

UNITED STATES PATENT OFFICE.

JOSEPH DONNER, OF CHICAGO, ILLINOIS.

CREAM DEPILATORY.

1,379,855.

Specification of Letters Patent.

Patented May 31, 1921.

No Drawing. Continuation of application Serial No. 378,644, filed May 3, 1920. This application filed March 3, 1921. Serial No. 449,530.

To all whom it may concern:

Be it known that I, JOSEPH DONNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Cream Depilatory, of which the following is a specification.

This application is filed as a continuation of my application filed May 3, 1920, Serial No. 378,644.

My invention relates to a toilet preparation or cosmetic, particularly to that class known as depilatories, which are used for removing hair, superfluous or normal from the human body.

One of the primary objects of my invention is the preparation of a depilatory in the form of a cream or paste.

Another principal object of my invention is the incorporation of a depilating agent in an air-restraining base.

A further object of my invention is the preparation of a finished depilatory cream or paste, which is permanent and stable, free from sulfid or other objectionable odor, and possessing instead a distinctly refreshing and fragrant odor.

A further and particular object is the production of a complete or finished depilatory which may be applied directly to the skin without the intervention of water or any other substance, and which will effect the removal of the hair with facility, and with perfect safety to the skin.

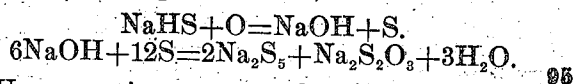
Heretofore depilatories have been made in the following forms:—powder, liquid, and lotion; and the physical states of these are such that their application is invariably attended with inconvenience, or waste of material, or both. The powdered depilatories consisting of mixtures of polysulfids with inert excipients such as starch, flour, chalk, talc, etc., require to be mixed with water before using, which process is mussy, involves the soiling and washing of mixing utensils, is time consuming, and is apt to be attended with loss of material through the preparation of a larger quantity of paste than is required for a single application.

A serious fault attending the use of liquid depilatories is that because of their fluidity

they are apt to spread or flow over a greater area than that of the intended application, and it is difficult to confine them to the removal of hair in a small localized area without their acting on the adjacent skin. This same objection may be applied to the lotion depilatories, which are essentially imperfect suspensions of alkaline and alkaline earth sulfids, polysulfids, and sulphydrates in water.

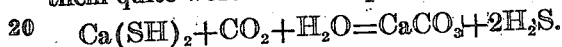
My invention consists of a depilatory, the physical state of which is a plastic mass of tooth paste or cold cream like consistency, and thus overcomes all difficulties of application attendant upon the use of those mentioned above. It is permanent, complete, and handleable; it can be taken from the jar or tube in quantities as desired, and can be applied over an area such as is occupied by one or two hairs on a mole, or upon a surface as extensive as the entire face. Likewise it can be applied to surfaces such as the armpits, with grace and convenience. Furthermore, once placed in position upon the area to be depilated, the cream remains without danger of running or spreading until the hair is disintegrated.

I have found that the sulfid depilatories heretofore in common use have consisted of the sulfids, polysulfids, and sulphydrates of the alkali, alkaline earth, and earth metals, in solution or suspension in water, alone or in admixture with one another in various proportions and strengths. In all of these the dissolved sulphydrates constitute the active depilating agent. Undissolved sulfids and polysulfids have little or no depilating power. When sulphydrate solutions are exposed to the air, the sulphydrates are converted into hydroxids, sulfur being liberated and dissolving in the base, thus:



Upon opening a receptacle containing a liquid or lotion depilatory, air enters, and through the convection currents that are created in its penetrating the surface layer it is brought into intimate contact with every part of the preparation. Frequent exposures, such as attend the use of depila-

5 tories prepared in small packages, before and during application, permit the entrance of sufficient air to allow the reaction mentioned above to advance to a stage where the original depilatory is materially altered in composition, resulting in an increase in irritant caustic alkali content (NaOH, Ca(OH)₂, KOH, etc.), and a decrease in the content of the depilating agent (NaSH, Ca(SH)₂, KSH, etc.). That is, the preparation becomes less valuable or valueless as a depilatory, and more caustic, or even dangerously irritant to the skin. In the case of the alkaline earth sulfid preparations, prolonged exposure to the air converts them to solid insoluble carbonate, through interaction of the carbon dioxide of the air, causing them to cake, and renders them quite worthless as depilatories; thus:



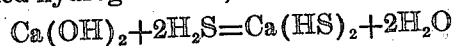
Often in the original package, liquid or lotion depilatories undergo air deterioration and change so as to render them valueless as depilatories, and also capable of producing harmful effects when applied.

