

D. GESSNER.  
 APPARATUS FOR TREATING CLOTH.  
 APPLICATION FILED APR. 4, 1906.

946,916.

Patented Jan. 18, 1910.

6 SHEETS—SHEET 1.

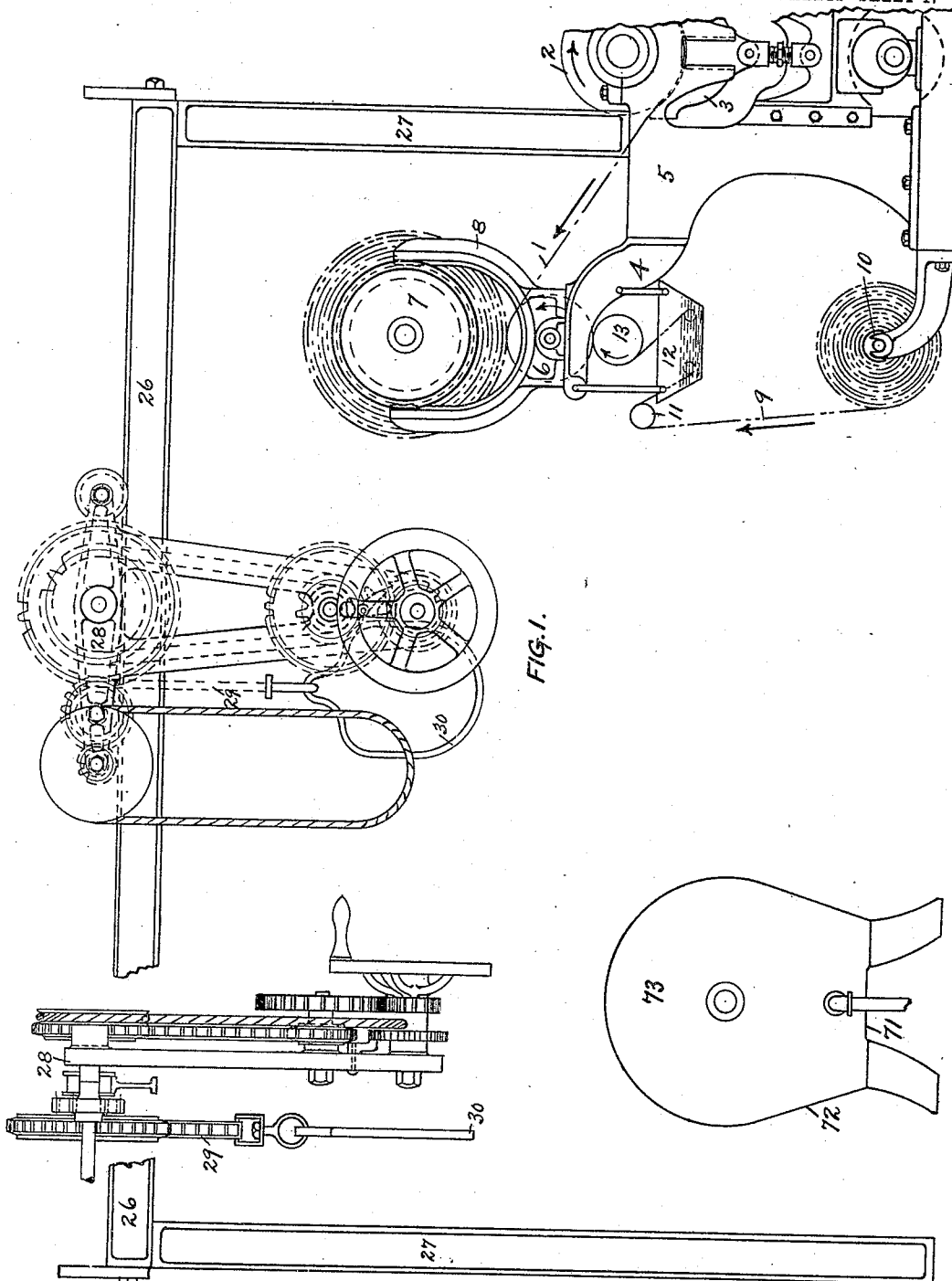


FIG. 1.

