Oct. 14, 1941. H. F. WANAMAKER 2,259,405

HOSIERY MOISTENER

Filed July 6, 1939 2 Sheets-Sheet 1

Fig. 2.

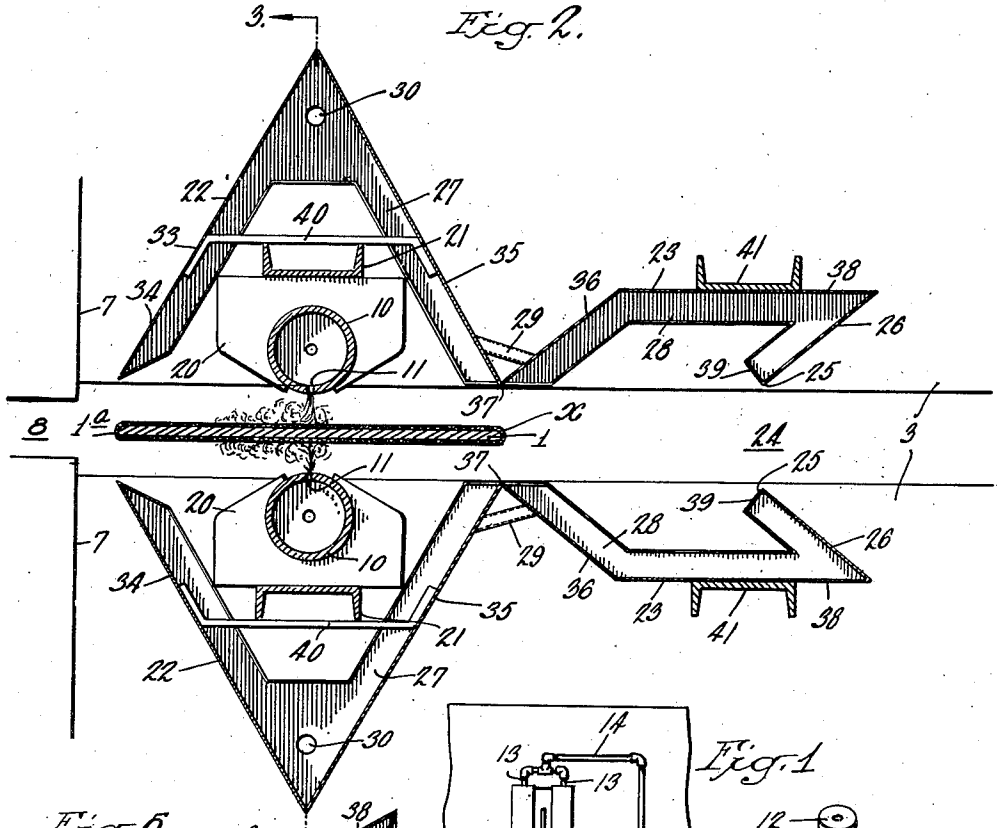


Fig. 5.

