June 12, 1945. W. J. SIMONDS 2,378,333

CLOTH STRING FEED APPARATUS

Original Filed Oct. 9, 1941

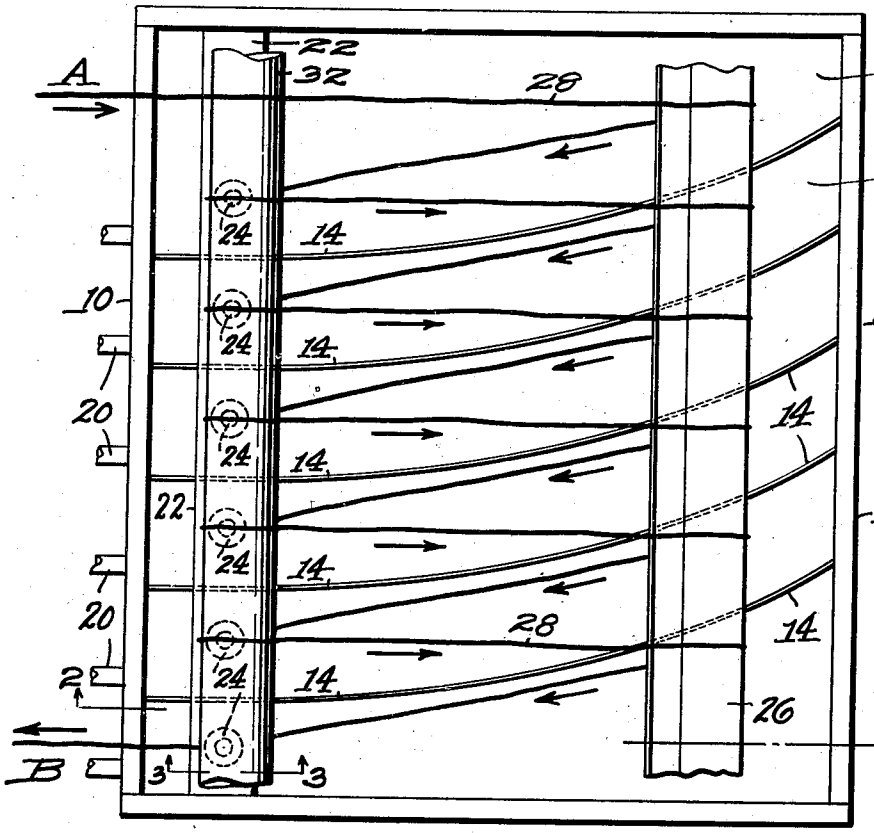


Fig. 1.

