Oct. 11, 1938. T. MILNES 2,133,034

APPARATUS FOR MANUFACTURING WOVEN DRIER FELTS

Original Filed Feb. 26, 1936 3 Sheets-Sheet 1

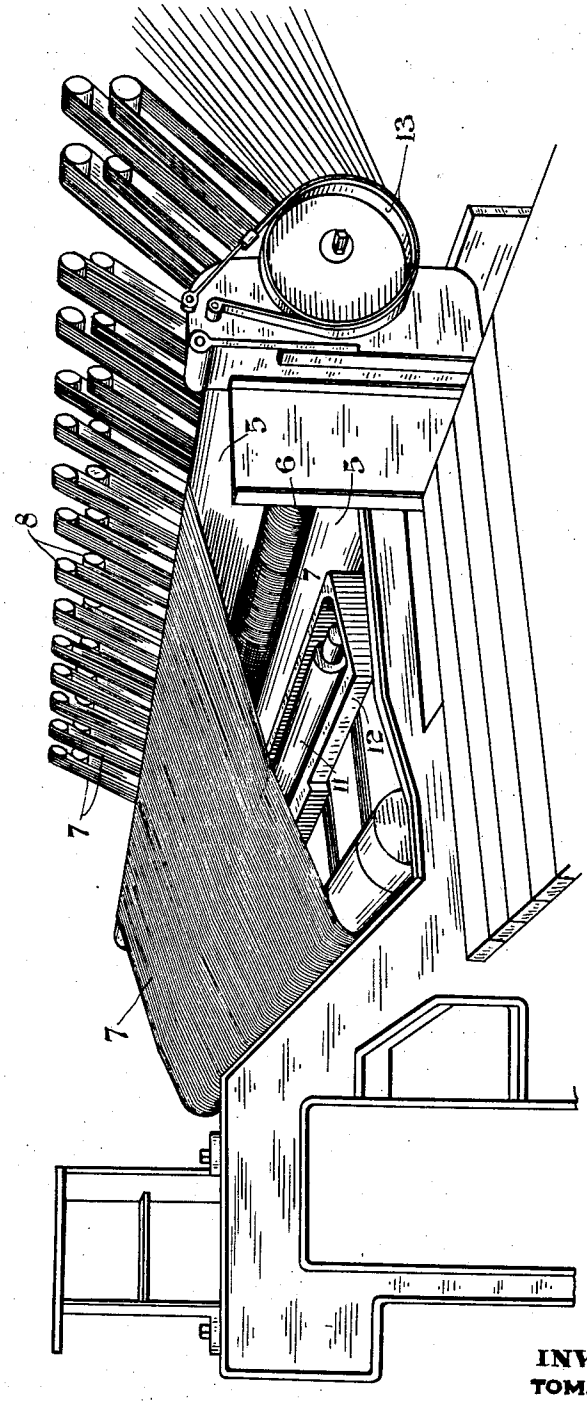



FIG. 1

INVENTOR
TOM MILNES
BY J. D. O'Connell
ATTORNEY

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APPARATUS FOR MANUFACTURING WOVEN DRIER FELTS

Original Filed Feb. 26, 1936 3 Sheets-Sheet 2

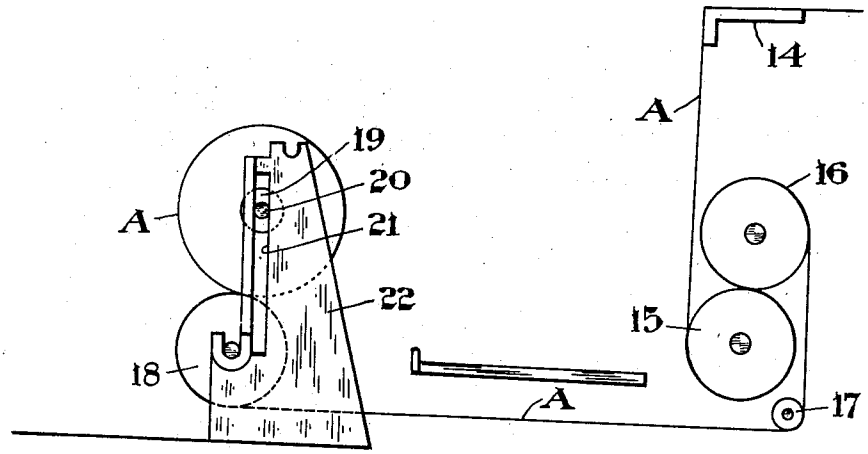



FIG. 4

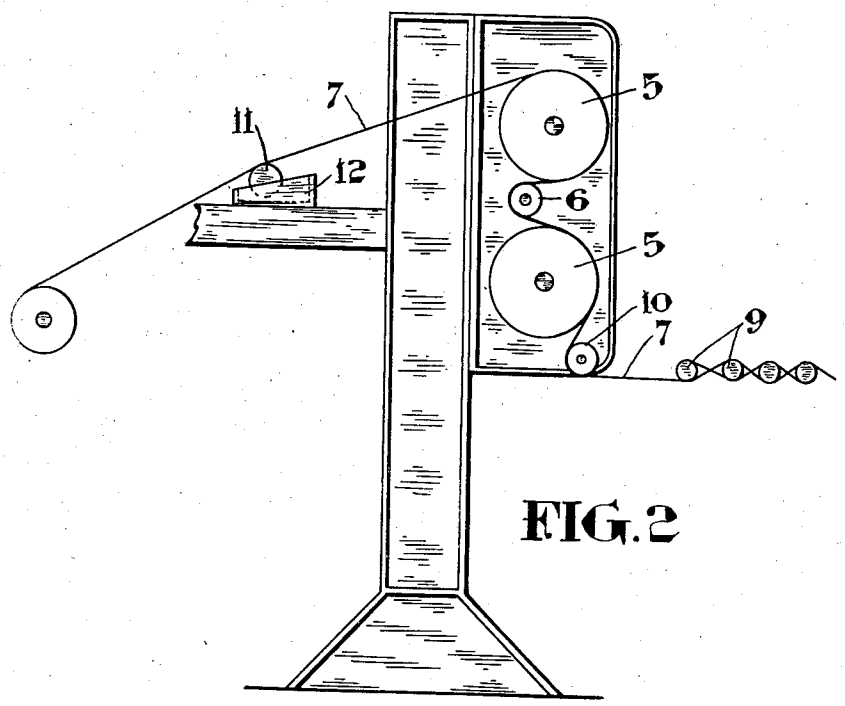



FIG. 2

INVENTOR
TOM MILNES
BY J. D. Cornell
ATTORNEY

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APPARATUS FOR MANUFACTURING WOVEN DRIER FELTS

Original Filed Feb. 26, 1936 3 Sheets-Sheet 3

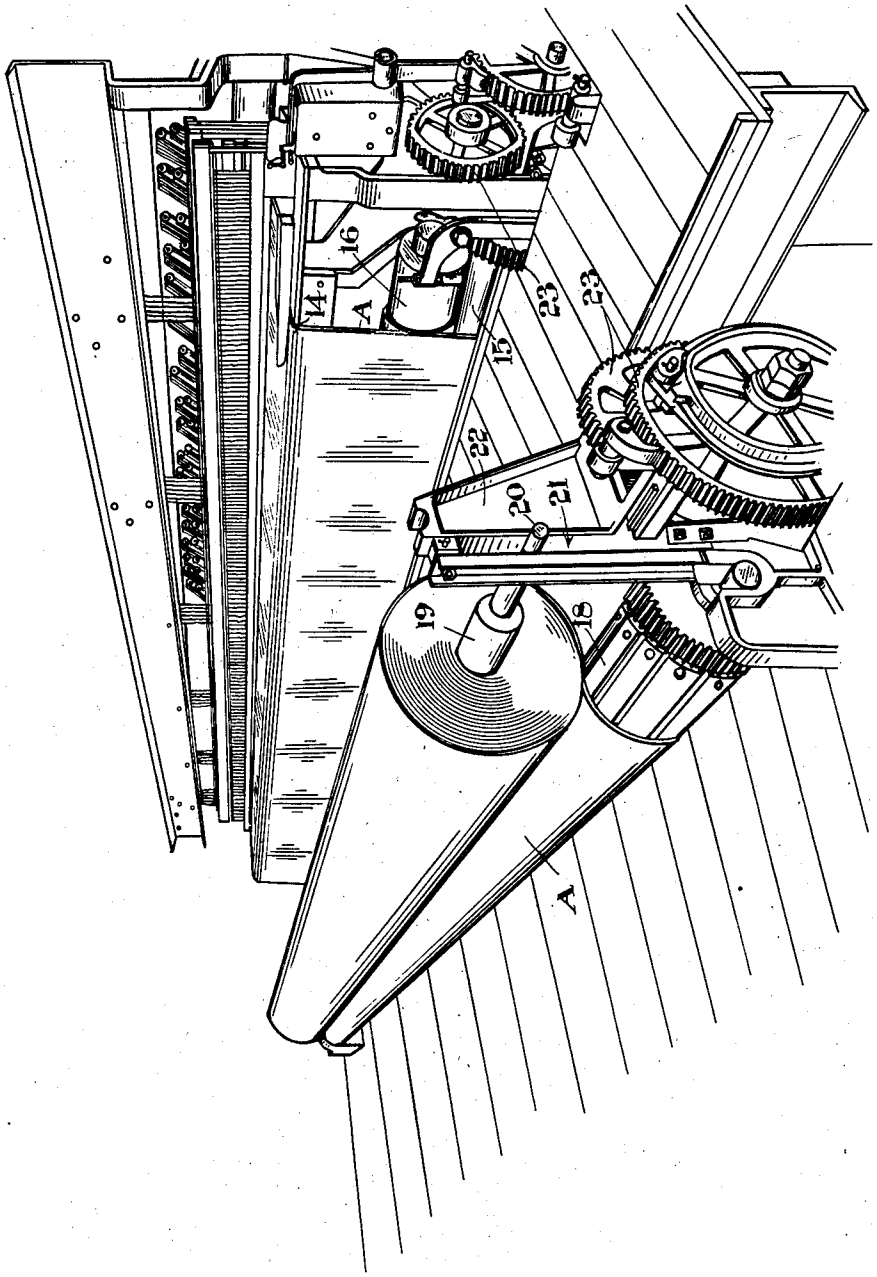



FIG. 3

INVENTOR
TOM MILNES
BY J. D. O'Connell
ATTORNEY

Patented Oct. 11, 1938 2,133,034

# UNITED STATES PATENT OFFICE

2,133,034

## APPARATUS FOR MANUFACTURING WOVEN DRIER FELTS

Tom Milnes, Lachute Mills, Quebec, Canada

Original application February 26, 1936, Serial No. 65,754. Divided and this application September 16, 1937, Serial No. 164,211

3 Claims. (Cl. 139—291)

