Oct. 12, 1937. P. JENNY ET AL 2,095,550

SYSTEM FOR TREATING YARN OR THE LIKE

Filed Feb. 16, 1934 5 Sheets-Sheet 1

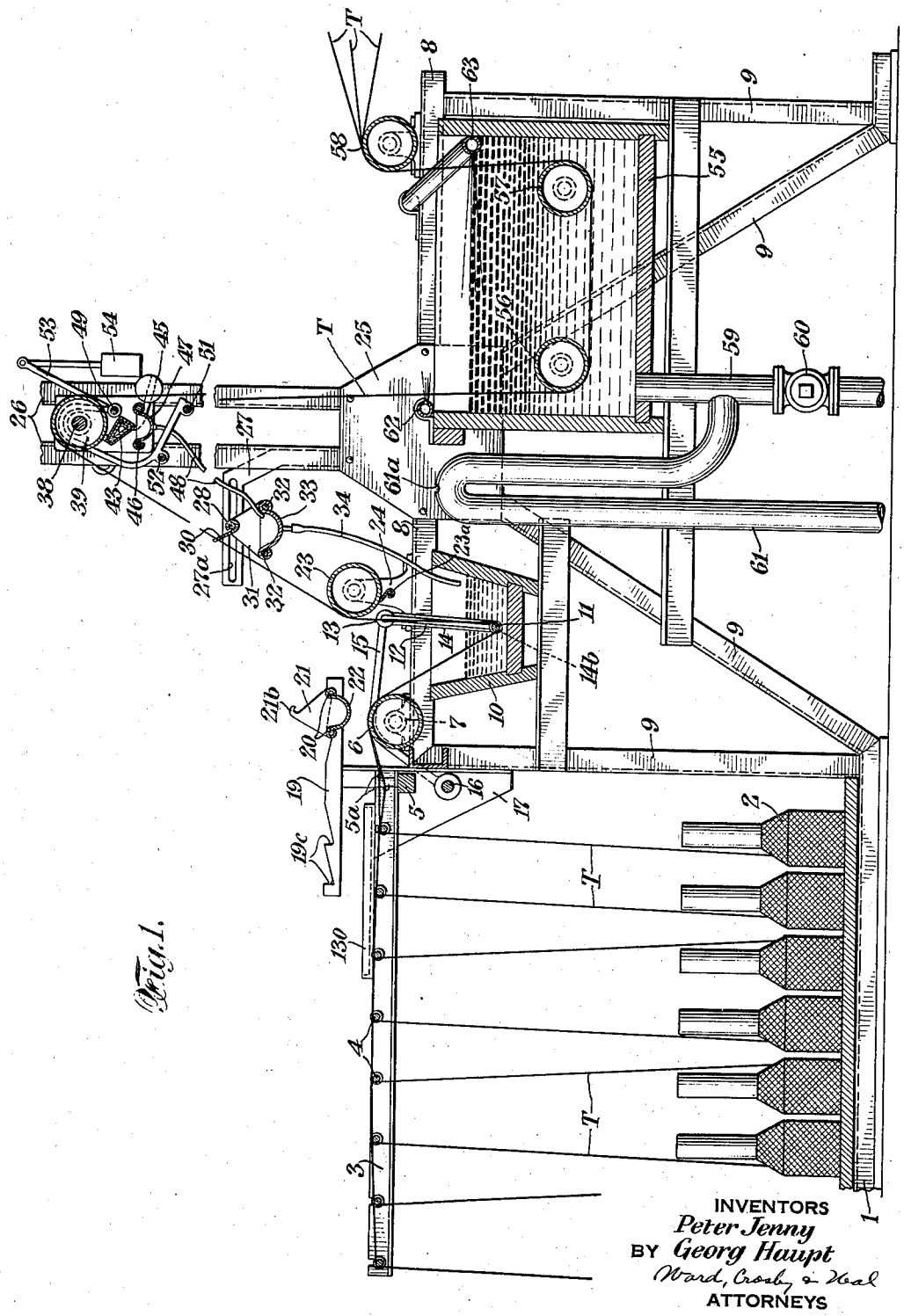


Fig. 1.

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SYSTEM FOR TREATING YARN OR THE LIKE

