Aug. 12, 1924. 1,504,991.

J. STERN

DRYING MACHINE

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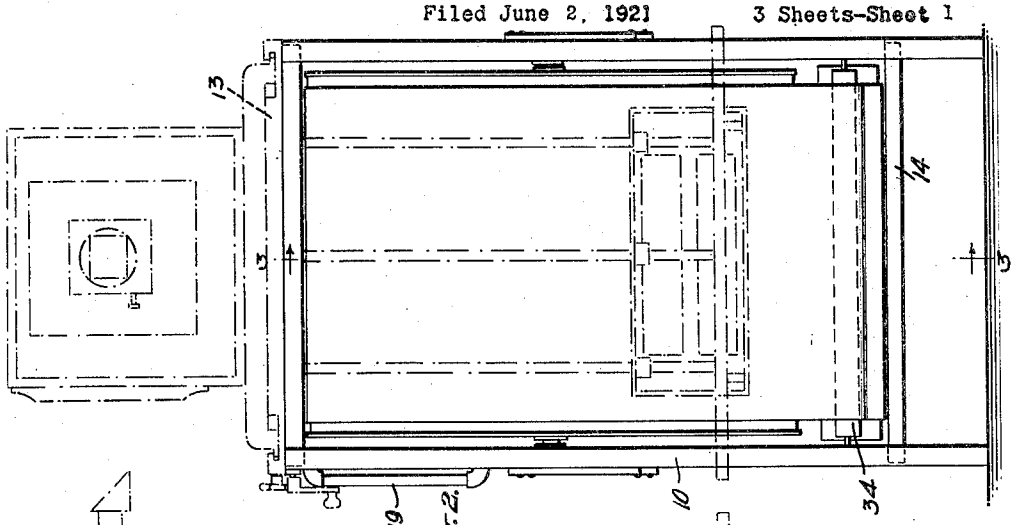


Fig. 2.

