April 18, 1950 G. J. SCHLESINGER 2,504,882
NOW BY JUDICIAL CHANGE OF NAME
G. J. SINCLAIR
TEXTILE TREATING APPARATUS

Filed Feb. 7, 1947 3 Sheets-Sheet 1

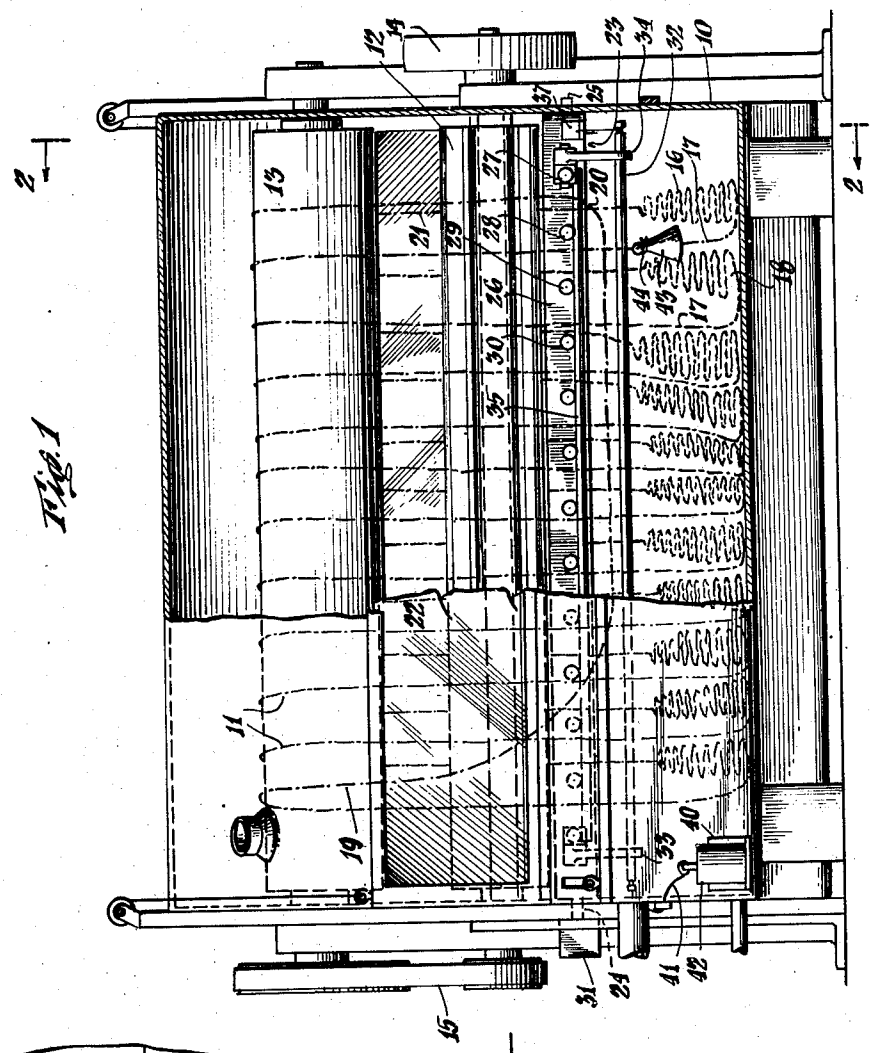


Fig. 1

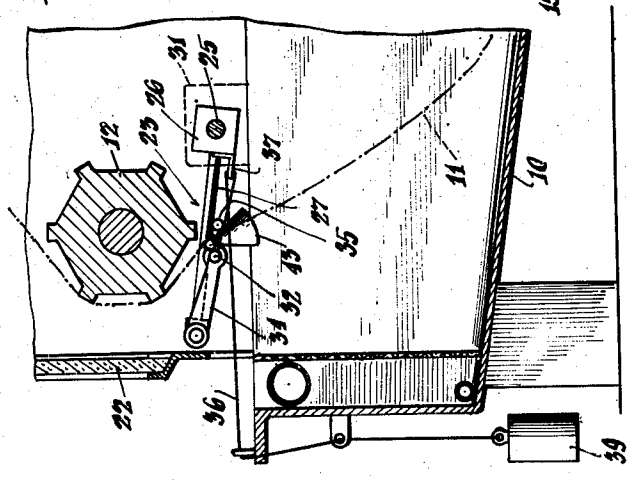
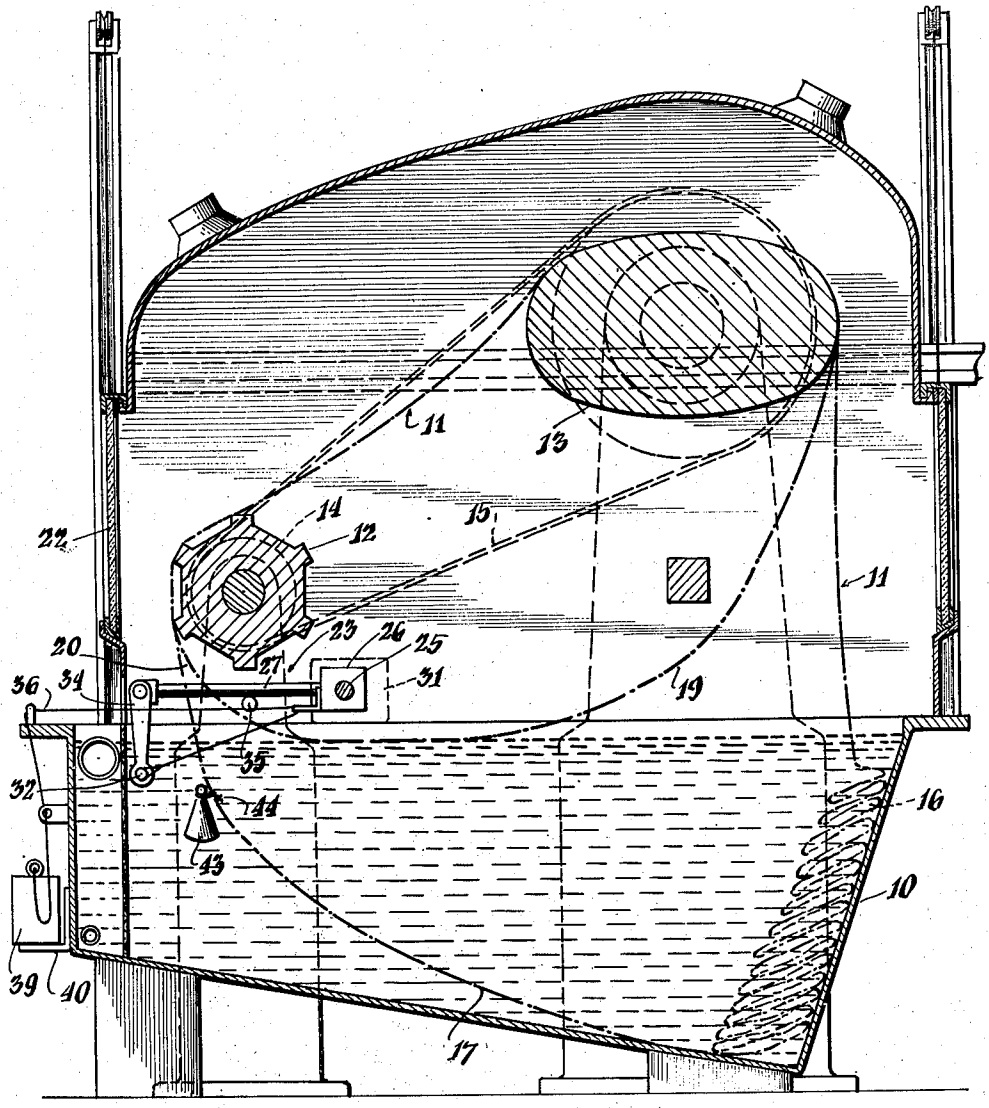


