Feb. 27, 1945. E. F. WESELY 2,370,432

SOCK AND STOCKING DRYING MACHINE

Filed Feb. 1, 1943 4 Sheets-Sheet 1

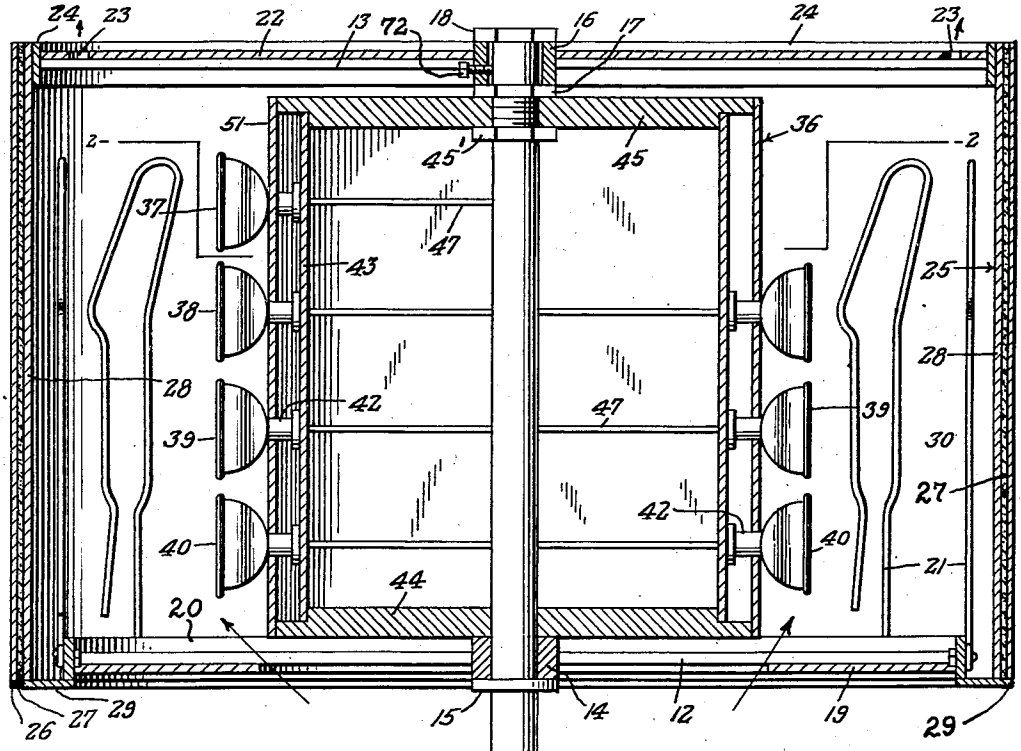


Fig. 1.

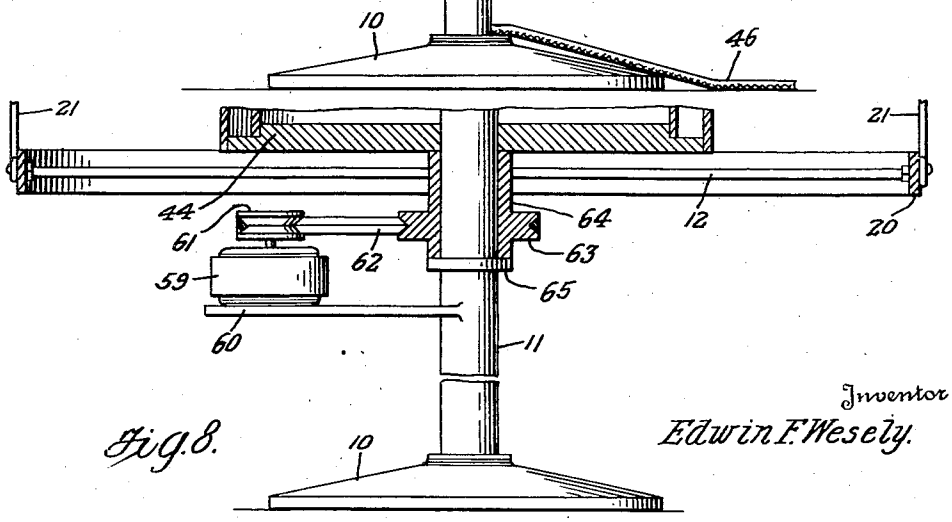


Fig. 8.

