This invention relates to textile machinery and more particularly to a braking mechanism for controlling the downward pressure exerted on the calendar roll in lap winding apparatus.

In cotton picking machinery of the type with which this invention is utilized a web of cotton passes between feed rolls and is received on a calendar roll which gradually increases in diameter as the web is wound thereon and this calendar roll is supported by the cotton which rests on a pair of parallel driving rolls. Obviously, as the diameter of the calendar roll increases the shaft or axle thereof moves upwardly away from the driving rolls and means must be provided to exert a downward pressure on the shaft to maintain tight contact between the cotton and the driving rolls to facilitate the transfer of power thereto.

It has been found that by providing additional braking mechanism to control downward pressure exerted on the roll shaft that the amount of cotton which may be applied to a single roll may be increased by approximately 30 to 50 percent above that now commonly wound on the ordinary roll utilizing conventional apparatus. In the conventional apparatus heretofore used, braking means for controlling the downward pressure on the roll shaft has been provided but this has proved insufficient and has not provided a smooth and even control of such downward pressure as the diameter of the roll increased with the application of the cotton thereto. Furthermore, if the downward pressure is not smoothly controlled, frequent breakage of the cotton web is experienced which necessitates splicing or piecing of the web resulting in uneven portions in the roll and also in the loss of time of the machine since an appreciable amount of time is necessary to satisfactorily complete the splice in the cotton web.

The present invention contemplates the provision of a supplementary braking mechanism which may be applied to existing machines or supplied with new machines and provides a mechanism whereby the downward pressure on the roll shaft may be conveniently controlled, it being noted that this pressure must be varied as the diameter of the roll increases with the addition of cotton webbing thereto. The mechanism of this invention utilizes the conventional braking mechanism of the lap winding machine and at the same time utilizes the control pedal provided therewith to operate both the conventional braking mechanism and the supplemental braking mechanism of this invention.

It is therefore an object of this invention to provide a braking mechanism for lap winding machines which may be economically manufactured of readily available materials, which requires no precision machine work and therefore may be produced by relatively unskilled labor.

It is a further object of this invention to provide a braking mechanism for lap winding apparatus which may be conveniently applied to existing machines or which may likewise be applied to new machines in the process of manufacture.

It is a further object of this invention to provide a braking mechanism for lap winding apparatus in which adjustments are provided to synchronize the operation of the same with the conventional braking mechanism supplied with the machine and in which the degree of braking may be closely controlled.

Further objects and advantages of the invention will be apparent from the following specification taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a side elevational view of the braking mechanism of this invention with such parts of the lap winding machine shown as are necessary to illustrate the application and operation thereof; and

Fig. 2, a front elevational view of the mechanism shown in Fig. 1 with certain parts in section for greater clarity.

With continued reference to the drawing there is shown a shaft 10 which serves to support a roll 11 which roll receives cotton in a form of a web 12 thereon. The roll 11 is supported on driving rolls 13 mounted on shafts 14, rolls 13 being driven and serving to rotate the roll 11 and shaft 10 associated therewith. The web of cotton 12 as it builds up on the roll 11 rides on the drive rollers 13 which continue to drive the same, the web 12 being supplied thereto by feeding rolls 15 mounted on shafts 16.

The roll 11 and cotton web 12 carried thereby is maintained in engagement with the driving rolls 13 by a logger head structure 17 which comprises a head 18 rotatably carrying a roller 19 which roller engages the roll shaft 10 to resist upward movement thereof as the diameter of the cotton web on the roll 11 increases. The head 18 is secured to a vertically extending and
slidably mounted rack 20 having rack teeth 21 thereon which mesh with pinion gears 22 mounted on a pinion shaft 23. By extending transversely of the machine. Shaft 23 may be rotated to raise or lower the roller heads 11 by operation of a hand wheel 24 mounted on the shaft 23 outwardly of the framework of the machine and in a position conveniently accessible to the operator. Since the diameter of the roll 11 increases as the cotton web 12 builds up thereon, this causes upward movement of the roll shaft 10 and consequent upward movement of the roller heads 11 and shaft engaging rollers 15, the upward movement of roller heads 11 must be controlled in order to maintain the proper downward pressure on the roll shaft 10 and the proper driving engagement between the roll of cotton on the roller 11 and driving rolls 13. For controlling the upward movement of roller heads 11 as the diameter of roll 11 increases, there is provided a braking mechanism which forms the subject matter of this invention.

