(No Model.)

C. C. WEBBER.

CLOTH DOUBLING AND ROLLING-UP MACHINE.

No. 345,344. Patented July 13, 1886.

Fig. 1.

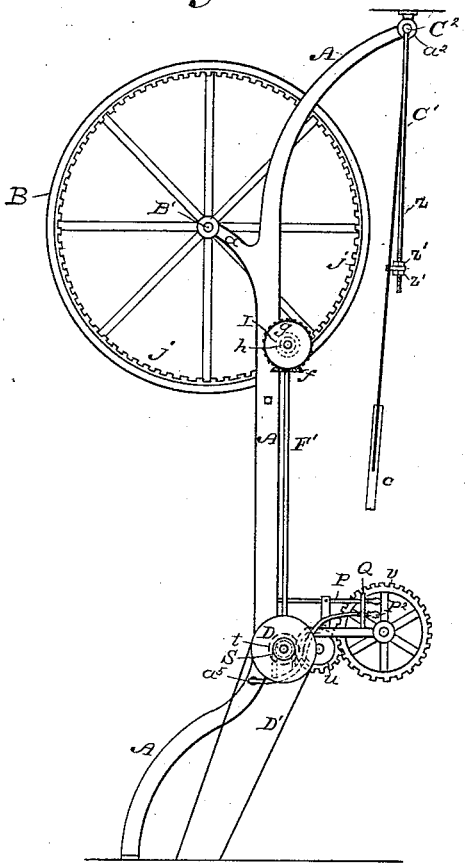


Fig. 2.

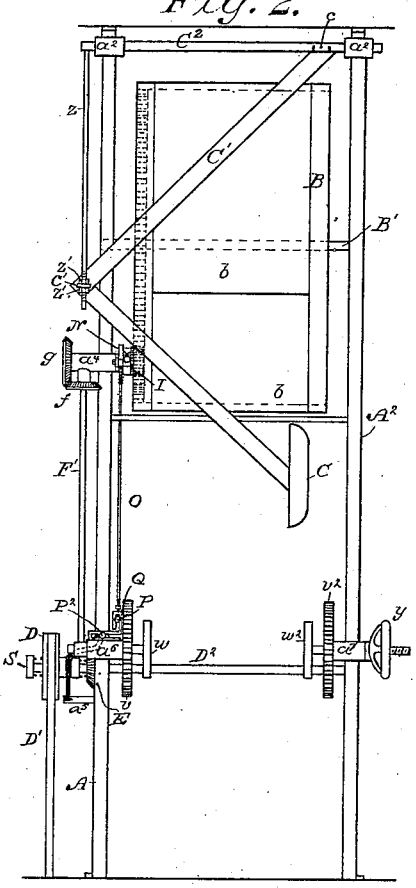


Fig. 3.

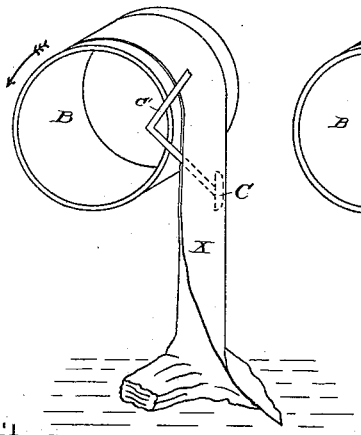


Fig. 4.

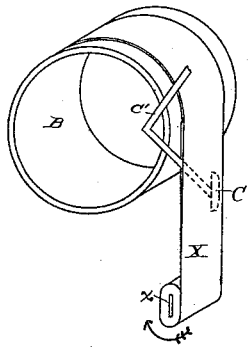


Fig. 5.

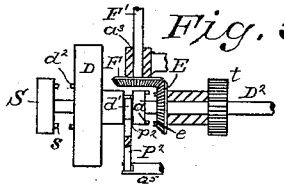


Fig. 6.

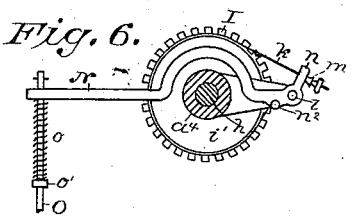
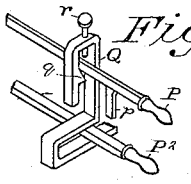


Fig. 7.