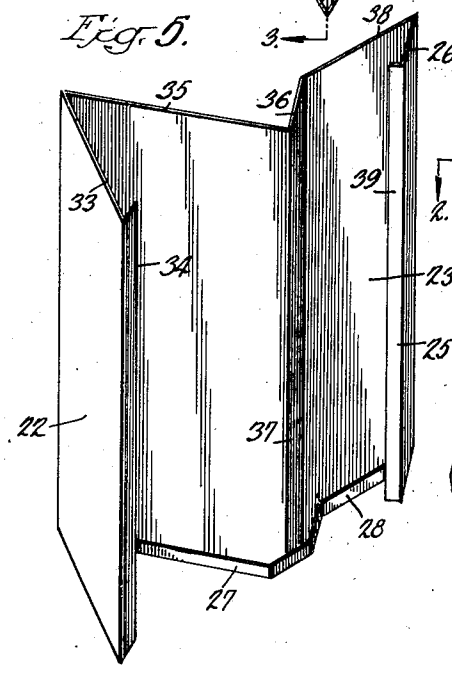


Fig. 1

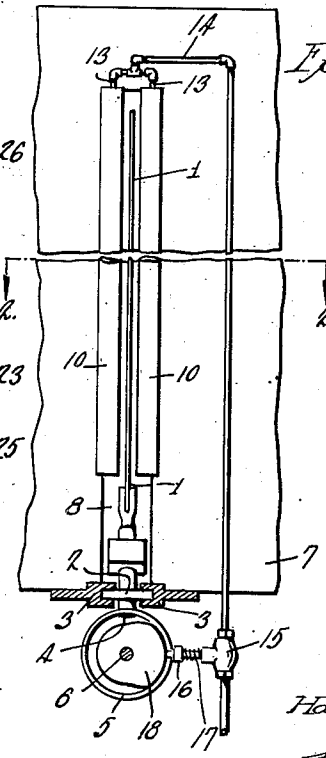
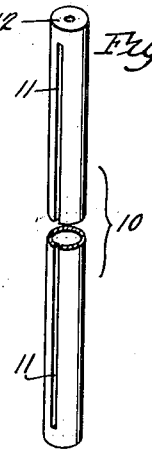


Fig. 6.



Inventor
Harry F. Wanamaker
by his Attorneys
Howson & Howson

Oct. 14, 1941. H. F. WANAMAKER 2,259,405

HOSIERY MOISTENER

Filed July 6, 1939 2 Sheets-Sheet 2

Fig. 3.

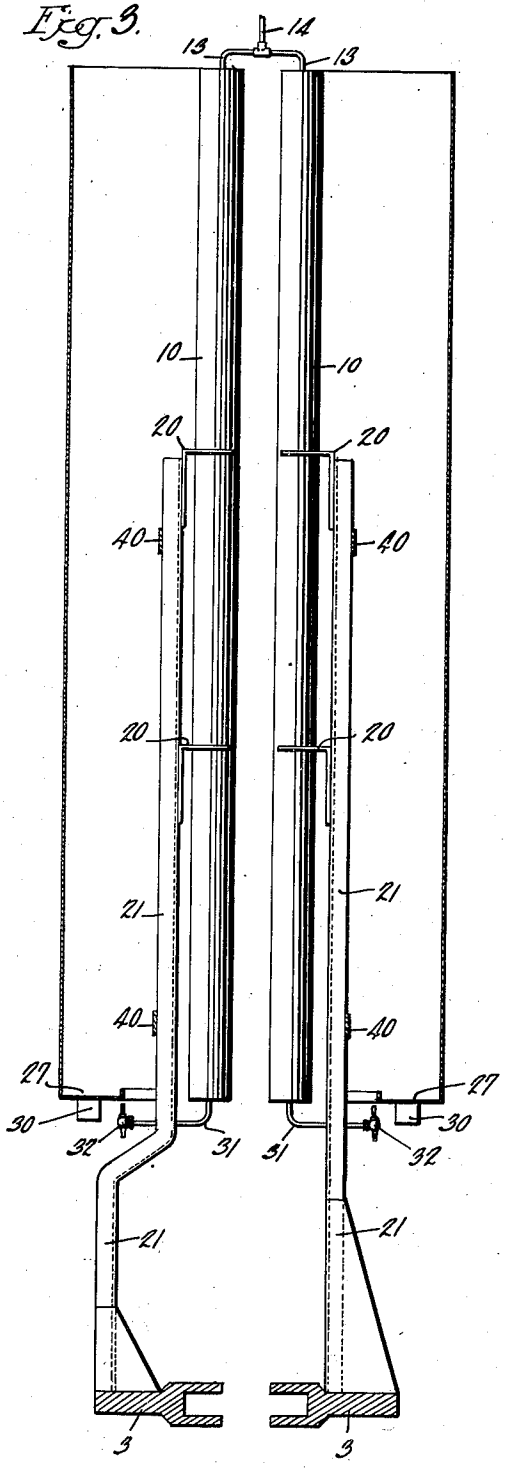
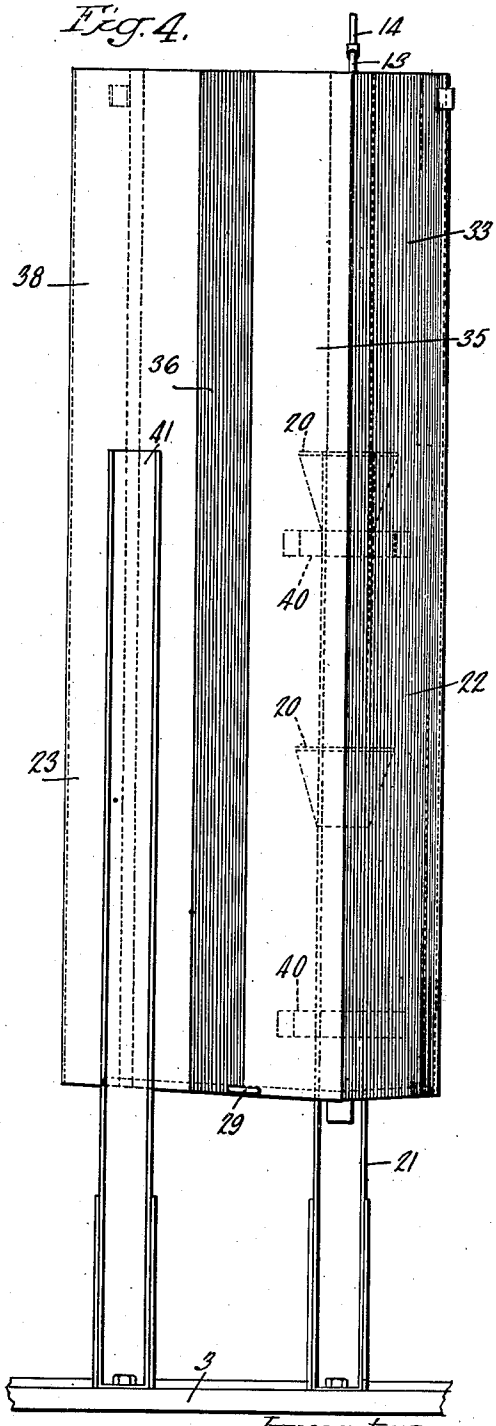


