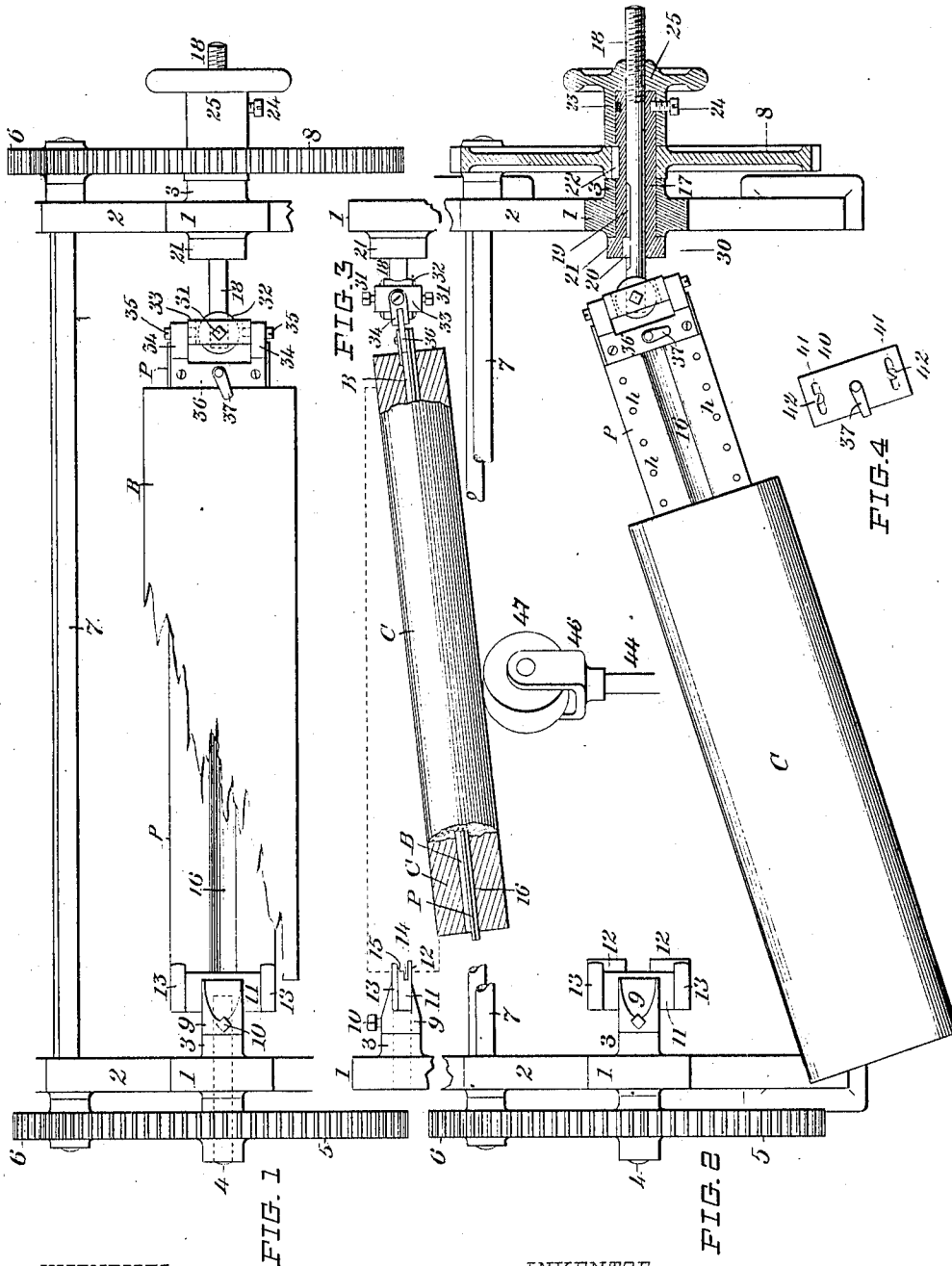


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CLOTH WINDING MACHINE.
APPLICATION FILED JULY 15, 1909.

