

July 21, 1964

A. I. GILBERT

3,141,665

FOLD FORMING ELEMENTS FOR CLOTH LAYING MACHINES

Filed May 14, 1963

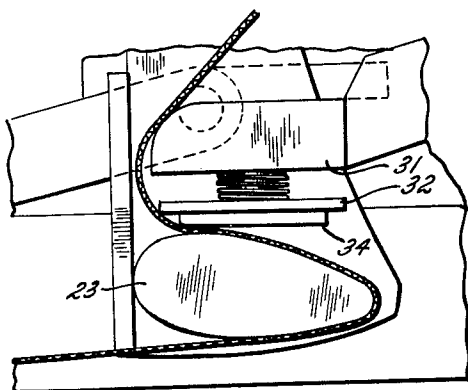
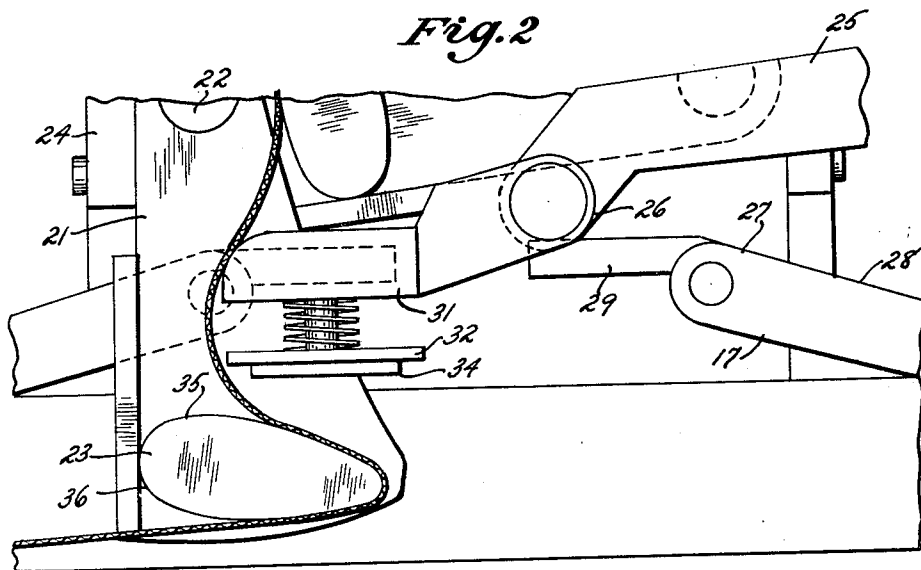
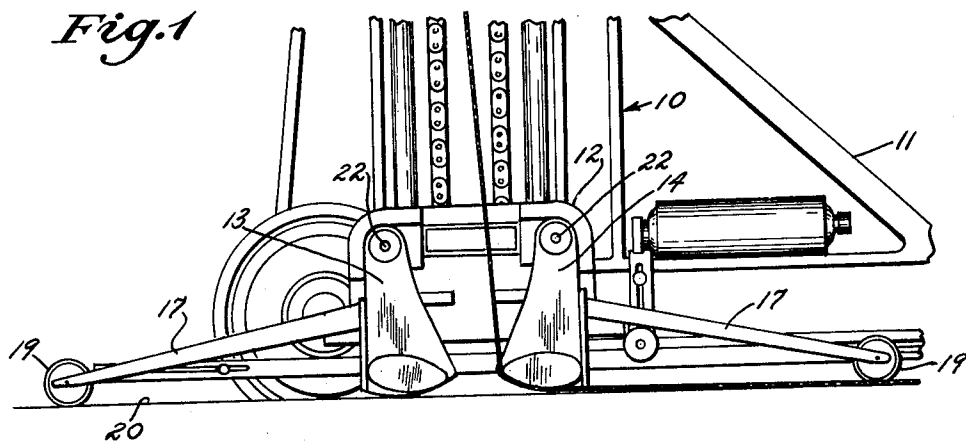


