No. 675,606. Patented June 4, 1901.

G. A. MUENZENMAIER.

DRYING APPARATUS.

(Application filed Jan. 19, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

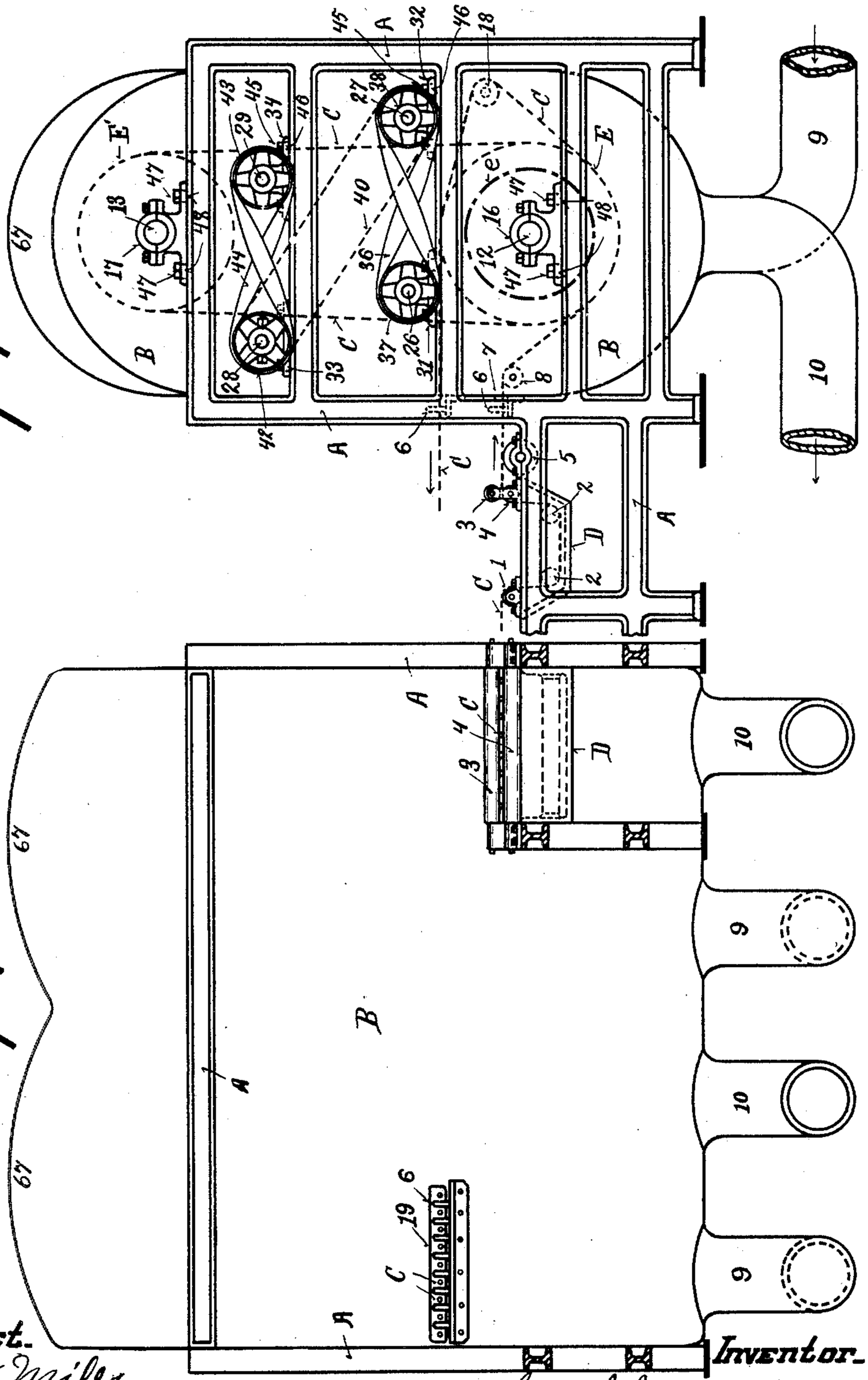

Fig. 2.

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DRYING APPARATUS.

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(No Model.) 3 Sheets—Sheet 2.