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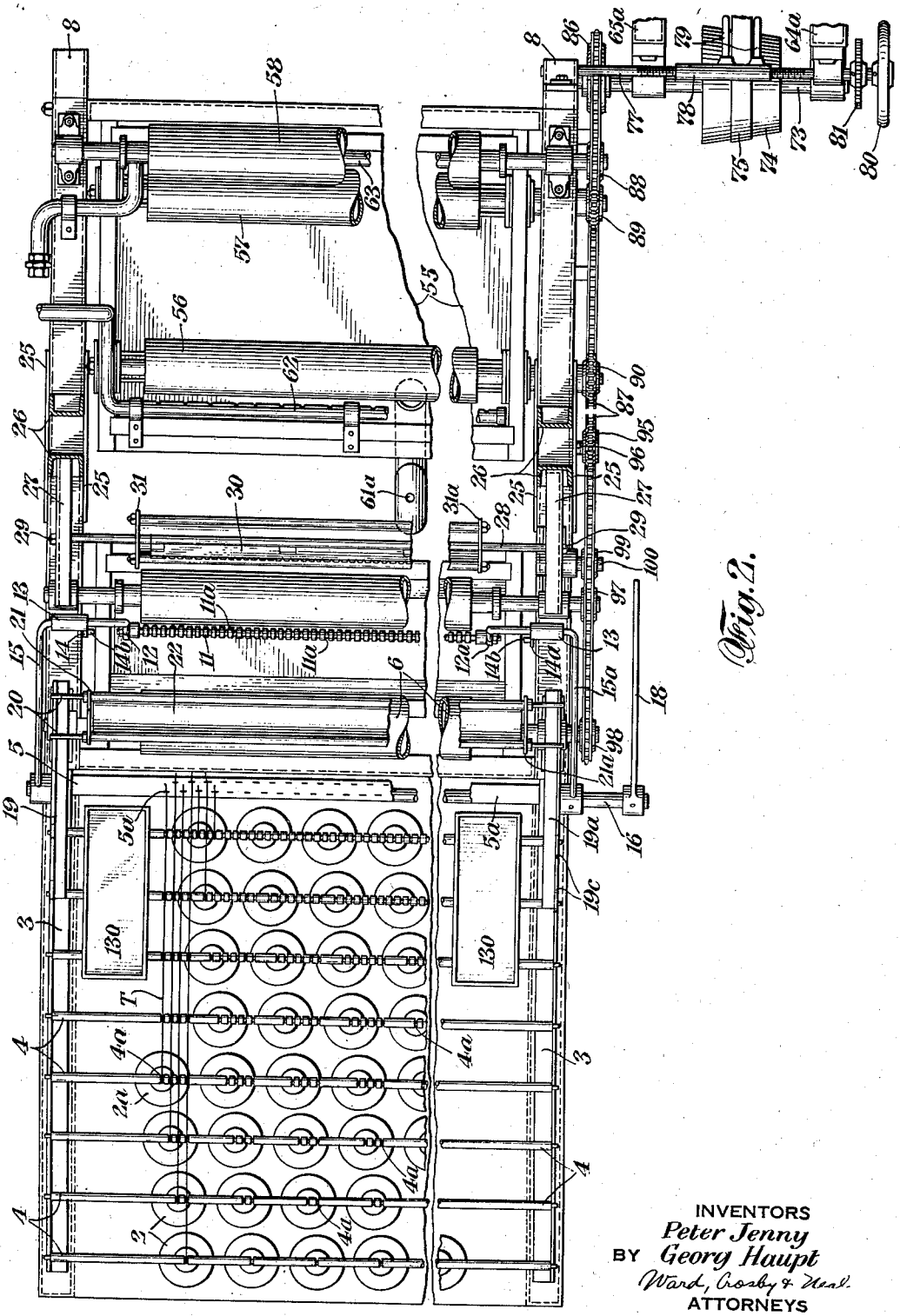


Fig. 2.

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SYSTEM FOR TREATING YARN OR THE LIKE

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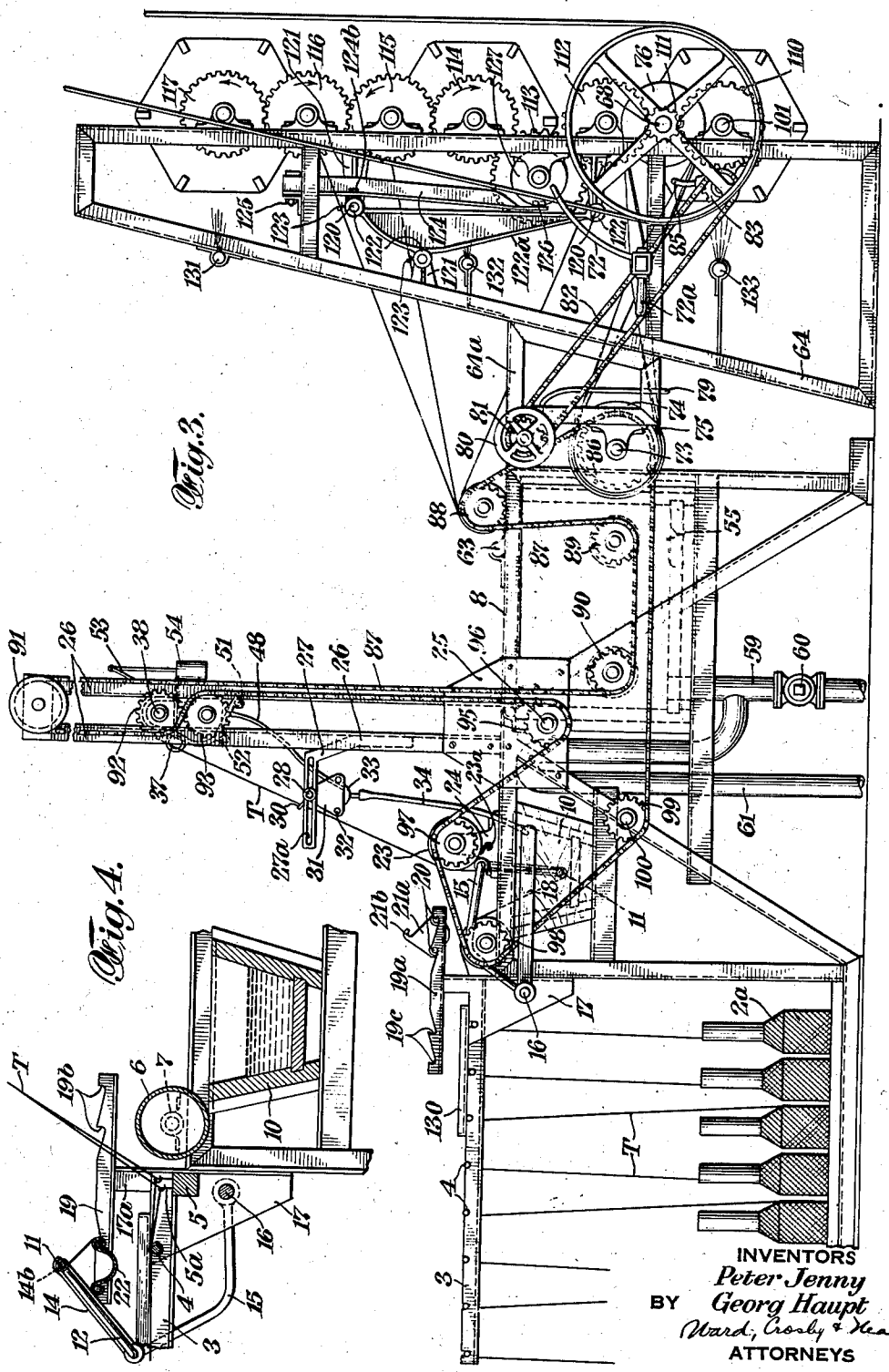


Fig. 3.