Fig. 3

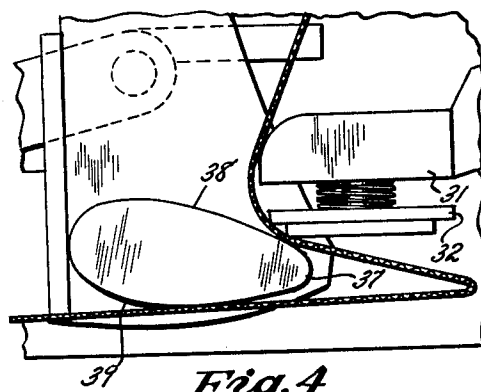


Fig. 4

1

2

3,141,665
**FOLD FORMING ELEMENTS FOR CLOTH
 LAYING MACHINES**

Abner I. Gilbert, New York, N.Y., assignor to Cutting
 Room Appliances Corp., New York, N.Y., a corpora-
 tion of New York

Filed May 14, 1963, Ser. No. 280,231
 3 Claims. (Cl. 270-31)

This machine relates generally to the field of cloth-
 laying machines, employed for laying a plurality of super-
 imposed layers of cloth upon a table by utilizing a moving
 carriage supported by the table and reciprocating in either
 of two directions over the upper surface thereof. The
 carriage is normally operated in conjunction with a pair
 of cloth fold-retaining elements which are also supported
 by the table and alternately contacted by portions of the
 carriage in such manner that the cloth fold-retaining ele-
 ments are lifted momentarily to enable a fold of cloth to
 be positioned therebeneath, following which the fold-re-
 taining element is allowed to fall on the now-formed fold.
 Each succeeding reciprocation of the carriage produces
 another fold which is positioned directly over a pre-
 viously formed fold.

In more complicated constructions, the fold is formed
 by a rotating bar, which pivots about its own axis to
 stretch a portion of cloth beneath the cloth fold-retain-
 ing means. Simpler constructions merely support a bar
 which extends transversely across the table perpendicular
 to the line of motion of the carriage and the bar passes
 directly beneath the cloth fold-retaining means until the
 latter is allowed to fall upon the former to engage a
 portion of the cloth adjacent to the fold, and permit the
 bar to be withdrawn. Where, as in prior art constructions,
 the bar has been of a rectangular cross-section offering a
 relatively sharp right angle edge to the cloth at the point
 where the fold is formed, there has been a tendency for
 the sharp edge to move the cloth from beneath the cloth
 fold-retaining means, to result in an uneven fold. Fur-
 ther, since the above mentioned bar also serves on an-
 other surface thereof, as a guide means to assist in the
 laying of the cloth upon the table, right angle edges pres-
 ent upon same have also hindered effective and smooth
 cloth laying.

It is therefore among the principal objects of the pres-
 ent invention to provide an improved form-folding ele-
 ment for use in conjunction with cloth laying machines
 of the above described type, in which the above-men-
 tioned disadvantages have been substantially eliminated.

Another object of the invention lies in the provision of
 an improved pivotally mounted form-folding element,
 in which the transverse bar thereof is provided with a
 cross-section of airfoil shape which permits the web of
 cloth to slide readily therefrom during the formation of a
 fold, and readily thereover during a clothlaying recipro-
 cation of the carriage upon which the fold-forming ele-
 ment is mounted.

The further object of the invention lies in the pro-
 vision of an improved fold-forming element for use in
 conjunction with cloth-laying machines in which the cost
 of fabrication may be directly comparable with existing
 prior art devices, thereby permitting consequent wide-
 scale distribution and use.

Yet another object of the invention lies in the provision
 of a fold-forming element for use with a cloth-laying
 machine which can readily form uniform folds which are
 directly super-imposed upon each other with great ac-
 curacy.

A feature of the invention lies in the fact that it may
 be incorporated into existing cloth-laying machines at
 relatively low cost, thereby permitting older types of
 construction to be readily modernized.