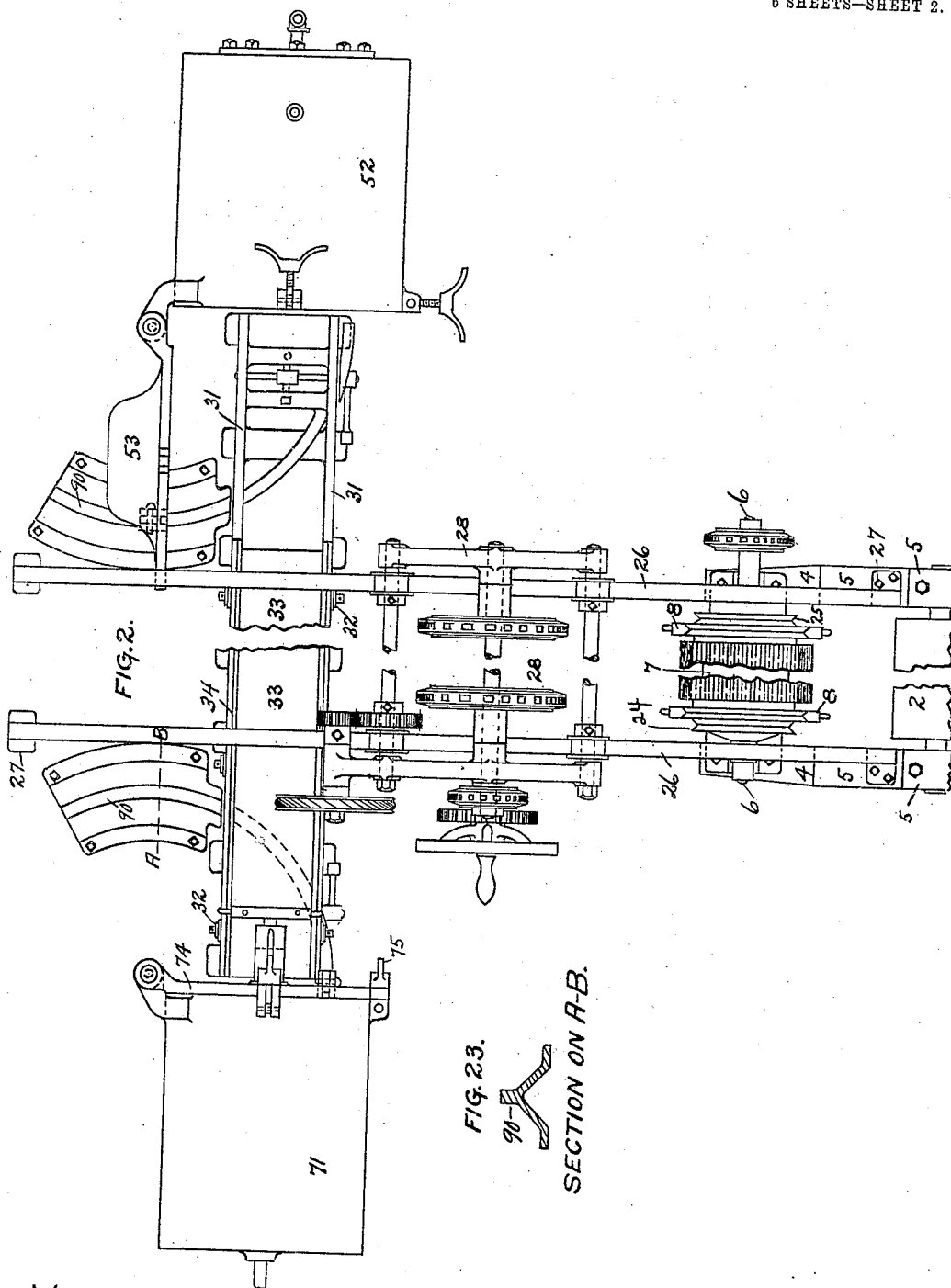
WITNESSES:  
*W. A. Pauling*  
*Joe. J. Pierando.*

