(No Model.)

# J. D. ELLIOT.

## CLOTH FOLDING MACHINE.

No. 306,597. Patented Oct. 14, 1884.

Fig. 1

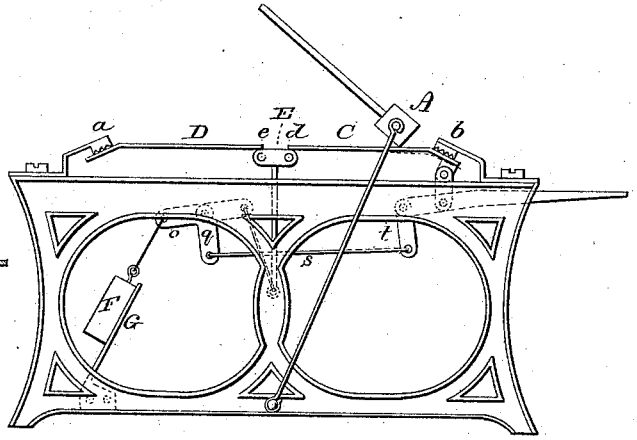



Fig. 5

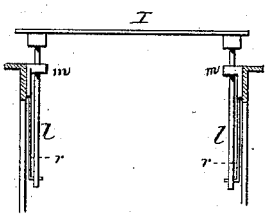



Fig. 2

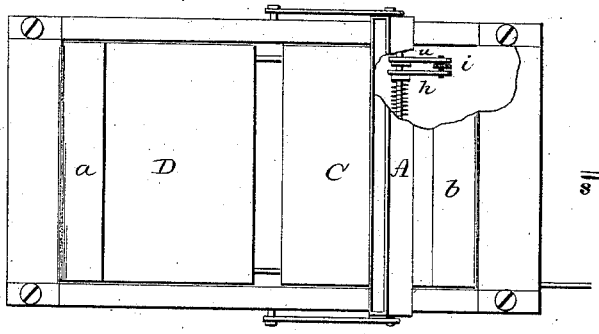



Fig. 4

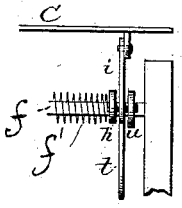



Fig. 6

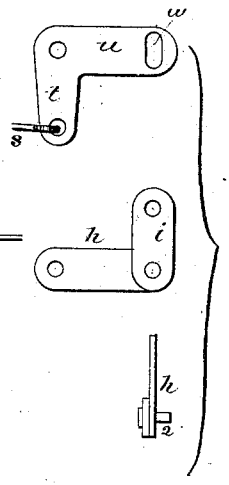



Fig. 7

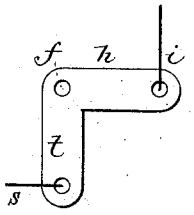
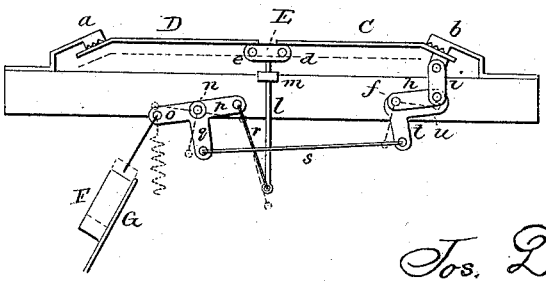



Fig. 3

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# UNITED STATES PATENT OFFICE.

JOSEPH D. ELLIOT, OF NEWTON CENTRE, MASSACHUSETTS.

## CLOTH-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 306,597, dated October 14, 1884.

Application filed February 2, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH D. ELLIOT, of Newton Centre, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Cloth-Folding Machines; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view of so much of the machine as is necessary to illustrate my invention; Fig. 2, a sectional top view of the same; Fig. 3, a sectional side view of the same; Fig. 4, a partial end view from the right of Fig. 1; Fig. 5, a transverse section looking toward the rods *l* from the right; Fig. 6, the bell-crank lever *t u* and the arm *h* detached and enlarged; Fig. 7, a modification of the connecting devices between the lever *o p q* and one end of the table.