These objects and features, as well as other incidental
 ends and advantages, will more fully appear in the pro-
 gress of the following disclosure, and be pointed out in the
 appended claims.

In the drawing, to which reference will be made in the
 specification, similar reference characters have been em-
 ployed to designate corresponding parts throughout the
 several views.

FIGURE 1 is a fragmentary longitudinal sectional view
 of an embodiment of the invention.

FIGURE 2 is an enlarged fragmentary sectional view
 corresponding to the central portion of FIGURE 1, but
 showing engagement of a cloth fold-retaining element.

FIGURES 3 and 4 are enlarged fragmentary longitudi-
 nal sectional views, corresponding in most respects to
 that seen in FIGURE 2, but showing altered relative posi-
 tions of the component parts.

In accordance with the invention, there is illustrated in
 FIGURE 1 in the drawing, a fragmentary view of a cloth-
 laying machine, generally indicated by reference char-
 acter 10. The machine 10 includes a carriage element 11
 having a lower support member 12 which supports first
 and second cloth fold-forming elements 13 and 14 of the
 type disclosed in the copending application of Emmanuel
 Theodosiou, Serial No. 153,546; filed November 20, 1961,
 and entitled, "High-Speed Cloth Laying Machine," said
 application having been assigned to the same assignee as
 the instant application. In devices of this type, the sup-
 port member 12 is provided with a transverse generally
 rectangularly-shaped opening 15 through which a web of
 cloth 16 passes to be spread upon the table. A pair of
 cloth fold-retaining element operating members 17 is
 provided at each end of each of the fold-forming elements
 13 and 14, the outer extremities 18 thereof being pro-
 vided with rollers 19 to permit the same to pass freely
 over the upper surface 20 of the cloth laying table.

Referring to FIGURE 2, the cloth fold-forming ele-
 ments, 13 and 14 are generally similar, each including a
 pair of shaped links 21, having a horizontal axis 22 of
 pivotal movement, the lower ends of the links 21 being
 inter-connected by a transverse bar 23. Pivotal move-
 ment is limited by means 24 which contacts a surface of
 each of the links 21 of either element 13-14, and does not
 allow the links to pass a generally vertical position in a
 direction of movement opposite that in which the carriage
 11 is moving, wherein the bar 23 may serve as a guide to
 change the direction of the web of cloth 16 as the same
 deposited upon the table surface 20.

In FIGURE 2 there is illustrated a conventional type
 of cloth fold-retaining element, including a pair of arms,
 one of which is indicated by reference character 25 hav-
 ing roller means adapted to contact the upper surface 27
 of a respective operating member 17. Member 17 also
 includes a ramp portion 28 and a terminal portion 29,
 passage of the roller means 26 past the end thereof allow-
 ing the arms 25 to drop directly upon a portion of the
 web 16 supported by the upper surface of the bar 23, at
 the moment of formation of a fold in the cloth. The
 arms 25 support a transverse member 31, which in turn
 supports a resiliently cushioned member 32, having a rub-
 ber or similar friction-inducing lower surface-forming
 member 34.

Referring to FIGURE 2, the bar 23 is of generally air-
 foil cross-section, including an outer surface 35, formed
 by a first end in the portion 36 of relatively large radius,
 a second end portion 37 of relatively smaller radius, as
 well as upper and lower curved surfaces of radius sub-
 stantially greater than that of the first end portion 36,
 the surfaces 38 and 39 being disposed on either side of a
 median plane passing through the first and second por-
 tions 36 and 37, respectively. By selecting a cross-sec-
 tion of the type illustrated, the bar 23 has great strength

3

along the above-mentioned median plane, and features a complete elimination of sharp edges which in prior art constructions have caused irregular operation. Thus, at the moment of the dropping of the member 34 upon the upper curved surface 38, owing to the fact that the surface 38 is highly polished and of a tapered shape, it offers little static and dynamic friction to the under surface of the web 16 of cloth positioned thereon, whereby it may be smoothly withdrawn to permit proper formation of a fold of cloth. (See FIGURES 3 and 4.) A similar action takes place between the lower surface 39 and the upper surface of previously formed folds (not shown).