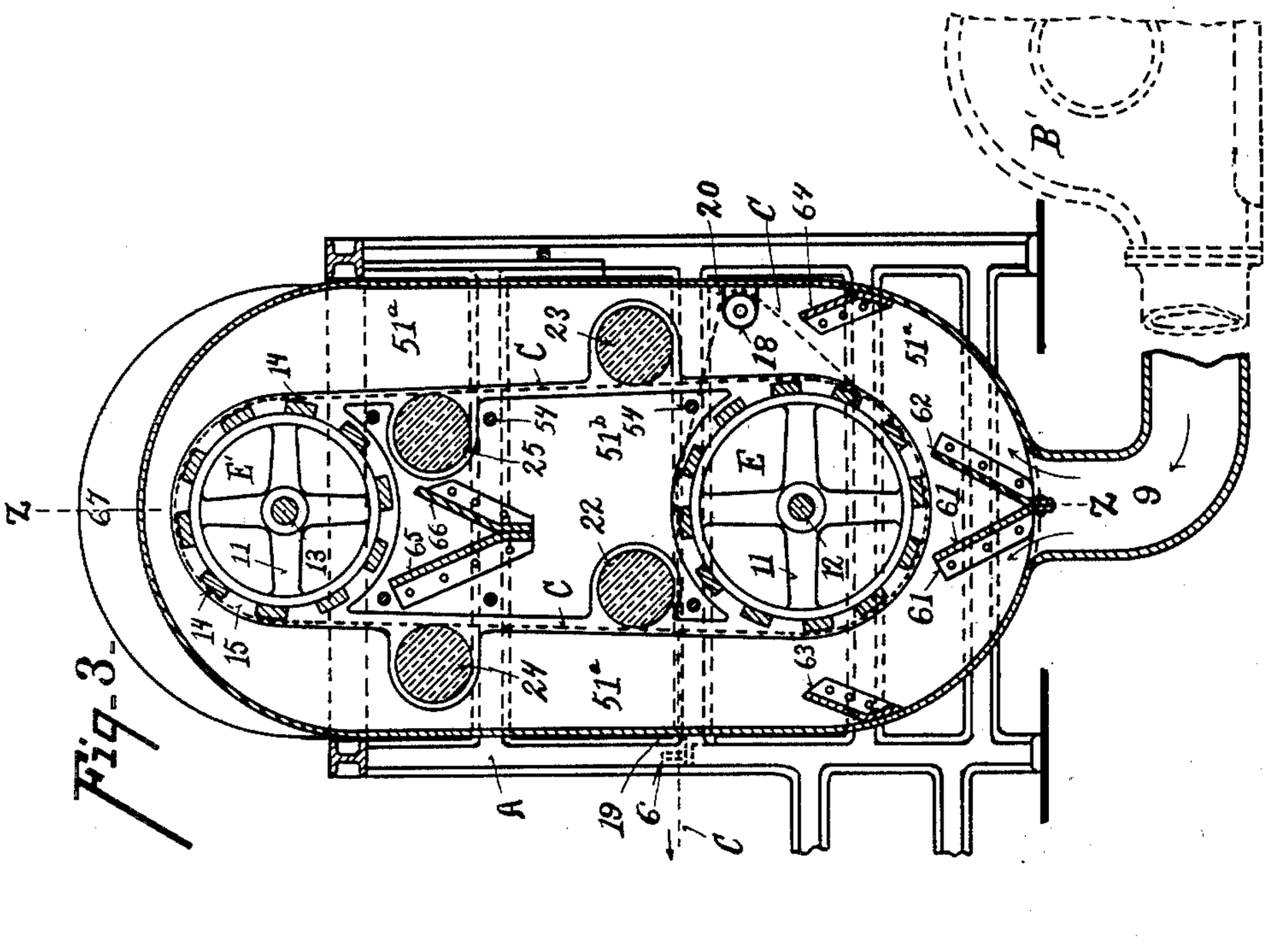

Fig. 3.

