

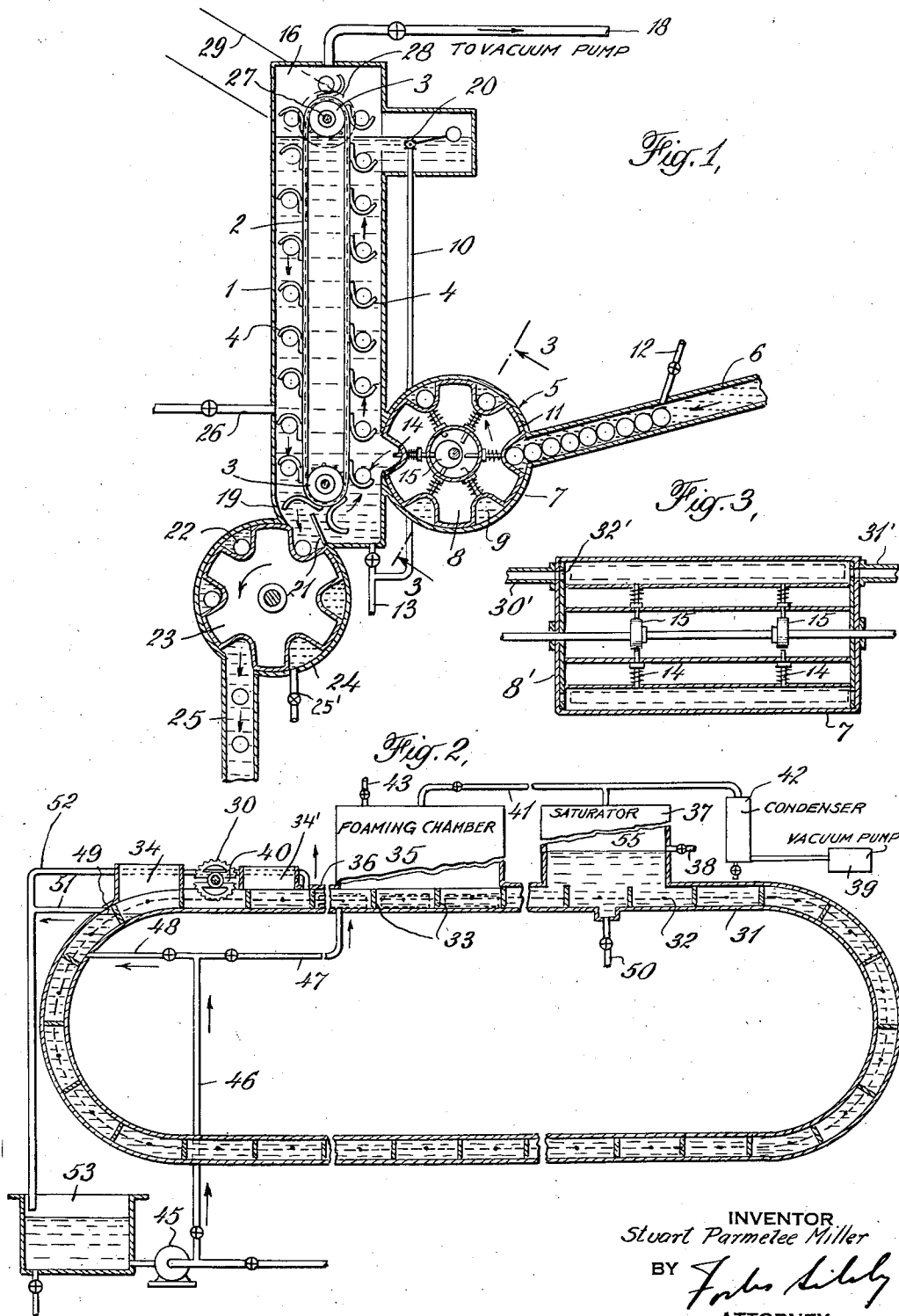
June 2, 1936.

S. P. MILLER

2,042,677

SATURATOR FOR ABSORBENT ARTICLES

Original Filed June 29, 1932 2 Sheets-Sheet 1



INVENTOR
Stuart Parmelee Miller
BY *John H. Kelly*
ATTORNEY

June 2, 1936.

