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PROCESS OF BLEACHING ESTER TYPE WAX

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This application relates to a process of bleaching and more particularly to a process adapted for bleaching waxes. More specifically, it relates to a process of bleaching which utilizes as the active bleaching agent, a peroxide, a percarbonate, a perborate or other similar compound which yields hydrogen peroxide in solution. The process is especially adapted for the bleaching of beeswax. By the use of our process, it is possible to obtain a product of satisfactory lightness of color without a prohibitively large chemical cost.

Beeswax now obtainable in the market is usually classified into two distinct groups. Domestic beeswax or the wax sold by American bee keepers is usually a dark colored material, and it is impossible to bleach this wax to a satisfactory white color by the usual air and sun bleaching method now ordinarily employed. Imported wax, on the other hand, is generally relatively easy to bleach merely by exposure to the sun and air in accordance with ordinary commercial practices. While imported waxes are generally easy to bleach, there are certain kinds of imported waxes which are so difficult to bleach that ordinarily little of these waxes are commercially prepared in the lighter colors. Thus, African wax or the wax from African wild bees is very difficult to bleach.

While the reason for the relative ease of bleaching of the waxes produced by some species of bees as contrasted with the comparative difficulty of bleaching waxes from other sources is not definitely known, it is believed that the chemical characteristics of waxes obtained from different strains of bees and different sources of pollen vary greatly. Obviously, this means that different conditions and/or quantities of bleaching agent are necessary for different beeswaxes. Another reason is that in domestic bee keeping, the wax comb is used over again the second or third successive year and by the time the wax is delivered to the bleachery, it has become exceedingly dark in color. Waxes from strains of wild bees, such as are frequently encountered in imported beeswaxes, are ordinarily from combs used but one year and for this reason are not so dark in color.

Beeswax which is intended for cosmetic purposes is now ordinarily bleached by exposing it to the rays of the sun in the open air. This necessitates forming the wax into ribbons or threads and spreading it out in the open air for a considerable period of time as the action of the sun in bleaching the wax is relatively slow. Moreover, bleaching by the action of the sun in the open air is ordinarily restricted to certain seasons of the year as spring and fall, as in the summer season, the heat of the sun is so great that it melts the wax and interferes with bleaching, while in the winter, there is an insufficiency of sunlight. On days when the sun does not shine, as on cloudy days or days when the hours of sunlight are relatively few, serious delay is encountered by reason of the prolonged period necessary to effect bleaching. The process is as best primitive and is obviously so dependent, to a large extent, on external uncontrollable conditions that it does not harmonize with present day industrial requirements.

Moreover, bleaching by the action of the sun is now entirely restricted to the bleaching of imported waxes. Thus far, it has been impossible to bleach domestic waxes in the sunlight and obtain a product which is satisfactory for use in the cosmetic industry. Of course, the manufacture of cosmetics such as cold cream from beeswax constitutes one of the important and large outlets for this material and any process which will not render domestic waxes suitable for this use obviously possesses serious limitations. At present, the process of sun bleaching waxes for use in the cosmetic manufacturing industry is very much of an art and the skill of the bleacher in blending a difficultly bleachable wax with an easily bleachable wax plays a very large part in the success or failure of the process. Thus, it is customary to take a dark colored imported wax and a relatively light colored imported wax and blend them in different proportions in order to obtain a mixture which will bleach to a satisfactory degree of lightness. Very frequently, from 3% to 5% of tallow or beef fat is added to the wax in order to render it easy to bleach. While not especially objectionable, the addition of tallow to the wax obviously constitutes an adulteration and for this reason is preferably avoided. However, in some bleaching processes, it has been ordinarily necessary to add this material even to special blends of different imported waxes in order to produce a product satisfactory for use in the cosmetic trade.

A beeswax satisfactory for use in cosmetics must not only be of a substantially white color but must also be of a character that will cream satisfactorily. Domestic waxes cannot be satisfactorily bleached by sun bleaching methods. Since this excludes from a large market the entire domestic supply of beeswax, attempts have

been made to bleach these waxes by chemical bleaching methods.