Fig. 4.



Inventor
Harry F. Wanamaker
By his Attorneys
Howson & Howson

Patented Oct. 14, 1941 2,259,405

UNITED STATES PATENT OFFICE

2,259,405

HOSIERY MOISTENER

Harry F. Wanamaker, Philadelphia, Pa., assignor to Proctor & Schwartz, Incorporated, Philadelphia, Pa., a corporation of Pennsylvania

Application July 6, 1939, Serial No. 283,106

1 Claim. (Cl. 223—76)

This invention relates to a hosiery moistener adapted to be installed on a hosiery dryer immediately in advance of the hosiery forms, with stockings in position thereon, entering the drying chamber.

Prior to the present invention it has been known to moisten hosiery on forms prior to the entrance thereof into drying chambers, by passing the hosiery forms through a suitable cloud of steam or vapor within a chamber situated adjacent the entrance to the dryer. It has also been known to moisten hosiery by projecting jets of steam from a plurality of small relatively spaced nozzles against the opposite sides of the stocking in advance of its entrance into the dryer.

The first of the above noted systems is not entirely satisfactory because the steam in the moistening chamber is at atmospheric pressure, due to the chamber necessarily being open to the atmosphere to permit passage of the hosiery forms into and out of the moistening chamber, as disclosed in the prior U. S. Letters Patent to Schwartz and Kiehnel No. 1,576,333, dated March 9, 1926, and in the U. S. Letters Patent to Griffith and Wanamaker, No. 2,006,501 dated July 2, 1935. In some instances under this system, for said reason, the hosiery is not thoroughly moistened.

The second system is open to the objection of the jets of steam impinging upon relatively spaced points along the hosiery form not effecting uniform moistening of the hosiery; and causing spotting of the hosiery as a result of condensation of the steam as it spreads to parts of the form intermediate the points at which impingement of the jets occurs.

The object of the present invention is to provide a hosiery moistener which will overcome all of the above noted objections, in a manner which will hereinafter be fully disclosed in connection with the description of the apparatus, a practical form of which is shown in the accompanying drawings, wherein:

Fig. 1 is a front elevation, partly in section, of one end of an automatic hosiery dryer of the type disclosed in the aforesaid prior patents and in the patent to Coulston and Schwartz, No. 1,126,619, dated January 26, 1915, with the moistener only of the present invention applied thereto;

Fig. 2 is a section plan view taken on the line 2—2, Fig. 1, and drawn to an enlarged scale with steam confining casings around the moistener;

Fig. 3 is a transverse sectional elevation taken on the line 3—3, Fig. 2;

Fig. 4 is a side elevation of the apparatus shown in Fig. 3;

Fig. 5 is a detached perspective view of one half of the steam confining casing; and

Fig. 6 is a detached perspective view of one of the moisteners of the invention.