Fig. 3

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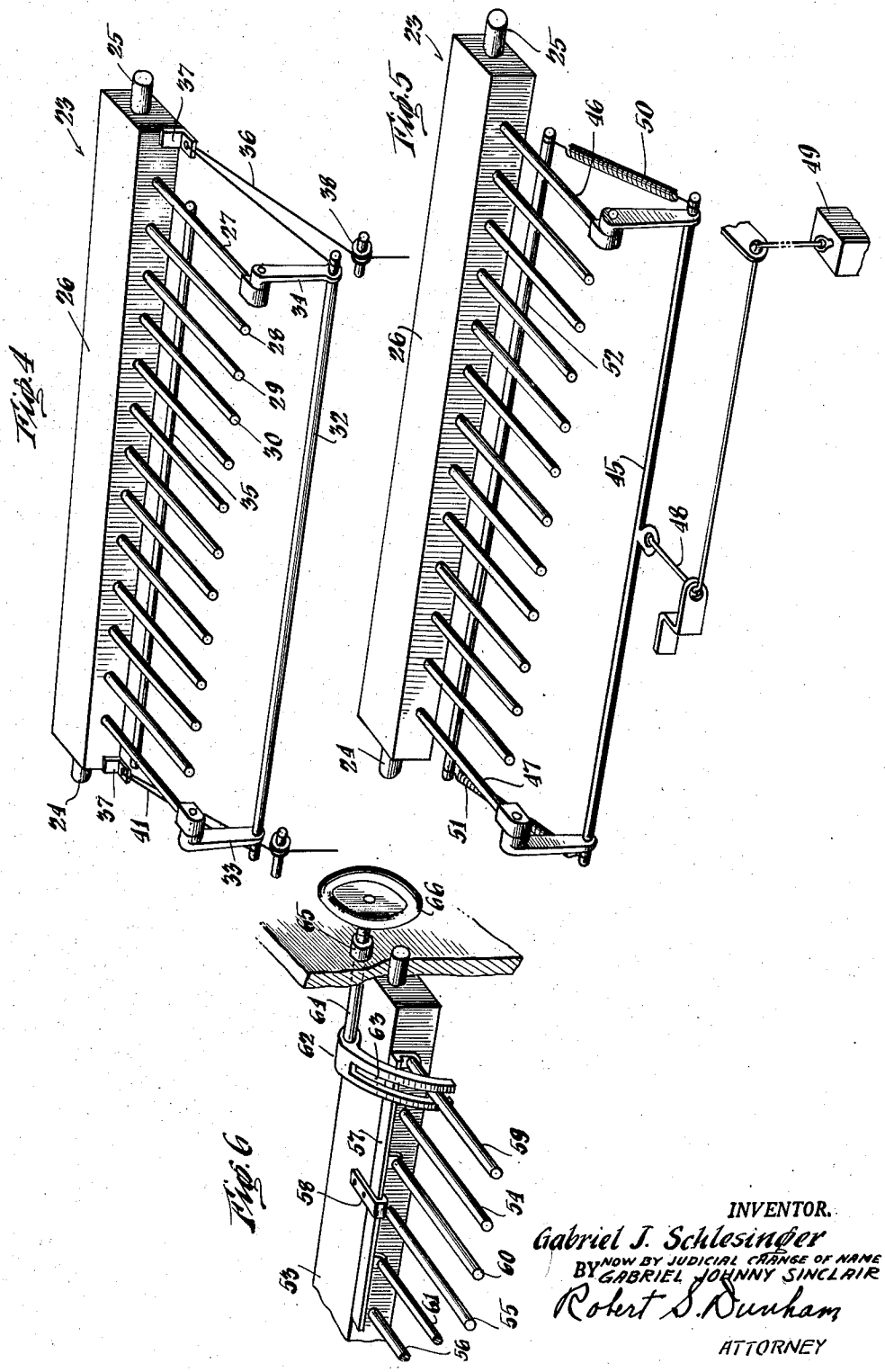
Fig. 2



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UNITED STATES PATENT OFFICE

2,504,882

TEXTILE TREATING APPARATUS

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10 Claims. (Cl. 192—125)

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This invention relates to apparatus for treating textile material and more particularly to mechanism for stopping the travel of an endless string of material being treated to make the material available for inspection at a predetermined location in the string.

