May 24, 1932. E. HOPE ET AL 1,859,513

WORK LOCATING AND GUIDING DEVICE

Original Filed Sept. 4, 1924

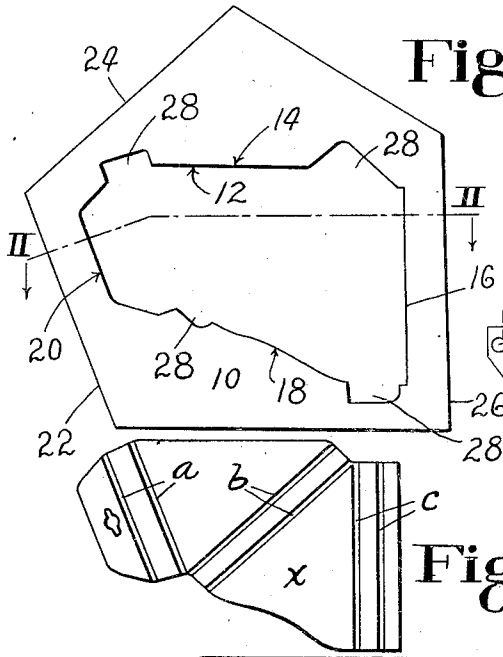


Fig. 1.

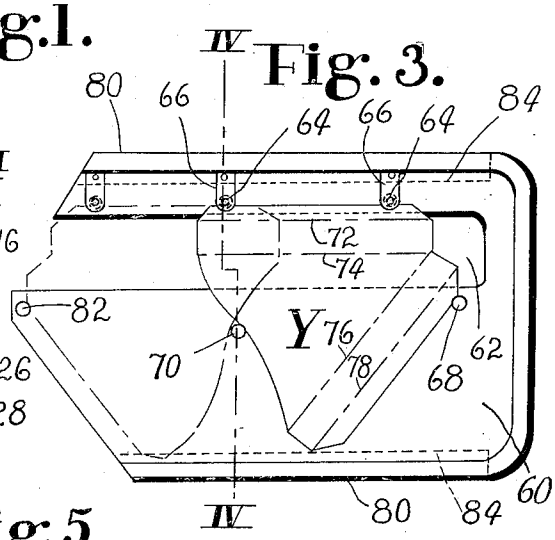


Fig. 3.

Fig. 5.

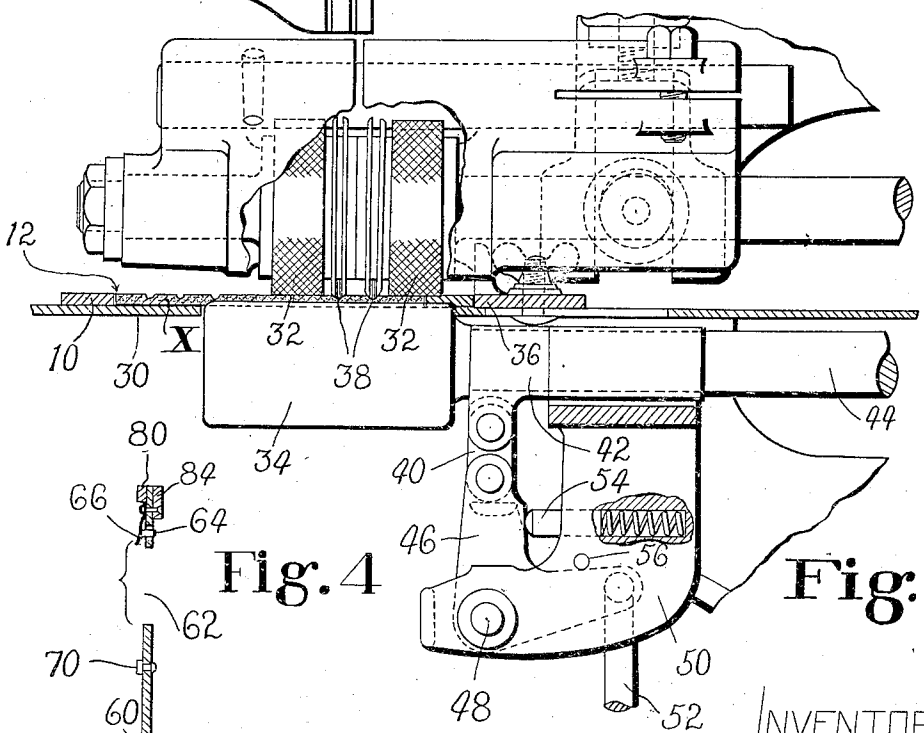


Fig. 2.