In my invention I have overcome these difficulties by taking advantage of the air-restraining properties of colloids and colloid-like bodies, which are capable, when mixed with the depilating agent and any suitable vehicle, of producing a pasty or cream-like mass, in which the molecules of the depilating agent are permanently suspended, and which renders them proof against the substantial entrance of and interaction with air; thus guaranteeing their stability, and the permanence of the preparation. The colloids used, besides having the properties of adhesiveness and air-exclusion, are such that do not decompose the depilating sulfid or sulfhydrate solution.

It is well known that all the sulfid depilatories heretofore in use were attended with the markedly putrid odor of hydrogen sulfid. Heretofore, the disguising of the sulfid odor of these depilatories has been attempted through the use of perfumes, essential oils, or the phenols, alcohols, aldehydes, esters, or other chemical bodies which represent the odorous principles of volatile oils and perfumes. These agents, singly or in admixture with one another are not sufficient to completely mask the odor of appreciable quantities of hydrogen sulfid.

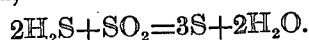
I have found that pure solutions of the sulfhydrates of the alkali and alkaline-earth metals are practically odorless, and that any trace of hydrogen sulfid odor in solutions or mixtures of sulfids, polysulfids or sulfhydrates is an indication of the presence of uncombined hydrogen sulfid. As free hydrogen sulfid has no depilating value its presence in a depilatory is superfluous and unnecessary.

In my preparation herein described advantage is taken of that fact for rendering the depilating mixture inodorous. I accomplish this by subjecting the sulfhydrate mixture, immediately after its preparation, to a low grade vacuum, preferably 200 to 250 mm., at a temperature of 20° C. to 35° C., and thus the removal of uncombined, excessive, dissolved hydrogen sulfid, is effected, rendering the residue practically inodorous, without impairing its depilating properties. The same end can be accomplished also, by the addition of a small excess of suitable alkali to effect the combination with uncombined hydrogen sulfid, thus:

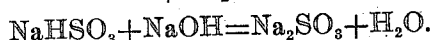
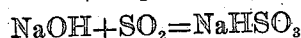
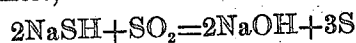


If now this odorless depilating mixture be immediately admixed with adhesive, non-reactive colloids as herein described, which are capable of absorbing traces of hydrogen sulfid, and at the same time act to protect the sulfhydrate mixture against subsequent air decomposition which would result in the evolution of that gas, a compound is obtained which is essentially free from sulfid odor, and which is capable of taking on and asserting the odor of any desired volatile principle or perfume.

I am also aware that sulfur dioxide or sulfurous acid has been suggested as a deodorant for sulfid mixtures, producing its result through chemical combination with hydrogen sulfid, thus:

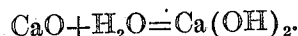


At the same time it has an equal affinity for sulfids and sulfhydrates in solution, reacting with them to form bisulfites and neutral sulfites, thus:



But the sulfites and bisulfites have no depilating value, and hence the use of sulfur dioxide effects the removal of sulfid odor from a depilatory at the expense of reducing the content of depilating agent, and thus lowering the activity of the final product.

As an instance of manufacture I place a quantity of quicklime (CaO) in a large vessel, and slake it by pouring upon it approximately 4 times its weight of water. The interaction of the water and lime result in the formation of a mass of calcium hydroxid (Ca(OH)₂), thus:



To this calcium hydroxid mass I add sufficient water to bring it to the consistence of a thin magma; that is, about 10 parts of water to 1 of lime are used. This is strained through gauze or a wire sieve to remove

extraneous or gritty matter, and then distributed in suitable vessels, preferably glass, preparatory to charging with hydrogen sulfid. I then pass a current of hydrogen sulfid gas through this slaked lime cream until the whole assumes an even pale blue color, after which the current of hydrogen sulfid is removed. This pale blue magma, consisting of calcium sulfid (CaS), calcium hydroxid ($\text{Ca}(\text{OH})_2$), and a solution of calcium sulfhydrate ($\text{Ca}(\text{SH})_2$) and calcium hydroxy-sulfhydrate ($\text{Ca}(\text{SH})\text{OH}$) constitutes the depilating mixture, of which the calcium sulfhydrate solution is the principal depilating agent. When made in this manner the calcium sulfhydrate solution is generally saturated; that is, it contains approximately 7% of calcium sulfhydrate.

