

UNITED STATES PATENT OFFICE.

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DYEING OF ANIMAL FIBERS AND FABRICS OF A PROTEIN NATURE.

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This invention relates to improvements in and connected with the dyeing of animal fibers or fabrics of a protein nature and more especially to an improved method of increasing the dye-absorbing power of the said fibers or fabrics.

I have found that when fibers, or fabrics, or substances of a protein nature, such as wool, fur, bristles, silk, leather, feathers, woollen fabrics, or the like, are subjected to the action of ozone or ozonized air (the ozone being produced by ultra violet radiation, silent discharge, or any other of the usual well known methods) that a considerable amount of the ozone is absorbed by the fibers or fabrics aforesaid, with no apparent change in their appearance, or alteration or deterioration in their textile strength.

As well known all the substances as aforesaid, preparatory to dyeing, in order to remove grease, dirt, or the like, have to undergo a cleaning or scouring treatment with dilute solutions of alkalies, and acids or soap, the strength of the solutions varying according to the nature of the substances to be treated. When subsequently treated with ozone in accordance with this invention the said substances or materials are found to have an enormously increased capacity for absorption of practically all the classes of dyestuffs in general use and more intensive shades are obtained than are possible by the ordinary processes as hitherto employed. The dyes are found to be fixed more firmly and the colours are more resistant to the action of light, washing, acids and the like while costs are reduced. Further, where, in the ordinary processes chemical mordants are essential, in the present process in many instances they are not required, as the materials take up the colours direct.

The following example will further shew how my invention may be carried out in practice but the invention is not limited to this example.

The fibers or fabrics after having been scoured or cleaned in the usual manner are preferably first soaked for a few minutes

in a dilute alkaline solution, a five per cent solution of ammonia proving effective. The material is then hydro-extracted for a few minutes and while still damp entered into a closed chamber through which a slow current of ozonized air is passing, the ozonized air being saturated with water by passing the gas through water before entering the chamber.

A good working strength of the ozonized air is 1 part of ozone to 1000 parts of air, the ozonized air being produced by any of the well-known methods but preferably by ultra violet radiation, though stronger concentrations may be used, according to the substances to be ozonized.

Test pieces of the wool, fur, or other substance under treatment are removed at intervals of a few hours and tested for acidity. If acid the fabric is soaked again in a five per cent solution of alkali (ammonia), again hydro-extracted and the ozonization continued, test pieces being occasionally withdrawn and dyed to note the increased absorptive capacity.

When sufficiently ozonized, the fabric or protein substance is well washed in water and either dyed at once (which is preferable) or dried at low temperature and stored for the dyeing treatment later as the absorptive capacity is retained for some considerable time.

When dyeing according to the present process in the case of furs, and in particular white furs, it has been observed that in some cases they acquire a remarkable silky lustre which adds very considerably to their commercial value.

What I claim is:—

1. A process for dyeing animal fibers of a protein nature comprising the step of treating said fibers with an alkaline solution, subjecting such fibers to the action of ozone, and dyeing the same.

2. A process for dyeing animal fibers of a protein nature comprising the steps of treating said fibers with ammonia, subjecting such fibers to the action of ozone, and dyeing the same.

3. A process for dyeing animal fibers of a protein nature comprising the steps of treating the fibers with an ammonia solution, hydro-extracting the same, subjecting said
5 fibers to the action of ozone, washing them, and dyeing the fibers, substantially as described.
4. As an article of manufacture, animal fibers of a protein nature treated with ammonia, subjected to the action of ozone, and 10 dyed.

In testimony whereof I have signed my name to this specification.

SAMUEL WRIGHT WILKINSON.