Upon the reversal of movement of the carriage 11, and the transfer of contact of the web 16 of cloth to the oppositely disposed bar 23, a second portion 37 takes over the function of guiding the web at about substantially a right angle so that the same may be smoothly deposited upon the table surface 20. Here again, because of the lack of a sharp edge, the flow of the cloth over the portion 37 is smooth and substantially frictionless.

I wish it to be understood that I do not consider the invention limited to the precise details of structure shown and set forth in this specification, for obvious modifications will occur in those skilled in the art in which the invention pertains.

I claim:

1. In a cloth-laying machine, including a cloth-laying table, a carriage element supported for reciprocation along a line of motion upon said table, and at least one cloth-retaining fold element periodically raised to an elevated position at the completion of a reciprocating stroke, to permit a fold of cloth to be positioned therebeneath, the improvement comprising: at least one cloth fold-forming element, including first and second link members pivotally mounted upon said carriage for rotation about a horizontal axis substantially perpendicular to the line of motion of said carriage element, and a transversely extending fold-forming bar, inter-connected with and supported by said link members, said bar having an outer surface including a first portion of relatively large radius of curvature facing outwardly of said table, a second portion to form the fold of relatively smaller radius of curvature facing inwardly of said table and beneath and proximate to said cloth-retaining fold element, and third and fourth portions of radius of curvature greater than that of said first portion and inter-connecting said first and second portions on either side of a median plane, passing between said first and second portions, said third portion positioned adjacent said cloth-retaining fold element for contact therewith as the folded cloth is removed from said bar.

2. In a cloth-laying machine, including a cloth-laying table, a carriage element supported for reciprocation along

4

a line of motion upon said table, and at least one cloth-retaining fold element periodically raised to an elevated position at the completion of a reciprocating stroke, to permit a fold of cloth to be positioned therebeneath, the improvement comprising: at least one cloth fold-forming element, including first and second link members pivotally mounted upon said carriage for rotation about a horizontal axis substantially perpendicular to the line of motion of said carriage element, and a transversely extending fold-forming bar, inter-connected with and supported by said link members, said bar having an outer surface including a first portion of relatively large radius of curvature facing outwardly of said table, a second portion to form the fold of relatively smaller radius of curvature facing inwardly of said table and beneath and proximate to said cloth-retaining fold element, and third and fourth portions of radius of curvature greater than that of said first portion, and inter-connecting said first and second portions on either side of a median plane, passing between said first and second portions said third portion positioned adjacent said cloth-retaining fold element for contact therewith as the folded cloth is removed from said bar.

3. In a cloth-laying machine, including a cloth-laying table, a carriage element supported for reciprocation along a line of motion upon said table, and at least one cloth-retaining fold element periodically raised to an elevated position at the completion of a reciprocating stroke, to permit a fold of cloth to be positioned therebeneath, the improvement comprising: at least one cloth fold-forming element, including first and second link members pivotally mounted upon said carriage for rotation about a horizontal axis substantially perpendicular to the line of motion of said carriage element, and a transversely extending fold-forming bar, inter-connected with and supported by said link members, said bar having an airfoil cross-section including a first portion of relatively large radius of curvature facing outwardly of said table, a second portion to form the fold of relatively smaller radius of curvature facing inwardly of said table and beneath and proximate to said cloth-retaining fold element, and third and fourth portions of radius of curvature greater than that of said first portion and inter-connecting said first and second portions of either side of a median plane, passing between said first and second portions, said third portion positioned adjacent said cloth-retaining fold element for contact therewith as the folded cloth is removed from said bar.

References Cited in the file of this patent

UNITED STATES PATENTS

2,966,353 Deichmann ----- Dec. 27, 1960