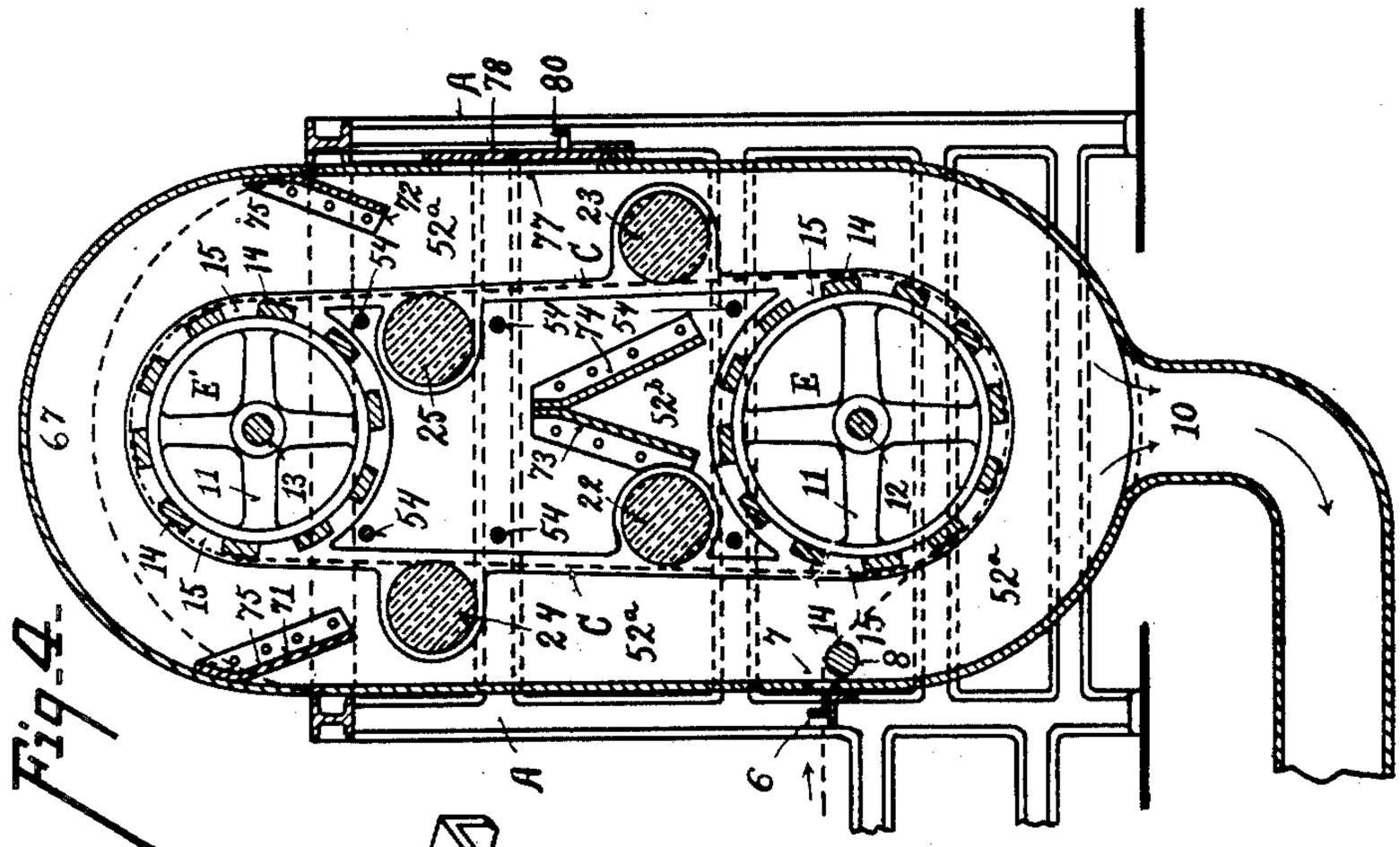

Fig. 4.

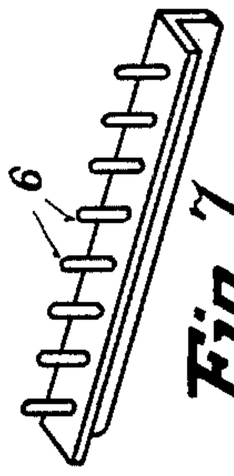

Fig. 7.

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DRYING APPARATUS.

(Application filed Jan. 19, 1900.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 6.

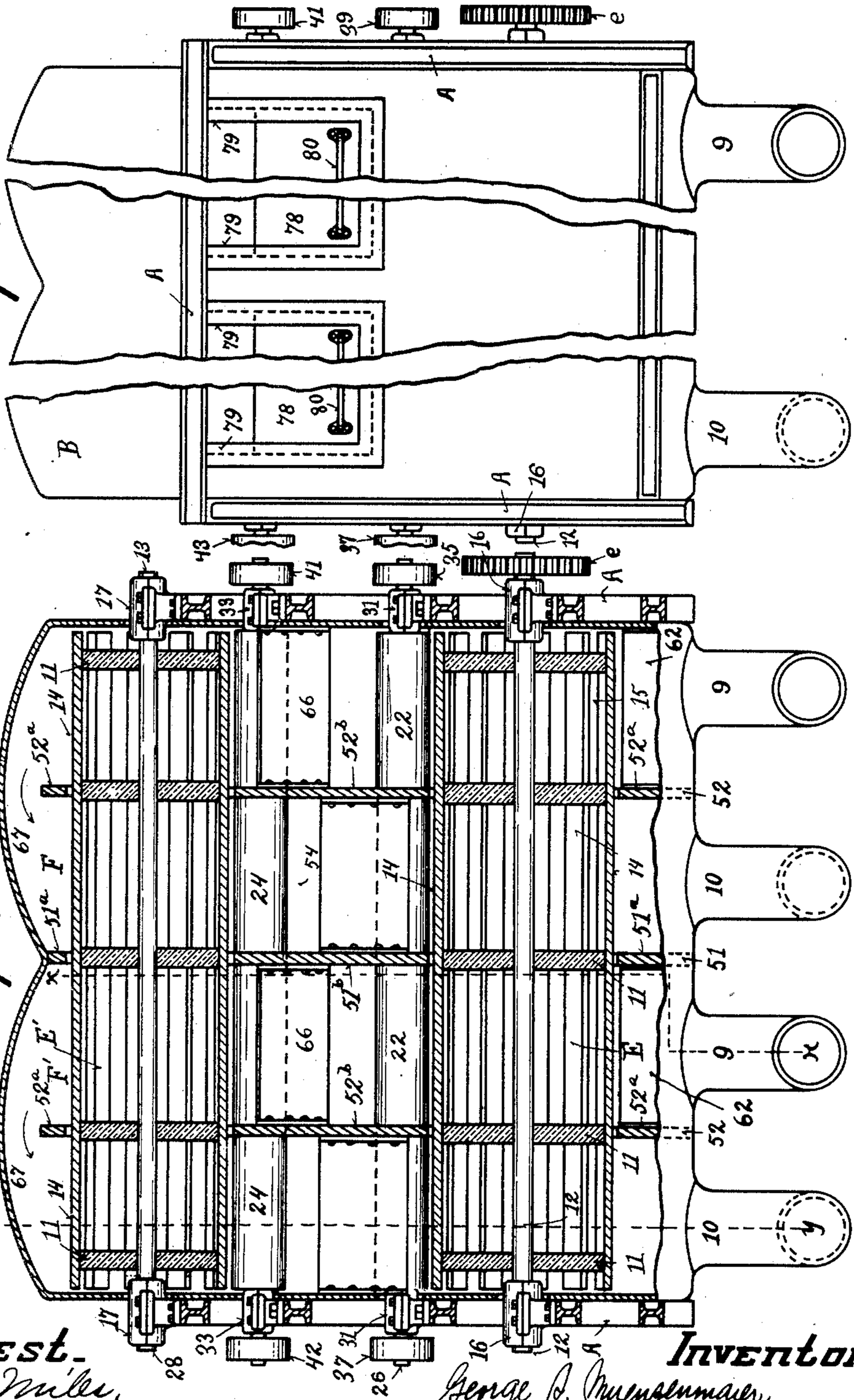

Fig. 5.