For example, strong oxidizing agents such as potassium dichromate, $K_2Cr_2O_7$, and potassium permanganate, $KMnO_4$, have been tried. While domestic waxes can be lightened to a satisfactory light color by means of these strong oxidizing agents, at the same time, the wax is injured so that it is unfit for cosmetic use. After such treatment, the wax will not cream satisfactorily and is therefore worthless for the cosmetic trade since the ability to cream is an essential requirement of a beeswax intended for use in cosmetic preparations.

It is accordingly one of the objects of this invention to develop a method which will satisfactorily bleach domestic waxes so that they can be utilized in the manufacturing of cosmetic preparations. As previously explained, domestic beeswax is now completely excluded from the cosmetic market and reliance has been placed entirely on imported waxes.

Another object of this invention is the development of a method which will employ chemicals and preferably active oxygen yielding chemical compounds as the bleaching agents. Present sun bleaching methods are unsatisfactory for the various reasons explained above, and previously known methods in which active oxygen yielding compounds have been utilized have produced a product unfit for commercial utilization. Accordingly, it is our object to work out a method which will be successful even in bleaching the dark colored domestic waxes and still will not destroy those properties which are essential in a beeswax which is to be utilized as an ingredient in cosmetic preparations.

Another object of our invention is to devise a process which will rapidly bleach the wax and which will nevertheless not require a large amount of equipment or chemicals which are not easily obtainable commercially. Present bleaching methods are all open to the objection that they are too slow and uncertain and it is our purpose to develop a method which is sure and rapid.

Another object of our invention is to devise a process in which the cost of the chemicals necessary will be kept down by means of the utilization in combination of a series of distinct steps, each of which serves in some measure to lighten the product. The usual commercial unbleached beeswax is very dark in color and complete bleaching by means of a chemical agent would ordinarily require an excessively large amount of the bleaching agent. Since the method has to compete with the product produced by the relatively inexpensive sun bleaching method, it is necessary that the chemical cost be kept down to within reasonable limits.

Therefore, another object of our invention is to combine with the active oxygen bleaching treatment certain steps which will remove part of the adhering dirt mechanically from the beeswax and other steps which will accomplish the required lightening or bleaching by means of a relatively cheaper chemical or an inexpensive, easily obtainable substance such as atmospheric air. Furthermore, it is an object to avoid the use of excessively strong oxidizing agents which would injure the beeswax so that it would be rendered unsuitable for use in the manufacture of cosmetic preparations but still to develop a process which will produce a satisfactory degree of lightness in a relatively short period of time. Moreover, while our process is suitable for use on waxes which have been blended, as is customary in the present day sun bleaching methods, it is an object of our invention to work out a method which will make it unnecessary to add an adulterating agent such as tallow to the beeswax. These and other objects of our invention will be ascertainable and obvious from the ensuing description which is a disclosure of the best method known to us for bleaching waxes of this type generally.

As the first step in our process, the beeswax which is usually quite dark in color, part of the darkness being due to foreign materials such as dirt which have become incorporated in the wax during the handling, is melted by the application of heat. The melted wax is then washed in an acid bath. Any acid may be used although for considerations of cost, we prefer to use an inorganic acid. Inorganic acids are usually among the cheapest commercially obtainable acids. Moreover, we prefer to use an acid which is non-oxidizing under the conditions of the process. While hydrochloric, phosphoric, oxalic and other acids may be utilized, we have found that a 3% to 10% solution of sulfuric acid is most advantageous. Sulfuric acid is among the cheapest of acids and is non-oxidizing under the conditions of use. If the other acids enumerated should be employed, baths of these acids should be made up which will be substantially equivalent to the 3% to 10% sulfuric acid bath which is our preferred treating agent.

We have found that the quantity of sulfuric acid necessary is not critical so long as the bath in which the molten wax is washed is of approximately 3% to 10% concentration of diluted sulfuric acid, or similar concentration of equivalent acid. These percentages of acid are by weight. The volume of dilute acid necessary is not critical and for convenience, we have found it desirable to employ a volume of dilute acid which is approximately equivalent in volume to the volume of the melted wax. An elevated temperature of treatment is preferably employed and in any case, a temperature above the melting point of the wax must be maintained. We have found that temperatures ranging from 180° F. to the boiling point (at 212° F. or slightly above) are most suitable during this step involving treatment of the wax in a dilute acid bath containing approximately 3% to 10% concentration of sulfuric acid, or other suitable acid. The treatment time usually varies from 15 minutes to one hour and in general, we have found treatment periods of half an hour to be entirely suitable when the acid concentration is as specified above. Again we wish to emphasize that the weight of the solution bears no relationship whatsoever to the weight of the wax as but little of the acid seems to be used during the washing process. It is thus possible to use the same dilute acid solution over and over again for successive batches of wax since the quantity of acid used up in the process is ordinarily negligible. It is entirely sufficient that any convenient volume of dilute acid be employed and as previously specified, we have obtained results giving complete satisfaction when the volume of dilute acid is approximately equal to that of the wax. In any event, sufficient dilute acid should be used to effect thorough washing of the wax and greater or less quantities may be employed if convenient.