The braking mechanism of this invention comprises a frame 25 which may include spaced horizontal bars or side members 26 and spaced vertically extending side members 27. The frame 25 is positioned with respect to the lap winding machine by a lower bearing member 28 secured to the frame 25 which bearing engages a transverse shaft 29 mounted in the machine. The lower bearing member 28 and frame 25 are securely held in position by a bearing cap 30 secured to the lower bearing member 28 by screw-threaded fastening means or the like 31.

The frame 25 is secured to the floor or other supporting structure by screw-threaded fastening means or the like 32 which extend through angle members 33 secured to the horizontal side bars 26 by screw-threaded fastening means or the like 34. The angle members 33 are provided with slots for receiving the fastening means 34 whereby the frame 25 may be adjusted in a vertical direction.

In order to facilitate such adjustment and to level the apparatus with respect to the lap winding machine, there may be provided on the frame 25 a plurality of adjusting screws 35 which are threaded through ears 36 provided on the side bars 26 of the frame 25, the adjusting means 35 further being provided with lock nuts 37 which serve to clamp the same against undesired movement once the apparatus is properly leveled and adjusted. The adjusting screws 35 are intended to engage the upper surface of the floor or other supporting structure and to adjust the height of the frame 25 and associated apparatus in order to properly position the same. Once this adjustment has been made, the lock nuts 37 are securely clamped against the ears 36 and screw-threaded fastening means 34 are securely tightened to fasten the frame 25 to the angles 33 and thus rigidly support the same on the floor or other supporting structure.

Transverse shaft 23 of the lap winding apparatus which carries the pinions 22 is provided with a brake drum 44 which may be engaged by the brake shoe 45 on the beam 39 when the beam moves in a clockwise direction. This is accomplished by means of a foot engaging portion 43 in other words, when the foot engaging portion 43 is in its uppermost position, thus, the brake shoe 46 in engagement with the brake drum 44 provides a braking effect and impedes rotation of the shaft 23 and consequent upward movement of the rolls 20 and roller heads 11.

In order to provide additional braking surface and to provide smooth convenient adjustment of the braking effect, an auxiliary braking mechanism including a bar 45 is pivotally mounted at 46 on the upstanding portion 27 of the frame 25. The brake shoe 47 is applied to the bar 45 where it is pivotally mounted on the brake shoe 47 having secured thereto suitable brake lining 48 which in its lowestmost position engages the brake drum 44 to apply a braking effect thereon. The brake shoe 47 is conveniently mounted by a pivot pin 49 to a clevis 50 which in turn is pivotally mounted on the bar 45 by a pin 51. The position of the brake shoe 47 with relation to the bar 45 may be conveniently adjusted by bolts 52 which are threadedly received in the bar 45 on either side of the pin 51, bolts 52 being provided with lock nuts 53 which serve to retain the same in adjusted position, the heads 54 of the bolts 52 serving to contact the brake shoe 47 and prevent pivotal movement of the same beyond the desired limits.

The bar 45 is normally urged downwardly to hold the brake shoe 47 and brake lining 48 in engagement with drum 44 by tension springs 55 which are attached at 56 to the bar 45 by a suitable cross pin extending therethrough. The opposite ends of tension springs 55 are connected to links 57 which in turn are pivotally secured at 58 to bell crank lever 59 which are pivotally mounted at 60 on the frame 25. Each of the bell crank levers 59 is provided with an adjusting bar 61 which extends to the front of the machine and is slidably received in an ear 62 extending from the frame 25. The bars 61 are threadedly engaged by wing nuts 63 which serve to adjust the same and upon tightening of the wing nuts the bars 61 move toward the left, as viewed in Fig. 1, to rotate the bell crank levers 59 in a clockwise direction, thus increasing the tension on the springs 55 and increasing the pressure between brake shoe 47 and brake drum 44.