As shown in Figs. 1 and 2, each stocking x is positioned on a hosiery form 1. The form is supported by a carriage 2 which is adapted to travel along a track 3 forming part of a hosiery drying machine of the type disclosed in the above noted prior patents. Each carriage 2 is provided with a driving projection 4 which is disposed in the path of a spiral ribbon cam 5 operable below the track 3 and secured to the rotary shaft 6. The track 3 extends within the drying chamber 7 of the drying machine and outwardly beyond said chamber, providing a circuit through which the carriages 2 move the forms 1 for drying hosiery thereon within the chamber and for removal of the dried hosiery from the forms and the replacement thereof by hosiery to be moistened outside the drying chamber.

Each form 1, with a stocking x thereon, immediately in advance of its entrance into the drying chamber 7 through a slot 8 formed in the front wall of the drying chamber 7, passes between a pair of vertically disposed steam boxes or chambers 10, 10 which constitute the moisteners.

As shown in Fig. 6 each of the moisteners 10, in the present case, is in the form of an elongated hollow cylinder of a length substantially equal to or greater than the portion of the form 1 which extends above the uppermost portion of the carriage 2. The longitudinal axes of the moisteners 10, 10 are arranged vertically at opposite sides respectively of the path of movement of the forms 1 along the track 3. Each of the moisteners 10 is provided with a continuous uninterrupted slot 11 extending longitudinally thereof, substantially from end to end thereof, said slots 11, 11 being arranged on the sides of the cylinders 10, 10 lying adjacent the path of movement of the forms 1, 1, i. e. the slots 11, 11 lie in a common vertical plane disposed substantially at right angles to the vertical plane in which said forms move as they travel horizontally along the track 3.

To the upper closed end 12 of each of the moistening cylinders 10, 10, is connected at steam pipe 13, said pipes being connected to a common supply pipe 14 in which is a control valve 15, between the moistening cylinders 10, 10 and a suitable source of steam supply, in which supply the steam is maintained at a pressure in excess of atmospheric pressure.

The valve 15 is provided with a plunger 16 and a spring 17 thereon for normally maintaining the valve in a closed position, to cut off the supply to the moisteners 10, 10. As the leading edge 1a of each form 1 advancing along the track 3 approaches the moistening cylinders 10, 10, a cam 18 on the carriage drive shaft 6 depresses the plunger 16 against the action of the spring 17 and permits steam under pressure to flow through the feed pipe 14 and its branches 13, 13 into the

cylinders 10, 10, from which the live steam under pressure escapes in the form of a pair of sheets moving in opposite directions in the common plane of the slots 11, 11 toward the opposite sides respectively of the stocking x mounted on the form which is moving along the track 3 between the cylinders 10, 10, whereby the two oppositely moving sheets of steam simultaneously impinge upon the opposite sides respectively of the stocking.

The impingement of the two sheets of steam simultaneously throughout the full length of the stocking on the form, as the stocking moves between the cylinders 10, 10, effects immediate penetration of the fabric, uniformly from end to end of the stocking.

The steam, after impinging against the sides of the hosiery on the form, will rebound laterally, and such rebound is trapped by and confined within casings 22, 22 which surround the rears of the cylinders 10, 10. Heat from within the drying chamber 7 flows outwardly through the entrance slot 8 into space left between the trap casings to permit travel of the forms 1 therethrough and tends to move the cloud of steam out of the trap casings 22, 22 in a direction opposite to that in which the forms 1 advance in entering the slot 8. This moving steam is trapped by complementary trap casings 23, 23 arranged along the track 3 in advance of the main trap casings 22, 22, which surround the moistening cylinders 10. Thus, as each form 1 with the stocking x thereon enters the passageway 24 formed between the innermost edges 25, 25 of the convergent front walls 26, 26 of the complementary trap casings 23, 23 respectively, it passes into an atmosphere of expanded wet steam or damp vapor and the stocking on the form receives a preliminary moistening, prior to its entrance between the impinging sheets of live steam projected outwardly through the continuous slots 11, 11 of the moistening cylinders 10, 10 respectively.

