This invention relates to fabric treatment methods and apparatus and, more particularly, it relates to steam or water vapor treatment of fabrics to remove wrinkles or sags.

Many different sorts of irons and pressing devices have been developed. However, several problems are introduced with such devices, particularly if they are attempting to fulfill use as a light, inexpensive, portable instrument for carrying in a suitcase while on a trip for removing wrinkles and sags from a large variety of fabrics such as silk, cotton, wool and synthetic fibers found in different weights and weaves in both women's and men's clothing. As may be appreciated, the heat produced in ordinary irons must be carefully controlled for treating different fabrics such as cotton and synthetic fibers without damage, thus requiring expensive and sensitive variable thermostatic controls.

Steam irons are known, but they also contain heated irons which must be carefully regulated to prevent burning, and are susceptible to leakage of water and are inconvenient to carry. Also, when using them, they require special auxiliary equipment in the form of ironing or pressing boards.

Other irons have used sponges, brushes, pads and other means of introducing dampness or steam to tables or ironing surfaces. Many require complex valves, water feed means or other devices if even and adequate dampening without wetting is achieved. Otherwise, they wet some spots too much and others not enough and depend upon a heated iron surface to press and dry a dampened fabric, and even sometimes to heat, vaporize, and distribute water applied to the fabric.

It is therefore a general object of this invention to provide improved methods and apparatus for removing wrinkles and sags from fabrics while correcting the foregoing problems.

Another object of the invention is to provide fabric treatment apparatus which will be simple, light and portable and yet which will treat a wide range of fabrics without burning or damage.

A further object of the invention is to provide improved fabric treatment methods and simplified apparatus not requiring heated iron surfaces, pressing boards or other special equipment.

Yet another object of the invention is to provide portable fabric treatment apparatus light in weight and inexpensive, which may be used on different types of fabrics without danger or damage.

In accordance with this invention therefore, there is provided a portable garment unwrinking device that essentially comprises a heated water vapor generator and an unheated caressing head for passing the vapor evenly through the fabric to be treated.

Further details, objectives and advantages of the invention together with a preferred embodiment illustrating its operation and construction are described in the accompanying drawings, wherein:

FIGURE 1 is an elevation view, partly in cross section, of a fabric treatment apparatus embodiment of the invention;

FIGURE 2 is a cross section view of the cylindrical casing of this apparatus taken through lines 2-2 of FIGURE 1;

FIGURE 3 is a plan view of a caressing head constructed in accordance with the invention;

FIGURE 4 is a side view of this caressing head;

FIGURE 5 is a plan view of the caressing head and mount assembly, looking into the axis of the view of FIGURE 1 from the top; and

FIGURE 6 is a sketch illustrating the manner of treating fabrics to remove wrinkles or sags in accordance with the teachings of this invention.

As seen by cross sectioning in FIGURE 1, the entire casing assembly 10 and caressing head 11 is of plastic construction, which might be made of any plastic material stable in the presence of steam, such as thermosetting plastics or that known by the trade name "Delrin." Only the internal heating element 12 need have any metal construction, and the heater is confined within a chamber 14 which holds water 18 for the purpose of vaporization by application of heat, to thereby permit flow of heated water vapor or steam out of aperture 15 in the water chamber 14 and through apertures 16 in the caressing head 11. If desired, a thermostatic switch 17 may be included to regulate the heat in the chamber, and this is preferable to protect the unit in the event it is operated without water in the chamber 14. A suitable power cord 19 (FIGURE 6) may be connected to the heating element 12 and passed through the strain relief bushing 20.

Since the casing 10 contains a heater and perhaps steam, an insulated grip handle 21 with a serrated surface (FIGURE 2) surrounds the water chamber in that it may be held in hand for use (FIGURE 6) without danger of discomfort. A stand 22 is provided for resting the apparatus in upright position with the axis 23 of the cylindrical casing 10 vertically inclined. The caressing head 11 has its mount housing 24 (FIGURE 3) inclined at an acute angle from the casing axis 23, and includes a separate vapor chamber 25. This chamber is separated from the water chamber 14 by means of apertured diaphragm 26 having a taper extending toward the aperture 15 in the direction of the water chamber. This serves to pass any condensed water vapor back into the water chamber 14 by force of gravity. Furthermore, with the extended head mount housing 24 inclined and with the construction of base member 22, this member serves as a very simple valve or stop preventing water from spilling from the chamber 14 if the device is tipped over or carried in a suitcase.

Each end of the water chamber is sealed with a gasket 29, 30 to make the compartment 14 watertight. The top member 31 screws in place, and may be removed to insert water into compartment 14. The bottom is sealed by means of bolt 32 holding the base in place with radial fins 33 snugly fitting against the cylindrical body 10 and with gasket 30 squeezed between collar 34 and heater 12 to
give a tight frictional fit against the inside cylinder wall 35.

