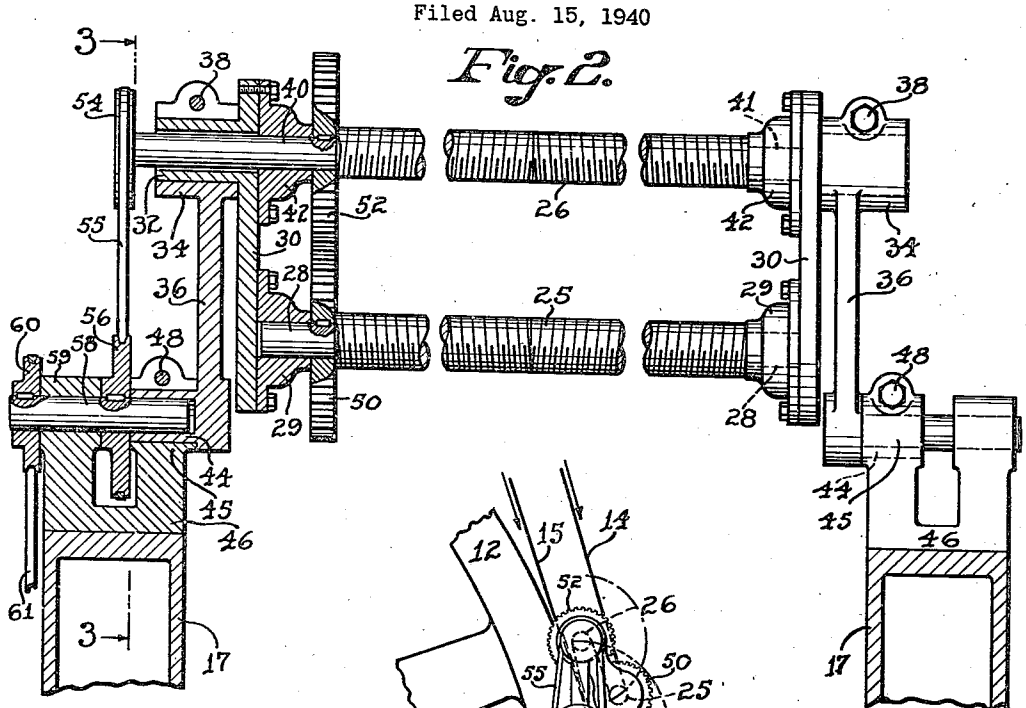
May 5, 1942. H. A. SMITH 2,281,627

FABRIC SPREADING DEVICE FOR A TEXTILE TREATING MACHINE

Filed Aug. 15, 1940

Fig. 2.



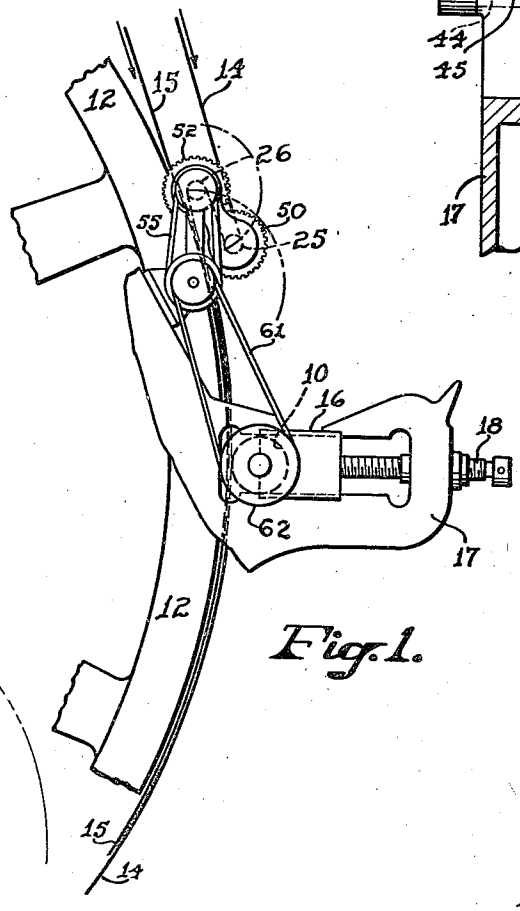


Fig. 1.

