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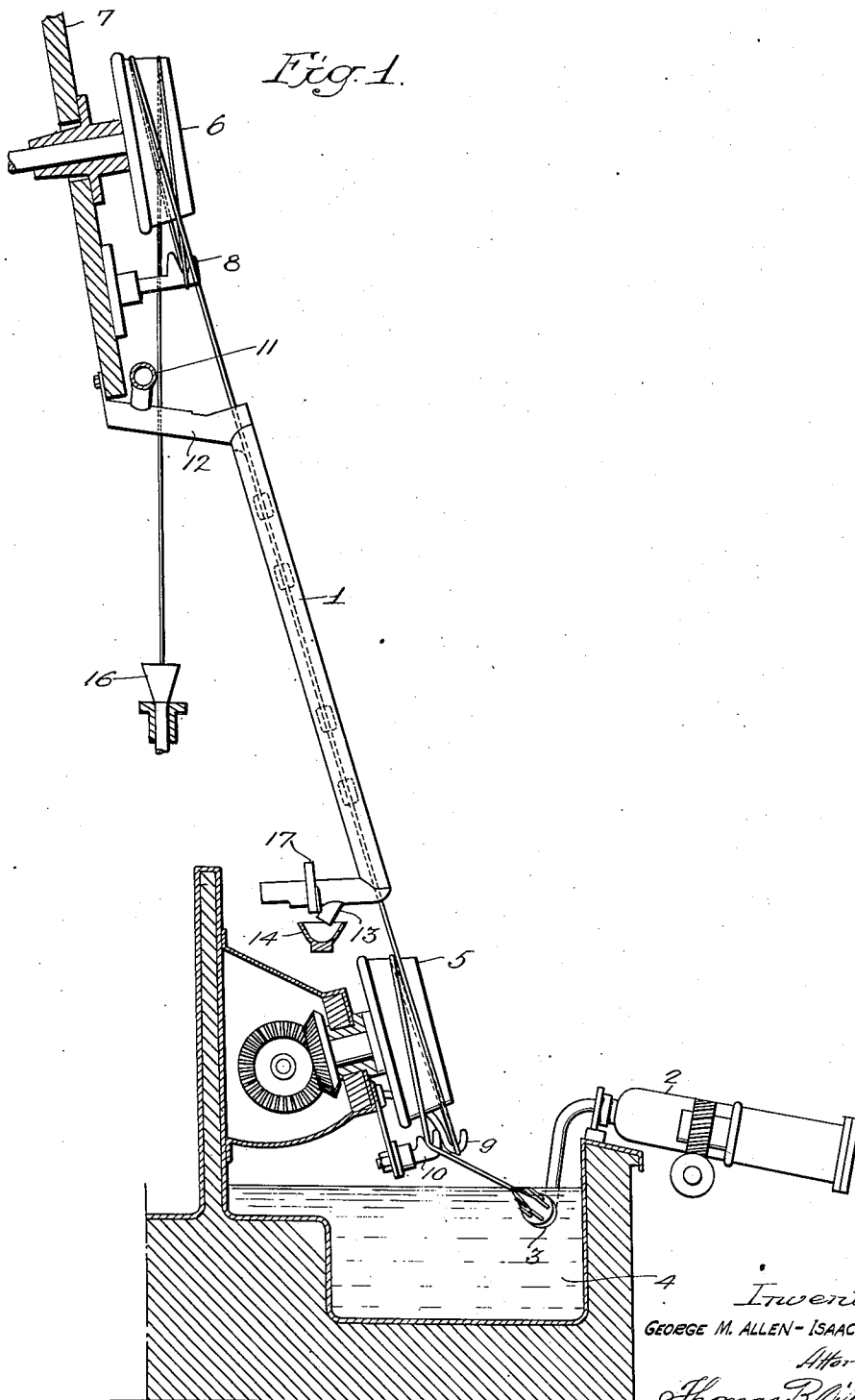
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2,265,984