This invention relates to the manufacture of drier felts for paper making machines and particularly to the manufacture of cotton felts provided with an asbestos surface comprising yarns composed wholly of asbestos fibres or asbestos fibres twisted around a strengthening core of cotton or the like. The present application is a division of my co-pending application Serial No. 65,754, filed Feb. 26, 1936.

In the weaving of asbestos-surfaced drier felts considerable difficulty is encountered owing to the difference in the tensile strength of the cotton yarn used in the body of the felt as compared with the tensile strength of the yarns used in weaving the asbestos surface portion of the felt. The present practice is to apply the same tension to both yarns with the result that the required tensioning of the cotton body yarns frequently results in excessive tensioning and breakage of the weaker asbestos yarns. Efforts to overcome this difficulty have hertofore been directed toward increasing the tensile strength of the asbestos yarns and keeping the tensioning of the yarns within the maximum stretchability of the asbestos yarns.

According to the present invention the asbestos yarns, instead of being subjected to the same tension as the cotton body yarns, are tensioned separately by a simple attachment capable of convenient application to standard looms used in the weaving of drier felts. With this arrangement the cotton yarn tensioning means may be adjusted to apply any desired tension to these yarns without danger of overtensioning and breaking the asbestos yarns.

Another feature of the invention consists in modifying the take up mechanism of a standard loom so that the woven felt is subjected to a calendering operation by the take up rolls as it passes from the cloth rest of the loom to the winding roll of the cloth stand.

Proceeding now to a more detailed description reference will be had to the accompanying drawings, in which—

Fig. 1 is a perspective view of my improved yarn tensioning attachment applied to a standard loom used for the weaving of asbestos-surfaced drier felts.

Fig. 2 is a diagrammatic view of the yarn tensioning attachment appearing in Fig. 1.

Fig. 3 is a perspective view of the front portion of the loom showing the take up mechanism by which the woven felt is subjected to a calendering operation in accordance with the invention.

Fig. 4 is a diagrammatic view of the take up mechanism showing the relative arrangement of the various take up rolls over which the felt passes as it travels from the cloth rest of the loom to the winding roll of the cloth stand.