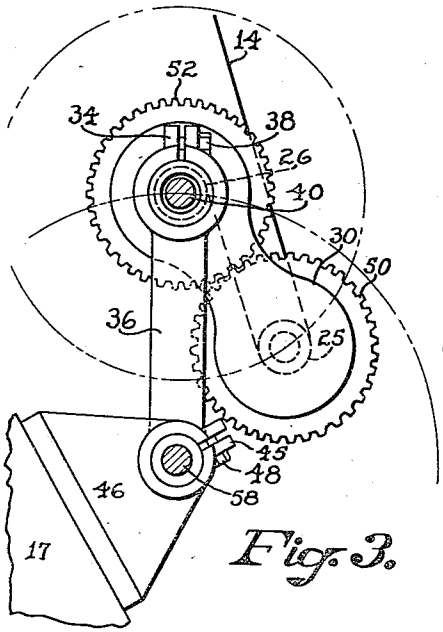


Fig. 3.

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FABRIC SPREADING DEVICE FOR TEXTILE TREATING MACHINES

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Application August 15, 1940, Serial No. 352,751

5 Claims. (Cl. 26—63)

This invention relates to textile treating machines, and more particularly to spreaders arranged to smooth out the cloth and control its location relative to a printing cylinder or other type of roll.

The spreaders heretofore employed on textile printers and other machines have been either stationary bars or rotatable shafts provided with angularly arranged ridges or helical threads, in which the ridges or threads run in left and right handed directions from the center of each spreader towards its ends and are so arranged as to spread or smooth a cloth drawn thereover. The stationary spreaders tend to become charged with lint which ultimately drops back into the ink and detrimentally affects the printing operation. The rotary spreaders are usually positively driven and by the helical movement of the threads tend to smooth out the cloth. These spreaders have been arranged in parallel with the cloth passing over one and under the other, and they have been mounted for a limited adjustment into different angular positions relative to the cloth. It, however, has not been possible to move these spreaders into the many different positions required for various types of textile treating operations so as to give a proper control of the tension and the spreading of the cloth without disturbing its drive. It is desirable that the spreaders be so mounted that either or both may be located close to the backing cylinder of the machine and that both be capable of wide angular adjustment relative to each other and to the cloth, in order to provide a desired extent of frictional contact with the cloth and to insure proper control of the different types of cloth that are to be printed or otherwise treated.

The primary object of this invention is to satisfy these desired ends and to provide a mount for two spreaders which is substantially universal in its adjustments whereby the spreaders may be arranged in any desired angular positions relative to the cloth and to each other, and either or both may be moved close to or away from the cloth and the backing cylinder of the printer, and the cloth may be passed over either one and under the other with a desired extent of surface contact and location relative to the cylinder. Further objects will be apparent in the following disclosure.

Referring to the drawing which illustrates a preferred embodiment of this invention as applied to a textile printer:

Fig. 1 is a fragmentary end elevation, partly broken away, of a textile printing machine having a printing roll and a backing cylinder for the fabric, and showing my spreader device mounted in position on the machine;

Fig. 2 is a side elevation, partly in section and partly broken away, of the spreaders; and

Fig. 3 is an enlarged detail, taken on the line 3—3 of Fig. 1.

The textile printing machine may be of any suitable construction, such as the standard Rice Barton printer, and it may have one or preferably a plurality of positively rotated printing cylinders 10 suitably arranged relative to a backing cylinder or drum 12 for printing a fabric 14 fed thereto. The printing rolls may be suitably mounted, such as is shown in the patent to McNicol et al. No. 1,924,614 of August 29, 1933, whereby they may be driven and adjusted relative to the backing drum and cloth. That is, the bearings for each printing roll may be each carried in a bearing block 16 slidably mounted within a projecting portion of the frame 17 and adjusted by means of the screw 18 and other cooperating parts. The printing cylinder may be suitably supplied with ink, and other arrangements are made as shown in said patent for printing one or many colors on the cloth. A pressure roll may, if desired, be suitably mounted to hold the cloth tightly against the drum in advance of the printing cylinder. The cloth 14, and preferably associated with a backing cloth 15, is fed downwardly beneath the pressure roll 20 and to the printing cylinder 10.