Fig. 4.

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SYSTEM FOR TREATING YARN OR THE LIKE

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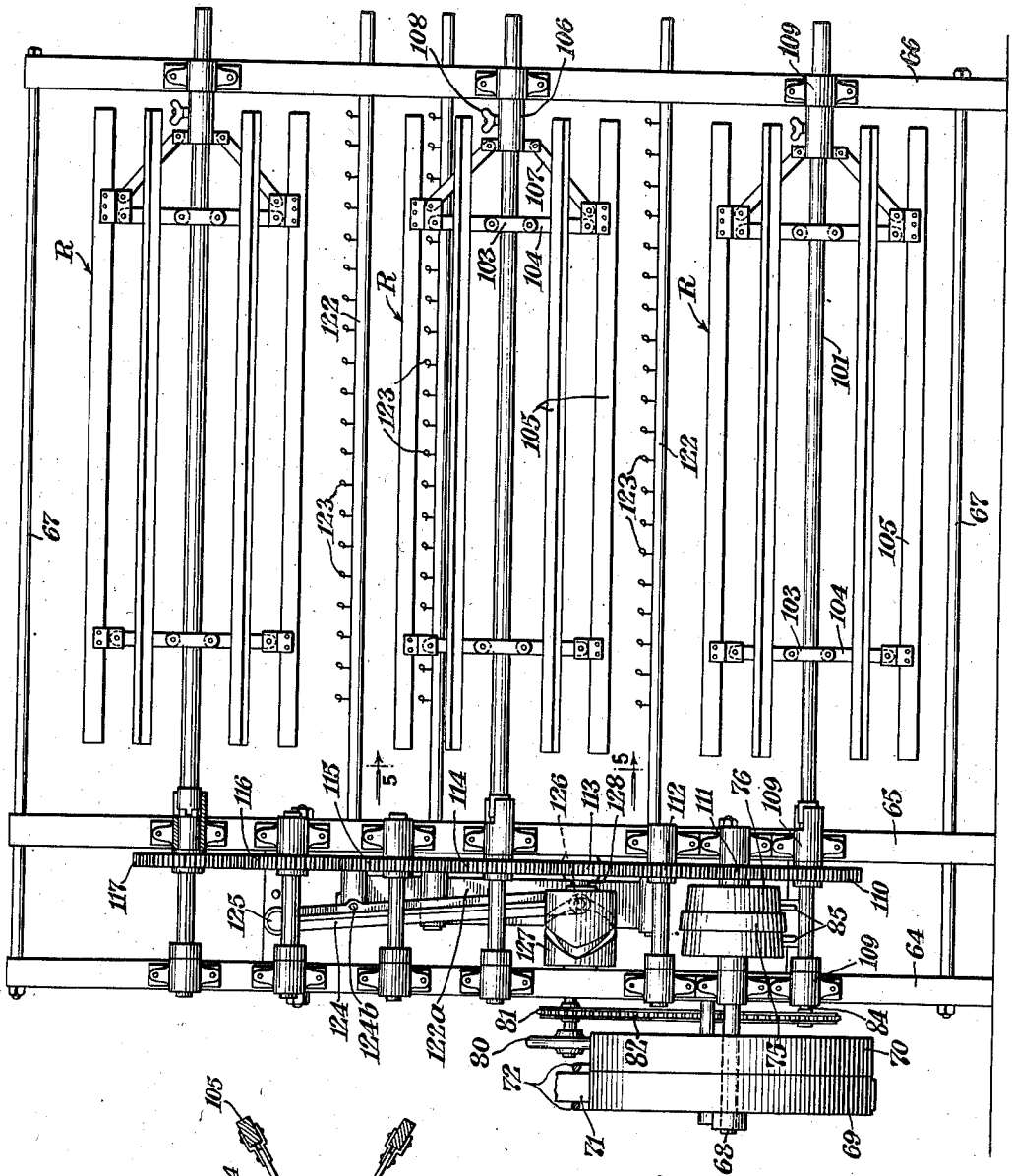


Fig. 5.

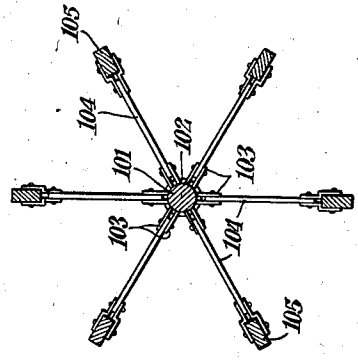


Fig. 6.

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SYSTEM FOR TREATING YARN OR THE LIKE

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Fig. 7.