INVENTOR;  
*David Gessner*  
 by *W. A. Pauling* ATTYS

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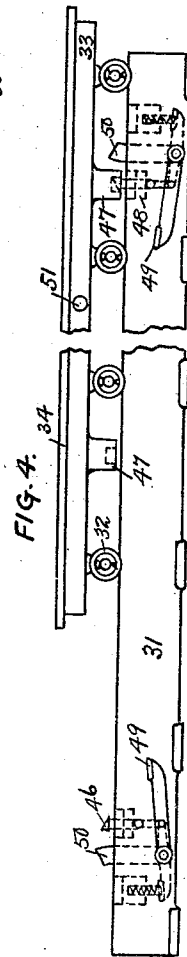
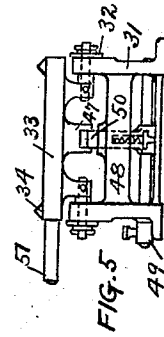
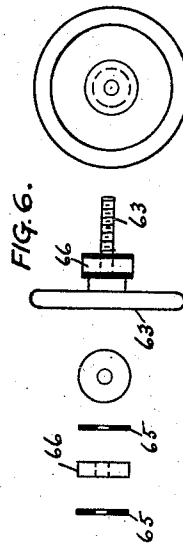
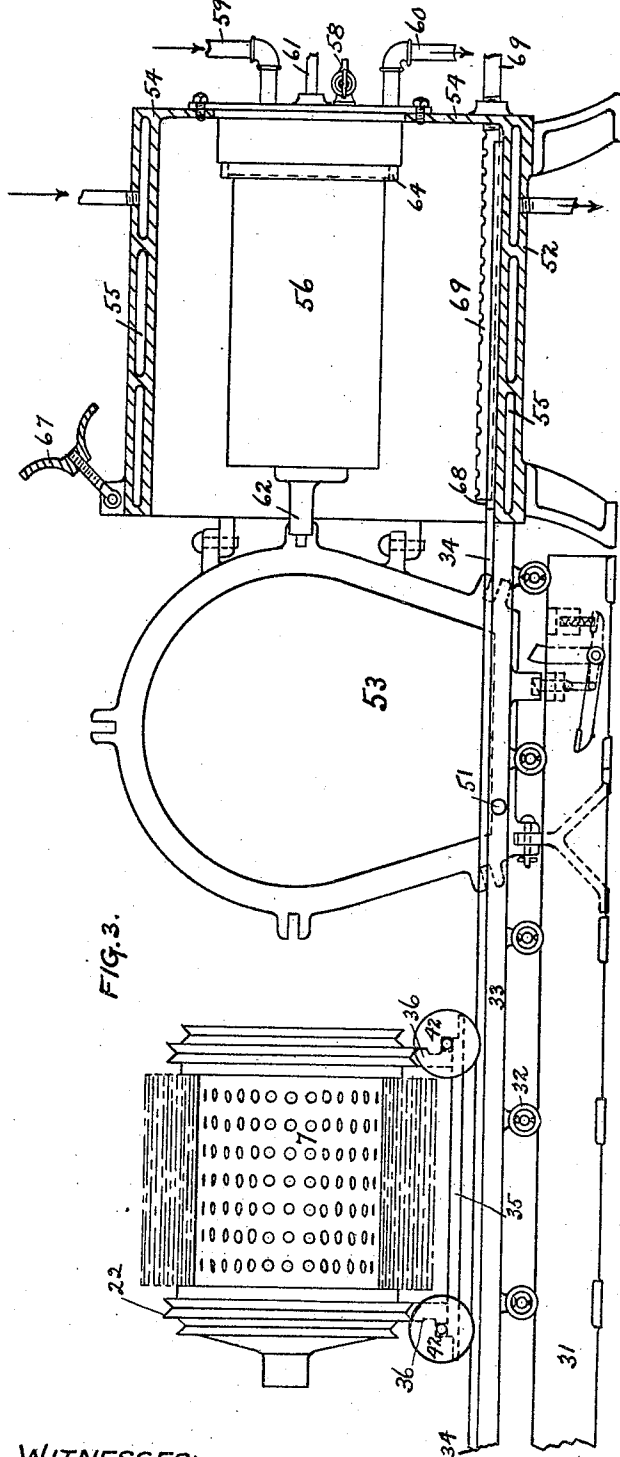
WITNESSES:  
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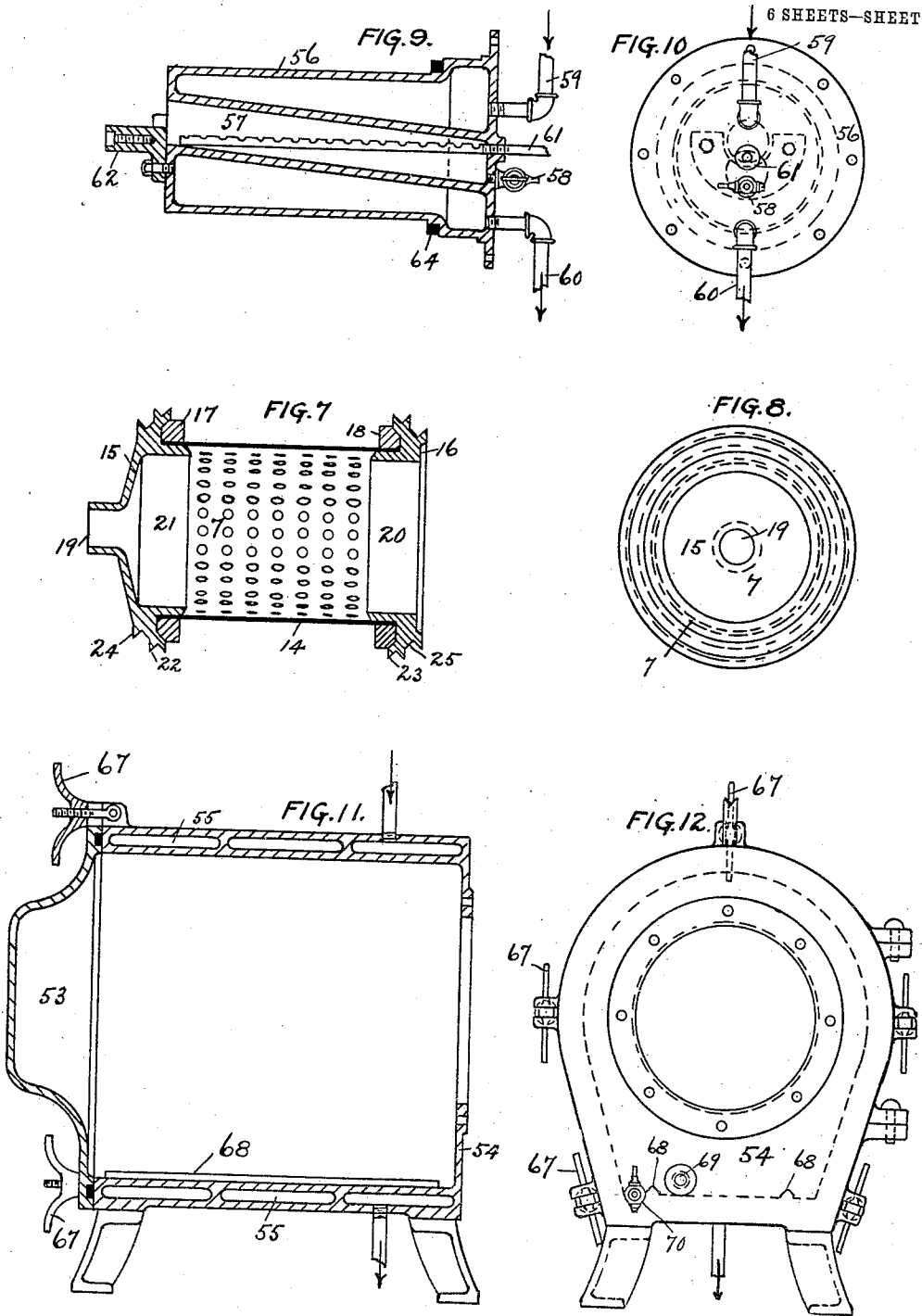
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WITNESSES:  
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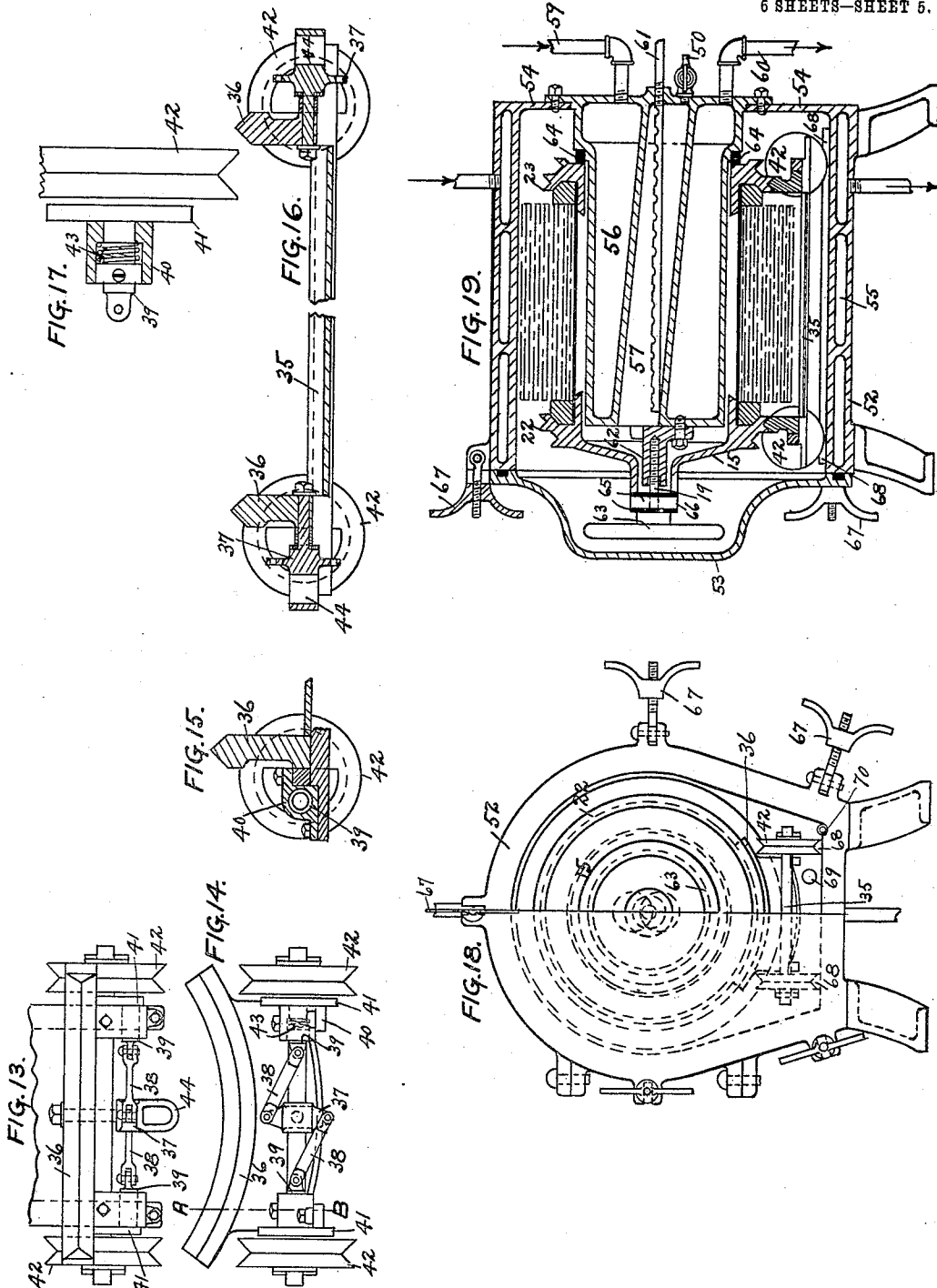
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6 SHEETS—SHEET 5.