Textile materials are commonly dyed, bleached or otherwise treated in a machine which is provided with rolls for advancing an endless string of material through a treating liquid. The endless string of material may constitute a single piece with its ends sewed together, or it may be constituted of a plurality of pieces sewed together end-to-end. The string is sometimes quite long, frequently exceeding 1600 yards. It is necessary that every portion of the string be uniformly dyed or otherwise treated, and in order to accomplish this it is necessary to inspect the fabric repeatedly. Each inspection should be made at the same location along the string so that levelness of treatment of all of the material in the string may be assured. For accomplishing this it has been customary for an operator to watch the string and stop its travel at a predetermined point, such as at a selected seam, each time a test is to be made. When there are a number of seams, sometimes twenty, more or less, a seam desired to be located may come into and pass from view without detection, and the operator may be exposed to rising vapors for quite a long time before he detects the seam desired and stops the machine.

It is among the objects of the invention to provide for stopping the travel of an endless string of material being treated so as to make accessible for inspection a given area of the material as it travels through a tank containing fluid-treating liquid. The apparatus for accomplishing this result is so constructed and arranged as to be effective for stopping the travel of the endless string within a relatively short time after the stopping mechanism has been set, regardless of the length of the string and the location in the apparatus of the portion of the string containing the area to be inspected.

Another object of the invention is to provide mechanism settable at will for automatically interrupting the travel of an endless string.

Further and other objects of the present invention will be hereinafter set forth in the accompanying specification and claims and demonstrated by the drawings which show by way of illustration a preferred embodiment and the principle of the invention and what is now considered the best mode of applying that principle.

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In the drawings, Fig. 1 is an elevational view of a textile dyeing machine employing the invention with the right portion broken away to show the interior;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is a detail showing the stopping mechanism of the machine in machine-stopping position;

Fig. 4 is a perspective view of one form of stopping mechanism;

Fig. 5 is a perspective view of another form of stopping mechanism; and

Fig. 6 is a view of still another form of stopping mechanism.

The structure of the present invention is shown as embodied in a dyeing machine having a tank 10 through which an endless string of textile material 11 is advanced. The string is helically draped over a pair of driven rolls 12 and 13, in such a manner that the various convolutions of the string, as shown in Fig. 1, pass upwardly to and over roll 12, over roll 13 and down into the tank 10. The rolls are motor-driven through a pulley 14 mounted on the shaft of roll 12, and roll 13 is driven from roll 12 by a belt connection 15. The string of textile material is usually disposed over these rolls in such a manner that it descends to the bottom of the tank and its slack rests in gatherings, such as illustrated at 16. The material is drawn upwardly from the gatherings, as shown at 17, and passes over roll 12 and then roll 13 in the next succeeding convolution and again descends to and is gathered in the tank, as shown at 18. The string of material travels in convolutions in like manner for the full length of the rolls or for any length of the rolls required to be used. In the last convolution the descending portion 19 of the string likewise passes through the liquid contained in the tank and is then drawn upwardly, as shown at 20, and over rolls 12 and 13. The string is then returned, as shown at 21, to enter the first convolution at the other end of the rolls. The machine is provided with a slidable window 22 through which the travel of the string of material may be observed. The window is displaceable so that an operator may reach in and rearrange any entanglements which occur in the string.

