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㉒ Proprietor: **Ochiai, Hiromichi**
No. 1-28-5, Kakinokizaka
Meguro-ku Tokyo (JP)

㉓ Inventor: **Ochiai, Hiromichi**
No. 1-28-5, Kakinokizaka
Meguro-ku Tokyo (JP)

㉔ Representative: **Mayer, Hans Benno**
Via dell'Orso 7/A
I-20121 Milano (IT)

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Description

Background of the invention

The present invention relates to a method of drying and shaping an article of clothing mainly formed of vegetable fiber or blended with vegetable fiber and synthetic fiber such as, for example, an outing shirt, a white garment and coat and so forth and a body-shaped bag used therefor.

Generally, a clothing of vegetable fiber is dried and finished by adhering textile size of wet state to the clothing and drying the clothing with an iron or an iron pressing machine, thereby drying and solidifying the size by means of the heat and pressure of the iron pressing machine. In this case, wet size together with the heat and pressure are required under the conditions.

On the other hand, a clothing mainly formed of animal fiber or blended with animal fiber and synthetic fiber is shaped and finished by a steam iron. A steam pressing machine, a body-shaped steam and hot air finishing machine, a steam cabinet, and a steam tunnel, etc. In this case, the steam and small tension are required under the conditions.

When the steam is sprayed to the animal fiber clothing, since the animal fiber has plasticity with the steam, and the clothing is immediately dried so as not to remain the moisture in the animal fiber, the predetermined shape can be maintained in the clothing. In case of the animal fiber clothing, no size is necessary.

A body-shaped steam and hot air finishing machine used for shaping and finishing an animal fiber clothing, e.g., an upper garment of a sack suit, an overcoat, etc. serves to dry and shape the clothing ordinarily by wearing the clothing to be finished on a body-shaped bag formed of textural material of heat resistant, steam resistant and air permeable synthetic fiber, retaining the front of the clothing, then feeding steam into the bag to give sufficient wet heat to the clothing, stopping the steam, thereafter blowing hot air of low temperature (50 to 70°C) to expand the body-shaped bag, and exhausting the remaining steam from the bag.

It is indispensable to sufficiently eject the steam to finish the animal fiber clothing. If the air flow and pressure are excessively more than required, the animal fiber will expand, and the flow rate and pressure of the hot air may be in the degree as necessary as the formation of the clothing to be pressed, and the hot air temperature may be preferably lower than 100°C. Because the animal fiber might be damaged at the temperature higher than 100°C.

In the US Patent No. 3 568 900 is described a shirt pressing machine, using a bag having air passage holes for blowing-up the arms of the shirt. This involves high consumption of hot air and furthermore the delicate tissue of the arms is directly urged by hot air.

Furthermore in the US Patent 3 568 900 is foreseen that the bag near thick portions or overlaid

tissues, such as pockets of a shirt, is produced in roughly mesh fiber which has no resistance concerning permeability to air. Also in this case, the tissue of the garment is urged directly by the hot air stream, not desired for delicate tissues.

Summary of the invention

Accordingly, a primary object of the present invention is to provide a method of drying and shaping a clothing formed mainly of vegetable fiber or blended with vegetable fiber and synthetic fiber, which can finish the clothing beautifully by the steps of blowing hot air of strong pressure and high heat into a body-shaped bag to expand the entire bag and to impart tension to the clothing and drying and shaping the clothing with hot air slightly ejected through the texture of the textural material of hard permeability forming the bag and the surface heat of the bag.

A body-shaped bag for performing the method is described, which bag can prevent the discharge of large quantity of hot air externally from the interior of the bag with the textural material formed in hard air permeability, thereby obtaining necessary tension at the bag, maintaining the surface heat required and eliminating the decrease in the working efficiency due to the discharge of the hot air.

The body-shaped bag can dry and shape the superposed portions in double or more laminates of the clothing, e.g., pockets, shoulder portions, etc. similarly to the other portions of the clothing in the same period of time.