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SOCK AND STOCKING DRYING MACHINE

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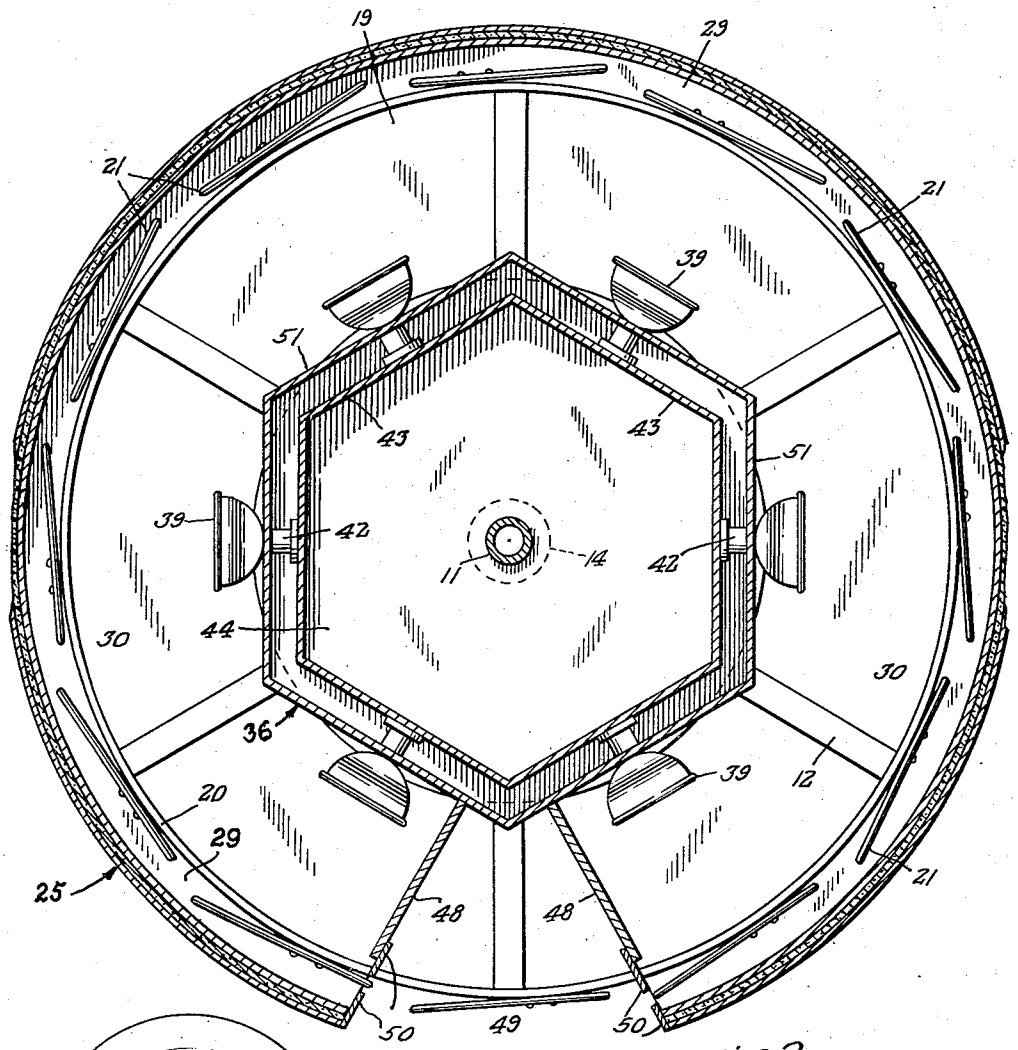


Fig. 2.