1,055,409.

Patented Mar. 11, 1913.

2 SHEETS—SHEET 1.



WITNESSES:

Charles H. Houghton
Geo. F. Houghton -

INVENTOR.

EDWARD A. McMILLIN,

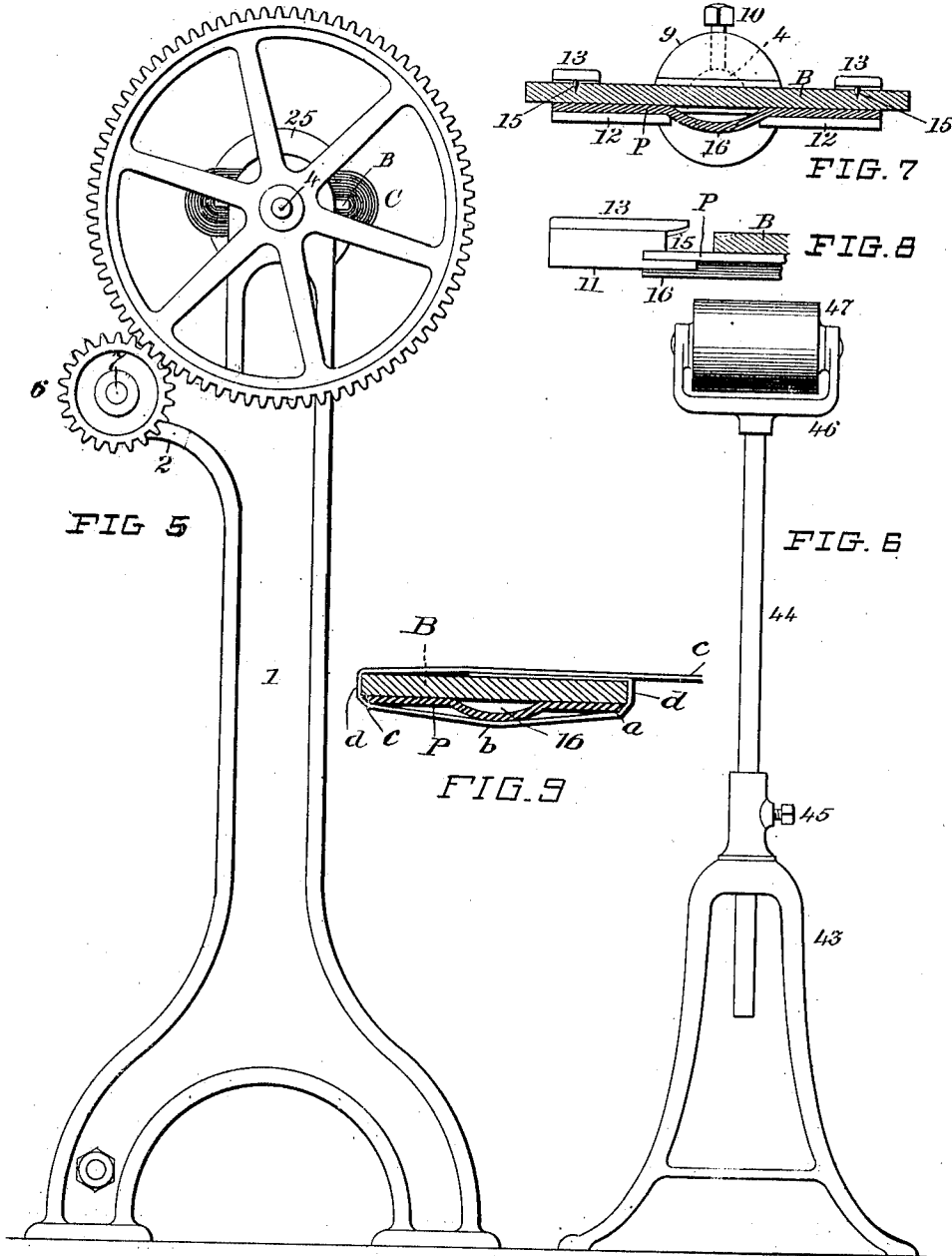
BY Franklin Scott, ATTORNEY

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WITNESSES.

