Feb. 8, 1938. T. FRUSHER, JR 2,107,476

FULLING CANAL

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Fig. 1

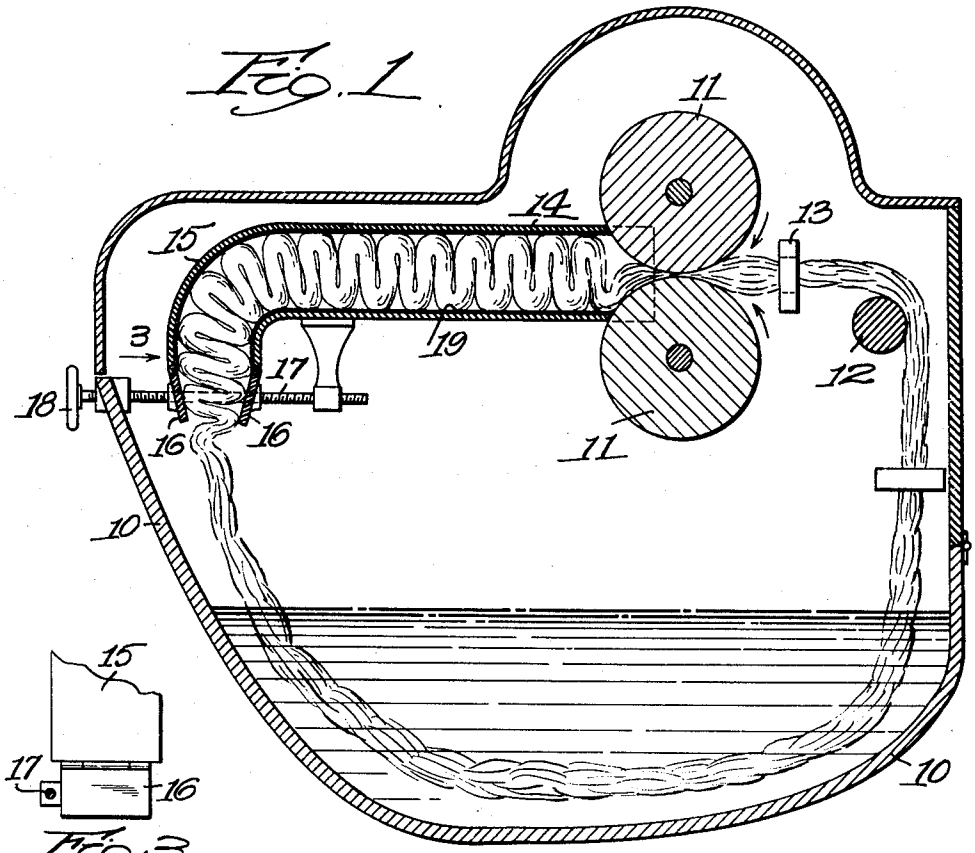


Fig. 3.

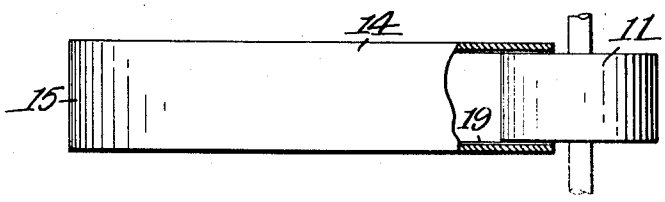


Fig. 2.

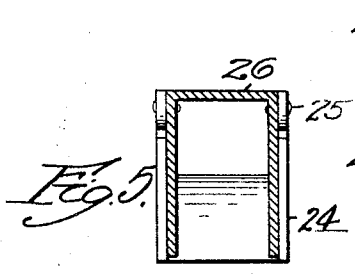


Fig. 5.

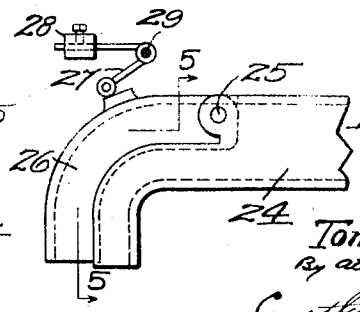


Fig. 4.

Inventor
Tom Frusher Jr.
By attorneys
Southgate & Gay & Harby

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Fig. 6.

