

(No Model.)

W. A. RICHARDSON.
CLOTH FOLDING MACHINE.

No. 519,073.

Patented May 1, 1894.

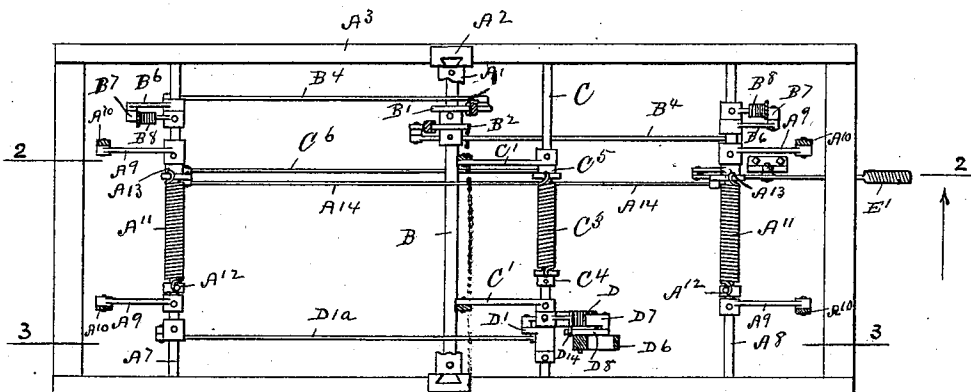


Fig. 1.

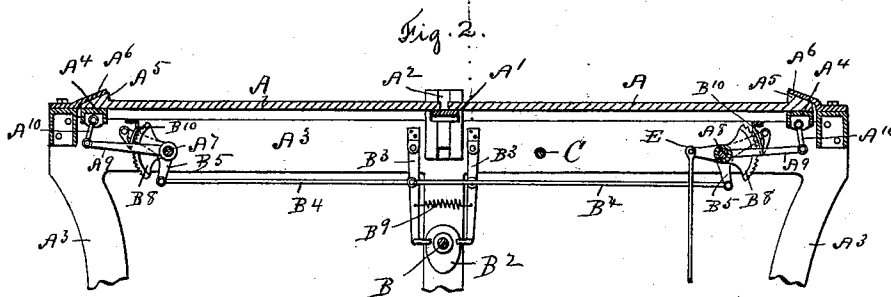


Fig. 2.

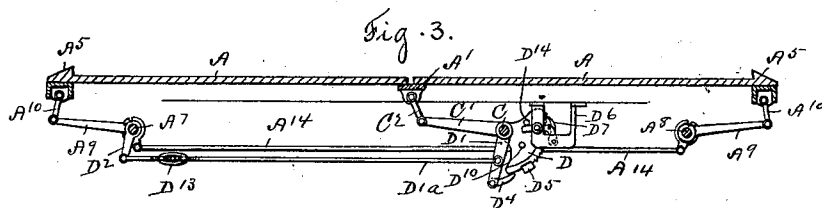


Fig. 3.

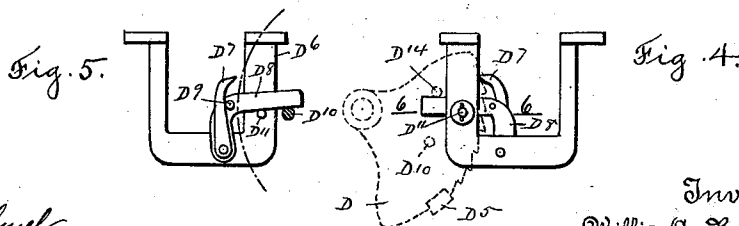


Fig. 5.

Fig. 4.

Witnesses
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Fig. 6.

Inventor
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By his Attorney
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UNITED STATES PATENT OFFICE.

WILLIE A. RICHARDSON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR, BY
DIRECT AND MESNE ASSIGNMENTS, TO ALBERT CURTIS AND EDWIN T.
MARBLE, OF SAME PLACE.

CLOTH-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 519,073, dated May 1, 1894.

Application filed October 20, 1892. Serial No. 449,492. (No model.)

To all whom it may concern:

Be it known that I, WILLIE A. RICHARDSON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a certain new and useful Improvement in Cloth-Folding Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part of the same, and in which—

Figure 1 is a top view of the operative mechanism, by which the table is actuated. Fig. 2 is a sectional view of the same, on line 2, 2, Fig. 1, and also showing the cloth table connected therewith. Fig. 3 is a sectional view on line 3, 3, Fig. 1 and showing the mechanism by which the center of the table is lowered as the cloth is folded. Fig. 4 is a view upon a larger scale, of the retaining pawl by which the center of the table is held and showing the tripping lever by which the pawl is disengaged. Fig. 5 represents the opposite side of the same, with the retaining pawl as disengaged by the tripping lever. Fig. 6 represents the spring actuated latching pin by which the tripping lever is held, with its supporting frame shown in sectional view.