Charles H. Knight
Geo. J. Knight -

INVENTOR,

EDWARD A. McMILLIN.

BY *Franklin Scott*, ATTORNEY.

UNITED STATES PATENT OFFICE.

EDWARD A. McMILLIN, OF NORTH ADAMS, MASSACHUSETTS, ASSIGNOR TO THE E. A. McMILLIN COMPANY, OF PHILMONT, NEW YORK, A CORPORATION OF NEW YORK.

CLOTH-WINDING MACHINE.

1,055,409.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Application filed July 15, 1909. Serial No. 507,813.

To all whom it may concern:

Be it known that I, EDWARD A. McMILLIN, of the city of North Adams, in the county of Berkshire and State of Massachusetts, have
5 invented certain Improvements in Cloth-Winding Machines, of which invention the following description, in connection with the accompanying two sheets of drawings, constitutes a specification.
10 This invention is designed for use in textile mills and factories where the fabric is prepared for market by winding it upon boards to avoid folding or creasing the goods and to facilitate handling, packing
15 and shipment. Hitherto wood boards of proper dimensions as to length, breadth and thickness have been very generally used, and as long as good lumber was plentiful and cheap, no substitute for wood was
20 sought. At first pine of good quality was used which could be dressed smoothly, but as its cost advanced, poorer and more knotty shaky stuff was used, until the price of such inferior stuff rose to where it barred its use
25 for such purposes. Then spruce and other inferior lumber was resorted to for the purpose, but the available supply of that has so deteriorated as to compel manufacturers to seek cheaper substitutes, as boards which
30 are shaky are liable to split after the cloth has been wound on them, or they may have pitchy or gummy knots or seams in them, which facts unfit the wound bolt of cloth for the market or later causes its return to
35 the manufacturer which involves re-winding. As it is necessary that a wood board shall be reasonably smooth so that the fibers of the cloth shall not be caught by knots, slivers or shives of the wood, if such boards
40 are used they must be papered or otherwise protected to prevent injury to the fabric wound upon them. The strength, stiffness and rigidity of wood boards are ordinarily in excess of the requirements for ordinary
45 cloth-boards to support and protect the wound bolt of cloth after it leaves the winding machine, but as a considerable degree of stiffness and rigidity in a board is necessary to withstand the rack and strain of the
50 winding process and the contraction of the bolt after winding, the use of wood has not yet been successfully superseded.

The object of this invention is to provide means capable of use in connection with

cloth-winding machines now in use which 55 will facilitate the introduction and use of cheaper, more flexible and lighter boards than can now be handled by the ordinary apparatus for winding cloths. Boards which would be too weak, flexible and slender to keep their shape between the jaws of the ordinary winding machine, and resist
60 the strain of the fabric in winding without doubling up, by reason of the support afforded by this invention may be successfully used in the winding machine and afterward
65 meet all the requirements in maintaining the shape of the bolt of cloth wound thereon that were afforded by the old wooden boards.

With the aid of this invention it has been 70 made feasible to wind cloth on boards made from strawboard or wood pulp with a facility which was impossible with the old machines.

