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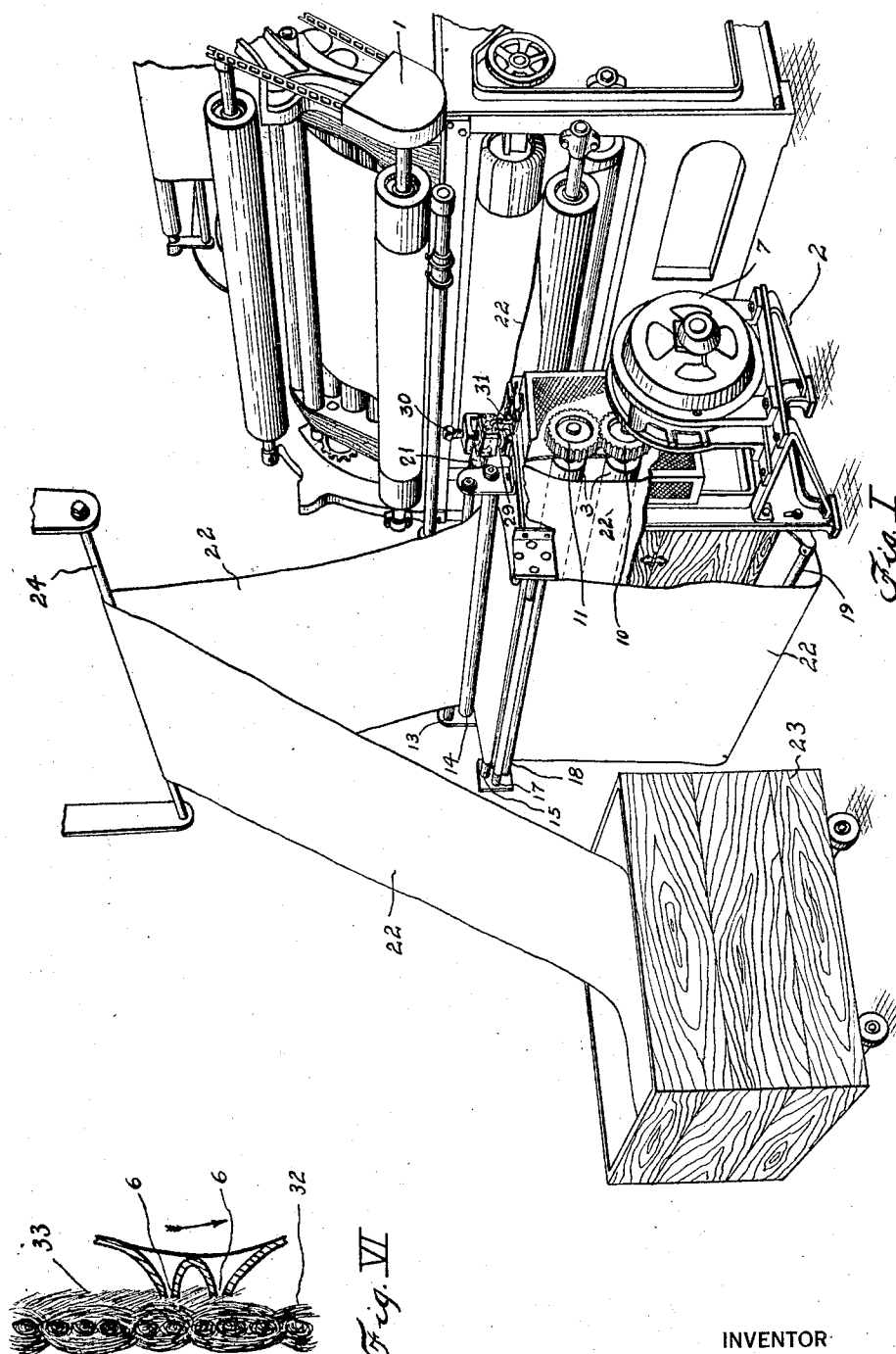
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CLOTH MAKING