The brake shoe 47 is applied and released from engagement with the brake drum 44 by means of the beam 39 through a linkage comprising a link 64 pivotally connected at 65 to the bar 45, the opposite end of link 64 being pivotally connected at 66 to a lever 67 which is pivotally mounted at 68 on the upstanding bar 27 of the frame 25. The opposite end of lever 67 is pivotally secured at 69 to one end of a turn buckle 70, the opposite end of the turn buckle being secured to a clamp 71 which engages the beam 39 and may be positioned thereon for proper actuation of the mechanism. Clamp 71 is secured in position on beam 39 by screw-threaded fastening means or the like 72.

In operation, the brake shoe 40 and brake shoe 47 are disengaged from the brake drum 44 by depressing the left-hand end of the beam 39, as is shown by the upper view of the construction. The opposite end of the beam 39 provides a foot engaging portion whereby the brake may be conveniently actuated by the foot of the operator. The transverse shaft 23 of the lap winding apparatus which carries the pinions 22 is provided with a brake.
the shaft 10 to urge roll 11 to engagement with the driving rollers 12. This adjustment is accomplished by manipulation of the hand wheel 28 on pinion shaft 25 to actuate the logger heads through pinions 22 and rack teeth 21. Upon starting the winding operation the beam 39 is released by the operator to allow the brake shoe 40 and brake shoe 47 to engage the brake drum 44, this engagement being caused by the weight 41 and the tension springs 55 pulling downwardly on the outer end of the bar 45. The relative position of the brake shoe 40 and brake shoe 47 may be adjusted by the turn buckle 16.

As the roll 11 increases in diameter, due to the cotton web 12 applied thereto, the logger heads 17 move upwardly which movement is retarded by the braking action on the drum 44, thus providing a smooth and even roll and providing the proper tension in the web 12 to accommodate the maximum amount of cotton on the roll 11. If desired, during the winding operation the braking effect of the brake shoes 40 and 47 may be varied by the operator simply by depressing the beam 39 by engaging the same with his foot at the portion 43. This results in providing a manual controlling effect although normally such braking would be accomplished by the weight 41 and springs 55 which have been adjusted previously to provide the desired braking action.

It will be seen that by the above described invention there has been provided a relatively simple braking mechanism for lap rolling machines which may be applied to existing machines or supplied with new machines in which the parts thereof are manufactured from readily available material and commercially available parts resulting in an extremely economical device which efficiently operates to provide the desired braking effect and thus materially increase the capacity of the winding machine and at the same time provide a much smoother and more evenly wound roll of cotton.

It will be obvious to those skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore this invention is not limited to that shown in the drawings nor to that described in the specification but only as indicated in the appended claims.

What is claimed is:

1. For use in a lap winding apparatus including a roll shaft, logger heads for resisting upward movement of said roll shaft and a pinion shaft for controlling movement of said logger heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a beam pivotally mounted on said apparatus, a brake shoe carried on said beam and movable into and out of engagement with said brake drum, a weight adjustable mounted on said beam adjacent one end thereof for moving the same to engage said brake shoe with said brake drum, a frame means for adjustable positioning said frame with respect to said apparatus and for fixing the same in adjusted position, a bar pivotally mounted on said frame and overhanging said brake drum, a second brake shoe pivotally mounted on said bar and movable into and out of engagement with said brake drum, adjusting means on said bar for limiting pivotal movement of said second brake shoe for limiting pivotal movement of said second brake shoe with respect thereto, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a bell crank lever pivotally mounted on said frame, a link connecting the opposite end of said bar and said lever and a turn-buckle connecting said lever and said beam whereby upon pivotal movement of said beam said brake shoes will be moved toward or away from said brake drum, the relative braking effect of said brake shoes being correlated by adjustment of said turn-buckle.

2. For use in a lap winding apparatus including a roll shaft, logger heads for resisting upward movement of said roll shaft and a pinion shaft for controlling movement of said logger heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a beam pivotally mounted on said apparatus, a brake shoe carried on said beam and movable into and out of engagement with said brake drum, a weight adjustable mounted on said beam adjacent one end thereof for moving the same to engage said brake shoe with said brake drum, a frame means for adjustable positioning said frame with respect to said apparatus and for fixing the same in adjusted position, a bar pivotally mounted on said frame and overhanging said brake drum, a second brake shoe pivotally mounted on said bar and movable into and out of engagement with said brake drum, adjusting means on said bar for limiting pivotal movement of said second brake shoe with respect thereto, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a bell crank lever pivotally mounted on said frame, a link connecting the opposite end of said bar and said lever and a turn-buckle connecting said lever and said beam whereby upon pivotal movement of said beam said brake shoes will be moved toward or away from said brake drum, the relative braking effect of said brake shoes being correlated by adjustment of said turn-buckle.