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UNITED STATES PATENT OFFICE.

GEORGE A. MUENZENMAIER, OF CINCINNATI, OHIO.

DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 675,606, dated June 4, 1901.

Application filed January 19, 1900. Serial No. 1,967. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. MUENZENMAIER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Drying Apparatus, of which the following is a specification.

My invention relates to drying apparatus especially adapted for drying, or for drying and polishing, or for drying, polishing, and finishing cord, twine, yarn, cordage, rope, and the like.

For the sake of convenience and brevity I shall hereinafter use the term "cord" as embracing also twine, yarn, cordage, rope, or similar articles.

In finishing, polishing, and drying cord it is customary to pass the cord through a bath of suitable sizing material to coat the cord to admit of its being finished and polished. It has been customary heretofore after the cord leaves the sizing-bath to pass and repass the same over a pair of interiorly-steam-heated cylinders and to depend upon the heat conveyed from the cylinders to the cord for effecting the drying operation. This mode of drying results in forming a crust of the sizing material upon the outside of the cord before the inside of the cord has become properly dried and results in insufficient drying of the core of the cord. It also results in the frequent excessive heating and scorching of the cord. The old mode also presents an apparatus in which the drying of the cord is attempted to be accomplished by the mere heating of the cord, resulting in the objections above mentioned, and which also produces a product which after it leaves the machine and is rolled into balls or upon bobbins or spools ready for storage or shipment undergoes a sweating process injurious to the cord, resulting from the ineffectual or insufficient drying of the core of the cord by the objectionable mode of drying pursued, which, as stated, forms a crustation upon the outside of the cord while the core of the cord is still damp, the mere heat from the cylinders being ineffectual to properly dry the core and the crustation serving to retain the moisture in the core, the moisture in the core being afterward gradually absorbed by the entire ball, bobbin, or spool of cord as soon as it cools or while cooling, resulting in the sweating mentioned, thereby injuring the texture and polish of the cord. I obviate these objections by means of my improved device, in which I pass the cord through a preferably closed drying-chamber and during its passage therethrough subject the same to a current of preferably heated and dry air or other suitable drying medium, which I prefer to pass in a direction reverse to the passage of the cord through the chamber. I also subject the cord to the action of polishing-rolls while the same is being subjected to the action of the drying-current, producing an especially highly-polished finish and superior product and avoiding the sweating of the cord hereinbefore mentioned. My improved device also enables the drying operation to be accomplished within a greatly-reduced space or within a greatly-reduced time when compared to the old modes mentioned.

In my improved device the cord is subjected to a current of preferably heated drying medium, which acts on the cord more in the manner of sun-drying and prevents the crustation on the outside of the cord incident to the old modes of drying by passing the cord over heated cylinders or pipes, which acted more in the nature of baking. The polishing-rolls also acting on the cord at the same time with the current of drying medium incorporate the size into the cord in a more effectual manner, because crustation is prevented, and produce a cord of stronger texture and more pliability, owing to the combined effect of the simultaneous application of the current of drying medium and the action of the polishing-rolls.

It is a desideratum in cord-making to produce a cord of strong texture, high polish, great pliability, and soft "feel," and by means of my improved device I am enabled to obtain all of these in a superior manner.

My improved device also dispenses with the disadvantage of using steam or the like in a moving cylinder or pipes for drying the cord, the use of steam and similar agencies within a moving cylinder or pipes causing corrosion, leakages, and breaks and consequent inconveniences. The cylinders or pipes are also very expensive in construction

and maintenance. The drawback also of having the steam converted into water during the drying operation within the moving cylinder or pipes is also avoided.

My improved device is also capable of an increased output of product.

My invention, therefore, consists in providing a machine in which the cord to be dried is passed through a preferably closed chamber and therein subjected to a current of drying medium circulating reversely to the passage of the cord; further, in providing a machine in which the cord to be dried is passed through a preferably closed chamber and therein subjected to a current of drying medium and simultaneously subjected to the action of the polishing means; further, in providing a machine in which the cord to be dried is passed through a preferably closed chamber and therein subjected to a current of drying medium and simultaneously subjected to the action of polishing-rolls acting on the cord while the latter is passing through the chamber and is being dried by being subjected to the current of drying medium; further, in providing a chamber of the character described with suitable guides or guides and deflectors to direct the current of drying medium to the most desirable points for accomplishing the purpose specified, and, further, in the parts and in the construction, arrangement, and combinations of parts hereinafter more fully described and claimed.

In the drawings, Figure 1 is a side elevation of my improved device shown in connection with so much of a cord-finishing machine as may be necessary to illustrate my invention, and Fig. 2 is a front elevation of the same with part of the frame broken away. Fig. 3 is a vertical transverse section taken on the line *x x* of Fig. 5, and Fig. 4 is a similar view taken on the line *y y* of Fig. 5. Fig. 5 is a vertical longitudinal section taken on the line *z z* of Fig. 3 looking toward the front of the machine, but showing the deflectors 62, 66, and 74. Fig. 6 is a rear elevation of my improved device, partly broken away; and Fig. 7 is a perspective view of the guiding-pins.

A represents the frame of the machine, and B a casing, which may be suitably supported thereby, preferably located within the frame.

