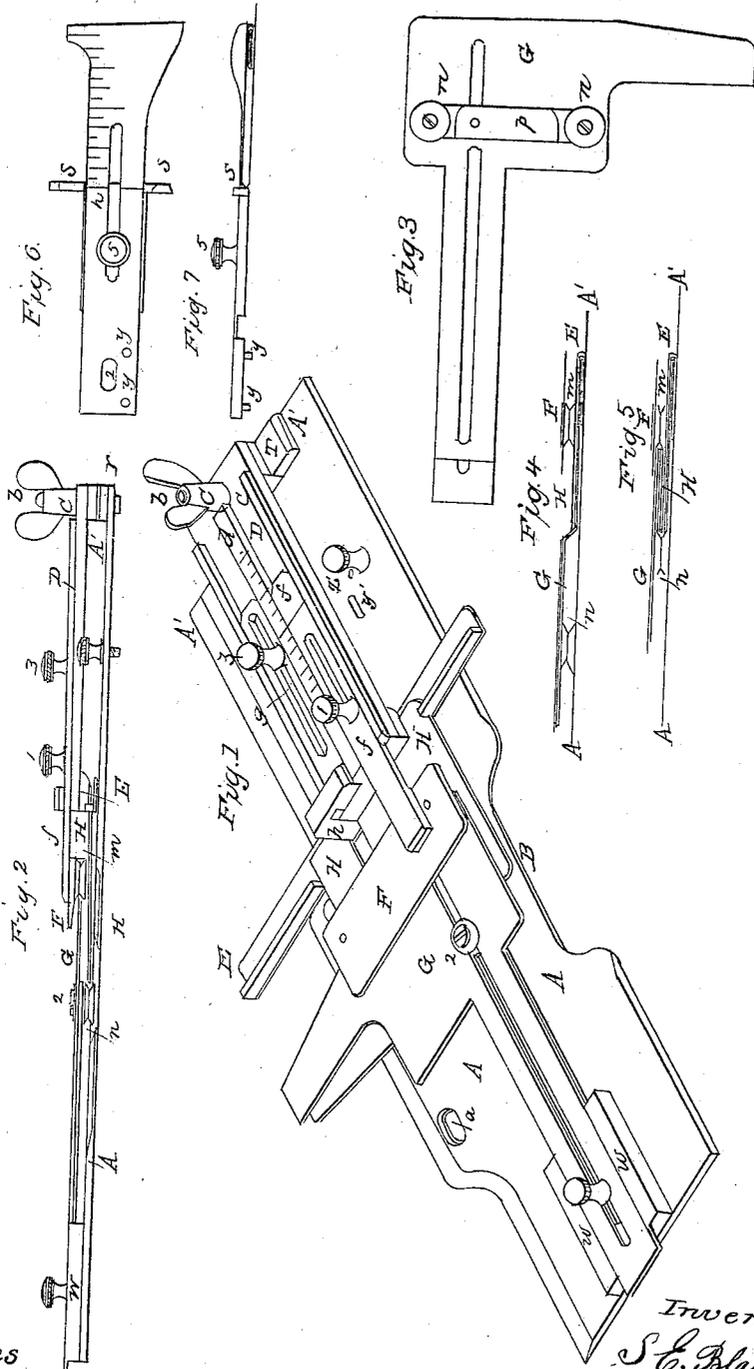


S. E. BLAKE.

Folding and Tucking Gage for Sewing Machines.

No. 35,667.

Patented June 24, 1862.



Witnesses
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN FOLDING AND TUCKING GAGES FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. 35,667, dated June 24, 1862.

To all whom it may concern:

Be it known that I, SOLOMON E. BLAKE, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Folding and Tucking Gages; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is an isometrical perspective view of the apparatus complete. Fig. 2 is a side elevation of the same. Fig. 3 is a plan view of one of the folding-blades, showing the construction upon its under side. Figs. 4 and 5 are diagrams in illustration of the operation of the apparatus, and Figs. 6 and 7 are plan and side views of a hemmer to be used in connection with the instrument for producing plaits or tucks.

The formation of folds or plaits on shirt-bosoms or other articles of dress was heretofore attended with much difficulty, particularly when such folds or plaits were afterward to be sewed on a sewing-machine. The mechanical devices employed, suggested, or invented to perform the folding and tucking automatically and in advance of the feeding mechanism on a sewing-machine effected the result, so far as I am aware, but imperfectly. Thus the various hemming-gages in use, although capable of automatically folding the cloth, simply act upon the edge of the cloth by turning it over or under, as well understood. Tucking-gages require the folding by hand of the cloth, and they only deliver the material to be sewed to the sewing mechanism, so that the needle shall operate in a line parallel with its folded edge. Moreover, the stitching of the material when passing through the ordinary tucking-gage can only be effected through two thicknesses. When, therefore, it is intended to make the folds of shirt-bosoms, it becomes necessary once more by hand to fold down the material close to the seam, and in order to fasten down the fold thus made another seam is to be run in close vicinity to the former seam. It will thus appear that four distinct operations are necessary to produce a single fold or plait. Another important disadvantage attending the ordinary tucking-gage consists in the inability of accurately determining or marking the several folds in relation to each other. This has been done here-

tofore either by hand or by a marking-instrument attached to the gage, so that while one tuck is being sewed down the line of the next succeeding fold is determined and marked; but inasmuch as the marker is stationary while the cloth is moved, actuated, as it is, by both the feed and the gage, it is obvious that any imperfection in the action of the feed or of the tucking-gage in making the first fold will be repeated in the next succeeding folds.

