

[54] **APPARATUS FOR THE COMPRESSIVE PRESHRINKAGE OF FABRICS**

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[56] **References Cited**

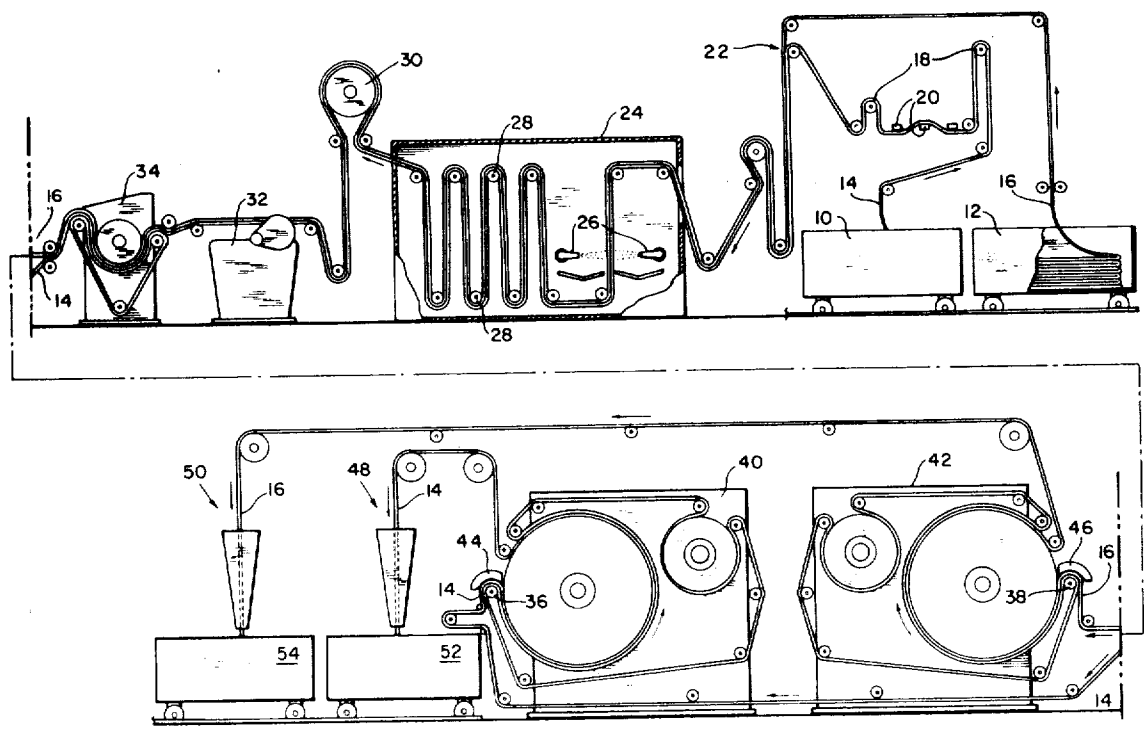
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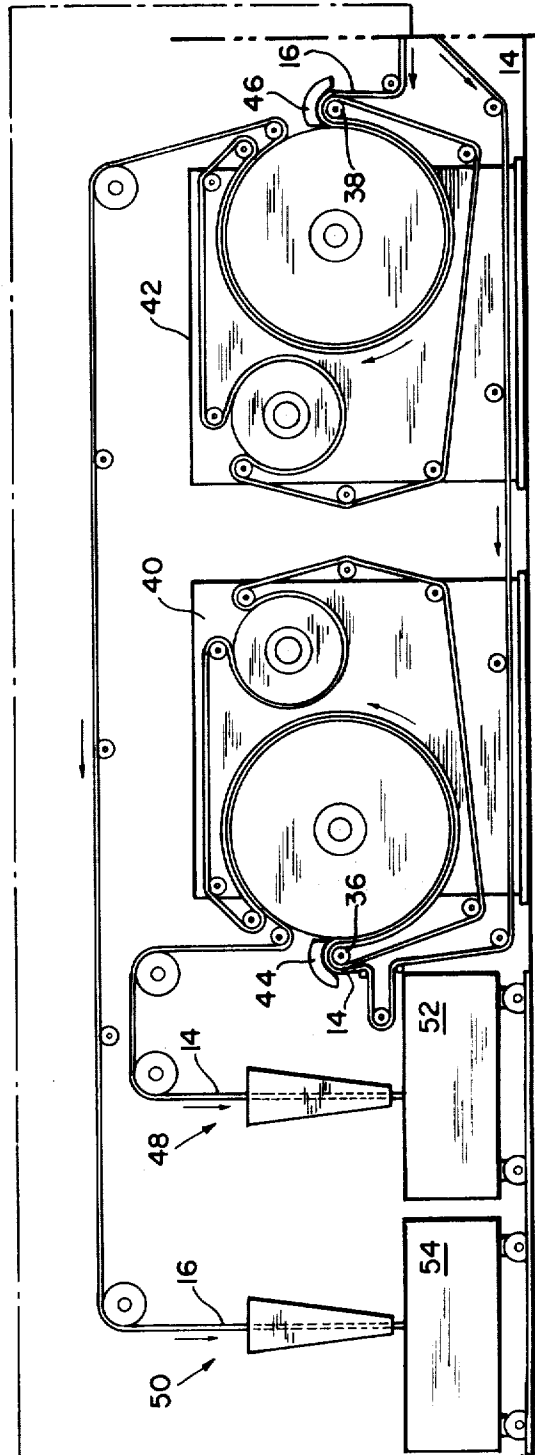
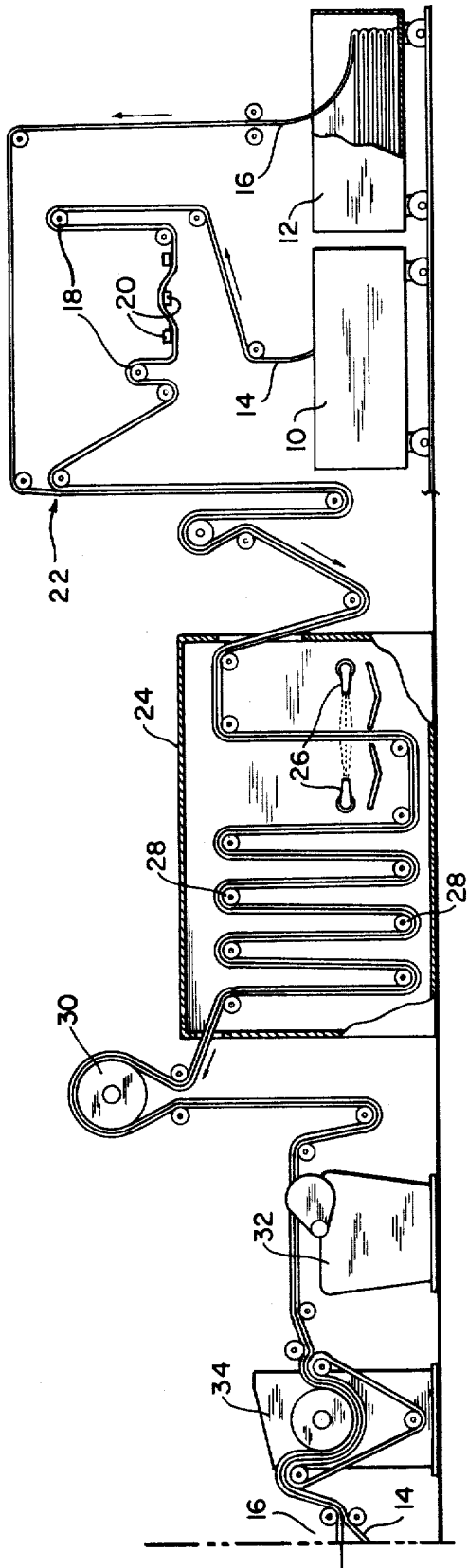
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[57] **ABSTRACT**