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UNITED STATES PATENT OFFICE.

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CLOTH DOUBLING AND ROLLING-UP MACHINE.

SPECIFICATION forming part of Letters Patent No. 345,344, dated July 13, 1886.

Application filed December 27, 1884. Serial No. 151,334. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. WEBBER, a citizen of the United States, residing at Holyoke, in the county of Hampden, in the State of Massachusetts, have invented a new and useful Cloth Doubling and Rolling-Up Machine, of which the following is a specification.

The general object of this invention is to provide mechanical devices for doubling lengthwise broad goods and rolling them up double, in marketable shape, on the flat cloth-boards customarily used, and so that the cloth shall be as tightly rolled as may be desired, and free from creases or wrinkles. The common practice is to double and roll such goods on a table by hand for the market, although machines for doubling cloth in the process of manufacture have heretofore been used.

My present invention consists in certain novel combinations of mechanical parts, hereinafter described and claimed, whereby as a whole the object above stated is accomplished, and which have been embodied in a single simple machine, to which, as the best means known to me for carrying out the principles of my invention, this specification will be confined, not limiting myself, however, to details and associations of parts which are not essential to the respective combinations of parts as hereinafter claimed.

A sheet of drawings accompanies this specification as part thereof.

Figure 1 of the drawings is a side elevation of my said cloth doubling and rolling-up machine, and Fig. 2 is a front view thereof. Figs. 3 and 4 are perspective views of certain parts, illustrating, respectively, the "doubling" and "rolling-up" operations. Fig. 5 is a sectional view of part of the machine, on a larger scale, from the same point of view as Fig. 2. Fig. 6 is a like view of another part of the machine, on a still larger scale, from the same point of view as Fig. 1; and Fig. 7 is a perspective view of another portion of the machine enlarged from Figs. 1 and 2.

Like letters of reference indicate corresponding parts in the several figures.

A A^2 represent light rigid frame-castings forming the sides of the machine, and fastened at their respective ends to the floor and ceiling or parallel horizontal supports in the room in which the machine is to be used.

B represents a large rotary cylinder, or "drum," as it will hereinafter be termed, having a horizontal axis, and mounted in an elevated position between rearwardly-projecting arms *a*, Fig. 1, of said frame-castings, provided with suitable bearings for its shaft B'.

C represents a fold-guide, suspended below the level of said drum B and close in front of the latter by a rigid crooked arm, C', which depends from a horizontal pivot-rod, C^2, mounted in bearings a^2 at or near the upper ends of said frame-castings.

D represents a band-pulley, hereinafter termed the "driving-pulley;" D', a driving-band rotating the same continuously; and D^2, a horizontal shaft, upon which said pulley is loosely mounted so as to run idly, save when in clutch, as hereinafter described. Said shaft D^2 is mounted in bearings in the frame-castings A A^2 at a distance more or less great below said drum B, determined by the convenient height of the rolling-up mechanism, with which for convenience said shaft is more directly associated as to location. The driving-pulley D, in one working position thereof, (its right-hand position as viewed in Fig. 2,) is interlocked by clutch-pins *d e*, Fig. 5, with a bevel-gear, E, which is loose on said shaft D^2, and in constant mesh with a bevel-gear, F, fast on the lower end of a vertical shaft, F', mounted in bearing a^3 a^4 on said frame-casting A, in front and to the left of the latter. This vertical shaft is connected at its upper end by bevel-gears *f g* with the left-hand end of a short horizontal shaft, *h*, Figs. 1 and 6, mounted in a cross-bore of said bearing a^4, and carrying at its inner end a pinion, I, Fig. 6, shown in dotted lines in Figs. 1 and 2 in mesh with the teeth of an internal gear, *j*, Fig. 1, which forms the left-hand end of the drum B. Said drum thus receives a slow rotary motion for the doubling operation, which is illustrated by Fig. 3, as aforesaid. For this doubling operation the loosely-folded cloth is placed on the floor at or near the foot of the machine, and its upper end is doubled around