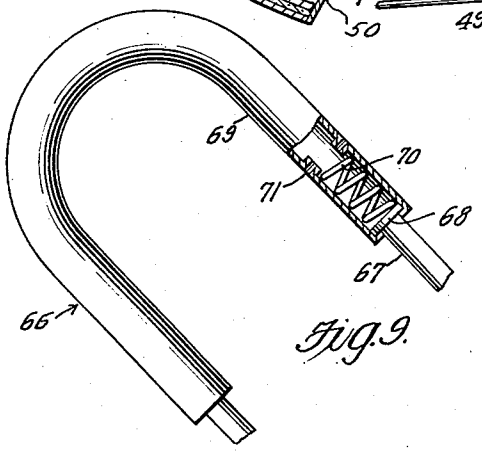


Fig. 9.

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SOCK AND STOCKING DRYING MACHINE

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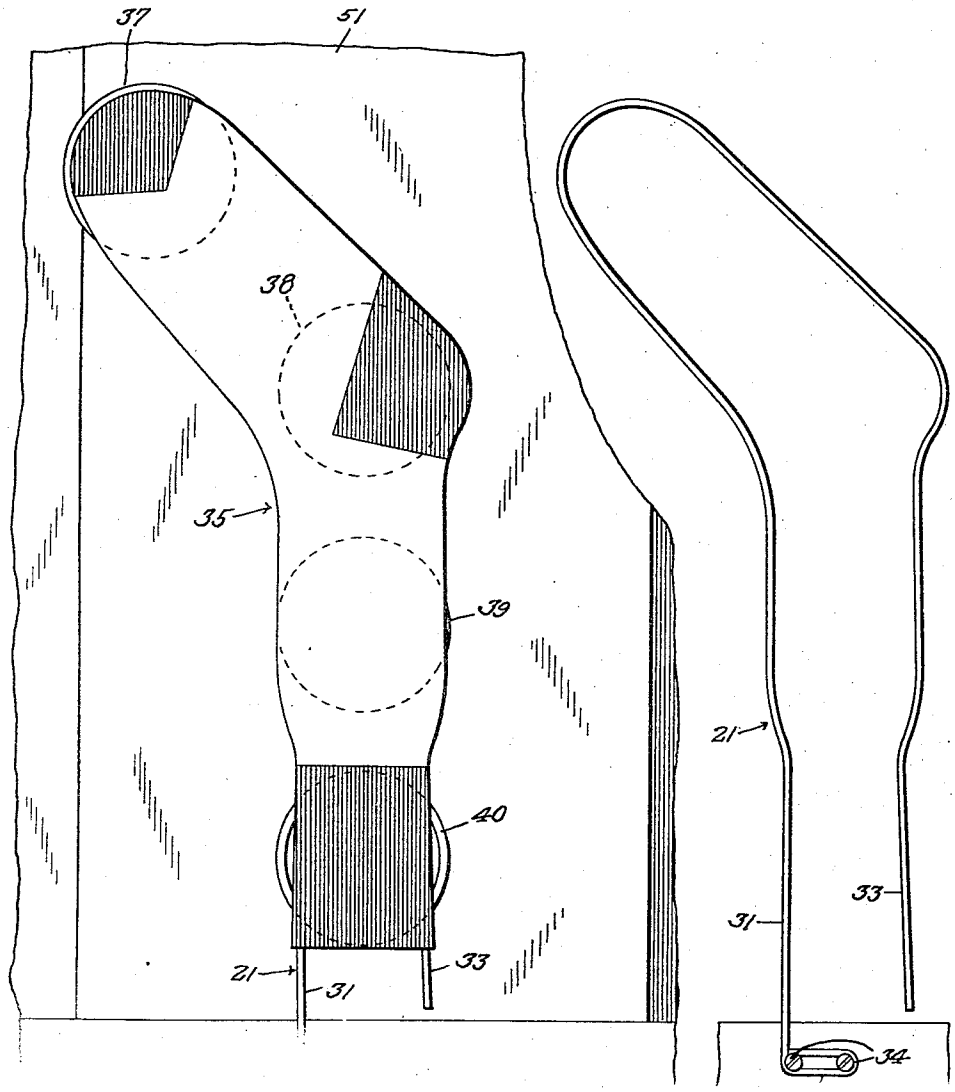


Fig. 3.