I am aware that an attempt has been made at devising a gage to effect the triple folding of the cloth, so as to deliver it in three plies to the sewing-machine; but I am also aware that such gage is inoperative on account of certain radical defects in the principle of construction, arrangement, and operation, of which I would mention, first, the method of gaging the material to be sewed upon and against the under fold of a preceding plait, which, being almost flush with the rest of the material, presents no hold to the guiding device; second, the friction created by dragging cloth crimped over and against three thin closely lying metallic edges is calculated to divert the cloth from the path imparted by the guiding device, particularly as a powerful feeding mechanism is required to move the material. If it be then considered that the perfect operation of the folding apparatus depends entirely on the gage, it will appear obvious that the elements of success in a folding-gage are, first, positive and unfailing means of guiding the material according to the first folded edge, whether the same be a hem or any other kind of fold; second, in order not to interfere with the proper guiding of the cloth, that friction should be reduced as much as possible; third, that the method of adjustment of the folding-plates shall be such as to preclude possibility of the cloth puckering or of its being crimped between the stationary surfaces. These conditions necessary to the perfect operation of a folding-gage I have combined in the gage which is the subject-matter of this application; and my invention consists in so constructing and combining the parts constituting a gage for folding linen, cotton, or other material to be sewed into tucks, folds, or plaits, &c., as that, while capable of adjustment to admit of the production of folds, tucks, or plaits of various widths and at various distances apart, it shall afford the necessary facility for unfail-

ingly guiding the material while being sewed, and at the same time permit of the parts being brought into operative condition and relation to each other without too great friction or strain being created upon the cloth, thereby rendering the work liable to be disarranged before being brought under and across the path of the needle.

To enable others skilled in the art to make and use my invention, I shall now proceed to describe its construction and the manner of operating the same.

In the accompanying drawings, A A' is the base plate, or the plate upon which the several parts constituting my folding-gage are fixed or adjusted. It is provided at some convenient place with holes or apertures *a*, through which the shanks of set-screws are passed to fix the plate and the apparatus it carries onto the table of a sewing-machine. The plate is fixed to the table so that the recessed portion B shall face the feeding mechanism of the machine, and so that the material shall be fed away from it. Supposing, therefore, the feeding mechanism to consist of a wheel revolving from the left to the right in relation to the operation, the folding apparatus will have the part marked A in front and the part A' in rear of the machine. From the rear part of the base-plate projects upwardly a screw-threaded spindle, *b*, upon which is fixed by means of a nut, *c*, the guide-bar D, consisting of a plate provided on the rear extremity with a heel-piece, whereby it is held up away from the base-plate, but in a position parallel therewith, so as to allow of the gage E to be slid along the guide-bar between it and the base-plate. Two guide-beds are formed on top of the guide-bar by means of a center ridge, *d*, and two border ridges, *e*. Within these beds are confined the slotted shanks *f* and *g* of the plate F and the gage E, by which the latter are adjusted in relation to the stationary guide-bar. The center ridge is graduated and performs the office of a scale, upon which the measurement of the width of the folds or plaits and the distance between the folds from edge to edge may be with accuracy effected. The gage E is a straight-edge extending transversely to the guide-bar. It is connected therewith by means of a curved or angle piece, *h*, and its office is simply to guide the cloth to be sewed in a line parallel with the folded edge of a hem or any preceding plait or fold. The plate F is designed to throw forward the unfolded part of the cloth as well as to hold the grooved rollers *m* in opposition to the folding-blade G, so that the folding-edge of the latter shall form a line tangential to the said rollers. To the front end of the guide-bar is secured the stationary folding-blade H. Its folding-edge is parallel with the line of feed as well as with all other folding-edges. This folding-blade is held in a position parallel with the base-plate at a slight distance therefrom, so as to bear upon the material with gentle pressure, sufficiently strong to prevent the cloth from puckering, yet light enough to allow of its being

drawn through without sensible resistance. To the opposite or forward end of the base-plate are secured ways *w* for the proper adjustment of the folding-plate G. This plate is held in such a manner as to occupy intermediately between the plate F, carrying the rollers *m*, and the stationary folding-plate H a position corresponding to the creases of the said rollers, so as to impinge upon them when sufficiently pushed forward. This folding-plate is provided at its under side (see Fig. 3) with grooved rollers *n*, revolving on axles fastened by means of a screw, 2. These rollers are so arranged that their grooves shall coincide with the edge of the stationary folding-blade H.

