

Oct. 3, 1950

C. W. ENGLISH
MEANS FOR FORMING THE CORNERS OF PAPER
BOX COVER BLANKS

2,524,344

Filed Nov. 18, 1947

2 Sheets-Sheet 1

Fig. 1.

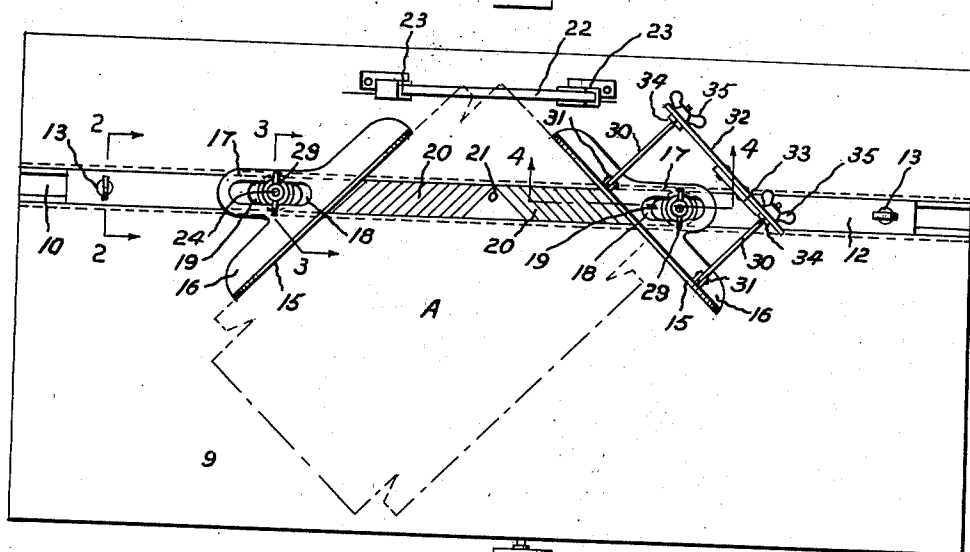


Fig. 2.

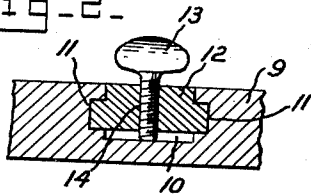


Fig. 4.

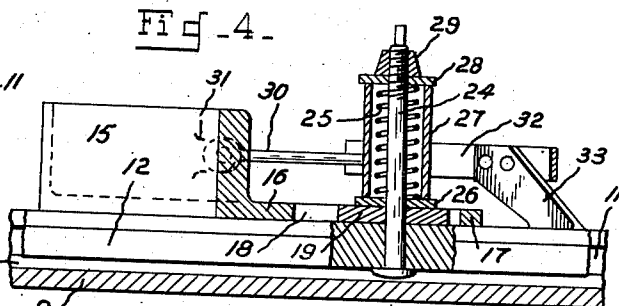


Fig. 3.

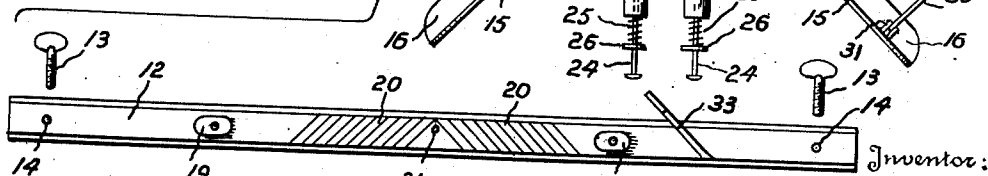
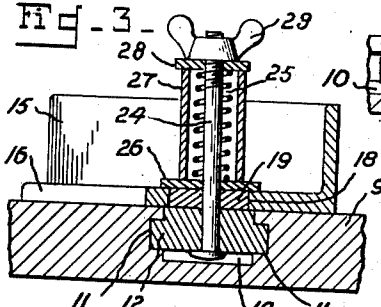


Fig. 5.