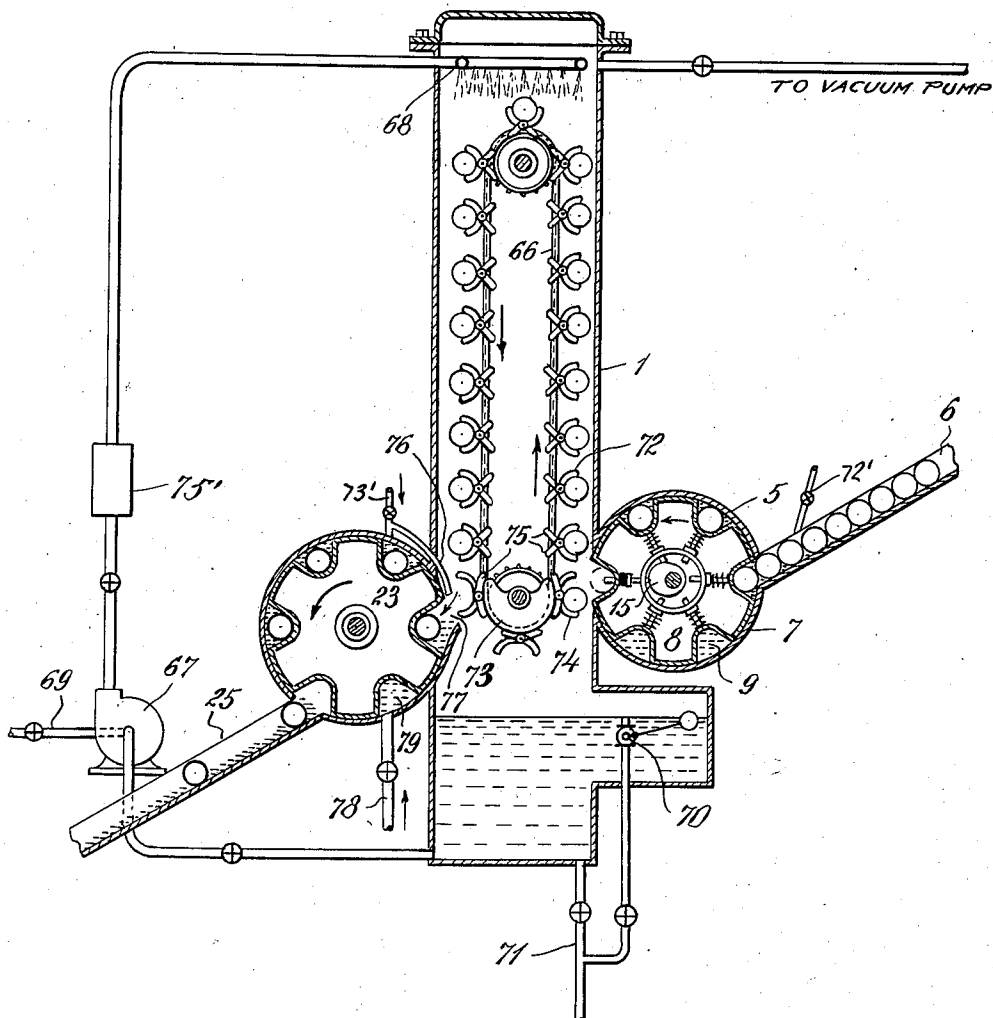
S. P. MILLER

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Fig. 4,



INVENTOR
Stuart Parmelee Miller
BY *Forbes Lihby*
ATTORNEY

UNITED STATES PATENT OFFICE

2,042,677

SATURATOR FOR ABSORBENT ARTICLES

Stuart P. Miller, Englewood, N. J., assignor to
The Barrett Company, New York, N. Y., a cor-
poration of New Jersey

Original application June 29, 1932, Serial No.
619,939. Divided and this application Novem-
ber 1, 1932, Serial No. 640,654

17 Claims. (Cl. 91-46)

This invention is directed to apparatus for saturating absorbent articles, and particularly, apparatus for continuously saturating and impregnating fibrous conduits employed to conduct and protect underground cables, telephone lines, electric light, and other conductors, and for the formation of water pipes and drain pipes to render them substantially waterproof and resistant to abrasion, corrosion, and conditions encountered above or underground by fibrous conduits. While, as above stated, the invention is particularly adapted for the saturation of fibrous conduits, it will be understood that it may be employed to saturate small fibrous or other articles requiring impregnation, such as spools, coils, etc., asbestos articles, concrete pipes, flashing blocks, etc. This application is a divisional of my copending application Serial No. 619,939 filed June 29, 1932, and which has matured into Patent Number 2,012,969.