The asbestos yarn tensioning attachment shown in Figs. 1 and 2 comprises relatively large upper and lower rolls 5 and a relatively small intermediate roll 6. The asbestos yarns 7 are passed from the supply spools 8 over a series of preliminary guide spools 9 which serve to straighten the yarns and prevent tangling thereof. From the guide spools 9 the yarns pass beneath a lower guide roll 10, over the lower tensioning roll 5, under and around the intermediate tensioning roll 6 and thence over the upper tensioning roll 5. From the upper roll 5 the yarns are passed over a roll 11 to the loom proper. The roll 11 dips in a water tank 12 and serves to moisten the yarns passing thereover with the result that the asbestos surface of the completely woven felt is sufficiently damp to permit of a satisfactory finish being imparted thereto by the calendering apparatus hereinafter described.

The tensioning rolls 5 and 6 are rotated solely by frictional contact with the asbestos yarns passing thereover. The weight of the rolls 5 is such that they exert just sufficient drag on the yarns 7 to give them the proper tension. The intermediate roll 6 may be provided with a friction brake indicated at 13 in Fig. 1 so that if the weight of the rolls 5 is not sufficient to give the desired tension this brake may be adjusted to offer a certain amount of frictional resistance to rotation of the roll 6. It is also contemplated that the rolls 5 may be provided with friction brakes similar to that associated with the roll 6.

Figs. 3 and 4 show the take up mechanism by which the woven felt is subjected to a calendering operation as it comes from the loom. As here shown the felt A passes directly from the cloth rest 14 around the take up rollers 15, 16, 17 and 18 onto the winding roller 19. The roll 16 is a large hollow steam heated roll which rests on the roll 15 so that the woven felt, in passing between these rolls, is subjected to a certain amount of pressure. Both of the rolls 15 and 16 are driven so that they have a slight slippage with respect to the felt A and thus produce a calendering effect. From the roll 16 the felt passes around the guide roll 17 to the roll 18 which is also a large hollow steam heated roll. The roll 18 is driven at a higher speed than the rolls 15 and 16 and has a greater slippage with respect to the felt so that a further calendering effect is produced at roll 18. After passing around the roll 18 the felt is wound around the winding roller

19 which is mounted so that its trunnions 20 are free to slide in vertical guideways 21 provided in the side frames of the cloth stand 22.

No novelty is claimed in respect to the mounting and driving of the rolls 15, 16 and 18 except insofar as the driving gear, generally indicated at 23, is adjusted to drive the roll 18 at a higher speed than the rolls 15 and 16. Aside from this adjustment of the roll driving means the invention resides in the substitution of hollow steam heated rolls 16 and 18 in place of the non-heated rolls usually found in the same location on a standard loom. This heating of rolls 16 and 18, together with the slippage of these rolls with respect to the felt, results in a very satisfactory calendering of the felt prior to its being wound on the winding roller 19. In ordinary practice the woven felt coming from the loom is either wound on the roll or pleated to form a bolt. The roll or bolt is then subjected to a calendering operation in a separate apparatus such as a stack calender or the like. By converting the take up mechanism into a calender the present invention eliminates the necessity of the very expensive stack calender heretofore employed besides eliminating the labor heretofore required in transferring the roll or bolt from the loom to the calender which is usually in a separate department of the mill.

The method of supplying steam to the interior of the rolls 16 and 18 is not shown since this may be accomplished in accordance with the usual practice followed in introducing steam into the interior of a hollow rotating roll. Preferably each roll is provided with a hollow trunnion to which a steam supply pipe is connected by a suitable form of steam joint which permits the necessary rotation of the roll.

Having thus fully described what I now conceive to be the preferred embodiments of this invention it will be understood that various modifications may be resorted to within the scope and spirit of the appended claims.

Having thus described my invention what I claim is:—

1. Apparatus for weaving paper drier felts comprising a loom equipped with a combined take up and calendering mechanism comprising a pair of superposed take up rolls around which the woven felt issuing from the loom is trained so that it is passed between the rolls from beneath the lower roll and then over the upper roll, a steam heated roll around which the felt is passed after leaving said first mentioned take up rolls and a vertically displaceable winding roll on which the felt is wound by the steam heated roll, means for driving said superposed upper and lower rolls at different relative speeds and means for driving the steam heated roll at a higher speed than either of said upper and lower rolls.

2. Apparatus as set forth in claim 1 in which the lower of said superposed rolls is heated to serve as a calendering roll.

3. Apparatus for weaving paper drier felts comprising a loom equipped with the usual winding roll and a plurality of take up rolls arranged between the winding roll and the cloth rest of the loom, said take up roll serving to pass the woven felt from the cloth rest to the winding roll, means for heating certain of said take up rolls and means for driving said rolls so that there is sufficient slippage between the rolls and the felt to subject the latter to a calendering operation as it passes to the winding roll.

TOM MILNES.