In accordance with my invention, I provide two spreaders 25 and 26 having left and right handed helical threads running outwardly from the center. These spreaders may be of the stationary type; but they are preferably rotated positively in such directions that the frictional grip of the helical threads tends to spread the cloth outwardly and thus to smooth it into position for reception by the drum and printing roll. In order to provide the desired universal movement, the spreaders are mounted on supports so arranged that one may be moved through a 360° angle about the other. The two spreaders are also mounted to swing as a unit about a pivot through any desired angle, such as 180° more or less, depending on the location of the pivot point. These mounts are, therefore, so arranged that the two spreaders may be arranged with either one above the other and with either one or both close to or remote from the drum.

In the preferred construction, the spreader 25 has its reduced ends or trunnions 28 mounted to rotate in a pair of bearings, which may be ball

or roller bearings or in plain cylindrical bearings, as shown, in the bosses 29 suitably secured, as by cap screws, to a pair of swinging supports 30. Each of these supports is provided at one end with a laterally extending hollow trunnion 32 which is pivotally supported within a hollow bearing 34 on the end of the swinging arm 36. In order that the spreader 25 may be clamped in any desired angular position relative to the other spreader, the sleeve 34 is split and provided with a clamping screw 38 threaded into its two halves and so arranged that upon tightening the screw the split bearing may be caused to grip tightly against the trunnion 32 of the support 30 and thus hold the latter rigidly in position. The spreader 26 is likewise provided at its ends with reduced bearing portions 40 and 41 which pass through the trunnions 32 and are carried by the bearings 42 suitably secured on the side of the swinging support 30. Any of the bearings may be constructed as anti-friction bearings for ease of operation of the spreaders.

The two swinging arms 36 are provided at their lower ends with laterally extending hollow trunnions 44 which have outer cylindrical bearing surfaces turning within clamping or split bearing 45 on the inner ends of the V-shaped mounts 46 which are suitably secured to the framework 17 of the printing press. Each of the split bearings 45 has a clamping screw 48 threaded into the two halves which serves to clamp the bearing tightly against the trunnion 44 and thus will hold the swinging arm 36 rigidly in any adjusted position. Hence, the spreaders 25 may be revolved around the spreader 26 and the latter swung through a wide arc so that the spreaders may be adjusted into any desired and suitable position.

It is preferred that the spreaders be positively driven, and to this end the spreader 25 is provided with a gear 50 keyed thereto which meshes with a gear 52 keyed on the spreader 26. These gears are preferably of the same size so that each will rotate at the same speed. The left hand bearing end 40 of the spreader 26 passes through the trunnion 32, and it has a pulley 54 keyed on its outer end which connects through a driving belt 55 with another pulley 56. The latter pulley is secured on a jack shaft 58 mounted at one end in the hollow trunnion 44 of the swinging arm 36 and at its other end in a suitable bearing 59 provided in the left hand end of the support 46. A pulley 60 keyed to the end of this shaft 58 is driven by a belt 61 from a suitable driving gear, such as the pulley 62 mounted on the end of the printing roll shaft.

In operation, the fabric 14 is passed over one of the spreaders, such as 25, and around the same and then over the other spreader 26 and then along the surface of the drum beneath the roll 20 and to the printing roll 10. The spreaders are preferably rotated in a direction opposite to that of the cloth movement, and the helical threads are arranged to smooth the cloth outwardly from the center. In the arrangement shown in Fig. 1, the spreader 26 is located close to the drum and the spreader 25 is in such an angular position relative to the other that the cloth 14 has an extensive frictional gripping contact with both spreaders. If less surface contact of cloth on the spreaders is desired, then the spreader 25 may be rotated about the spreader 26 to any desired angular position. That is, the spreader 25 may be moved through about 180° where it will lie close to the drum 12, and the contact of the cloth with the two spreaders will be at a minimum. Also, the arms 36 may be moved to position the spreaders in many other required locations, whereby either one of the spreaders may be located either above the other or laterally thereof. By thus providing the two sets of swinging arms 30 and 36, I have made it possible to arrange the spreaders in all desired locations.

