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J. STEIN

3,524,637

CUTTLING OR FOLDING MACHINE

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2 Sheets-Sheet 1

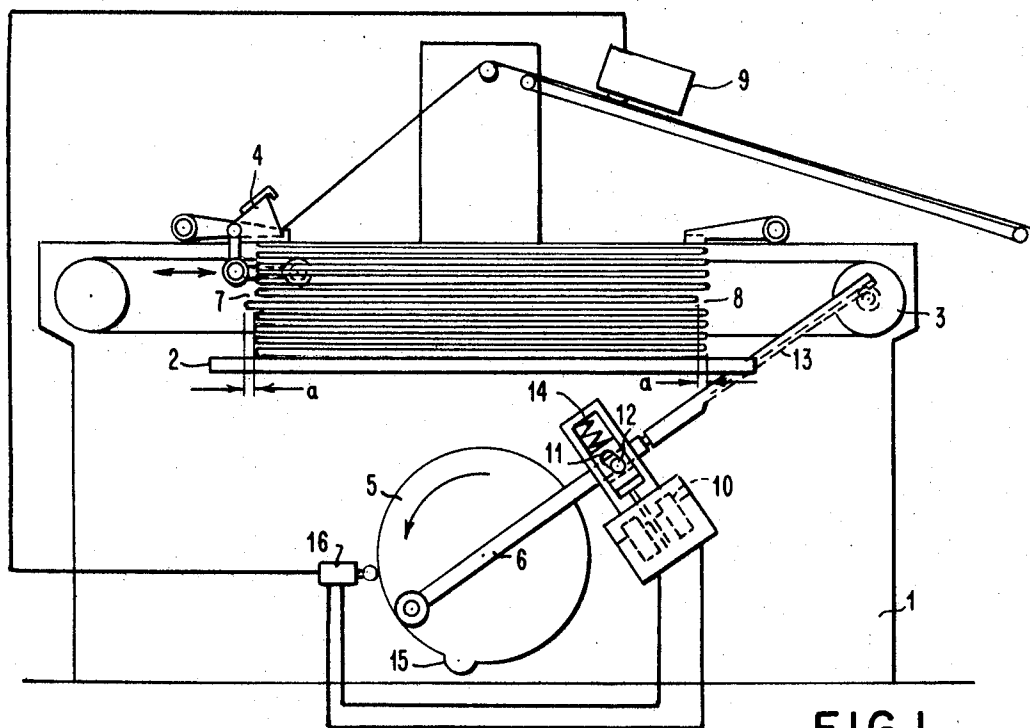


FIG. 1

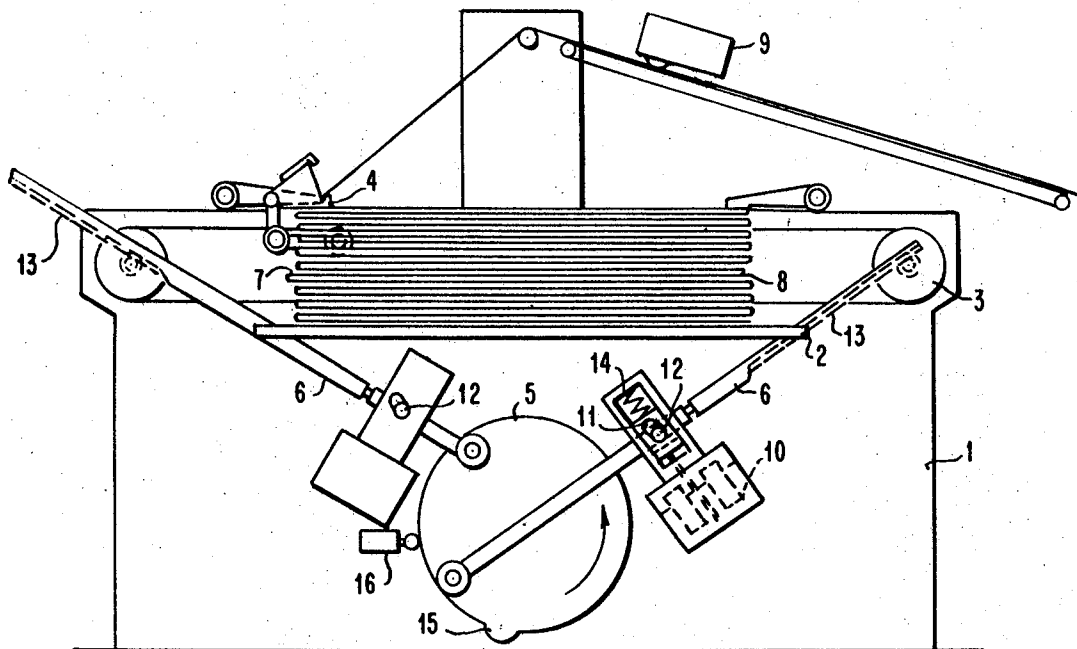