The acid solution is then removed from the

molten beeswax by some suitable method such as decanting or siphoning. A large portion of the dirt present in the wax and forming part of the discoloring material collects at the interface between the wax which floats above the acid and the dilute acid solution itself. Preferably, the wax is maintained in molten condition and then washed with several portions of water in order to wash it free of the acid. Removal of the acid carries with it a large portion of the dirt and each successive washing not only removes adhering acid but also carries away part of the solid dark colored impurities. While not constituting all of the discoloring material present in the wax, it has been found that solid mechanically held particles of dirt are an important part of the total quantity of discoloring materials present.

We have found that two washings are usually entirely sufficient to free the wax of acid although the molten wax may be tested with litmus or other suitable indicator in order to ascertain the moment when the wax is acid free. As previously stated, the adhering dirt in large amount seems to collect in the interface and when the wax is allowed to solidify will be found to adhere to the lower part of the solid block of wax floating on the heavier wash water.

Accordingly, after washing the wax at a temperature above its melting point, the wax is permitted to solidify and it is then removed from the last wash water. The next step in our process comprises mechanically scraping off adhering dirt which, as we have previously indicated, seems to collect close to the lower portion of the solid beeswax. By this procedure, a large quantity of the foreign materials may be mechanically removed which could not be removed effectively by bleaching.

After scraping off the dirt, the wax is again melted. The next step comprises treating it with an alkaline solution of hydrogen peroxide or a solution which will yield an alkaline solution of hydrogen peroxide such as sodium peroxide, sodium percarbonate, or sodium perborate. In practice, we prefer to use a solution of sodium peroxide, Na_2O_2, as this is one of the relatively cheap commercial forms of active oxygen.

The treatment time during which the melted wax is subjected to the action of an alkaline aqueous solution of an active oxygen yielding compound at a temperature above its melting point should range from 2 to 8 hours and will depend, to some extent, on the temperature and on the peroxide concentration of the treating bath. We have found that ordinarily when sodium peroxide is used, the amount of this peroxide necessary varies from 2% to 8% by weight, based on the weight of the wax being treated. When using hydrogen peroxide, another relatively inexpensive commercial source of active oxygen, equivalent amounts of this peroxide should be used. Since the customary 100-volume solution of hydrogen peroxide of commerce contains about 27.5% of hydrogen peroxide, in order to prepare a solution containing an equivalent amount of active oxygen, concentrations of the 100 volume hydrogen peroxide solution ranging from 3% to 10.5%, based on the weight of the beeswax being treated, will normally be required.

As previously stated, it is necessary that the active oxygen yielding solution be maintained on the alkaline side. While a pH value somewhere between 7 and 8 will be found to give some bleaching, we have found it more desirable to maintain the pH at some value within the range 10 to 13. Ordinarily, the bleaching action is much more rapid if the pH falls within the limits 10 to 13. However, pH values as low as 9 may be utilized with relatively rapid results and accordingly, we do not wish to be limited to any precise pH values. As previously mentioned, any pH value above 7.0 may be employed and ordinarily, there is no advantage in going above a pH of 13 for the wax may be injured by too high alkalinity. While the most rapid bleaching occurs in the range of pH values 10 to 13, it is to be understood that any value on the alkaline side can be used.