WITNESSES:  
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*Jos. E. Pierando*

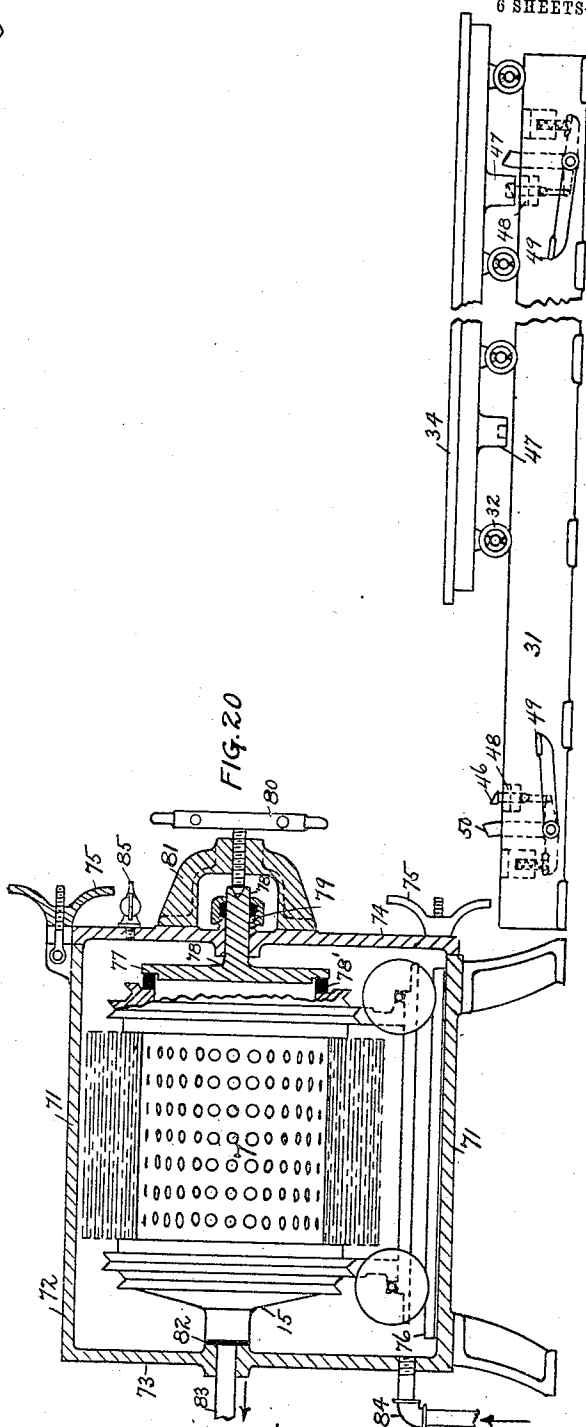
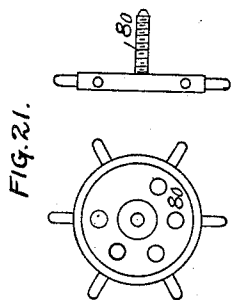
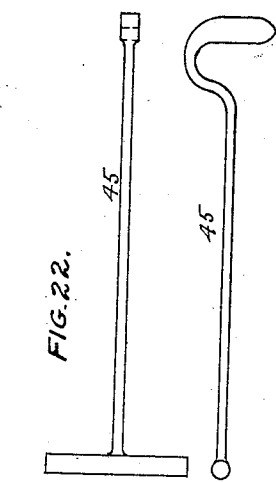
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6 SHEETS—SHEET 6.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

DAVID GESSNER, OF WORCESTER, MASSACHUSETTS.