said guide C, with the right-hand edge of the latter in its mid-width fold, and said upper end of the cloth is pinned to the outer end of a leader, *b*, Fig. 2, of suitable textile fabric, the inner end of which remains attached to the periphery of the drum B. This is done, of course, while the drum is at rest, before the driving-pulley D is clutched with said gear E. Motion is then transmitted to the drum B by the means aforesaid, and the cloth X is drawn upward, falling by its own gravity around the guide C, and is laid double with the aid of said guide on the periphery of the large drum, without liability to wrinkle it at its fold. When the whole of a piece of cloth is so doubled, the driving-pulley D is unclutched from said gear E, rendering the drum free to unwind the cloth in the rolling-up operation illustrated by Fig. 4.

To render the motion of the drum B steady in the doubling operation, and to prevent accidental unwinding of the cloth at its close, but more particularly for applying tension to the cloth through the medium of the drum in said rolling-up operation, next to be described, a friction-brake, Fig. 6, is combined with said pinion I, which meshes with the internal gear, *j*, of the drum. A smooth-turned hub, *i*, projecting at the left-hand side of said pinion, is embraced, as shown in Fig. 6, by a flexible friction-band, *k*, of iron lined with leather. This friction-band is connected to a lever, N, at two points on the latter, between which said lever is pivoted on a stud, *l*, at the extremity of an arm projecting forward from said bearing a^4. One end of the band, terminating in a screw, passes through and receives a thumb-nut, *m*, (followed by a check-nut,) in front of a short arm, *n*, of said lever N, while its other end is looped around a stud, n^2, on the lever. Projecting rearwardly beyond said hub *i*, the lever N is engaged at this rear end thereof by a spiral spring, *o*, embracing the upper end of a vertical rod, O, above a tight collar, *o'*, thereon, the extremity of this rod working in a vertical hole in the extremity of said lever N, as clearly shown in Fig. 6. The lower end of the rod O is coupled with the rear end of a centrally-pivoted horizontal hand-lever, P, Figs. 1, 2, and 7. By depressing the handle of this, (when the pulley D is unclutched or is clutched with the rolling-up mechanism,) said rod O is elevated, and said spring *o* thereon is caused to press upward more or less strongly against said lever N, causing the latter to draw more or less strongly by its arm *n* on said thumb-nut *m*, and therethrough on said friction-band *k*, so as to cause the latter to embrace said hub *i* of the pinion I more or less tightly, and frictionally resist the rotation of the latter, and therethrough control the rotation of the drum B, as aforesaid. Said hand-lever P works in a vertical space in a keeper, Q, (clearly shown in Fig. 7,) and a vertical screw, *r*, working in a tapped hole in the top of said keeper, provides for limiting the return movement of the lever, so as to preserve a suitable degree of constant friction to steady the motion of the drum in the doubling operation, as aforesaid, while a detent-lug, *q*, projecting laterally into said space, affords means for retaining said hand-lever (hereinafter termed the "friction-lever") in its depressed position during the rolling-up operation. Another hand-lever, P^2, (hereinafter termed the "starting-lever,") works in said keeper Q, occupying a horizontal space, the right-hand end of which is below said vertical space, as shown in Fig. 7. This starting-lever P^2 is pivoted at its rear end to a stud, a^5, on said frame-casting A, as shown in Fig. 1, and carries a fork, p^2, Fig. 5, which engages a circumferential groove, *d'*, Fig. 5, in the hub of the driving-pulley D for shifting the pulley laterally to clutch and unclutch it, as aforesaid, and as hereinafter stated. When the handle end of said starting-lever occupies its right-hand position, in which it is shown in Fig. 7, beneath said vertical space in said keeper Q, said pulley D is clutched with said bevel-gear E for the doubling operation, as aforesaid. During this operation no drum-retarding friction is needed, nor to be allowed, except the slight constant friction regulated by said thumb-screw *r*, and to preclude fastening down or materially depressing the friction-lever P while said starting-lever P^2 is in its said right-hand position, a stop-lug, *p*, is formed on said friction-lever, so as to engage with said starting-lever in this position of the latter. Should the friction-lever be already fastened down when said starting-lever is shifted to said right-hand position, the latter will strike said stop-lug *p* and disengage the friction-lever from the detent-lug *q* automatically. In the left-hand position of said starting-lever P^2 said driving-pulley D is interlocked by clutch-pins d^2 *s* with a clutch-disk, S, fast on the left-hand end of said driving-shaft D^2, which shaft also has fast thereon a pair of small spur-wheels, *t*, (dotted in Fig. 1, and one of them shown in Fig. 5,) which are in constant mesh with idle-wheels *u*, Fig. 1, connecting them with spur-wheels *v* v^2, fast, respectively, on a pair of sleeve-shafts which are mounted in bearings at the front extremities of brackets a^6 a^7 on the front of the frame-castings A A^2, respectively. The interior of the sleeve-shaft of said wheel *v* is occupied by the smooth stem of a T-shaped cloth-board clamp, *w*, which is fastened therein so as to project more or less, to accommodate the machine to cloth-boards of different lengths, by means of a set-screw occupying a tapped radial hole in said shaft in customary manner. The interior of the sleeve-shaft of said wheel v^2 is occupied in like manner by the stem of a matching cloth-board clamp, w^2, splined within said sleeve-shaft, so as to rotate with the latter, but movable freely lengthwise by means of a hand-wheel nut, *y*, swiveled to the right-hand end of the sleeve-shaft, and a screw-thread in the stem of said clamp w^2 to coact therewith. By turning the hand-wheel nut