Similar letters refer to similar parts in the different figures.

My invention relates to that class of folding machines, in which the cloth is folded in uniform lengths; and my invention relates particularly to the operating mechanism by which the center of the cloth table is lowered with a positive motion during the operation of folding the cloth and is an improvement upon the cloth folding machine shown and described in Letters Patent No. 456,851, granted to me July 28, 1891.

In the following specification and accompanying drawings, I have described and shown only such portions of the machine as are concerned in my present invention and reference may be made to the above mentioned patent for the general description of the folding mechanism of a machine of this class, in which successive folds of cloth are carried by a folding bar between jaws, which

are separated to receive the folding bar and closed to seize and hold the cloth.

Referring to the accompanying drawings, A, Fig. 2 denotes the table upon which the cloth is folded, consisting of two leaves resting at the center upon a bar A' extending transversely across the machine and capable of a vertical movement in ways A², A², which are supported by the frame-work A³ of the machine. The outer edges of the leaves of the table A are carried by the transverse bars A⁴, A⁴, and are provided upon their upper surfaces with the cloth holding jaws A⁵, A⁵ which are pressed against the fixed jaws A⁶, A⁶ supported upon the frame-work A³. Journaled in the frame-work of the machine are rocking shafts A⁷ and A⁸ having radial arms A⁹ attached thereto which are connected by the links A¹⁰ with the transverse bars A⁴.

Springs A¹¹, A¹¹, are placed upon the rocking shafts A⁷, A⁸, each of said springs being connected at one end with collars A¹² attached to the rocking shafts A⁷, A⁸, and the opposite ends of said springs are connected with collars A¹³, which are united, or coupled together by a connecting rod A¹⁴, which rod holds the collars A¹³ from turning and causes the torsional tension of the springs to be applied to the rocking shafts A⁷ and A⁸ to raise the arms A⁹ and lift the ends of the table A and the jaws A⁵ against the fixed jaws A⁶ and seize the folds of the cloth.

Journaled in the frame-work of the machine is a shaft B carrying the cams B¹, B², which act alternately upon swinging levers B³ connected by rods B⁴ with the arms B⁵ of bell crank levers pivoted upon the rock-shafts A⁷ and A⁸. The other arms B⁶ of the bell crank levers carry pawls B⁷, which in their downward motion engage the ratchet teeth of the sectors B⁸ attached to the rock-shafts A⁷ and A⁸. The motion of the pawls is reversed by the action of a spring B⁹ applied to the operating mechanism, and conveniently attached to the two swinging levers B³; and the pawls, at the upper end of their movement are carried upon guard-plates B¹⁰, attached to the frame-work of the machine and ex-

tending concentrically over a portion of the sectors, for the purpose of disengaging the pawls and allowing the tension of the springs A¹¹ to rock the shafts A⁷, A⁸ and bring the cloth holding jaws A⁵ and A⁶ together.

Journalled in the frame-work, similarly to the shafts A⁷ and A⁸, is a rock-shaft C, to which are attached radial arms C', C', connected by links C² with the transverse bar A', upon which the center of the table is supported. A spring C³ is operatively connected with a collar C⁴ attached to the shaft C and a collar C⁵ coupled by a connecting rod C⁶ with one of the collars A¹³, whereby the torsional tension of the spring C³ is applied to the shaft C in the same manner as the tension of the springs A¹¹ is applied to the rock-shafts A⁷ and A⁸ to raise the bar A'. Attached to the shaft C is a ratchet D and pivoted upon the shaft C, is an arm D' connected by a rod D'^a with a radial arm D² attached to the rock-shaft A⁷; and carrying a pawl D⁴ arranged to engage a tooth D⁵ upon the ratchet D and rock the shaft C to lower the bar A'. A frame D⁶, attached to the frame-work of the machine, supports a retaining pawl D⁷, by which the ratchet D is held from being reversed by the tension of the spring C³. Pivoted upon the frame D⁶ is a tripping lever D⁸, carrying a pin D⁹, which extends behind the retaining pawls D⁷. The end of the tripping lever D⁸ extends across the path of a pin, or stud D¹⁰ carried by the ratchet D. The intermittent angular motion of the ratchet D, as moved by the actuating pawl D⁴, will bring the stud D¹⁰ against the end of the tripping lever D⁸, carrying the pin D⁹ against the retaining pawl D⁷ and disengaging it from the teeth of the ratchet D, the position of the several parts being indicated in Fig. 5. The frame D⁶ holds a spring actuated latch-pin, represented in Fig. 6, the end of which bears against the side of the tripping lever D⁸ when the tripping lever is in its lowest position, as represented in Fig. 4, but when the tripping lever has been raised by the stud D¹⁰, so as to clear the latch-pin D¹¹, the latch-pin will be forced forward beneath the tripping lever by the tension of the spring D¹², thereby sustaining the tripping lever D¹¹ and holding the retaining pawl D⁷ out of engagement with the ratchet teeth. The latch-pin D¹¹ has its inner end next the tripping lever rounded so that when the tripping lever is forced downward over the rounded end of the latch-pin, it will again crowd the latch-pin back and compress the spring D¹².