APPARATUS FOR THE LIQUID TREATMENT OF THREADS

Filed March 18, 1939

2 Sheets-Sheet 1



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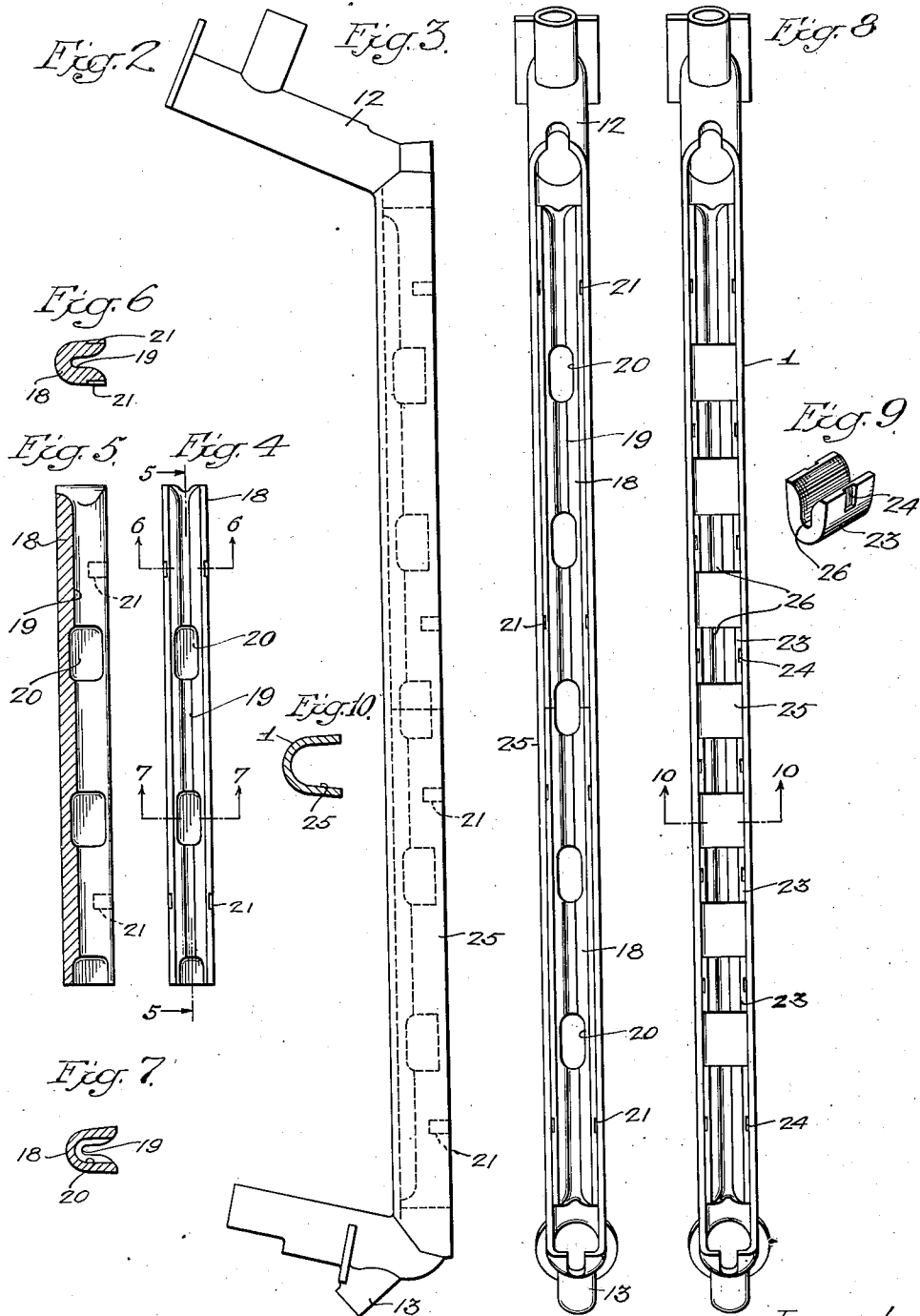
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APPARATUS FOR THE LIQUID TREATMENT OF THREADS

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Inventors.
GEORGE M. ALLEN - ISAAC P. DAVIS.

Attorney
Thomas R. W. Kelly

UNITED STATES PATENT OFFICE

2,265,984

APPARATUS FOR THE LIQUID TREATMENT
OF THREADSGeorge M. Allen and Isaac P. Davis, Swarthmore,
Pa., assignors to American Viscose Corporation,
Marcus Hook, Pa., a corporation of Delaware

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6 Claims. (Cl. 18—8)

This invention relates to improvements in apparatus for the liquid treatment of threads particularly where the treatment is carried out on moving threads.

During the manufacture of threads, particularly rayon, it is often desirable to subject the threads to a liquid treatment. Ordinarily during the liquid treatment of threads it is difficult to insure uniform penetration of the threads by the treating fluid and maintain the composition of the treating fluid uniform.

It is, therefore, an object of this invention to provide methods and apparatus for the liquid treatment of threads that will insure uniform penetration of the threads with the treating fluid and at the same time maintain the composition of the treating fluid uniform.

Another object of this invention is to provide methods and apparatus whereby moving threads may be uniformly treated with a treating fluid which is agitated and kept uniform during the treatment.

Another object of this invention is to provide methods and apparatus whereby moving threads may be uniformly treated with a flowing stream of treating fluid which is caused to cascade during the treatment thereby agitating the fluid and maintaining it uniform and insuring thorough wetting of the thread.

A further object of this invention is to provide methods and apparatus for the liquid treatment of rayon threads during the spinning process which are adapted to be used with conventional rayon spinning machines.

Other objects and advantages of the invention will become apparent from the following description taken in connection with the accompanying drawings and the appended claims.

A preferred embodiment of the invention is shown in the drawings in which:

Figure 1 is a side elevation of the thread treating means positioned in a rayon spinning machine for the liquid treatment of the rayon during the spinning process.

Figure 2 is a side elevation of the thread treating means.

Figure 3 is a front elevation of the thread treating means.

Figure 4 is a front elevation of the portion of the thread treating means which contacts the threads during the liquid treatment.