The article to be saturated may, of course, be prepared in any known manner. In the case of fibrous bases for conduits, newsprint and paper pulp, or other fibrous material may be beaten in the usual paper beaters and the resultant stock screened and then pumped to paper cylinder machines and there formed into wet felts or paper. The wet paper may be wound about a cylindrical or other shaped tube or mandrel to produce a wet conduit of proper thickness. This conduit may be dried in kilns to remove the major portion of its moisture content. The fibrous base may, of course, be prepared in other known manner. Such conduits are made in several sizes, commonly varying from 2 inches to 6 inches or larger in internal diameter, have an average wall thickness of approximately $\frac{3}{8}$ of an inch and are usually produced in 5, 6, and 8 foot lengths. The wall thickness of the conduits may, of course, be greater or less than $\frac{3}{8}$ of an inch and other dimensions may vary. As they come from the drying kilns, they usually contain from 5 to 8 per cent moisture, although considerably more than 8 per cent moisture may, on occasion be found present.

The porosity or absorptive characteristics of the walls of fibrous conduits may vary within wide limits from a very dense wall of density corresponding to hard wood and exceedingly difficult to saturate with low carbon water gas tar pitch or even with other waterproofing material, such as asphalt, to a porous open wall similar in density to that of roofing felt, which will readily absorb bituminous saturants. Samples of present commercial fibrous conduits have been tested and

found to vary from substantially less than 1 cc. of voids per gram of tube wall to 2.8 or more cc. of voids per gram of tube wall. To determine the cubic centimeters of voids per gram of tube wall, a small sample of tube wall (say 2" x 5") is dried for one hour at 100° C., cooled, desiccated and thereafter weighed. It is then immersed in kerosene, maintained at a temperature of 25° C., for 18 hours. Thereafter, the sample is removed from the kerosene, drained in vertical position for 30 seconds, and again weighed. The difference in weight represents the kerosene absorbed. This difference in weight in grams, divided by the specific gravity of the kerosene, corresponds to the cubic centimeters of kerosene absorbed. This volume in cubic centimeters, divided by the original weight in grams, gives the voids in cubic centimeters per gram.

It is an object of this invention to provide apparatus for saturating porous or absorbent articles in a simple and continuous manner. The apparatus of this invention is of high capacity, low in operating and equipment costs, capable of automatic operation, materially reduces saturation costs, and results in uniformly saturated conduits of improved waterproofness and resistance to corrosion, abrasion, and soil pressures. Further, the apparatus is flexible and can readily be adapted to efficiently saturate articles varying widely in their porosity, e. g., dense or porous conduits, with different saturants.

As the saturant for the conduits, coal tar pitch, water gas tar pitch, asphalt, cutback pitches, blended pitches, or other waterproofing material may be used. A coal tar pitch having a melting point of from 140° to 180° F. is particularly suitable for saturation of fibrous conduits. Pitch of a melting point as high as 225° F. may be used in special cases, e. g., where conduits are to be exposed to temperature which would soften the lower melting point pitches. Preferred pitches having melting points of from 140° to 180° F. or higher will have a "free carbon" content of from 5 to 9 per cent, but pitches of higher "free carbon" content up to from 15 to 25 per cent, or even higher may be used to give commercially satisfactory saturation under favorable conditions, e. g., in saturating articles having comparatively open wall structure.

Preferably, coal tar pitch made by a vacuum distillation process, such for example as disclosed in Patent No. 1,759,816, granted May 20, 1930, or other processes minimizing decomposition of the tar undergoing distillation, is employed as the saturant. Pitches made by a low temperature

vacuum distillation process are characterized by low "free carbon" content as compared with pitches made by higher temperature processes from the same tar, and I have found that such pitches are particularly suitable as the saturant for fibrous conduits.

Besides waterproofing absorbent articles such as conduits, this invention may be employed, in fireproofing, oil proofing, gas proofing, insulating, painting and coloring such articles. For example, in fireproofing an article, it may be impregnated with an aqueous solution of inorganic salts, e. g., solutions comprising inorganic phosphates, in oil proofing a resin or cellulose solution may be used, in gas proofing and insulating the articles may be saturated with resin, cellulose or rubber mixture and in painting and coloring the articles may be impregnated with paints, lacquers, enamels or varnish.

