June 19, 1934. B. A. PARKES 1,963,672

CIRCULAR DRYING, STRETCHING, AND FINISHING MACHINE

Filed June 5, 1931 3 Sheets-Sheet 1

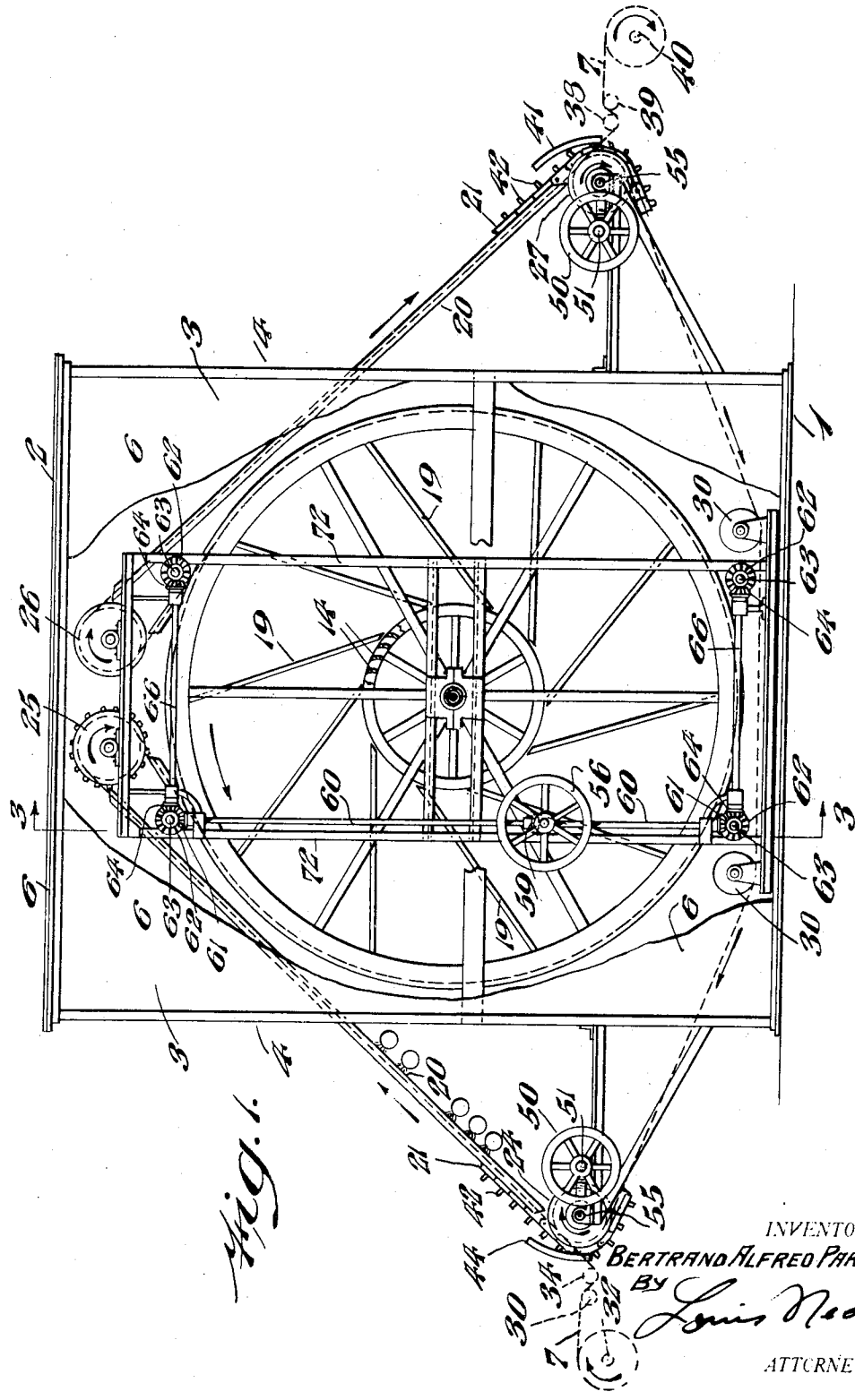


Fig. 1.