3. For use in a lap winding apparatus including a roll shaft, logger heads for resisting upward movement of said roll shaft and a pinion shaft for controlling movement of said logger heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a beam pivotally mounted on said apparatus, a brake shoe carried on said beam and movable into and out of engagement with said brake drum, a weight adjustable mounted on said beam adjacent one end thereof for moving the same to engage said brake shoe with said brake drum, a frame, a bar pivotally mounted on said frame, a second brake shoe pivotally mounted on said bar and movable into
and out of engagement with said brake drum, adjusting means on said bar for limiting pivotal movement of said second brake shoe with respect thereto, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a bell crank lever pivotally mounted on said frame, a link connecting the opposite end of said bar and said lever and a turn-buckle connecting said lever and said beam whereby upon pivotal movement of said beam said brake shoes will be moved toward or away from said brake drum, the relative braking effect of said brake shoes being correlated by adjustment of said turn-buckle.

4. For use in a lap winding apparatus including a roll shaft, roller heads for resisting upward movement of said roll shaft, a brake mechanism for controlling movement of said roller heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a beam pivotally mounted on said apparatus, a brake shoe carried by said beam and movable into and out of engagement with said brake drum, adjustable means engaging said beam for moving the same to engage said brake shoe with said brake drum, a frame, a bar pivotally mounted on said frame, a second brake shoe mounted on said bar and movable into and out of engagement with said brake drum, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a bell crank lever pivotally mounted on said frame, a link connecting the opposite end of said bar and said lever and a turn-buckle connecting said lever and said beam whereby upon pivotal movement of said beam said brake shoes will be moved toward or away from said brake drum, the relative braking effect of said brake shoes being correlated by adjustment of said last-named adjustable means.

5. For use in a lap winding apparatus including a roll shaft, roller heads for resisting upward movement of said roll shaft and a pinion shaft for controlling movement of said roller heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a brake shoe carried by said beam and movable into and out of engagement with said brake drum, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a bell crank lever pivotally mounted on said frame, a bar pivotally mounted on said frame, a second brake shoe mounted on said bar and movable into and out of engagement with said brake drum, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a bell crank lever pivotally mounted on said frame, a link connecting the opposite end of said bar and said lever and a turn-buckle connecting said lever and said beam whereby upon pivotal movement of said beam said brake shoes will be moved toward or away from said brake drum, the relative braking effect of said brake shoes being correlated by adjustment of said turn-buckle.

6. For use in a lap winding apparatus, roller heads for resisting upward movement of said roll shaft and a pinion shaft for controlling movement of said roller heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a beam pivotally mounted on said apparatus, a brake shoe carried by said beam and movable into and out of engagement with said brake drum, adjustable means engaging said beam for moving the same to engage said brake shoe with said brake drum, a frame, a bar pivotally mounted on said frame, a second brake shoe mounted on said bar and movable into and out of engagement with said brake drum, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a bell crank lever pivotally mounted on said frame, a link connecting the opposite end of said bar and said lever and adjustable means engaging said beam for moving the same to engage said brake shoe with said brake drum, a frame, a bar pivotally mounted on said frame, a second brake shoe mounted on said bar and movable into and out of engagement with said brake drum, the relative braking effect of said brake shoes being correlated by adjustment of said last-named adjustable means.

7. For use in a lap winding apparatus including a roll shaft, roller heads for resisting upward movement of said roll shaft and a pinion shaft for controlling movement of said roller heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a beam pivotally mounted on said apparatus, a brake shoe carried by said beam and movable into and out of engagement with said brake drum, a frame, a bar pivotally mounted on said frame, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a bell crank lever pivotally mounted on said frame, a bar pivotally mounted on said frame, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a second brake shoe mounted on said bar and movable into and out of engagement with said brake drum, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a bell crank lever pivotally mounted on said frame, a link connecting the opposite end of said bar and said lever and adjustable means engaging said beam for moving the same to engage said brake shoe with said brake drum, a frame, a bar pivotally mounted on said frame, a second brake shoe mounted on said bar and movable into and out of engagement with said brake drum, the relative braking effect of said brake shoes being correlated by adjustment of said last-named adjustable means.