When using a solution of sodium peroxide in the amount specified above, it will be found that the pH value of the solution falls within the range of pH values specified and no added material need be introduced for the purpose of regulating the pH value. However, with hydrogen peroxide solution, since these solutions are ordinarily acid as shipped and since beeswax contains free acid, it will be found necessary to add an alkalining agent. When utilizing sodium perborate solutions, an added alkalining agent is frequently necessary in order to bring the pH value within the range of values which will result in relatively rapid bleaching. Sodium percarbonate solutions, on the other hand, ordinarily fall within the required degrees of alkalinity. At this time, it might be advisable to state that during the emulsifying step, which forms part of the treatment, any pH value on the alkaline side is sufficient to maintain the emulsion. However, it may be desirable to distinguish between the pH necessary to effect rapid bleaching and the pH value necessary to ensure emulsification of the wax. For mere emulsion, ordinarily, any pH value above 7.0 is suitable while in order to bleach in a rapid and effective manner, the pH value of the solution should ordinarily fall within the range 10 to 13, as explained above.

Accordingly, we have found it desirable in practice to emulsify the molten beeswax thoroughly by holding it at a temperature above its melting point and substantially close to 180° F. Any temperature above the melting point of the wax is suitable but in general, we prefer to use temperatures which are below about 200° F. as at the higher temperatures, considerable amounts of active oxygen are lost as the result of decomposition of the peroxide, percarbonate, and perborate employed. As stated above, the treatment time necessary for bleaching the emulsified mixture will vary to some extent and depends on the peroxide content and on the temperature employed. While not absolutely essential to hold the beeswax at a temperature above its melting point in emulsified form until the mixture is substantially or practically free from free peroxide or active oxygen, ordinarily in commercial practice this is desirable in order to avoid wasting any peroxide. Usually, from 2 to 8 hours are necessary for this treatment and if desired, a small portion of the wax may be periodically treated with potassium iodide and starch in accordance with the usual tests for the presence of free active oxygen. When the sample shows the presence of no free active oxygen, the bleaching action will be complete. After several trials with any given type of wax, it will be possible to ascertain fairly accurately when the emulsion is entirely free from free hydrogen peroxide and this will render unnecessary the use of the potassium iodide-starch test. A wax treated with the active oxygen yielding material in the form of

an emulsion will be found to bleach much more satisfactorily. Commercially, the wax should be held at the temperature above its melting point and below 200° F., preferably in the neighborhood of 180° F. until there is no free active oxygen present therein which will require a period of time ranging from 2 to 8 hours.

While the amounts of sodium peroxide or other active oxygen yielding material, such as hydrogen peroxide specified above, depend on the quantity of wax being treated, the particular concentration of the bleaching solution employed is immaterial. Thus, amounts of the bleaching agent within the stated limits may be added to any volume of water which is convenient except, of course, that extremely dilute solutions are not ordinarily suitable. We have found it preferable to employ a bleaching solution which is equivalent in volume to about four times the volume of the wax being treated. This criterion is based, however, on conditions of convenience and is in no sense to be regarded as an essential factor in our process. As long as the solution is not too dilute, the concentration of the solution is immaterial although, of course, the amount of active oxygen yielding material necessary is strictly to be determined in accordance with the quantity of wax being treated.

Any suitable alkalining agent may be added if necessary in order to bring the pH value of the solution within the desired limits. Thus, pH values of 7 to 14 are operative although a value above 10 is desirable in order that the bleaching action may be rapid. Sodium hydroxide or sodium carbonate are examples of satisfactory alkalining agents which may be necessary if hydrogen peroxide or sodium perborate are utilized. Ordinarily, with sodium peroxide and percarbonate solutions, the addition of alkalining agents is unnecessary.

After the emulsified wax and active oxygen yielding solution is substantially free from hydrogen peroxide, the solution may be neutralized with an acid until it is very faintly acid. This results in breaking the emulsion and the separation of the wax and the solution into two separate and distinct layers, the molten wax floating on the solution. Any acid can be used for rendering the solution slightly acid although here again, we prefer to use an inorganic acid which is non-oxidizing at the temperature of the mixture. Sulfuric acid is our preferred acidifying medium because of its cheapness and relative inertness. Sodium sulfate solution may also be used to break the emulsion if desired although ordinarily, it will not be found as satisfactory as sulfuric acid. The wax and solution are then separated, either by decanting the solution or wax or by siphoning off one liquid layer from the other.

The wax which is meanwhile maintained in a molten state and prevented from solidifying is then thoroughly washed with water to remove from it any remaining acid and salts, formed as the result of the neutralization. We have found that two washings with water are usually sufficient. If desired, a small sample of the wax may be tested with an indicator in order to ascertain when it is entirely free of remaining acid.