C is the cord or other article to be operated on, which is adapted to be dried and polished by means of my improved device. Before entering the drying-chamber it receives the usual treatment of being sized by passing through one or more sizing-baths, of which I have shown one, D. It proceeds to the sizing-bath in the usual way from a series of bobbins (not shown, because well known) in a series of strands side by side. The cord is guided into the sizing bath or trough over a roller 1 and under a pair of rollers 2 2 in the trough to cause the cord to be submerged in the size and thence between a pair of rollers 3 4 at the far end of the trough to have the size properly incorporated with the cord and to remove the surplus size therefrom. It then passes, preferably, over a smoothing-roll 5, suitably driven, adapted to help lay the fibers projecting from the cord and help remove the surplus size and to more evenly spread the size remaining on the cord. The cord then passes a series of guiding-pins 6, the latter in one or more rows, and through an opening 7 into the casing or drying-chamber and over a roller 8. Up to the point where the cord is guided by the guiding-pins 6 the mode of operation and treatment of the cord is similar to the modes of operation and treatment now in use, and I make no claim to that part of the apparatus herein shown and described. In the old constructions, however, after leaving the guiding-pins it has been the custom to pass the cord over a pair of interiorly-steam-heated cylinders, the contact of the cord with the steam-heated cylinders being depended upon to dry the cord, which resulted in the objections I have heretofore described, and which objections I obviate by means of my improved device. After the cord leaves the guiding-pins, therefore, I pass the same into a drying-chamber, in which I cause a current of preferably heated air or other drying medium to circulate, as by means of pressure-blower B′, preferably in a direction substantially reverse to the general direction in which the cord travels through the chamber. The circulation of the drying medium may also be caused by an exhaust-fan. An inlet-opening 9 and outlet-opening 10 are provided for the drying medium.

To support the cord and to cause it to travel properly and to provide as little obstruction as possible to the circulation of the heating-currents, I provide two drums, cylinders, or reels E E′, preferably formed of suitable webs 11, supported by shafts 12 13 and having their peripheries or outer edges preferably provided with suitable slats 14, having spaces 15 between the same to allow a circulation of the drying medium and to provide as little contact as possible between the drums, cylinders or reels, and the cord. The slats thus form the outer edges or peripheries of a drum, cylinder, or reel. It is obvious that true cylinders closed at their peripheries may also be employed without departing from the spirit of my invention.

For convenience and brevity I shall hereinafter refer to the cord-supporting agency—namely, the drum, cylinder, or reel—as a "drum."

The shafts 12 and 13 are mounted in bearings 16 and 17, supported by the frame, and may, if desired, be made adjustable to provide "track" for the cord, as in a manner similar to the adjustment for the polishing-roll bearings hereinafter described. The strands of cord after they pass from the bobbins and through the sizing-baths pass, as stated, through an opening 7 and thence under the drum E, upwardly over the drum E′, downwardly under the drum E, and again

upwardly, so as to pass and repass the drums the desired number of times, until after their last downward passage they pass about the under side of the drum E once more, thence over a roller 18, thence over the upper side of the drum E, and through an egress-opening 19 in the drying-chamber, from whence they are fed past guiding-pins 6 and onto bobbins in the usual way. The roller 18 is preferably a short roller at the egress end of the frame of about the length of the egress-opening 19 and may be supported in suitable bearings 20. The drum E is preferably driven by a suitable pulley or gear, and the drum E′ preferably receives its motion from the cord itself taking about the two drums. The cord is caused to pass progressively diagonally from the receiving end of the cylinders to the discharge end thereof. Suitable polishing-rolls, as shown at 22, 23, 24, and 25, are provided for polishing the cord, removing or rubbing any slivers on the cord into the same, so that the slivers will either be removed or become united with the body of the cord by being embedded in the sizing material thereon and for giving the cord a high polish. The polishing-rolls are rotated in directions reverse to the direction of passage of the cord past the same. Shafts 26, 27, 28, and 29 are provided for the rolls, respectively, journaled in bearings 31, 32, 33, and 34. The rolls are rotated from any suitable source of power, as by means of a belt taking about a pulley 35 on the shaft 26. A twist-belt 36 passes from a pulley 37 on the shaft 26 to a pulley 38 on the shaft 27. At the opposite end of shaft 27 a pulley 39 is located, having a belt 40 pass thereover to a pulley 41 on a shaft 28. The other end of shaft 28 also carries a pulley 42, from which motion is transmitted to a pulley 43 on shaft 29 by means of a twist-belt 44. The polishing-rolls 22, 23, 24, and 25 are preferably covered by so-called "coir-rope" spirally wound thereon, which coir-rope is a hard rough-surfaced rope having abrading and polishing properties. The polishing-rolls may be given an adjustment transverse to the travel of the cord in order to contact with greater or less force against the cord, as by having bolts 45 take through slots 46 in the bearings. The adjustment of the drums for the track of the cord hereinbefore mentioned may be made by having similar bolts 47 take through slots 48 in the drum-bearings.