In accordance with the preferred embodiment of this invention, a closed saturating tank, suitably sealed against the atmosphere at its inlet and outlet is provided. Since the tank is sealed any desired height of saturant may be maintained with an evacuated space thereabove. The tank need not be of a height sufficient to accommodate a maximum barometric column of saturant. A conveyor is disposed within this tank and is provided with suitable baskets, clamps or holders for the fibrous conduits. The conduits are introduced into the tank through the inlet side, carried by the conveyor through the body of saturant in the tank up into the evacuated space above the saturant, and then down through the saturant to the discharge outlet of the saturating tank.

In the preferred embodiment illustrated in the drawings, the invention is shown incorporated in the production of fibrous conduits saturated with bituminous material and the present disclosure will be confined to the present illustrated embodiment of the invention. It will be understood, however, that the novel features and improvements are susceptible to other applications, such, for example, as apparatus for saturating articles generally. Included in the scope of my invention is apparatus for saturation of conduits made of cement, concrete, cement-asbestos mixtures, or other porous, or absorbent articles capable of being saturated. Hence, the scope of this invention is not confined to the specific embodiments herein described.

In the drawings, in which like reference numerals designate like parts,—

Fig. 1 shows a vertical section through a mechanically sealed type apparatus for saturating conduits in accordance with the process of this invention; i. e., the saturating tank of Fig. 1 is sealed at its base so that any desired height of saturant may be maintained therein;

Fig. 2 shows a modified form of mechanically sealed type apparatus for saturating conduits;

Fig. 3 is a vertical section, parts being shown in elevation, taken in a plane passing through line 3—3 of Fig. 1;

Fig. 4 is a vertical section through a mechanically sealed type apparatus for saturating conduits in which the saturant is sprayed onto the conduits.

Referring to Fig. 1, tank 1 is shown in which any desired level of pitch or other saturant may be maintained constant by a float-controlled valve 20 regulating the discharge of saturant from the tank 1 through pipe 10 which connects with the valve-controlled drawoff 13 at the base

of the tank. Disposed within this tank is a conveyor 2 passing over sprockets 3 suitably mounted in the tank. Conveyor 2 is shown provided with clamps or supports 4 of any well known type at spaced intervals therealong and at opposite sides thereof arranged to support and feed the fibrous conduits through the saturant 1; other means for holding the tubes may be employed.

A rotary feed device 5 delivers the tubes from entry chute 6 to the clamps 4 on the conveyor 2. This feeder comprises a casing 7 in which a rotor 8 having pockets 9 is rotatably mounted. Only a small clearance 11 is provided between the rotor 8 and the casing 7. This clearance is maintained sealed by the continuous feed of pitch or other saturant through valve-controlled pipe 12. The conduits are moved by the rotor from the entry chute 6 to the discharge point where spring-pressed plungers 14 within the rotor 8 are forced outwardly by cams or eccentrics 15 causing the fibrous conduit to be discharged from the rotor into the tank 1.

Movement of conveyor 2 may be continuous or intermittent, and synchronized with the movement of rotor 8 so that as each clamp 4 is brought into position the plungers 14 effect the discharge of a fibrous conduit thereinto. The conveyor elevates the conduits through the column of saturant in tank 1 into the evacuated space 16 thereabove. Vacuum in tank 1 may be created by a vacuum pump (not shown) communicating with tank 1 through pipe 18. From the evacuated space 16, the conveyor moves the conduits down through the column of saturant in tank 1. The clamps may be formed in any well known manner so that the conduits are held seated therein during the downward movement thereof. One form of clamp for holding the tubes during the up and down movement of the conveyor is shown in Fig. 4 and is described hereinafter. Upon the conveyor reaching the position 19, suitable cams or other mechanism cause the clamps to disengage the conduits and permit their discharge into the pockets 22 of a rotor 23 rotatably mounted in casing 24. A guide plate 21 disposed between clamps holding the opposite ends of the tubes aids the discharge of the tubes or conduits. Any suitable positive discharge mechanism, such as spring-pressed plungers resembling plungers 14, may be provided adjacent or in lieu of guide plate 21 to positively remove the conduits from the clamps and move them into a discharge rotor 23, which, like rotor 8, has but a small clearance between its ends and side walls and casing 24. The clearance is maintained sealed by liquid saturant introduced through inlet 25'. Movement of rotor 23 brings the pockets 22 into registry with the clamps discharging the saturated conduits and into registry with discharge chute 25.

