April 10, 1928.

1,665,624

W. L. CONRAD

PROCESSING APPARATUS

Filed April 5, 1926

2 Sheets-Sheet 1

Fig. 1.

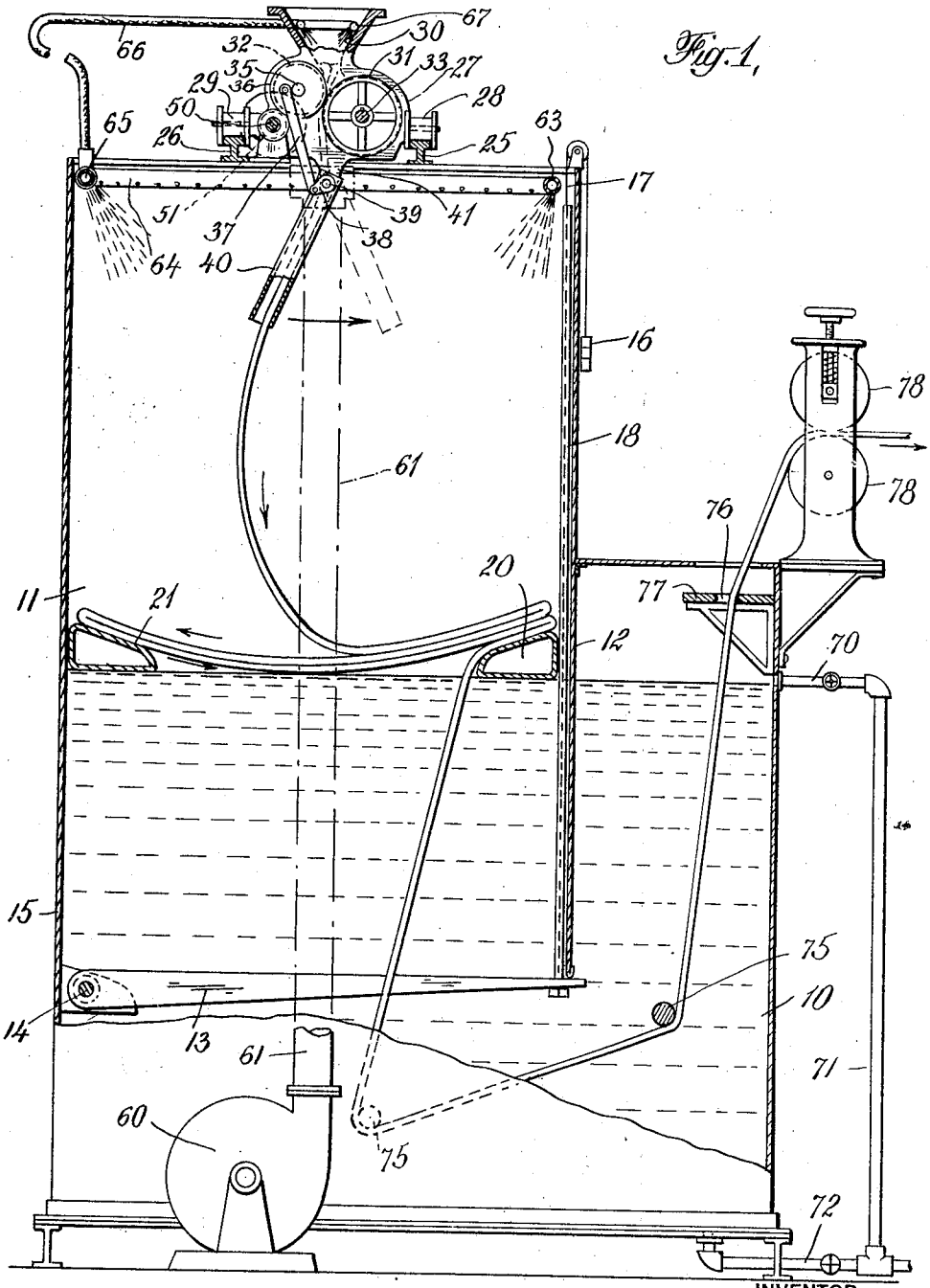

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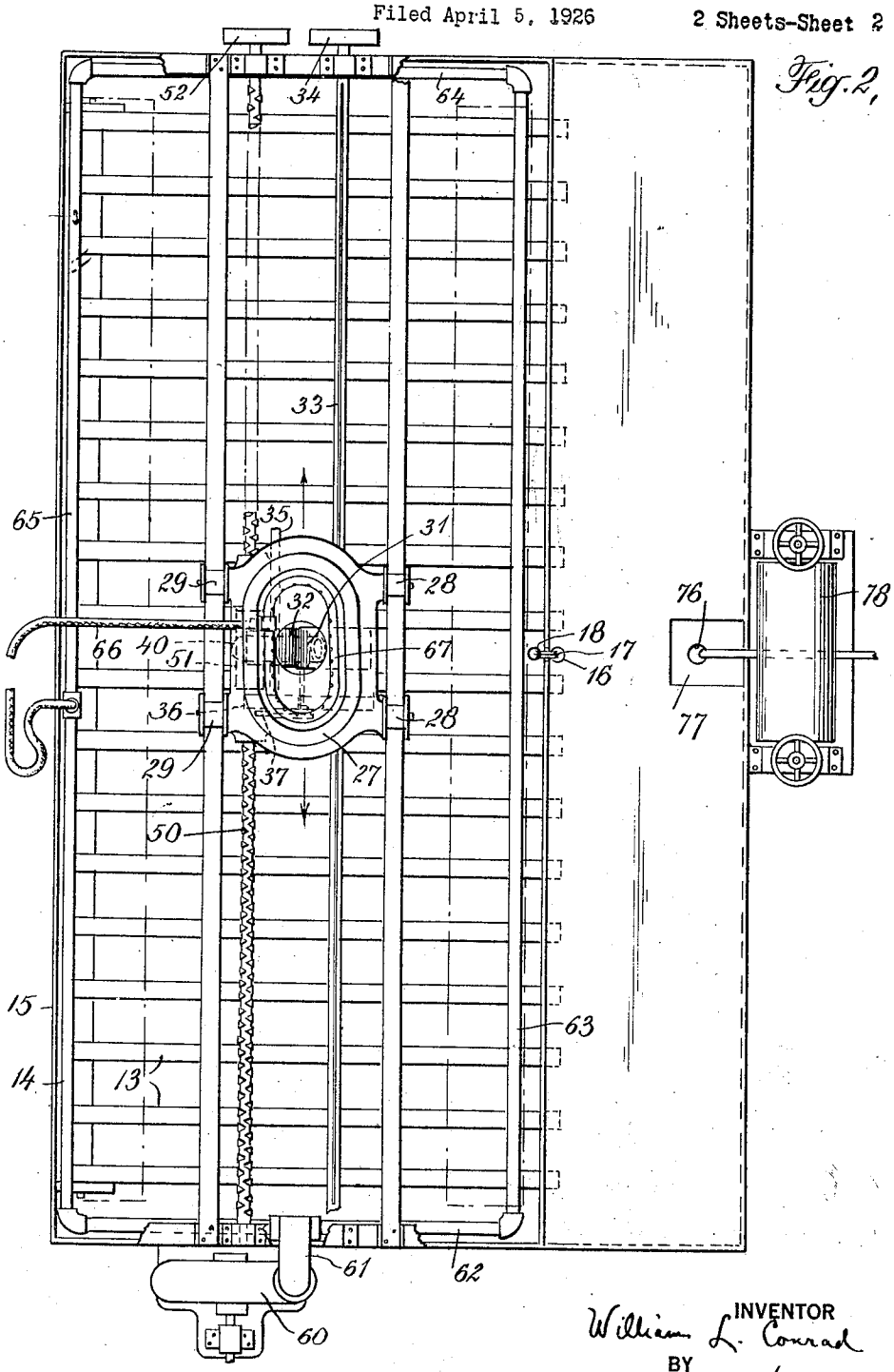
Fig. 2.



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Patented Apr. 10, 1928. 1,665,624

UNITED STATES PATENT OFFICE.

WILLIAM L. CONRAD, OF BOSTON, MASSACHUSETTS.

PROCESSING APPARATUS.

Application filed April 5, 1926. Serial No. 99,765.

This invention relates to processing apparatus.

Processing apparatus in which textile material is subjected to a process involving the use of a treating liquor has many applications such as boiling, dyeing, chemicking, bleaching, etc.

The apparatus embodying the invention is designed to carry on a process continuously and to operate on a web or rope of fabric or on a skein of yarn or like material which is continuously fed into the keir or vat in which liquid is circulated and continuously withdrawn therefrom. The apparatus is so constructed and arranged as to accumulate enough of the fabric between the entering and leaving points to allow the fabric to be subjected to the action of the liquor for a sufficient length of time for the liquor to have the desired action on the fabric.

The processing apparatus hereinafter described constitutes an improvement on the structure covered by Gantt Patent 1,074,568, September 30, 1913. The device shown in the patent is efficient in operation, but because of its construction requires considerable head room which is not always available. For instance, in plants where the old style keirs or vats are used there is comparatively little head room and therefore these keirs or vats cannot be replaced by the keirs disclosed in the Gantt patent.