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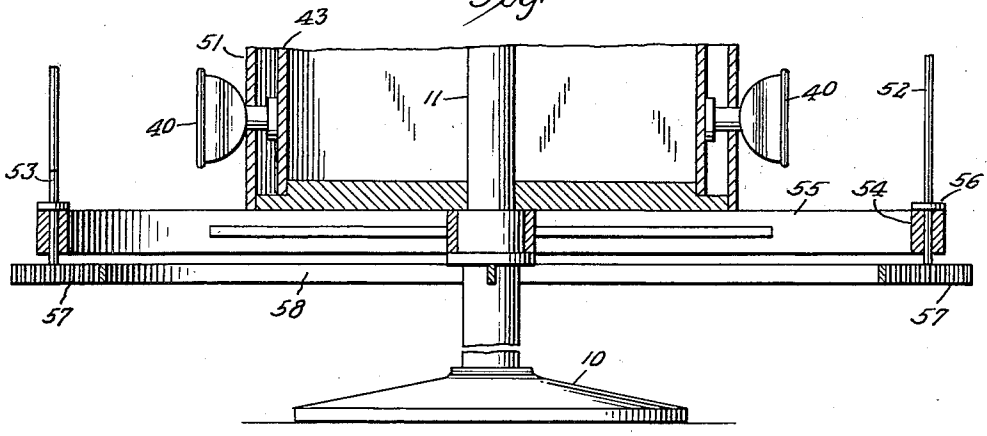
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SOCK AND STOCKING DRYING MACHINE

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Fig.6.



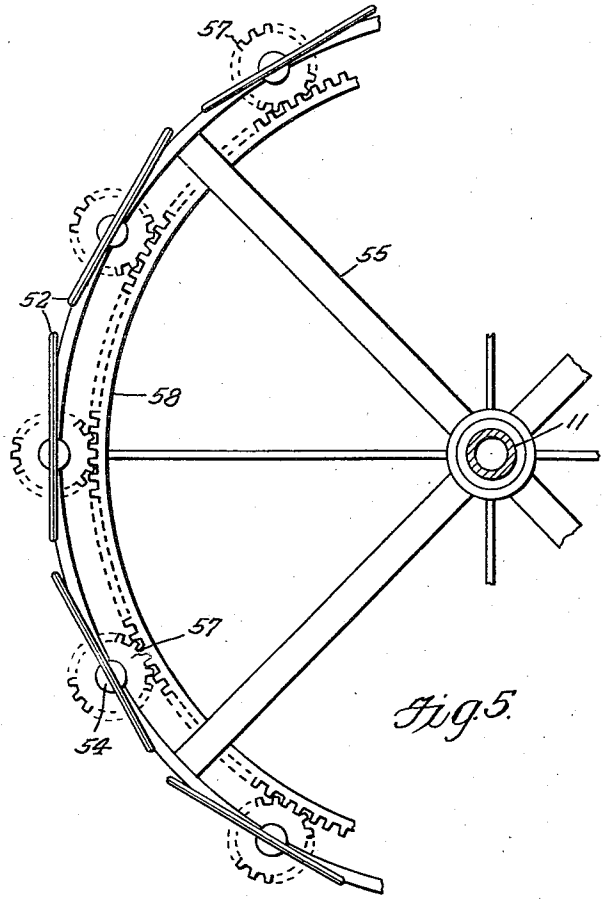


Fig.5.

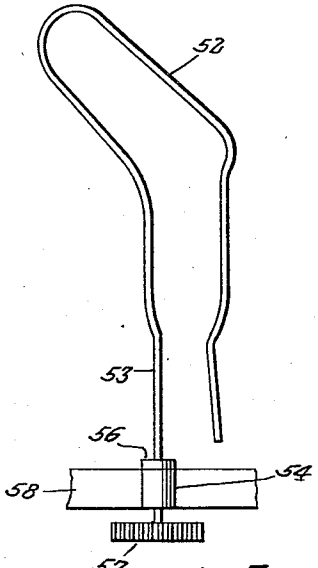


Fig.7.