Filed June 1, 1923

2 Sheets-Sheet 1



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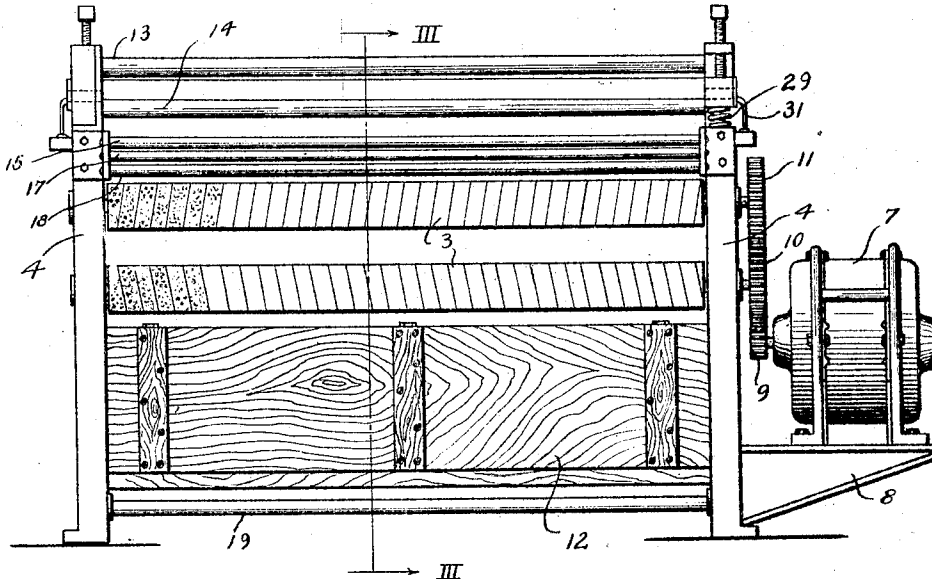
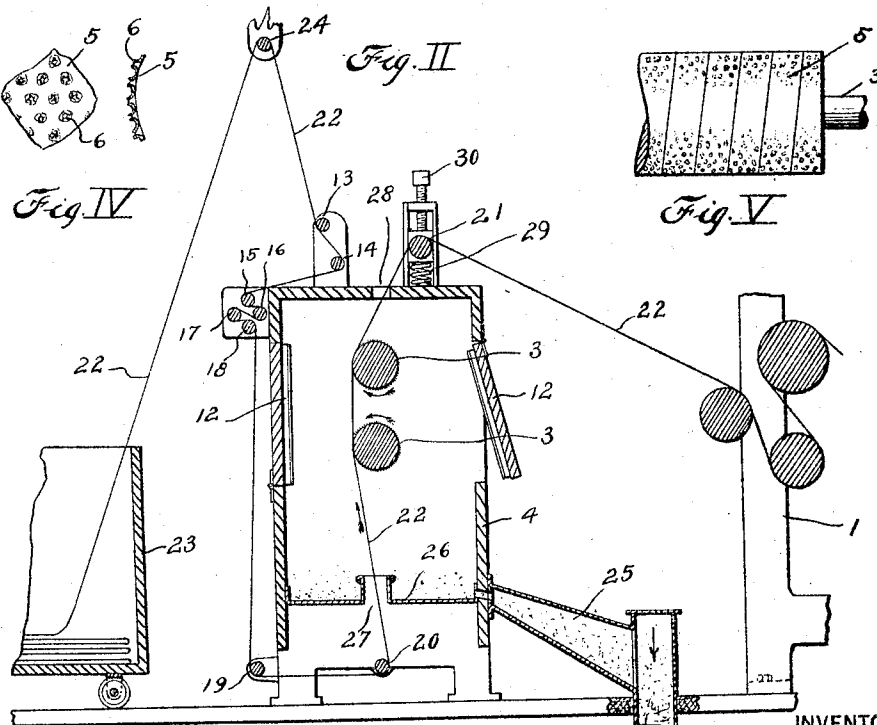


Fig. III

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UNITED STATES PATENT OFFICE.

ALPHONSE J. HENRICHON, OF PALMER, MASSACHUSETTS.

CLOTH MAKING.

Application filed June 1, 1923. Serial No. 642,809.

To all whom it may concern:

Be it known that I, ALPHONSE J. HENRICHON, a citizen of the United States, residing at Palmer, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Cloth Making, of which the following is a specification.

This invention relates to a new and useful process in the napping of cloth, and has particular reference to a process for separating the fiber of the hard surface of the cloth, and to new improvements in machines for producing such nap cloth, and the product so produced which shall have the general appearance and feel of wool.

The principal objects of the invention are: to break the fiber of the cloth; to save labor and cost in the napping of cloth; to increase the speed of napping, to improve the appearance and feel of the cloth; to decrease the cost of the production of cloth; to provide means for removing all dust and lint; to provide breaker means simple in construction, low in its cost of maintenance, easily installed in conjunction with regular napping machines, and operable without increase in labor over the operation of the regular napping machine; to provide automatic stopping means in case of breakdown or catching of the cloth; to provide facile means of removing and replacing the breaker means, and in general to provide a breaker device simple in construction, low in cost of maintenance, high in efficiency of operation, production and application, and facile in the removal, upkeep and repair of parts.