Any condensation of the expanded steam within the casings 22, 22 and 23, 23 produced by contact thereof with the inner surfaces of the walls of the trap casings, will collect on said inner walls and descend into an internal drip trough 27 formed along the lower edges of the casings 22, 22 and corresponding drip troughs 28, 28 extending along the lower edges of the casings 23, 23, said drip troughs being connected by pipes 29, 29. Condensation collected within the casings is drained from the troughs 27, 27 through suitable drain pipes 30, 30. Similarly any condensation that may occur within the interiors of the cylinders 10, 10, is drained from the lower ends of said cylinders by drain pipes 31, 31, under control of drip valves 32, 32.

As shown in Figs. 2 and 5, each of the trap casings 22 is of a triangular cross section with the open sides thereof facing each other at opposite sides respectively of the path of movement of the forms 1. One edge of each casing 22, adjacent the drying chamber 7, is bent inwardly at an acute angle to the rear wall 33 of the casing, as shown at 34, the edge walls 34, 34 flaring backwardly and outwardly with respect to the path or movement of the forms 1, in divergent relation to each other. The second or front wall 35 of each casing 22 terminates immediately adjacent the path of movement of the forms 1 and meets with an angular rear wall 36 of the casing 23, at the point 37.

The back walls 36, 36 of the casings 23, 23 and the front walls 26, 26 of said casings, are substantially parallel to each other and are arranged in backwardly and outwardly flaring relation to each other, in substantially the same manner as the walls 34, 34 of the casings 22, 22. The front walls 26 and the rear walls 36 of the casings 23 are connected by side walls 38 which are substantially parallel to the path of movement of the forms 1. The front walls 26, 26 of the casings 23, 23 from the edges 25, 25 thereof flare outwardly, as indicated at 39, 39.

The above arrangement tends to trap and hold the moving cloud of expanded steam, to effect preliminary moistening of the hosiery on the forms 1 before being introduced to the impinging sheets of live steam from the cylinders 10, 10.

The tops of the casings 22 and 23 are shown as being open in the present instance, to permit natural rise of the expanded steam, while the casings 22 and 23 trap and confine the lateral movement of the steam as it expands.

The cylinders 10, 10 are supported by brackets 20, 20 respectively, which in turn are carried by uprights 21, 21 secured, in the present instance, to the track 3.

The casings 22 are each supported by brackets 40 which are secured in any suitable manner to the uprights 21, and the casings 23, 23 may be supported by similar additional uprights 41, 41, or in any other suitable manner.

I claim:

A moistener for hosiery comprising a series of flat vertical hosiery-supporting forms successively movable edgewise in a vertical plane along a horizontal path into an entrance slot of a dryer adjacent which the moistener is adapted to be located, a pair of steam chambers respectively located at opposite sides of said path with continuous vertical slots respectively directing sheets of steam in opposite directions toward said path in a common plane transverse to the plane of movement of said forms, a main casing enclosing said steam chambers and having a form entrance and exit connected by a through passageway for said forms coincident with said path and aligned with said dryer slot, said main casing being adapted to catch and condense steam rebounding from said forms as said forms pass through said sheets of steam, and an auxiliary casing contiguous to that side of said main casing remotely situated with respect to said dryer and having a through passageway for said forms in line with the passageway of said main casing, said auxiliary casing being adapted to catch and condense steam driven from the form entrance of said main casing by a current of air escaping from said dryer through said slot therein and entering the form exit of said main casing, those parts of said auxiliary casing disposed at opposite sides respectively of said passageway each comprising adjacent angularly arranged vertical walls forming a rhomboidal configuration cross-sectionally in a horizontal plane, with one side of each rhomboidal casing part lying adjacent and parallel to said passageway and being open for entrance of the steam thereinto, said rhomboidal casing parts being disposed reversely at said opposite sides of said passageway with the longer diagonals of the rhomboids diverging from the form entrance of the main casing in the direction opposite to the movement of the forms through said juxtapositioned main and auxiliary casings.

HARRY F. WANAMAKER.