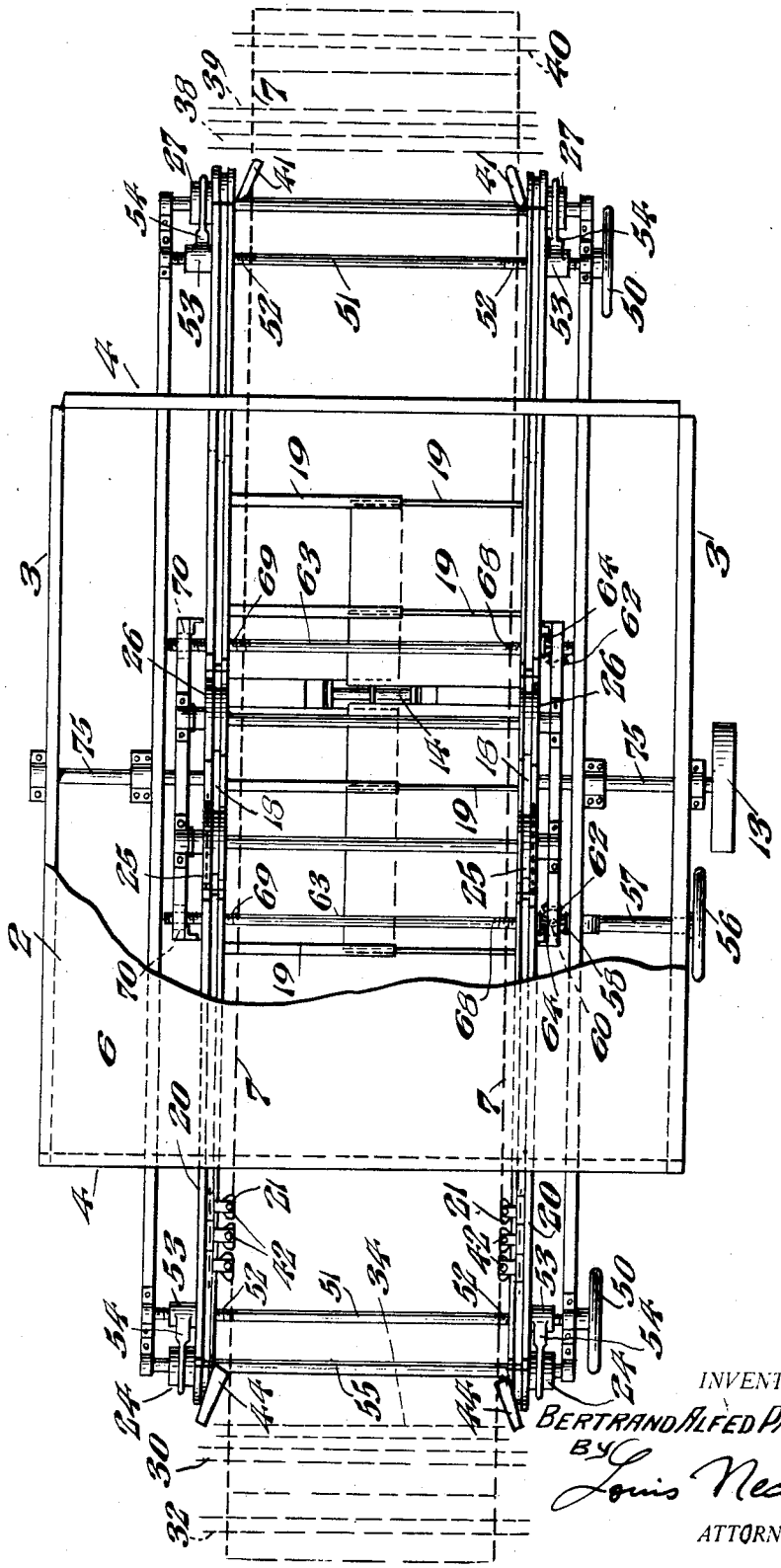
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Fig. 2.



