

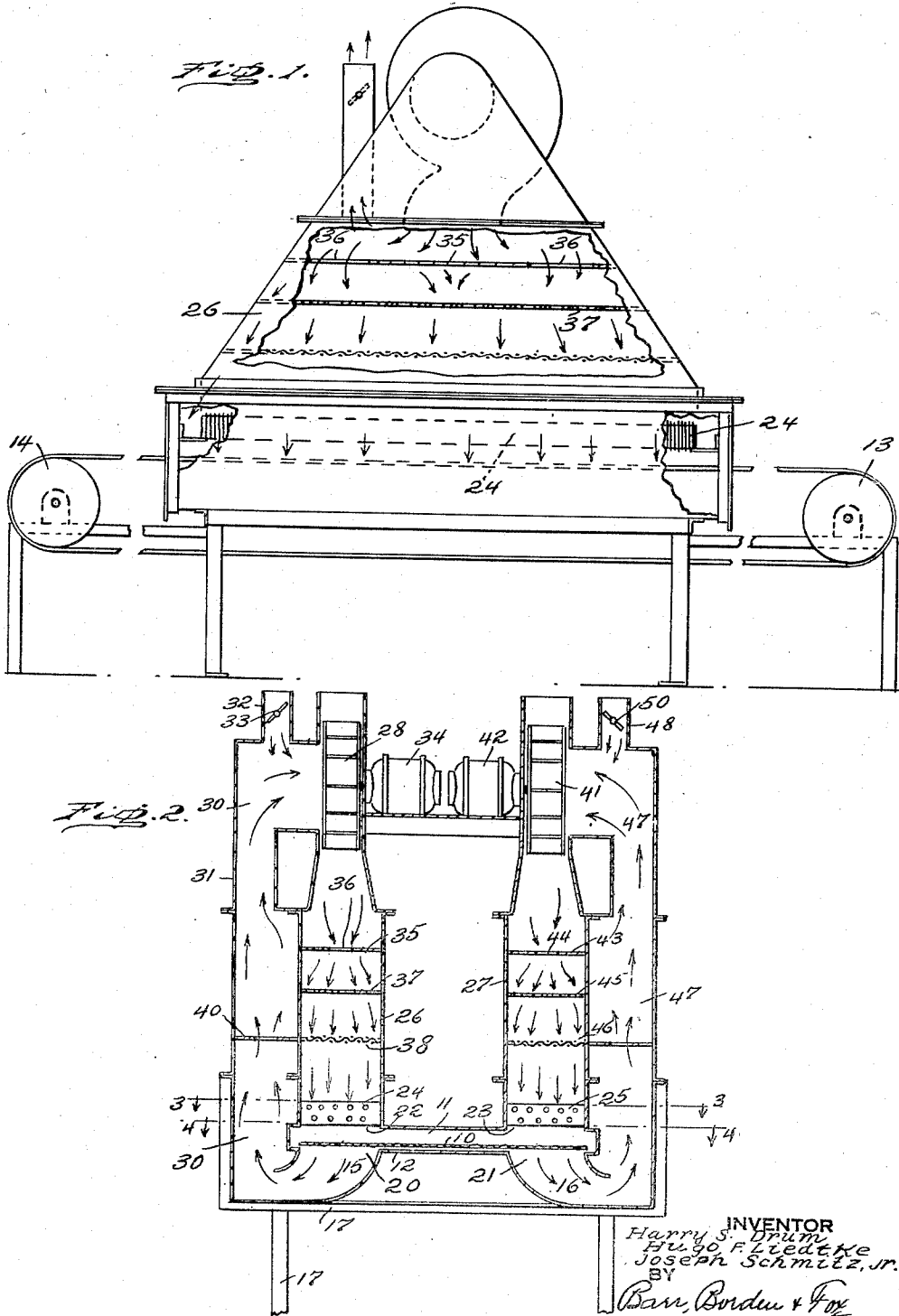
Feb. 23, 1954

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MACHINE FOR DRYING HOISERY

2,669,788

Filed June 7, 1950

2 Sheets-Sheet 1



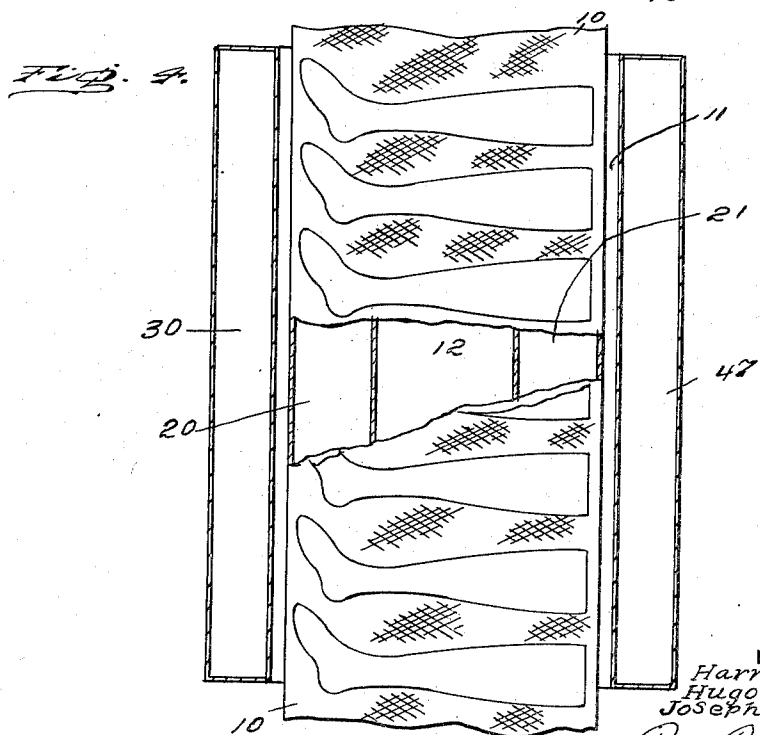
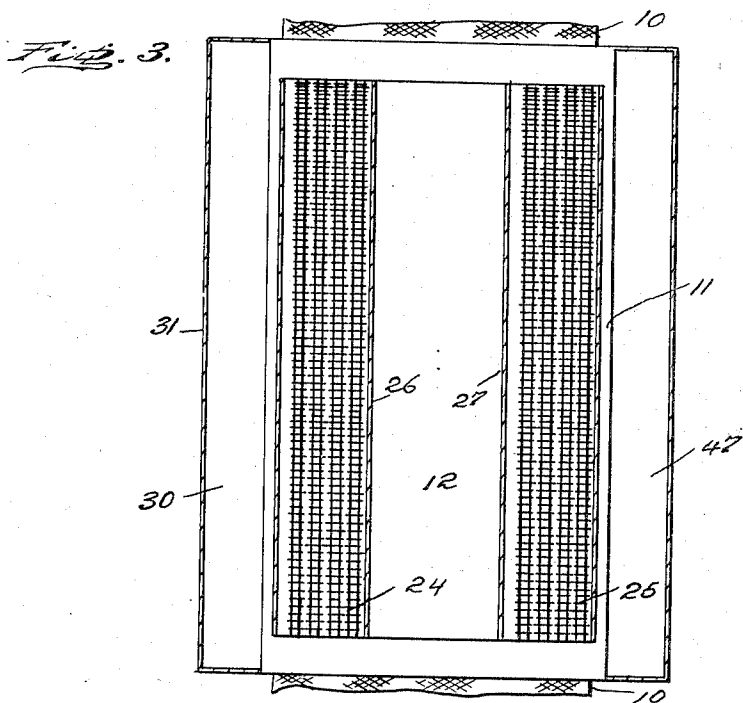
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MACHINE FOR DRYING HOSIERY

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1 Claim. (Cl. 34—223)

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The present invention relates to material drying apparatus and more particularly to a novel machine for drying hosiery.

In the manufacture and handling of hosiery as heretofore practiced, there are two methods in present day use, both of which require two or more handlings of the stockings and the use of skilled operators.

In the first method the knitted stockings are preset on boards individually, removed from the boards and put into bundles of twelve and wrapped in muslin, after which a number of these bundles are put into a bag. These bags are now placed in a dyeing machine where they are dyed and a finish applied. When this operation is completed, they are removed from the dyeing machine and transferred to a mechanical extractor for extraction of excess liquid. Following this operation, the stockings are removed from the bags, the muslin wrapping taken off so that each stocking can be pulled onto a heated hosiery form for drying and re-shaping. In some hosiery plants the bundling and wrapping in muslin is dispensed with and the stockings drop into the dye bag in loose form.