Figure 5 is a sectional view, the plane of the section being shown by the line 5—5 in Figure 4.

Figure 6 is a sectional view, the plane of the section being shown by the line 6—6 in Figure 4,

Figure 7 is a sectional view, the plane of the section being shown by the line 7—7 in Figure 4.

Figure 8 is a front elevation of a modification of the thread treating means.

Figure 9 is a view of one of the thread contacting members shown in Figure 8.

Figure 10 is a sectional view, the plane of the section being shown by the line 10—10 in Figure 8.

The thread treating means as shown in Figure 1 is positioned in a rayon spinning machine to subject the thread to a liquid treatment during the spinning operation while it is being stretched. The spinning machine comprises the pump and filter means designated by reference character 2, the spinneret 3, the spinning bath 4, lower and upper godets 5 and 6, and the thread guides 8, 9, and 10. The frame members 7 and 17 support the thread treating means in operative position in the spinning machine. The thread treating means comprises an open trough like member 1 which is of material that is resistant to chemicals and a fluid supply connection 12 and a discharge connection 13. Fluid is supplied to the connection 12 by the conduit 11. The open channel members 18, which are also of material that is resistant to chemicals, are fitted into member 1 and secured by lugs or wedges in the notches 21. The channel members 18 are formed with a shallow, relatively narrow groove or channel 19 that extends longitudinally through them and serves as a means for guiding the travelling thread. At spaced intervals 20 the groove or channel is formed wider and deeper.

In the modification shown in Figures 8 and 9 the open channel members 23 are fitted into the trough member 1 and are secured in position by lugs or wedges in the notches 24. The channel members are made of chemically resistant material and have a shallow and relatively narrow groove or channel 26 extending longitudinally through them. The channel members are positioned at spaced intervals as shown in Figure 8. The portion of the trough member 1 between the channel members 23 forms a channel which is wider and deeper than the channel 26 and serves the same purpose as the deeper and wider portions 20 in the channel members 18.

The deeper portions of the channel member are of sufficient depth that the thread in passing over these portions is positioned above the bottom of them.

During the operation of the thread treating means as shown in Figure 1 the thread passes from the lower to the upper godet through the

channel member 18 along the bottom of the shallow narrow portions 19 which serve as a guiding means for the thread during its travel. Treating fluid from the conduit 11 is introduced into the connection 12 and flows downwardly through the channel members 18 while treating the thread that is being stretched by the godets and is discharged through the connection 13. A relatively shallow depth of treating fluid flows through the channel portions 19 of the channel and cascades into the deeper portions 20 creating an appreciable turbulence in these portions of the channel. The turbulence of the fluid insures all parts of the thread being wetted while passing over the deeper portions and serves to continually agitate the fluid and maintain its composition uniform.

The treating fluid may be recirculated through the thread treating means during the process with adjustments in composition, if desired, being made at some convenient point in the circulating system. In addition, any desired temperature condition may be maintained through standard heating or cooling elements inserted in the system.

While the thread treating means is shown in use in connection with a rayon spinning machine in which the rayon is stretched while passing from the lower to the upper godet such as that described in the United States patent to Griffin 1,950,922, it may be used with any type of stretching means or in any place where it is desired to treat a moving thread with a liquid. Also while a preferred embodiment of the invention has been shown it is to be understood that changes and variations may be made in it without departing from the spirit and scope of the invention as defined by the appended claims.

Having thus described our invention what we claim is:

1. In a rayon spinning machine having means for stretching the rayon being spun, means for subjecting the rayon being stretched to a liquid treatment comprising an inclined open trough like member having liquid inlet and discharge con-

nections near its ends, means for supplying treating liquid to the inlet connection, channel forming means positioned in the trough like member having longitudinally extending relatively shallow channel like grooves longitudinally spaced apart by a deeper portion.

2. In a rayon spinning machine having means for stretching the rayon being spun, means for subjecting the rayon being stretched to a liquid treatment comprising an inclined open trough like member having liquid inlet and discharge connections near its ends, means for supplying treating liquid to the inlet connection, channel forming means positioned in the trough like member having longitudinally extending relatively shallow channel like grooves longitudinally spaced apart by deeper portions.

3. Means for the liquid treatment of a running thread comprising an open trough like member having liquid inlet and discharge connections near its ends, channel forming means positioned in the trough like member having longitudinally extending relatively shallow channel like grooves longitudinally spaced apart by a deeper portion.

4. Means for the liquid treatment of a running thread comprising an open trough like member having liquid inlet and discharge connections near its ends, channel forming means positioned in the trough like member having longitudinally extending relatively shallow channel like grooves longitudinally spaced apart by deeper portions.

5. Means for the liquid treatment of a running thread comprising an open trough like member, channel forming means positioned in the trough like member having longitudinally extending relatively shallow channel like grooves longitudinally spaced apart by a deeper portion.

6. Means for the liquid treatment of a running thread comprising an open trough like member, channel forming means positioned in the trough like member having longitudinally extending relatively shallow channel like grooves longitudinally spaced apart by deeper portions.

GEORGE M. ALLEN.
ISAAC P. DAVIS.