The objects of the present invention are achieved with a method of drying and shaping a garment formed of vegetable fibre or blends thereof under tensile state, using a body-shaped inflatable bag in combination with a pressing unit comprising the steps of:

a) using a body-shaped bag formed of textile material having over the greater part of its surface low air permeability of substantially 2,5 cm³/cm²/sec with high heat resistance and strength, the neck, arms and waist of the bag being sealed;

b) providing in regions of said bag adjacent in use to superposed portions of the clothing such as pockets or shoulder, a higher air permeability of approximately 5 cm³/cm²/sec;

c) moistening the garment with starch before application to the bag;

d) pressing the vertical hem of the garment against a rigid member in the bag;

e) providing the bag with completely sealed neck, arm and waist portions, and inflating the bag with hot air blown from below at a flow rate of 20—35 m³/min (in case of static pressure 0) forming an air pressure in the bag corresponding to 15—25 kp/m² and heating the surface of the bag to 100°—200°C, preferably to 110°—150°C.

Furthermore it is advantageous to use a bag (21) having a plurality of pockets (28) formed in the interior thereof is used and that slender rectangular and thin elastic plates (29) are inserted into the respective pockets.

Brief description of the drawings

The specific nature of the invention, as well as other objects, uses and advantages thereof, will clearly appear from the description and from the accompanying drawings, in which:

Fig. 1 is a side view of the finishing machine mounted with a body-shaped bag used for the method of drying and finishing a clothing according to the present invention; and

Fig. 2 is a front view of the body-shaped bag constructed according to the present invention.

Description of the preferred embodiments

The method of drying and finishing a clothing mainly formed of vegetable fiber or a blend of vegetable fiber and synthetic fiber, and a body-shaped bag used therefor of the present invention will now be described in more detail with reference to the accompanying drawings, and the finishing machine necessary to shape and finish the clothing of the present invention will be first schematically described.

A finishing machine has a post 11 stood on the top of a base 10, a collar clamp 12 provided on the top of the post 11, and a heater 13 such as an iron extended from the collar clamp toward the base which is heated by steam. Further, a post 14 is stood oppositely to the post 11 on the base 10, and a hem pressing and fixing unit 16 is provided corresponding to the heater 13 through a linkage 15 at the post 14.

A hot air generator is internally mounted in the base 10. When the hot air generator is operated, the hot air of predetermined quantity is blown from below into the body-shaped bag 21. The body-shaped bag 21 used in this invention is mounted on the finishing machine to cover the post 11 and the heater 13 as shown in Fig. 1.

A fan for blowing hot air used for the finishing machine has strong power of the blower used for finishing the animal fiber clothing. That is, the fan used for the animal fiber clothing finishing machine has ordinarily 200W and less than 20 m³/min. of air flow rate of static pressure 0 (mmH₂O), but the fan used for the finishing machine of the present invention has 400 to 750W and 30 to 40 m³/min. of air flow rate of static pressure 0 (mmH₂O) or higher.

In the execution of the present invention, the body-shaped bag which has high heat resistance and strength, is sealed at the neck portion, arm portions and waist portion and is formed at the textural material of hard air permeability, is mounted on the finishing machine, the vegetable fiber clothing to be dried and shaped is mounted on the outer periphery of the body-shaped bag, both vertical hems of the clothing are fastened under strong pressure between the vertical hem pressing unit with heat resistant sponge for pressing the vertical hem from the exterior of the clothing and the vertical heater of slender shape provided in the bag, and then high pressure and high temperature hot air sufficient to expand the clothing is blown from the hot air blowing unit at 100 to 200°C of the surface temperature of the bag.

The vegetable fiber has much stronger wet strength than the animal fiber but has much less wet elongation and less elongation at the wet heating time as well as much higher heat resistant temperature than the animal fiber. Therefore, the vegetable fiber clothing can be efficiently dried, shaped and finished due to the properties of the vegetable fiber described above according to the method of the present invention. Under this condition, it is necessary that the textural material of the body-shaped bag is formed in hard air permeability according to the method of the present invention.

The concrete embodiment of the method of drying and shaping a clothing according to the present invention will now be described in more detail.

The vegetable fiber clothing is washed, is then sized, is then finished at the collar and cuffs by a collar cuffs pressing machine, is further lightly pressed at the tuck portion of the arms, and is mounted on the body-shaped bag in the state that the vertical hem of the front of the clothing, the back and both arms are moistened. The neck portion is fastened by the collar clamp, and the arms of the body-shaped bag are inserted into the arms of the clothing. Further, both lower ends of the vertical hem of the clothing are pulled downwardly to elongate the wrinkles, and the surface of the clothing is pressed by the pressing unit. The body-shaped bag is, of course, mounted on the finishing machine so that the neck and the waist of the clothing are sealed. The ends of the arms of the body-shaped bag are sealed by means, e.g., sewing or the like. Thereafter, the hot air is fed at the flow rate of 25 to 35 m³/min. (case of static pressure 0) into the body-shaped bag to expand the bag and the air pressure in the bag is maintained at 15 to 25 mmH₂O, and the surface temperature of the bag is maintained at 100 to 200°C. Further, the heat is applied for 20 to 40 sec. to the body-shaped bag, thereby drying and shaping to finish the clothing.