This disclosure teaches a method and apparatus for compressively preshrinking two layers of high-shrinkage fabric simultaneously and for limiting post-processing loss of preshrinkage in either layer to a minimum. Two layers of fabric are drawn through preliminary finishing apparatus, such as a cloth spreader, then both layers are advanced together through a conditioning chamber and around a heated drum, preferably through a clip expander, and then together they are run through a rubber-belt compressive-preshrinkage unit. Thereafter the layers are separated and each is delivered to a separate woolen felt-belt dryer. Each of the layers, as it enters its respective felt-belt dryer, is passed around an input roller against which it is pressed by a heated shoe which performs a final compressive preshrinking function and the layers are dried completely so that preshrinkage effected theretofore in the layers is not altered due to stretching in a wet condition in subsequent handling.

1 Claim, 1 Drawing Figure





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**APPARATUS FOR THE COMPRESSIVE
PRESHRINKAGE OF FABRICS**

BACKGROUND OF THE INVENTION

Fabric compressive-preshrinkage equipment generally is both bulky and costly, requiring much space and a large capital investment. Accordingly, when it is desired to increase production, it is necessary to provide a corresponding increase in such equipment with subsequent burdens on space and capital. Therefore, it is an object of this invention to provide a method and apparatus for increasing production of fabric compressive preshrinkage, but calling for only minor additional capital investment for equipment and for only a small amount of additional space.