FIG. 2

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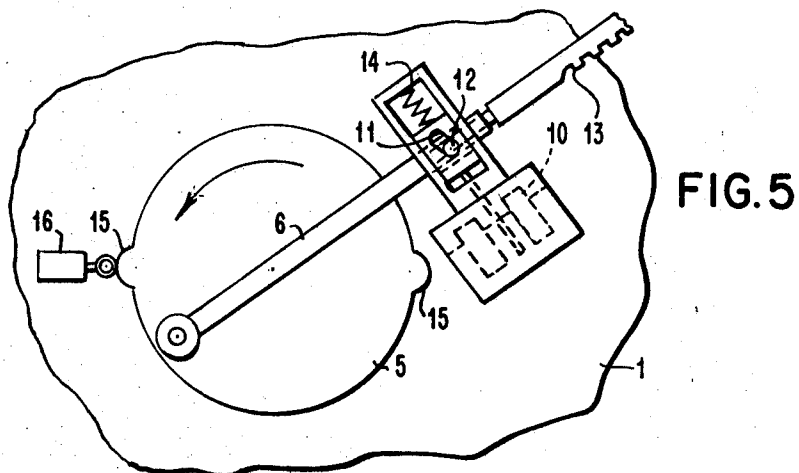
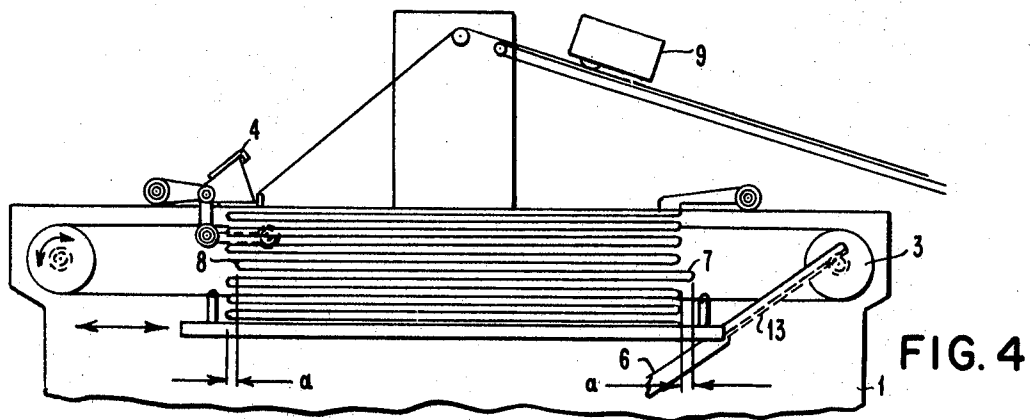
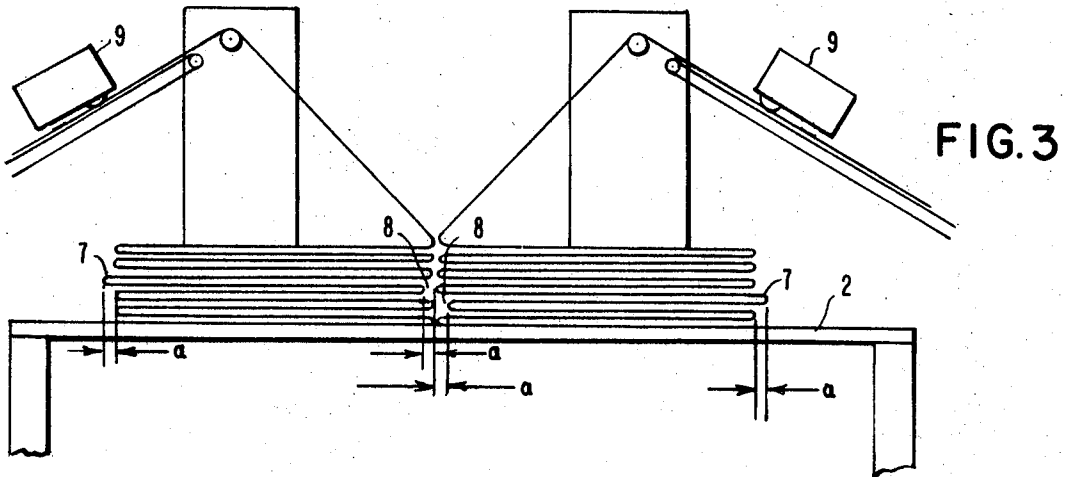
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CUTTLING OR FOLDING MACHINE