The molten wax is then decolorized with an adsorbent material. Any adsorbing agent which will absorb colored particles may be used. Thus, silica gel is entirely suitable but we prefer to use the relatively cheaper adsorbing agents, such as fuller's earth and charcoal. While activated charcoal is much more effective in its adsorbing action than fuller's earth, it is considerably more expensive than the latter material. As the result of experimentation, we have found that a certain amount of the relatively less active fuller's earth may be used in conjunction with charcoal and in this way, a cheaper adsorbent is prepared than would result either by using a larger amount of fuller's earth or an operative amount of charcoal. The particular mixture that we have found most suitable, chiefly because of its relative cheapness, is a mixture comprising fuller's earth in amounts ranging from 3% to 10%, based on the weight of the wax being treated in admixture with about ½% to 2% by weight of activated charcoal. The selected amounts of fuller's earth and charcoal are mixed together and then thoroughly stirred up with the molten wax. Of course, they may be added separately to the wax but in any event, the molten beeswax should be agitated for about ½ to 2 hours either by stirring or by some other means so that there is thorough contact between the adsorbing agent and the wax.

It is, of course, to be understood that the particular mixture described above which we have found most suitable as an adsorbent because of its relative economy, is not an essential factor in our invention. Thus, pure charcoal alone or pure fuller's earth alone may be used. When using pure activated charcoal, we have found that amounts ranging from 2% to 5%, based on the weight of the beeswax, are necessary. When using fuller's earth alone, we have found that generally, amounts of fuller's earth ranging from 10% to 25% of the beeswax must be used. While we have ascertained that other adsorbents such as silica gel and alumina gel may be used, the amounts of these materials necessary should be ascertained by experimentation with the particular wax being treated. This is due primarily to the varying nature of these adsorbing agents and the varying characteristics of the different types of beeswax encountered in commercial practice. While it is impossible for us to specify any particular amounts of these agents generally applicable to all types of beeswax, it may be stated that these adsorbents will possess some decolorizing action even if present in less than the amount required to exert their full decolorizing action and a large excess will be undesirable not only because of wastage of the excess and unnecessary quantity of adsorbent but also because it may permanently adhere to the wax and thereby render a portion of it valueless.

The molten wax is then separated from the adsorbent by filtration or by some other suitable procedure. It is then allowed to solidify and will be found to be of a high degree of whiteness. In those cases where the original beeswax prior to treatment was extremely dark and discolored, it may be necessary to utilize the following step of our process. However, we wish to emphasize that in the great majority of cases, the product obtained at the termination of the treatment with the adsorbing agent is entirely satisfactory judged by present day commercial standards and is such as to render unnecessary the use of the following final treatment operation. However, in those cases when a product of a very superior degree of whiteness is desired or with those waxes which are originally extremely dark and dirty in color, it may be advisable to utilize the following final step employing atmospheric air.

In our final treatment, employed when neces-

sary, the wax is maintained in a molten condition and prevented from solidifying either by heating or by placing it in a carefully insulated vessel. Through the molten wax, air is bubbled in a moderate amount (approximately 0.05 to 0.5 cu. ft. of air per hr. per 100 grams of wax) and in a relatively slow current for a period ranging from about 5 to 20 hours. The quantity of air necessary depends in a large measure on the intimacy of contact between the air and wax. In general, we have found that a small current just sufficient to agitate the molten wax is all that is necessary and this may mean less air than 0.05 cu. ft. per 100 grams of wax. If the air is distributed carefully throughout different portions of the molten wax as by some type of a distributor, both the quantity of air and the time of treatment may be somewhat reduced.

If desired, the air may be preheated to a temperature above the melting point of the wax prior to its passage through the molten wax. By this means, careful insulation of the container containing the wax is rendered unnecessary and the wax may be maintained molten by means of the heated air stream. If undesirable or impractical to heat the air current, the wax itself may be heated as by means of steam coils positioned in or around it. In any case, when exceptionally dark waxes are being handled, it will be found that the treatment with air will be effective in removing the last tinges of color present in the wax. Any other form of oxygen, such as gases containing oxygen or pure oxygen itself, may, of course, be substituted for the atmospheric air although ordinarily, air is the cheapest material available for this step.

