UNITED STATES PATENT OFFICE.

HANNS R. ANDERS, OF PERTH AMBOY, NEW JERSEY, ASSIGNOR TO THE ROESSLER & HASSLACHER CHEMICAL CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PROCESS OF FINISHING ANIMAL FILAMENTS, FIBERS, OR THREADS.

1,210,394. Specification of Letters Patent. Patented Jan. 2, 1917.

No Drawing. Application filed December 10, 1914. Serial No. 876,591.

To all whom it may concern:

Be it known that I, HANNS R. ANDERS, a subject of the Emperor of Austria-Hungary, and a resident of the city of Perth Amboy, county of Middlesex, and State of New Jersey, have invented certain new and useful Improvements in Processes of Finishing Animal Filaments, Fibers, or Threads, of which the following is a specification.

My invention relates especially to the treatment of animal filaments, fibers or threads, such as for instance, human hair, to be used for hair goods, by formaldehyde, and the object of the invention is to substitute for the cumbersome agents commonly used an agent that shall be economical and effective in disposing the hair to shape into lasting forms, as may be desired, and will have no injurious effect upon the same.

I have discovered that formaldehyde is such an agent and that when it is brought into contact with hair, for example, in a suitable manner, at a proper degree of both concentration and temperature and for a sufficient length of time, it will bring the hair into a superior condition by restoring its natural luster and will render it fit to take a desired form such as curls, waves, etc., so that it will compare favorably with hair naturally displaying the desired properties.

Hair in its natural condition is usually a more or less straight filament or thread and in order to bring it into a desired form, as for instance curls, it has theretofore been treated since time immemorial by certain processes, as for instance by rolling it upon a round device for a considerable length of time, simultaneously resorting to the application of various auxiliary means, for instance heat from various sources, to shorten the time otherwise required; these processes have been only partly successful.

I have now found that I can avoid all the shortcomings of the old processes, by the application of formaldehyde to the hair, whereby the same is given a natural luster as well as a considerable increase in its strength.

For the better understanding of my invention I shall describe by way of example, one way of carrying out my new process.

In this preferred method of carrying out my invention I wind the hair upon a round stick of suitable material, for instance wood, glass, etc., and submerge it, at the usual temperature, in a commercial formaldehyde solution, which if required, is somewhat diluted with water.

The time the formaldehyde solution is allowed to act upon the hair is naturally dependent on various factors; for instance the thickness of the hair, its content of moisture and previous treatment with chemicals all play a part in this particular. I may say that usually an immersion for from about two to forty minutes is sufficient to obtain the desired result. After the hair is taken out of the solution it may be rinsed with water and dried in the open air, or by gentle heat, as the situation may require.

The advantages of my new process for improving hair are very considerable.

The luster of the hair is restored to its full natural brilliancy and the strength of the hair is considerably increased so that it will retain the preferred shape, for instance a curl, waves, etc. Even if the strength of the hair has been impaired by treatment with chemicals, especially by alkalis, which are very often applied in both bleaching and dyeing the hair, the damage done to the hair is completely repaired by the new stability conveyed to it by my process.

In processes for improving the hair by certain means exerting only a physical action on the hair, as for instance by heating it, it is extremely difficult to control the same to achieve a uniform effect for in most cases the heat can not act evenly on the hair, some parts being overheated and others show no effect at all. It is remarkable furthermore that one can not well apply heat to bleached hair, either in the dry or wet state, in order to curl the same for instance, inasmuch as the bleached hair thereby assumes a glossy and coarse appearance. By my new process, however, such shortcomings are entirely avoided and furthermore I obtain this desirable result in a considerably shorter time than is possible by any of the old processes. Furthermore, my new process, applies not only to human hair but also to any other animal hair, filament, thread or fiber, as for instance to wool, silk, etc.

As already pointed out above, the hair treated according to my invention retains any preferred shape given to the same, whether it is shaped into a curl or into a more or less straight form. In certain industrial operations a felt-like entanglement of hair or like material is undesirable and it is a further advantage of my invention that one can often entirely avoid or considerably reduce this felting phenomenon by treating the hair or the like with formaldehyde according to my process, for then the hair will not stick together so easily.

As far as the curling of hair is concerned it is by no means necessary that the hair be loose and if desirable my process may also be easily and readily applied to hair still on the animal hide.

It is of course understood that the action of formaldehyde referred to above may not only be derived from the commercial formaldehyde solution especially mentioned in the example, but I may, if desired, also use a solution of anhydrous formaldehyde in another suitable solvent, paste or salve, or a polymer of formaldehyde or any formaldehyde compound, splitting up into anhydrous formaldehyde when heated, either in its common form or also if preferred, in combination with a suitable vehicle of whatever form.

Though probably not so conveniently, the results of my process of finishing hair will finally also be obtained, as I am convinced on the ground of experiments, by the action gaseous formaldehyde on wet hair, and the application of gaseous formaldehyde is therefore also within the scope of my invention.

I claim:

1. The process of changing the form of animal filaments, fibers or threads, consisting in giving the same the desired form and subsequently treating it with formaldehyde.

2. The process of changing the form of animal filaments, fibers or thread, consisting in giving the same the desired form and subsequently treating it in the wet state with formaldehyde.

3. The process of changing the form of animal filaments, fibers or threads, consisting in giving the same the desired form and subsequently treating it with an aqueous solution of formaldehyde.

4. The process of curling human hair into lasting forms, consisting in giving the hair the desired form and subsequently treating it with formaldehyde.

5. The process of curling human hair into lasting forms, consisting in giving the hair the desired form and subsequently treating it in the wet state with formaldehyde.

6. The process of curling human hair into lasting forms, consisting in giving the hair the desired form and subsequently treating it with an aqueous solution of formaldehyde.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

HANNS R. ANDERS.

Witnesses:
ARTHUR L. GARDNER,
OTTO K. ZWINGENBERGER.