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6 Claims

ABSTRACT OF THE DISCLOSURE

Device for thrusting out indicator folds from a stack of folds of predetermined length in a folding machine, particularly for textile webs, wherein the drive mechanism for effecting relative displacement between the folding carriage and the folding table of the machine is provided with control means for increasing the length of the normal stroke producing the folds of predetermined length in one direction by a given amount and for shortening the length of the normal stroke in a direction opposite to the one direction by the same amount.

My invention relates to a cuttling or folding machine for web-like materials particularly textile materials, which is provided with a device for longitudinally displacing the stroke length forming the flipes or layers of the material. More specifically, my invention relates to means for causing a flipe or fold to extend out of the stack of folds of material, which is desirable for marking or indicating a web-connecting seam or for other purposes.

In cuttling or folding machines of this type known heretofore, an increase of about 2 cm. in the length of stroke that determines the longitudinal dimension of the flipes or folds of the web is effected by the conventional indicator-fold devices for the fold that is to extend out of the stack of folds, and thereafter, the cuttling machine operates at its normal length of stroke.

These heretofore known indicating-fold devices have a disadvantage in that the entire length of the folds of material does not accurately correspond to the value that results from multiplying the number of layers with the respective length thereof. The known machines therefore do not fully meet requirements for adjustability, especially if indicator folds are frequently thrust out of the stack of folds.

It is accordingly an object of the invention to provide folding machine with indicator fold-ejection means that are accurately adjustable and which will ensure that the entire length of a web folded in a stack will correspond exactly to the number of layers of folds times the length of a single normal folding stroke.

With the foregoing and other objects in view, I provide control means for the drive mechanism effecting relative displacement between the folding device, preferably a folding carriage, and the folding table of the machine, for increasing in one direction by a given amount the length of the normal stroke producing folds of predetermined length and for shortening the length of the normal stroke in a direction opposite to the one direction by the same amount.

In accordance with further features of my invention, the indicator fold device is installed in the drive mechanism for actuating the folding carriage, and there is provided a seam-sensing device, preferably a fault-indicating device or the like, functioning as pulse transmitter for the control mechanism.

In accordance with another feature of the invention, the control device is located on the folding table, and the latter is displaceable relative to the folding carriage for

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a stroke distance corresponding to the indicator fold length in order to form the indicator fold, and the folding table is then returned to its original normal position.

Other features which are considered as characteristic for the invention are set forth in the appended claims.

Although the invention is illustrated and described herein as embodied in cuttling or folding machine, it is nevertheless not intended to be limited to the details shown, since various modifications and structural changes may be made therein without departing from the spirit of the invention and within the scope and range of equivalents of the claims.

The construction and method of operation of the invention, however, together with additional objects and advantages thereof will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, wherein:

FIG. 1 is a partly diagrammatic side elevational view of one embodiment of the folding machine of the invention; and

FIGS. 2 to 5 are diagrammatic views of modified forms of the embodiment of FIG. 1.

In all of the figures, corresponding parts are identified by the same reference numerals.

Referring now to the drawing and first, particularly, to FIG. 1 thereof, there is shown a machine frame 1 in which there is mounted in a conventional manner a fold table 2 which is preferably able to be raised and lowered, a fold carriage 4 and a suitable drive mechanism 3 such as an endless belt for displacing the fold carriage 4 relative to the fold table 2 in a horizontal direction as shown in FIG. 1. The drive mechanism 3 is actuated through a crank-drive 5 and a connecting rod 6.