With these and other objects in view, the invention consists in the novel steps of the process, the product, and in the novel features of construction of the machine, together with the combination and arrangement of parts thereof described in the specification and pointed out in the claims, it being understood that only the preferred form of the invention is shown and described by way of illustration, and that many changes in the steps, operation and in the arrangement of parts may be made within the scope of the appended claims without departing from the spirit of the invention, and as such should fall within the invention. The preferred form of the

invention is described in the specification and shown in the accompanying drawings, in which:

Figure I is a perspective view showing the breaker unit in operation, in conjunction with a napping machine.

Figure II is a rear elevation of the breaker unit with the access door open showing the breaker rolls.

Figure III is a cross section on line III—III of Figure II.

Figure IV is a partial plan view and cross section of the breaker teeth for the breaker rolls.

Figure V is a partial section of a breaker roller showing the attachment of the breaker teeth.

Figure VI is a diagrammatic view in cross section of the cloth and the breaker teeth, showing the effect of the teeth on the hard surface of the cloth.

Referring now more particularly to the drawings, in which similar characters are embodied to denote similar parts throughout the several views:

Prior to this invention it was the practice to give the goods that are to be napped seven runs on each side through a Gessner napping machine 1, shown in perspective on the right hand of Figure I. This made the napping of cloth a long arduous and expensive operation which did not approach as satisfactorily as desired the formation of a nap on cotton cloth material that would have the appearance, pliability and general feel of wool.

The improved process of this invention consists in separating and breaking up the fibers of the hard cotton cloth by means of teeth or other means, as illustrated in Figure VI before the cloth is put through the regular and usual napping operations through the napper 1. The effect of separating and breaking the fiber is to raise the hard surface of the cotton cloth in such a way that after it has gone through the napping operations it has the general appearance and feel of wool, so that my improved process consists in first breaking and separating the fibers before the cloth is put through the usual napping operations.

A preferred way of separating and breaking the fibers of the cloth is illustrated in my nap raising or breaker unit 2 in Figure I,

which is used in conjunction with the regular usual napping machine 1. The breaker or nap raising unit 2 comprises a pair of breaker rolls 3 revolvably mounted in a housing 4. The breaker rolls 3 are provided with teeth or projections 6, preferably of a jagged form produced by punching through a piece of sheet material, as shown in Figure IV. The preferred way of placing the teeth on the breaker rolls 3 is to provide a strip of sheet metal 5 with the punched up teeth 6, which is spirally wound on the rollers 3 and secured in place thereon by brads. It will be noted that the teeth 6 are star-like in shape, being the rough punches with the jagged edges usual in punched up portions of thin sheet metal material. The starlike teeth 6 are very short, being simply short sharp points projecting from the body of the sheet material a very short distance, say less than a sixteenth of an inch. Being short they simply prick up the surface of the cloth by catching in the fibers thereof, pulling out the fibers and cutting or breaking them off short near the body of the cloth, being in their action very unlike the action of the usual napping needles or wires which are long and project deeply into the cloth, and pulling out long fibers as they emerge from the cloth. The old nappers, therefore, produced a long nap, making the cloth look like flannel, and a nap too long to look like wool. The short teeth of the present device gives a short wool like appearance to the cloth, as well as a pliable feeling like all wool goods, which, as far as is known, is the first time such cloth has been produced, and it is the result of first subjecting the cloth to the short teeth and thereafter napping it in the regular way, this process being new in this invention.

The breaker rollers 3 are driven by an electric motor 7 attached to the housing by a bracket 8; this motor drives a pinion 9, which meshes with a gear 10 driving the lower roller 3, which gear 10 in turn meshes with a gear 11 on the upper roller 3. The direction of motion of the breaker rollers is as indicated in Figure III by the arrows. Access to the breaker rollers in the housing is had through the door 12, Figure III. There are similar doors both on the rear and front of the housing.

In addition to the breaker rollers 3 there are several tension guide rollers 13, 14, 15, 16, 17, 18, 19, 20, and 21, which are in reality friction bars to keep the cloth at the proper tension across the breaker rollers 3, so that the teeth will have the proper break-up and separating action on the fiber of the cloth which passes over them.

The cloth 22 is folded in the carrier cart 23 and passes from thereover an overhead hanger 24, from thence over the tension rollers 13, 14, 15, 16, 17, 18, 19 and 20, thence

over the breaker rollers 3, and over the guide roller 21, around the rolls of the napping machine 1.