8. For use in a lap winding apparatus, including a roll shaft, roller heads for resisting upward movement of said roll shaft and a pinion shaft for controlling movement of said roller heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a beam pivotally mounted on said apparatus, a brake shoe carried by said beam and movable into and out of engagement with said brake drum, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a bell crank lever pivotally mounted on said frame, a link connecting the opposite end of said bar and said lever and adjustable means engaging said beam for moving the same to engage said brake shoe with said brake drum, a frame, a bar pivotally mounted on said frame, a second brake shoe mounted on said bar and movable into and out of engagement with said brake drum, a tension spring connected to one end of said bar and exerting a force to bias said second brake shoe toward said brake drum, a bell crank lever pivotally mounted on said frame, a frame, a bar pivotally mounted on said frame, a second brake shoe mounted on said bar and movable into and out of engagement with said brake drum, the relative braking effect of said brake shoes being correlated by adjustment of said last-named adjustable means.
ing a roll shaft, logger heads for resisting upward movement of said roll shaft and a pinion shaft for controlling movement of said logger heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a beam pivotally mounted on said apparatus, a brake shoe carried by said beam and movable into and out of engagement with said brake drum, adjustable means engaging said beam for moving the same to engage said brake shoe with said brake drum, a frame, a bar pivotally mounted on said frame, a second brake shoe mounted on said bar and movable into and out of engagement with said brake drum, adjustable means engaging said bar to bias said second brake shoe toward said brake drum, a lever pivotally mounted on said frame, a link connecting said bar and said lever, and adjustable means connecting said lever and said beam whereby upon pivotal movement of said beam said brake shoes will be moved toward or away from said brake drum, the relative braking effect of said brake shoes being correlated by adjustment of said last-named adjustable means.

9. For use in a lap winding apparatus including a roll shaft, logger heads for resisting upward movement of said roll shaft and a pinion shaft for controlling movement of said logger heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a beam pivotally mounted on said apparatus, a brake shoe carried by said beam and movable into and out of engagement with said brake drum, adjustable means engaging said beam for moving the same to engage said brake shoe with said brake drum, a frame, a bar pivotally mounted on said frame, a second brake shoe mounted on said bar and movable into and out of engagement with said brake drum, adjustable means engaging said bar to bias said second brake shoe toward said brake drum, and means connecting said bar and said beam whereby upon pivotal movement of said beam said brake shoes will be moved toward or away from said brake drum.

11. For use in a lap winding apparatus including a roll shaft, logger heads for resisting upward movement of said roll shaft and a pinion shaft for controlling movement of said logger heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a beam pivotally mounted on said apparatus, friction means carried by said beam and movable into and out of engagement with said brake drum, adjustable means engaging said beam for moving the same to engage said friction means with said brake drum, a frame, a bar pivotally mounted on said frame, a second friction means mounted on said bar and movable into and out of engagement with said brake drum, adjustable means engaging said bar to bias said second friction means toward said brake drum and adjustable means connecting said bar and said beam whereby upon pivotal movement of said beam both of said friction means will be moved toward or away from said brake drum, the relative braking effect of said friction means being correlated by adjustment of said last-named adjustable means.

12. For use in a lap winding apparatus including a roll shaft, logger heads for resisting upward movement of said roll shaft and a pinion shaft for controlling movement of said logger heads, a braking mechanism comprising a brake drum fixed to said pinion shaft, a beam pivotally mounted on said apparatus, friction means carried by said beam and movable into and out of engagement with said brake drum, adjustable means engaging said beam for moving the same to engage said friction means with said brake drum, a frame, a bar pivotally mounted on said frame, a second friction means mounted on said bar and movable into and out of engagement with said brake drum, adjustable means engaging said bar to bias said second friction means toward said brake drum and means connecting said bar and said beam whereby upon pivotal movement of said beam both of said friction means will be moved toward or away from said brake drum.

ROBERT J. HIGGINBOTTOM.

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