If indicator folds are to project beyond the right-hand edge of the illustrated stack of web folds, as shown in FIG. 1, such as the projecting indicator fold 7, then at the opposite or left-hand edge of the stack at the location 8, the stroke for forming the indicator fold 7 must be shortened by a length a which corresponds to the length a of the indicator fold 7 projecting beyond the left-hand edge of the stack.

In the illustrated embodiments of the invention, it is assumed that the indicator folds 7 are to serve for indicating the web-connecting seams.

In accordance with the invention, there is provided a suitable seam-sensing device 9 of conventional construction which cooperates with a switch 16 and an electromagnet 10 to operate a slide 11 formed with an inclined slot 12. The seam-sensing device 9 serves as a readying or preparatory switch for the switch 16 which is actuated by a cam surface 15 located on the crank disc 5 and switches on the electromagnet 10. The armature of the electromagnet displaces the slide 11 and, by means of the inclined slot 12 and a pin located on a toothed rack 13 telescoped in the connecting rod 6 and extending through the slot 12, effects a displacement of the toothed rack 13 relative to the connecting rod 6, whereby the fold carriage 4, on which a folding shovel is mounted, is fed forward a distance equal to the length of the stack of folds and forms the indicator folds 7. The carriage remains in this position, which is displaced relative to the normal fold stroke, until, after a full rotation of the crank disc 5 is carried out i.e. after a double stroke of the fold carriage 4 has been effected, the electromagnet 10 is de-energized by the opening of the switch 16, whereby a compression spring 14 restores the slide 11 and therewith the toothed rack 13 as well as the fold carriage 4 to their original positions. Thereby, the gap 8 at the opposite or right-hand edge of the stack is formed by the displaced position of the fold carriage 4. The cuttling or folding machine operates thereafter again with a normal stroke

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until a new pulse transmission is effected to the electromagnet 10 signalling the detection by the sensing device 9 of another seam in the travelling web.

In FIG. 2 there is shown quite schematically an embodiment of the invention corresponding in all details with the embodiment of FIG. 1 except that both rollers of the endless belt forming the drive mechanism 3 are positively driven relative to one another.

In the schematic view of FIG. 3, the embodiment of FIG. 1 is only modified by dividing the fold wagon 4 in two parts and displacing one part thereof relative to the other.

FIG. 4 is a schematic view of the embodiment of FIG. 1 modified in that the so-called fold carriage 4 is held at rest while the fold table 2 is displaced horizontally relative thereto.

In FIG. 5, the embodiment of FIG. 1 is shown modified by lengthening the crank radius in one limiting or dead-end position thereof and shortening it in the other dead-end position thereof.

In all of the foregoing embodiments, it is essential that the displaced position of the fold carriage 4 or the fold table 2, as the case may be, is maintained relative one to the other during a double stroke of the folding machine.

The invention has a main advantage in that it is usable even for the strictest standards or adjustment determinations, because the indicator folds, at the opposite edge, of the stack are completely balanced or equalized due to the fact that the respective gaps formed thereby in the stack are of equal length.

The invention is of particular importance in cases where, for example, the marking of faults in the web is to be effected by means of indicator folds, in which cases the indicator folds necessarily follow closely behind one another and at irregular intervals.

I claim:

1. Web-folding machine comprising a fold carriage and a fold table displaceable relative to one another in reciprocating strokes for forming a stack of aligned web folds of predetermined length on said fold table, drive mechanism for displacing said carriage and table reciprocatively relative to one another, and control means for increasing in one stroke direction by a given amount the length of a normal stroke producing the web folds of predetermined length and for shortening the length of the normal stroke in a stroke direction opposite to said one stroke direction by the same amount so as to form an indicator fold projecting from said aligned stack of web folds.

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2. Web-folding machine according to claim 1 wherein said fold table is stationary and said fold carriage is displaceable horizontally relative thereto.

3. Web-folding machine according to claim 1 wherein said fold carriage is stationary and said fold table is displaceable horizontally relative thereto.

4. Web-folding machine according to claim 1 wherein said fold carriage is divided into a plurality of parts displaceable relative to one another.

5. Web-folding machine according to claim 1 wherein said drive mechanism comprises a crank drive, and an endless belt having a pair of reversing rollers, at least one of which is operatively connected to said crank drive.

6. Web-folding machine according to claim 5 wherein said crank drive has a crank radius relatively longer in one dead-end position thereof and shorter in the other dead-end position thereof.

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LAWRENCE CHARLES, Primary Examiner

U.S. Cl. X.R.

270—79