The connecting rod D'^a is adjustable in length, by any well known means, the method shown consisting in forming the rod in two parts having right and left hand screw threads and being united by a right and left hand screw threaded nut D¹³, for the purpose of placing the pawl D⁴ at such distance from the tooth D⁵ that the angular movement of the

bell crank, as actuated by the rocking shaft A⁷, will cause the pawl to be carried against the tooth D⁵ without moving the ratchet, so that as a fold of cloth is placed between the cloth holding jaws A⁵ and A⁶, the space between the pawl D⁴ and the tooth D⁵ will be gradually reduced so as to cause the ratchet to be moved the space of a tooth and held by the retaining pawl D⁷.

In case the goods are of a bulky material causing the pile of folded cloth to be thicker in the center than at the ends, where it is compressed between the cloth holding jaws, I then lengthen the connecting rod D'^a, so as to take up a portion of the space between the end of the pawl D⁴ and the tooth D⁵, and cause the center of the table to be lowered before the introduction of the folded cloth between the cloth holding jaws and the distance which the center of the table is lowered can be determined by the adjustment afforded by the connecting rod D'^a. When the cloth has been removed and the center of the table again raised, lowering the ratchet D, the fixed pin, or stud D¹⁴ carried by the ratchet, will be brought in contact with the end of the tripping lever D⁸, causing it to be forced downward and over the rounded end of the latch-pin D¹¹, crowding the latch-pin back and retaining it by the tripping lever, thereby allowing the retaining pawl to again fall into engagement with the ratchet D.

In the operation of the machine as the folds of cloth are successively laid upon the cloth table A with their folded edges held between the cloth holding jaws, the ratchet D is intermittently raised by the actuating pawl D⁴ carried upon the free end of the arm D', which is connected with the radial arm D² upon the rock-shaft A, the ratchet D being held at each upward movement of a tooth or its multiple, by the retaining pawl D⁷ thereby causing the center of the table to be lowered with an intermittent motion determined by the accumulation of the folds of cloth between the cloth holding jaws. As the ratchet D is raised the stud D¹⁰ is brought into contact with the end of the pivoted tripping lever D⁸, carrying the pin D⁹ against the retaining pawl D⁷ and disengaging it from the ratchet D at the end of the operation and freeing the ratchet D, so the center of the table can be again raised after the cloth has been removed. The action of raising the center of the table lowers the ratchet D, bringing the stud D¹⁴ against the end of the tripping lever, depressing it, and releasing the retaining pawl D⁷, so it will again engage the ratchet D. When the tripping lever has been raised to disengage the retaining pawl it is sustained by the spring actuated pin D¹¹ and as the tripping lever is depressed the pin D¹¹ is pushed back and held by the tripping lever.

From the collar A¹³, held upon the rock-shaft A⁸, extends an arm E connected with a foot treadle E' in the usual manner, by which

the collar can be rocked upon its shaft. The two collars A¹³, A¹³, are coupled by the connecting rod A¹⁴, as already described, and the collar A¹³ upon the rock-shaft A⁷ is coupled by a connecting rod C⁶ with a similar collar C⁵ held upon the rock-shaft C. The spiral spring C³ is connected at one end with the collar C⁵ and at the opposite end with a collar C⁴, which is attached to the rock-shaft C, so the angular movement of the arm E, actuated by the foot treadle E' will cause the collar C⁵ on the shaft C to be similarly rocked and its motion imparted, through the connecting spring C³ and collar C⁴ to the shaft C, thereby raising the center of the table.

