

UNITED STATES PATENT OFFICE.

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PROCESS OF MANUFACTURE OF HATS.

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Specification of Letters Patent.

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No Drawing.

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To all whom it may concern:

Be it known that I, WILLIAM WOODBURY MARTIN, a citizen of the United States, residing at Haverhill, county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Processes of Manufacture of Hats, of which the following is a specification.

The object of the present invention is a process of making a felt hat for wear either by men or women, having a surface the color of which is changeable or iridescent. A hat made in accordance with my new process, when completed, shows two colors or tones, according to the way in which the light strikes it, in very much the same manner as a piece of changeable silk woven from threads of two colors shows the two different colors according to the position of the silk in the light. In the manufacture of hats in accordance with my process I do not employ fibers of two or more different colors but dye all the fibers comprising the felt uniformly. The hat made by my novel process also is of a uniform color throughout the body of the felt composing the hat, and, therefore, in the process of manufacture may be pounced or polished vigorously without danger of removing a surface coating.

The process embodying my invention produces a hat having a beautiful changeable surface being thoroughly polished to give it its shiny silky appearance. Various combinations of colors may be employed, as for instance, green and brown, or red and blue, these colors being chosen in shades which harmonize well with each other.

The invention will be fully understood from the following description, and the novel features thereof are pointed out and clearly defined in the claims at the close of this specification.

The process embodying my invention is as follows: I take an ordinary partly felted white wool bat, which is in a very loose and soft condition and is very open and porous. The bat in this condition is then placed in a bath of dye composed of two or more colors of such a chemical character that they do not unite with each other to produce a single shade, but on the other hand tend to separate when mixed. Such dyes are known

in the arts and commerce and are sometimes called eosin or fluorescent colors. After the two colors are made up in proper manner and mechanically mixed, the bat is immersed in this bath. Being loose and soft the dye penetrates completely. The bat is then placed in a felting mill and felted to size. The pounding to which the bat is subjected when being felted improves the color of the finished hat having an important effect thereon as well as on the texture of the felt composing the hat. After being removed from the felting mill, the hat is dried. At this time, the hat has the appearance of having been dyed with a solid color having the general tone of the predominant color used in the dye, but being dull and muddy, only the slightest appearance of the secondary color being visible. The hat is then pounced and buffed with sand paper. This operation has the effect of removing the curly fibers of the felt from the surface and straightening out and laying parallel with each other the fibers remaining on the surface and of polishing them. During this operation the secondary color begins to appear so that it is distinctly visible if the hat is turned in the light. The pouncing or polishing operation may be carried on as vigorously as necessary without danger of injuring or changing the color or tone of the surface. Thereafter the hat is subjected to steam pressure to fasten the polish in the well known manner. It may then be stiffened and is then flanged or shaped and again polished to give to the surface of the hat the highest possible luster. The final polishing and finishing brings out the secondary color very distinctly so that the hat appears to have two distinct colors, the predominant color being visible where the light strikes the hat strongly and the secondary color being apparently visible in the shady portions where the light is less strong.

If, for instance, it is desired to produce a hat having changeable shades of green and brown, the dyeing is performed as follows:—To 400 gallons of water is added, 4 oz. $9\frac{1}{2}$ pwt. formyl violet 4 B. F., 34 oz. $14\frac{1}{2}$ pwt. naphthol yellow S., 5 oz. rosazein B., 20 lbs. Glauber salts. The proportions of the colors may be varied according to the

particular effect which it is desired to produce. The materials are thoroughly mixed, 100 lbs. of the partially felted white hat bodies are placed in the bath which is then
5 brought to the boiling point. After boiling for three-quarters of an hour, 3 lbs. of oil of vitriol are added, and the boiling continued for an hour and a half longer. The liquor is then drained off and the hat bodies
10 are allowed to cool. After this, they are placed in the felting machines and the felting completed as previously described.

What I claim is:

1. The process of making a hat having an
15 iridescent appearance which consists in dyeing a partially felted wool bat in a bath

composed of two or more fluorescent colors, felting the bat and then pouncing and polishing the same.

2. The process of making hats which consists in dyeing a partially felted wool bat in a bath composed of two or more colors which separate, felting the bat and then
20 polishing the hat to bring out the separate colors and give the surface a glossy appearance and steaming the hat to set the polish.
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In testimony whereof I affix my signature, in presence of two witnesses.

WILLIAM WOODBURY MARTIN.

Witnesses:

HENRY P. EMMONS,
W. FRANK HARRIS.