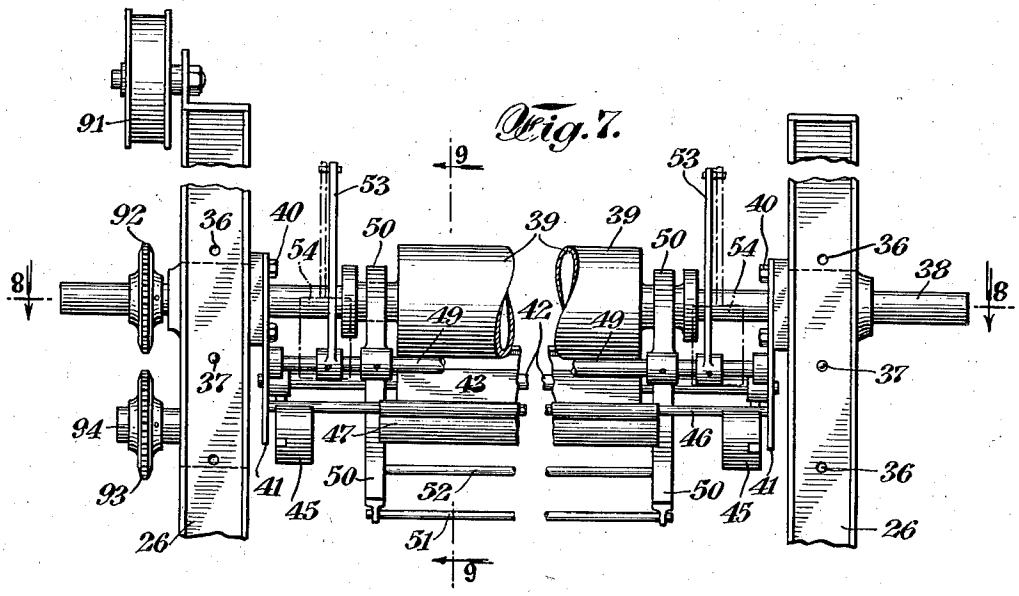


Fig. 8.

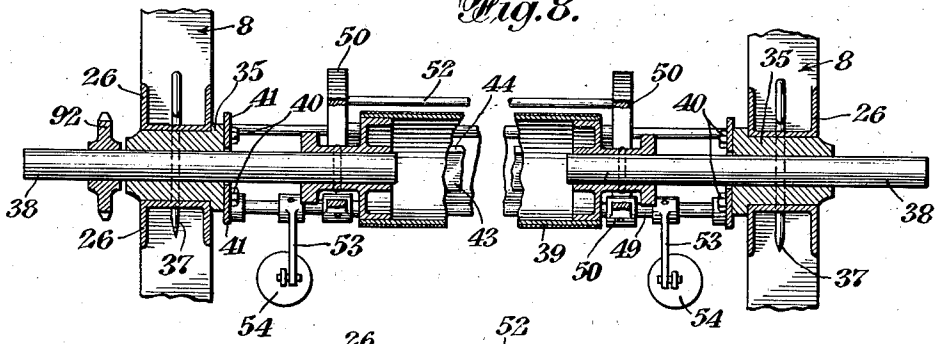
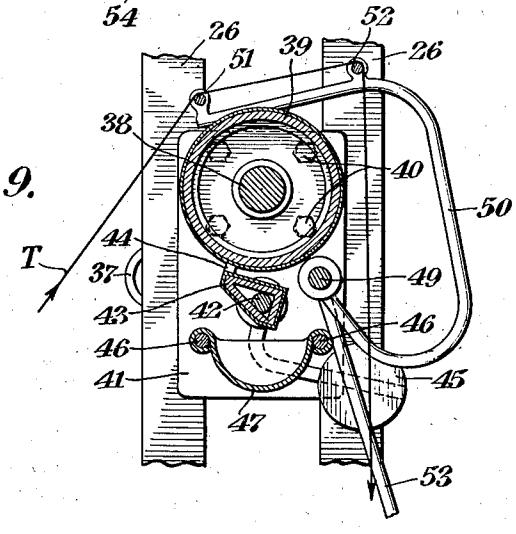


Fig. 9.



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Patented Oct. 12, 1937

2,095,550

UNITED STATES PATENT OFFICE

2,095,550

SYSTEM FOR TREATING YARN OR THE LIKE

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Application February 16, 1934, Serial No. 711,472

3 Claims. (Cl. 8—19)

Our invention relates to a machine for impregnating thread-like or strand-like material such as yarn with a reagent or other treating material.

In accordance with the invention, a plurality of threads or strands in spaced side-by-side relation are conveyed or passed through an impregnating bath and subsequently wiped or treated for the removal of impregnating material without recourse to undesired squeezing of the threads which would deform them.

Various other advantages, characteristics and features of our invention will become apparent from the following detailed description taken in connection with the accompanying drawings.

The apparatus herein described and claimed may be employed for practicing the process claimed in copending application Serial No. 711,471, filed February 16, 1934.

For an understanding of our invention and for an illustration of one of the preferred forms thereof, reference is to be had to the accompanying drawings, in which:

Figure 1 is a vertical sectional view, partly in elevation, of a machine constructed in accordance with our invention;

Fig. 2 is a plan view, partly in section and partly broken away, of the machine shown in Fig. 1;

Fig. 3 is an elevational view of the complete machine;

Fig. 4 is an enlarged vertical sectional view, partly in elevation, of a part of the machine;

Fig. 5 is a transverse vertical sectional view, partly in elevation, and is taken on the line 5—5 of Fig. 6;

Fig. 6 is an elevational view, partly in section, of a part of the machine;

Fig. 7 is an enlarged elevational view of a part of the mechanism shown in Figs. 1 and 3;

Fig. 8 is a horizontal sectional view, partly in plan, and is taken on the line 8—8 of Fig. 7 looking in the direction of the arrows; and

Fig. 9 is a transverse vertical sectional view, partly in elevation and is taken on the line 9—9 of Fig. 7 looking in the direction of the arrows and with some of the parts in different positions.

Referring to the drawings, 1 represents a suitable support upon which are mounted a plurality of bobbins 2 disposed in transverse rows as shown in Fig. 2. As shown, a thread T or the like extends vertically from each of said bobbins 2. A pair of spaced, parallel members 3 are supported in suitable manner at the respective opposite sides of the group of bobbins 2, and these members 3 carry a plurality of spaced bars 4 of rust-proof steel or the like, each bar 4 being disposed directly above a row of the bobbins 2 as shown in Fig. 2.