The invention is fully disclosed in the 75 accompanying drawings wherein—

Figure 1 shows a plan view of the top of a winding machine with my improvements, embodied therein. Fig. 2 is a similar view of the same machine showing the cloth-
80 board-support detached from the tail-stock of the winding apparatus and swung to one side with the bolt of cloth partially removed from the board support. Fig. 3 is a front elevation of my invention showing the head-
85 stock withdrawn and the bolt of cloth as having dropped onto and resting upon the carrying roll. Fig. 4 is a detail view of the reducing plate. Fig. 5 is an end view of the machine. Fig. 6 is an elevation of the
90 carrying roller and stand. Fig. 7 is an end view of the tail stock showing one of the boards in section and in position as when the winding apparatus is in service. Fig. 8
95 is an edge view of the tail stock showing a section of a board slightly withdrawn from its clamped position. Fig. 9 is a diagrammatic illustration of the means employed for counteracting the effect on the wound
100 bolt of the contraction of the cloth about the winding board as developed in the winding process.

This apparatus is adapted to carry any kind of a winding board but especially thin flexible boards, such for instance, as may
105 be made from pasteboard, straw, wood pulp or any other cheap material which may be wrought into the desired shape and thick-

ness, or light wooden frames. The main desideratum in the board is that it shall possess sufficient rigidity to keep its shape in the center of the bolt after the winding. If it will do this it will be strong enough to withstand the vicissitudes of the operation of winding the cloth thereon.

The frame on which this apparatus is mounted consists of suitable uprights 1, 1, connected by tie rods in the top of each of which uprights is a journal bearing 3, 3, for the reception of the two shafts 4 and 18. Shaft 4 carries a gear 5 by which it is rotated and its inner end carries the hub 9 of the tail-stock of the board supporting devices. This tail stock consists of a cross-head 11, grooved as seen at 14, Fig. 3, to receive the end of the supporting plate P, and is provided with the ledges 12, 12, which support the under side of that plate. Upon the opposite side of this cross-head are two spur-clips 13, 13, the outer ends of which overhang the ledges 12, 12, each of them being provided with a knife-edged spur on its under side which spur-edges are plainly seen in end and side views at 15 in Figs. 7 and 8. In practice the end of the plate P is forced into the groove 14 and the board B is forced between the upper side of the plate and the spurs on the under side of the clips 13, 13, the spurs 15, 15, entering the upper surface of the end of the board. These spurs prevent edge-wise shifting of the board in operation of winding.

The head stock consists of the head proper 36, having the pivot ears 34, 34, in which the ring 33 is hung. Within the ring 33 on transverse pivots 31, 31, is hung the ball 32 which is bored to receive the end of shaft 18 which can be held therein by one of the pivot screws 31. Shaft 18 is carried in a pipe bearing 17, which is fitted to rotate in a bearing 3 of the frame of the machine. The shaft and pipe bearing are fitted with a spline 20 in one and a groove 19 in the other so that they will be geared to revolve together but the shaft can slide within the pipe bearing. The outer end of the shaft 18 is screw-threaded and takes on a nut 25 which has a hub of sufficient proportions to cap over the end of the pipe bearing as seen in Fig. 2. A screw or pin 24 passes through the hub of this nut and its end enters and turns in the groove or necking 23 of the pipe bearing 17. Thus the pipe bearing 17 is prevented from endwise movement in its seat by the flange 21 at one end and at the other end by the screw connection between the pipe bearing and the nut-hub at 24. The gear 8 is rigidly attached to the pipe bearing by a key 22 or by other suitable means between the machine frame and the nut. Thus the motion of the gear 8 will through its rigid attachment to the pipe bearing 17 by means of key 22 rotate bear-

ing 17, and bearing 17 will through the spline and groove 20—19, rotate the winding shaft 18 and the headstock with it, the nut 25 being carried along with the bearing 17 and screw-shaft 18, the whole combination turning together. But as nut 25 is free to turn on the shaft 18 in either direction whether the machine is running or not, it is plain that the headstock may be drawn back at any time without obstruction, by simply turning the nut 25.

