Oct. 18, 1949. W. H. SHIELDS 2,485,072

HEAT-TREATING FABRIC

Filed July 22, 1946 2 Sheets-Sheet 1

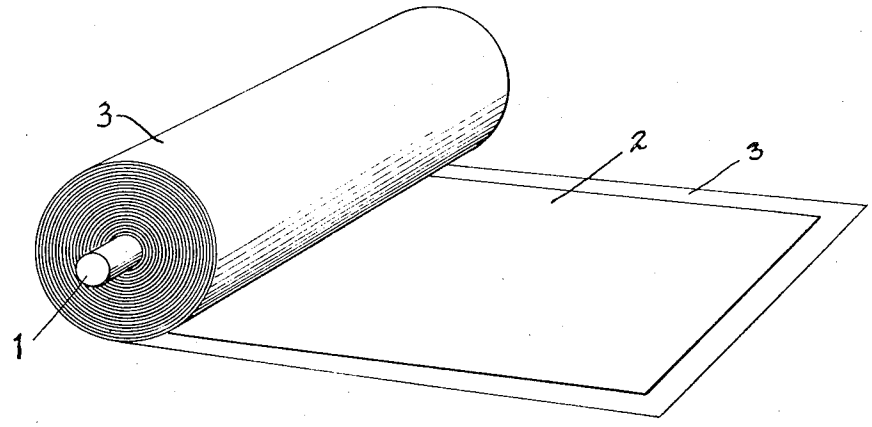



Fig. 1.

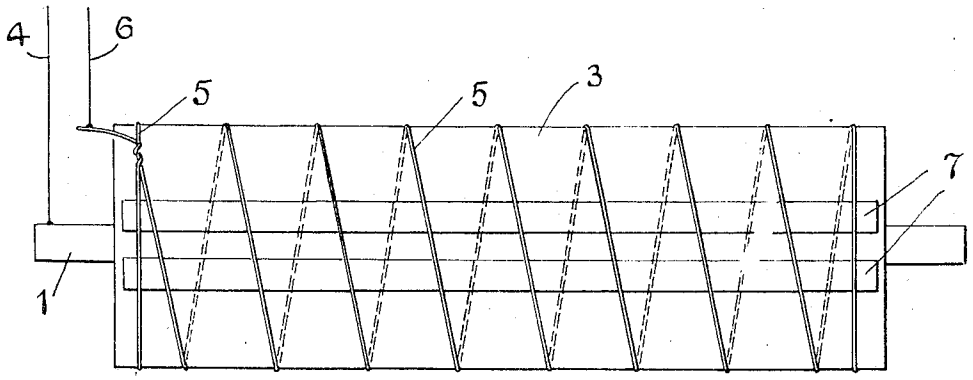



Fig. 2.

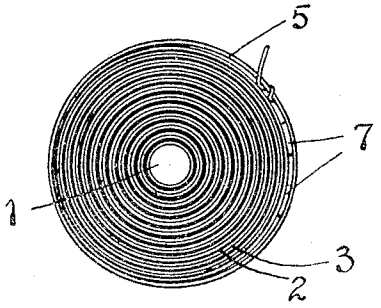



Fig. 3.

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HEAT-TREATING FABRIC

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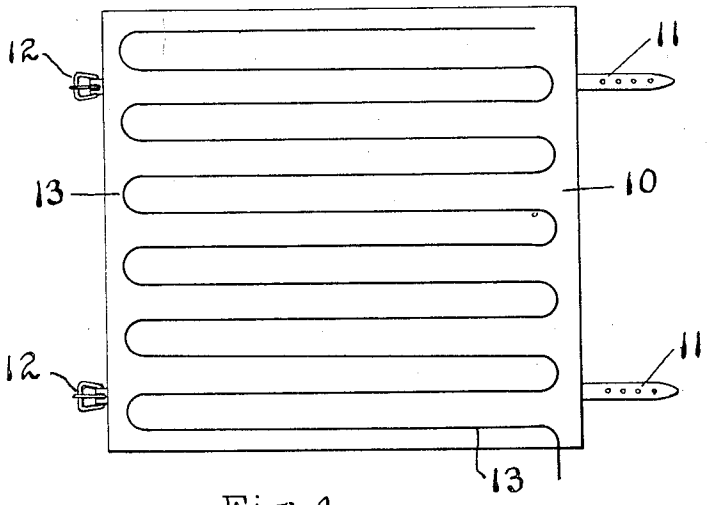



Fig.4.

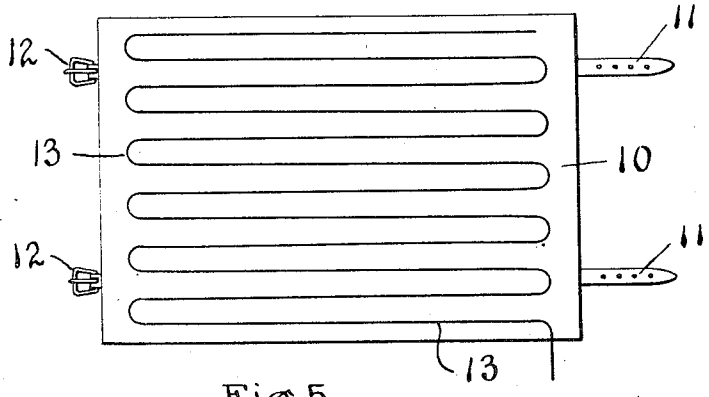



Fig.5.