## APPARATUS FOR TREATING CLOTH.

946,916.

Specification of Letters Patent. Patented Jan. 18, 1910.

Application filed April 4, 1906. Serial No. 309,729.

*To all whom it may concern:*

Be it known that I, DAVID GESSNER, a citizen of the United States, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in an Apparatus for Treating Cloth, of which the following is a specification.

In the old hand pressing operations, the cloth was placed by hand between press papers and inserted in a plate press operated either by hydraulic or screw pressure under well known conditions of heat and pressure and was permitted to remain therein for a long time, usually about twenty four hours, inclusive of the time devoted to the two pressings required. The finish thus imparted to the cloth was comparatively permanent and well set to resist the ordinary exposure to the atmosphere, particularly within doors. In the rotary cloth pressing operations, on the other hand, the cloth is subjected to heat and pressure in transit and for an extremely short time, modern speed requirements requiring often the rate of 6 to 12 yards a minute, and the finish imparted thereby is comparatively fugitive, and many attempts have been made to increase its permanence and cause the permanence of its finish to approximate that obtained by the hand or plate press operations first referred to. The general object of my present invention is in the same direction. But my present invention supplies a comprehensive system which is not only a new conception in its entirety, but contains many parts or steps which constitute conceptions severally as well as being components of the whole.

Heretofore, it has sometimes been the custom in the use of cloth presses to deliver the cloth from the press by rolling it upon a lap-roll while under its pressing heat; that is to say, the heat imparted to it by the two hot surfaces between which it is pressed. But before subjecting the cloth to further operations, it has been customary to unroll it from this lap-roll and rehandle it. The pressing imparts to the cloth a peculiarly lustrous finish and firm handle or substance which it retains when in the roll formed of it under its pressing heat immediately upon its delivery from the press. The manner of subsequent treatment heretofore applied, however, has tended to impair or destroy those qualities and one of the principal objects of my present invention is to render

those qualities fixed and permanent and improved, not only substantially retaining them until the cloth leaves the mill, but even rendering them so permanent that they are retained by the cloth notwithstanding wear and exposure to atmospheric conditions in ordinary use both indoors and out. My process may therefore be divided into three parts: first, the imparting to the cloth of the qualities incident to the use of the press as above referred to; second, the retaining of those qualities by keeping it in the roll in which it is formed under the pressing heat pending its arrival at the third part of the process; and third, a treatment by which those qualities are rendered so fixed and permanent that they will be retained by the cloth not merely when it is unrolled but afterward.

In the accompanying drawings, I have shown an apparatus by which my new system may be carried into effect.

Figure 1 is an elevation of the apparatus in general. Fig. 2 is a plan view of the same with some additions not shown in end view in Fig. 1. Fig. 3 is a vertical longitudinal section of the open steaming chamber and lap-roll carrying the cloth approaching it on its truck. Figs. 4 and 5 are details of the moving platform for carrying the truck. Fig. 6 are details of the hand screw 63 and its appurtenances. Fig. 9 is a cross section and Fig. 10 an end view of the heater 56. Fig. 7 is a longitudinal section and Fig. 8 an end view of the steamer cylinder 7. Fig. 11 is a longitudinal section and Fig. 12 an end view of the steam chamber. Figs 13 to 17 inclusive are details of the truck for carrying the steamer cylinder. Figs. 18, 19 are end view and longitudinal section of the steamer cylinder contained within the steam chest. Fig. 20 shows the steamer cylinder inclosed within the cooling chamber. Figs. 21 and 22 are details of the hand wheel 80 and its appurtenances. Fig. 23 is a cross section of the door-supporting-rail 90.

In my general system which I am about to describe the cloth during the later steps of its treatment is retained in the same roll in which it is formed while in the press, and although there are certain parts or steps of my invention which may be employed without this feature and which I therefore desire to claim without limitation thereto, nevertheless this feature is of so much importance to the quality of the cloth obtained

by the succeeding steps that I will describe the general invention under the following divisions: 1. The pressing of the cloth and forming it into a roll. 2. The transfer of this roll to the steamer. 3. The steamer. 4. The cooler. 5. The transfer of the roll from the steamer to the cooler.

The pressing of the cloth and forming it into a roll is accomplished as follows: The cloth 1 is pressed between a cylinder 2 and a bed-plate 3 which will be recognized as the ordinary steam heated cylinder and steam heated bed plate of a well known rotary press and which may be constructed and operated substantially as described in my Letters Patent No. 565072 dated August 4, 1896, and which therefore require no further description. The bracket 4 of the press-frame 5 carries the delivery roll 6 upon which rests the steamer-cylinder 7 which is held between the vertical guide-ways of the fork 8 so that it can rise as the roll of cloth accumulates upon it. I term the part 7 upon which the cloth is rolled the steamer-cylinder to distinguish it from the ordinary wooden lap-roll upon which, so far as I know, it has been the universal custom to roll or wind the cloth on a rotary press; the part 7 being the identical roll upon which the cloth remains during its subsequent treatments, inclusive of steaming; whether such steaming be accomplished by added steam or by steam produced from the heating of the moisture rolled up with the cloth. 9 is a nonendless apron which may be employed for winding up with the cloth. This apron may start from the roll 10 and pass over the guide 11 and through water contained in the tank 12 and around the guide 13 and the delivery roll 6, joining the cloth upon the delivery roll 6, and being wound up spirally therewith on the steamer-cylinder 7. I, however, do not wish to limit myself unless so expressed in the claims, to the use of this apron since in some work I intend that it should be dispensed with.