The most important part of this invention is embodied in the cloth-board supporting plate P. This plate possesses several distinguishing characteristics all of which contribute either separately or in combination with some one or more of the other features to the success of the machine. The plate P is designed with one plane side on which to place the winding board and the other is provided with an elevated rib or corrugation extending throughout the middle of its length. It is also made as thin as it can be and retain the requisite stiffness to do its work. This is for the purpose of leaving the finished bolt of cloth wound sufficiently close and tight that when the plate is withdrawn from the bolt its convolutions will contract enough, and only enough to hold the board firmly grasped within its folds so that it will not get displaced or loosened in the handling to which it may be subjected subsequently in packing, transportation or on the sales counter. Therefore its thickness ordinarily, should not be more than about an eighth of an inch. It should be practically integral in character so as to present a supporting surface which will be practically unbroken to support the winding board. Therefore, a solid integral thin plate seems best for these purposes and preferably made from steel to secure strength and lightness. Longitudinal parallel supporting bars or rods with open intervals between them are unsuited for the purpose, since the contraction of the wound bolt against the edges of the board is sufficient to buckle or force the body of the board down into these open intervals which leaves the interior folds of the goods next to or nearest to the board crumpled and wrinkled to such an extent that in many cases several yards of the inside end of a wound piece will be so wrinkled and damaged as to be unsalable and goes into the waste, or is turned back on the hands of the manufacturer or jobber. The rib or corrugation 16 contributes much to the success of this plate. The apex of this rib is considerably higher than the surface of the plate so that when the cloth is wound around the board and plate the length of the folds will be substantially longer than if the rib were absent. In this case the corrugation 16 not only provides a raised rib but also inci-

dentally fortifies the plate against being bent or distorted lengthwise. It will be seen that in winding the fabric around the plate P and the board B, the successive folds will lie flat or in contact with the entire breadth of the board on one side, while the folds which cross the opposite side stretch from the edge *a*, of one side of the plate across the high rib 16 to the edge *c*, thus bearing against the plate P, only at three points *a*, *b*, and *c*. Thus the frictional contact of the wound bolt upon the board and plate is much less than if the rib 16 were absent and the cloth pressed directly against the plate. This contributes to the easy withdrawal of the plate from the finished bolt, inasmuch as, the plate being slightly tapered lengthwise as elsewhere described, its initial start in removal is easy, and the pinching friction of the bolt being confined on one side to the rib 16 is much less to overcome than it would be if the cloth contacted with the entire broadside of the plate. By reason of the connection of the headstock with the winding shaft 18 by the universal joint previously described, this supporting plate, when disconnected from the tailstock is free to swing around the end of shaft 18 in any direction. Connection of this supporting plate is made with the tailstock by entering its free end in the groove 14, and if it carries a cloth board, the thickness of that board will fill the interval between the lips 14, 14, on which the end of plate P rests and the clips 13, 13, between which it will be pinched, the spurs 15, 15, engaging the material of the board and by their knife-like edges preventing it from slipping edgewise. The head-piece 36, to which the supporting plate P is attached, is approximately of the same thickness as the boards with which it is designed to be used, and has a button 37, or other fastening device to hold the cloth-board in place.

To adapt the apparatus for winding cloths of less width than the maximum width it is capable of winding, I have provided a reducing plate 40, seen in plan in Fig. 4, which is slotted at each end as at 41, 41, to receive the set-screws 42, 42. The margin of plate P is fitted with a series of screw-holes *h*, *h*, *h*, Fig. 2, to receive the screws 42, the slots being long enough to cover the range of adjustment between the holes *h*, *h*, *h*. This plate has similar provision to the head-piece 36 for holding the board B, in working position in service. This consists of the button 37. Thus, by the use of this reducing piece the distance between the clamping shoulders of the headstock and the tailstock against which the ends of the board abut when in service can be adjusted to correspond with the various lengths of boards to be used. This support-