In the second method, known as the "Dunn" system, the stockings are hung in a conditioning chamber where they are exposed to steam to produce what is called a "pre-setting." After removal from this cabinet the stockings are then prepared for dyeing in either of the two ways of the first method, after which the finished boarding operation is carried out on the same piece of apparatus as is used for pre-boarding referred to in the first method.

Both of these methods have certain disadvantages which have plagued manufacturers since the introduction of nylon and synthetic fibres. These relatively new fibres produce a very sheer fabric which is very easily damaged by handling. Thus, in the first method described, there are two individual handlings, and in the second method there is the handling preparing for the pre-setting operation and the finish boarding operation. Both of these operations must be carried out by skilled operators, and when the stockings are pulled on forms there is always the chance for variation in length due to one operator pulling the stocking down with greater force than another operator. Furthermore, in either of the foregoing methods constant supervision and labor are required because some of the finishing compound adheres to the forms on which the stocking is finish boarded. This requires the forms to be cleaned on an average of once every two or three hours because otherwise the crystalline nature of the finish as it bakes on the forms will cause damage to the inside of the stocking.

Some of the objects of the present invention are: to provide an improved machine for drying

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hosiery; to provide a hosiery drying machine in which the stockings in quantity or in bundle form are handled on a continuous basis; to provide a hosiery drying machine wherein means operate to direct the greater portion of the drying medium to the foot, hem, welt, or areas of greatest concentration of the fabric; to provide a hosiery drying machine comprising a cabinet or closed housing having a drying source therein and a conveyor traversing the cabinet for carrying a quantity of stockings into the path of the drying medium; to provide a hosiery drying machine which can be successfully operated by unskilled help instead of skilled help; to provide a hosiery machine which eliminates the pulling of stockings on individual forms, so that no drying forms are required and consequently the usual cleaning of such forms to get rid of finishing compounds is no longer necessary; to provide a hosiery drying machine in the operation of which skilled supervision of the workers is no longer required; to provide a hosiery machine which operates with less finishing compound than is necessary in present day machines; to provide a hosiery machine which reduces the damage ordinarily done to hosiery by the number of handlings; to provide a novel method of drying hosiery in stacked or bundled form; and to provide other objects as will become apparent as the description proceeds.

In the accompanying drawings, Fig. 1 represents a side elevation broken away of a hosiery dryer embodying one form of the present invention; Fig. 2 represents a vertical medial section of Fig. 1; Fig. 3 represents a section of line 3—3 of Fig. 2; Fig. 4 represents a section on line 4—4 of Fig. 2.

Referring to the drawings, one form of hosiery drying apparatus embodying the invention is shown wherein bundles or quantities of unboarded preset hosiery are placed upon a reticulated conveyor 10 in order to travel through a transverse passage 11 formed by a casing 12 and leading from the receiving side of the machine to the delivery side. Preferably, the width of the conveyor 10 and the passage 11 is such as to allow the hosiery to lie in flat extended position with the stocking welts at one side of the passage and the feet at the opposite side. The conveyor 10 projects from the ends of the casing 12 to travel around driving and driven pulleys 13 and 14, or the like, which are so laterally spaced with respect to the machine as to provide extensions respectively for loading and unloading purposes. As shown, the bottom of the casing 12 terminates at opposite ends respectively in arcuate diverging ducts 15 and 16, which seat on the top of a suitable support such as the skeleton base 17. While as heretofore described the width of the passage 11 is such that the stockings lie

flat transverse of the conveyor, the length of the passage 11 is greater than its width and so dimensioned as to ensure most effective drying action during the travel of the stockings through the passage 11. The bottom of the casing 12 is formed with two lengthwise arranged outlets 20 and 21 communicating respectively with the aforesaid two ducts 15 and 16, while the top of the casing 12 is formed with two lengthwise arranged inlets 22 and 23, which are aligned respectively with the outlets 20 and 21. By this construction a bundle of stockings travels with the conveyor, thereby positioning the two end portions of the stockings respectively between the inlet 22 and outlet 20 at one side and between the inlet 23 and the outlet 21 at the other side. Thus, the drying action can be concentrated at the reinforced portions of the stocking, namely the welt, foot, and heel portions.