Another object of this invention is to provide a method and apparatus of the character stated wherein two layers of denim (or the like) may be run together through one conditioning chamber, one clip expander and one rubber-belt compressive-preshrinkage unit.

Another object of this invention is to provide a method and apparatus of the character stated wherein polishing effects otherwise obtained on both sides of both layers are enhanced.

Another object of this invention is to provide a method and apparatus of the character stated wherein compressive preshrinkage of each layer is controllable as required.

SUMMARY OF THE INVENTION

In accordance with this invention there is provided a method for compressively preshrinking two or more layers of fabric whereby the fabric layers are preshrunk together. Two layers will be considered herein although it should be clear that more than two layers could be so compressively shrunk. Two layers of high shrinkage fabric, which layers may be of different fabrics, are advanced simultaneously through any desired preliminary processing apparatus, and are then joined together for passage through a series of processing units as described in U.S. Pat. No. 2,721,370, issued to Mr. Sanford L. Cluett, et al., on Oct. 25, 1955. As disclosed in that Cluett patent, a preferable compressive-preshrinkage arrangement and method include (inter alia) a conditioning chamber and a heated drum for heating the dampened fabric and for thorough dispersion of moisture therethrough. From the heated drum the two layers of fabric are passed together through a clip expander which spreads the fabric to a desired width and then the two layers of fabric are run together through a rubber-belt compressive-preshrinkage unit. Thereafter the two layers of fabric are separated and each is passed around a separate woolen felt-belt dryer and then to a separate plaiting unit which folds each of the shrunk fabrics into a cart for delivery to subsequent processing and/or conversion units. The layers could also be fed to a roll via a non-oscillating plaiting unit (not shown). Included in the improvement of this invention are heated shoes disposed for cooperation with input rollers at each of the felt-belt dryers. The purpose of the heated shoes is to further compressively preshrink each layer of fabric so that its susceptibility to subsequent stretching from handling in a wet condition will be minimized, whereby each of the fabric layers will have minimum shrinkage potential after it leaves its respective felt-belt dryer completely dried.

This expedient offers accurate control of compressive preshrinkage. Further, polishing of the fabric layers is also enhanced.

BRIEF DESCRIPTION OF THE DRAWING

The accompanying drawing illustrates one embodiment of the invention including apparatus for compressively preshrinking simultaneously two layers of fabric run together through a single conditioning chamber, over a single heated drum, through a single clip expander and through a single rubber-belt compressive preshrinkage unit.

**DETAILED DESCRIPTION OF A PREFERRED
EMBODIMENT**

The present method may be used for like or dissimilar fabrics. It is particularly effective on denims. A preferred embodiment for compressively preshrinking two continuous layers of high-shrinkage fabric, comprises subjecting either or both layers to preliminary processing apparatus. Such processing may include (for example) merely feeding the layers from a supply cart over conventional conveying and tensioning rolls or scrimp bars to straighten them out and to provide a fairly uniform drag on the fabric layers as they are advanced to subsequent apparatus. The two layers are then brought together so that they are advanced jointly through apparatus for performing the method here contemplated. In accordance with this method, the layers are dampened by passing them through a conditioning chamber wherein water is sprayed on them. The layers are also passed over conveyor rolls in the conditioning chamber arranged so that they follow a plurality of serpentine vertical runs. Next, the layers are passed over a heated drum, whereupon they are fed to a clip expander so that they are subjected to uniform lateral spreading accurately to form them to a desired width. The two layers are then advanced together through a rubber-belt compressive-preshrinkage unit. Thereafter, the two layers are separated and each is passed around a separate felt-belt dryer. Each of the layers, as it enters its respective felt-belt dryer, is passed around an input roller against which it is pressed by a heated shoe which performs a final compressive preshrinking function with subsequent complete drying so that preshrinkage effected theretofore is not altered due to stretching as would happen in a wet condition. After the felt-belt dryers, each of the layers is introduced to a separate plaiting unit which folds each of the preshrunk layers of fabric into a cart for subsequent processing and/or conversion. The layers could also be fed to a roll via a non-oscillating plaiting unit (not shown).

Apparatus for performing the above-described method comprise a pair of supply carts 10 and 12 for holding respective fabric layers 14 and 16, which layers may or may not be of different cotton or primarily-cotton materials or the like and which may or may not have different shrinkage characteristics. Layers 14 and 16 are withdrawn from their carts by means of a plurality of conventional driving, conveying, tensioning and idling rollers for delivering the respective layers to apparatus for carrying out the contemplated compressive-preshrinkage method. Either or both layers may be passed over tensioning rollers 18 and/or scrimping bars 20 to straighten out the fabric before it is compressively

preshrunk. Layers 14 and 16 are joined together at 22 for joint advancement.