The dust and lint caused by the action of the roller teeth on the cloth are carried off from the housing 4 by means of a suction duct 25, shown in Figure III, which is attached to the usual blower and suction arrangement.

In the bottom of the housing are sheet metal trays 26 to catch the lint and dust falling from the rolls.

The cloth passes into the housing through the opening 27 in the bottom tray 26 and emerges through the opening 28 at the top of the housing.

The guide roll 21 to guide the cloth to the napping machine is loosely and resiliently mounted in its bearings, being supported by a spring 29, Figures II and III, and being adjusted in its tension in its bearings by the screw 30. The spring supporting the bearings resists downward pressure of the cloth on the guide roll and this works in conjunction with a control stop button or contact 31, Figure II, which button contact is connected to the motor control in such a way that when the cloth catches in the teeth or in any way the guide roller 21 is pulled down on its spring bearings, makes the contact which throws the motor switch, shuts off the power, and thus stops the machine. This contact is an adjustable finger fastened to the sliding bearing so it can be regulated to make the proper contact and stop the machine at the proper point.

The electric motor used in the unit that has been operated has a speed of 1750 R. P. M. and the breaker rollers have a speed of 925 R. P. M. This speed may be regulated as desired by relating the teeth on the driving gears with those of the pinion on the motor shaft.

Of course, it will be understood that other power than the electric motor power may be used. One of the advantages of this arrangement is that one roll revolves in one way and the other in the opposite direction, thus breaking the fiber so that it will be a close imitation of wool. As stated, the production of cloth using this breaker system is considerably more rapid than has hitherto been the case; one man may run both the breaker unit and the napping machine at the same time, and it is only necessary with the breaker unit to run the cloth through the napper once on each side. This represents a considerable saving in time and labor, and in addition it is found that with the breaking up and separation of the fibers of the cloth, the cloth produced has a much more wool-like nap than that produced by the usual napping machines; the nap is longer, more fluffy, and the cloth is more pliable, so that with my improved

process and machine I am able to save considerable time in the production of cloth and to save considerable labor, and in addition can produce a cloth of higher quality than has hitherto been possible.

Another advantage of the machine is that being motor driven it can be easily installed in front of any napping machine and run in conjunction therewith.

As has already been referred to above, this invention produces not only economy in time and labor, but also produces an entirely different quality of cloth from that which has hitherto been produced by the usual napping machines and processes.

The operation of the breaker teeth upon the cloth is best shown in Figure VI. The hard surface of the cloth 32 shown at the bottom of Figure VI, comes in contact with the teeth 6 and the fibers are separated, broken, and raised up, as shown at 33, after the cloth has passed beyond the teeth and it is this separation and breaking of the fibers that produces the wool-like appearance with a long, soft pliable nap; this breaking up and separation is caused by passing the cloth at high speed over the two breaker rollers 3 so that the teeth operate as shown in Figure VI.

The operation of the machine is as has been described, before; the breaker rolls are driven in opposite directions by the motor through the pinion and gear teeth, the cloth is held in a cart 23 passing over the hanger 24, over the tension rods 13, 14, 15, 16, 17, 18, 19 and 20, then over the breaker rolls 3, then over the napper guide roll 21 to the napping machine 1; the lint and dust are carried off by the suction duct 25; access to the rolls is had through the doors 12, and the current is controlled by the resilient bearing 29 and the contact plate 31 which operates to shut off the motor current when a downward pressure is brought on the roll 21 caused by the catching of the cloth in the breaker rolls or in other places. The breaker unit being self-contained, and motor driven, may be placed in front of any napping machine and the napping and breaking operations combined at one continuous operation, as shown in Figure III.

It will be understood that while I have preferred the picked up teeth on the sheet metal spirally wound around the rolls, that other forms of teeth or pickers may be used.

Having thus described my invention, what I claim is:

1. In a device of the character described, a roller, a sheet metal cover on the roller having short, sharp, non-yielding, pointed teeth struck up therefrom, means to rotate the roller, and means to draw the cloth over the roller whereby the fibers of the cloth are raised and broken off close to the surface of the cloth.

2. In a device of the character described, a roller, a sheet metal strip wound spirally on the roller and having struck up short sharp, non-yielding, pointed teeth, means to rotate the roller, and means to draw the cloth over the roller whereby the fibers of the cloth are broken off close to the surface of the cloth.

3. In a device of the character described, a toothed roller, means operated by an electric current for driving the roller, a resiliently mounted guide roller, and a contact on the resilient roller adapted to shut off the current for driving the toothed roller when the guide roller is pressed down in its resilient mounting.