The steamer-cylinder 7 consists, as shown in longitudinal section in Fig. 7, of a perforated shell 14 bound to the two heads 15 and 16 by the shrunken rings 17 and 18. The head 15 is convex, containing the central opening 19. The head 16 contains an opening 20 as large as is permitted by the shell 14; said opening being in axial alinement and of the same diameter with the opening 21 in the head 15 so as to admit of a free passage within the cylinder 7 of the apparatus hereinafter referred to. On the periphery of the head 15 is formed a groove 22 and on the periphery of the head 16 a groove 23, which grooves fit the guideways of the fork 8. Outside of these grooves are the grooves 24 and 25 to receive the stirrups of the trolley next described.

The transfer of the cloth roll to the steamer

may be accomplished by the following mechanism. 26 are overhead rails extending transversely above the steamer-roll 7 and supported at each end by the posts 27. Upon these rails runs a trolley 28 carrying suitable hoisting mechanism, from the fall 29 of which are pendent the stirrups 30 adapted, respectively, to slip over the heads of the steamer-roll 7 and engage the grooves 24 and 25 thereon and lift the steamer-roll 7 out of the fork 8. Beneath the opposite ends of the overhead rails 26 are laid transversely the rails 31 upon which run the wheels 32 carrying the table 33 carrying the rails 34 upon which run the truck 35, shown in detail in Figs. 13—17 hereinafter more particularly described. Upon opposite ends of the truck are mounted the uprights 36, the tops of which are curved and V-shaped so as to fit the grooves 22 and 23 on the heads of the steamer-cylinder 7.

The hoisting mechanism upon the trolley 28 having raised the steamer-cylinder 7 from the press, carries it into position over the truck 35 and lowers it down upon the uprights 36 of that truck by which it is held in exact axial alinement with the steamer and cooler, hereinafter referred to.

The table and truck are provided with mechanism whereby the table may be moved longitudinally so as to provide a trackway for the truck into either the steamer or the cooler, or whereby the truck may be permitted to run upon the table into either the steamer or the cooler. This mechanism may be as follows: 37 is a rocker pivoted to the truck and connected at its opposite extremities by the links 38, 38, with the plungers 39 guided by the sleeves 40 for carrying the friction-plates 41, forming a friction clutch with the face of the truck wheels 42. 43 are springs constantly tending to disengage the friction surfaces. 44 is an eye in one piece with the rocker 37. By engaging a suitable hook 45, shown in detail in Fig. 22 with this eye, the operator may turn the rocker 37 so as to throw the friction surfaces into engagement and frictionally lock the truck wheels against movement along the table. When the truck wheels are thus locked by a mere twist of the hook and a push is exerted on the hook against the truck, the table and the truck will be moved together either toward the steamer or the cooler, as may be desired. When, however, the hook is not twisted, the springs 43 will disengage the friction surfaces and unlock the truck wheels so that the operator may shove the truck back and forth upon the table at will.

In order to hold the table during the movements of the truck upon it, I provide spring latches 46 projecting upward from the stationary track and engaging with a downward projection 47 from the bottom of the table. These latches are mounted in

guideways in the cross-ties 48 between the rails 31 and can be withdrawn by means of the foot-levers 49. The bevels of the two latches are so directed that when the table is shoved toward one end of the track one of the latches will automatically engage it and retain it until unlatched by the foot-lever. The other latch performs the same function when the table is moved to the other end of the track. Connected with each foot-lever 49 is also an arm 50 which acts as a starter for the table which, by the same movement of foot-lever that unlatches the latch is brought in contact with the projection 47 on the table so as to shove the table and give it a start toward the opposite end of the trackway. 51 is a pin projecting from the side of the table by which the operator can push the table along to such position on the track as he may desire.

The steamer 52 is preferably of the following construction: (see Figs. 3, 11, 12, 18, 19.) It consists of a horseshoe shaped chest one end of which is closed by the suitably packed hinged door 53 and the opposite end by the head 54. It is peripherally jacketed by the steam jacket 55. The interior diameter of the circular portion of this steam chest is such as to receive the roll of cloth carried upon the steamer-cylinder 7. Secured to the head 54 and extending concentrically inward is a heating cylinder 56, (see Figs. 9, 10, 19) the diameter of which is such that as the steamer-cylinder 7 is brought upon its truck within the steamer, it surrounds the heating cylinder 56 which is in such position as to register within the openings 20 and 21 leaving a clearance for the passage of the steam all around the heating cylinder. (See Fig. 19.) This heater 56 is a hollow casting into which extends the opening 57 inclined downward from front to rear and provided with a cock 58 at the rear. Steam pipes 59 and 60 supply the circulation of steam necessary for heating. Into the opening 57 extends a steam pipe 61 which is perforated within said opening and serves to supply steaming steam, or for other purposes, as desired. 62 is an interiorly threaded stud mounted upon the forward end of the heater 56 and extending into the opening 19 in the steamer-cylinder 7. 63 is a hand screw adapted to bear upon the head 15 around the opening 19 and screwed into the end of the stud 62. A rubber gasket 64 is interposed as a packing between the forward end of the steamer-cylinder and a shoulder on the heating cylinder. The two rubber washers 65 and the metal washer 66 are interposed between the hand wheel and the head of the steamer-cylinder. By this construction, the tightening of the hand screw 63 will tighten the rubber packings above referred to and close all exit 65 of steam from the inside of the steamer-

cylinder excepting through the perforations in its periphery. 67 are nuts by which the door of the heater is held closed. 68 are tracks upon the bottom of the steamer on which run the wheels of the truck. 69 is a steam pipe which projects into the steamer between said tracks and which is perforated within the steamer. 70 is a steam outlet provided with a pet-cock on the outside for the exit of steam or water from the steamer.