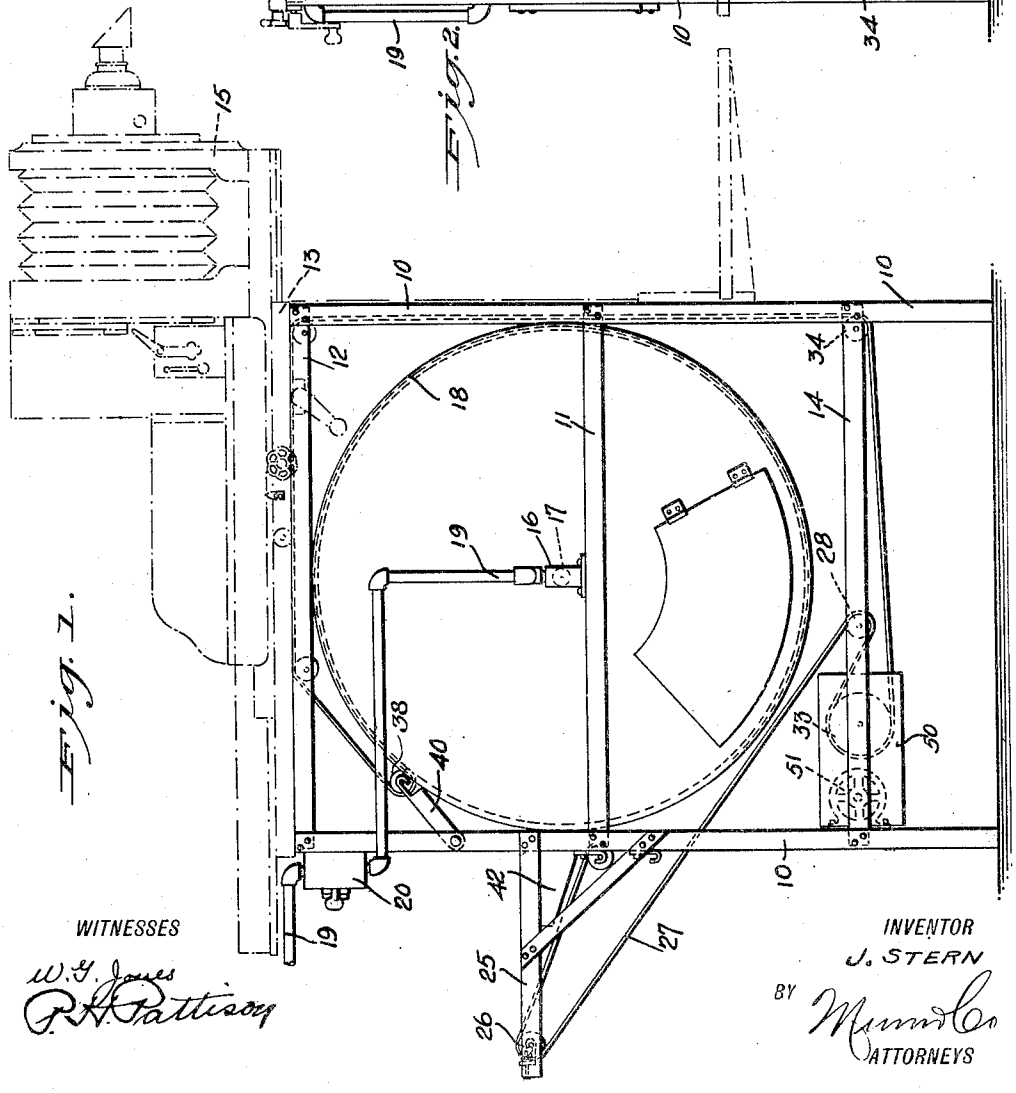


Fig. 1.

WITNESSES

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DRYING MACHINE

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Fig. 4.

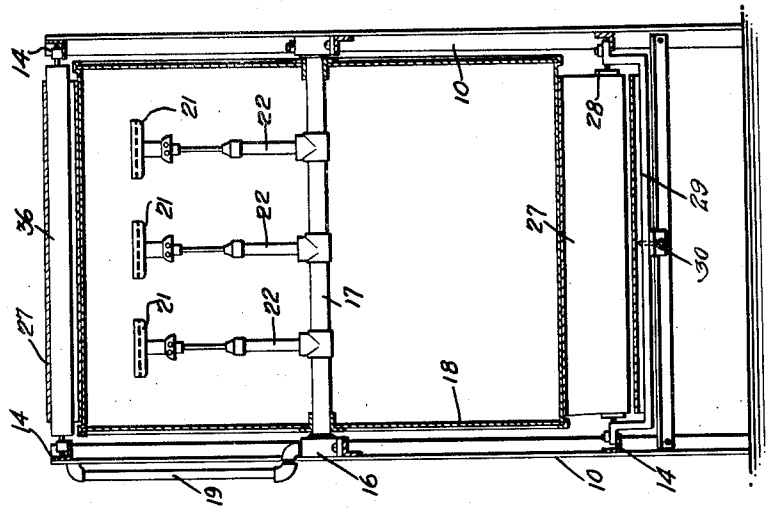
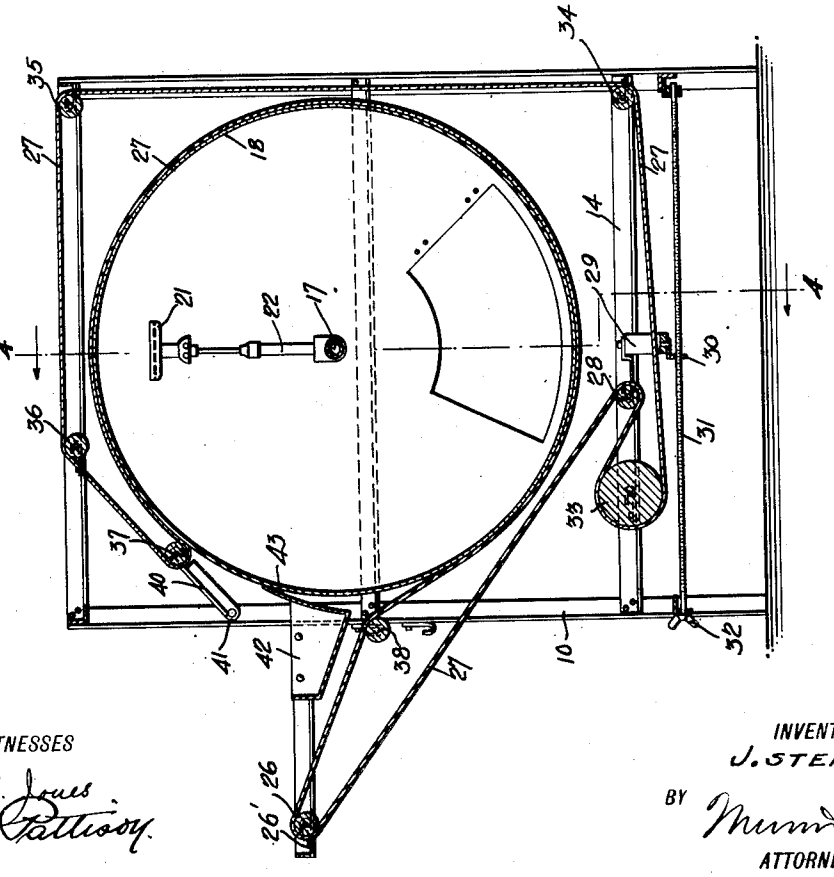


Fig. 3.