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Patented Feb. 27, 1945 2,370,432

UNITED STATES PATENT OFFICE

2,370,432

SOCK AND STOCKING DRYING MACHINE

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Application February 1, 1943, Serial No. 474,366

15 Claims. (Cl. 34—105)

This invention relates to improvements in apparatus for drying socks, stockings and other tubular and like articles including shirts, underwear and the like.

An object of the invention is to provide apparatus in which wet and damp laundered articles are subjected to heat and rays of the infra red type, for example, while moving through the machine mounted on suitable forms. A further object of the invention is to provide a series of stations of infra-red ray electric lamps of which the lamps of each station are arranged in the approximate spaced relation to direct a stream of heat and other rays against all portions of the article to be dried such as the toe, heel, leg and cuff or top sections of a sock or stocking, preferably four lamps for each station.

Another object of the invention resides in motor means for slowly rotating a bank of article drying frames each of which may have an adjustable toe portion and one side portion being resilient or movable away from the other side to stretch the article on the form. A still further object is to provide means to rotate each article form upon rotation of the bank of forms to present first one side of the article to the lamp rays and then the other.

The invention further aims to provide a fully automatically adjustable article form which will stretch the article to be treated or dried irrespective of its size thereby producing a dried article which restores thereto much of its original finish, shape and appearance.

Further objects will be apparent from the following description when considered in connection with the accompanying drawings, in which:

Figure 1 is a vertical sectional view of the drying machine,

Fig. 2 is a cross sectional view of the machine taken on line 2—2 of Fig. 1,

Fig. 3 is a side elevation of a sock drying frame,

Fig. 4 is a side elevation of a sock on a frame with a bank of lamps behind the sock,

Fig. 5 is a top view of a part of a modified drying machine,

Fig. 6 is a vertical sectional view of a part of the machine of Fig. 5,

Fig. 7 is a side elevation of a detail of a sock frame and its actuator,

Fig. 8 is a vertical sectional view of a part of the machine of Figs. 1 to 4 with a motor drive, and

Fig. 9 is a plan view of the toe portion of a modified frame.

It is to be understood that the machine according to this invention is capable of drying or treating any laundered or cleaned article but for purpose of illustration the drawings show a machine for drying socks and the following description will pertain to such a machine.

Referring to Figs. 1 to 4, the sock drying machine is suitably mounted on a base plate 10 of cast iron or other suitable material or metal, which may be bolted on a floor or it may be unfastened to make it readily available for shifting to various parts of a laundry or other building. A post, pipe or hollow column 11 is secured in the base plate and has two frame members rotatably mounted thereon which are preferably in the form of spoked wheels 12 and 13. The lower spoke frame 12 is rotatably mounted by means of a hub bearing 14 which is held in place relative to the height of the column 11 by means of an abutment member 15 secured on the column. The upper spoke frame 13 is rotatably mounted on column 11 by means of a hub 16 bearing against a nut 17 on the column and a second nut 18 is for the purpose of securing the spoke frame 13 in its adjusted position on the column.

The lower frame member 12 preferably has a large ring-shaped plate 19 secured thereto and a peripheral rim or form support 20, to the latter of which is secured a plurality of sock holding forms 21.

The upper frame member 13 is provided with a cover or plate 22 having a plurality of circumferentially arranged openings 23 therein to permit the escape of steam or water vapor and provide for some circulation of air. A peripheral rim 24 has a cylindrical shield or cover 25 suspended therefrom which is preferably composed of three layers, that is an outer layer 26 of sheet iron or other suitable material, an intermediate layer 27 of insulating material such as sheet asbestos, and an inner layer 28 of a suitable reflecting material such as aluminum, silver plated metal and the like. One of the layers, preferably the outer layer 26, is turned inwardly at the bottom a short distance to form a closure member 29 against the entry of too much air at the bottom of the drying chamber 30 adjacent the drying forms. It is of course obvious that the cover or shield 25 may comprise one or any suitable number of layers and said layers may be made of any suitable and desired materials.

Each sock holding form 21, Fig. 3, is made from a relatively stiff wire, rod or tube, preferably made of stainless steel or other non-rusting material, bent into the approximate shape to accommodate the articles to be dried such as socks,

as illustrated, in which one leg portion 31 is bent into a loop 32 and is rigidly secured by this loop to the rim portion 20 by means of bolts 34 and the like. The other leg portion 33 is free to move laterally to the right by inherent spring tension in order to stretch the sock 35 on the form during the drying operation, as shown in Fig. 4. It is of course obvious to weld each form 21 on the rim 20 if desired or to fix the leg portion 31 in a suitable hole in the rim.

