Dec. 23, 1941. R. J. MANN ET AL 2,267,117

TREATMENT OF TEXTILE FABRICS

Filed Feb. 1, 1939

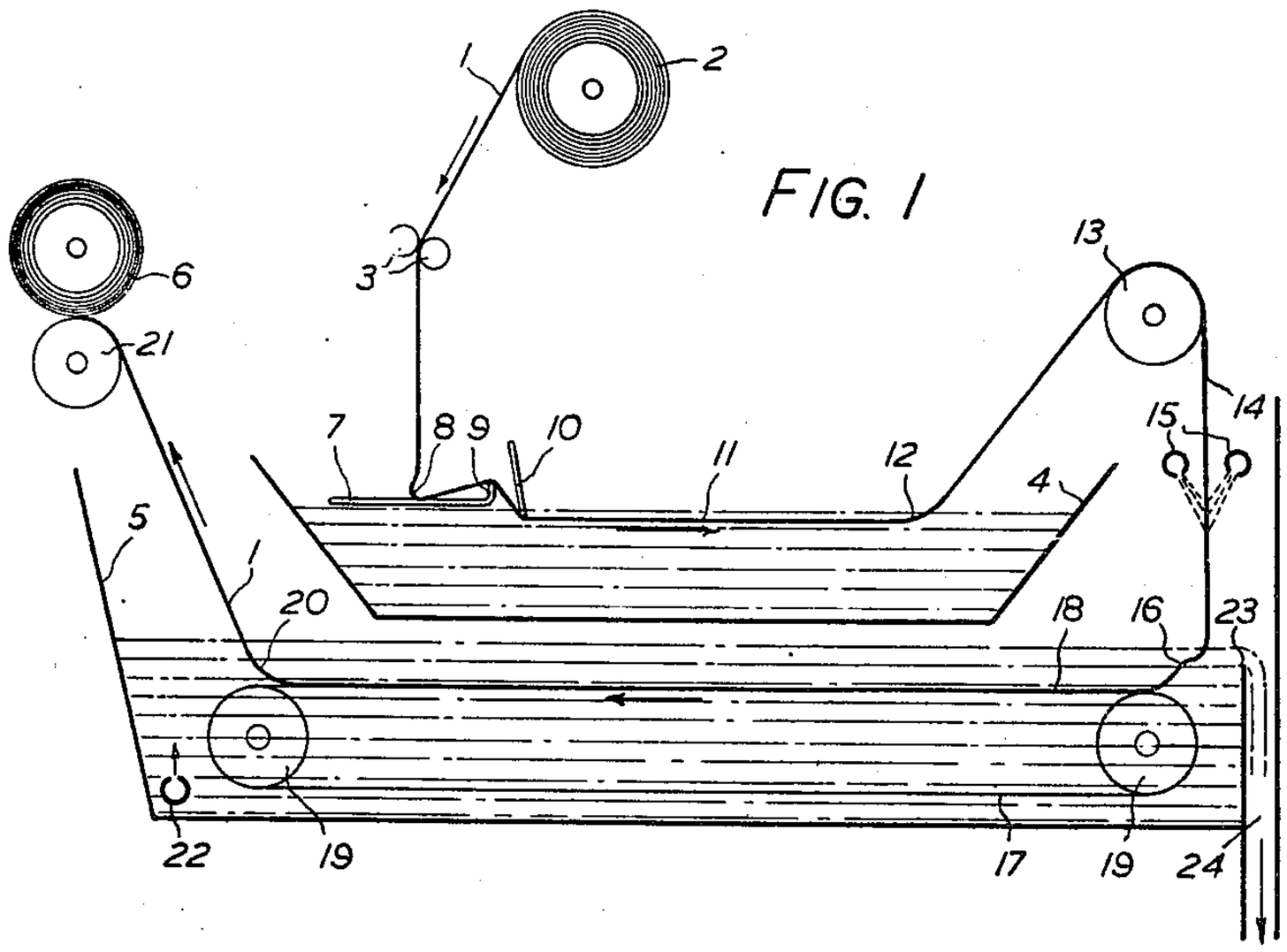

FIG. 1

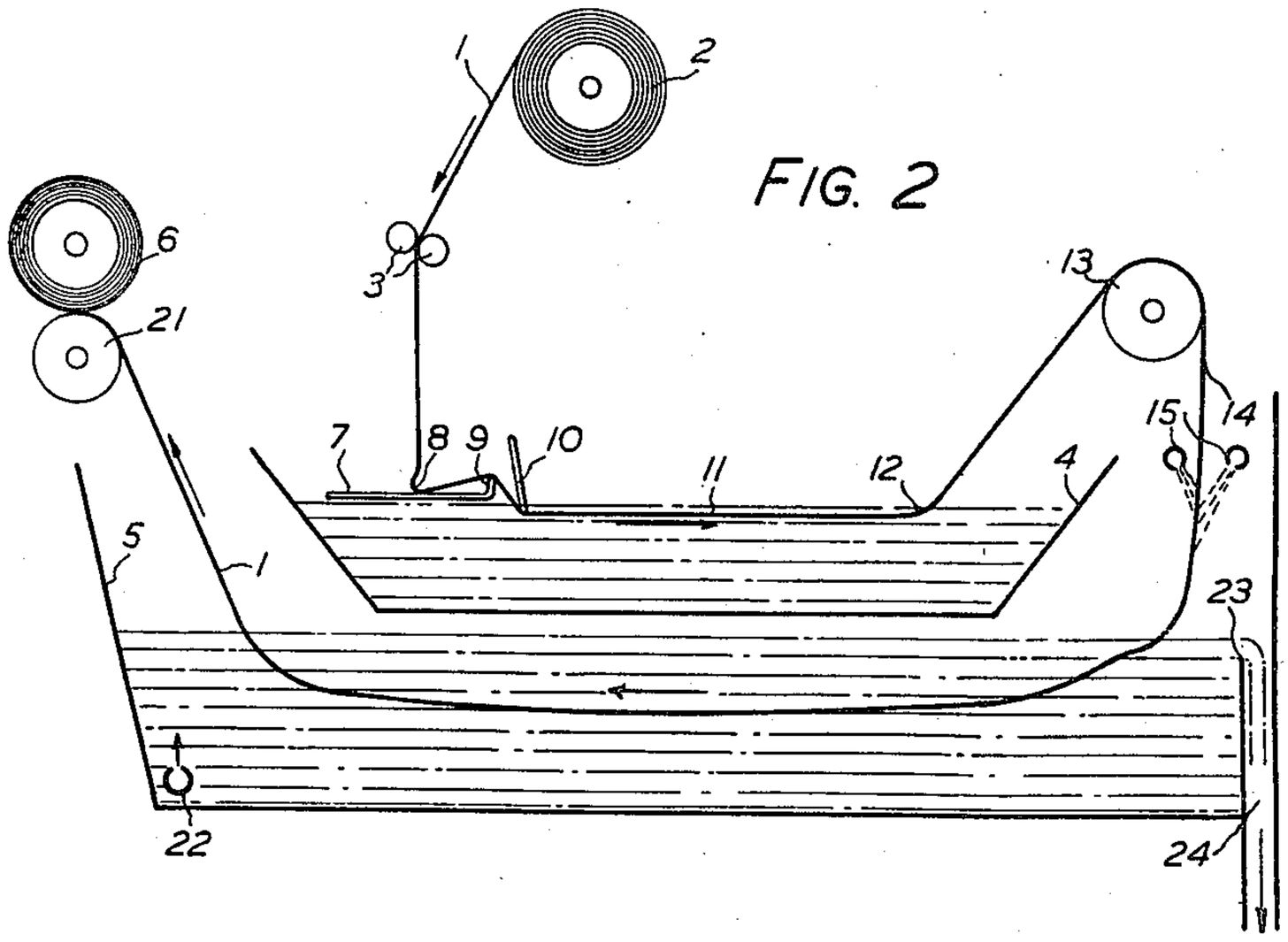

FIG. 2

R. J. MANN
W. HARMER
INVENTOR.

J. Belfer & C. Levinson
ATTORNEYS.

Patented Dec. 23, 1941 2,267,117

UNITED STATES PATENT OFFICE

2,267,117

TREATMENT OF TEXTILE FABRICS

Ralph James Mann and Wilfred Harmer, Spondon, near Derby, England, assignors to Celanese Corporation of America, a corporation of Delaware

Application February 1, 1939, Serial No. 254,046
In Great Britain April 9, 1938

1 Claim. (Cl. 68—175)

This invention relates to improvements in the shrinking of textile fabrics.

According to the invention, fabric is fed at a predetermined rate and substantially without tension to one side of a spreader that engages the full width of the fabric and depresses the fabric below the surface of shrinking liquor in a bath, and after passing the spreader the fabric moves through the shrinking liquor, being drawn along by a roller driven at a predetermined peripheral speed lower than the rate of delivery of the fabric so that the fabric is permitted to shrink. The fabric then passes to a washing bath, the roller drawing the fabric through the shrinking bath conveniently serving to transfer the fabric from one bath to the other, and before reaching the washing bath the fabric is sprayed, preferably on both sides, with wash water.

Preferably, the fabric is deposited on a tray lying just above the shrinking liquor close to the spreader and passes over an upturned lip on the tray on its way to the spreader. The lip prevents the fabric passing in folded form from the tray into the bath, the actual entry of the fabric into the bath taking place smoothly in a length that is maintained free from creases by the lip and the edge of the spreader. The lip and spreader offer very little resistance to the movement of the fabric and thus enable the fabric to be drawn along the bath under such low tension that shrinkage readily takes place. The fabric remains immersed in the bath until it approaches the delivery roller, when it rises sharply out of the bath and passes over the roller.

