Oct. 4, 1938. D. GESSNER 2,132,156

METHOD AND APPARATUS FOR SHRINKING AND DRYING CLOTH

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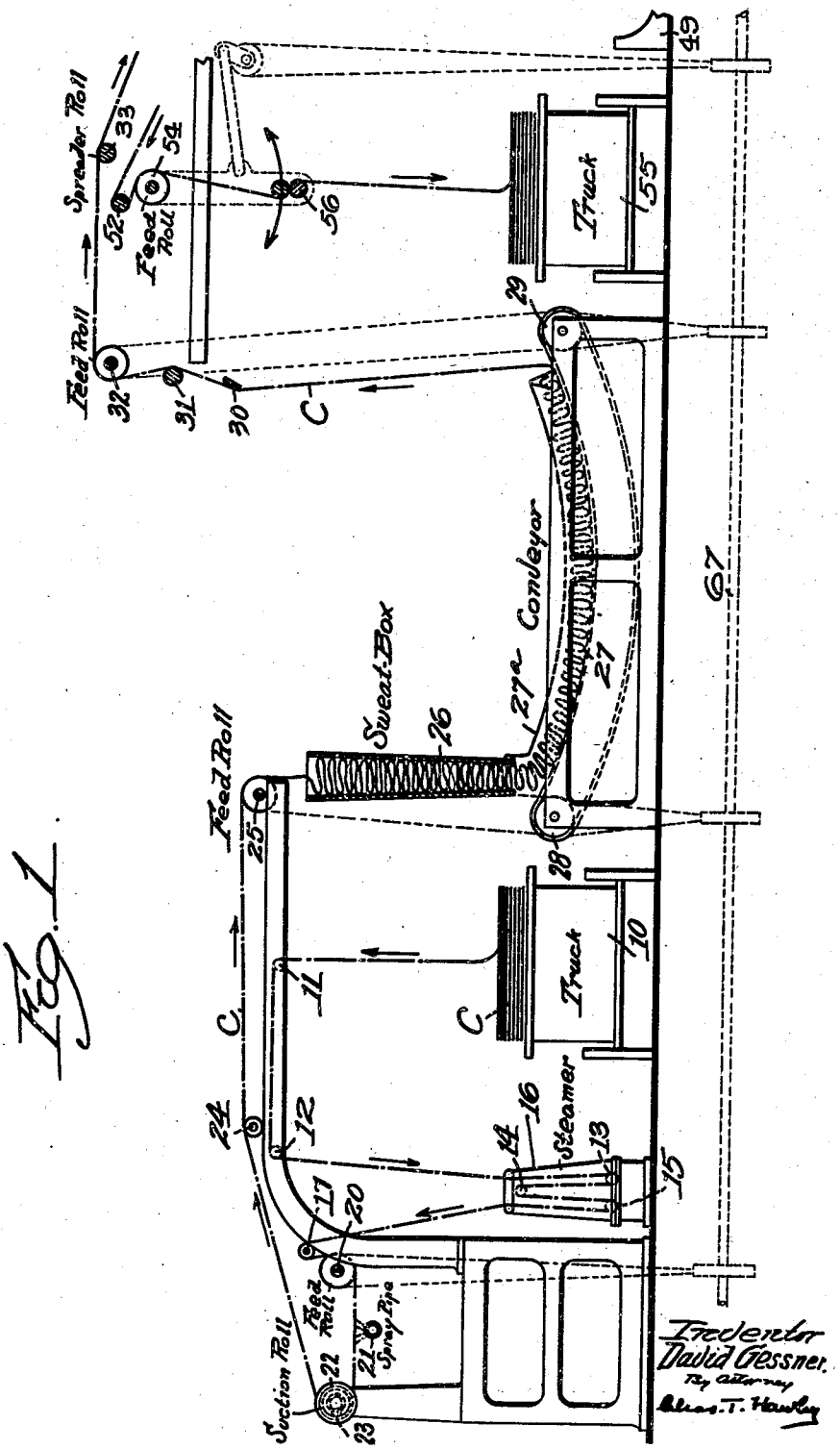