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Fig. 6

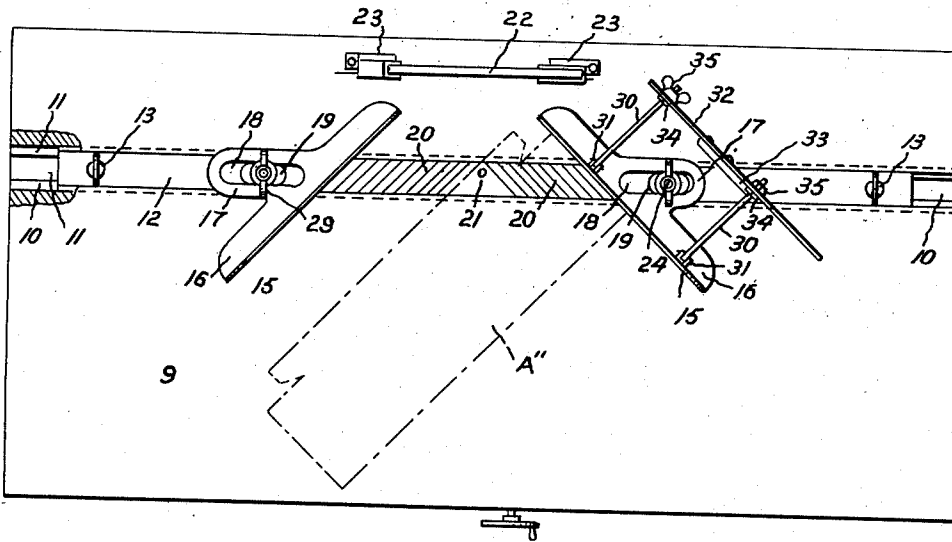


Fig. 7

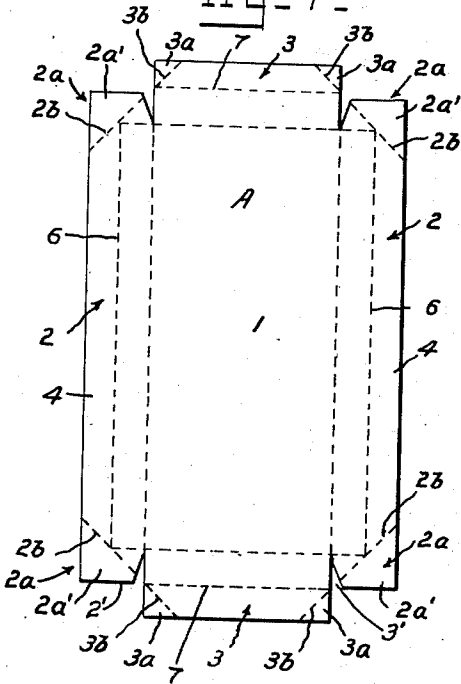
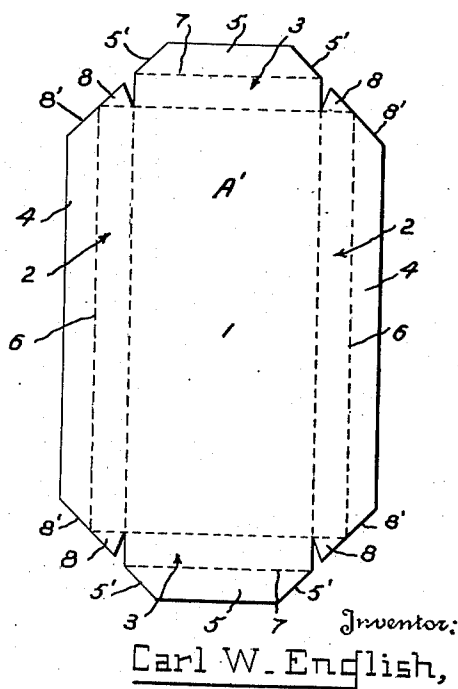