Fig. 4

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Patented May 24, 1932

1,859,513

UNITED STATES PATENT OFFICE

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WORK LOCATING AND GUIDING DEVICE

Original application filed September 4, 1924, Serial No. 735,863, and in Great Britain September 6, 1923. Divided and this application filed March 29, 1929. Serial No. 351,088.

This invention relates to improvements in work locating and guiding devices, this application being a division of a co-opending application Serial No. 735,863, filed Sept. 4, 1924, in the names of the present inventors. As herein illustrated the invention is embodied in a jig of novel construction for use in a machine such as a groove-forming machine to locate relatively to the operating instrumentality of the machine, and to guide past said instrumentality, a blank for a tool bag adapted for use on a bicycle.

In the manufacture of various kinds of bags, suit cases and the like, a blank is cut from a sheet of leather, leather-board or other material of such a shape that when the blank is bent or folded into the form of the finished article and the abutting edges of the blank are secured together, as by stitching, a bag or case of the desired shape is produced. To facilitate bending of folding of the blanks they are usually grooved on that side of the blank which is to constitute the inside surface of the finished article.

In making some kinds of bags or small cases of irregular contour, the lines along which the grooves are to be cut are not parallel to any edge of the blank and in such cases difficulty is experienced in rapidly and accurately forming the grooves.

One feature of the present invention consists in a jig of novel construction for use in cooperation with a gage member to guide past an operating instrumentality a piece of work to be operated upon along at least one line not parallel to any edge of the work, the jig comprising a flat plate having an edge portion for engaging the gage member to determine the direction of the relative movement of the work and the operating instrumentality while the work is being operated upon along said line, and means for locating the work relatively to the jig with said line parallel to said edge portion of the jig.

The invention will be particularly described with reference to the accompanying drawings, in which

Fig. 1 is a plan view of a jig constructed in accordance with the present invention;

Fig. 2 is a view, partially in elevation and partially in section, along the line II—II of Fig. 1, illustrating the manner in which the jig is used in a grooving machine;

Fig. 3 is a plan view of a jig of modified construction illustrating the manner in which a blank is positioned thereon;

Fig. 4 is a sectional view taken along the IV—IV of Fig. 3; and

Fig. 5 is a plan view of a blank in which grooves have been formed by the machine shown in Fig. 2.

Referring first to Figs. 1 and 2 of the drawings, the improved jig 10 therein shown consists of a flat plate made of sheet material, such as plywood, of a thickness substantially equal to the thickness of a blank X which is to be operated upon. The blank X is shaped to form a tool bag adapted for use on a bicycle, the blank being of the irregular form indicated in Fig. 1. The blank is shown as it appears after having been grooved to facilitate the folding of the blank into final shape, the blank having been provided for this purpose with a plurality of grooves *a*, *b* and *c*, the grooves *b* not being parallel to any edge of the blank but being formed along lines which bear a definite angular relation to the edges of the blank.

In order to receive the blank X and position it in fixed relation to the jig while the blank is being operated upon, an opening 12 is formed in the jig, the opening being of an irregular size and shape corresponding to the size and shape of the blank and the opening providing the angularly related edge faces 14, 16, 18, 20 for engaging corresponding edge faces of the blank. The outer edge portions 22, 24 and 26 of the jig 10 are respectively parallel to lines along which grooves such as the grooves *a*, *b* and *c* are to be cut. The jig is provided also with recesses 28 which are located at different points around the blank-receiving opening 12 for receiving the grooving cutters as they later emerge from the blank after forming grooves therein.

In using the jig shown in Figs. 1 and 2, a blank, such as the blank X, is fitted within the blank-receiving opening 12 and the jig, together with the blank, is placed upon the