The hub 14, spoke frame 12, plate 19, rim 20 and forms 21 form a rotatable table to carry the articles to be dried slowly or intermittently through the drying chamber 30 with the articles in a stretched upright position.

A lamp supporting drum 36 is made of any suitable material such as metal, plastic, heat insulation or even wood, and is composed of a number of panels 51 supporting a plurality of banks of electric lamps 38, 39, 40 and 37, preferably of the infra-red or ultra-violet ray type. The drum 36 is preferably in the shape of a hexagon or it may be cylindrical, but as shown on the drawings six banks of lamps are provided which is designed to provide sufficient heat rays to dry the articles commensurate with the speed of the operator to remove a dried article and replace a wet article to be carried through the drying machine without scorching. Each lamp has a suitable socket 42 secured to respective plates 43 forming part of the drum. A bottom plate 44 and a top plate 45 are mounted on the column 11 and secured thereon by means of nuts 17 and 45', Fig. 1. Electric current for the lamps is preferably conducted in a cable 46 entering the column just above the base plate 10 and thence up through the hollow column branching out from the column 11 in the drum 36 by means of wires or leads 47 to the individual sockets 42 by suitable openings in the column. The cable 46 could also enter the top end of the column if desired.

As shown in Fig. 2, two vertically arranged and spaced shield plates or side covers 48 of non-heat conducting material are secured to two adjacent panels 51 and are directed to a longitudinal opening 49 in the shield 25 opposite which the operator of the machine is stationed. The plates 48 protect the operator from the heat and light rays and in order to provide a most perfect closure, flexible strips 50 of asbestos, canvas or other suitable non-heat conducting material are secured to the ends of the shield 25 and plates 48 where the forms 21 pass into and out of the drying chamber 30 with the strips reaching just to such forms or even contacting or brushing them slightly. Therefore the segment defined by the plates 48 and opening 49 of the machine constitutes an article placing and removing station for an operator and the remainder of the circumferential outline of the machine constitutes the drying chamber.

Each bank of lamps 37 to 40 is arranged in the approximate positions corresponding to the shape of the article to be dried, and as shown in Fig. 4, for a sock drying arrangement the lamp 37 dries the region of the toe portion of sock 35, lamp 38 the heel portion, lamp 39 the leg portion and lamp 40 the top portion.

Figs. 5 to 7 illustrate a modified sock drier in which the sock forms rotate individually as the table rotates around the column 11. In this form of the invention the table is provided with drying forms 52, each in the general form for socks having one leg portion 53 extending through an opening in the rim 54 of the spoked wheel 55 and provided with an abutment bearing 56 and a gear 57 mounted thereon. Each form 52 rotates on its abutment 56 and receives its rotation from a large gear wheel 58 which is secured against rotation on the column 11. Upon rotation of the table 55 the forms 52 are rotated in order to present both sides of the sock intermittently to the direct rays of the lamps during the travel of such socks through the drying chamber.

It is also possible to slowly rotate the table by power instead of manual means. Fig. 8 illustrates a rotatable table in which a unit 59, including an electric motor with a reduction gear, is mounted on a bracket 60 secured on the column 11. The unit 59 drives a pulley 61 which by means of a V belt 62 drives a pulley 63 which may be secured to or made integral with a hub 64 of the spoked wheel 12. An abutment ring 65 on the column 11 forms a bearing for the wheel 12 together with the column.

Fig. 9 illustrates a toe end portion 66 of a sock form in which such form is provided with a self-adjusting toe end to more readily accommodate different sizes of socks. In this form the wire parts 67 on both sides are provided with an enlarged portion 68 over which a tubular toe end 69 projects and abuts at its ends. A spring 70 abuts at one end against the portion 68 and the other end against a number of punched in projections 71 in the end part 69. Thus the end part 69 may be moved or slid back on the wire parts 67, thereby compressing the springs 70 to shorten the length of the foot part of the form.