The machine is provided with a rockable rakebeam 23 which is pivotally mounted at its ends 24 and 25 in journals carried by the frame of the machine. This rakebeam is in the form of a frame including a rock shaft 26 and tines or sticks 27, 28, 29, 30, etc., equally spaced from

each other and normally extending substantially horizontally over an opening to the tank. These sticks separate the rising portions of the several convolutions of the string of textile material being treated.

The rakebeam has mounted thereon a mercury switch 31 which closes a circuit when the rakebeam is in normal operating position as when the sticks 27, 28, 29, 30, etc. are in a substantially horizontal position as shown in Fig. 2. This switch controls the circuit of the operating motor by which the rolls 12 and 13 are driven and the string of material is advanced through the machine. An entanglement or bunching occurring in the string is carried upwardly in one or another of the rising portions of a convolution of the string and engages adjacent sticks of the rakebeam and rocks the rakebeam. This movement of the rakebeam opens the circuit to the operating motor and causes discontinuance of the travel of the string. The operator's attention is drawn to the stoppage of the machine and he may then untangle the obstructing material and set the machine in operation for continuing the treatment.

In accomplishing the objects of the invention means are provided for reducing the areas for the passage of the string between pairs of sticks. As shown in Figs. 1 to 4, inclusive, this means comprises a bar 32 pivotally connected to the rakebeam 23 by means of a pair of links 33 and 34. The length of these links 33 and 34 is such that when the bar 32 is rocked upwardly towards the undersides of the sticks of the rakebeam the available space for the passage of the rising portions of each of the convolutions of the string is restricted. A bar 35 is preferably welded to the sticks forward of the rock shaft 26, as shown in Fig. 4. This bar defines the rearward limit of the available areas for the travel of the string.

As best seen in Fig. 4, a cable 36 is fastened to one end of the pivoted bar 32 and is threaded over pulleys 37 and 38. The free end of this cable has attached to it a weight 39 which is normally disposed on a shelf 40. Whenever it is desired to raise bar 32 to a position for reducing the available areas for the passage of the string between the sticks of the rakebeam, the weight 39 is removed from the shelf and permitted to hang from the cable 36. The tensioned cable raises bar 32 from the position shown in Figs. 2 and 4 to the position shown in Fig. 3. If desired, a second cable 41 may be attached to the other end of the pivoted bar 32 and provided with a weight 42 for use in raising bar 32 and holding it in a raised position. Either or both of weights 39 and 42 may be utilized for accomplishing the same purpose.

A bob 43, which may constitute a rigid object of revolution simulating a pear, is attached to a string at any location where repeated inspections of the string are desired to be made. The bob may be of rubber or of any other suitable material and is of such size as normally to pass through the spaces between pairs of sticks of the rakebeam and to be prevented from passing therethrough when the available areas for the passage of the string are reduced as by the positioning of bar 32 in an elevated position, as shown in Fig. 3. The bob is usually attached to a seam in the string by means of a band or cord 44 and it travels in a helical path along with the material being treated as the string is advanced through the machine.

Whenever an inspection of the progress of the dyeing or other treatment being effected is desired, the operator has only to remove weights 39 and 42 to apply tension to cables 36 and 41 and cause the raising of bar 32 into contact with the sticks 28, 29, 30, etc. of the rakebeam. In due course of time the bob will be carried by the string into contact with the bar 32 and between one or another pair of sticks and cause the rakebeam to be tilted sufficiently to shut off the operating motor and stop the travel of the string. When this occurs the operator may remove a sample test piece from the fabric and then restore the weights 39 and 42 to their shelves so that the obstructing bar 32 will return to inoperative position under the pull of gravity. The machine may then be set in operation. This procedure may be repeated at irregular intervals and as often as is necessary to secure samples of the material being treated.

A different arrangement for positioning the obstructing bar for reducing the areas between the sticks of the rakebeam is illustrated in Fig. 5. In this figure the bar 45 is similarly pivotally attached to the two sticks 46 and 47 at the ends of the rakebeam. Bar 45 is normally held in an inoperative or depending position by means of a cable 48 to which a weight 49 is attached. When weight 49 is raised and supported on a shelf (not shown) bar 45 is drawn upwardly into operative position adjacent the sticks by means of a pair of springs 50 and 51, which have their ends attached to the pivoted bar 45 and to the fixed bar 52 on the rakebeam.

