

# UNITED STATES PATENT OFFICE.

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## PRODUCTION OF EFFECTS ON MIXED GOODS COMPOSED OF COTTON AND WOOL.

No. 911,593.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed May 14, 1908. Serial No. 432,955.

*To all whom it may concern:*

Be it known that I, PHILIP GUTHLAC JONES, citizen of the Kingdom of Great Britain, residing at Manchester, Kingdom of Great Britain, have invented new and useful Improvements in the Production of Effects on Mixed Goods Composed of Cotton and Wool, of which the following is a specification.

10 In the United States Letters Patent 873,613 dated December 10th 1907 there is described that by treatment of wool with chromium compounds its affinity for sulfur colors is considerably reduced. I have  
15 found that the resistance of wool to sulfur compounds is increased, if instead of a treatment with chromium compounds alone wool is subjected to a treatment with formic aldehyde and chromium compounds and it  
20 loses after such treatment almost completely its affinity for sulfur colors.

On dyeing with sulfur colors mixed fabrics consisting of cotton and wool in which the wool has been treated as above mentioned,  
25 the wool will remain practically white and it may be dyed afterwards with suitable coloring matters. The wool may be dyed and treated as above mentioned before spinning or weaving with cotton. Cotton-  
30 cloth with white or colored woolen threads *e. g.* a cotton cloth with white or colored edges or lists can thus be obtained.

For the dyeing with sulfur colors it is advisable, to employ a method which does  
35 not impair the strength of the animal fiber. For this purpose the process of dyeing may be used which is described in German Letters Patent 173685 and according to which the mixed goods are dyed in a dye-  
40 bath containing the sulfur dye, sodium sulfid and salts of organic acids possessing a reducing action *e. g.* formic acid, lactic acid, or the like. If such a dyebath is employed for the dyeing of mixed goods, the  
45 woolen fiber contained therein is not injured and the lactic acid etc. in the dyebath adds to the power of the formaldehyde and the chromium compound which these substances exert in protecting the woolen fiber  
50 against being dyed by sulfur colors.

White effects can be obtained *e. g.* by using wool treated with formic aldehyde and chromium compounds as list-yarn for cotton piece-goods and dyeing the mixed

goods as above stated. Mixed colored 55 effects can be obtained by dyeing wool treating it with formic aldehyde and chromium compounds after dyeing, weaving or spinning the dyed wool with cotton yarn and finally dyeing the goods with sulfur-  
60 colors; or the white wool after treatment with formic aldehyde and chromium compounds is interwoven, the fabric dyed with sulfur-dyes and the wool is then dyed with suitable dyestuffs. 65

In carrying out the process more practically I can proceed as follows: The wool is treated at about 60° C. in a bath containing one per cent. of formic aldehyde and 0.15 per cent. of potassium bichromate. 70 It is then either spun or interwoven with cotton. The fabric is then dyed in a dye-bath charged per one liter with 8 grams of Katigen black TW extra, 8 grams of crystallized sodium sulfid, 5 grams of calcined  
75 soda, 30 grams of common salt, 26 cubic centimeters of the acid sodium salt of lactic acid. The goods are entered at 20—25° C. and dyed for from 1 to 1½ hours at this temperature, rinsed in water and then in a  
80 dilute acetic acid solution.

Instead of treating the wool fabric as mentioned by itself, it can be treated after having been spun or interwoven with cotton. In both cases black cotton cloth with white  
85 effects is obtained.

Instead of bichromate of potassium other suitable chromium compounds, *e. g.* chromium fluorid may be used. The treatment with chromium compounds and with for-  
90 maldehyde can also be done in two different operations. Of course other sulfur coloring matters can be used.

To obtain mixed colored effects the wool is treated with formic aldehyde and the chromium compounds either before or after being  
95 dyed with suitable coloring matters, *e. g.* anthracene yellow C, acid anthracene red 3B, benzo fast red FC, brilliant wool blue B extra, alkali fast green 3G extra. The dye-  
100 ing and treatment with formaldehyde and chromium compounds may be done either before the spinning or weaving with cotton or after; but in the latter case it must take place before the dyeing with the sulfur color-  
105 ing-matters. If however the wool has been treated with formaldehyde and chromium compounds the mixed fabrics can be dyed



first with sulfur coloring-matters and afterwards with suitable wool dyes. Variegated effects can be obtained on using wool dyed in different colors. If the dyeing of the wool  
5 precedes that of the cotton care must be taken to select only such dyestuffs, which are not affected by the chemicals necessary for dyeing the cotton.

I do not confine myself to the particulars  
10 given in the above example which are merely typical and can be varied within wide limits without altering thereby the nature of my invention.

Having now described my invention and  
15 in what manner the same is to be performed, I declare that what I claim is:—

1. The process of producing variegated colored effects on fabrics composed of cotton and wool, which consists in treating the wool  
20 with formaldehyde and suitable chromium compounds and then dyeing the fabric with

sulfur dyes, the wool resisting the action thereof and remaining uncolored, substantially as described.

2. The process of producing variegated 25 colored effects on fabrics composed of cotton and wool, which consists in treating the wool with formaldehyde and suitable chromium compounds and then dyeing the fabric with sulfur dyes, the wool resisting the action 30 thereof and remaining uncolored, and then dyeing the fabric with any of the colors ordinarily employed for wool dyeing, substantially as described.

In testimony whereof I have hereunto set 35 my hand in the presence of two subscribing witnesses.

PHILIP GUTHLAC JONES.

Witnesses:

JOHN WILLIAM THOMAS,  
MALCOLM SMETHURST.