From the time the fabric leaves the spreader until it has passed clear of the bath it does not come into contact with any mechanism likely to crease the fabric or locally engage its surface, either of which conditions might tend to cause marks to show in the finished fabric. The smooth passage of the fabric into and out of the bath provided by the arrangement described greatly assists in the uniform treatment of the fabric.

It is preferable to avoid any local contacting of the fabric with parts of the apparatus during the washing step. An endless blanket may be used to support the fabric during its passage through the washing bath and ensure even treatment during this step, and during such passage the fabric is preferably exposed to a counter-current of wash liquor which may conveniently be maintained by the constant introduction of fresh liquor at the end of the bath at which the fabric leaves, a weir or other flow arrangement being provided at the opposite end. On being withdrawn from the washing bath the fabric is batched in any suitable way.

The invention may be used in connection with the shrinking of different types of fabric, and is particularly useful for the treatment of cellulose acetate or other cellulose derivative fabrics to impart improved appearance and handle. Thus, fabrics made of or containing cellulose acetate yarns, e. g. taffetas, plain or striped shirtings, and fabrics containing bouclé or other fancy yarns, may be subjected to shrinking in acetone, dioxane, ethyl alcohol, isopropyl alcohol, ammonium thiocyanate, or nitric acid, the shrinking agents being used in suitable concentration. Appropriate wash liquors are employed, aqueous washing being suitable for all the agents above mentioned.

The apparatus according to the invention is conveniently constructed with one of the two baths superposed on the other, and an arrangement of this sort will now be described by way of example with reference to the accompanying drawing in which:

Fig. 1 is a diagrammatic sectional elevation of one form of apparatus; and

Fig. 2 is a similar view of a simplified apparatus.

The fabric 1 is drawn from a supply roll 2 at a predetermined rate by feed rollers 3 from which it is discharged downwardly at the left-hand end of a shrinking bath 4 along which it moves to the right, and from there passes into a washing bath 5 from which it emerges at the left-hand end to be batched on a roll 6.

The feed rollers 3 cause the fabric to fall freely on to a flat tray 7 mounted just clear of the shrinking liquor in the bath 4. From the loose fold 8 of fabric on the tray 7 the fabric is drawn over an upstanding lip 9 formed at the right-hand edge of the tray, and passes downwardly under the edge of a spreader board 10 dipping below the surface of the shrinking liquor. The slight tension thus imparted to the fabric at the point where it enters the liquor maintains the fabric in open width, without creases. The fabric is uniformly exposed to the shrinking liquor while it remains submerged in the liquor as indicated at 11. As the fabric reaches the point 12 the pull of a delivery roller 13 withdraws the fabric fairly sharply from the liquor.

The roller 13 is driven at a peripheral speed less by a predetermined amount than the peripheral speed of the rollers 3 to allow the shrink-

age to take place. Advantageously, a variable speed gear is employed to control the relative speeds of the rollers 3 and the roll 13 in accordance with the amount of shrinkage desired.

From the roll 13 the fabric passes downwardly in the vertical run 14 and is there washed on both sides by spray pipes 15 supplied with fresh wash liquor. At the point 16 the fabric enters the wash liquor in the bath 5 and is deposited on an endless blanket 17 which enables a long run 18 to be uniformly exposed to the wash liquor.

To allow for any further shrinkage occurring during washing off in the bath 5, a variable speed gear may be arranged to control the relative speeds of the roll 13 and the rollers 19 carrying the blanket 17. The washed fabric leaves the blanket 17 at the point 20 and is taken up on the batch roll 6 at a constant speed provided by the driving roll 21. Fresh wash liquor is introduced into the bath by the spray pipe 22, a lip 23 allowing for the overflow of spent liquor into the waste pipe 24. The fabric collected on the batch roll 6 is slack dried in any suitable apparatus.

In the apparatus shown in Fig. 2 the blanket 17 and its rollers 19 of Fig. 1 are omitted, this simplified form of apparatus being suitable in cases where after removal of the major part of the shrinking liquor the fabric is strong enough to proceed through the wash liquor in the bath 5 without support.

Having described our invention, what we desire to secure by Letters Patent is:

A machine for shrinking textile fabrics, comprising a bath for shrinking liquor, means for feeding fabric at a definite rate and substantially without tension towards the bath, a tray adapted to receive the substantially tensionless fabric fed towards the bath, a spreading member adapted to engage the full width of the fabric and guide it below the surface of liquor in the bath, said tray having a lip over which the fabric is drawn as it passes to the spreader, and means to cause the fabric to slide past the spreader and to draw the fabric through the bath at a definite rate lower than the rate of feed of the fabric, the said means serving to withdraw the fabric from the bath.

RALPH JAMES MANN.
WILFRED HARMER.