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Filed June 2, 1921 3 Sheets-Sheet 3

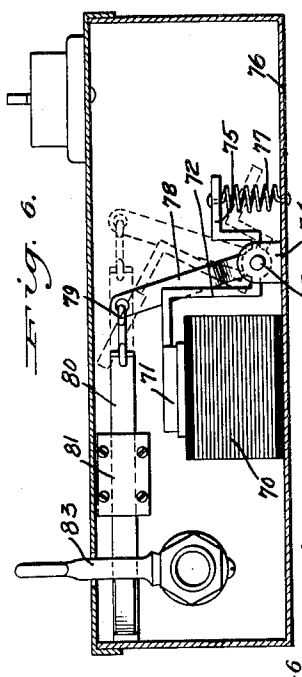


Fig. 6.

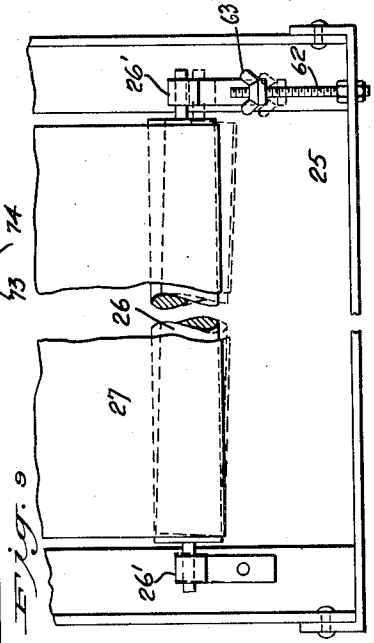


Fig. 9.

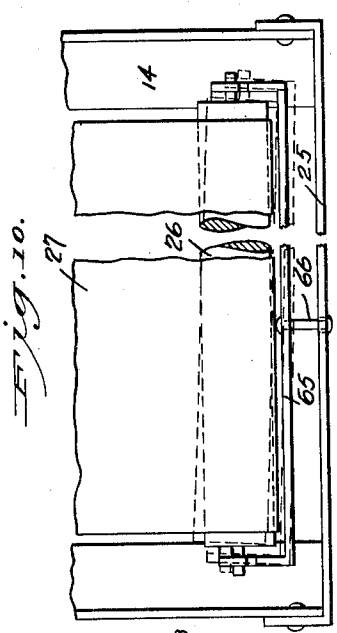


Fig. 10.

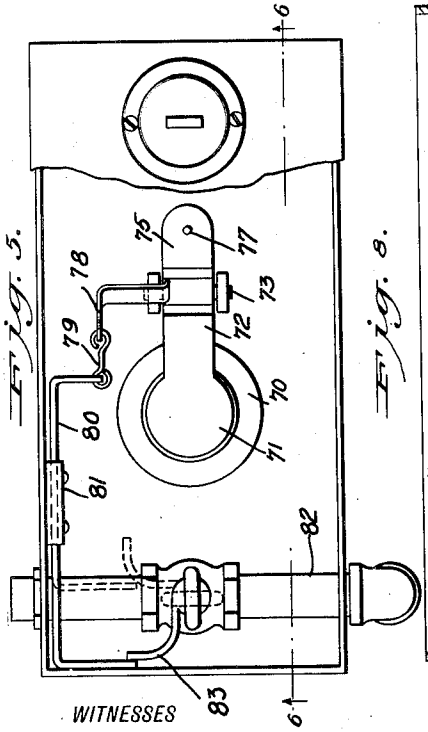


Fig. 5.