It will now be appreciated that this type of spreader may be used with various types of machines carrying a moving strip of cloth, such as are required for laundering, ironing, coating or otherwise treating the cloth. The invention is, however, particularly applicable for use with textile printing machines in which the backing drum 12 is arranged for vertical movement relative to its horizontal axis, such as is required for adjustments within the machine or for assembling a new rubber blanket which is used as a backing for the cloth being printed. In this particular construction, the spreading rolls are arranged close to the cylinder and above a horizontal plane passing through the cylinder axis; hence they are so located that they would prevent any substantial vertical movement of the cylinder if they were mounted on a fixed support. However, as constructed, the rollers may be adjusted close to the cylinder and then later swung out of the way and beyond the vertical path of the cylinder so as to permit such vertical movement of the latter without requiring dismantling of the spreader.

Various equivalent constructional features may be used, such as is involved in substituting gears for the belts and pulleys herein described and claimed. The term "helical thread" is to be interpreted as covering the partial helix or the angularly arranged ridges on a stationary spreader. Hence, the claims are to be considered as covering all equivalent constructions. Since many modifications and arrangements of the spreading device may be made within this invention, the above description is to be considered as illustrating the general principles of the invention and a preferred embodiment thereof and not as limiting the scope of the claims appended hereto.

I claim:

1. A fabric spreading device comprising a roll over which the fabric passes, a frame, two spaced spreaders having left and right handed helical threads arranged for spreading the fabric passing thereover, two supports pivotally connecting these spreaders and permitting revolution of one about the other, and two arms pivotally mounted on the frame and pivotally connected to said supports which hold the two spreaders as a unit in any desired location relative to the roll, said parts being so constructed and arranged that the fabric leading to the roll may pass over one spreader and under the other with a desired variable extent of surface contact therewith and with either spreader locatable close to the roll.

2. A fabric spreading device comprising a frame, two spaced spreaders having left and right handed helical threads arranged for spreading the fabric passing thereover, two supports pivotally connecting the two spreaders for revolution of one about the other, two arms pivotally mounted on the frame and pivotally connected to said supports which hold the two spreaders as a unit and permit their adjustment into desired angular positions, and means for rotating the two spreaders in any of their adjusted positions.

3. A fabric spreading device comprising a frame, two spaced spreaders having left and right handed helical threads arranged for spreading the fabric passing thereover, two supports pivotally connecting the spreaders for revolution of one about the other, a pair of arms pivotally mounted on the frame with their axes in alignment and pivotally connected to the supports so that the two spreaders may be moved as a unit relative to the frame, a driving pulley mounted to rotate about said aligned axes of said arms and means connecting said pulley with each of the spreaders whereby the latter may be rotated in any of their adjusted positions.

4. A fabric spreading device comprising a roll over which the fabric passes, a frame, two spaced spreaders having left and right handed helical threads arranged to smooth and spread the cloth passing thereover, two spaced supports having bearings at their opposite ends which support said spreaders for rotation and revolution of one about the other, a pair of arms, two pivots on the frame on which the arms are pivotally mounted, bearings on the arms which are axially aligned with said pivots, and means connecting said pulley with the spreaders to rotate the same in any of their adjusted positions, said spreaders being adjustable relative to each other and to the roll so that the fabric in its line of travel may make a desired surface contact with the spreaders and be led to the roll from any desired direction.

5. A fabric spreading device comprising a stationary frame, two spaced arms pivotally mounted thereon in axial alignment and arranged for revolving through a wide angle, two spaced supports pivotally mounted on said arms in axial alignment for revolution through an angle of 360 degrees, means for holding said arms and supports in different fixed angular adjustments, and a pair of spaced spreaders mounted on said supports in parallel arrangement and having left and right hand helical threads arranged for the passage of fabric successively over the spreaders and to wrap thereabout to an extent depending on the angular adjustment thereof.

HERMAN A. SMITH.