Fig. 8



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UNITED STATES PATENT OFFICE

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MEANS FOR FORMING THE CORNERS OF
PAPER BOX COVER BLANKS

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Application November 18, 1947, Serial No. 786,765

11 Claims. (Cl. 164—59)

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This invention relates to an apparatus for forming the corner portions of paper box shell covering blanks, and particularly to an apparatus for gauging and positioning partly formed or inchoate box blanks at a predetermined angular relationship to a cutter, whereby the outer corner portions of the previously formed and V-notched ends of the side and end wings of the inchoate blank lying on opposite sides of the notches may be cut off diagonally in such manner as to provide a covering blank or wrapper which when applied to a box shell will be devoid of lapped or other irregular surfaces on the interior of the box liable to cause injury to an article of delicate nature stored in the box.

The invention particularly relates to means for producing covering blanks of the type designed for application to boxes in which sheer stockings, laces and other like delicate articles are packed. A covering blank of the type generally used comprises a body portion secured to the bottom of the box shell and having side and end wings with flap portions which are folded against and secured to the outer and inner surfaces of the side and end walls of the box shell so that the completed box will have a cover or wrap giving it a good appearance. The ends of the wings and flaps of such a blank are so formed that when the flap wings are downturned and secured to the inner faces of the side and end walls of the box shell the ends of the flaps have excess portions which overlap or crumple to produce bulky or rough and irregular projections at these points liable to abrade or catch into the meshes of the stored delicate article and cause injury thereto.

One object of my invention is to provide blank gauging or positioning means for positioning and holding inchoate blanks relative to a cutter whereby previously partly-formed ends of the inchoate blanks may be cut away diagonally so as to produce completed wrapper blanks adapted to be applied so as to leave smooth surfaces at and in the regions of the inner corner portions of the box.

A further object of the invention is to provide a gauging device of the character described which may be readily applied to a worktable for coaction with a cutter and removed therefrom when its use is not required, and which embodies a pair of members adapted to be set in proper angular relationship and to be adjusted relative to each other to position blanks of different sizes for cutting actions.

A still further object of the invention is to provide means whereby the gauge members may

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be readily adjusted to proper relative position in the possible event that either one is accidentally moved out of its properly set position.

With these and other objects in view, the invention consists in an apparatus of the character set forth embodying the novel features of construction, combination and relationship of parts hereinafter described and claimed, and as shown in the accompanying drawings, in which:

Fig. 1 is a top plan view of a blank corner cutting apparatus constructed in accordance with my invention, showing in dotted lines an inchoate blank disposed in position for a corner cutting action.

Fig. 2 is a detail vertical transverse section on an enlarged scale through the worktable and gauge carrying slide bar, taken on line 2—2 of Fig. 1.

Fig. 3 is a similar section through the worktable, one of the gauges, and the gauge adjusting and holding means, taken on line 3—3 of Fig. 1.

Fig. 4 is an enlarged vertical section through the worktable and the other gauge, taken on line 4—4 of Fig. 1.

Fig. 5 is a view of the gauge bar, gauge member, and parts associated therewith, in disassembled relation.

Fig. 6 is a view similar to Fig. 1 showing in dotted lines a doubled inchoate blank as preliminarily arranged for the setting of the gauges for cutting the corners of a blank of a certain size.

Fig. 7 is a plan view of an inchoate blank, which may be a conventional wrapper blank, from which my improved blank is to be formed.

Fig. 8 is a view of my improved blank formed from the inchoate blank shown in Fig. 7.