Approximately the same amount of saturant is fed to tank 1 as will be absorbed by the conduits and discharged by rotor 23. If by chance more pitch is introduced than the conduits will absorb and the rotor discharge, the level of the saturant may be held constant by withdrawing pitch through float-controlled valve 20. A valve-controlled pitch supply pipe for tank 1 is indicated by the reference numeral 26.

The conveyor 2 may be driven through any suitable drive. One such drive is shown diagrammatically in Fig. 1. Top sprocket 3 is keyed to a shaft 27 having keyed thereon a sprocket 28, over which travels a chain 29. This chain may be driven from a motor (not shown) or other suitable source of power.

Instead of having the tank 1 arranged in a vertical direction with feed and discharge rotors located at the base thereof, the tank may be located in a horizontal direction with the feeder at either the top or bottom, and the discharge rotor in either the bottom or top respectively. In lieu of a rotary type feeder and discharger, reciprocating plunger or caisson-lock type feeders and dischargers sealed against ingress of air may be employed.

As shown in Fig. 3, one side of casing 7 may be provided with an inlet pipe 30' for saturant and the other side with an exit pipe 31'. Side walls 8' of the rotor 8 are formed with apertures 32' registering with pockets in the rotor. As opening 32' of each pocket comes into registry with inlet pipe 30' and exit pipe 31', a stream of saturant, such as pitch, is forced axially through the tube or conduit and about the outer walls thereof, washing the tube. This insures that a relatively clean fibrous conduit is delivered to the body of the saturant maintained in tank 1 and that any entrapped air is washed out of the conduit.

The apparatus of Fig. 1, it will be noted, may be employed for pressure saturation of fibrous conduits. Pressure may be built up in tank 1 by introducing pitch or inert gas into the tank until the desired pressure is created and the conduits passed continuously through the saturant maintained under pressure.

In the apparatus of Fig. 2, an elliptical shaped container having an elliptical shaped passageway 31 is utilized. Cable or chain 32 having seal members 33, preferably of flexible material spaced at regular intervals thereon, is arranged to travel through the elliptical shaped passageway in container 31. Chain 32 may be driven by a sprocket 30 rotated from a suitable source of power. The sprocket is provided with openings 40 into which sealing members 33, connected by the chain, pass as the sprocket rotates. Other driving mechanism for the chain may be employed. Movement of conveyor 32 causes the conduits, preferably disposed with their longitudinal axes in alignment with the longitudinal axis of the passageway, to enter the preliminary drying portion 35 of the passageway. The sealing member indicated on the drawing by reference numeral 36 maintains sealed the passageway with respect to opening 34'. The drying portion 35 comprises a foaming chamber communicating through pipe 41, with condenser 42. The foaming chamber is maintained under vacuum by means of pump 39. It is spaced away from the inlet for the conduits a distance equal to at least the distance between members 33 so that at least one sealing member is disposed within the passageway connecting the inlet with the foaming chamber and the latter thus sealed against the atmosphere. In order to show the parts of the apparatus on a large enough scale so that the drawing can readily be understood, it has been found necessary to show the conduit connecting the inlet and foam chamber, and also the conduit connecting the foam chamber and saturator as having parts thereof broken away. Moisture and occluded gas removed from the conduits pass from the foaming chamber to condenser 42 where condensable constituents are condensed. The foaming chamber may be maintained at atmospheric pressure and may communicate with a second condenser (not shown) by means of valve-controlled pipe 43.

Continued movement of conveyor chain 32 moves the conduits into and through the saturant

in tank 37 in which a substantially constant level of saturant is maintained under vacuum, excess saturant overflowing through valve-controlled line 38 leading to a drain tank or other disposal point. The vacuum is maintained in tank 37 by means of the vacuum pump 39 connected to the tank 37 by a line 41 leading through a condenser 42. Oils coming off from the saturant are condensed in 42 and may be returned to the system or otherwise utilized. Tank 37 is provided with a valve-controlled drawoff 50. The saturated conduits, upon leaving tank 37, are moved through the lower run of passageway 31 to opening 34 where the saturated conduits may be removed. The passageway 31 is made of sufficient diameter to permit the passage of the conduits through the curved portions thereof.