This invention relates to that class of machines for folding cloth in which the cloth is laid upon a table in successive folds, each fold of a predetermined length, and whereby the cloth is not only folded, but measured at the same operation.

A machine of this class consists of a table over which a folder is caused to pass from one end to the other, back and forth, to deliver each fold of the cloth to a jaw at the respective ends of the table, and by which jaw the successive folds are caught and held, the extent of the fold being a predetermined length, so that the number of folds denote the quantity of cloth folded. In the best construction of the machine the jaw *a* at one end and *b* at the other end are fixed, the table jointed at the center, so that as the folder A approaches the jaw *b* it strikes upon the upper surface of the table and depresses that end of the table, as indicated in broken lines, Fig. 1, to deliver the fold beneath the jaw, the spring causing the table to take such a hold of the cloth that the folder is withdrawn, leaving the fold held between the jaw and table. Then the folder passes to the other end, delivering to the jaw *a* a fold in like manner, and so on back and forth, fold after fold, until the requisite number of folds be delivered and the piece be entirely folded and measured. The two parts C D of the table are hinged at the center, as at *d e*, Fig. 1.

In folding soft or "fluffy" goods—such, say, as canton-flannels—the pile increases much more rapidly at the center than at the jaws, because of the soft or light character of the material, and as the fold must be laid over this increasing pile it follows that the length of fold will increase as the center rises, so that accurate measurement is not attained, the folds gradually increasing from first to last. Again, this increasing thickness at the center and from that toward the jaws causes the folder to strike the upper surface at a constantly-increasing distance from the jaws, and the material, being soft, is naturally forced forward of the folder toward the jaw which the folder is approaching, and the strain in thus forcing is brought upon the opposite jaw, and frequently draws the cloth from that jaw.

To overcome this difficulty is the object of my invention; and it consists in the construction and combination of mechanism, as more fully hereinafter described, and particularly recited in the claims.

The upward force is best applied to the ends of the table by means of a rock-shaft, *f*, to which a spring, *f'*, is applied, as seen in Fig. 4. This spring *f'* is best made as a spiral spring, one end in connection with the shaft and the other with the frame or some stationary part of the machine, in the usual manner of arranging a torsion-spring—a device too well known to require particular description. From the shaft *f* an arm, *h*, extends, and from the end of the arm a connection, *i*, is made to that end of the table. The tendency of the spring is to rotate the shaft so as to force the end of the table up against its jaw. This is the usual construction for catching the folds. At the center the two parts of the table are hinged, as at *d e*, to a cross-bar, E. From this cross-bar rods *l* extend downward through suitable guides, *m*.

*n* is a rock-shaft parallel with the rock-shaft *f*, and on this rock-shaft is a three-armed lever, *o p q*, fixed to the shaft, and so as to rock with it. From one arm, *p*, a connection, *r*, is made to the vertical rod *l*. From the rod *q* a

connection, *s*, is made to one end, *t*, of a bell-crank lever, *t u*, loose on the rock-shaft *f*. To the other arm, *o*, a weight, F, is hung, preferably lying upon an inclined plane, G. The other arm, *u*, of the bell-crank lever, loose on the rock-shaft *f*, stands in a plane parallel with the arm *h*, fast to the shaft *f*, and in this arm *u* is a vertical slot, *w*, concentric with the shaft *f*, and from the arm *h* a stud, 2, extends into said slot *w*. When the parts are in their normal condition, the stud 2 stands above the lower end of the slot *w*, as seen in Fig. 3, and so as to give a little freedom to the end of the table independent of the bell-crank lever *t u;* but after the laying of several folds the table will have dropped so far as to bring the stud 2 into engagement with the arm *u*. Then the further descent of the table will cause the bell-crank lever to turn, and in turning will turn the three-armed lever *o p q*, and through the action of the connection *r* the center of the table will be dropped accordingly, and as seen in Fig. 3, the broken lines showing the extreme movement of the table. This turning of the lever *o p q* draws down the center of the table, and will continue so to do as each fold is added, because of the continued dropping of the ends of the table, and this dropping of the table at the center compensates for the increase of the pile at the center. The weight F is applied to counterbalance the table, as something is necessary to hold it up with a yielding pressure and bring it back to its place when the folded cloth is removed from the table. The weight is arranged upon the inclined plane G so as to slide thereon, to prevent its "jumping" or swinging so as to interfere with the proper working of the machine.

