No. 654,086. Patented July 17, 1900.

L. A. AUMANN.

MACHINE FOR UNWINDING CYLINDRICAL COTTON BALES.

(Application filed Dec. 7, 1899.)

(No Model.)

Fig. 1.

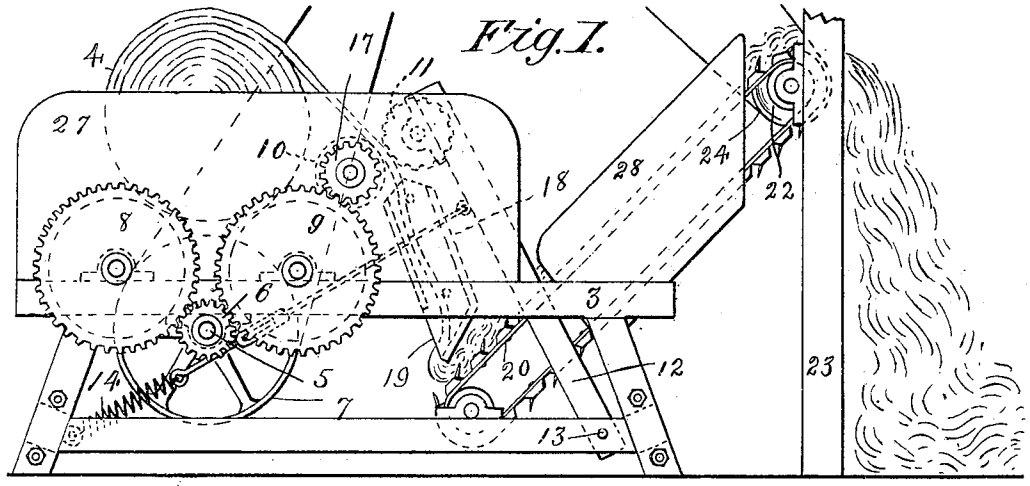


Fig. 2.

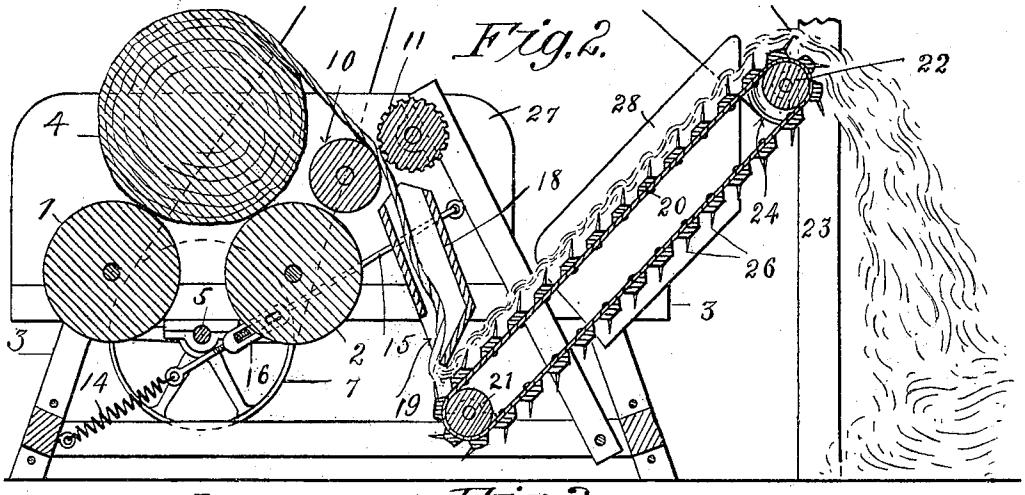


Fig. 3.

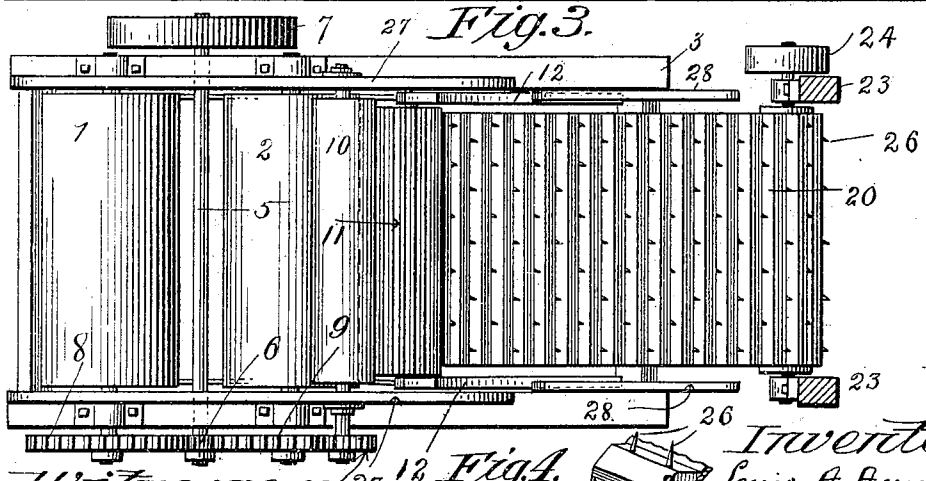
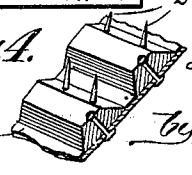