4. In a device of the character described, a roller, a sheet metal cover on the roller having short, sharp, non-yielding, pointed teeth struck up therefrom, means to rotate the roller, means to draw the cloth over the roller whereby the fibers of the cloth are broken off close to the surface of the cloth, and tension rollers adapted to hold the cloth in contact with the teeth at the required pressure.

5. In a device of the character described, a toothed roller, a resilient tension guide roller adapted to guide the cloth over the toothed roller at the desired tension, electric means for driving the roller, a contact on the resilient roller adapted to stop the electric driving means when the resilient roller is depressed.

6. In a device of the character described, a pair of separated toothed rollers, tension guide rollers adapted to guide the cloth over the toothed rollers at the desired tension, electric means for driving the rollers, a guide roller mounted in resilient bearings, and a contact on the guide roller adapted to stop the electric driving means when the guide roller is depressed on its resilient bearings.

7. The process of making cotton cloth, consisting in first breaking off the fibres of the cloth close to the body thereof by passing it over rotating stiff, non-yielding struck up metallic tubular teeth, each tooth having a plurality of sharp projecting points, and thereafter napping it.

8. A fiber separator and breaker unit, comprising a box-like housing, a pair of toothed rollers mounted in the housing, electric means for driving the rollers, tension guide rollers adapted to guide the cloth over the toothed rollers, a resilient guide roller and a contact on the resilient roller adapted to stop the electric driving means when the resilient roller is depressed.

9. A fiber separator and breaker unit, comprising a box-like housing, a pair of rollers mounted therein, a metal plate having short sharp punched teeth spirally secured to the rollers, and a door in the hous-

ing to give access to the rollers to take off or put on the spiral toothed sheet.

10. In a device of the character described, a box-like housing, a hanger-like roll supported outside of the housing, two staggered guide rolls on top of the housing, four staggered guide rolls at the top rear of the housing, a guide roll at the bottom rear of the housing, a guide roll at the bottom center of the housing, two toothed rollers mounted within the housing, and a resilient guide roll mounted on the top front of the housing, substantially as shown and described.

11. A fibre separator unit comprising a box-like housing, a toothed roller mounted in the housing, tension guide rolls adapted to guide the cloth over the toothed roller at proper tension, electric means for driving the toothed roller, a resilient guide roller, and a contact thereon adapted to stop the electric driving means when the resilient roller is depressed.

12. A fiber separator unit comprising a box-like housing, a toothed roller mounted in the housing, tension guide rollers adapted to guide the cloth over the toothed rollers, a duct from the housing for conveying away lint and dust liberated by the toothed roller, electric means for driving the toothed roller, a resilient guide roller, and a contact on the resilient guide roller adapted to shut off the electric driving means when the resilient roller is depressed.

13. A fiber separator unit comprising a box-like housing, a pair of separated toothed rollers mounted therein, tension guide rollers on the top, rear and bottom to guide the cloth at proper tension over the toothed rollers, a suction passage from the housing to carry off the lint and dust liberated by the toothed rollers, gears for driving the toothed rollers, and electric motor meshing with the driving gears, a resiliently

mounted guide roll, and a contact on the resiliently mounted guide roll adapted to shut off the current in the motor when the resilient roll is depressed.

14. The process of finishing hard surface cotton cloth, comprising first submitting the cloth to the action of short, stiff, non-yielding struck up metallic tubular teeth, each tubular tooth having a plurality of sharp points, moving in two opposite directions to tear up and break off short the surface fibers, and thereafter submitting the cloth to the action of independent napping means to produce a short wool-like surface on the cloth.

15. A breaker unit for preparing cloth for napping, comprising a breaker roll having short, stiff, non-yielding struck up metallic tubular teeth, each tubular tooth being separated into a plurality of sections, each section having a sharp pointed extremity.

16. A breaker unit for preparing cloth for napping, comprising a pair of breaker rolls, each roll having short, stiff non-yielding struck up tubular metallic teeth, the tubular portion of each tooth being separated into a plurality of sections, each having a sharp pointed end, and adapted to tear up and break off the surface fibers of the cloth, and power means adapted to turn the rolls in opposite directions so that the surface fibers of the cloth are broken off simultaneously in two opposite directions.

17. A breaker unit for preparing cloth for napping, comprising a breaker roll having short, stiff non-yielding struck up tubular metallic teeth, each tubular tooth being separated into a plurality of sections having a sharp pointed extremity adapted to tear up and break off the surface fiber of the cloth, and power means adapted to turn the roll against the cloth.

ALPHONSE J. HENRICHON.