In accordance with the invention, the bars 4 are adapted to support and maintain the threads T in spaced, side-by-side or substantially parallel relation as they pass longitudinally of the machine. To this end, the arrangement may be such as illustrated in Fig. 2 wherein the longitudinal rows of upstanding bobbins 2 are shown as disposed parallel with respect to each other and angularly related with respect to the bars 4. The latter are provided with a plurality of spaced, peripheral grooves 4*a* and, in each instance, there is a groove 4*a* directly above one of the bobbins 2. Thus, a groove 4*a* is disposed directly above the bobbin 2*a*, Fig. 2, the thread T of said last named bobbin riding in a part of this groove. This last named thread T extends from left to right, Fig. 2, substantially at right angles with respect to the bars 4 and rides in grooves formed in the respective bars. The guiding arrangement for the other threads is similar to that described and accordingly, as will be obvious, all of said threads pass through the respective grooves 4*a* in the bar 4 at the right, Fig. 2, in spaced, substantially parallel relation.

Beyond the bar last named, the threads T pass, respectively, through spaced eyelets 5*a* of a suitably supported member 5 and then over a driven roller 6 mounted in bearing brackets 7 supported by the respective side frame members 8 of the machine, said frame members 8 being supported by the uprights or braces 9.

Beyond the roller 6, the threads T pass downwardly and then upwardly through the vat 10. Disposed adjacent the bottom of said vat 10 and around which the threads T pass is a bar 11 of glass, or equivalent, provided with spaced, peripheral grooves 11*a* for receiving the respective threads T and maintaining them in substantially the same parallel relation as described above in connection with the bars 4 and eyelets 5*a*.

In accordance with the invention and as shown in Figs. 1–4 inclusive, the bar 11 is supported by rods 12, 12*a* which extend upwardly and then laterally for connection to the respective sockets 13. Depending from said sockets 13, respectively, are rods 14, 14*a* having lugs 14*b* projecting from the lower ends thereof. Extending from the respective sockets 13 are rods 15, 15*a* which terminate in collars pinned to a shaft 16 supported in brackets 17 carried by the machine framework, the shaft 16 having an actuating handle 18 at one end thereof.

Suitably supported as, for example, by mem-

bers 17a upstanding from the brackets 17 are angle members 19, 19a each having a vertical section formed, adjacent one end, with a pair of pockets 19b and, adjacent its other end, with a pair of pockets 19c. As shown in Fig. 2, a pair of parallel rods 20 are resting in the respective pockets 19b. These rods 20, adjacent their ends, support upstanding plate sections 21, 21a each of which has a hook section 21b utilizable as hereinafter described. The rods 20 form the main support for a trough 22 which extends transversely of the machine as clearly illustrated in Fig. 2 and which is open at its ends.

After leaving the vat 10, the threads T pass upwardly over a driven roller 23, the actuating shaft for which is mounted in brackets 24 upstanding from the respective frame members 8.

Secured to each of the frame members 8 midway between the ends thereof are pairs of plates 25, each of which supports a standard formed by a pair of angle irons 26. Thus, at opposite sides of the machine, there are upstanding standards and, from each, a suitably supported bracket 27 projects in a lateral direction.

Each bracket 27 is slotted as indicated at 27a and these slots receive the opposite, respective ends of a rod 28. Each end of said rod 28 carries a nut 29 whereby the rod may be clamped in a desired adjusted position along the bracket 27. The rod 28 carries an inclined plate 30 provided at the end thereof with a series of spaced notches the same in number as the threads T and through which said threads are adapted to pass respectively. The rod 28 also carries a pair of spaced plates 31, 31a which, in turn, support a pair of rods 32 utilizable for supporting a trough 33 which has a discharge conduit 34 leading into the vat 10.

Referring now to Figs. 7 and 8, each set of the upstanding angle irons 26 is shown as supporting a block 35. The blocks 35 are vertically adjustable and maintainable in adjustable positions in any suitable manner. To this end, each set of angle irons 26 may be provided with transverse passages 36 with which similar passages in the blocks 35 may be alined respectively. Thus, as shown in Fig. 7, the block passages are in alinement with a set of the passages 36 at the same level, and in these alined passages, the respective prong members 37 are disposed whereby the blocks 35 are maintained in desired adjusted positions. Obviously, the members 37 may be removed and the blocks 35 moved downwardly until the passages therethrough aline with the respective lower passages 36 whereupon said members 37 may be reinserted to positively retain the blocks 35 in their lower positions.

A shaft 38 is rotatably mounted in the blocks 35 and this shaft carries a roller 39 with which the threads T coact in the manner hereinafter described.

Suitably secured, as by bolts 40, to the blocks 35 are the respective plates 41 which carry a transverse rod 42, Fig. 9. Oscillatable on the rod 42 is a member 43 which comprises a wiper member 44 coactable with the roller 39. The member 43 and its wiper member 44 are suitably biased in a clockwise direction, Fig. 9, as by the eccentrically disposed weights 45 and, accordingly, the wiper member 44 is maintained in contact with the roller 39. A pair of rods 46 extend between and are supported by the plates 41, these rods 46 carrying a trough 47 which is disposed beneath the wiper member 44. A discharge conduit 48 leads from the trough 47 and opens into the trough 33.