By the mechanism above described the operator is able to reverse the motion of the shaft C and raise the center of the table, when the retaining pawl D⁷ has been disengaged from the ratchet D by the action of the tripping lever D⁸, as already described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a cloth folding machine, the combination of a table upon which the cloth is folded, cloth holding jaws at the ends of said table, means by which said jaws are opened to receive the folds of cloth, a rock-shaft having radial arms upon which the center of said table is supported, a ratchet attached to said rock-shaft, actuating and retaining pawls engaging said ratchet, said actuating pawl being operatively connected with the jaw opening mechanism, whereby said rock-shaft is rocked to lower the center of the table as successive folds of cloth are inserted between the cloth holding jaws, substantially as described.

2. In a cloth folding machine, the combination of a table upon which the cloth is folded, cloth holding jaws arranged at the ends of said table, means by which said jaws are opened to receive the folds of cloth, a rock-shaft having radial arms operatively connected with the center of said table by which the center of the table is lowered by the rocking of said shaft, a ratchet attached to said rock-shaft, actuating and retaining pawls engaging said ratchet, said actuating pawl being operatively connected with the jaw opening mechanism, means for adjusting the movement of said actuating pawl in order to vary the movement of the center of the cloth table relatively to the opening of the cloth holding jaws, substantially as described.

3. In a cloth folding machine, the combination of a table upon which the cloth is folded, provided with cloth holding jaws at its ends, fixed jaws overlapping the ends of said table, actuating mechanism operatively connected with said table, whereby the ends of the table are reciprocated to open and close the jaws, a rock-shaft provided with arms upon which the center of said table is supported, a ratchet attached to said shaft, an actuating and a retaining pawl engaging said ratchet, said actuating pawl being operatively connected with

the table actuating mechanism, whereby said rock-shaft is moved in order to lower the center of the table in correspondence with the reciprocating movement of its ends, substantially as described.

4. In a cloth folding machine, the combination of a table A, supported at its center upon the radial arms, a rock-shaft C having radial arms by which the center of the table is supported, a ratchet D attached to said shaft and provided with a tooth D⁵, a vibrating arm D', an actuating pawl D⁴ carried by said arm, rock-shaft A⁷ provided with a radial arm D², means for operating said rock-shaft and an adjustable rod D'^a connecting said arms D' and D², whereby the position of the actuating pawl is varied with reference to the ratchet tooth D⁵, substantially as described.

5. In a cloth folding machine, the combination of a table having jaws A⁵, fixed jaws A⁶, rock-shaft C having arms by which the center of the table is supported, ratchet D attached to said rock-shaft and provided with a tooth D⁵ to receive an actuating pawl, an actuating pawl D⁴ carried upon a vibrating arm D', rock-shaft A⁷ having arms upon which one end of said table is supported, a radial arm D² attached to the rock-shaft A⁷ and a connecting rod between said arms D' and D², whereby the pawl D⁴ is moved synchronously with the motion of the rock-shaft A⁷, causing the center of the table to be lowered as the jaws A⁵ and A⁶ are separated by the folded cloth, substantially as described.

6. In a cloth folding machine, the combination of the table A, rock-shaft C, arms C', C', on which the center of the table is supported, ratchet D attached to said shaft, actuating and retaining pawls D⁴ and D⁷, pivoted tripping lever D⁸, provided with a pin D⁹ arranged to engage the retaining pawl, and a stud D¹⁰ carried by said ratchet, substantially as described.

7. In a cloth folding machine, the combination of a table A, rock-shaft C having arms C', upon which the center of the table is supported, a ratchet attached to said shaft, actuating and retaining pawls engaging said ratchet and studs D¹⁰ and D¹⁴ carried by said ratchet, a pivoted tripping lever with its end extending into the path of said studs and provided with a pin engaging said retaining pawl, substantially as described.

8. In a cloth folding machine, the combination with a table upon which the cloth is folded, of a rock-shaft C, provided with radial arms by which the center of the table is supported, a ratchet attached to said shaft, a retaining pawl engaging said ratchet, a stud D¹⁰ carried by said ratchet, a tripping lever placed in the path of said stud and carrying a pin engaging said retaining pawl, a sliding latch pin D¹¹ and a spring D¹² all combined and operating, substantially as described.

9. In a cloth folding machine, the combination with the table A, of the shafts A⁷ and

A⁸, collars A¹³ on said shafts connected by the connecting rod A¹⁴, arm E on one of said collars A¹³, connected with a foot treadle E', shaft C, arms C', C', supporting the center of the table, collar E² on said shaft C, rod E³ connecting said collar E² with one of the collars A¹³, spring E⁴ connecting said collar E² with the collar E⁵, collar E⁵ attached to said shaft C, whereby the motion of said shaft is reversed and the center of the table raised, 10 substantially as described.

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Witnesses:

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