Of particular interest is the construction of the caressing head 11, as shown in FIGURE 3 which has a generally flat surface held in mount 24 by screws 37. A plurality of apertures 36 each terminate in a tapered groove arrangement 38 which provides a channel for distributing vapor over a wider surface when the grooves are partially blocked by the presence of a fabric in contact with the face of the caressing head 11. It may be seen from the typical arrangement illustrated that a stroking of the faceplate across a fabric would tend to evenly distribute vapor over the entire fabric surface to pass through it without pressing or ironing in the manner suggested by FIGURE 6. It has been found that this very effectively unwrinkles garments of many types, such as the trousers 49 shown hung by the cuffs 41 in slot 42 to allow vapor 43 to pass through the fabric. Furthermore, the unheated caressing head 11 is never at a temperature high enough to melt nylon or to burn silks or wools, and yet is effective on cottons.

Furthermore, thin ladies garments may be treated the same as thick men's suits, and there need be no special training or careful handling to use the device afforded by this invention. Wrinkles or sags are simply removed therefore in accordance with this invention by generating heated water vapor, conveying it through an unheated flat dispensing surface, disposing fabrics for treatment in free air or other position permitting passage of the vapor through the fabrics, and gently stroking or caressing the fabric surface with the dispensing surface in the vicinity of any sags or wrinkles to permit the vapor to pass through the fabric. The instrument could as readily process drapes while hanging as a man's jacket on a conventional hanger.

Having therefore described both novel apparatus and mode of operation for treating fabrics to remove sags and wrinkles, those novel features of the invention believed descriptive of its spirit and scope are defined with particularity in the appended claims:

What I claim is:

1. Apparatus for treating fabrics to remove wrinkles and sags comprising means generating heated water vapor under pressure, a plurality of orifice means disposed substantially uniformly over a flat surface and connected with the generating means for dispensing said water vapor upon the surface of a garment, and separate longitudinally disposed depressed channels surrounding each orifice to gather and direct the water vapor over a significant surface area when the flat surface is disposed adjacent a fabric which covers the channels.

2. A portable hand-held garment unwrinkler comprising in combination, a chamber for containing a supply of water, a heating element introduced into said chamber with sufficient heating capacity to vaporize the water supply in said chamber and provide vapor pressure, a caressing head with a flat face for stroking across a fabric having a plurality of apertures through said face to disperse the water vapor, a conveyance passageway from the water chamber to said apertures to pass said vapor therethrough by sole medium of its pressure, a housing about said chamber and attached to said head adapted to hold the supply of water against said heating element by force of gravity and to retain the vapor under pressure above said supply of water, structure providing about each of said apertures a separate contiguous depressed channel extending over an elongated area on the face of said head and presenting a pattern of channels distributing vapor evenly over the entire fabric surface when the head is stroked across a fabric.

3. A device as defined in claim 2, including baffle means in said conveyance passageway above the water supply restricting the flow of water out of said chamber.

4. A device as defined in claim 2, including a plastic hand grasp affixed to said housing and extending therefrom.

5. A device as defined in claim 2, mounted in a portable casing having a cylindrical water chamber with a plastic hand grasp piece affixed thereto by insulating means and surrounding the water chamber.

6. A device as defined in claim 2, mounted in a portable casing having a cylindrical water chamber, wherein said caressing head extends from one end of the cylinder at an acute angle from the axis of the cylinder.

7. A device as defined in claim 6, wherein a separate vapor chamber is defined at the end of said cylinder heading leading to said apertures in the head, said chamber being separated from the water chamber by a diaphragm with a single aperture and having a taper extending toward the aperture in the direction of said water chamber and inclined to pass condensed vapor into the water chamber by force of gravity.

8. A device as defined in claim 2, including a portable housing of substantially cylindrical configuration with a base at one end forming a stand for the housing holding the cylinder vertical with said caressing head affixed to the upper end.

9. A device as defined in claim 2, wherein the entire device is enclosed in a plastic outer housing, with said heating element including metal parts and consisting of substantially the entire metallic structure in said device.

References Cited

UNITED STATES PATENTS

1,784,223 12/1930 Crockem ----- 68—222 X
2,172,917 9/1939 Voigt ------------ 68—222
3,258,578 8/1966 Ferris --------- 68—222 X
3,272,964 9/1966 Carlos et al. -- 219—271
3,395,469 8/1968 Gilbert --------- 38—69

FOREIGN PATENTS

1,117,228 11/1961 Germany.

WILLIAM I. PRICE, Primary Examiner

U.S. CI. X.R.

38—69; 219—271; 401—3