The plates 41 also carry an oscillatable shaft 49 to which a pair of spaced, curved arms 50, 50 are suitably secured. These arms, near their ends, carry a pair of spaced bars 51 and 52 formed from copper, or equivalent, which are engaged by the threads T in the manner hereinafter described. The shaft 49 also carries a pair of spaced arms 53, 53 to each of which a weight 54 is secured. As clearly appears from a consideration of Fig. 1, the arms 50 are so curved that, in one position thereof, they closely embrace a part of the shaft 38 while the curved end sections thereof lie beneath said shaft. The relation is such that the arms 50 remain in this position without application of a restraining force thereto, but are movable from said position in response to downward movement imparted to the weights 54. Movement of the character last noted causes the parts to assume the relation shown in Fig. 9 wherein the bars 51 and 52 are disposed above the roller 39. As will be obvious, the weights 54 automatically cause the various parts to remain in the position of Fig. 9 without application of a restraining force other than the stop effect of one of the rods 46 upon the arms 53.

Suitably supported by the framework of the machine is a tank or vat 55. Adjacent the bottom of said tank 55, a pair of spaced rollers 56 and 57 are supported for free rotatable movement. The threads T pass downwardly into the tank 55, partly around and beneath the rollers 56, 57, then upwardly and over a roller 58 supported by brackets carried by the respective frame members 8.

The tank 55 may be drained by a pipe 59 controlled by a valve 60. Connected to the pipe 59 is a pipe 61 formed with an inverted U-bend vertically disposed at one side of said tank 55, the U-bend, at the top thereof, being formed with a vent opening 61a. With the valve 60 closed, it will be obvious that the liquid level in the tank 55 remains as indicated in Fig. 1, that said tank drains through the pipe 61 and that the latter, by reason of its U-section, prevents said tank 55 from overflowing.

As illustrated in Figs. 1 and 2, one or more spray pipes 62 and 63 may be associated with the tank 55 the former directing a liquid spray toward the threads T as they enter said tank, and the latter directing a spray toward the threads as they leave the tank. As shown in Fig. 2, the pipes 62 and 63 may be provided with intake sections leading to any suitable source of supply, not shown.

Referring now to Fig. 6, a plurality of spaced frame members 64, 65, and 66 are shown as maintained in vertical upright relation by tie members 67. A driven shaft 68 is journalled in the frame members 64, 65, and this shaft carries a fixed pulley 69 and a loose pulley 70, the fixed pulley being driven by a belt 71 operated by any suitable source of power, not shown, and the belt being shiftable to the loose pulley by a belt shifter 72 pivoted on a part of the frame member 64 and operated by a handle section 72a, Fig. 3.

The frame members 64 and 65 have frame extensions 64a, 65a secured respectively thereto and these frame extensions form bearings for a shaft 73 which carries a conical pulley 74. A belt 75 engages the pulley 74 and this belt leads to a second conical pulley 76 which is mounted on the aforesaid shaft 68, Fig. 6.

Rotatably mounted in the frame extension 64a

and in the adjacent frame member 8 is a rod 77 having a sleeve 78 threaded thereto. The sleeve 78 carries a pair of spaced prong members 79 which extend downwardly at opposite sides, respectively, of the belt 75, Figs. 2 and 3. The rod 77 carries an operating hand wheel 80 and a sprocket wheel 81. The latter has an endless chain 82 meshing therewith, said chain leading to and meshing with a second sprocket 83 mounted on a suitably journalled stub shaft 84 which has threaded thereto a sleeve corresponding with the hereinbefore described sleeve 78. This sleeve of the shaft 84 carries a pair of spaced prong members 85 which extend upwardly at opposite sides, respectively, of the belt 75.

The pulleys 74 and 76 are disposed in parallel relation and face in opposite directions. Accordingly, the hand wheel 80 may be rotated to move the sleeve 78 in one direction or the other transversely of the shaft 77 whereby, by the prong members 79, the belt 75 is moved transversely with respect to the pulley 74. At the same time, due to the operation of the chain 82, said belt 75, by the prong members 85, is moved in the same direction transversely of the pulley 76. In this manner, the rotative speed of the pulley 74, under the driving influence of the pulley 76, may be varied in a desired manner.

The aforesaid shaft 73 carries a sprocket wheel 86 which serves as a driving member for an endless chain 87. This chain passes over and partly around a sprocket wheel 88 carried by the shaft of the roller 58, beneath and partly around sprocket wheels 89 and 90 carried, respectively, by the shafts of the rollers 57 and 56, over and partly around an idler roll 91 carried at the top of one of the uprights 26, partly around a sprocket wheel 92 carried by and rotatable with the shaft 38, partly around an idler sprocket wheel 93 rotatable on a stub shaft 94 carried by the aforesaid upright 26, Fig. 7, partly around an idler sprocket wheel 95 rotatable on a stub shaft 96 supported by one pair of the plates 25, partly around a sprocket wheel 97 carried by the shaft of the roller 23, partly around a sprocket wheel 98 carried by the shaft of the aforesaid roller 6, and partly around a sprocket wheel 99 rotatable on a stub shaft 100 carried by one of the members 9, said chain 87 passing from the sprocket wheel 99 to the aforesaid sprocket wheel 86.

The aforesaid frame members 65 and 66 are adapted to support a plurality of reels R, Figs. 3 and 6. In accordance with a preferred form of the invention, each of these reels comprises a shaft 101 having a pair of spaced collars 102 secured thereto in suitable manner. Each collar 102 has a plurality of sets of radially extending brackets 103 and each bracket carries a pivoted arm 104. As clearly appears, each arm 104 of a collar 103 is in alinement, longitudinally of the shaft 101, with an arm 104 of the other collar 103 and each pair of the arms 104 thus longitudinally alined carries a bar 105. Slidable on each shaft 101 is a collar 106, Fig. 6, to which, radially thereof, a plurality of links 107 are pivoted, these links also being pivotally connected to the outer ends of the respective arms 104 of the adjacent collar 102. As shown, a set screw 108 may be utilized for securing any collar 106 in the position shown in Fig. 6. Under such circumstances, the various arms 104 are maintained in vertical upright position and the bars 105 are held in their fully extended positions with respect to the adjacent shaft 101.