Fig. 4.



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UNITED STATES PATENT OFFICE.

LOUIS A. AUMANN, OF CHICOPEE, MASSACHUSETTS.

MACHINE FOR UNWINDING CYLINDRICAL COTTON-BALES.

SPECIFICATION forming part of Letters Patent No. 654,086, dated July 17, 1900.

Application filed December 7, 1899. Serial No. 739,562. (No model.)

To all whom it may concern:

Be it known that I, LOUIS A. AUMANN, a citizen of the United States of America, residing at Chicopee, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Machines for Unwinding Cylindrical Cotton-Bales, of which the following is a specification.

This invention relates to cotton machinery, and particularly to a machine for opening cylindrical bales of cotton and delivering the fiber in condition to be fed to the "openers," so called.

Cylindrical cotton-bales consist of a lap of cotton wound up under heavy pressure around a small arbor to the required diameter. To open up a bale thus formed, various devices have been used to unwind the lap from the bale, the cotton falling in folds on the floor and then being gathered up by the operatives and thrown in pieces into the openers. Owing to the enormous compression of the fiber at and near the center of the bale it is found that in the unwinding process, as the bale is reduced in diameter, the cotton will not unwind without assistance from the operative, and if the lap becomes broken its end remaining on the bale will be rolled into the surface thereof and is lost, and the lap must be torn therefrom by hand and the unwinding started again. As a consequence each bale requires the constant attention of an operative during the unwinding of the last third of its diameter, which renders the handling of bales of this form expensive.

The object of this invention is to obviate these difficulties and to provide a machine in which these bales may be unwound from beginning to end without a break and, further, to disintegrate the hard compressed lap and deliver the cotton in a partially-opened-up condition in front of the openers.

The invention consists in the construction described in the following specification and pointed out particularly in the claims.

In the drawings forming part of this specification, Figure 1 is a side elevation of a machine embodying this invention. Fig. 2 is a vertical longitudinal section through Fig. 1. Fig. 3 is a plan view of Fig. 1. Fig. 4 is a perspective view of a portion of a toothed apron forming part of the machine.

This machine comprises two parallel rolls 1 and 2, mounted to rotate on a suitable frame 3 in proximity to each other and in the same horizontal plane. On these rolls the cylindrical cotton-bales 4 are supported. A driving-shaft 5 is located on the frame somewhat below the rolls 1 and 2, midway between them, on one end of which is a pinion 6 and on the opposite end a driving-pulley 7. On the shafts of said rolls 1 and 2 are located two gears 8 and 9, adapted to mesh with the pinion 6, whose rotation will impart to said rolls rotatory movements in the same direction, and thus impart a rolling movement to the cotton-bale 4, resting on said rolls. In proximity to the roll 2 two drawing-rolls 10 and 11 are arranged parallel with said roll 2, the roll 10 rotating in bearings in the frame and the roll 11 being supported in the ends of two arms 12, pivoted to the lower part of the frame at 13. The roll 11 in the end of these arms is spring-pressed toward the roll 10 by means of two springs 14 14, attached to the frame by one end and their opposite ends attached to rods 15, extending to and secured to the said arms, all as shown clearly in the drawings.

Suitable means, as the turnbuckle 16, may be used for adjusting the tension of the springs to increase or diminish the pressure of the roll 11 against the roll 10. On the end of said roll 10 is a gear 17, in mesh with the gear 9 on the roll 2, whereby a rotary movement is imparted to the roll 10 in a direction contrary to that of said roll 2, and the relative dimensions of the gears 9 and 17 are such that the circumferential speed of the roll 10 will exceed that of the rolls 1 and 2, which rotate at the same speed. The roll 11, above referred to, may be fluted, as shown, or not, as desired.