Pitch or other saturant may be continuously introduced into the system by a pump 45 through valve-controlled lines 46, 47, and 48, the pitch introduced being sufficient in amount to completely fill the drying zone of the passageway and maintain a level indicated by the reference number 49. Excess pitch flows off through lines 51 and 52, returning to tank 53 from whence it was pumped into the passageway.

The passage of the conduits through the hot saturant in zone 35 results in the drying of the conduits prior to their introduction into the saturant maintained under vacuum in tank 37. The conduits are maintained in contact with the saturant throughout a prolonged path of movement occasioned by the length of the passageway 31. If desired, conveyor 32 may be arranged to carry the conduits into the evacuated space 55 above the level of pitch so that the conduits are subjected to vacuum out of contact with the pitch between periods of contact with the pitch saturant. A second conveyor may be associated with conveyor 32 and disposed in tank 37 arranged to remove the conduits from conveyor 32, move them up to evacuated space 55, down through the saturant in tank 37, and finally return the conduits to conveyor 31. The level of saturant in container 37 may be changed by moving the overflow up or down to the desired height.

The tank 37 may be made of such height as to require no regulator for the level of pitch; i. e., the pitch may be allowed to rise to its maximum barometric level. In the latter event, the saturating tank 37 will be sealed against air leaks by the pressure of pitch introduced through 47 and the constant level of pitch maintained at 49 and subjected to atmospheric pressure. The pitch forms a liquid seal between the moving members 33 and the passage 31.

Instead of passing the conduits through a body of saturant maintained under vacuum, the saturant may be sprayed onto the conduits while the latter are subjected to vacuum. The apparatus of Fig. 4 may be employed to practice such process. This apparatus is in general similar to that of Fig. 1, except that the conveyor 66 does not pass through a body of saturant. In the apparatus of Fig. 4 a pump 67 is provided for forcing saturant through strainer 75' to sprays 68 which shower the saturant over the conduits. Sprays (not shown) are arranged to direct the saturant axially through the conduits as well as spray the saturant over the conduit walls. Excess saturant falls to the base of tank 1 from whence it is withdrawn by pump 67 and passed back to the sprays 68. Additional saturant may be fed to the intake end of the pump 67 by means of a valve-controlled pipe 69. The level of saturant

in the base of tank 1 is not permitted to rise above a predetermined point by float-controlled valve 70 disposed in a line communicating with the drawoff 71 which leads to a storage tank (not shown). The saturated conduit is delivered to, and removed from, the tank by means of rotors corresponding to those of Fig. 1. The parts of these rotors are identified by like reference characters.

The pockets and clearance space in rotor 7 are filled with saturant introduced through pipe 72' and the inlet to tank 1 is thus sealed against the atmosphere. Saturant is admitted through valve-controlled pipe 73' having an extension 76 to discharge rotor 23. Saturant from the valve-controlled extension 76 fills the pocket corresponding to the pocket indicated by the reference numeral 77, into which the conduit is introduced. Valve-controlled pipe 78 admits saturant to the base portion of the rotor at the point indicated by the reference numeral 79. Thus the pockets and clearance spaces in rotor 23 are filled with saturant and the discharge outlet of tank 1 sealed against the atmosphere.

Conveyor 66, as shown in Fig. 4, is provided with finger-like clamps 72 arranged to be opened by rotatable cam 73 and receive a conduit as indicated at 74. Upon the extremities 75 of clamps 72 leaving cam 73 the clamps are closed by spring pressure or otherwise. Preferably, the clamps are disposed to support both ends of the tubes. When the clamps reach the discharge position, extremities 75 are engaged by rotating cam 73 and the clamps opened permitting the gravitation of the tubes into a pocket of the discharge rotor 23. Positive plunger mechanism for moving the conduits from the clamps to discharge rotor 23 may be employed.

Instead of having the inlet and outlet rotors on opposite sides of tank 1, the inlet and outlet may be on the same side. The conveyors may be fitted with baskets for holding a plurality of conduits in lieu of the clamp for carrying individual conduits depicted on the drawings.

Prior apparatus for saturating conduits required the handling of from 400 to 600 tons of saturant in the system. The apparatus of this invention, for corresponding capacity, will require the use of less than 100 tons of saturant, and consequently, materially reduces the amount of saturant that must be kept in storage and permits relatively more rapid renewal and freshening of the saturant.