Still another arrangement of structure by which the areas for the passage of the string through the rakebeam may be reduced is illustrated in Fig. 6. In this modification the rakebeam consists of two frames which are displaceable relative to each other to reduce the available spaces between sticks extending from the respective frames. One frame includes a rock shaft 53 pivotally mounted on the machine. Sticks 54, 55, 56, etc. are fixedly mounted on the shaft and extend over the opening of the tank.

A second frame includes a bar 57 which is carried on the shaft 53 and slidably supported by guides 58 which are fastened to the shaft. Bar 57 is provided with sticks 59, 60, 61, etc. which are disposed in alternating arrangement with sticks 54, 55, 56, etc. of the first frame. The spaces provided between pairs of successive bars of the assemblage normally correspond with the usual spaces provided in a rakebeam for the passage of a string of material.

Alternate spaces may be reduced in area by sliding the bar 57 axially with respect to shaft 53. To accomplish this, a fork 62 is provided with its slot 63 adapted to engage opposite sides of one of the sticks 59 of the slidable bar. The fork 62 is loosely mounted on the rotatable shaft 64 so as to respond to the axial movement thereof. The shaft 64 is threaded for engagement with the fixed nut 65. A hand wheel 66 is provided to enable the operator to rotate the shaft 64 and thereby translate the slidable frame with respect to the pivoted frame whenever it is desired to reduce the areas between alternate pairs of sticks of the respective frames.

In each case the controlling mechanism for setting the means by which the areas between the sticks of the rakebeam is so arranged that the operator may accomplish a setting from the outside of the machine and without opening the machine.

This invention is capable of numerous forms

and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the specific description herein be deemed illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the particular showing herein to indicate the scope of this invention.

What is claimed is:

1. In combination, a tank for containing fluid material, a rockable rakebeam having sticks spaced from one another and defining open areas for the passage of an endless string of material being treated, means for advancing said string, means operable upon the rocking of said rakebeam for stopping the advance of said string, means positionable for reducing said open areas for the passage of said string, and a bob adapted to be attached to a string of material being treated, said bob being of such size as normally to pass through said open areas and to be prevented from passing therethrough when said positionable means is so positioned as to reduce the sizes of said open areas.

2. In combination, a tank for containing fluid material, a rockable rakebeam having sticks spaced from one another and means defining with said sticks open areas for the passage of a string of material from said tank, means for advancing said string of material, means responsive to the rocking of said rakebeam for controlling the movement of said string, means pivotally mounted on said rakebeam and adapted for movement into cooperation with said sticks for reducing the areas provided for the passage of said string, actuating means for said last-named means, and a bob adapted to be attached to a string of material, said bob being of such size as normally to pass through said areas and to be prevented from passing said rakebeam when said pivotally mounted means is in position to reduce the sizes of said areas.

3. In combination, a tank for containing fluid material, a rockable rakebeam having sticks spaced from one another and means defining with said sticks open areas for the passage of a string of material from said tank, means for advancing said string of material, means operable upon the rocking of said rakebeam for stopping the advance of said string, a bar pivotally mounted on said rakebeam and normally in an inactive position, means operable at the will of an operator for setting said bar into cooperative relationship with said sticks for reducing the areas available for the passage of said string, and a bob adapted to be attached to a string of material, said bob being of such size as normally to pass through said areas and to be prevented from passing said rakebeam when said areas are reduced by said bar.