In my improved construction the cylinders and polishing-rolls are preferably inclosed in the drying-chamber or arranged in such manner that the polishing-rolls act on the cord after passing into the chamber and while being subjected to the drying-currents, thereby producing a high finish. It is obvious that these drying-currents may pass through the chamber in any desired manner to effect the desired result; but I prefer to cause them to circulate in a direction opposite to the general direction of passage of the cord, and I also prefer to divide the chamber into compartments, so that the drying operation may be more effectively, quickly, and economically performed. For this reason I have shown (see Fig. 5) the drying-chamber divided into two general compartments F F′ by a partition 51, having two inlet and two outlet openings for the drying medium. Each of the compartments is also provided with a partition 52, forming two passages for each compartment for the guidance of the drying medium. In order to provide for the proper passage of the cord, however, I find it desirable to divide each of the partitions into two portions 51^a and 52^a and 51^b and 52^b, the former taking about the outside of the line of travel of the cord and the latter taking within the inside of that line of travel and also avoiding the drums and rolls, with the strands of cord passing slightly diagonally between the outside and inside portion of the partitions. In this way I provide unobstructed passage for the cord, while causing the currents to follow predetermined paths.

The outside portion of the partitions may be secured to the casing or frame in any suitable manner, and the inside portion of the partitions may be hung on rods 54, projecting longitudinally of the casing from the ends of the casing or frame, the rods passing through apertures in the partitions, which latter may, if desired, be also secured from the rods against sidewise displacement or may be secured against similar displacement by the deflectors hereinafter mentioned.

In order to direct the currents of the drying medium in directions to produce the best results and to cause the circulation of the drying medium in directions that will produce the least obstruction from the parts in the interior of the casing and directing it in the most effective way against the cord to be dried and to provide for the circulation of the drying medium from the inlet past the strands of cord to the outlet-opening, I provide a series of deflectors, which I will now describe. These deflectors also serve the purpose of preventing cross-currents in the interior of the casing. At the inlet-opening for the drying medium I provide two deflectors 61 62, converging toward the opening to direct the currents of the drying medium toward the side of the lower drum. On either side of the drum I provide a deflector (marked, respectively, 63 and 64) converging away from the inlet-opening to direct the currents of the drying medium against the strands taking about the drums. Below the upper drum I provide other deflectors 65 66, converging toward the inlet-opening located between the strands taking about the drums to again direct the currents of the drying medium toward the strands and toward either side of the upper drum. It will be noticed that I also provide the upper end of the casing with deflectors in the shape of a dome 67, the currents of the drying medium striking the inner curved sides of the dome and being di-

rected thereby to the second passage communicating with the outlet-opening. At the upper end of the latter passage and preferably just below the dome to either side of the drum I provide a deflector, (marked, respectively, 71 72,) the deflectors being arranged to converge toward the outlet-opening of the drying medium and directing the current of the latter toward the strands of cord. Preferably just above the lower drum on the inside of the strands of cord I provide other deflectors 73 74, converging away from the outlet-opening and directing the current of drying medium toward the strands and toward either side of the lower drum. The lower part of the drying-chamber is also curved or provided with deflectors to direct the current of drying medium toward the outlet-opening. It will thus be seen that the current of drying medium is caused to pass and repass the cord while it is circulating through the chamber and in a direction opposite to that in which the cord passes through the drying-chamber. Thus the ingress-opening for the cord is at the same end of the chamber at which the outlet-opening for the drying medium is located, and the egress-opening for the cord is at the same end of the drying-chamber that the inlet-opening for the drying medium is located.

As will be noticed from Fig. 5, I divide the drying-chamber into two general compartments, with two inlet and two outlet openings for the drying mediums, the top of the casing being provided with two domes, one for each compartment. It is obvious, however, that the drying-chamber may consist of only one compartment, with one inlet and one outlet opening for the drying medium; also, that the inlet and outlet openings for the drying medium may be located at other points than at the bottom, at which I have preferred to show them, and that any suitable number of partitions may be employed.

In the constructions heretofore in general use it has been the custom to pass the twine over interiorly-steam-heated cylinders. These cylinders are expensive to make and have the added disadvantage that more or less of the steam is therein converted into water, which it is found difficult to remove and is a source of annoyance and expense. I obviate the objections to steam or otherwise heated cylinders in my improved device and provide a device economical in construction and operation and producing a superior product and one capable of imparting to the cord a superior finish and high polish and of economically and thoroughly drying the cord throughout.

The deflectors I have described may be secured in any suitable manner, as by being provided with flanges 75 and secured to the casing and partitions by means of bolts or rivets.

The drying-chamber may be provided with suitable openings, as shown at 77, for examination of the cord or other purposes, and the openings are adapted to be closed by suitable doors 78, which may slide in ways 79 and be provided with grips 80.

I do not limit myself to the particular construction herein shown and described, as alterations and changes may be made without departing from the spirit of my invention.

I claim—

1. The combination, in a machine of the character described for operating on material of the character described, of a drying-chamber for the material, means for coating the material with a size, means for supporting and propelling the coated material through the chamber and guiding the same progressively longitudinally of the supporting means, polishing means operating on the coated material for incorporating the size into the material and polishing the same, means for producing a current of drying medium acting directly on the coated material for drying the same, and means for passing the current through the chamber about the coated material and arranged so that the current of drying medium makes direct contact with the coated material, and constructed and arranged for drying the coated material solely by the action of said current of drying medium, substantially as described.

2. The combination, in a machine of the character described for operating on material of the character described, of a drying-chamber for the material, means for coating the material with a size, means for supporting and passing the material through the chamber, means for passing a current of drying medium forcibly about the material for acting directly thereon in drying the same, and polishing-rolls operating on the material while the same is passing through the chamber and subjected to the action of the forced drying-current, substantially as described.