As described above, the clothing sized and moistened is expanded by the body-shaped bag by means of the hot air of high pressure, and is thus extended and shaped, and is further dried and solidified at the size by the slight hot air ejected through the texture of the textural material of the hard air permeability and by the surface heat of the bag. In this manner, the clothing can be dried, shaped and finished.

Since the pressure is internally applied to the clothing according to the method of the present invention, the surface of the clothing thus finished has beautiful appearance peculiar for the fiber, and the back surface of the clothing has advantageously relatively smooth state to be readily worn on the human being.

The embodiment of the body-shaped bag used for the method of drying and shaping the clothing of the present invention will now be described in more detail.

The body-shaped bag used in the present invention has not only the high heat resistance but also

hard air permeability as the most advantageous feature, which can provide necessary tension and can maintain the permeability for retaining the necessary temperature on the surface.

The body-shaped bag has, as shown in Fig. 2, a bag body 21 formed of body, breast, shoulders and neck, right and left arms 22 formed integrally. The ends of the arms 22 are sealed by sewing or the like. The arms 22 are formed in half sleeve length as shown to finish clothings to be readily mounted with the clothing. The body-shaped bag also has a neck portion 25 and a waist portion 26 opened at the upper and lower parts.

Strings 27 are inserted into the lower portions of the bag body 21 to squeeze the waist portion when the clothing is mounted on the finishing machine. It is noted that when the bag 21 is mounted on the finishing machine, the neck portion 25 and the waist portion 26 are sealed.

Further, a plurality of pockets 28 are aligned at the insides of both sides of the bag 21 and elastic slender rectangular thin plates 29 are respectively inserted into the pockets 28, and are made of steel plates, heat resistant plastic plates, etc. The plates 29 prevents the wrinkles and slacks of the waist of the clothing by natural expansion when the hot air is blown into the interior of the bag to expand the bag 21.

The textural material of the body-shaped bag is formed by twill weaving raw polyester yarns of 100 denier (110 dtex) for warps and 100 (110 dtex) denier for wefts in the density of 214×96 pieces/inch, and has 0.22 mm thick, 28% of longitudinal elongation, 27% of lateral elongation, 3.7 kg of longitudinal tearing strength, 1.7 kg of lateral tearing strength, 187 kg/5 cm of longitudinal tensile strength, 100 kg/5 cm of lateral tensile strength, and is rolled by calender rolls to the degree of 2.5 cc/cm²/sec. of air permeability. The portions of the bag corresponding to the superposed portions in double or more laminates of the pockets, shoulders or the like of the clothing use polyester cloth of approx. 5 cc/cm²/sec. of air permeability.

Since the melting point of the polyester material is 240 to 250°C, the body-shaped bag can endure against 200°C sufficiently. The vertical front center of the body-shaped bag, i.e., the portion to be interposed between the internal iron and the pressing plate may be preferably formed of further high heat resistant textural material. Silicone resin may be coated on the texture of the body-shaped bag.

Since the body-shaped bag is formed in the portions corresponding to the superposed portions of cloth such as pockets, shoulders or the like of the cloth of approx. 5 cc/cm²/sec. of air permeability and in the other portions of cloth of approx. 2.5 cc/cm²/sec. of hard air permeability, the bag can be provided with necessary tension and can also maintain the necessary temperature to dry the clothing.

Claims

1. A method of drying and shaping a garment formed of vegetable fibre or blends thereof under tensile state, using a body-shaped inflatable bag in combination with a pressing unit comprising the steps of:

a) using a body-shaped bag formed of textile material having over the greater part of its surface low air permeability of substantially 2.5 cm³/cm²/sec. with high heat resistance and strength, the neck, arms and waist of the bag being sealed;

b) providing in regions of said bag adjacent in use to superposed portions of the clothing such as pockets or shoulder, a higher air permeability of approximately 5 cm³/cm²/sec.;

c) moistening the garment with starch before application to the bag;

d) pressing the vertical hem of the garment against a rigid member in the bag;

e) providing the bag with completely sealed neck, arm and waist portions, and inflating the bag with hot air blown from below at a flow rate of 20—35 m³/min (in case of static pressure 0) forming an air pressure in the bag corresponding to 15—25 kp/m² and heating the surface of the bag to 100°—200°C, preferably to 110°—150°C.