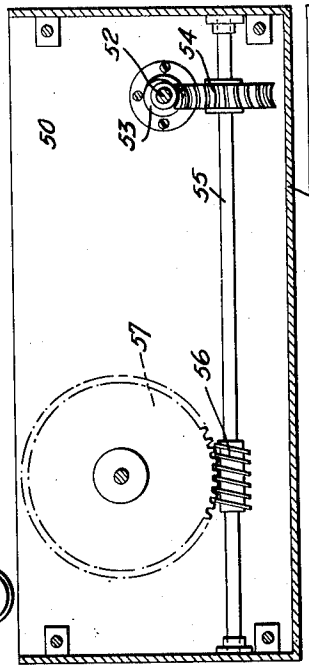


Fig. 8.

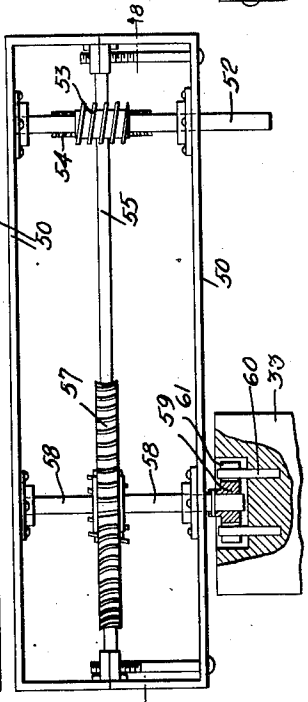


Fig. 7.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOSEPH STERN, OF NEW YORK, N. Y.

DRYING MACHINE.

Application filed June 2, 1921. Serial No. 474,328.

To all whom it may concern:

Be it known that I, JOSEPH STERN, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Drying Machine, of which the following is a full, clear, and exact description.

The present invention relates to new and useful improvements in drying machines and while the principles thereof may be applied to drying machines of various types, the machine is more particularly adapted for drying photographic prints.

It is one of the objects of the invention to provide a machine in which the several working parts are reduced in number and are of smaller construction in order to render the machine more readily disassembled for the purpose of repair, cleaning and the like.

It is a further object of the invention to provide a new and novel method of mounting an endless belt in order that the same may be adjustable as to tension and as to the path of travel.

The invention contemplates a heated drum and it is a further object of the invention to provide means for automatically cutting off the supply of heat upon a stopping of the machine.

It is a further object of the invention to so construct a machine of this character that a photostatic machine may be mounted upon the top thereof in such a manner as to prevent injury to the photostatic machine.

With the above and other objects in view, reference is had to the accompanying drawings, in which

Figure 1 is a side elevation of the machine;

Fig. 2 is a rear end elevation of the machine;

Fig. 3 is a vertical sectional view of the machine;

Fig. 4 is a vertical sectional view taken at right angles to the section in Fig. 3 and on the line 4—4 thereof;

Fig. 5 is a detail top plan view of the automatic heat control;

Fig. 6 is a detail sectional view of the housing in which the heat controlling means is mounted, showing the heat controlling means in elevation;

Fig. 7 is a detail plan view of the driving mechanism;

Fig. 8 is a detail sectional view thereof, the driving mechanism being shown in elevation;

Fig. 9 is a detail view showing a method of adjusting one of the belt rollers in order that the path of travel of the belt may be regulated, and

Fig. 10 is a detail view of another form of path travel regulating means.

Referring more specifically to the drawings and particularly to Figs. 1 and 2 thereof, the machine comprises a framework consisting of a plurality of vertical standards 10 secured together intermediate of their ends by means of transverse braces 11. The upper ends of the standards 10 are connected by means of braces 12, and said braces 12 form the means for supporting the top 13 of the machine. Near their lower ends the vertical standards 10 are connected by means of transverse braces 14, it being understood that all of said braces 11, 12 and 14 are rigidly secured to the standards at their points of attachment thereto.

The reference character 15 designates a photostatic machine and said photostatic machine is mounted upon the top 13 in such a manner as to be adjustable thereon, said top 13 being formed of a suitable heat-insulating material in order to protect the photostatic machine from the heat generated by the drier.

Secured to the transverse braces 11 are bearing members 16 and mounted in said bearing members 16 is a hollow shaft 17. This hollow shaft 17 forms the supporting means for a drum 18, said drum being formed preferably of sheet metal. Connected to the hollow shaft 17 is a pipe line 19 and said pipe line 19 extends through a housing 20 as more clearly shown at the upper left-hand corner of Fig. 1. This housing 20 carries an automatically operated cut-off device to be hereinafter more specifically referred to.