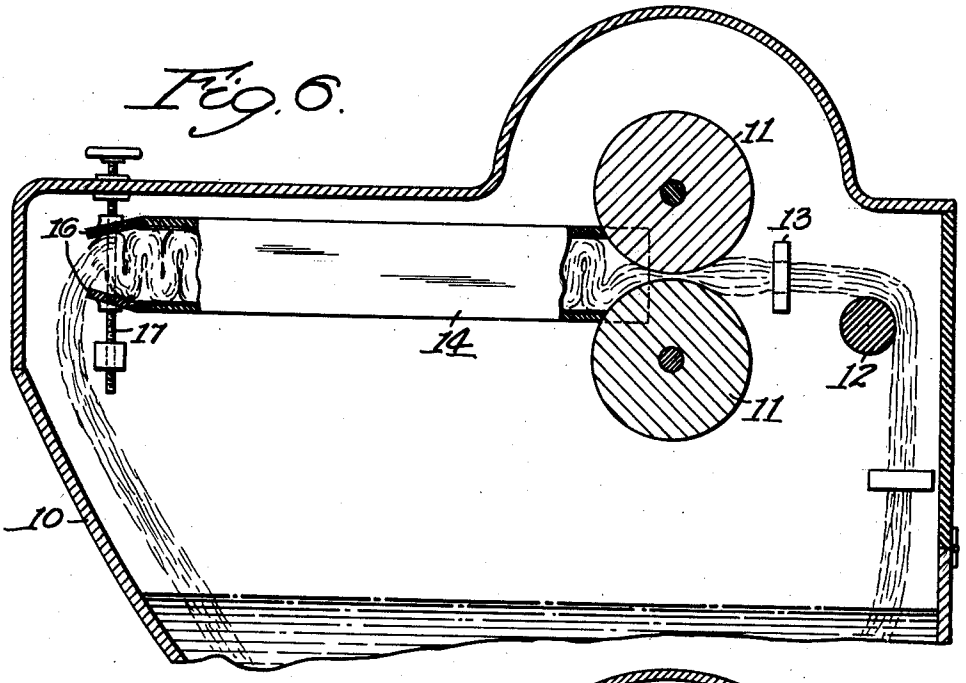
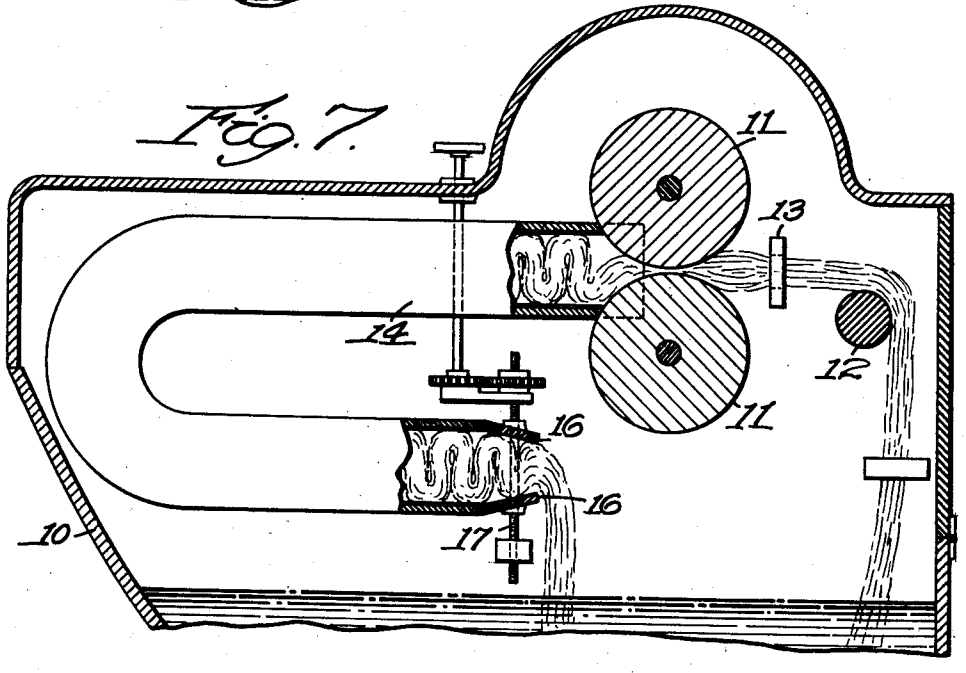


Fig. 7.



Inventor
Tom Frusher Jr.
by attorneys.
Scarbrough Fay & Harley

Patented Feb. 8, 1938

2,107,476

UNITED STATES PATENT OFFICE

2,107,476

FULLING CANAL

Tom Frusher, Jr., Groton, Conn., assignor to Rodney Hunt Machine Company, Orange, Mass., a corporation of Massachusetts

Application December 9, 1935, Serial No. 53,459

1 Claim. (Cl. 26—21)

This invention relates to a fulling canal particularly for use in rotary fulling mills. The principal objects of the invention are to provide a canal for such a fulling machine which exerts the same pressure on the goods in all places along the length of the fulling canal; to provide a construction which allows the goods to stay in a felting condition with a minimum degree of heating by the rolls; to provide a construction which allows all fibres in the goods controlled within the canal an equal amount of room for felting; to provide a construction by which the goods can be delivered to the body of the fulling machine evenly and under even and non-varying friction; to provide an apparatus which provides even friction on the goods during their entire passage through the fulling canal; to provide for delivering the goods to the bowl of the machine vertically under normal pressure, and to provide for insulating the canal so as to retain within it a normal amount of heat.