Fig. 1

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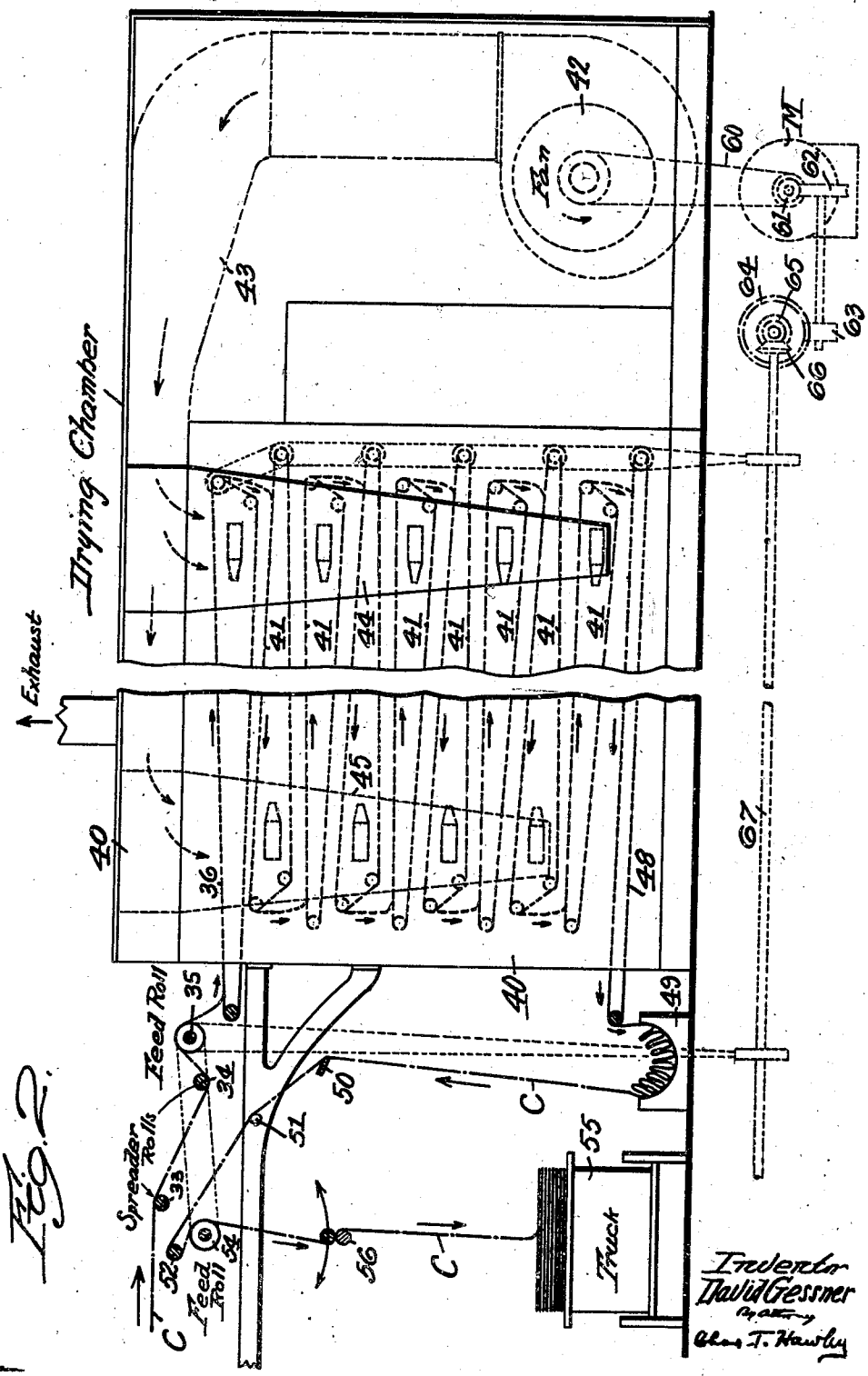


Fig. 2.

Inventor
David Gessner
by Attorney
Chas. T. Hawley

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METHOD AND APPARATUS FOR SHRINKING AND DRYING CLOTH

David Gessner, Worcester, Mass.

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1 Claim. (Cl. 26—18.5)

This invention relates to the manufacture of cloth, and particularly to the shrinking and drying of wool fabrics preparatory to garment cutting. It is well known that cloth finishing operations, such as shearing, brushing, pressing, etc., tend to stretch and elongate woolen and worsted fabrics to such an extent that careful shrinkage is necessary afterwards before they can be made into garments. Mere dampening and immediate drying of such fabrics is not sufficient, as complete shrinkage of them requires a substantial period of time.

It has been customary in many of the higher class establishments to moisten the fabric, let it sweat over night and then hang it up in festoons for a considerable period, frequently twenty-four to thirty-six hours, in order to dry it before delivering it to the garment cutters.

It is the general object of my present invention to provide an improved method and apparatus for properly shrinking and drying cloth, by which the wetting, sweating, shrinking and drying may be carried out in an uninterrupted operation and much more rapidly than could be done with satisfactory results by methods or apparatus previously in use. By the practice of my improved method and the use of my improved apparatus, substantially uniform and final shrinkage is attained.

My invention further relates to an ordered procedure and to definite arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of my improved apparatus, suitable for the carrying out of my improved method, is shown in the drawings, in which

Fig. 1 is a side elevation, partly in section, of the left-hand end portion of my improved shrinking and drying apparatus; and

Fig. 2 is a side elevation, partly in section, of the right-hand end portion of the apparatus.

Referring to the drawings, I have shown a pile of cloth C disposed in folded condition on a truck 10 by which it may be conveniently presented to the apparatus. The cloth C passes over guide-rolls 11 and 12 and is then drawn downward and around guide-rolls 13, 14 and 15 in a steaming device 16. The cloth then travels upward around a guide-roll 17 to a driven feed roll 20.

The cloth is then drawn over a spray pipe 21 and around a suction roll 22 having a suction nozzle 23 mounted therein. The suction roll and nozzle may preferably be of the construction shown in detail in my prior Patent No. 2,017,455, issued October 15, 1935.