The jointly-advancing layers are drawn through conditioning chamber 24 having a pair of nozzles 26 which apply water to the two layers, thereby dampening the layers in preparation for compressive preshrinking. The layers are then led over rollers 28 in conditioning chamber 24, so that they follow a plurality of serpentine vertical runs whereby each layer is moistened thoroughly. Next, the two plies are passed jointly around a heated drum 30 and then through clip expander 32 which operates on the layers to adjust their widths.

Upon completion of the foregoing, the layers are advanced jointly through rubber-belt compressive-preshrinkage unit 34 which operates in a known manner to preshrink the fabric layers by a predetermined percentage. Basically compressive-preshrinkage unit 34 includes a rotary heated drum, a pair of relatively small-diameter belt-support rolls (either or both of which may be driven) a lower idler roll and a thick rubber belt (that passes beneath the drum as well as around the belt-support rolls and the idler roll). Together the layers enter a leading nip between the belt and the drum and become compressed longitudinally or preshrunk by action of the belt as its contacted surface changes from an elongated condition under tension around the lead belt-support roll to a compacted condition under compression around the drum.

After layers 14 and 16 are discharged from compressive-preshrinkage unit 34 they are separated and passed around input rollers 36 and 38, respectively, of a pair of separate felt-belt dryers 40 and 42. In accordance with the present invention, there are included heated shoes 44 and 46 arranged to press the fabric layers 14 and 16 against input rollers 36 and 38, respectively, for further compressively preshrinking the layers. The layers are then passed through the felt-belt dryers for complete drying so that subsequent handling of these layers will not cause them to stretch and alter desired preshrinkage achieved theretofore. The felt-belt dryers are of known construction and operation. Heated shoes 44 and 46 are shown and described in detail in the above-mentioned Cluett U.S. Pat. No. 1,992,194 and they comprise preferably ironing blocks which are heated by internal electric elements, and which are employed here to dry the respective layers and to coat with the felt-belt dryers in imparting a desired polishing effect to the layers.

Finally, layers 14 and 16 are advanced separately as they leave felt-belt dryers 40 and 42, and are delivered respectively to plaiting units 48 and 50 of known design and operation, whereby the fabric layers are folded in a desired manner as they are deposited in carts 52 and 54 for transfer elsewhere. The layers could also be fed to a roll via a non-oscillating plaiting unit (not shown).

It can be seen that a new combination of apparatus has

been disclosed for preshrinking compressively simultaneously two layers of fabric, and for preshrinking compressively such layers to the same or to differing degrees. Furthermore, it can be seen that for double the output the newly combined apparatus require only a minor increase in floor space sufficient only to receive an additional felt-belt dryer. It can be appreciated readily that the two felt-belt dryers can be disposed in any convenient physical relationship each to the other: That is, one above the other, end to end, side to side or otherwise. Additionally, stretching problems occasioned by handling wet fabrics after compressive preshrinkage are overcome by the step of pressing each of the respective layers before their entry into their respective felt-belt dryers. The pressing step is performed by apparatus disclosed herein including heated shoes 44 and 46 which cooperate with input rollers 36 and 38, respectively.

It will be understood by those familiar with compressive preshrinkage of fabrics that wide deviations may be made from the foregoing preferred embodiment without departing from the theme of invention set forth in the following claims.

I claim:

1. A combination of apparatus for preshrinking compressively simultaneously a plurality of smooth open-web layers of high-shrinkage fabric comprising:

means for bringing the layers together for continuous joint advancement,

a conditioning chamber for dampening all of the jointly advancing layers together,

a heated drum with means for passing the jointly advancing layers from the conditioning chamber over the heated drum,

a clip expander with means for passing the jointly advancing layers from the heated drum through the clip expander,

a rubber-belt compressive preshrinkage unit with means for passing the jointly advancing layers from the clip expander through the compressive preshrinkage unit,

means for separating the layers after passage through the compressive preshrinkage unit,

an endless felt belt dryer for each of the layers and each dryer provided with an input roller for receiving one of the layers and a heated endless felt belt for passage thereover so that preshrinkage of the layer is not altered thereafter by subsequent handling,

each of the input rollers provided with a heated shoe arranged opposite the input roller for pressing the layer thereagainst as well as to further compressively preshrink, dry and polish the layer on its surface remote from the felt belt before entry of the layer into the dryer whereby the same or different fabrics can simultaneously be compressively preshrunk to the same or differing degrees.

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