the clamp w^2 is advanced inward or retracted to clamp or release the cloth-board, as the case may be. Both clamps have V-shaped grooves in their heads, which embrace the ends of an ordinary cloth-board, *x*, Fig. 4, during said rolling-up operation and preparatory thereto.

Supposing the board *x* in position and a doubled piece of cloth on the drum B, as aforesaid, the guide C again occupying its mid-width fold, and the outer end of the cloth attached to the board *x* by wrapping a few turns of the cloth on the board in customary manner, said starting-lever P^2 is shifted from its position of rest to its left-hand position, as aforesaid, and the cloth-board is rapidly rotated by power applied to both ends thereof through the devices just described, as represented by the arrow in Fig. 4, the friction-lever P being simultaneously or subsequently depressed, so as to apply more or less tension to the cloth in the manner aforesaid.

In rolling up the cloth on flat boards a swinging motion of the fold-guide C and its supports becomes necessary. This is provided for by said pivot-rod C^2 and its bearings a^2. To render said guide adjustable laterally, so that different widths of cloth may be each wound in the proper place on given cloth-boards, said crooked arm C′, to the lower end of which the guide is fixedly attached, is connected with said pivot-rod C^2 at the upper end of the former by a horizontal pivot-pin, *c*, the end of the arm occupying a longitudinal slot in the rod, as indicated in Fig. 2, and at the angle of said arm by a rod, *z*, the upper end of which is fixedly attached to said pivot-rod C^2, while its lower end is screw-threaded and provided with a pair of thumb-nuts, *z*′, on the respective sides of an eye-bracket, *c*′, on the front of said arm C′, at its said angle, as clearly shown in Fig. 2. By adjusting said nuts *z*′ the position of the guide may be regulated with the greatest nicety.

I disclaim as old a fold-guide, broadly considered, against and around which cloth is drawn to fold the cloth longitudinally; also, provision, broadly considered, for drawing the cloth vertically upward against and around such fold-guide; also, the within-described form of brake or friction device, consisting of a friction drum or hub, a flexible friction-band, and a lever to which both ends of such band are attached, as means for tightening it around such hub, the same being used in hoisting apparatus, for example; also, means, broadly considered, for automatically loosening such friction-bands when the machinery is started, and, finally, means, broadly considered, for tightly rolling up doubled cloth, as I am aware that an English patent sets forth a cloth-doubling machine having a frictionally-driven roll of the doubled cloth with weights applied to its shaft as means for tightening or solidifying said roll. This tends to produce wrinkles in the doubled cloth and to render them permanent. In my machine I wind the cloth loosely on a drum of large diameter, in contradistinction to tightly rolling it up at the doubling operation, so as to avoid wrinkling or creasing it, and I insure tightly winding it on the cloth-boards at the rolling-up operation by lengthwise tension on the cloth, effected by a friction device controlling the rotation of said drum from which the doubled cloth is taken in this operation, and I thus provide for stretching out of the cloth any wrinkles or creases which may be in it, and also for equalizing and matching the edges of the cloth, so that the rolls of cloth shall be and are ready for the market and in perfect condition.