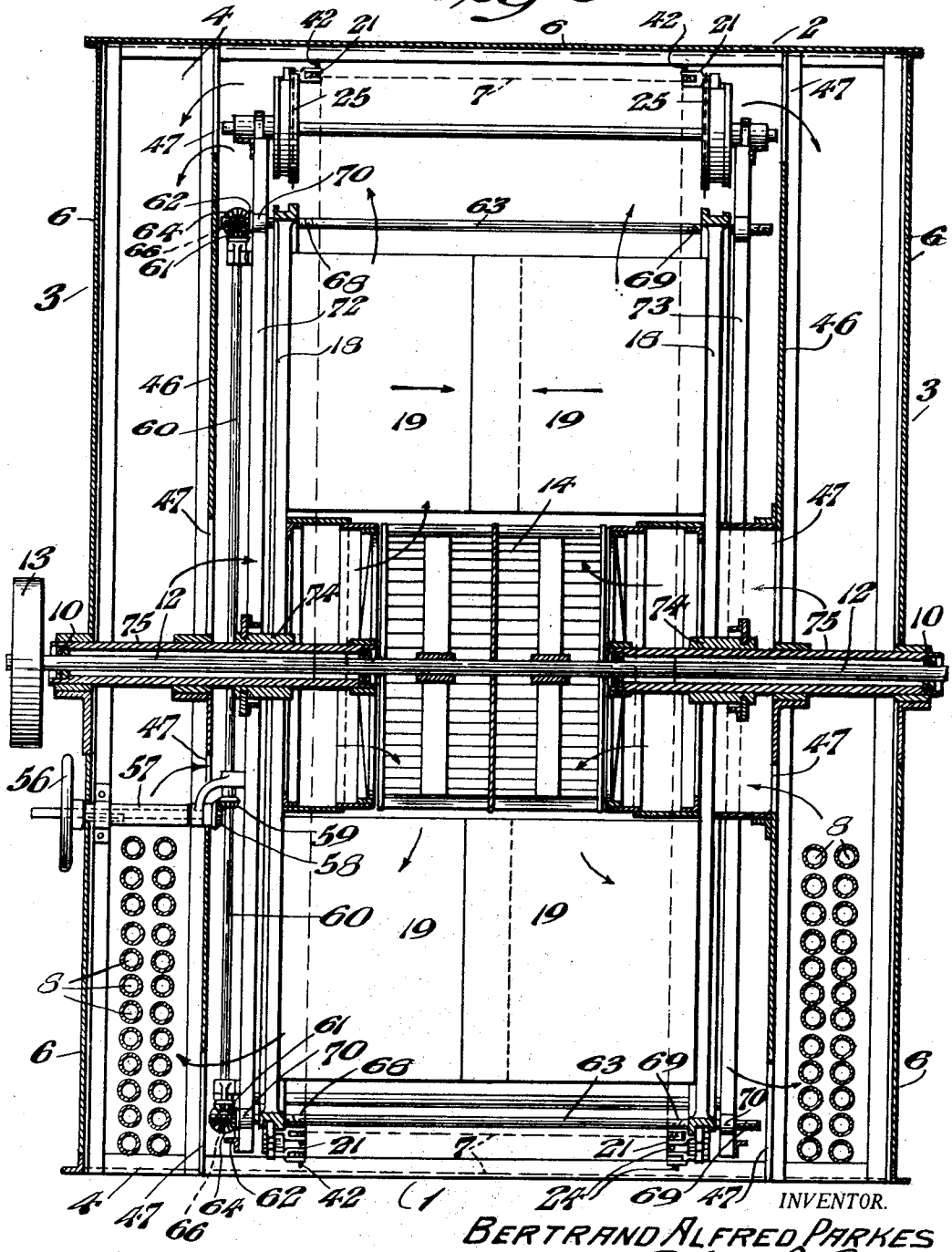
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Fig. 3.