For heating air and circulating it through the bundle of stockings, two heating coils 24 and 25 are mounted respectively above the two casing inlets 22 and 23, and housed transversely respectively of two inverted funnel shaped conduits 26 and 27. The upper end of the conduit 25 is in communication with the discharge of a blower 28, the suction side of which communicates with a chamber 30 formed between an enclosing housing 31 and the conduit 25. The duct 15 discharges into the lower end of the chamber 30 to form a return for the air for re-circulation. An inlet 32 is provided to the chamber 30 and has a valve 33 therein for controlling the fresh air supply. The blower 28 is driven by a suitable electric motor 34 mounted in proper axial relation.

In order to diffuse and distribute the air on its way to the heating coils 24, a distributor plate 35 is mounted transversely across the conduit 26 adjacent to the discharge from the blower, and is provided with air passages 36, preferably laterally spaced apart to form a central baffle to divide the air stream into two oppositely moving flows leading to the respective passages 36 for proper distribution. Below the plate 35 and suitably spaced therefrom, in parallel relation, there is a perforated distributor plate 37 through which the air passes to enter a portion of the conduit 26 defined by a transversely disposed diffuser screen 38, located above and suitably spaced from the coils 24. Thus, the air discharged from the blower 28 travels successively through a series of conduit portions each successively of increased volume until the maximum is reached at the heating coil 24. After this air circulates through the bundle or stack of stockings on the conveyor, it leaves by way of the duct 15 to rise in the chamber 30 and return to the suction side of the blower 28. It is preferable to provide an apertured baffle 40 in the return.

Since the conduit 27 is a duplicate of the conduit 26, it will not be specifically described, but generally includes a blower 41 at the upper end of the conduit driven by a motor 42 to discharge air into the succession of increased volume conduit portions formed by a distributor plate 43 with passages 44, perforated plate 45, and screen 46. The discharged air from this conduit 27 traverses the bundle of stockings and discharges through the duct 16 into the housing space 47 to return to the suction side of the blower 41. An inlet 48 for fresh air communicates with the space 47 and is provided with a control valve 49.

It will now be apparent that a novel machine for drying hosiery has been devised producing new results as compared to drying apparatus

heretofore in use. By reason of the continuous feeding of hosiery the production of the finished hosiery is about double present day methods, while unskilled help can replace the usual skilled help. Since the stockings during the drying operation are handled in bundle form instead of individually, the necessity of pulling the stockings onto forms individually is eliminated so that no drying forms are required. Consequently, there is no cleaning of forms to get rid of finishing compounds, which means no supervision is required for this operation. Also, approximately fifty percent less finishing compounds are required because it all remains on the stockings. Furthermore, less damage is done to the goods because of less handling and because the stockings are not subjected to the possibility of damage from the sides clinging to the forms.

Because the drying operation produced by the present method and apparatus is done in bundles, uniformity in preset foot sizes and length of hosiery and texture of fabric is produced, whereas in the standard boarding or post preboarding operation which consists in pulling the damp stocking over a form made principally of metal, irregular result is necessarily produced in heel length, overall length and texture of the knitted fabric. Also, by the present invention there is a complete elimination of any finger scratches across the wales of the knitted fabric which is usually produced in the boarding operation. To applicants' knowledge there is no other method of drying stockings known or used in the finishing operation of hosiery known as boarding or pressing, that will produce this uniformity now obtained by the method and apparatus of this invention.

We claim:

A hosiery drying machine, comprising the combination of a housing, a casing in said housing forming a closed end transverse passage having two upper spaced air inlets and two lower spaced air outlets respectively aligned with said inlets, said passage having a width to receive a stocking disposed flat transversely of said passage with the leg portion thereof juxtaposed to the casing between said inlets and the welt and foot portions respectively aligned with said inlets, conduits for air respectively communicating with said inlets, heating coils respectively on said conduits, blower means for delivering air to said heating coils, and return circulation conduits leading respectively from said outlets to said blower means.

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