In the process as above outlined the presence of an excess of hydrogen sulfid is carefully avoided. However, should the process of sulfuration be carried too far and the product have a marked hydrogen sulfid odor, the excessive uncombined hydrogen sulfid may be removed by subjecting the sulfuret to the action of a low grade vacuum, or by the addition of a suitable excess of milk of lime ($\text{Ca}(\text{OH})_2$), as above stated.

To any desired quantity of this depilating magma light calcined magnesia (MgO) is added in sufficient quantity to make a pasty mass of about the consistence of a cold cream or tooth paste. If the magnesium oxid is substantially pure approximately 1 part of it to 5 parts by weight of the depilating magma is required to bring the mixture to this consistence. A small quantity of oil of rose-geranium is added to impart an odor to the mixture, (usually 1 cc. to 500 grams of the paste), and the whole is admixed until an even, homogenous paste is secured.

The product is a smooth, velvety cream, of the density and consistence of a tooth-paste, and is of a pale blue color. It is substantially free from sulfid odor, and is possessed, instead, of the fragrant odor of oil of rose-geranium, and is essentially soluble in and miscible with water in all proportions. It is permanent and stable in commercial containers (jars and collapsible tubes) at ordinary temperatures, and is of sufficient strength to effect the removal of hair from within 3 to 10 minutes from the time of its application, without irritation or injury to the skin.

While I have thus described a preferred embodiment of my invention I do not wish to limit myself to the exact materials or proportions outlined in the preceding. A variety of materials of like or similar properties may be used in lieu of those described herein, without departing from the scope of my invention or the spirit of the appended claims.

If desired, inert powdered excipients which are non-reactive with the depilating solution may be added to the depilating magma along with the colloidal adhesive to increase the density and give body to the whole. Examples of these are kaolin, talc, starch, calcium silicate and a variety of natural clays consisting mainly of the insoluble silicates of the earth and alkaline earth metals.

In place of the light magnesium oxid described herein, to effect the adhesion of the component parts of the mixture and to protect it against air deterioration, I may employ the gelatinoid hydroxids of non-reactive metals such as aluminium hydroxid $\text{Al}(\text{OH})_3$, or non-reactive colloidal salts such as kaolin $\text{Al}_2\text{H}_2(\text{SiO}_4)_2 \cdot \text{H}_2\text{O}$, or any one or a mixture of the mucilaginous emulsoid colloids such as agar-agar, tragacanth, acacia, flaxseed mucilage, chondrus, quince-seed mucilage, starch, flour, pectin, etc.; the adhesive selected depending upon the depilating agent used. The vegetable colloids are best suited as gel or agglutinating bases for the alkaline sulfid solutions. When made from these basic agents and a clear sulfid solution alone, the finished depilatory is transparent or translucent, and has the appearance of a jelly. It can be made to any degree of firmness or fluidity by varying the proportion of colloid or mucilage. Through admixture with metallic oxids, metallic hydroxids, metallic salts, paraffins or certain soaps, the product can be made to vary in transparency from slight opalescence to the optical density of a solid fat, and in consistence from that of a jelly to that of a cream.

An excellent compound which will illustrate the type of preparation which can be made from vegetable colloids, alkaline sulfid solutions, and inert filling material is the following: starch 10 parts, 3% sodium sulfid solution 100 parts, heavy magnesium oxid 20 parts, and eucalyptol sufficient to mask the odor of the mixture.

As a depilating agent I may use any of the following: the sulfids, polysulfids, and sulfhydrates of the alkali metals, the earth metals, and the alkaline earth metals, alone, or in combination with one another in strengths varying from 2 to 50% solution or suspension.

Nor need the odor of the product be that of oil of rose-geranium. Any desired odor can be effected through the incorporation of the corresponding perfume, essential oil, or odorous principle.

Likewise the color of the product can be varied through the use of suitable mixtures of sulfids and sulfhydrates, and the agency of organic and inorganic colors.