4. In combination, a tank for containing fluid material, a pivoted rakebeam with sticks extending therefrom and providing spaces therebetween for the passage of separate convolutions of a string of material being treated, means for advancing said string of material, means operable upon the rocking of said rakebeam for stopping the advance of said string of material, a member pivotally mounted on said rakebeam and movable from an ineffective position to an effective position in association with the sticks of said rakebeam for reducing the spaces for the passage of said string between said sticks, and a bob adapted to be attached to a string of material, said bob being of such size as to pass freely through the spaces between said sticks and to be prevented from passing said sticks when said member is disposed in cooperation therewith, whereby upon engagement of said bob with any of said sticks and said member, the rakebeam is rocked and the advance of the string being treated is interrupted.

5. The combination described in claim 4 in which manipulative means is provided for setting the pivotally mounted member at will.

6. In combination, a tank for containing fluid material, a pivoted frame having sticks extending over an opening to said tank, a second frame slidably mounted on said first-named frame and having sticks extending between and in alternate arrangement with the sticks of said first-named frame whereby equal spaces are provided between pairs of sticks of the respective frames for the passage of an endless string of material being treated, means for advancing said string of material, means operable upon the rocking of said first-named frame for stopping the advance of said string, a bob adapted to be attached to a string of material being treated, said bob being of such size as freely to pass through the spaces between spaced sticks of said respective frames, and means for sliding said frames relatively to each other to reduce the available space between a pair of sticks of the respective frames so as to cause engagement of said bob to rock said first-named frame and stop the advance of said string of material.

7. In combination, a tank for containing fluid material, a substantially horizontally etxending rakebeam including a pivoted frame having sticks extending over an opening to said tank, a second frame having sticks extending in vertical planes alternately arranged with respect to the sticks of said first-named frame, means for advancing a string of material to be treated through said pivoted frame, means operable upon the rocking of said pivoted frame for stopping the advance of said string, a bob adapted to be attached to the string of material being treated, said bob being of such size as freely to pass through said pivoted frame, and means for displacing said frames relatively to each other to reduce the available spaces through said pivoted frame to effect engagement of said bob, whereby upon engagement of said bob with said pivoted frame, the pivoted frame is rocked and the advance of the string being treated is interrupted.

8. In combination, supporting means, a reel journalled therein, means for driving said reel to advance a string of material thereby, a rockable rakebeam having sticks extending laterally therefrom and spaced from one another along the rakebeam, a pivoted bar carried by said rakebeam and pivotally mounted to swing with respect to the rakebeam from an inactive position to an active position toward the path of travel of a string of material between said sticks so as to be engageable by a bob carried by the string of material when said pivoted bar is disposed in active position, yieldable means to hold said pivoted bar in active position alongside the path of said string, and means controlled by said rakebeam for stopping the rotation of said reel when said rakebeam is rocked by the engagement of the bob with said pivoted bar in its active position.

9. In combination, supporting means, a reel journalled therein, means for driving said reel to advance a string of material thereby, a rockable rakebeam having sticks extending laterally there-

from and spaced from one another along the rakebeam, a bar fastened to and extending crosswise of said sticks, a pivoted bar carried by said rakebeam and pivotally mounted to swing with respect to the rakebeam from an inactive position to an active position toward said first-named bar and in which active position the space between said bars for the travel of the string and a bob carried by the string is reduced, means to hold said pivoted bar in its active position, and means controlled by said rakebeam for stopping rotation of said reel when said rakebeam is rocked by the engagement of the bob with said pivoted bar in its active position.

10. In combination, supporting means, a reel journalled therein means for driving said reel to advance a string of material thereby, a rockable rakebeam having sticks extending laterally therefrom and spaced from one another along the rakebeam, said sticks providing normally open areas therebetween for the passage of a string of material, means carried by said rakebeam for reducing the normal sizes of the areas

between said sticks, a bob adapted to be carried by the string of material, said bob being of such size as to pass through the normal areas between said sticks without engaging said areas-reducing means to cause rocking of the rakebeam and to be engaged by said means to cause rocking of the rakebeam when said means are positioned to reduce the normal areas between said sticks, and means controlled by said rakebeam for stopping the rotation of said reel when said rakebeam is rocked.

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