Referring now more particularly to the drawings, A in Fig. 7 represents the inchoate blank, and A' in Fig. 8 the improved blank completed by corner cutting actions. These blanks are formed for application to a box shell of a given size and, with certain exceptions, are generally similar in construction to each other. As shown, each blank is of oblong rectangular form and comprises a body portion 1 adapted to be adhesively secured to the bottom of the box shell, and having side wings 2 and end wings 3, the wings including flap portions 4 and 5, respectively. The wings are foldable along their junction lines with the body 1 to cover the outer surfaces of the side and end walls of the box shell, and the flaps 2 and 3 are foldable upon the inner surfaces of said walls of the box shell, to which the wings and the flaps are adhesively secured.

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The side wings 2 of the blank A are of greater length than the body portion 1 and have straight parallel longitudinal side edges and straight, parallel transverse end edges, the ends of said wings forming tabs 2a which have oblique inner edges 2' spaced from the straight longitudinal end edges of the adjacent end wings 3, by a V-notch 3' which wings 3 are equal in width to that of the body 1 and have straight transverse end edges and straight side edges. In the use of a blank of this form or having wings formed in the same manner, the wings 3 and their flaps are folded against the outer and inner surfaces of the end walls of the box shell and against portions of the tabs 2a, other portions of which fold with the flaps of the side wings against the inner surfaces of the side walls of the box shell, with the result that interior lapping portions at the inner corner angles of the box are produced in the form of bulges or projections of more or less irregular shape and sufficiently stiff to cause injury to portions of a stored delicate fabric article coming in contact therewith. This objection is avoided by the provision of the improved wrapper blank A' which is formed from the blank A by diagonally cutting away the outer corners of the end portions of the wings along the dotted lines 2b and 3b to remove the parts denoted 2a' and 3a. This produces the blank A' shown in Fig. 8, in which the side wings 2 have diagonally cut away or oblique end edges 2 and triangular tongues 3' and the folds 5 of the end wings 3 have diagonally cut away or oblique end edges 5' coincident with the edges 3' and the outer edges of the tongues 2, whereby the parts of the blank A' are adapted to be applied to the box shell in a novel manner to avoid the formation of bulges or projections of the character referred to at or in the regions of the inner corners of the covered box shell.

The apparatus for accurately forming the wrapper blanks or box covers A' from the inchoate blanks A comprises a work-table 9 having a T-shaped groove or slot 10 opening through its upper face and ends and provided with side channels 11. A T-shaped supporting bar 12 is fitted in the groove 10 and has its opposite side portions slidably engaging the channels. The bar is adapted to be longitudinally adjusted in the groove and inserted and removed via either end of the groove, and set screws 13 engaging threaded openings 14 in the bar are provided to hold it fixed in adjusted position.

The bar carries a pair of gauge members 15, each in the form of a vertical gauge plate extending upward from a horizontal base plate 16 which rests upon the upper surfaces of the bar and the worktable. A holding arm 17 extends from the outer surface of the plate 16, at an angle thereto, and is formed with a longitudinal slot 18. Guide blocks 19 rest on or project upward from the bar 12 and fit within the groove 10 to guide the gages 15 in their adjusting movement and to hold them from turning out of set position with relation to each other or with relation to diagonal scales 20 set at reverse angles to an intermediate zero mark 21. The scale portion of the bar is arranged in advance of a vertically movable cutter 22 slidable in guides 23 mounted on the table, the cutter being actuable by hand or other suitable means and arranged parallel with the bar and a predetermined distance in rear thereof.

Each gage is adapted to be adjusted to and held in a fixed position on the bar by means of a bolt 24 passing upward through the bar and

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through a fastening assembly comprising the block 19, the slot 18 in the arm 17, a coiled clamping spring 25, a bottom washer 26, a sleeve 27 enclosing the upper part of the bolt 24 and spring, and a washer 28 bearing on the upper end of the spring, a nut 29 being fitted on the upper threaded end of the bolt whereby the spring may be placed under pressure and the parts tightened up to clamp the gauge member in adjusted position.