Instead of a weight, its known equivalent—a spring—may be substituted for it; yet I prefer the weight, as it gives a constant upward force upon the table, instead of an increasing force, as must be the case where a spring is applied.

The application of the spring is indicated in broken lines, Fig. 3, it only being essential to this part of my invention that there shall be a counter-balance to raise the table at the center. By thus dropping the center of the table automatically during the process of folding I am enabled to lay the folds substantially flat—that is, in a horizontal plane between the two jaws—and thereby overcome the difficulties before mentioned.

While I prefer to employ the arm *u*, with its slot *w*, it may be dispensed with, and the arm *h* made a fixed part of the arm *t*, in a bell-crank-lever form, as seen in Fig. 7.

I claim—

1. The combination of the two parts of the table, C D, hinged at the center, the stationary jaws *a b* at the respective ends of the table, and mechanism, substantially such as described, to impart to the center of the table a gradual descent as the folds upon the table increase, substantially as specified.

2. The combination of the two parts C D of the table, hinged at the center, the jaws *a b* at the respective ends of the table, vertical guide-rods *l*, a rock-shaft, *f*, an arm, *h*, extending therefrom, a connection between said arm *h* and the table, near one end, a rock-shaft, *n*, parallel with the rock-shaft *f*, a lever on said rock-shaft *n*, a connection between one arm, *p*, of said lever and the central part of the table, and a connection between the other arm, *q*, of said lever and the arm *h*, whereby the descent of the table at one end imparts a corresponding descent to both parts of the table at the center, and a counter-balance to return said lever *p q* to raise the table at the center, substantially as specified.

3. The combination of the two parts C D of the table, hinged at the center, the jaws *a b* at the respective ends of the table, vertical guide-rods *l*, a rock-shaft, *f*, an arm, *h*, extending therefrom, a connection between said arm *h* and the table, near one end, a rock-shaft, *n*, parallel with the rock-shaft *f*, a lever on said rock-shaft *n*, a connection between one arm, *p*, of said lever and the central part of the table, and a connection between the other arm, *q*, of said lever and the arm *h*, whereby the descent of the table at one end imparts a corresponding descent to both parts of the table at the center, and a counter-balance to return said lever *p q* to raise the table at the center, the said counter-balance being hung to an arm extending from the rock-shaft *n*, and arranged upon an inclined plane, G, substantially as specified.

4. The combination of the two parts C D of the table, hinged at the center, jaws *a b* at the respective ends of the table, rock-shaft *f*, arm *h*, extending therefrom, a connection between said arm *h* and the end of the table, whereby the descent of the table imparts rotation to said rock-shaft *f*, a bell-crank lever, *t u*, loose on said rock-shaft *f*, a second rock-shaft, *n*, parallel with the rock-shaft *f*, the three-armed lever *o p q* on said rock-shaft *n*, a connection between the one arm, *q*, of said lever and the arm *t* of the lever *t u* upon the shaft *f*, a connection between the other arm, *p*, and the table at the center, the arm *u* constructed with a slot, *w*, and the arm *h* provided with a stud, 2, to work in said slot *w*, and a counter-balance to return the rock-shaft *n*, substantially as specified.

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