This invention has for its salient object to provide processing apparatus of the type set forth so constructed and arranged that comparatively little head room will be required thereby.

Another object of the invention is to provide an apparatus of the character described so constructed and arranged that the fabric treated therein will be thoroughly permeated by and uniformly treated with the treating liquor.

Further objects of the invention will appear from the following specification taken in connection with the drawings, which form a part of this application, and in which

Fig. 1 is a vertical sectional elevation of apparatus constructed in accordance with the invention; and

Fig. 2 is a top plan view of the structure shown in Fig. 1.

The invention briefly described consists of apparatus comprising a receptacle in which the treating liquor is circulated and means for depositing the fabric, preferably in rope, open width or skein form, in the receptacle. The fabric feeding or depositing means is so constructed that the fabric will be fed back and forth transversely of the receptacle and also longitudinally of the receptacle and the feeding means is so constructed that comparatively little head room is required above the top of the receptacle. In the particular form of the invention illustrated, a carriage is reciprocably mounted on the top of the receptacle and has mounted thereon feed rolls and there is also suspended below the carriage a pivoted member through which the fabric passes and by means of which it is fed transversely back and forth across the receptacle. The treating liquor is conducted to the top of the receptacle and is sprayed on the fabric as it is deposited in zigzag folds in the receptacle. The fabric is thus thoroughly and uniformly permeated with the treating liquor. Further details of the invention will appear from the following description.

In the particular form of the apparatus illustrated, there is shown a receptacle or keir 10 provided with a fabric containing portion 11, this portion being separated from the remaining portion of the receptacle by a downwardly extending plate or partition 12.

A rack consisting of a plurality of bars 13 is pivoted at 14 to wall 15 of the keir and this rack is maintained in elevated position by means of a counterweight 16 which is connected to the rack by cable 17. A pipe or conduit 18 surrounds the cable and prevents the fabric from contacting therewith. The counterweight 16 also acts as a tell tale to show the position of the rack. The purpose of the rack 13 and tell tale weight 16 is to notify the attendant or operative when the liquor in the keir 12 is low and to prevent the fabric from reaching the bottom of the keir.

A buoyant frame or float 20 is mounted in the portion 11 of the keir and is adapted to support the fabric 21 as it is deposited in the portion 11 of the keir by means of the guiding and feeding apparatus hereinafter described.

Fabric feeding and guiding mechanism.

The fabric feeding and guiding mechanism is supported on a pair of rails 25 and 26 mounted on the top of the keir and extending longitudinally thereof. A carriage

27 is provided with two sets of rollers 28 and 29 which are mounted on the tracks 25 and 26.

The carriage 27 has a funnel shaped mouth or opening 30 adapted to receive and guide the fabric to the feed rolls 31 and 32. The roll 31 is splined on the shaft 33 and slidably mounted thereon and the shaft is driven by a pulley 34 which is connected to any suitable source of power. The roll 32 is driven by frictional engagement with the roll 31 and is mounted on a freely rotatable shaft 35. The shaft 35 also has secured thereto a disk 36 which is connected by a pitman 37 to a crank 38. The crank 38 is connected to the pivot 39 of a sleeve or tube 40 pivotally supported in lugs 41 extending downwardly from the frame 27. The upper end of the tube 40 is disposed below the feed rolls 31 and 32 in a position to receive the fabric as it is fed downwardly by the feed rolls.

The carriage 27 is reciprocated longitudinally of the receptacle on the tracks 25 and 26 by means of a shaft 50 having right and left hand threads which engage a nut 51 mounted on the carriage. The shaft 50 is rotated by means of a pulley 52 which in turn is driven in any suitable manner. The nut and shaft are constructed in the usual manner so that as the carriage reaches one end of the track its movement will be automatically reversed so that it will be alternately reciprocated in opposite directions.

In order to insure the thorough permeation of the material with the treating liquor, means is provided for spraying the liquor on the material as it is fed downwardly from the feed rolls and before it is piled in zig-zag folds across the receptacle or is submerged in the bath of liquor. This is accomplished by means of a pump 60 which is adapted to continuously withdraw liquor from the bottom of the receptacle and feed the liquor upwardly through a conduit 61 to pipes 62, 63, 64 and 65, which, as shown in Fig. 2, extend around the four sides of the top of the receptacle. These pipes are provided with openings therein adapted to direct the liquor downwardly as shown in Fig. 1 so that it will impinge against and thoroughly permeate the fabric as the fabric is fed downwardly by the feed rollers and is guided back and forth across the receptacle by the pivoted sleeve 40. If desired the hot treating liquor can be directed against the fabric or skein before it enters the rolls 31, 32. This can be accomplished by conducting the liquor from pipe 65 to the carriage 27 by a flexible pipe 66 and spraying the liquor on the material from a nozzle or ring 67. A pump intake pipe 68 communicates with the bottom of the receptacle and the liquor is drawn into the pump through this pipe and is pumped out through pipe 61.