By reference to Figures 1 and 6 it will be seen that the gauges 15 extend diagonally across the bar 12 in adjusted positions on the scales, convergingly toward the cutter and at right angles to each other, and it will be understood that they may be adjusted along the scales toward and from each other to vary their distance apart to suit any size blank to be positioned for a corner cutting action, while preserving the angular relationship of the gauges to the bar and to each other. The gauges when once fixed for any certain size of blank need no further adjustment in the operations of cutting the corners of the blank, which are cut in succession by shifting the blank to bring its corners one after the other into cutting position, shifting adjustment of the gauges being necessary only when blanks of different sizes are to be cut. It may sometimes happen, however, that one of the gauges may be accidentally shifted out of position relative to its companion gauge. I, therefore, provide a means for taking care of such a contingency and whereby at least one of the gauges may be quickly adjusted with respect to the other for the purpose. To this end an adjusting device is employed, which is shown as arranged to coact with the right hand gauge. This adjusting device comprises a pair of link rods 30 connected at one end 31 to the gauge at opposite sides of the arm 17 and passing at their opposite threaded ends through apertures in a bridge piece 32 secured to a bracket 33 projecting upward from the bar 12. On the threaded ends of the rods are fitted check nuts 34 and wing nuts 35. In the event that the gauge should be accidentally shifted out of its intended adjusted position, this may be corrected by slacking the check nuts, adjusting the wing nuts to move the gauge back to proper position and then tightening the nuts. It will be evident, of course, that the gauge device as a whole is of unitary type and may be applied to and removed from any type of cutter table having a bar-receiving slot of the character shown, and it is to be understood that each gauge may be provided, if desired, with an adjusting device of the kind just above described, and that the blocks 19 may be independent of or integral with the bar 12.

Fig. 6 shows the manner of setting the gauges for cutting the corners of a blank for a box of a certain size, while Figure 1 shows the manner of positioning the blank for a corner cutting action. In Fig. 6 a blank A' is shown which is folded on a central longitudinal line so that its longitudinal edges aline and portions of each of its end edges aline. The blank is disposed with its alined free side edges in register with one (the first) gauge mark of the left hand scale of the bar 12 and with one of its ends facing the right hand gauge member, which gauge member is set in register with the gauge mark of the right hand scale with which, such end of the blank registers. The right hand gauge member is then fixed in position, and thereupon the blank is reversed to the opposite position to indicate the

position to which the left hand gauge member should be set and this gauge member is then fixed in such position. The device is then ready for use to cut the corners of blanks A of the desired size to form the blanks A'.

In cutting the corners of a stack of blanks A, the stacked spread open blanks are laid on the table 9 with one of the end edges of the blanks abutting against the right hand gauge member 15 and one of the side edges of the blanks abutting against the left hand gauge member. This will bring one of the corners of the stack beneath the cutter 22 at a proper angle to form the cut along the lines 2b-3b. The stack may then be turned over or reversed to bring the opposite corner at the same end beneath the cutter to similarly cut away the portions 2a-3a at that corner. The stack is then reversed end for end and the remaining corners cut in the manner above described, with the result that blanks A will be produced having all four corners cut to produce the completed cover blanks. As a stack of a large number of blanks may be cut at one time the operation may be quickly and economically carried out. The advantages of employing the blanks A' are evident from the foregoing description.

While the construction of apparatus shown herein is preferred, it is to be understood that the invention is not limited thereto and that changes in the form, construction and arrangement of parts, falling within the scope of the appended claims, may be made without departing from or sacrificing any of the advantages of the invention.