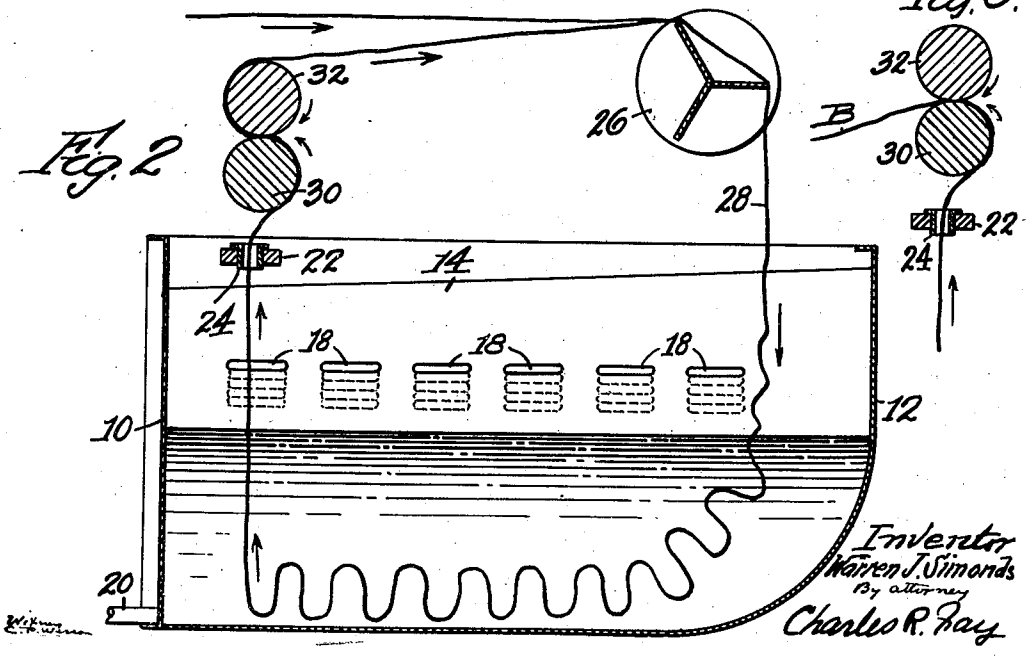


Fig. 2.

Fig. 3.

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CLOTH STRING FEED APPARATUS

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1 Claim. (Cl. 68—22)

This invention relates to an improvement in a reel and roll arrangement for feeding a continuous cloth string through a textile processing machine such as a slack washer. This application is a division of my co-pending application, Serial No. 414,363, filed October 9, 1941.

Objects of the invention include the provision of a reel and roll arrangement for feeding a continuous cloth string through a textile processing machine wherein the rolls are so arranged as to avoid inequalities in speed of the string, such inequalities being common in the prior art due to the "bumping" of bunches in the cloth string as they pass through the nip of the rolls, the cloth string bunches tending to temporarily separate the rolls as they are "bumped" by the bunches, this separation resulting in a momentary loss in engagement between the rolls and the string, so that driving contact is lost.

Further objects of the invention include the provison of a tub, vat, or the like for containing liquids used in textile processing, there being a reel arranged at one side of the tub and a pair of rolls spaced from the reel but parallel thereto, these rolls being mounted one above the other vertically and in substantially contacting relation to provide a nip therebetween for driving a cloth string therethrough, the upper roll being rotatable in a direction the same as the direction of the reel, and the lower roll being rotatable in the opposite direction, whereby a cloth string may be led down into the tub from the reel and up towards the rolls, through the nip of the rolls in a direction away from the reel, up over the upper roll, and thence over the reel. This action is repeated for a plurality of passes through the machine, whereby the rolls provide means for obtaining an S-shaped twist of the cloth string about the rolls to an extent heretofore not obtainable in devices of the type described.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing, in which

Fig. 1 is a plan view of a textile processing machine embodying the present invention;

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

Fig. 3 is a section on line 3—3 of Fig. 1.

In the drawing the present invention is disclosed as applied to a slack washer embodying a tub or vat having front wall 10 and rear wall 12 connected by end members to form a liquid tight receptacle for holding washing, dyeing, bleaching or other liquids commonly used in textile processing. In the present case the tub is provided with a series of substantially parallel partitions 14 extending from side to side of the tub, so as to divide the latter into a plurality of separate liquid holding receptacles. Partitions 14 may be provided with apertures 18 for intercommunication of the liquids in the separate receptacles, and as illustrated in Fig. 2 apertures 18 are located on a vertically descending scale from one end of the tub to the other so as to provide for cascading of the liquids throughout the machine. Drain pipes 20 may be provided for each receptacle.

A support 22 is mounted on the end walls of the tub and extends the length thereof to provide for mounting a vertically disposed cloth string guide or pot-eye 24 for each receptacle, as it is the intention in this case to let one pass of a cloth string through each receptacle once. A reel 26 is mounted adjacent one edge of the tub parallel thereto for the purpose of leading cloth string 28 thereover and down into the separate receptacles. This reel may be of any desired construction and may be mounted by any convenient means so long as it is located in position to guide the cloth string down into the tub as shown in Fig. 2.