As more clearly shown in Figs. 3 and 4, a plurality of burners 21 are mounted interiorly of the drum 18, and said burners are connected to the hollow shaft 17 by suitable connections 22. By this construction it is apparent that fuel of a suitable nature may be applied to the burners 21 through the hollow shaft 17 upon which the drum 18 is rotatably mounted.

Secured to the forward end of the machine is a frame 25, and mounted in the

outer end of said frame 25 is a roller 26. This roller 26 is retained in U-shaped clips 26', and passing around this roller is a belt 27. From the under side of the roller 26, the belt 27 extends around an idle roller 28, and said idle roller 28 is adjustable in the following manner: Referring to Fig. 3, it will be seen that the idle roller 28 is mounted on a carriage 29 slidably mounted upon one of the lower braces 14, and said carriage 29 has a depending member 30, which in turn has threaded engagement with a screw-threaded rod 31. Upon the outer end of the screw-threaded rod 31, an operating member 32 is secured in order that the rod may be rotated to move the carriage for the purpose of adjusting the tension or idle roller 28. The reference character 33 designates a roller around which the belt 27 passes from the roller 28 and 34 designates a roller at the rear of the machine beneath which the belt 27 passes to the upper roller 35. The belt 27 after passing around the roller 35, passes over a roller 36 and over a roller 37 from whence it passes around the drum 18 towards the rear and back to the front thereof over a roller 38. Each of these several rollers is mounted in U-shaped clips similar to the clips 26', the open end of said clips being positioned opposite the strain or tension of the belt 27 in order that the rollers may be retained within their respective clips by the tension of the belt 27. By this construction it is apparent that it is only necessary to loosen the tension roller 28 when the belt together with all of its rollers may be removed from the machine.

By this construction, it is apparent that as the belt 27 is driven, the drum 18 will be driven owing to the frictional contact with the belt and that articles between the belt and the drum 18 will be carried around said drum.

The roller 37 is carried by a pivoted frame 40, said frame being pivotally connected to the two front vertical standards 10 as at 41. Positioned beneath the frame 40 is a tray 42, and said tray 42 has a stripper 43, which removes the articles dried from the outer surface of the drum 14 and deposits them in the tray 42.

The reference character 50 designates a housing mounted on one of the lower transverse braces 14 and mounted within said housing 50 is the mechanisms which serves to drive the belt 27. The reference character 51 designates a motor suitably secured to the frame exteriorly of the housing 50 to the rear thereof, as shown in Fig. 1. This motor 51 has a shaft 52 more clearly shown in Figs. 7 and 8 and carried by the shaft 52, is a worm gear 53. This worm gear 53 meshes with a gear 54 mounted upon the shaft 55, and carried by the shaft 55 is a worm gear 56 meshing with a gear 57 mounted on a shaft 58, which shaft is mounted in the sides of the housing 50.

Carried by the shaft 58 exteriorly of the housing, is a notched disk 59, and engaged with said notched disk 59, are pins 60. These pins 60 are mounted in a recess 61 in one end of the roller 33 in order that as the shaft 58 is rotated, the roller 33 may likewise be rotated. By this construction it is apparent that as the motor 51 is driven, through the medium of the gearing heretofore mentioned the roller 33 will be likewise driven and the belt 27 will be caused to operate to rotate the drum 18 and convey the articles to be dried therearound.

In Figs. 9 and 10 of the drawings are shown two different methods of mounting the roller 26, and in Fig. 9 the roller 26 has one of its bearings adjustable by means of a screw-threaded rod 62 carried by the outer wall of the frame 25. This screw-threaded rod 22 has a wing nut 63 by means of which the end bearing 26' may be adjusted relatively to the opposite end bearing 26' in order that the path of travel of the belt 27 may be changed by a positioning of the roller 26. In this part of the invention as shown in Fig. 10, the roller 26 is mounted in a yoke 65 and said yoke 65 is pivotally mounted upon a bolt 66 secured to the frame 25. By this construction it is obvious that the yoke 65 is pivotally mounted in order that the roller 26 may automatically assume the proper position to maintain the belt 27 in proper relation to the drum 18.

In Figs. 5 and 6 is shown in detail the mechanism employed for automatically cutting off the fuel supply to the burners when the machine is stopped, and in these Figures the reference character 70 designates an electromagnet. The reference character 71 designates the armature of said electromagnet and said armature is carried by an arm 72 pivotally mounted as at 73 in a bracket 74. The opposite end of the arm 71 has a right-angular extension 75, and interposed between said right-angular extension 75 and the bottom wall of the housing 76, is a tension spring 77. Carried by the arm 72 is a lever 78, and connected to the upper end of said lever 78, by means of a link 79, is a reciprocating rod 80, said rod being mounted in a guide 81. The reference character 82 designates the fuel supply pipe and 83 designates the handle of a valve thereof. The reciprocating rod 80 engages the operating handle 83 of the valve in such a manner that as the rod 80 is reciprocated in either direction, the valve will be operated to open and close depending upon the direction of reciprocation of the handle 83.