The preparation is applicable to all or any of the body surfaces for the removal of

hair, though as is obvious its usefulness is not confined alone to the removal of hair for cosmetic purposes. It is convenient and applicable for the removal of hair preceding surgical operations, effecting the removal of the hair and leaving the surfaces perfectly clean, aseptic and free from any irritation or injury. It is also of especial and particular value for the removal of hair in cases of infestation as by pediculidæ, and when so used it effects not only the complete removal of the hair but it also acts to destroy the insects and their eggs, as the chitinous body structure of an insect is so similar to the keratin of hair that the destructive or disintegrating effect of the sulfids or sulfhydrates is alike effective on both, and the preparation serves thus as a depilatory and also as an insecticide. By reason of its physical condition as a creamy or plastic mass the preparation can be put up in collapsible tubes similar to the ordinary tooth pastes to permit of its easy and convenient handling, any quantity as desired being expressed by squeezing or compressing the tube; and when so put up or when furnished in jars or in other forms the preparation is preferably of the consistency of the ordinary tooth paste or cream as supplied in collapsible tubes. The preferable consistency being such that the preparation is applicable without further treatment as a soft paste or cream so that it may be easily and quickly applied and spread on the surfaces or areas to be treated and remain as applied without running over or spreading to other areas. As the preparation, however, is readily miscible with water it may be thinned or brought to any degree of fluidity by the addition of water, so that any proper quantity of the paste or cream may be admixed with the requisite amount of water or like liquid to be reduced to any desired consistency.

That which I regard as the dominant and characteristic feature of my invention is the discovery of the air-restraining and agglutinant or adhesive properties of non-reactive colloids or colloid-like bodies when used with depilating mixtures which enable the same to be prepared in the form of creams, pastes, or jellies; which, by virtue of their air-restraining properties maintain the depilating agents from air interaction whereby they are preserved from deterioration, and which, by their adhesive or agglutinant properties bring the depilating mixture into a cream or paste form which permits of its easy application in definite areas with freedom from spreading. By reason also of the fact that the depilating agent or agents are preserved in their original strength without deterioration, and that the preparation is in the form of an applicable cream or paste, the product may be prepared of standard

strength, insuring its effective use, without danger of harm or injury.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A composition of matter, for the purpose specified, comprising a depilatory in the form of a substantially permanent cream or paste.

2. A composition of matter comprising a depilatory mixture and a vehicle carrying the same, in the form of a finished, stable, depilatory cream.

3. A composition of matter for the purpose specified, comprising a depilating agent incorporated in an air-restraining base.

4. A composition of matter for the purpose specified, comprising a depilating agent incorporated in a colloidal base.

5. A composition of matter for the purpose specified, comprising a depilating agent carried in a base of colloids, in a mixture of creamy consistency.

6. A composition of matter comprising a depilating agent permanently suspended in a vehicle in the form of a finished creamy plastic mass.

7. A composition of matter comprising a depilatory mixture and a colloid carrying the same, in the form of a finished, stable depilatory paste.

8. A composition of matter for the purpose specified, comprising an aqueous solution of a depilating agent and an emulsoid colloid dissolved in said solution.

9. A composition of matter for the purpose specified, comprising an aqueous solution of a depilating agent, and a mineral suspensoid colloid permanently suspended in said solution.

10. A composition of matter for the purpose specified, consisting of an emulsoid colloid, a suspensoid colloid, and an aqueous solution of a depilating agent.

11. A depilatory comprising an alkaline sulfid solution, and a substance capable of forming a gel therewith.

12. A depilatory composition consisting of a sulfid jelly, and an agent to render the same of creamy consistence.

13. A depilatory cream consisting of a depilating sulfid and sulfhydrate mixture, and sufficient colloidal agglutinant to maintain the whole substantially stable and homogeneous.

14. A cream depilatory consisting of an alkaline earth sulfid solution in admixture with a vehicle containing sufficient colloid-like adhesive to maintain the whole substantially stable and homogeneous.

15. A depilatory cream consisting of a depilating sulfid and sulfhydrate mixture, with body material to afford density, and sufficient colloidal agglutinant to maintain

the whole substantially stable and homogeneous.

5 16. A depilatory comprising a depilating agent consisting of the products of interaction of hydrogen sulfid and slaked lime, in admixture with sufficient colloid-like agglutinant to form a creamy mass.

17. A depilatory cream comprising a depilating agent consisting of the products of interaction of hydrogen sulfid and slaked lime, in admixture with light magnesium oxid. 10

JOSEPH DONNER.