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UNITED STATES PATENT OFFICE

1,963,672

CIRCULAR DRYING, STRETCHING, AND FINISHING MACHINE

Bertrand A. Parkes, Philadelphia, Pa.

Application June 5, 1931, Serial No. 542,220

1 Claim. (Cl. 26—59)

My present invention relates to an improvement in drying machines of the general character disclosed in my prior Patent No. 1,773,852 which in addition to embodying all of the advantages of my prior patented construction is also adapted for treating and finishing and for adjustably stretching the cloth while it is being dried so as to produce a finished cloth of a predetermined width.

It is well known that cloth is subject to shrinkage during the drying, dyeing and finishing processes and it is further necessary that the finished cloth be of an accurately fixed width to conform to standard commercial requirements.

It is also well known that it is sometimes desirable to humidify or otherwise treat or finish the goods prior to the placing of such goods on the market, as for instance in the case of silk which is deliberately made to carry a humidity of about 11%.

It is therefore the object of my invention to produce a combined drying and stretching machine whereby the cloth being dried is subjected to various stretching operations with the progress of the cloth through the drying machine, so that the ultimate width of the finished cloth may be accurately predetermined.

It is also a further object of my invention to produce a machine of this general character which, without any material structural changes, will lend itself to the treatment or finishing of the material and not only to the drying thereof.

To the above ends my invention consists of a drying machine wherein the cloth is propelled in a circular path about a blower adapted to blow hot air, cold air or moist air through the cloth, cloth stretching devices at the feed end of the machine to predetermine the width of the cloth as it enters the drying machine, cloth stretching devices for predetermining the width of the cloth while it is passing around said blower and cloth stretching devices at the delivery end of the drying machine for predetermining the width of the dried cloth as it leaves the drying machine, all of said cloth stretching devices being capable of individual operation, control and adjustment.

My invention further consists of various other novel features of construction and advantage all as hereinafter described and claimed in connection with the accompanying drawings in which:

Fig. 1 is a side elevation of a combined drying and stretching machine embodying my invention, certain parts being omitted for clarity of illustration.

Fig. 2 is a plan view of Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 1.

Referring to the drawings in which like reference characters indicate like parts, I have illustrated a drying machine suitably supported on a frame or housing, which comprises a bottom 1, the top 2, the side walls 3 and the end walls 4. The entire frame or housing is preferably enclosed by insulated casing 6, it being understood that the casing 6, which is only partly shown in Figs. 1 and 2 is apertured to permit the entry and exit of the cloth 7 into and out of the drying machine in the direction of the arrows in Fig. 1. In the bottom part of the housing and on either side of the machine, I position any suitable heating devices 8 which are shown in Fig. 3 only, said heating devices being omitted from Figs. 1 and 2 in order to avoid confusion, since said heating devices if shown in Figs. 1 and 2 would lie across and render invisible other more important parts of the machine. To the side walls 3 of the housing are secured suitable bearings 10 in which is journalled the shaft 12 which carries the pulley 13 which is driven by any source of power not shown. The shaft 12 carries and revolves the fan 14 which may be of any desired construction. At opposite ends of the fan wheel 14 are chain guides 18 which are mounted to revolve independently of the shaft 12 and which are provided with the inwardly deflected vanes 19 which serve to distribute and direct the air blown by the fan 14. Over the chain guides 18 are adapted to travel the sprocket chains 20, said sprocket chains being formed of a series of clamps 21 for holding the edges of the cloth 7. The sprocket chains 20 travel endlessly over the sprocket wheels 24 and 25 before reaching the chain guides 18. At the bottom of the machine are provided the idler rollers 30 for guiding the chains 20 thru the machine. The cloth 7 originally on the roll 32 passes over the tension bar 30 and under the tension bar 34 and the edges thereof are clamped by the clamps 21 after which the cloth travels in the direction of the arrows into the drying machine to pass around the chain guides 18 in which position a current of air heated by the coils 8, is blown by the fan 14 thru the cloth 7 to dry the latter. When the cloth emerges from the drying machine it travels over the sprocket wheels 26 and 27, under the tension bar 38 and over the tension bar 39 to be wound on the roller 40. At the rear end of the machine I provide a dog 41 which is adapted to engage the lugs 42 of the clamps 21 to open and disengage said clamps from the edges of the cloth 7 to release the latter for winding on the roll 40. At the front of the machine I provide another dog 44 which engages the lugs 42 of the clamps 21 to open