An overflow pipe 70 is connected to the receptacle 10 and is adapted to conduct the liquor downwardly into the bottom of the receptacle through conduits 71 and 72. If desired, a plurality of units similar to that above described may be used in which case the conduit 72 may be connected to the other units in the manner shown and described in Patent 1,074,568.

The fabric is led from the bottom layer supported on the float 20 around idler rolls or guide rods 75 through an opening 76 in a bracket 77 and through squeeze rolls or wringer rolls 78 which squeeze out excess liquor from the fabric.

From the foregoing description it will be seen that the treating liquor will thoroughly and evenly permeate the fabric before the material is immersed in the bath of liquor in the keir. It will also be evident that the feeding and guiding means, because of its construction, will require a minimum amount of head room but will operate efficiently to deposit the material evenly throughout the length and breadth of the receptacle.

Although one specific embodiment of the invention has been particularly shown and described, it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the various cooperating parts may be made without departing from the spirit or scope of the invention, as expressed in the following claims.

What I claim is:

1. Apparatus of the character described comprising a receptacle, drawing feed rolls located above the receptacle, means for moving said rolls axially longitudinally of said receptacle, and means for receiving the fabric from said rolls and distributing the fabric back and forth across the receptacle as the rolls move longitudinally of the receptacle.

2. Apparatus of the character described comprising a receptacle, drawing feed rolls located above the receptacle, means for moving said rolls axially longitudinally of said receptacle, and means located below the feed rolls for receiving the fabric from said rolls and distributing the fabric back and forth across the receptacle as the rolls move longitudinally of the receptacle.

3. Apparatus of the character described comprising a receptacle, drawing feed rolls located above the receptacle, means for moving said rolls axially longitudinally of said receptacle, and pivoted means for receiving the fabric from said rolls and distributing the fabric back and forth across the receptacle as the rolls move longitudinally of the receptacle.

4. Apparatus of the character described comprising a receptacle, a carriage mounted above the receptacle, means for reciprocat-

ing said carriage longitudinally of the receptacle, drawing feed rolls mounted on said carriage, and guide means for leading the fabric to said rolls.

5. Apparatus of the character described comprising a receptacle, a carriage mounted above the receptacle, means for reciprocating said carriage longitudinally of the receptacle, drawing feed rolls mounted on said carriage, and means for receiving the fabric from the feed rolls and guiding the fabric back and forth across the receptacle as the carriage is reciprocated.

6. Apparatus of the character described comprising a receptacle, a carriage mounted above the receptacle, means for reciprocating said carriage longitudinally of the receptacle, drawing feed rolls mounted on said carriage, and pivoted, tubular means located below said rolls for receiving the fabric from the feed rolls and guiding the fabric back and forth across the receptacle as the carriage is reciprocated.

7. Apparatus of the character described comprising a receptacle, a carriage mounted above the receptacle, means for reciprocating said carriage longitudinally of the receptacle, drawing feed rolls mounted on said carriage, and pivoted, tubular means mounted on said carriage for receiving the fabric from the feed rolls and guiding the fabric back and forth across the receptacle as the carriage is reciprocated.

8. Apparatus of the character described comprising a keir, drawing feed rolls mounted above the keir and means for reciprocating said feed rolls in an axial direction and longitudinally of the keir.

9. Apparatus of the character described comprising a keir, drawing feed rolls mounted above the keir, means for reciprocating said feed rolls in an axial direction and longitudinally of the keir, and means for receiving the fabric from said rolls and guiding the fabric back and forth transversely of the keir.

10. Apparatus of the character described comprising a receptacle, feed rolls located above the receptacle, means for moving said rolls axially longitudinally of said receptacle, means for receiving the fabric from said rolls and distributing the fabric back and forth across the receptacle as the rolls move longitudinally of the receptacle, and means for impregnating the fabric with treating liquor before it reaches said feed rolls.

11. Apparatus of the character described comprising a keir, feed rolls mounted above the keir, means for reciprocating said feed rolls in an axial direction and longitudinally of the keir, means for receiving the fabric from said rolls and guiding the fabric back and forth transversely of the keir, and means for spraying treating liquor on the fabric before it passes between said feed rolls.

In witness whereof, I have hereunto set my hand this 30th day of March, 1926.

WILLIAM L. CONRAD.