As shown in Fig. 6, three of the reels R are provided, these reels being mounted in superposed vertical relation. The shafts 101 for the respective lower, intermediate and upper reels R together with the operating shafts therefor are mounted in sets of bearing brackets 109 carried, respectively, by the frame members 64, 65, and 66. A shaft alined with and to which the lower shaft 101 is detachably connected carries a pinion 110 which meshes with and is driven by a pinion 111 carried by the hereinbefore described driven shaft 68. The pinion 111 also operates another pinion 112 which, by a pinion 113, operates a pinion 114 carried by a shaft alined with and with which the shaft 101 of the intermediate reel R is detachably associated. The last named pinion drives a pair of meshing pinions 115 and 116, the latter operating a pinion 117 carried by a shaft alined with and with which the shaft 101 of the upper reel R is detachably connected. As clearly appears from a consideration of Figs. 3 and 6, rotation of the driving pinion 111 in a clockwise direction, Fig. 3, causes, by the described pinion operating arrangement, similar clockwise movement of the lower and intermediate reels R, and counter-clockwise movement of the upper reel R.

In Fig. 3, a plurality of rods 120 are shown as mounted on brackets 121 extending laterally from the frame members 65 and 66. Slidable longitudinally on each of these rods 120 is a sleeve 122 and each of those sleeves has a plurality of spaced eyelets 123 upstanding therefrom. The sleeves 122 are connected together by a frame 122*a* and this frame is suitably connected, as at 124*b*, to a lever 124 mounted for oscillatory movement on a suitably supported pivot 125. The lever 124 has a laterally projecting cam follower 126 which coacts with the groove of a cam 127 mounted on the shaft 128 of the aforesaid pinion 113.

It follows, therefore, that rotation of the pinion 113 imparts similar rotative movement to the cam 127 whereby oscillatory movement is imparted to the lever 124. As a result, the frame 123 and the thereto-connected sleeves 122 are reciprocated in a direction substantially parallel to the longitudinal axes of the reels R.

The operation is as follows:

With the belt 71 on the pulley 69, operation of said belt effects rotation of the shaft 68. Rotation of the shaft last named causes rotative movement to be imparted to the shaft 73 by the endless belt 75. The shaft 73 carries the sprocket wheel 86 with which meshes the hereinbefore described endless chain 87 which, when operated by the sprocket wheel 86, effects rotation of the various hereinbefore described rollers 58, 57, 56, etc. under the control of the respective sprocket wheels 88, 89, 90, etc.

Rotation of the shaft 68 also effects slow rotation of the reels R and the cam 127 under the control of the pinion 111 in the manner hereinbefore described. As stated, the pinion 111 is included in the driving connection of the intermediate reel R and this pinion operates the cam 127 whereby reciprocatory movement is imparted to the sleeves 122.

As hereinbefore described, all of the threads T pass from the rinsing tank 55 over the roller 58. In accordance with the form of the invention described herein, the total number of threads T leaving the roller 58 are allotted to the various reels R in substantially equal proportions. That is, when three reels R are provided, about one-

third of the threads T pass to each of said reels. Accordingly, approximately one-third of the threads T pass, respectively, through the upper eyelets 123, Fig. 6, and are wound upon the upper reel R. Another one-third of the threads T pass, respectively, through the intermediate eyelets 123 and are wound upon the intermediate reel R. The remaining one-third of the threads T pass through the lower eyelets 123 and are wound upon the lower reel R.

Under normal operating conditions, the threads T, while maintained in non-contacting relation, pass over the roller 6, downwardly through the treating material in the vat 10, partly around the bar 11, upwardly through the vat 10, over the roller 23, through the respective notches of the plate 30, over the roller 39, downwardly into the vat 55 which contains a suitable rinsing liquid, partly around the rollers 56 and 57 in said vat 55, upwardly from the vat, and then over the roller 58. From said roller 58, the threads T pass to the various reels R in about the proportion for each reel as hereinbefore described.

A single source of power, i. e., that applied to the shaft 68 is utilized for rotating the reels and the various rollers. With these parts properly synchronized, it will be obvious that any section of a yarn thread T passes from bobbin to reel in a uniform manner and at a substantially constant rate of speed.

After the side-by-side threads T leave the vat 10, they contact first with the roller 23 and then with the surfaces defining the notches in the plate 30. The roller 23 removes a part of the entrained liquid from the threads T and this liquid, in turn, is removed from said roller 23 by the wiper member 23a, the liquid thus removed dropping back into the vat 10. The notched plate 30 functions to guide the threads T laterally and the notches of said plate also serve the purpose of wiping additional quantities of the entrained liquid material from said threads T, the material thus removed passing into the trough 33 and thence to the vat 10 by way of the discharge conduit 34. Beyond the plate 30, the threads T come into engagement with the roller 39 which serves to remove more of the entrained material from said threads. The wiper member 44 removes this liquid material from the roller 39, such material passing into the trough 47 and eventually reaching the vat 10 by way of the conduit member 48, trough 33 and conduit member 34.

The arrangements described immediately above for removing the entrained material from the threads T constitute important features of my invention. In the manner described, the entrained material of the vat 10 is removed to a substantial extent from the threads T without recourse to thread squeezing. It follows, therefore, that said threads T are not deformed or distorted in an undesirable manner.

Another important feaure of the invention relates to the disclosed arrangement for removing the threads from the treating material in the vat 10 and also from the roller 39 when the machine is stopped for any length of time. To this end, the operator swings the handle 18 in the counterclockwise direction, Fig. 3, to thereby swing the shaft 16, rods 15, 15a, sockets 13, rods 14, 14a, rods 12, 12a and bar 11 from the respective positions shown in Fig. 3 to those positions shown in Fig. 4. In so doing, the lugs 14b of the respective rods 14, 14a come into engagement with hook sections 21b of the respective plates 21, 21a. It results, therefore, that the above described swinging movement of the rods 14, 14a causes the trough 22 to be moved from the position shown in Fig. 3 to that shown in Fig. 4. At this time, the bars 51 and 52 may be moved to the position shown in Fig. 9 whereby the threads are elevated above the roller 39.