By the term "continuous" as used herein, it is intended to include the passage of conduits or other articles to be saturated intermittently, i. e., step-by-step, through the drying and/or saturation zones, the material remaining at rest for predetermined periods of time in its passage therethrough, as well as the non-stop passage of the material through the drying and/or saturation zones.

It will be noted that the apparatus of this invention is continuous, of high capacity, capable of automatic regulation, requires a minimum of saturant for its operation and results in uniformly saturated conduits of improved waterproofness.

It is to be understood that this invention is not restricted to the present disclosure otherwise than defined by the appended claims.

I claim:

1. In apparatus for saturating absorbent articles, in combination, a container for the saturant having an inlet and an outlet for the

articles to be saturated, means for feeding the articles to the inlet of said container, means for mechanically sealing the inlet against the atmosphere, means for discharging the saturated articles through the outlet, means for mechanically sealing the outlet against the atmosphere, and means for creating a vacuum in said container.

2. In apparatus for saturating absorbent articles, in combination, a container for saturant having an inlet and an outlet for the articles to be saturated, means for feeding the articles to the inlet of said container, means for flushing the articles with saturant as they are fed to the inlet of the container, a conveyor disposed within the container and arranged to feed the flushed articles therethrough, means for discharging the saturated articles from the container, and means for creating a vacuum in said container.

3. In apparatus for saturating absorbent articles, in combination, means for flowing a stream of saturant over the articles to flush them, a container for saturant, means for introducing the flushed articles into the saturant in the container and passing it therethrough, means for creating a vacuum in said container, and means for discharging the saturated articles from said container.

4. In apparatus for saturating absorbent articles, in combination, means for flushing the articles with saturant, a container for saturant having an inlet and an outlet for the articles to be saturated, means for feeding the flushed articles to the inlet of said container, means for mechanically sealing the inlet against the atmosphere, means for discharging the saturated articles through the outlet, means for mechanically sealing the outlet against the atmosphere, and means for creating a vacuum in said container.

5. In apparatus for saturating absorbent articles, in combination, means for flushing the articles with saturant, a container for the saturant having an inlet and an outlet for the articles to be saturated, means for feeding the flushed articles to the inlet of said container, means for mechanically sealing the inlet against the atmosphere, means for maintaining a body of saturant in said container with an evacuated space thereabove, means within the container for receiving the flushed articles and carrying them through the saturant in the container, into and through the evacuated space thereabove, means for discharging the saturated articles from the container through the outlet of said container, and means for mechanically sealing the outlet against the atmosphere.

6. In apparatus for saturating absorbent articles, in combination, a container for saturant having an inlet and an outlet, a rotor for feeding individual articles to said inlet, said rotor being enclosed in a casing so that only a small clearance exists between the rotor walls and the casing, means for supplying saturant to the rotor and thus sealing the inlet of said container against the atmosphere, means in said container for receiving the individual articles from said rotor and carrying them through the container to the outlet therefrom, means for mechanically sealing the outlet against the atmosphere, and means for creating a vacuum in said container.

7. In apparatus for saturating absorbent articles, in combination, a container for saturant having an inlet and an outlet, a rotor for feeding individual articles to said inlet, said rotor being

enclosed in a casing so that only a small clearance exists between the rotor walls and the casing, means for supplying saturant to the rotor and thus sealing the inlet of said container against the atmosphere, means in said container for receiving the individual articles from said rotor and carrying them through the saturant in said container to the outlet, a discharge rotor enclosed in the casing so that only a small clearance exists between the rotor walls and the casing, said discharge rotor receiving the articles from the conveying means in said container, said clearance being filled with saturant so that the discharge outlet of said container is sealed against the atmosphere, and means for creating a vacuum in said container.

8. In apparatus for saturating fibrous conduits, in combination, a container for saturant having an inlet and an outlet, a rotor for feeding individual fibrous conduits through said inlet, said rotor being enclosed in a casing so that only a small clearance exists between the rotor walls and the casing, means for flushing the fibrous conduits carried by the rotor and for supplying saturant to the rotor and thus sealing the inlet to said container against the atmosphere, a conveyor in said container for receiving the individual conduits from said rotor, means for receiving the saturated conduits from the conveyor and removing them from the container through the outlet thereof, means for mechanically sealing the outlet against the atmosphere, and means for creating a vacuum in said container.

