulting mass of alkalined and bleached base material, washing with water the thus bleached solids contents of the mass, removing liquid content from the washed mass and thereby leaving the solids content of the mass with a relatively small quantity of liquid dispersed throughout the same, thereafter mixing with the solids of the thus dewatered mass aqueous sulfuric acid in quantities sufficient to further the release and derivation of gelatinous matter from the mass of bleached solids, heating and simultaneously agitating the mass to which the sulphuric acid has been added until the gelatin-yielding material of the mass has been converted into liquid phase, thereafter separating the remaining residue as impurities from the resulting liquid phase product whereby the latter is obtained as a relatively clear liquid phase product but in which there is included a certain quantity of water content, and further treating and processing such clear liquid phase product so as to eliminate the water content and incorporating a diluting and cutting agent whereby the resulting product is in the form of a dehydrating viscous solution adapted for various modes of ultimate employment.

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