Thus, with the parts positioned as shown in Fig. 4, the threads T are disposed tautly between the eyelets 5a and the thread-supporting bars 51 and 52 at the upper end of the standards 26. When thus tautly positioned, the threads T are removed from the treating material in the vat 10 and, moreover, these threads clear the roller 23 and the notched plate 30.

As the trough 22 is moved from right to left to the position shown in Fig. 4, it remains under the bar 11 and receives the liquid material that drips therefrom. This material passes from the open ends of the trough 22 into the pans 130 which may be suitably supported, for example, just above the bars 4 as shown in Figs. 1, 2, and 3. By virtue of the arrangement just described, drippings from the bar 11 are prevented from passing to the dry thread sections which as yet have not been immersed in the treating material in the vat 10.

With the parts positioned as shown in Fig. 4, they may be returned to the position of Fig. 3 by swinging the handle 18 clockwise to the position shown in Fig. 3. As a result, the bar 11 is returned to the bottom of the vat 10 and the trough 22 is shifted back to the position shown in Fig. 3.

Under normal operating conditions, the hereinbefore described bars 51 and 52 are positioned as shown in Fig. 1. As stated, however, these rods may be moved to the position shown in Fig. 9 and, when thus positioned, they engage the thread sections and hold the same removed from the roller 39.

Another important feature of the invention resides in the fact that the height of the roller 39 may be varied. This is accomplished by removing the prong members 37, moving the blocks 35 either upwardly or downwardly as may be desired, and then repositioning said prong members 37 in the standards 26 and block members 35. In this manner, the time which elapses while a given thread section passes from the vat 10 to the rinsing tank 55 may be varied to prolong or shorten the treating period whereby the appearance and/or structural character of the treated threads may be controlled as desired. It is desirable that the machine include some such arrangement for varying the duration of the treating period and, moreover, it is preferable that this be accomplished without changing the speed of thread movement.

After the threads leave the roller 39, they pass downwardly and are subjected to an initial rinsing action by liquid sprayed from the pipe 62, when and if utilized. Thereupon the threads pass through the liquid of the rinsing tank and, during upward passage from said tank, said threads may again be subjected to an indirect spraying action by liquid ejected from the pipe 63.

As shown in Fig. 3, it may be desirable to provide pipes 131, 132, and 133 which are supported by the frame sections 65 and 66. From these pipes, liquid is sprayed toward the thread skeins as the latter are built up on the respective reels R.

As stated above, the threads T, after leaving the roller 58, are separated into three groups

and these traverse the respective upper, intermediate and lower sets of eyelets 123. Since these groups of eyelets are reciprocatory, it results that the threads are wound upon the reels R in skein formation. After these skeins have become sufficiently large, the machine may be stopped and, by a suitable arrangement, the reels R may be removed therefrom and then said reels may be collapsed, after loosening of the respective set screws 108, to effect removal of the skeins. Alternatively, the reels R with the skeins thereon, may be removed and, before said reels are collapsed, the skeins while on the reels may be further treated in a centrifuge washing apparatus, or equivalent.

As is obvious, the handle 72*a* may be actuated whenever it becomes desirable to shift the driving belt 71 from the driving pulley 69 to the idler pulley 70.

As the thread builds up on the reels the thickness of the thread layer increases. This increases the peripherial speed of the thread covered reels and hence the speed of thread passing to the reels.

By rotating the hand wheel 80, the belt 75 may be shifted on the conical pulleys 74 and 76 to vary the speed of the rollers driven by the endless chain 87 with respect to the speed of the reels R. This arrangement is provided so that the tension of the thread sections between the impregnating tank 55 and the reels R may be varied in a desired manner to obviate breakage of the threads.

For the purpose of this description, it may be assumed that the threads T are of vegetable fibrous material, such as mercerized cotton, and that the treating material in the vat 10 is sulfuric acid. When these mercerized cotton threads are passed through the acid bath in spaced, side-by-side relation as illustrated, swelling action occurs without deformation of the threads by contact with one another. Thereafter, the acid treating material is removed from the threads without recourse to a squeezing action, i. e., by action of the roller 23, plate 30, and roller 39. The threads, after completion of the operation disclosed in this application, are of permanently stiff character resembling horsehair and, in addition, they possess certain marked advantages over horsehair.

Although the invention is particularly useful for the treatment of material of the character stated with sulfuric acid, it shall be understood that the invention is not to be thus limited.

While the invention has been described with respect to a certain particular preferred example which gives satisfactory results, it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a machine of the class described, a vat for a treating reagent, a vat for a rinsing liquid, means for passing through said vats a plurality of threads maintained in spaced side-by-side relation, a member engaged by said threads while passing between said vats, means for adjusting the height of said member to vary the length of the thread path between said vats, and means for elevating said threads above said member.

2. In a machine of the class described, a vat for a treating reagent, a vat for a rinsing liquid, means for passing through said vats a plurality of threads maintained in spaced side-by-side relation, a member engaged by said threads while passing between said vats, means for adjusting the height of said member to vary the length of the thread path between said vats, and means for elevating said threads above said member, said last named means comprising a plurality of spaced members manually movable into engagement with said threads.

3. In a machine of the class described, a reel arrangement upon which threads are wound in skein formation, vats for a treating reagent and a rinsing liquid, means for passing through said vats a plurality of threads disposed in spaced side-by-side relation, a source of power for operating said reel arrangement and said means, and means for varying the operative speed of said means with respect to that of said reel arrangement.

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