Obviously, we have developed a process which by the use of relatively cheap materials such as inexpensive oxidizing agents, mineral acids, adsorbents and atmospheric air reduces some of the expense incident to bleaching beeswax by means of active oxygen yielding materials. Moreover, we have developed a process which is the first process utilizing active oxygen yielding chemicals which will bleach the wax and still not change its characteristics so that it is unsuitable for use in the manufacture of cosmetics. Specifically, our process does not destroy the necessary creaming properties of the beeswax which destruction is characteristic of all previously known methods of commercially bleaching beeswax by means of chemicals.

Moreover, our process permits the bleaching of domestic waxes which were formerly not capable of being bleached by sun bleaching methods. The fact that it is now possible for the trade to employ domestic waxes in the bleaching of beeswax for use by the cosmetic industry is a distinct step forward in this art.

It is evident that our process is much more rapid and much more satisfactory than the uncertain and primitive sun bleaching now employed in the beeswax bleaching industry. Darker waxes can be bleached generally by our method and, ordinarily, blending of different waxes, which blending step is essential in sun bleaching, is unnecessary when our method is employed. Our process is readily carried out commercially, requiring no expensive equipment and is easily carried out by unskilled operators. While it is particularly adapted for the bleaching of beeswax and this step is an essential advance in this art, it may also be used for the bleaching of other similar waxes and we do not wish to be restricted in the scope of protection accorded only to this one type of commercial wax.

It is to be understood that although the peroxides, percarbonate and perborate of sodium have been taken as illustrative in describing our process, other metallic and non-metallic per-compounds can, of course, be used. For example, the compounds of the other alkali and the alkali earth metals are suitable as well as various other per-compounds obtainable commercially. Any compound capable of yielding hydrogen peroxide in aqueous alkaline solution is applicable in our process.

It is also to be understood that the various amounts and concentrations given in our description are to be considered as illustrative of our preferred method, and that our method is not specifically restricted to these manipulations and amounts. It is to be understood that amounts have been specified merely for the purpose of giving a complete disclosure as to the best method known to us of practicing our invention. It is obvious that various changes may be made in the procedure, the temperatures employed, the treatment times necessary and the amounts of chemicals and/or other agents specified without departing from the scope and spirit of our invention. For this reason, we do not wish to be restricted to specific manipulations or amounts except as necessitated by the scope of the appended claims which define our invention.

Wherever, in the appended claims, reference is made to hydrogen peroxide, it is intended to include within the scope of this term any material which is capable of yielding hydrogen peroxide when in solution, e. g., the various persalts, percarbonates, perborates, various peroxides, etc.

As examples of our novel process, the following may be given:

Example 1

100 grams of a crude dark-colored beeswax was boiled in 400 cc. of 10% sulfuric acid solution for approximately 30 minutes. The temperature was maintained at the boiling point, approximately 212° F. The wax, still molten, was then washed three times in hot water. At the conclusion of the third washing, it was allowed to solidify and mechanically held dirt was scraped off the bottom surface of the cake of beeswax.

An active oxygen bath was prepared by adding 4.0 grams of sodium peroxide to 400 cc. of cold water. The solution was then warmed up and added to the wax. The solution and wax were stirred together with a mechanical stirrer until the wax was completely melted and emulsified. The agitation was continued for 15 additional minutes until the wax was thoroughly emulsified.

The emulsified wax and active oxygen solution were then placed in an oven which was maintained at 180° F., and allowed to remain for four hours. At the conclusion of this time, warm dilute H_2SO_4 of approximately 25% concentration was added to the emulsion for the purpose of breaking the emulsion and separating the wax and solution into two separate liquid layers. The solution was made slightly acid with this dilute sulfuric acid. The resulting molten wax was then washed while still liquid, in warm water and permitted to solidify.

The next step in the process was the decolorization of the washed wax by using 10 grams of fuller's earth and 0.5 gram of activated carbon. The adsorbing agents and the wax were mixed

together and held in an oven at 180° F. for two hours. At the end of this period, the molten wax was filtered through ordinary filter paper in order to remove the decolorizing or adsorbing agents. A wax of extreme light color and satisfactory creaming properties, suitable for use in the preparation of cosmetics, was obtained.

Example 2

100 grams of a second sample of crude beeswax was boiled in 400 cc. of 10% H_2SO_4 for approximately 30 minutes. At the end of this time, it was washed three times in warm water and then allowed to solidify. Adhering dirt was removed by scraping it from the solidified wax.