3. The combination, in a machine of the character described for operating on cord or like material, of a drying-chamber for the material, means for coating the material with a size, material-supporting drums located within the chamber with the material passing thereabout, polishing-rolls operating on the material while the same is passing through the drying-chamber, and means for passing a current of drying medium forcibly into direct contact with and about the material for drying the same, substantially as described.

4. The combination, in a machine of the character described for operating on material of the character described, of a drying-chamber inclosing material-supporting means and polishing means for operating on the material, means for coating the material with a size, with means for passing a current of drying medium forcibly about the material and about the supporting means and the polishing means, substantially as described.

5. The combination, in a machine of the character described for operating on material of the character described, of a drying-cham-

ber for the material, means for coating the material with a size, means for supporting and passing the coated material through the chamber and guiding the same progressively longitudinally of the supporting means, a fan for speeding a current of drying medium for acting directly on the material, inlet and outlet openings for the chamber for the current and constructed and arranged for direct action of the drying medium on the coated material, and polishing means operating on the coated material for incorporating the size into the material and polishing the same, with the polishing means operating on and the current of drying medium passing about the coated material simultaneously for simultaneously drying and polishing the coated material, substantially as described.

6. The combination, in a machine for finishing cord or like material, of a drying-chamber for the material, means for coating the material, means for supporting and propelling the coated material and guiding the same progressively longitudinally of the supporting means, polishing means operating on the material, means for speeding a current of drying medium about the material for direct contact of the current with the material, with the polishing means operating on and the current of drying medium passing about and contacting with the material simultaneously for simultaneously drying and polishing the material, substantially as described.

7. The combination, in a machine for finishing cord or like material, of a drying-chamber for the material, means for coating the material, means for supporting and propelling the material through the chamber and guiding the same progressively longitudinally of the supporting means, and polishing means operating on the material, and means for speeding a current of heated drying medium about the material for direct contact of the current with the material, with the polishing means operating on and the current of heated drying medium passing about and contacting with the material simultaneously for simultaneously drying and polishing the material, substantially as described.

8. The combination, in a machine of the character described, of a drying-chamber for material to be operated on, means for supporting and passing the material through the chamber, means for coating the material with a sizing composition, a polishing-roll operating on the coated material, means for producing a current of drying medium acting directly on the coated material for drying the same, means for passing the same through the chamber about the coated material, and means for directing the current of drying medium to the place of contact between the polishing-roll and material, substantially as described.

9. The combination, in a machine of the character described, of a drying-chamber for material to be operated on, means for supporting and passing the material through the chamber, means for producing a current of drying medium forcibly passing about the material for drying the same, and polishing-rolls operating on the material while the same is passing through the chamber and subjected to the action of the forced drying-current with the said supporting means and rolls unheated by other agency than said current, substantially as described.

10. The combination, in a machine of the character described, of a drying-chamber, material-supporting drums located within the chamber, with the material passing thereabout, polishing-rolls operating on the material while the same is passing through the drying-chamber, and means for producing a current of drying medium and passing the same about the material for drying the same with the drums and rolls unheated by other agency than said drying-current, substantially as described.

11. The combination, in a machine of the character described, of a drying-chamber inclosing a pair of material-supporting means and polishing-rolls for operating on the material, with means for forcing a current of drying medium about the material and about the supporting means and rolls, constructed and arranged for simultaneously drying and polishing the material with the supporting means and rolls unheated by other agency than said drying-current, substantially as described.

12. The combination, in a machine of the character described, of a drying-chamber for material to be operated on, means for supporting and propelling the material through the chamber, and guiding the same progressively longitudinally of the supporting means, polishing-rolls operating on the material, and means for mechanically forcing a current of drying medium about the material for drying the same, the supporting means and rolls unheated by other agency than said current of drying medium, with the polishing-rolls operating on and the mechanically-forced current of drying medium passing about the material simultaneously for simultaneously drying and polishing the material, substantially as described.

13. The combination, in a machine of the character described, of a drying-chamber for material to be operated on, drums for supporting and propelling the material through the chamber and guiding the same progressively longitudinally of the drums and polishing-rolls operating on the material located within the chamber, and means for mechanically forcing a current of heated drying medium about the material for drying the same with the drums and rolls unheated by other agency than said current of heated drying medium, with the polishing-rolls operating on and the mechanically-forced current of heated drying medium passing about the material simultaneously for simultaneously drying and polishing the material, substantially as described.

14. The combination of a drying-chamber, rotatable cord-drums for cords passing about the drums, means for forcibly passing a drying medium through the drying-chamber, with a partition for the chamber extending transversely to the axis of the drums and dividing the chamber into passages and directing the drying medium through the passages in reverse directions, substantially as described.

15. The combination of a drying-chamber, rotatable cord-drums for cords passing about the drums, means for forcibly passing a drying medium through the drying-chamber, with a partition for the chamber extending transversely to the axis of the drums, and a partition within the drums in substantially the plane of the partition for the chamber, substantially as described.

16. The combination of a drying-chamber, cord-drums for cords to be operated upon passing about the drums, means for forcibly passing a drying medium through the chamber, and a partition extending transversely of the drums, with a dome beyond the end of the partition, substantially as described.

17. The combination in a machine of the character described, of a drying-chamber for material to be operated upon passing through the chamber, drums for the material, polishing-rolls for the material, with a partition and deflectors for directing a current of drying medium to pass and repass the material and the drums, substantially as described.