said clamps to permit engagement of the edges of the cloth 7 as it is fed into the machine, the clamps 21 being closed by gravity after passing the sprocket wheel 24. On either side of the fan 14 are provided the shields 46 which are provided with the openings 47 and which serve to circulate and recirculate the air blown by the fan 14 around the heating coils 8 and thru the cloth 7 as shown by the arrows in Fig. 3. In order to be able to regulate or adjust the width of the cloth 7 before it is delivered into and after it leaves the drying machine, I have provided the hand wheels 50 which turn the shafts 51 which have the left and right hand screw threads 52 which threadedly engage the hubs 53, to vary the space between the latter. The hubs 53 have the yokes 54 which engage the sprocket wheels 24 and 27 which are loose on their supporting shafts 55. Thus, by turning the hand wheels 50 to vary the spacing of the hubs 53 from each other, the pairs of sprocket wheels 24 and 27 are brought closer together or are spaced further apart, as desired.

I have also made provisions for adjusting the width of the cloth 7 while it passes over the chain guides 18 and to that end I have utilized the hand wheel 56 which turns the shaft 57 which carries the pinion 58 which meshes with the pinion 59 on the shaft 60. The shaft 60 is provided with the pinions 61 which mesh with the pinions 62 on the shafts 63. The pinions 62 also mesh with the pinions 64 on the shafts 66. The shafts 63 have the right and left hand screw threads 68 and 69 which threadedly engage the hubs 70 of the frame members 72 and 73. The side frame members 72 and 73 are carried by bearings 74 which slide on sleeves 75, in which extends the shaft 12. Thus, by turning the hand wheel 56 the side frames 72 and 73 and the chain guides 18 are brought closer together or are spaced further apart as may be desired, to vary the width of the cloth 7 while it is subjected to the drying action of the heated air blown through the cloth by the fan or blower 14.

While I have described and shown my invention as applied to the drying and stretching of the fabric, it is to be understood that my machine is equally applicable to the treating or finishing of fabrics simultaneously with or independently of the drying operation since it is equally within the scope of my invention to blow cold, and/or damp air through the cloth being dried in place of heated air which is used for drying purposes.

It is also to be noted that in my novel machine the cloth to be dried, or otherwise treated or finished, is passed around the drying or other mechanism in a circular path so that a relatively great length of cloth is treated by a machine which occupies a relatively small overall area.

It is further within the scope of my invention to provide the chain guides 18 over which the cloth 7 travels, with inwardly or outwardly extending, V or U-shaped indentations or projections, thereby still further greatly increasing the length of the cloth 7 which is subjected to the stretching or drying operation or other treatment.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

A circular drying, stretching and finishing machine, comprising a bilaterally symmetrical frame work, air conditioning means carried thereby, parallel endless chains carried by said frame work and adapted to travel in a substantially circular path around said air conditioning means, tenter clamps carried by said chains and adapted to engage the edges of the cloth to be treated, means at the feed end of the machine for closing said clamps over the edges of said cloth, means at the delivery end of said machine for disengaging said clamps from the edges of said cloth, means coacting with said air conditioning devices to direct the flow of the conditioned air against said cloth, means at the feed end of the machine for controlling the width of the cloth prior to its entry into the drying machine, means for controlling the width of the cloth during its passage in said drying machine, and means for controlling the width of said cloth at the delivery end of said machine.

BERTRAND A. PARKES.