5.3 grams of sodium hydroxide was added to 400 cc. of water maintained at a temperature of 180° F. The wax was then added to the resulting solution and thoroughly emulsified by stirring. To the emulsion 5.4 cc. of Albone "C" (100-volume hydrogen peroxide) was added. The pH of the solution was approximately 13.0.

The mixture was stirred with a mechanical stirrer and placed in an oven maintained at 180° F. where it was allowed to remain for eight hours. It was then removed and the emulsion was broken with hot dilute sulfuric acid. The still molten wax was then washed with warm water and allowed to solidify.

The washed wax was then decolorized, using 10 grams of fuller's earth and 0.5 gram of activated charcoal, by agitating the adsorbing agents rapidly in a glass beaker with the molten wax. The temperature was maintained at 180° F. for one-half hour and the agitation was continued throughout this period.

The wax was then filtered through an ordinary filter paper to remove the decolorizing agents. It was then held at a temperature above its melting point for about eight hours and a moderate current of air was bubbled through it. The current of air was equivalent to approximately two-tenths cubic feet of air per hour.

The beeswax was then allowed to solidify. The product was exceptionally light in color and of a quality which was entirely satisfactory for use in the manufacture of cosmetic preparations.

We claim:

1. A process for bleaching ester type wax without destroying properties which render it suitable for use in the manufacture of cosmetics which comprises emulsifying the wax at a temperature at which said wax is molten with an alkaline solution of hydrogen peroxide, said alkaline solution of hydrogen peroxide having a pH value such that the pH value of the resulting emulsion falls within the range 7 to 14, and then permitting said emulsified wax and alkaline solution to remain in contact without agitation for a period of time sufficient to bleach said wax.

2. A process for bleaching ester type wax without destroying properties which render it suitable for use in the preparation of cosmetics which comprises emulsifying the wax at a temperature at which said wax is molten with a dilute solution of hydrogen peroxide, the pH value of said dilute solution of hydrogen peroxide being such that the resulting emulsion has a pH value falling within the range 10 to 13, and then permitting said emulsified wax and solution of hydrogen peroxide to remain in contact, without agitation, for a period of time sufficient to bleach said wax.

3. A process for bleaching ester type wax which comprises subjecting said wax in molten condition to the action of a dilute solution of sulfuric acid, separating said sulfuric acid solution from said molten wax, and then emulsifying said wax with an alkaline solution of hydrogen peroxide of such alkalinity that the resulting emulsion is alkaline in reaction, the temperature being maintained throughout said treatment sufficiently high that said wax is in the molten state.

4. A process for bleaching ester type wax which comprises subjecting said wax in the molten condition to the action of a dilute solution of sulfuric acid, removing said wax from said dilute solution of sulfuric acid, permitting said wax to solidify, scraping off adhering dirt, and then melting the wax and emulsifying said wax with a dilute solution of hydrogen peroxide of such alkalinity that the resulting emulsion is alkaline in reaction.

5. A process for bleaching ester type wax which comprises subjecting said wax in molten condition to the action of a dilute solution of sulfuric acid, separating said solution of sulfuric acid from said wax, permitting said wax to solidify, scraping off from said solidified wax adhering dirt, melting said wax, emulsifying said molten wax with a dilute alkaline solution of hydrogen peroxide, the alkalinity of said solution being such that the resulting emulsion is alkaline in reaction, recovering said wax from said emulsion, and then decolorizing said wax in the molten condition by treating it with a color adsorbing agent.

6. A process for bleaching ester type wax which comprises subjecting said wax to the action of a dilute solution of sulfuric acid, removing said wax from said solution of sulfuric acid, permitting said wax to solidify, scraping off adhering dirt, emulsifying the wax with a dilute alkaline solution of hydrogen peroxide, said solution having an alkalinity such that the resulting emulsion is alkaline in reaction, recovering said wax from said emulsion, decolorizing said wax by treating it with a color adsorbing agent, and finally subjecting said wax to the action of atmospheric air in order to complete said bleaching process.