When a bale of cotton is placed on the rolls 1 and 2 and the end of the cotton-lap introduced between the rolls 10 and 11, the rotation of said rolls 1 and 2 will cause the bale to rotate in a direction necessary to effect its unwinding, and the rolls 10 and 11, having a somewhat-greater circumferential speed than have the rolls 1 and 2, as stated, will always exert a drawing tension on the cotton-lap as it unwinds from the bale.

From between the rolls 10 and 11 the cotton-

lap is fed into the upper end of the trough or spout 18, the bottom of which is downwardly inclined toward the rear side of the trough, a delivery-slot 19 extending across the back lower edge of the trough, through which the cotton-lap drawn from the roll may pass out. The lower edge of said rearwardly-inclined bottom of the trough serves as a point of resistance, against which the lap of cotton may be disintegrated by the action of a moving toothed apron 20, to be described. Said trough is of substantially the same width as the rolls 10 and 11, which in turn are slightly longer than the cotton-bale. Said apron is upwardly inclined and is located near said rolls 10 and 11, its lower end being supported on a drum 21, the shaft of which runs in suitable bearings on each side of the frame. Said frame is of the same width as the trough 18 and is so located that the operative surface thereof runs close to the end of the trough 18, the edge of the rearwardly-inclined bottom thereof forming a sharp angle relative to the course of the apron. This apron may be of any desired length and is adapted to not only disintegrate the closely-packed fibers of the lap, thus preparing the material for said openers without subjecting it to any intervening operation, but it has the further capability and function of conveying the thus disintegrated cotton to a point from which it may be fed into the openers or to conveyer mechanism, whereby it may be delivered to said machines located at some distance therefrom.

In the accompanying drawings the upper end of the apron is shown supported on a drum 22, similar in all respects to that which supports the lower end, and the shaft of said drum 22 may be supported on suitable posts 23 or in any other suitable way. A driving-pulley 24 is fixed to the shaft of this drum 22.

The apron 20 is made of a series of slats or strips of wood secured to some flexible belt 25, as canvas. (See Fig. 4.) The slats are arranged thereon parallel with and close to each other and parallel with the axis of the drums over which the apron runs, and in these slats are fixed the teeth 26, forwardly inclined relative to the direction of their movement.

The driving-pulley 24 is adapted to impart to the apron 20 a superficial speed greater than the speed of delivery of the cotton-lap thereto by the rolls 10 and 11, to the end that the lap as it is fed down through the opening in the rear side of the trough may be engaged by the teeth 26 of the apron, whereby the compact fibers may be separated and be torn in small bunches from the lap and carried up to and over the drum 22, from which point it may drop to the floor, as shown, onto a conveyer mechanism. The teeth 26 are spaced far enough apart to prevent any cotton from adhering thereto as they pass over the upper drum and are made sharp and smooth and straight.

The ends of the rolls and the bale are inclosed between two perpendicular sides 27, mounted on the frame of the machine, and the sides of the apron are inclosed between two side pieces 28, also secured to the frame.

This machine greatly facilitates the handling of cylindrical cotton-bales and adapts itself to the requirements of any conveyer mechanism for carrying the disintegrated fibers to the openers and saves considerable manual labor heretofore employed in tearing up the lap of cotton from said bales to prepare it for feeding into the openers.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. Unwinding mechanism for cylindrical cotton-bales comprising bale-supporting rolls adapted to rotate in unison in the same direction, drawing-rolls supported in proximity to said first-named rolls, said drawing-rolls having a greater circumferential speed than said supporting-rolls, an apron adapted to receive the cotton-lap from said drawing-rolls, and movable at a speed in excess of the speed of delivery of said drawing-rolls, and means for supporting said cotton-lap in proximity to, and against the action of, said apron, substantially as described.

2. Unwinding mechanism for cylindrical cotton-bales, comprising bale-supporting rolls adapted to rotate in unison for unwinding a bale, drawing-rolls having a greater circumferential speed than said first-named rolls and comprising one roll supported fixedly on the machine and one yieldingly held against said fixed roll; an upwardly-inclined apron having teeth on its outer surface and movable at a speed in excess of the speed of delivery of the drawing-rolls, a support for the cotton in proximity to the lower end of the apron, whereby the cotton is held against the moving apron, substantially as described.

3. In a machine for unwinding cylindrical cotton-bales, a pair of rolls for supporting and rotating a bale, a second pair of rolls between which the unwound lap of cotton passes, a movable apron having teeth thereon adapted to disintegrate said cotton and convey it away from the machine, means for supporting the cotton against the action of the apron and for feeding the cotton to the latter at a slower rate of speed than that attained by the apron, substantially as described.

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