Having thus described the several parts constituting my improved folding-gage and the manner in which the same are arranged in relation to each other, I shall now proceed to describe the operation of the apparatus as a whole. I shall premise by stating that for the formation of the first fold, which generally necessitates a hem to be formed on the edge of the cloth, I use a hemming-gage with which is combined an ordinary tucking-gage. (See Figs. 6 and 7.) This instrument consists of a blade thicker in the rear, so that the front part shall be held in a position parallel with the base-plate at a distance therefrom to allow free play and adjustment of the straight-edge *s*. It is fitted to the base-plate by means of pins *y*, projecting from its under face and entering corresponding oblong slots, *y'*, within which it is adjustable to a limited extent; and the instrument is secured to the base-plate, after being properly fitted, by means of a set-screw passing through the slot *z* into the threaded opening *z'* in the rear part of the base-plate. The front part of the blade is thin, and is bent into a convolute flare-mouthed hemmer, to receive and turn over the edge of the cloth to be hemmed. The plate is slotted longitudinally, and carries underneath, by means of a set-screw, 5, passing through the slot, a transverse straight-edge or gage, *s*, at right angles to the blade itself. The upper surface of the blade may be marked to form a scale, whereby the operator may determine the width of the first fold. If it be intended to make the first fold of a shirt-bosom, the guide-bar, with its several parts, is removed, and the combined hemmer and tucker shown in Figs. 6 and 7 is introduced in lieu thereof. The edge of the material to be hemmed, folded, or plaited is first introduced within the formers of the hemmer. It is then doubled and allowed thus doubled to run back until its folded or doubled edge reaches the gage *s*. The blade being slightly elastic, it will, in connection with the straight-edge, perform the function of a tucking-gage, and thus guide the cloth, when fed in such a manner as that the stitching shall be effected through three thicknesses of the cloth—*i. e.*, through the hemmed portion thereof—in a line parallel with the folded edge. The straight-edge being adjustable, it will be understood that the width of the first fold, or the distance

of the hem to the fold edge, may be varied at pleasure. The cloth is thus prepared for the plaiting. The hemmer is removed, and in its stead the guide-bar, with its folding-blades, rollers, and straight-edge, is now secured on the spindle. Before introducing the material the screw is loosened and the blade G is slid back in its ways entirely, to clear the other folding-blades and to allow free access to the cloth from above to under the stationary folding-blade up to the straight-edge. The folded part of the material is then introduced under the blade H and pushed back until its fold edge comes in contact with the gage E. The part thus introduced, it will be seen, being doubled, is less limber than the unfolded part of the material, and its stiffness is increased by being confined between two parallel and closely-lying plates. The work therefore, guided or gaged against the straight-edge by a comparatively rigid material, is not liable to pucker and not capable of getting off the guiding-surface. After the material is properly engaged between the base-plate and the stationary folding-plate, the operator holds it down with his fingers, while with his other hand he pushes the second folding-blade, G, toward the rear of the machine and against the rollers *m*. By this movement of the blade the loose portion of the material is gathered up and folded over the edge of the first blade. The cloth is at the same time thrown back by the plate F, so as to form a fold over the edge of the second folding-blade. This done the blades are all secured into their respective positions by tightening the several set-screws. The cloth is by this means firmly held between the several folding-blades and bent or turned over the edges, and is thus ready to be sewed down by the machine.

From the description of the construction and arrangement of the parts it will be readily understood how various widths may be given to

the tucks or plaits. But to illustrate: Suppose a narrower plait is desired to be produced than that shown in the drawings. To adjust the instrument accordingly it simply requires the adjustment of the rollers *m* in suitable relation to the stationary folding-blade H. To do this, loosen the screw 1; advance the plate F, with the rollers *m*, toward the front—*i. e.*, toward A—of the apparatus and tighten it again; then loosen the screw 2 and push back the strip bearing the rollers *n* a distance equal that of the advance of the plate F, and secure it in the last position by means of the set-screw 1.

If it be desired to vary the distance from plait to plait, the straight-edge alone is moved accordingly back and forth, and this is done by first loosening the screw 3, by then adjusting the straight-edge, and tightening the screw again.

Having thus described my invention, I claim the apparatus described as an attachment to a sewing-machine for automatically folding or plaiting the material to be used, the same consisting of the following elements combined:

1. An adjustable gage for the determination of the distances from fold to fold, and by which the material to be folded and sewed is guided to the sewing mechanism, as herein described.
2. Two folding-blades, either or both of which are movable within planes parallel, so as to allow of their adjustment in relation to each other and in relation to the gage, as herein described.
3. Rollers so hung on spindles fixed to or in folding-blades as that the edge of said folding-blades shall impinge upon the said rollers, substantially as herein described.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

SOLOMON E. BLAKE.

Witnesses:

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WM. H. HARRISON.