The cooler 71 (see Fig. 20) is a chest of the same form as the heater consisting of the horseshoe shaped periphery 72, the rear head 73 and the front door 74 closed by the hand-nuts 75 and a bottom track 76. 77 is a disk adapted to close the open end of the steamer-cylinder 7; a packing ring 78' being interposed. The disk 77 is carried by a plunger 78 that extends through a stuffing box 79 in the cooler door. Upon the outer end of the plunger impinges a hand screw 80 screwthreaded to the bracket 81 secured to the outer side of the door. 82 is a packing ring interposed between the opposite head of the steamer-cylinder and the head of the cooler. Thus, when the hand screw 80 is tightened the only outlet for the passage of air between the outside and the inside of the steamer-cylinder 7 is through the perforations in the periphery of the cylinder and the roll of cloth wound thereon. 83 is an exhaust pipe extending through the head of the cooler and opening into the interior of the steam-cylinder 7. A suitable suction-pump will furnish the exhaust for the pipe 83. 84 is an air inlet into the interior of the cooler. 85 is another air inlet that may be employed, if desired, and which is controlled by a cock.

In Fig. 2, I have shown tracks 90, 90, 105 which may be employed for supporting the heater and cooler doors as they swing open. A cross section of one of these tracks is shown in Fig. 23.

*The transfer of the cloth roll from the steamer to the cooler.*—In order that the truck may have a substantially continuous trackway into the steamer and also out of the steamer again and into the cooler, I extend the rails 34 at opposite ends of the table 33 so that when the table is caused to abut against the heater or the cooler, the outward projection of its rails will abut against the ends of the rails in the bottom of the heater or the cooler, as the case may be, and is shown in Fig. 3.

There are various ways in which the apparatus above described may be operated, depending upon the effect which it is desired to produce upon the cloth. Some of these ways I will now proceed to describe. One way may be described as follows: In the press, the cloth is wound up spirally on the steamer-cylinder 7 in conjunction with the wet endless apron 9. In the steamer, no

outside steam is applied to the cloth and it is subjected only to the steam produced by the evaporation of the water already contained within it and the apron. The heat  
 5 for evaporating this water is applied interiorly from the steam circulating within the heating cylinder 56 and exteriorly from the steam within the steam jacket 55. After this evaporation has continued as long as  
 10 desired, the vapor which has thus been evaporated into the space within the steamer outside of the cloth may be drawn back through the cloth by means of an exhaust applied to the pipe 61. All other openings  
 15 into the heater are closed while this exhaust is in progress so that it tends to produce a vacuum within the heater. In the cooler, a draft of cold air is induced through the cloth by permitting cold air to enter the cooler  
 20 through the pipe 84 and applying an exhaust to the pipe 83. By this means, the cloth is rapidly cooled so that its fibers are given the desired set.

Another way of operating is as follows:  
 25 In the press, the cloth is wound up on the steamer-cylinder in the dry condition in which it leaves the presser and without any wet apron, although a dry apron may or may not be present, as preferred. In the  
 30 steamer, the roll of cloth is subjected not merely to heating, but also to steaming by wet steam admitted through the pipe 69 and exhausted through the pipe 61. At the same time that this steaming by wet steam is in  
 35 progress, the cloth is subjected to heat by the heat applied interiorly from the heater 56 and exteriorly by the steam jacket 55, so as to prevent the steam from producing water spots. If any water should condense  
 40 within the heater, it will accumulate at the bottom of the heater and be reëvaporated into steam. In the cooler the operation is as before.

Another way may be described as follows:  
 45 It is the same as the second way with the exception that in the heater, the live or steaming steam is passed through the cloth in both directions—that is, from the exterior inward and from the interior out-  
 50 ward, or vice versa. This is done, for example, by first supplying the steam through the pipe 69 and exhausting it through the pipe 61 and subsequently supplying it through the pipe 61 and exhausting through  
 55 pipe 69. This produces a uniformity in the treatment of the cloth in all parts of the roll, both from end to end and from the inside out, greater than I believe has ever before been obtained.

60 In applying the live steam either from the inside or from the outside in either of the ways above mentioned, the steam supply may be under so little pressure as to require the exhaust for drawing it through the  
 65 cloth or it may be supplied under such pres-

sure that no exhaust will be necessary. Wherever the steam is supplied under such low pressure that the exhaust is necessary, I prefer to precede the supply of the steam by exhausting until a vacuum has been  
 70 created by the exhaust within the steamer. Then, as soon as the steam supply is turned on, it will more quickly penetrate all the way through to the exhaust pipe.

The process described in the foregoing  
 75 specification is not claimed herein, being the subject of application Serial No. 272,122, filed July 31, 1905.

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

1. In combination, a cloth carrying roll and a core adapted for temporary insertion into the same containing a surface adapted to form one member of a steam tight joint  
 85 with said roll.

2. In combination, a cloth carrying roll, a core adapted for temporary insertion into the same and mechanism for forcing the roll  
 90 onto said core.

3. In combination, a cloth carrying roll, a core adapted for insertion into the same and a support whereby said core is supported  
 95 independently of the roll.

4. In combination, a cloth carrying roll, a core adapted for insertion into the same and a heating jacket; the space between said  
 100 core and said jacket being adapted to receive said roll and the cloth thereon.

5. In combination, a cloth carrying roll, a heating core adapted for insertion into the same and a heating jacket; the space between said core and said jacket being adapted  
 105 to receive said roll and the cloth thereon, whereby the cloth is closely confined between heating members inside the roll and outside the cloth.

6. In combination, a cloth carrying roll, a heating core adapted for insertion into the same, a heating jacket, the space between  
 110 said core and jacket being adapted to receive said roll and the cloth thereon and a head closing said space at one end wherefrom said core projects in horizontal position.

7. In combination with a cloth carrying roll, a core adapted for temporary insertion into the same containing, in combination, a heater periphery, a chamber and means with-  
 115 in said chamber for discharging steam.