Having thus described my invention, I claim:

1. An apparatus for diagonally cutting away the outer corners of the end and side flaps of a previously formed box shell covering blanks including in combination a worktable, a vertically movable straight cutter blade extending transversely of and arranged in operative relation to the surface of the table, a supporting bar mounted on the table in advance of and adjacent to and parallel with the cutter, a pair of opposed gauges mounted on the bar and extending diagonally across the same at right angles to each other and convergently in the direction toward the cutter, each gauge having an arm provided with a slot extending longitudinally of the bar, fastening means for securing each gauge to the bar comprising a bolt extending upwardly from the bar and through the slot in the arm and a nut engaging the bolt to fasten the gauge in position, the gauge when free for movement being slidably and pivotally mounted by its slotted arm on the bolt, and an adjusting device carried by the bar and connected with a gauge on opposite sides of its fastening bolt for returning it to a properly adjusted position in the event of its pivotal or sliding displacement from adjusted position on its fastening bolt.

2. A box cover corner cutter for diagonally cutting away the outer corners of the end and side flaps of a previously formed box cover blank in which adjacent ends of the flaps at either end of each side of the blank are separated by a V-notch, said corner cutter comprising a worktable having a straight transversely extending track, a bar shiftable longitudinally along the track to set positions and having its upper surface provided with sets of gage marks extending diagonally across the same with the marks of each set at right angles to the marks of the other set, a pair of gauge members mounted on the bar and ex-

tending across the bar at right angles to each other and diagonally of the bar and parallel with companion gauge marks and so as to converge toward the rear of the table, means for adjusting the gauge members on the bar and pivotally and slidably securing the same thereto and clamping the members against turning out of their predetermined angular relation to the bar and to each other, and a straight cutting blade back of the space between the gauge members so as to extend lengthwise transversely of the table and parallel with the bar and in position for cutting off the outer corner portions of the end and side flaps at one side of a cover blank set in place upon the table with an end edge and one side edge thereof in contact with the respective gauge members.

3. An apparatus of the character described including in combination a worktable having a straight transverse receiving groove, a vertically movable straight cutter blade arranged lengthwise transversely of the table and parallel with the groove, a supporting bar fitted in the groove, adjacent to and parallel with the cutter blade, a pair of opposed gauge members extending across the bar at right angles to each other and diagonally of the bar and convergently in the direction toward the cutter, each gauge member having a slotted arm arranged above the bar and in a plane parallel therewith, and fastening means including a clamping spring and a bolt passing therethrough and through the slots in the arms of the gauge members and securing the same to the bar to permit adjustment of said members toward or from each other.

4. An apparatus of the character described including in combination a worktable, a vertically movable straight cutter blade extending lengthwise transversely of the table, a transverse supporting bar mounted on the table adjacent to and parallel with the cutter, a pair of opposed gauge members extending across the bar at right angles to each other and diagonally of the bar and convergently in the direction toward the cutter, each gauge member having a slotted arm arranged above the bar and in a plane parallel therewith, and fastening means including a clamping spring and a bolt passing therethrough and through the slots in the arms of the gauge members and securing the same to the bar to permit pivotal and sliding adjustment of said members toward or from each other.

5. An apparatus for diagonally cutting away the outer corners of the adjacent end and side flaps of a previously formed box shell covering blanks in which such ends of the flaps of the blank are separated by V-notches, said apparatus comprising a worktable, a vertically movable straight cutter blade movable toward and from the table and extending lengthwise transversely of the table, a pair of opposed gauges, arranged in advance of the cutter blade at right angles to each other and diagonally with relation to the blade and extending convergently toward the same, said gauges having integral arms extending at an angle thereto and respectively toward the opposite sides of the table on lines coincident with each other transversely of the table and each parallel with the cutter blade, each of said arms being provided with a longitudinal slot arranged in an accurate diagonal position of its gauge parallel with the cutter blade, a bolt for securing each gauge in adjusted position, said bolt being supported by the table and extending upwardly through the slot in the gauge arm so as to adapt the gauge when free for adjustment to be slidably

adjusted transversely of the table and pivotally adjusted to change its diagonal angle, and a nut engaging each bolt to fasten its gauge in adjusted position.