A pair of squeeze rolls 30, 32 are mounted adjacent the front wall 10 of the tub. The specific mounting and driving means for these rolls form no part of the invention and these have therefore not been shown. It is pointed out, however, that roll 32 is mounted directly vertically above roll 30 in parallel relation thereto and so that the rolls will substantially contact each other to form a nip therebetween for squeezing and feeding the cloth string. Also the vertical plane containing the axes of rolls 30 and 32 will be seen to be located slightly to the right of the cloth guides 24 as seen in Fig. 2; i. e. the cloth guides 24 are located to the side of the roll axes in a direction away from reel 26.

As seen in Fig. 2, reel 26 and upper roll 32 are to be rotated in a clockwise direction so that the cloth string 28 may be fed to the right over roll 32 and reel 26. The lower roll 30 is adapted to be rotated in a counter-clockwise direction so that the nip of the rolls provides a cloth string squeezing and feed means which directs the cloth string to the left as shown in the drawing, in a direction away from reel 26.

The cloth string is directed into the machine as shown in the arrows in Fig. 1 from a point as at A, and initially the string is passed over roll 32 and over the reel 26 down into the first separate liquid receptacle 34. The cloth string then passes through receptacle 34 in a direction at an angle with respect to the ends of the tub, then

up to and through the first cloth guide **24** which is located directly above a portion of the initial receptacle **34**. The string is then led slightly reversely in an upward direction towards the rolls and about the inner side or inward aspect of roll **30** and through the nip of the rolls so that approximately a 180° wrap of the string about roll **30** is achieved. The string then proceeds through the nip and up about the outward aspect of roll **32** and over the top of the same to be led back towards the reel **26** and thence down into the next adjacent liquid receiving receptacle **36**.

This procedure is followed throughout the length of the machine as clearly shown in Fig. 1 and the cloth string finally emerges from the machine at point B, although the string might be joined at points A and B so as to provide for a continuous endless string for a plurality of passes through the machine.

It will be seen that the above described construction provides for a continuous soaking and alternate squeezing of the cloth string, and that the string passes in an S twist about the rolls **30** and **32** so that although a bunch in the cloth should momentarily tend to separate the rolls, there will still be substantially 360° wrap of the cloth string about the rolls whereby a good driving contact will be maintained at all times even though at some particular instant the nip of the rolls becomes momentarily separated. The wrap-around effect is enhanced as to the lower roll by the location of guides **24** at the side of the roll axes opposite from the reel. It is pointed out that if the direction of rotation of the rolls should be reversed as is conventional in the prior art, the cloth string would have to pass up merely about the outside aspect of roll **30** and through the nip, thus losing the the wrap-around effect of roll **32**, so that upon "bumping" of a cloth string the feeding effect of the rolls would be momentarily lost, and this loss of feeding being cumulative during the period of run of the machine, the string is apt to become tangled and to pile up in the tub. For example, a yardage per minute of 25 or 50 is not critical, but the usual installations under modern practice in the handling of cotton goods are designed to continuously run 10,000 to 50,000 yards at 200 yards per minute, and hence a "bump" of ⅛'' or ¼'' sometimes is disastrous because the loss of pull is cumulative, and in 25,000 to 50,000 yards this loss becomes great enough to require shutting down to realign the goods during the run. The present invention provides means for obviating this difficulty as hereinbefore explained.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claim, but what I claim is:

In an apparatus of the class described, a tub, a reel adjacent one side of the tub, two squeeze rolls parallel to the reel and located in horizontal spaced relation thereto adjacent another side of the tub, said rolls being arranged in superimposed close relation so that one is vertically above the other, the reel and upper roll being adapted to rotate in the same direction and the lower roll in the opposite direction, whereby a cloth string may be passed and re-passed between said rolls and over a substantial peripheral length of both rolls, and a cloth string guide located below the lower roll and offset horizontally from the roll axis in a direction opposite to the infeeding side of the lower roll, whereby the cloth string may be passed over substantially equal peripheral lengths of the rolls.

WARREN J. SIMONDS.