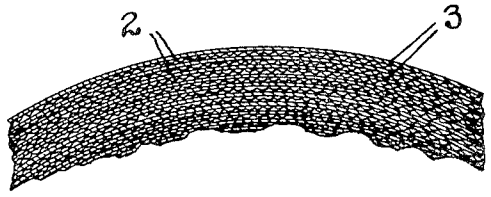



Fig.6.

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Patented Oct. 18, 1949 2,485,072

# UNITED STATES PATENT OFFICE

2,485,072

## HEAT-TREATING FABRIC

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Application July 22, 1946, Serial No. 685,300

1 Claim. (Cl. 26—1)

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This invention relates to heat treating fabrics and more particularly to treating fabrics made of thermoplastic thread or yarn of which nylon is an example although the invention is operable upon any thermoplastic fabric.

The purpose of the invention is to make a fabric smooth after it has been fabricated or in some cases to imprint a pattern therein. To perform the operation the fabric is pressed between smooth surfaces, or surfaces having the desired pattern and then heated to the point where it becomes plastic and allowed to cool while pressed between said surfaces.

I have found it expedient to roll the plastic about a shaft having a continuous sheet of paper interposed between the layers of fabric upon the roll and the heat is applied by means of a high frequency electric current passed through the roll but in order for the high frequency current to become active I have found it necessary to moisten the fabric.

To properly prepare the roll of combined fabric and paper in alternate layers and to moisten the fabric I have used such a machine as is shown in either of the patents to Harry A. Shields No. 1,926,457 or No. 1,954,496. After the fabric and paper have been rolled and the fabric steamed in such a machine thus giving it the proper moisture content it is subjected to a high frequency electric current until it becomes heated to the plastic point of the fabric after which it is allowed to cool.

The accompanying drawings illustrate the invention in which,

Fig. 1 is a perspective view of a roll of cloth and paper.

Fig. 2 is a diagrammatic illustration of one method of applying the electric current to the roll.

Fig. 3 is an end view of the roll.

Figs. 4 and 5 are plan views of blankets each having an electric conductor used to wrap around the roll to apply the electric current thereto, and,

Fig. 6 is a fragmentary cross section of the roll of combined fabric and paper.

Like numbers refer to like parts in the different figures in the drawings.

The shaft about which the fabric and paper are rolled is of metal so that it will form the central electric conductor. About the shaft 1 is rolled the fabric 2 and the paper 3 so that when the roll is completed it comprises alternate layers of fabric and paper. During the rolling operation the fabric is moistened to the desired extent as by steam in the said patented machines. It is

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desirable to roll the fabric and paper tightly and with even tension.

When the roll is completed it is prepared to receive the high frequency electric current in a manner so that the current will pass uniformly throughout its entire body. This may be done by connecting one of the conductors 4 from the source of current to the central shaft 1 and by wrapping around the periphery of the roll a wire 5 in helical fashion so that it will extend the whole length of the roll and this wire is connected to the other conductor 6 from the source of current. To improve the conductivity and dispersal of the current and balance the two elements to get maximum resistance, I have found it advantageous to insert strips of electric conducting material 7 lengthwise of the roll under the coil 5.

When so prepared the current is applied and in passing through the roll the fabric becomes heated and the treatment is continued until the entire roll of fabric is heated to a plastic state or higher than subsequent processing temperatures whereupon the fabric will become smooth or if the separating sheet has a pattern formed in it the fabric will assume the shape of the pattern.

After the roll of fabric has been raised to the temperature in which it becomes plastic the roll is disconnected from the source of electric current and while still rolled it is allowed to cool and after it has become cool it is unrolled and the fabric will be found to have assumed a smooth finish or a pattern if such a pattern was provided in the separating sheet.

As an alternative for the conductor coil 5 illustrated in Fig. 2 the blankets of Figs. 4 and 5 may be used. These blankets may be wrapped around the roll and provided with suitable fastening means such as straps 11 and buckles 12. These blankets are provided with electric conductors 13 consisting of wires laid evenly over the entire surfaces. The surface areas of the central conductor 1 and the peripheral conductor should be substantially the same and therefore the length of the conductor wire 13 in the blankets is calculated with the respect to its surface to have substantially the same surface area as the cental conductor 1. The rolls of cloth and paper are of different lengths and therefore the blanket of Figs. 4 and 5 are provided of different lengths but the conductor wires 13 are always calculated to have sufficient length and area to correspond with the central core 1. In use a blanket is wrapped around the periphery of the roll and the

conductor 13 attached to one of the conductors 6 from the source of the electric current.

The invention is defined in the appended claim and is to be considered comprehensive of all forms of structure coming within its scope.

I claim:

The method of treating thermoplastic fabric which comprises moistening a length of thermoplastic fabric, winding said fabric and a superposed length of surfacing material onto an electrical conducting core resulting in alternate layers of fabric and surfacing material, surrounding said roll with an electrical conductor, connecting said core and said surrounding conductor in a high frequency electric circuit whereby said high frequency current passes through said roll heating the same, maintaining said current until said roll has become heated to the plastic point of the fabric, and then disconnecting said current and allowing said roll to cool.

WENDELL H. SHIELDS.




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