Other objects and advantages of the invention will appear hereinafter.

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

Fig. 1 is a longitudinal section of the rotary fulling mill showing a preferred embodiment of this invention employed therein;

Fig. 2 is a plan of the canal;

Fig. 3 is an elevation of the fulling canal looking in the direction of the arrow 3 in Fig. 1;

Fig. 4 is a side view of a modified form of fulling canal capable of accomplishing most of the objects of this invention;

Fig. 5 is a sectional view of the same on the line 5—5 of Fig. 4; and

Figs. 6 and 7 are views similar to Fig. 1 showing two modifications.

This invention relates to the fulling or felting of woolen or mixed goods in rotary fulling mills. It has always been difficult to full evenly and quickly such goods, used in the manufacture of clothing, upholstery, or other fabrics, which have to be felted to complete their manufacture. The ordinary felting or packing box does not retain the goods long enough each time they have passed through the friction or heating rolls. This has put them in a moist and heated condition at the time felting starts. The cause for the goods not being retained long enough is that the conventional type of felting or packing box has to be fitted with a movable tongue or pressure control device to exert pressure. This tongue forces the goods into a small space, increasing the pressure in proportion to the force with which they have to be introduced into the packing box. When this pressure is more than the weight which holds the tongue against the goods, the tongue being pivoted, lifts and allows a large amount of goods to be discharged from the packing box. This results in the forcing of a further amount into the packing box. When pressure is again built up, the goods are discharged unevenly and in many cases they are unevenly fulled and must pass through the friction rolls and packing box an additional number of times in order to be properly fulled.

This invention relates particularly to the fulling or felting canal which I make of such shape and length as to tend to grip and maintain an even pressure on the goods all along the length of the canal and I dispense with the movable tongue, in the preferred form of this invention. This allows the goods or cloth to be retained much longer in their heated and moist felting condition and under uniform pressure. The goods, being evenly folded and not forced by undue and varying pressure into a cramped space, discharge much more evenly and also they felt faster and require fewer passages through the friction rolls and canal.

Pressure in the canal in this case, not being produced by a movable tongue but from the length and shape of the canal itself, it is not necessary to exert much pressure to retain the goods in the canal. This is done by control gates at the discharge opening of the canal. The goods, being evenly folded, are subjected to an even pressure on the individual fibre which allows more even felting of the fibres and a quicker felting with less wear and tear on the goods. The goods retain an even heat and this is added to cause the fulling canal which is insulated to keep the heat from being dispersed and to keep the goods at a normal heat all the time.

The invention is shown as applied to an ordinary rotary fulling mill which comprises a tank 10 in which the parts are located. The usual friction rolls 11 are employed and the cloth or goods are guided between them over a front roll 12 and through a guide 13. The fulling canal 14 is formed of uniform cross section from the friction rolls for a considerable distance and this is not variable in any way.

In order to provide the necessary resistance for the purpose of fulling, this canal is provided with a curved portion 15, which in Fig. 1 is shown as constituting an outlet in the form of a quadrant. The distance across this quadrant is the same as

the height of the main part of the canal and of the same cross section.

Control gates 16 are provided which are pivotally mounted on the canal itself and operated by a right and left-hand screw 17 through a hand wheel 18 on the screw. These perform the function of controlling the amount of pressure that has to be applied to keep the goods in the canal properly held back to produce the desired friction. They open downwardly and the goods are discharged through them vertically down into the liquor in the tank. The canal may be rectangular in cross section at all points from the entrance to the control case. The advantages and operation of this device have been described in full above.

The inside of the canal is provided with insulation 19 for retaining the heat and causing the fulling action to be uniform. Said insulation is in the form of a heat-retaining lining to the canal extending throughout its interior surface.

Another form in which most of these advantages can be obtained is shown in Figs. 4 and 5. Here the canal 24 is substantially like the canal 14 especially on the lower side but on the upper side at 25 is pivoted a gate 26 which performs the double function of changing the shape of the canal from flat to curved and also acting as a gate to control the opening at the lower end. This gate is operated by a lever 27 with a weight 28 which is pivoted at 29 and in this case the friction and heat are controlled non-positively by the weight instead of positively by the screw-operated control gates.

In Fig. 6 a modification is shown in which the fulling canal is made longer to get the desired action and the outlet is a horizontal one at the end, comprising gates 16 and a controlling screw 17.

In Fig. 7 another form is shown to get practically the same result by curving the fulling canal around 180° and this provides a long fulling action.

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 combination with a rotary fulling mill and its friction rolls, of a fulling canal of uniform and constant shape from the friction rolls to a point near the other end thereof, said canal being straight for a material distance and curved downwardly at said other end, and control gates at the bottom of the curved section provided with means for moving them toward or from each other to control the discharge and the fulling.

TOM FRUSHER, JR.