7. A process for bleaching beeswax which comprises subjecting said beeswax in the molten condition to the action of dilute sulfuric acid, removing said beeswax from said sulfuric acid, permitting said beeswax to solidify, removing adhering dirt from said solidified beeswax, melting said beeswax, emulsifying said beeswax with a dilute solution of hydrogen peroxide having a pH between 10 and 13, the resulting emulsion being alkaline in reaction, recovering said beeswax from said emulsion, decolorizing said beeswax by contacting it with a color adsorbing agent and then blowing atmospheric air through said molten beeswax in order to complete the bleaching operation.

8. A process for bleaching beeswax which includes the steps of treating said molten beeswax with dilute sulfuric acid, separating said sulfuric acid solution from said beeswax, treating said beeswax with a dilute alkaline hydrogen peroxide solution of such pH that a relatively permanent emulsion results, said emulsion being sufficiently permanent to permit bleaching of said beeswax by said hydrogen peroxide to occur, breaking said emulsion at the termination of the last named bleaching step, recovering the molten wax which separates as a supernatant layer, decolorizing said beeswax by contacting it in the molten state with a color adsorbing agent, and subsequently removing said color adsorbing agent from said molten

beeswax and permitting said molten beeswax to solidify.

9. A process for bleaching beeswax which comprises subjecting said beeswax in the molten condition to the action of dilute sulfuric acid, separating said wax from said dilute sulfuric acid solution, emulsifying said wax in the molten condition with dilute alkaline hydrogen peroxide solution of such alkalinity that the resulting emulsion is alkaline in reaction, recovering said beeswax from said emulsion, and then completing the bleaching operation by treating said beeswax in the molten condition with a color adsorbing and decolorizing agent.

10. In a process of bleaching ester type wax, the steps which comprise emulsifying said wax with a dilute alkaline solution of a material selected from the group which consists of hydrogen peroxide, an alkali metal peroxide, a percarbonate and a perborate, said solution having an alkalinity such that a relatively permanent emulsion of wax in bleaching solution results, and then permitting said emulsified beeswax and alkaline solution to remain in contact, without agitation, for a period of time sufficient to bleach said wax.

11. A process for bleaching beeswax which comprises emulsifying said beeswax with a dilute alkaline solution of a per compound having a pH between 10 and 13 which includes an active oxygen yielding compound selected from the group which consists of peroxides, percarbonates and perborates, and then permitting said emulsion to remain, without agitation, for a period of time sufficient to effect bleaching.

12. A process for bleaching beeswax which comprises treating said beeswax in the molten state with a dilute alkaline solution of hydrogen peroxide having a pH value such that a relatively permanent emulsion of molten wax and alkaline solution results and then permitting said emulsion to stand, without agitation, for a period of time sufficient to effect bleaching.

13. A process for bleaching beeswax which comprises converting said beeswax, in the molten condition, into a relatively stable emulsion by first treating it with an alkaline solution capable of yielding hydrogen peroxide in the bleaching bath and of such alkalinity that a permanent emulsion of wax in solution will result, and then agitating said molten beeswax and solution for a period of time sufficient to form an emulsion of molten beeswax in peroxide solution which will be sufficiently permanent to remain as an emulsion for the period of time necessary to effect bleaching of the beeswax, thereby eliminating the necessity of agitating in order to insure intimate contact between said beeswax and said peroxide bleaching agent.

14. A process for bleaching beeswax which comprises converting said beeswax, in the molten condition, into a relatively stable emulsion by first treating it with an alkaline solution having a pH within the range 10 to 13 and capable of yielding hydrogen peroxide in the bleaching bath, and then agitating said molten beeswax and solution for a period of time sufficient to form an emulsion of molten beeswax in peroxide solution which will be sufficiently permanent to remain as an emulsion for the period of time necessary to effect bleaching of the beeswax, thereby eliminating the necessity of agitating in order to insure intimate contact between said beeswax and said peroxide bleaching agent.

15. A process for bleaching beeswax which comprises converting said beeswax, in the molten condition, into a relatively stable emulsion by first treating it with an alkaline solution of sodium peroxide having a pH within the range 10 to 13, and then agitating said molten beeswax and solution for a period of time sufficient to form an emulsion of molten beeswax in peroxide solution which will be sufficiently permanent to remain as an emulsion for the period of time necessary to effect bleaching of the beeswax, thereby eliminating the necessity of agitating in order to insure intimate contact between said beeswax and said peroxide bleaching agent.

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