6. An apparatus for diagonally cutting away the outer corners of the adjacent end and side flaps of a previously formed box shell covering blank in which such ends of the flaps of the blank are separated by V-notches, said apparatus comprising a worktable, a straight cutter blade movable vertically toward and from the table and extending lengthwise transversely of the table, a pair of opposed gauges arranged in front of the cutter blade at right angles to each other and diagonally with relation to the cutter blade and extending convergently toward the blade, said gauges having fixed arms extending at an angle thereto and respectively toward the opposite sides of the table on lines coincident with each other transversely of the table and each parallel with the cutter blade, each of said gauge arms being provided with a longitudinal slot arranged parallel with the cutter blade when the gauge is disposed in an accurate diagonal position, a bolt for securing each gauge in adjusted position, said bolt being supported by the table and extending upwardly through the slot in the gauge arm so as to adapt the gauge when free for adjustment to be slidably adjusted transversely of the table and pivotally adjusted to set it at a proper diagonal angle, and a nut engaging each bolt to fasten its gauge in adjusted position.

7. An apparatus for diagonally cutting away the outer corners of the adjacent end and side flaps of a previously formed box shell covering blank in which such ends of the flaps of the blank are separated by V-notches, said apparatus comprising a worktable, a straight cutter blade movable vertically toward and from the table and extending lengthwise transversely of the table, a pair of opposed gauges arranged in front of the cutter blade at right angles to each other and diagonally with relation to the cutter blade and extending convergently toward the blade, said gauges having fixed arms extending at an angle thereto and respectively toward the opposite sides of the table on lines coincident with each other transversely of the table and each parallel with the cutter blade, each of said gauge arms being provided with a longitudinal slot arranged parallel with the cutter blade when the gauge is disposed in an accurate diagonal position, a bolt for securing each gauge in adjusted position, said bolt being supported by the table and extending upwardly through the slot in the gauge arm so as to adapt the gauge when free for adjustment to be slidably adjusted transversely of the table and pivotally adjusted to set it at a proper diagonal angle, a nut engaging each bolt to fasten its gauge in adjusted position, and an adjusting device connected with a gauge for readjusting it relative to the bolt to a correct diagonal position in the event of its movement out of such position on the bolt.

8. An apparatus for diagonally cutting away the outer corners of the adjacent end and side flaps of a previously formed box shell covering blank in which such ends of the flaps of the blank are separated by V-notches, said apparatus comprising a worktable, a straight cutter blade movable vertically toward and from the table and extending lengthwise transversely of the table, a supporting bar mounted on the table in front of and adjacent to and parallel with the cutter blade, a pair of opposed gauges mounted on the

bar in front of the cutter blade at right angles to each other and diagonally with relation to the cutter blade and extending convergently toward the blade, said gauges having fixed arms resting on the bar and extending at an angle to the gauges and respectively toward the opposite side of the table on lines coincident with each other transversely of the table and each parallel with the cutter blade, each of said arms being provided with a longitudinal slot arranged parallel with the cutter blade when the gauge is disposed in an accurate diagonal position of adjustment relative to the cutter blade, a bolt for securing each gauge in adjusted position, said bolt being supported by the bar and extending upwardly through the slot in the gauge arm so as to adapt the gauge when free for adjustment to be slidably adjusted transversely of the table and pivotally adjusted to set it at a proper diagonal angle, and a nut engaging each bolt to clamp it to the bar and fasten its gauge in adjusted position.