It is of course obvious that if desired in the forms of the invention illustrated in Figs. 1 to 4, 8 and 9, a second series of banks of lamps (not shown) may be mounted in the cover 25 or on a separate support to provide direct heat rays as the forms pass between such opposite banks of lamps. If it is desired to provide for a positive withdrawal of the moist air from the chamber 30 it is obvious to place a hood (not shown) with a fan over the upper spoke frame 13.

Upon operating the drying machine the operator turns on the electric current to energize the lamps 37 to 40 and assuming a position in front of the open portion 49, Fig. 2, the operator places wet socks one by one on the forms 21 which then intermittently pass through the drying chamber. The socks on the forms pass in front of the banks of lamps the rays of the latter of which are directed on the side of the sock facing the lamps by direct radiation and on the other side by reflected radiation from the polished reflecting surface 28. Also the heat rays directed from the lamps will pass through both sides of the sock to dry not only the side nearest the lamps but also the opposite side. The table with the forms is preferably rotated clockwise, Fig. 2, and when the dried socks appear from the right they are individually removed at 49 and a new wet sock placed on its form to thereby provide a continuous drying operation in which the time of drying is dependent on the heat ray supply and the speed of the operator, as well as the amount of moisture in the socks.

It would also be within the scope of this invention to provide solid sock forms instead of the open frame type shown herein.

If one of the lamps burns out, it is merely necessary to unscrew a set screw 72 in the hub 16 whereby the shield 25 may be rotated to a point where the opening 49 is opposite the bank of lamps where the burned out lamp is located. It is thus possible to reach the burned out lamp

and replace it with a new one, after which the shield is rotated back to its original position to register the opening 49 with the plates 48 and then tighten the set screw 72.

In the foregoing description, it is believed that the sequence of operations together with the various features of construction have been sufficiently explained and illustrated so that the advantages are self evident. Therefore the embodiments described and illustrated are only representative of many other forms in which these operations and constructions may be incorporated into an efficient and practical machine. Therefore, the right is accordingly reserved to make all such reasonable changes and variations which come within the scope of the appended claims.

It is also to be understood that the lamps 37 to 40 may be of any type not only to generate heat rays but also to direct specific rays which contain the function of sterilization and other properties.

I claim as my invention:

1. A drying machine for laundered or cleaned socks, stockings and the like, comprising a column, a table rotatably mounted on the column having a plurality of forms adapted to receive laundered articles and secured thereon in spaced relation on the table, an electric lamp supporting means secured in fixed relationship on the column relative to the table, and a shield secured in fixed relationship on the column relative to the table, said shield surrounding the forms to reflect the heat rays against the forms and to protect the operator against the heat rays from the lamps.

2. A drying machine for laundered or cleaned socks, stockings and the like, comprising a column, a table rotatably mounted on the column having a plurality of sock forms secured thereon in spaced relation on the table, an electric lamp supporting means secured in fixed relationship on the column relative to the table, and a shield secured in fixed relationship on the column relative to the table, said shield surrounding the sock forms to reflect the heat rays against the sock forms and to protect the operator against the heat rays from the lamps, and said shield having an opening therein through which the operator places and removes socks on and from the sock forms.

3. A drying machine according to claim 1, in which the table and the shield are provided with means to permit a small current of air to circulate by the forms to remove the moisture laden air from the machine.

4. A drying machine for laundered or cleaned socks, stockings and the like, comprising a column, a circular table rotatably mounted on the column having a plurality of sock forms secured thereon in spaced relation on the periphery of the table, an electric lamp supporting drum secured on the column above the table and having a plurality of banks of lamps secured thereon, and a cylindrical shield secured in suspended relationship on the column above the drum and extending downwardly to the table to reflect the heat rays against the sock forms and to protect the operator against the heat rays from the lamps.

5. A drying machine for laundered or cleaned socks, stockings and the like, comprising a column, a circular table rotatably mounted on the column having a plurality of sock forms secured thereon in spaced relation on the periphery of the table, an electric lamp supporting drum secured on the column above the table and having a plurality of banks of lamps secured thereon, and a cylindrical shield secured in suspended relationship on the column above the drum and extending downwardly to the table to reflect the heat rays against the sock forms and to protect the operator against the heat rays from the lamps, said shield having a polished internal reflecting surface to redirect the heat rays against the sock forms.

