

UNITED STATES PATENT OFFICE.

ARTHUR WEIL, OF NEW YORK, N. Y., ASSIGNOR TO HENRY C. NAGEL, TRUSTEE.

MATERIAL AND METHOD FOR STIMULATING GROWTH OF HAIR.

No Drawing.

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The present invention relates to a novel material and process for stimulating the growth of hair, and is based upon my discovery that it is possible to overcome the lack of a proper growth of hair, by administering to the system, the materials from which hair can be elaborated by the normal means, to persons who are apparently suffering from a lack of the normal hair constituents or from a lack of the ability to cause the normal constituents to produce a proper growth of hair.

As is well known, hair is a keratinous material, and as the basis of the present invention, I preferably employ keratin, in forms in which it is readily procurable, and subject the same to such a degree of hydrolysis as to convert the same largely or substantially into amino acids, polypeptides and the like.

Human hair is different from most other kinds of keratinous material, such as animal hair, hoofs, horn, feathers, wool and the like, in that human hair contains, as a constituent of its keratin, a much larger amount of cystine than is present in ordinary keratin.

In accordance with the present invention, the keratin or material containing keratin or consisting largely of keratin, such as those above referred to, is first subjected to hydrolysis, preferably a rather complete hydrolysis, either in the presence of an acid or alkali. The mode of accomplishing this step can vary, a simple method is to first clean the hair or other keratin material (horse hair being mentioned by way of example), by giving the same a washing and brushing operation, after which the fats and other fatty substances are removed by extraction with ether, chloroform, benzol, carbon tetrachloride, or similar solvents, this operation leaving substantially pure keratin, but in an insoluble condition. The cleaned and extracted hair can then be placed, at room temperature, say into hydrochloric acid or sulphuric acid, of about 25% strength. This can be allowed to stand at room temperature until the hair has dissolved. If desired, the reaction can be accelerated by heating, and the heating can be conducted at normal pressure or at super-atmospheric pressure in an autoclave if desired. It will be obvious that when heat is to be employed, acids of considerably lower strength than 25% can be employed, and obviously the

concentration of the acid should be below that which would cause any substantial amount of charring of the hair material.

In a modified form of the process, I can start with barium hydroxide as the reagent for effecting the hydrolysis of the keratin, this reaction can be conducted at atmospheric pressure, but is preferably effected at a somewhat higher temperature, the concentration of the barium hydroxide being adjusted to suit the temperature at which the same is to be employed. When this is to be employed at room temperature, a solution of about 10% strength will be found to be sufficient.

When the hair has been dissolved, the solution can be filtered if desired to separate any insoluble material, and is then neutralized, with acids or alkalies, to substantial neutrality (to litmus). For neutralizing the hydrochloric acid or sulphuric acid solution, I can use chalk, soda or the like, and for neutralizing the excess of barium hydroxide I can employ sulphuric acid if desired. The invention however is not restricted to the use of particular reagents for the hydrolysis of the keratin, nor for the neutralization of the resulting solution. Various other methods of producing the hydrolysis of the keratin will be obvious to those skilled in the art. Any insoluble precipitates produced in the neutralization step will of course be removed, e. g. by filtration, leaving the products of the hydrolysis in solution.

The solution having thus been neutralized, it is evaporated to dryness, this operation being preferably conducted in vacuum, at a temperature too low to produce any substantial amount of decomposition, of the materials.

Either before, during or after the evaporation step, I preferably adjust the relative proportions of the principal constituents of the product, in order to produce as nearly as possible the composition of the proteids of human hair. For most purposes this means the addition of a certain amount of cystine, ordinarily about 12-15% based upon the albuminate content of the original material under treatment.

It will be understood that the hydrolyzed material, after neutralization and evaporation to dryness will consist largely of mono-amino acids and di-amino acids, polypeptides and the like, these materials being ca-

pable of conversion in the human organism into hair, if present in available condition in sufficient proportions.

After evaporation to dryness, and after adding cystine if desired, the material can be reduced to the form of a syrup or powder and thoroughly mixed.

The medicine is then in a completed condition, and is preferably taken into the system as a pill or capsule. The material is preferably placed into capsules made of a material which is substantially unacted upon or undissolved in the stomach but is readily dissolved in the intestinal juices. Capsules of this character are well known in the art and need not be described in detail here.

The average dose can vary between wide limits, and for an adult I propose to give, two or three times a day, for a period of say about 3 to 4 weeks, doses of say 7 to 10 grains, although it will be understood that the invention is in no way restricted to this particular dosage, which may be increased or decreased as desired, and an excess of the material does not seem to produce any harmful effects upon the human system.

It will be noted that heretofore most investigators have endeavored to promote the growth of hair by applying suitable external medicines to the scalp or to the portion of the scalp where the hair is missing or is scanty. In accordance with the present invention, the medicine is taken internally, preferably by the mouth.

The principal ingredient of the medicine, so far as affects the growth of hair, is cystine and this constituent is much higher in human hair than in most of the other keratin materials which are readily procurable. In accordance with the rule of minimum proportions, I preferably add enough cystine to the material to bring this component up to about 12% of the total amino acid mixture.

This mixture is accordingly much closer to the composition of human hair than are other keratinous materials, which latter contain most of the other amino-acid constituents of human hair in about the same percentage as human hair.

I claim:—

1. In the art of stimulating hair growth, the herein described improvement which comprises the internal administration of hydrolyzed keratin, split up into polypeptides and amino acids, together with an additional amount of cystine, for stimulation of hair growth by supplying to the body the specific albumoid components necessary for the composition of the hair.

2. In the art of stimulating growth of hair, the herein described improvement which comprises administering internally the amino acids and polypeptides of the character possessed by the products of substantially complete hydrolysis of keratin, in assimilable condition, in approximately the proportions present in human hair, to furnish the normal constituents from which normal hair can be formed.

3. An ingestible material suitable for stimulating growth of hair, which comprises a completely hydrolyzed keratin material in an ingestible container which container is of material not substantially attackable by the gastric juice, but which is readily dissolved by the intestinal digestive fluids.

4. An ingestible material suitable for stimulating growth of hair, which comprises a completely hydrolyzed keratin material, together with an additional amount of cystine, in an ingestible container which container is of material not substantially attackable by the gastric juice, but which is readily dissolved by the intestinal digestive fluids.

In testimony whereof I affix my signature.
ARTHUR WEIL.