8. In combination with a cloth carrying roll, a core adapted for temporary insertion into the same containing, in combination, a heater and means for discharging steam so  
 120 as to impinge upon said heater.

9. In combination with a cloth carrying roll, a core adapted for temporary insertion into the same containing, in combination, a heater adapted to leave a narrow space be-  
 125 tween its exterior and the interior of said

roll and means for conducting a current of steam to said space.

10. In combination with a cloth carrying roll, a core adapted for temporary insertion into the same containing, in combination, a heater, a chamber within said heater communicating with the space around said heater and means for discharging steam within said chamber.

11. In an apparatus for steaming cloth, in combination, a perforated cloth carrying cylinder, a detachable steaming core for said cylinder and heads of said cylinder adapting it to constitute the receiving roll of a cloth pressing machine.

12. In an apparatus for steaming cloth, in combination, a perforated cloth carrying cylinder, a detachable combined steaming and heating core for said cylinder and heads of said cylinder adapting it to constitute the receiving roll of a cloth pressing machine.

13. In an apparatus for steaming cloth, in combination, a perforated cloth carrying cylinder, a detachable steaming core for said cylinder; an inclosing steam chamber and heads of said cylinder adapting it to constitute the receiving roll of a cloth pressing machine.

14. In combination, a cloth carrying roll, a cloth steamer containing a core constituting a fixture of the steamer and adapted to receive said cloth carrying roll and mechanism whereby the roll is conveyed onto said core.

15. In combination, a cloth carrying roll, a steamer chamber, rails extending therein for the conveyance of said cloth carrying roll and a core fixed within said chamber and adapted to receive a cloth carrying roll conveyed on said rails.

16. In an apparatus for steaming cloth in the roll, in combination, an inclosing chamber, a hollow cylinder upon which the cloth is rolled, a truck on which the roll is carried into said chamber without unrolling and a steaming core adapted to receive said cylinder temporarily.

17. In an apparatus for steaming cloth, in combination, a cloth carrying roll, an inclosing chamber, a trackway leading into said chamber, a roll bearing truck adapted to run into said chamber and be inclosed therein and a heater projecting from the wall of said chamber within said roll and adapted to constitute the core of said roll.

18. In an apparatus for treating a roll of cloth carried upon a perforated cylinder, in combination, the perforated cylinder, a core adapted to project within the same and a support for said core at one end thereof.

19. In an apparatus for treating a roll of cloth carried upon a perforated cylinder, in combination, the perforated cylinder, a core adapted to extend within the same, means

at one end of said core whereby the same is supported in horizontal position and a carriage adapted for conveying the perforated roll onto said horizontal core.

20. In an apparatus for treating a roll of cloth carried upon a perforated cylinder, the perforated cylinder, a core and an inclosure combined substantially as described whereby an annular space is provided between them adapted to fit the cloth roll and carrying cylinder.

21. In an apparatus for treating a roll of cloth carried upon a perforated cylinder, the perforated cylinder, a combined heating and steaming core and a heating inclosure combined substantially as described whereby an annular space is provided between them adapted to fit the roll and carrying cylinder.

22. In an apparatus for treating a roll of cloth carried upon a perforated cylinder, the perforated cylinder, a core and an inclosure combined substantially as described whereby an annular space is provided between them adapted to fit the cloth roll and carrying cylinder and mechanism whereby the same is forced into said space.

23. In an apparatus for steaming cloth in the roll, in combination, a perforated cylinder on which the cloth is wound, a chest inclosing the roll, means whereby steam may be passed from the interior of the roll outward, means whereby steam may be passed from the exterior of the roll inward, means whereby the steam is heated inside the roll and means whereby the steam is heated outside the roll.

24. In an apparatus for steaming cloth in the roll, in combination, a perforated cylinder upon which the cloth is wound, a chest inclosing the roll of cloth, a steaming core and means whereby the interior of said core is cut off from the space within the chest excepting through the roll of cloth.

25. In an apparatus for steaming cloth in the roll, in combination a perforated cylinder on which the cloth is wound, a chest inclosing the roll, means whereby steam may be passed from the exterior of the roll inward, means whereby the steam is heated inside the roll and means whereby the steam is heated outside the roll.

26. In an apparatus for steaming cloth in the roll, in combination, a perforated cylinder on which the cloth is wound, a chest inclosing the roll, means whereby steam may be passed from the exterior of the roll inward and means whereby the roll is heated both externally and internally.

27. In an apparatus for steaming cloth in the roll, in combination, a perforated cylinder on which the cloth is wound, a chest inclosing the roll, means whereby the space immediately inside the perforated shell of said cylinder is cut off from the space with-

in the chest excepting through the roll and a heater within said perforated cylinder.

28. In an apparatus for steaming cloth in the roll, in combination, a perforated cylinder on which the cloth is wound, a horse-shoe shaped steam chest and a truck supported at the heel of the horseshoe whereby the roll is supported in the circular portion thereof.

10 29. A cloth carrying roll containing, in combination, the perforated shell 14 and the head 16 containing an opening nearly as large as the inside diameter of the shell, and a member surrounding the same adapted to form one member of a tight joint.

15 30. A cloth carrying roll containing, in combination, the perforated shell 14, the head 16 containing an opening nearly as large as the inside diameter of the shell, and a member surrounding said opening adapted

ed to form one member of a tight joint and an annular member having a peripheral groove 22 adapted to cooperate with a guideway.

31. A cloth carrying roll containing, in combination, the perforated shell 14, the head 15 containing an abutment adapted to receive axial pressure and the head 16 containing an opening nearly as large as the inside diameter of the shell and a member surrounding said opening adapted to form one member of a tight joint.

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

DAVID GESSNER.

Witnesses:

ELIJAH L. GREENSLIT,  
ALMON SUMNER FARR.