The cloth passes from the suction roll 22 around a guide-roll 24 and second driven feed roll 25 and is deposited in a downwardly contracted chute or so-called "sweat-box" 26 in which the cloth is closely packed and folded.

As the cloth leaves the lower end of the chute or sweat box 26, it is deposited on a conveyor belt 27 supported on driven rollers 28 and 29 which move the cloth, still in folded condition, slowly to the right as viewed in Fig. 1. A blanket or covering 27a may be removably supported above the conveyor belt 27.

The cloth C is then drawn upward past a guide bar 30 and guide-roll 31 by a driven feed roll 32 and is then drawn over a spreader roll 33 and under an additional spreader roll 34 (Fig. 2) by a driven feed roll 35.

The cloth is then deposited on a belt conveyor 36 by which it is carried into a drier 40 in which the cloth is transferred to successive conveyors 41 and is exposed to heated air delivered to the drier by a fan 42 through a main air duct 43 and branch ducts 44 and 45.

The detailed construction of the drier forms no part of my present invention and for a more complete description thereof, reference is made to my prior Patent No. 1,907,786, issued May 9, 1933.

The cloth C is delivered from the drier by a bottom conveyor 48 and is preferably deposited in loosely folded condition in a cloth receptacle 49, from which it is drawn upward over guide-bars 50 and 51 and a guide-roll 52 by a driven feed roll 54. It may then be deposited in folded condition on a truck 55 by a folding device 56.

Suitable driving mechanism is provided, which insures that all parts of the apparatus shall operate in a predetermined and desired speed relation.

For purposes of illustration I have indicated a motor M (Fig. 2) connected by a belt 60 to drive the fan 42, and connected by a worm 61, worm gear 62, worm 63, worm gear 64 and bevel gears 65 and 66 to drive a main shaft 67. The shaft 67 is belt-connected as indicated to drive the several feed rolls, the conveyor 27, the conveyors 36, 41 and 48 in the drier 40, and the folding device 56, all at suitable relative speeds.

As substantial shrinkage of the fabric takes place in the sweat-box 26 and while the dampened cloth is resting under the covering 27a on the conveyor 27, it is desirable that the feed rolls 32 and 35 be driven at a correspondingly slower surface speed, and the feed roll 54 is driven at a still slower

speed to allow for the additional shrinkage which takes place in the drier 40.

The speeds are so arranged that a substantial period of time is consumed by the cloth in passing through the box 26 and along the conveyor 27. This period of time varies for different kinds and weights of fabric but is usually from thirty to forty-five or sometimes sixty minutes.

The operation of the apparatus described will be readily understood. The preliminary steaming of the cloth facilitates the moistening operation. The combined action of the spray pipe and suction roll effectively moisten all parts of the fabric without excess of water. The packing of the wet cloth in the sweat-box and its slow passage therethrough and along the conveyor produces a condition which is ordinarily called "sweating", as the temperature of the cloth is definitely higher at the point of removal from the conveyor.

During this period in which the cloth is closely packed and comparatively inactive in the box 26 and on the conveyor 27, the moisture provided by the spray pipe 21 and sucked into the fabric by the suction roll 22 and nozzle 23 is very evenly dispersed and distributed throughout the fabric, so that all of the fibers are uniformly moistened and are exposed to uniform shrinkage conditions.

It is found by actual test that a sixty-yard piece of fabric will shrink from one and a half to one and three quarters yards or more before it leaves the conveyor 27. The subsequent required shrinkage of the cloth in the drier 40 is clearly correspondingly reduced, so that the full necessary shrinkage is more easily and quickly accomplished and a more complete and satisfactory result is attained.

By the use of my improved method and apparatus I not only substantially reduce the time and labor over the previous practice, but I also attain more complete shrinkage and more satisfactory and uniform results.

My present invention is not to be confused with fulling or milling machines or with any other machines which compact, felt or shrink fabric before finishing operations such as shearing, brushing or pressing are performed thereon. My present invention is designed for the final shrinking of otherwise finished wool and worsted fabrics for immediate use by cutters or tailors and performs substantially 100% shrinkage of said finished fabric.

By the term "moistening" as used in the claim I mean supplying steam or water to the finished fabric and removing surplus water therefrom to such an extent that the moisture left in the fabric as it is delivered to the sweat box is not substantially more than one-third the weight of the cloth.

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:—

The method of final shrinking of woolen and worsted fabrics after all finishing operations such as shearing, brushing and pressing have been performed thereon, which comprises moistening the cloth, drawing the moisture into the cloth and leaving not substantially more than one-third by weight of water in the cloth, closely confining the moistened cloth for a predetermined and substantial sweating period, slowly advancing the cloth in folded condition on a conveyor without immersion of said cloth and thereby maintaining said cloth in substantially the same moistened condition and without the addition of moisture thereto for a further sweating period, and thereafter drying said cloth, all of said steps being performed successively and as parts of a continuous final shrinking operation.

DAVID GESSNER.