9. In apparatus for saturating fibrous conduits, in combination, a container for saturant having an inlet and an outlet, a rotor for feeding individual fibrous conduits through said inlet, said rotor being enclosed in a casing so that only a small clearance exists between the rotor walls and the casing, means for flushing the fibrous conduits carried by the rotor and for supplying saturant to the rotor and thus sealing the inlet to said container against the atmosphere, a conveyor in said container for receiving the individual conduits from said rotor, a discharge rotor communicating with the outlet from said container for receiving the saturated conduits from the conveyor and removing them from the container, said discharge rotor being enclosed in a casing so that only a small clearance exists between the rotor walls and the casing, said clearance being filled with saturant so that the discharge outlet of said container is sealed against the atmosphere, means for creating a vacuum in said container above the level of saturant therein, said conveyor in the container being arranged to carry the fibrous conduits through the evacuated space above the level of saturant therein, and means for maintaining a substantially constant level of saturant in said container.

10. In apparatus for saturating absorbent articles in combination, means in which there is formed a passageway, means disposed within the passageway provided with sealing members for moving articles through the passageway, a saturating tank communicating with said passageway, means for maintaining pressure conditions within said tank and means for supplying saturant to said tank and passageway, said saturant in said passageway cooperating with said sealing members to maintain said pressure conditions within said tank.

11. In apparatus for saturating absorbent articles, in combination, means in which there

is formed an endless passageway, an endless member moving within said passageway provided with spaced sealing members for the passageway, said sealing members being arranged to contact with the articles to be saturated to move them through the passageway, and means for supplying liquid saturant to the passageway, said liquid saturant cooperating with the sealing members to provide liquid seals.

12. In apparatus for saturating absorbent articles, in combination, means in which there is formed an endless passageway, an endless member moving within said endless passageway provided with spaced sealing members for the passageway, said sealing members being arranged to contact with the articles to be saturated and to move them through the passageway, means for supplying saturant to the passageway, a saturating tank communicating with the passageway, and means for creating a vacuum in said tank.

13. In apparatus for saturating absorbent articles, in combination, an elliptical-shaped passageway comprising upper and lower runs, an endless member moving through said passageway, provided with spaced sealing members, a loading stage communicating with said passageway for supplying fibrous conduits thereto, a foaming chamber communicating with the upper run of said passageway, a saturating tank communicating with the upper run of said passageway, means for supplying saturant to the passageway and tank, and means for creating a vacuum in said saturating tank and foaming chamber.

14. In apparatus for saturating fibrous conduits, in combination, a container having an inlet and an outlet, a rotor for feeding fibrous conduits to said inlet, said rotor being enclosed in a casing so that only a small clearance exists between the rotor walls and the casing, means for supplying saturant to the rotor and thus sealing the inlet of said container against the atmosphere, a conveyor disposed within the container, arranged to receive fibrous conduits from the rotor to carry them through the container, means disposed in the top of the container for spraying saturant over the conduits, means for maintaining a substantially constant level of saturant in the bottom of the container beneath the conveyor, means for passing the saturant from the base of the container to the sprays disposed at the top of the container, a discharge rotor for receiving the saturated fibrous conduits from the conveyor, and means for creating a vacuum in said container.

15. In apparatus for saturating absorbent articles, in combination, a container for the saturant having an inlet and an outlet for the articles to be saturated, means for feeding the articles to the inlet of said container, means for mechanically sealing the inlet against the atmosphere, means for discharging the saturated articles through the outlet, means for mechanically sealing the outlet against the atmosphere, and means for maintaining a pressure other than atmospheric in said container.

16. In apparatus for saturating fibrous conduits, in combination, a container for the saturant having an inlet and an outlet for the conduits to be saturated, means for feeding conduits to the inlet of said container, means for mechanically sealing the inlet against the atmosphere, a conveyor in said container for receiving said conduits from said feeding means and for carrying the conduits through the saturant in said con-

tainer, means for discharging the saturated conduits through the outlet, means for mechanically sealing the outlet against the atmosphere and means for creating a vacuum within said container.

5 17. In apparatus for saturating individual fibrous articles, a container provided with an inlet, means for successively feeding a plurality of articles to be saturated, means for maintaining a
10 body of saturant with an evacuated space thereabove in the container, means within the contain-

er for moving the articles through the body of saturant into and through the evacuated space and then into the body of saturant, means to receive the articles from said feeding means and deliver the articles through the inlet to the feed- 5 ing means within the container, said article receiving means providing a seal for the said inlet, and means for discharging the saturated articles from the container.

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