18. The combination of a drying-chamber inclosing a pair of drums and polishing-rolls, a partition dividing the chamber into compartments, with a partition and deflectors in each compartment for directing a current of drying medium to pass and repass the drums and the material taking about them, substantially as described.

19. The combination of a drying-chamber inclosing a pair of drums and polishing-rolls, a partition dividing the chamber into compartments, with a partition and deflectors in each compartment for directing a current of drying medium to pass and repass the drums and the material taking about them, and a dome for each compartment beyond the partition therein, substantially as described.

20. The combination of a drying-chamber, drums, with material to be operated upon taking diagonally about the drums, with a divided partition extending transversely to the drums and arranged for directing a current of drying medium and allowing the material to pass the same, substantially as described.

21. The combination, in a machine of the character described, of a drying-chamber, cord-drums for cords passing and repassing the drums diagonally and progressively longitudinally of the drums, and deflectors for directing a current of drying medium, substantially as described.

22. The combination, in a machine of the character described, of a drying-chamber, cord-drums for cords passing and repassing the drums diagonally and progressively longitudinally of the drums, and a partition and deflectors for directing a current of drying medium, substantially as described.

23. The combination, in a machine of the character described, of a drying-chamber for material to be operated on, means for coating the material with a sizing composition, means for supporting and propelling the coated material through the chamber, and guiding the same progressively longitudinally of the supporting means, polishing-rolls operating on the coated material for incorporating the sizing composition into the material, and polishing the same, means for producing a current of drying medium energized to exceed the natural speed of a heated current for acting directly on the coated material for drying the same, and arranged so that the current of drying medium makes direct contact with the coated material, and means for passing the current through the chamber about the coated material, and constructed and arranged for making direct contact between the current and the coated material while the latter is being operated upon by the polishing-rolls, substantially as described.

24. The combination, in a machine for finishing cord or like material, of a drying-chamber for the material, means for coating the material with a size, means for supporting and passing the material through the chamber, means for speeding a current of drying medium beyond the natural speed of a heated current about and arranged for making direct contact with the material, and polishing means operating on the material while the same is passing through the chamber and subjected to the action of the speeded drying-current, substantially as described.

25. The combination, in a machine of the character described, of a drying-chamber for material to be operated on, means for coating the material with a sizing composition, means for supporting and passing the material through the chamber, means for speeding a current of drying medium to outside the supporting means beyond the natural speed of a heated current about and arranged for making direct contact with the material for drying the same, and polishing-rolls operating on the material while the same is passing through the chamber and subjected to the action of the speeded drying-current, substantially as described.

26. The combination, in a machine of the character described, of a drying-chamber for material to be operated on, means for coating the material with a sizing composition, means for supporting and passing the material through the chamber, with power-actuated current-producing mechanism for speeding a current of drying medium to outside the supporting means beyond the natural speed of a heated current and passing the same about and in direct contact with the material for

drying the same, and polishing-rolls operating on the material while the same is passing through the chamber and subjected to the action of the speeded drying-current, substantially as described.

27. The combination, in a machine of the character described, of a drying-chamber for material to be operated on, means for coating the material with a sizing composition, means for supporting and passing the coated material through the chamber and guiding the same progressively longitudinally of the supporting means, means for energizing a current of drying medium beyond the natural speed of a heated current for acting directly on the material for drying the same, an inlet and an outlet opening for the casing for the current, and constructed and arranged for drying the coated material by direct action of the drying medium on the coated material, and polishing-rolls operating on the coated material for incorporating the sizing composition into the material and polishing the same while the same is passing through the chamber and subjected to the action of the energized drying-current, with the polishing-rolls operating on and the energized current of drying medium passing about the coated material simultaneously for simultaneously drying and polishing the material, substantially as described.

28. The combination, in a machine for finishing cord or like material, of a drying-chamber for the material, means for coating the material with a size, means for supporting and passing the material through the chamber, a fan for speeding a current of drying medium about the material into direct contact therewith, and polishing means operating on the material while the same is passing through the chamber and subjected to the action of the speeded drying-current, substantially as described.

29. The combination, in a machine of the character described, of a drying-chamber for material to be operated on, means for supporting and passing the material through the chamber, means for producing a current of drying medium for forcibly passing about the material for drying the same, and polishing-rolls operating on the material while the same is passing through the chamber and subjected to the action of the drying-current, with the said supporting means and rolls of substantially the temperature of said current, substantially as described.

30. The combination, in a machine for finishing cord or like material, of a chamber for the material, means for moving the material within the chamber, means for applying size to the material, with polishing means, and means for mechanically propelling a current of drying medium into direct contact with the coated material while the latter is being acted on by the polishing means and passing through the chamber, substantially as described.

31. The combination, in a machine for finishing cord or like material, of a chamber for the material, means for moving the material therein, means for applying size to the material, with polishing means acting on the material within the chamber, and means for directing a current of drying medium directly to the point where the polishing means acts on the material, substantially as described.

32. The combination, in a machine for finishing cord or like material, of a chamber for the material, means for moving the material within the chamber, means for applying size to the material, with polishing means, and means for mechanically moving a current of drying medium within the chamber and subjecting the coated material to direct contact therewith at the point where the polishing means acts on the material, substantially as described.

In testimony whereof I have signed my name hereto in the presence of two subscribing witnesses.

GEORGE A. MUENZENMAIER.

Witnesses:

ERNEST G. SIMON,

FLORENCE BRANDES.