9. An apparatus for diagonally cutting away the outer corners of the adjacent end and side flaps of a previously formed box shell covering blank in which such ends of the flaps of the blank are separated by V-notches, said apparatus comprising a worktable, a straight cutter blade movable vertically toward and from the table and extending lengthwise transversely of the table, a supporting bar mounted on the table in front of and adjacent to and parallel with the cutter blade, a pair of opposed gauges mounted on the bar in front of the cutter blade at right angles to each other and diagonally with relation to the cutter blade and extending convergently toward the blade, said gauges having fixed arms resting on the bar and extending at an angle to the gauges and respectively toward the opposite side of the table on lines coincident with each other transversely of the table and each parallel with the cutter blade, each of said arms being provided with a longitudinal slot arranged parallel with the cutter blade when the gauge is disposed in an accurate diagonal position of adjustment relative to the cutter blade, a bolt for securing each gauge in adjusted position, said bolt being supported by the bar and extending upwardly through the slot in the gauge arm so as to adapt the gauge when free for adjustment to be slidably adjusted transversely of the table and pivotally adjusted to set it at a proper diagonal angle, a nut engaging each bolt to clamp it to the bar and fasten its gauge in adjusted position, and an adjusting device mounted on the bar and connected with a gauge for readjusting it relative to the bolt to a correct diagonal position in the event of its movement out of such position on the bolt.

10. An apparatus for diagonally cutting away the outer corners of the adjacent end and side flaps of a previously formed box shell covering blank in which such ends of the flaps of the blank are separated by V-notches, said apparatus comprising a worktable, a straight cutter blade movable vertically toward and from the table and extending lengthwise transversely of the table, a supporting bar mounted on the table in front of and adjacent to and parallel with the cutter blade, a pair of opposed gauges mounted on the bar in front of the cutter blade at right angles to each other and diagonally with relation to the cutter blade and extending convergently toward the blade, said gauges having fixed arms resting on the bar and extending at an angle to the gauges

and respectively toward the opposite side of the table on lines coincident with each other transversely of the table and each parallel with the cutter blade, each of said arms being provided with a longitudinal slot arranged parallel with the cutter blade when the gauge is disposed in an accurate diagonal position of adjustment relative to the cutter blade, a bolt for securing each gauge in adjusted position, said bolt being supported by the bar and extending upwardly through the slot in the gauge arm so as to adapt the gauge when free for adjustment to be slidably adjusted transversely of the table and pivotally adjusted to set it at a proper diagonal angle, a nut engaging each bolt to fasten its gauge in adjusted position, and a device for readjusting a gauge in the event that it moves out of correct position on its bolt, said device comprising a bracket supported by the table, a cross piece carried by the bracket, rods pivoted at one end to the gauge forward and rearward of its slotted arm and slidably engaged with the cross piece at their opposite ends, and adjusting and fastening members connected to the latter named ends of the rods.

11. An apparatus for diagonally cutting away the outer corners of the adjacent end and side flaps of a previously formed box shell covering blank in which such ends of the flaps of the blank are separated by V-notches, said apparatus comprising a worktable, a straight cutter blade movable vertically toward and from the table and extending lengthwise transversely of the table, a supporting bar mounted on the table in front of and adjacent to and parallel with the cutter blade, a pair of opposed gauges mounted on the bar in front of the cutter blade at right angles to each other and diagonally with relation to the cutter blade and extending convergently toward the blade, said gauges having fixed

arms resting on the bar and extending at an angle to the gauges and respectively toward the opposite side of the table on lines coincident with each other transversely of the table and each parallel with the cutter blade, each of said arms being provided with a longitudinal slot arranged parallel with the cutter blade when the gauge is disposed in an accurate diagonal position of adjustment relative to the cutter blade, a bolt for securing each gauge in adjusted position, said bolt being supported by the bar and extending upwardly through the slot in the gauge arm so as to adapt the gauge when free for adjustment to be slidably adjusted transversely for the table and pivotally adjusted to set it at a proper diagonal angle, a nut engaging each bolt to fasten its gauge in adjusted position, and a device for adjusting a gauge in the event that it moves out of correct position on its bolt, said device comprising a bracket supported by the bar, a cross piece carried by the bracket, rods pivoted at one end to the gauge forward and rearward of its slotted arm and slidably engaged with the cross piece at their opposite ends, and adjusting and fastening members connected to the latter named ends of the rods.

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