table or work support 30 (Fig. 2) of a blank grooving machine between upper and lower feed rolls, such as the upper rolls 32 and the lower roll 34 shown in Fig. 2, with one edge face of the jig in engagement with a fixed work guide such as the fixed but adjustable edge guide 36. The illustrated grooving machine is provided with two grooving tools 38 for forming simultaneously two parallel grooves in the work. The upper rolls 32 and the groove-forming tools 38 are unyieldingly mounted. The lower feed roll 34 is unyieldingly supported during the operation of the machine by a toggle comprising a link 40 pivoted at its upper end to a bearing 42 of the lower feed roll shaft 44 and at its lower end to an arm of a bell crank lever 46 pivoted at 48 to a bracket 50 fixed on the frame of the machine. A second arm of the bell crank lever 46 is connected by a rod 52 with a treadle (not shown) by means of which the toggle may be broken to lower the feed roll 34 below the surface of the table 30 to allow the work to be inserted between the rolls 32 and 34 or removed therefrom. When the treadle is released, the toggle is straightened to raise the feed roll by means of a spring-pressed plunger 54 mounted in the bracket 50. A stop pin 56 limits the movement of the lever 46 under the influence of the plunger 54. The feed rolls 32, 34 function to feed the work past the groove-forming tools 38 by engagement either with the jig or with the work, the blank being guided past the tools 38 by engagement of one or another of the edge portions 22, 24, 26 of the jig with the fixed edge gage 36. When the grooves have been cut entirely across the blank the grooving tools 38 leave the blank and emerge into one of the recesses 28 in the jig whereupon the jig and the blank may be repositioned for the cutting of another pair of grooves in the blank or, if all of the grooves have already been cut, the jig and the blank may be removed from the machine after lowering the feed roll 34 by means of the mechanism above described. Because of the fact that the edge portions 22, 24 and 26 of the jig are parallel respectively to the lines along which the grooves *a*, *b* and *c* are formed the grooves are properly located upon the blank. It will be observed that the grooves *b* are located along the desired lines irrespective of the fact that there is no edge upon the blank itself which is parallel to the lines of these grooves.

A modified form of jig is shown at 60 in Figs. 3 and 4. The jig 60 comprises a thin metal plate having an opening 62 through which the lower feed roll 34 may project to engage the under side of a piece of work Y. The work Y is positioned in the jig 60 against pins 64 carried on leaf springs 66 fixed to the jig plate and against pins 68, 70 projecting directly from the jig plate. The blank Y shown in Fig. 3 requires to be grooved along lines 72, 74, 76 and 78. The blank Y is inserted in the jig 60 in the position shown in full lines in Fig. 3 and the grooves are cut along the lines 72, 74, the edge 80 of the jig being used to guide the jig by engagement of this edge with the edge gage 36 of the machine. The blank Y is then moved relatively to the jig 60 into the position shown by dot-and-dash lines in Fig. 3 and where it is maintained in place by means of the pin 70 and a pin 82 upon the gage plate 40 and the grooves are cut along the lines 76 and 78, the same edge face 80 being used to guide the jig. The upper feed rolls 32 pass over the leaf springs 66 as the jig is fed through the machine. The jig plate 60 has secured to its under side metal strips 84, 84 which provide bearing surfaces for the jig on the work table 30. It will be understood that blanks varying considerably in size and shape may be rapidly grooved in jigs similar in construction to those above described but adapted to receive the particular blanks which it is desired to operate upon.

Having described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. For use in co-operation with a gage member to guide past an operating instrumentality a piece of work to be operated upon along at least one line not parallel to any edge of the work, a jig consisting of a flat plate having an edge portion for engaging said gage member to determine the direction of the relative movement of the work and the operating instrumentality while the work is being operated upon along said line, and means for locating the work relatively to the jig with said line parallel to said edge portion of the jig.

2. For use in co-operation with a gage member to guide past an operating instrumentality a piece of work to be operated upon along at least one line not parallel to any edge of the work, a jig consisting of a flat plate having an edge portion for engagement with said gage member to determine the direction of the relative movement of the work and the operating instrumentalities while the work is being operated upon along said line, the jig having an opening extending therethrough shaped to fit the outline of the work and arranged to locate the work with said line of operation parallel to said edge of the jig.

3. For use in connection with a table across which a flat blank is to be fed past an operating tool to cause the tool to operate progressively along the blank, a jig plate having an opening extending therethrough for receiving the blank in position to rest upon the table, the opening being defined by edges shaped to conform to the contour of the blank to locate the blank in a predetermined position relatively to the jig, and the jig plate being formed with an outer edge portion

shaped to guide the jig and the blank in a path not parallel to any edge of said opening to determine the line of operation of said tool.

4. For use in connection with a device for grooving the surface of a blank of sheet material, a jig having outer edges for determining paths of relative movement between the blank and the grooving device, said jig being provided with an opening a portion of the edge of which is shaped to fit the contour of a blank to be grooved to hold the blank in fixed relation to the jig and another portion of which is shaped to provide a recess communicating with said opening into which the grooving tool may emerge from the blank at one locality and reenter the blank at another locality.

5. A jig for locating in a machine an irregularly shaped piece of work and guiding it past an operating instrumentality, comprising a plate of sheet material provided with an opening the contour of which corresponds to the contour of a piece of material having angularly related straight edges, said opening being adapted to receive the piece of work with at least two of said edges in engagement with corresponding edges of the opening in the jig plate, the periphery of said plate including a straight edge portion not parallel to any of the edges of said opening for determining the path of movement of the work.

In testimony whereof we have signed our names to this specification.

ERNEST HOPE.
ALFRED EDWARD RICHARDS.