This part of the invention operates as follows:

When the switch of the electric motor 51 is turned and the motor is driven, the magnet

70 will be simultaneously energized and will attract the armature 71. This attraction of the armature 71 causes a rocking movement of the arm 72 about its pivotal point 73, and this action permits the rod 80 to be reciprocated to a position where the fuel valve may be manually operated.

Assuming now that for any reason it is necessary to stop the electric motor 51: Immediately upon breaking the circuit thereto, the electromagnet 70 will be de-energized and under the influence of the spring 77, the arm 72 will be rocked to the dotted-line position in Fig. 6. As this arm rocks to the dotted-line position shown in Fig. 6, the bar 80 will be reciprocated in its guide 81, and owing to its engagement with the handle 83 of the valve will close the valve to cut off the supply of fuel to the burners. By this construction it is apparent that when it becomes necessary to stop the machine, the heating medium thereof is automatically cut off in order that the machine may not overheat, which condition has been found to result in damage to the belt 27 and articles contained between said belt and the drum 18.

In the present instance the machine is shown as employing gas as the heating medium, but it is obvious that an electric switch could be used in lieu of the gas valve in machines which are electrically heated.

From the foregoing it is apparent that the present invention provides a new and improved drying machine in which the several parts may be adjusted as necessity requires, by the operator. Furthermore, the machine provides a drying drum which is rotated by the conveyor which carries the articles to be dried therearound.

In machines of this character great disadvantages have prevailed owing to neglect on the part of the operator in his failure to cut off the heat when the machine is stopped, and it is apparent that the present invention removes this detriment by reason of its automatic control of the heating medium.

I claim:

1. In a drying machine, a drum, means for driving said drum, and means for heating said drum, and means associated with the driving means controlling the heating means whereby said driving and heating means are simultaneously operated.

2. In a drying machine, a drying drum, a belt passing around said drum and forming means for driving said drum, an electric motor for driving said belt, means for heating said drum, said heating means being operable during operation of the drum, and means for automatically cutting off the supply of heat to the drum upon cutting off the power thereof.

3. In a machine of the class described, a frame, a heated drum rotatably mounted therein, a belt passing around said drum, means for driving said belt, and a plurality of rollers for guiding said belt, said rollers being removably retained in position by the tension of the belt.

4. In a machine of the class described, a frame, a heated drum, means for driving said drum, means for heating said drum, and means for automatically cutting off the heat of said drum upon a cessation of movement of said drum.

5. In a machine of the class described, a frame, a heated drum rotatably mounted therein, a conveyer belt passing around said drum, a plurality of rollers for guiding said conveyer belt, a driven roller for driving said conveyer belt, an adjustable roller for regulating the tension of said conveyer belt, and an angularly movable roller for regulating the path of travel of said conveyer belt, substantially as described.

6. The combination with a dryer comprising a rotatable drum, a heater within the drum, and an electric motor to drive the drum, of an electro-magnetic device in circuit with the motor and controlling the heater whereby said heater and said motor may be energized and de-energized simultaneously.

7. In a machine of the class described, a frame, a drying drum mounted therein, a conveyer belt passing around said drying drum and adapted to serve as the driving means thereof, a plurality of rollers for supporting and guiding said conveyer belt about the frame and the drying drum, a driven roller adapted to drive said conveyer belt, and an angularly movable roller for varying the path of travel of said conveyer belt, substantially as described.

8. In a drying machine, a drum, means for supplying heat thereto, means for supplying power to the drum, rotating means to operate the same, and means for automatically cutting off the supply of heat to the drum upon cutting off the power of the drum-driving means.

9. In combination with a power operated drying drum and a motor for actuating said drum, means for heating said drum, and means for automatically cutting off the supply of heat to said drying drum upon cutting off the power to said motor.

10. In a drying machine, a drum, means for heating said drum, an electric motor for driving said drum, and means in circuit with said electric motor for cutting off the heat of said drum upon cutting off the power of said electric motor.

JOSEPH STERN.