ing plate should be slightly tapered to facilitate its withdrawal from the finished bolt of cloth at the finish of the winding process, but not enough to interfere with correct winding. A taper of a sixteenth or an eighth of an inch in its length is sufficient. The edges over or across which the cloth is wound should be protected against being bent or distorted by the contraction of the wound bolt before the plate has been removed from the bolt. An integral plate affords ample means to resist this crushing force but other designs are competent to meet the requirement in this respect. If the opposing edges are supported by connecting stays or grids this object would be secured. This feature is important for the following reasons:—In winding cloth from a beam or roll onto a flat board, as is the common practice, a tension roller of some weight is employed to lie on the web between the roll of cloth and the cloth board for the purpose of keeping the running web taut so as to secure close winding. As the cloth board rotates it produces alternate tightness and slackness of the web unless something is provided to take up this slack which the tension roller does, but in so doing it intermittently rises and falls on the web with great force, which blows have the effect of producing a very hard, close-wound roll. As the running web of cloth receives two of these blows at each revolution of the cloth-board, the effect is to collapse the board if it is not protected by support throughout all its surface. This hammering of the tension roller has force enough to permanently bend heavy, strong bars of iron or steel when they have been used in pairs on which to wind the cloth hence such bars have been found unsuited for cloth-winding purposes. By making this cloth-board support from an integral, or practically integral plate, or one in which the edges are supported throughout its entire length by a solid web or by intermediate stays, its maximum stiffness is preserved and the tension roller produces no effect during the winding process tending to impair its shape.

To facilitate the removal of the wound bolt of cloth from the winding machine, a supporting roller 47 is provided which is carried in bearings 46 on standard 44, which is vertically adjustable on the stand 43 by means of the set screw 45 which passes through the head of the stand and bears against the standard 44. One of these stands and rollers is provided for each machine, and after the roller has been adjusted to the proper height under the supporting plate the stand is preferably fastened to the floor with the roller set at just the right angle with the machine for the bolt to drop onto it when the head shaft is withdrawn so that the end of the plate B will drop out of

engagement with the tail stock. When it is desired to remove a wound bolt of cloth from the supporting plate P, by turning the nut 25 in the proper direction the shaft 18 with the plate P will be drawn away from the tailstock 11 thus leaving the free end of the plate to drop onto the roller 47 as seen in Fig. 3. On this it can rest momentarily until the attendant can seize it and draw the bolt off in the manner shown in Fig. 2, bringing the cloth-board along with it. It has been found that the long flat corrugation or rib 16 of the supporting plate greatly facilitates this removal as it lifts the cloth away from the flat surface of the plate thereby diminishing the area of frictional surface contact of the cloth with the plate.

I therefore claim as my invention and desire to secure by Letters Patent the following:

1. In a cloth-winding machine of the class described, the combination with the head and tailstocks and means for supporting and rotating them in unison, of a cloth-board support spanning the interval between said stocks, having a raised longitudinal rib on one side thereof and means for holding a cloth-board in correct operative position thereon, substantially as specified.

2. In a cloth-winding machine of the class described, in combination with the two winding shafts and their provisions for clamping the ends of the clothboard, of a thin stiff support for the board adapted to give it support throughout its substantially entire superficial area, having one plain

side and a raised longitudinal rib on its opposite side, substantially as specified.

3. The combination with the stocks and supporting plate having a raised longitudinal rib on one side thereof of V-shaped spur-ribs for engaging the flat surface of the ends of the boards to prevent displacement of the board on the support during the winding process, substantially as specified.

4. The combination with the stocks and an integral supporting plate with a raised longitudinal rib on one side of means adapted to engage the material of the board itself to prevent its displacement on the supporting plate during the winding process, substantially as specified.

5. In a cloth-winding machine, a device for carrying a folding board, consisting of a thin, rigid metallic plate substantially plane on one side to receive the board and support it throughout its extent, and having a longitudinal elevated rib on the opposite side preferably located midway the margins of the plate and of sufficient length to extend through the wound bolt, in combination with means for confining the board to the plate, and for mounting and rotating the same substantially as specified.

In testimony whereof I have hereto subscribed my name in the presence of two witnesses.

EDWARD A. McMILLIN.

Witnesses:

EMILY SCOTT,
FRANKLIN SCOTT.