2. A method for drying and shaping a garment under tensile state, according to claim 1, characterized in that a bag (21) having a plurality of pockets (28) formed in the interior thereof is used and that slender rectangular and thin elastic plates (29) are inserted into the respective pockets.

Patentansprüche

1. Verfahren zum Trocknen und zum Formgeben eines Bekleidungsstückes, bestehend aus pflanzlichen Fasern oder einer Mischung mit diesen Fasern, die in gespanntem Zustand vorliegen, unter Verwendung eines aufblasbaren, körperartige Form aufweisenden Sackes, zusammen mit einer Pressvorrichtung und unter Einsatz der folgenden Schritte:

a) Verwendung eines körperartig geformten Sackes bestehend aus Textilmaterial, der ueber den groessten Teil seiner Flaechen geringe Luftdurchlaessigkeit, in der Groessenordnung von 2,5 cm³/cm²/s, aufweist und sich durch grosse Hitzebestaendigkeit und mechanische Belastbarkeit auszeichnet, wobei das Halsstueck, die Armstuecke, und die Taillebpartie des Sackes dicht abgeschlossen sind;

b) Teilbereiche des Sackes, die waehrend des Gebrauchs in der Naehen von uebereinanderrliegenden Teilen des Kleidungsstückes angeordnet sind, wie z.B. bei Taschen und Schultern weisen eine hoehere Luftdurchlaessigkeit von ungefaehr 5 cm³/cm²/s auf;

c) Benetzen des Kleidungsstückes mit Staerke, vor Aufbringen des Kleidungsstückes auf den Sack;

d) Anpressen der vertikalen Partie des Klei

dungsstueckes gegen eine im Sack vorgesehene Aussteifung;

e) Vorsehen des Sackes mit vollstaendig abgedichter Halspartie, Armpartie und Taillienpartie und Aufblasen des Sackes mit heisser Luft, die von der Unterseite des Sackes mit einer Zustrommenge von 20—35 m³/min (bei statischem Druck Null) erfolgt und Aufbau eines Luftdruckes im Sackinnern von 15—25 kp/m² und Aufheizen der Sackoberflaeche auf 100°—200°C, in vorteilhafter Weise auf 110°—150°C.

2. Verfahren zum Trocknen und zum Formgabe eines Kleidungsstueckes unter Spannung, nach Anspruch 1, dadurch gekennzeichnet, dass der Sack (21) eine Anzahl von Taschen (28) im Inneren des Sackes aufweist und, dass leichte, rechteckige, duenne, elastische Platten (29) in die entsprechenden Taschen eingesteckt sind.

Revendication

1. Procédé de séchage et de mise en forme d'un vêtement en fibre végétale ou mélange de telles fibres dans un état de tension, au moyen d'un sac gonflable en forme de corps humain associé à un dispositif de pressage, qui consiste à:

a) utiliser un sac en forme de corps, en matière textile, présentant sur la plus grande partie de sa

surface une faible perméabilité à l'air, de l'ordre de 2,5 cm³/cm².s, avec une résistance à la chaleur et une résistance mécanique élevées, le cou, les bras et la taille du sac étant fermés;

b) prévoir dans les régions du sac qui sont adjacentes, un utilisation, à des parties superposées du tissu, telles que les poches ou les épaules, une plus grande perméabilité à l'air, de l'ordre de 5 cm³/cm².s;

c) humidifier le vêtement avec de l'amidon, avant application sur le sac;

d) presser l'ourlet vertical du vêtement contre un élément rigide du sac;

e) munir le sac de parties de cou, de bras et de taille complètement fermées, et gonfler le sac avec de l'air chaud soufflé par le bas à un débit de 20—35 m³/mn (dans le cas d'une pression statique nulle) de manière à engendrer dans le sac une pression d'air correspondant à 150—250 Pa et à chauffer la surface du sac à 100—200°C, et de préférence à 110—150°C.

2. Procédé de séchage et de mise en forme d'un vêtement dans un état de tension, suivant la revendication 1, caractérisé en ce qu'on utilise un sac (21) comportant à l'intérieur une pluralité de poches (28) et en ce que des plaques légères, rectangulaires, élastiques et minces (29) sont insérées dans les poches respectives.