Having thus described my said cloth-doubling and rolling up machine, I claim as my invention and desire to patent under this specification—

1. In combination with a drum of large diameter provided with an internal gear, a pinion in mesh with said gear, a loose driving-pulley, mechanism for transmitting motion from said pulley to said pinion, devices for clutching said pulley to said transmitting mechanism and unclutching it therefrom, and a friction device for controlling the motion of said drum through the medium of said pinion when said pulley is unclutched from said transmitting mechanism, substantially as herein specified, for the purposes set forth.

2. The combination of an elevated drum of large diameter upon which the doubled cloth is wound, means for rotating said drum and for permitting it to unwind the cloth, a friction device for controlling its unwinding rotation, a rolling-up mechanism arranged to take the doubled cloth under tension from said drum, a thin fold-guide between said drum and said rolling-up mechanism, and an arm supporting the latter in contact with the longitudinal fold of the cloth inside, substantially as herein specified.

3. In combination with an elevated drum of large diameter upon which the doubled cloth is wound, and means for rotating said drum and for permitting it to unwind the cloth, a friction device for controlling its rotation, composed of a friction-hub, a flexible friction-band embracing said hub, a lever connected with said band, a spring acting on said lever, a vertical rod having a collar beneath said spring, and a hand-lever coupled to said rod, substantially as herein specified.

4. The combination of a cloth-drum, mechanism for rotating the same, comprising a driving-pulley and transmitting mechanism, a friction device for controlling the rotation of said drum, a vertically-moving friction-lever for actuating said device, and a horizontally-moving starting-lever for clutching and unclutching said pulley and transmitting mechanism, said friction-lever having a stop-lug which abuts against said starting-lever to prevent applying friction when said pulley and transmitting mechanism are clutched, substantially as herein specified.

5. The combination of a cloth-drum, mechanism for rotating the same, a friction device, including a friction-lever depressed to increase its resistance, and having a stop-lug at its handle end, a keeper having a detent-lug to retain said friction-lever in depressed position, and a starting-lever moving horizontally in the same keeper in a path crossed by said stop-lug in the depressed position of said friction-lever, substantially as herein specified, for the purpose set forth.

6. The combination of an elevated drum upon which the doubled cloth is wound, a rolling-up mechanism adapted to receive and rotate cloth-boards, an intermediate fold-guide, an arm supporting said guide in contact with the longitudinal fold of the cloth inside, and a horizontal pivot-rod from which said arm depends, whereby said guide is adapted to swing freely, substantially as herein specified.

7. The combination, substantially as herein specified, of an elevated cloth-drum, a rolling-up mechanism, an intermediate fold-guide, a crooked arm carrying said guide at its lower end, a horizontal pivot-rod at the upper end of said arm, an eye-bracket at its angle, and a vertical rod passing through said eye-bracket and having a screw-threaded lower end provided with thumb-nuts above and below said eye-bracket, for adjusting said guide laterally for cloth of different widths, in the manner set forth.

8. The combination of an elevated drum of large diameter, upon which the doubled cloth is wound, means for rotating said drum and for permitting it to unwind the cloth, a friction device for controlling its rotation, so that it delivers the doubled cloth under lengthwise tension, a rolling-up mechanism below said drum, adapted to receive and rotate cloth-boards on which the cloth is finally rolled up, a thin longitudinal fold-guide between said drum and said rolling-up mechanism, common to both, an arm supporting said guide in contact with the longitudinal fold of the cloth inside, devices for adjusting said guide laterally, and a horizontal pivot-rod from which said arm depends, substantially as herein specified.

Signed at Holyoke this 15th day of December, 1884.

CHARLES C. WEBBER.

Witnesses:
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