6. A drying machine for laundered or cleaned socks, stockings and the like, comprising a column, a circular table rotatably mounted on the column having a plurality of sock forms secured thereon in spaced relation on the periphery of the table, an electric lamp supporting drum secured on the column above the table and having a plurality of banks of lamps secured thereon, and a cylindrical shield secured in suspended relationship on the column above the drum and extending downwardly to the table to reflect the heat rays against the sock forms and to protect the operator against the heat rays from the lamps, said shield consisting of three layers of which the outer layer is composed of sheet iron, the intermediate layer of heat insulating material and the inner layer of polished aluminum.

7. A drying machine for laundered or cleaned socks, stockings and the like, comprising a column, a circular table rotatably mounted on the column having a plurality of sock forms secured thereon in spaced relation on the periphery of the table, an electric lamp supporting drum secured on the column above the table and having a plurality of banks of lamps secured thereon, and a cylindrical shield secured in suspended relationship on the column above the drum and extending downwardly to the table to reflect the heat rays against the sock forms and to protect the operator against the heat rays from the lamps, said shield consisting of three layers of which the outer layer is composed of sheet iron, the intermediate layer of heat insulation material, and the inner layer of polished silver plated sheet metal.

8. A drying machine for laundered or cleaned socks, stockings and the like, comprising a column mounted on a base plate, a circular table rotatably mounted on the column having a plurality of sock forms secured thereon in spaced relation on the periphery of the table, an electric lamp supporting drum secured on the column above the table and having a plurality of banks of lamps secured thereon, and a cylindrical shield secured in suspended relationship on the column above the drum and extending downwardly to the table to reflect the heat rays against the sock forms and to protect the operator against the heat rays from the lamps, said column being hollow to accommodate electric lead wires to the lamps.

9. A drying machine according to claim 4, in which each sock form consists of a double wire frame in the outline of a sock having one leg secured to the table and the other being free to move away from the first-mentioned leg to stretch the sock on the form.

10. A drying machine according to claim 4, in which means are provided on the column and each sock form to rotate each form as the table rotates.

11. A drying machine according to claim 4, in which power means are mounted on the column and on the table to rotate the table.

12. A drying machine according to claim 4, in which each sock form is provided with a gear, and in which a large gear is secured on the column to rotate each form as the table rotates.

13. A drying machine for laundered or cleaned socks, stockings and the like, comprising a column, a circular table rotatably mounted on the column having a plurality of sock forms secured thereon in spaced relation on the periphery of the table, an electric lamp supporting drum secured on the column above the table and having a plurality of banks of lamps secured thereon, and a cylindrical shield secured in suspended relationship on the column above the drum and extending downwardly to the table to reflect the heat rays against the sock forms and to protect the operator against the heat rays from the lamps, said shield having an open portion therein to permit an operator to place wet socks and remove the dried socks from the forms.

14. A drying machine for laundered or cleaned socks, stockings and the like, comprising a column, a circular table rotatably mounted on the column having a plurality of sock forms secured thereon in spaced relation on the periphery of the table, an electric lamp supporting drum secured on the column above the table and having a plurality of banks of lamps secured thereon, a cylindrical shield secured in suspended relationship on the column above the drum and extending downwardly to the table to reflect the heat rays against the sock forms and to protect the operator against the heat rays from the lamps, said shield having an open portion therein to permit an operator to place wet socks and remove the dried socks from the forms, and a pair of plates secured to the drum and each extending toward one side end of the open portion in the shield to protect the operator from the heat rays of the lamps.

15. In a wire form for sock drying machines, a foot portion including spaced rod members, a resilient toe portion comprising a U-shaped tubular toe end telescopically connected with said rod members of the foot portion, said toe portion having an internal projection in each end of the U-shaped toe end spaced a short distance from the end thereof, and a pair of springs, one for each end of the tubular toe end and abutting against its projection at one end and the other end against said rod members of the foot portion.

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