Nov. 21, 1939. M. H. SIDEBOTHAM 2,180,748

MANUFACTURE OF LOCKED CORNER BOXES

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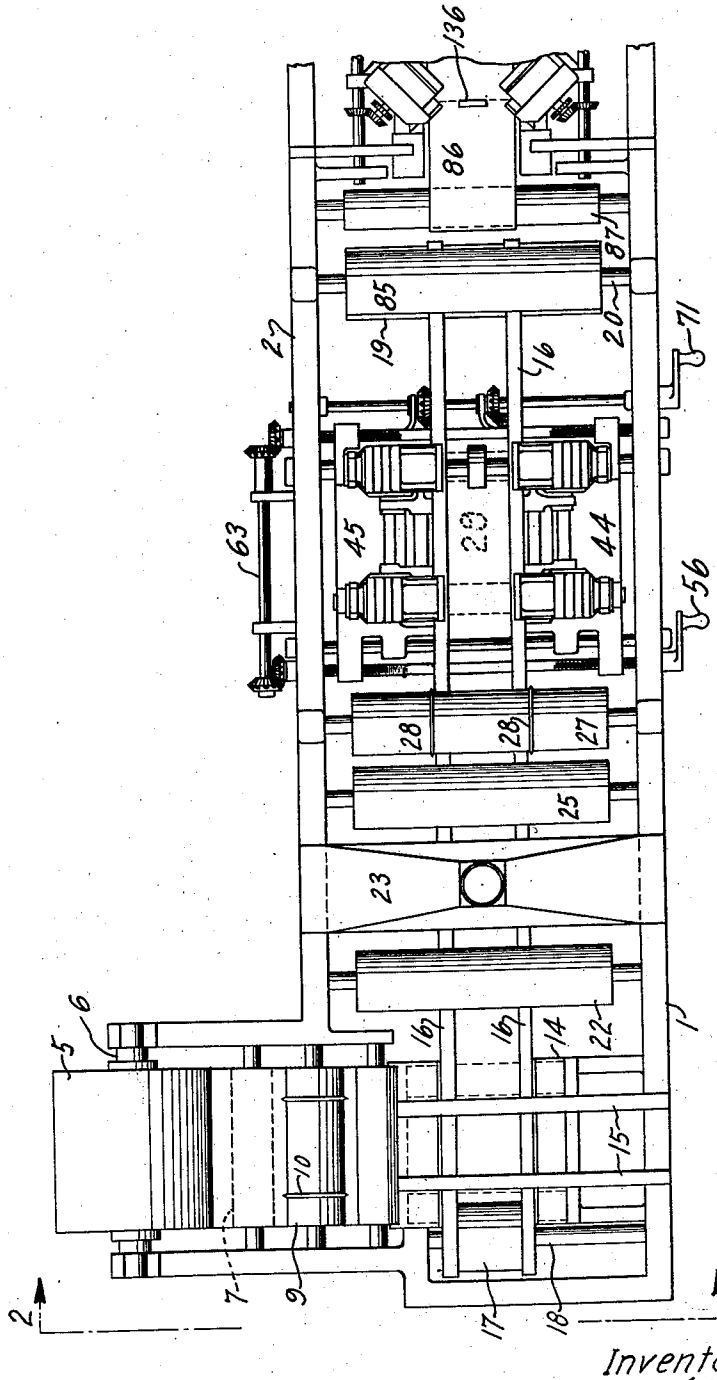


Fig. 1

Inventor
Melvin H. Sidebotham

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MANUFACTURE OF LOCKED CORNER BOXES

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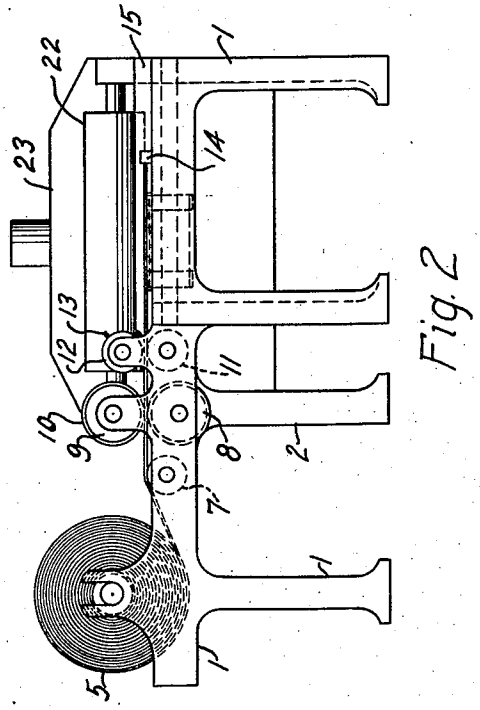


Fig. 2

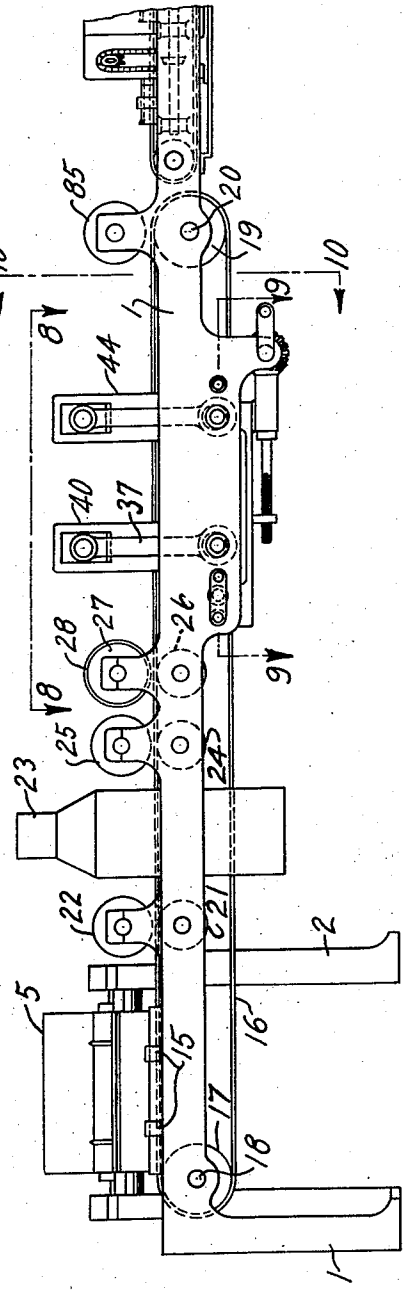


Fig. 3

Inventor
Melvin H. Sidebotham

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MANUFACTURE OF LOCKED CORNER BOXES

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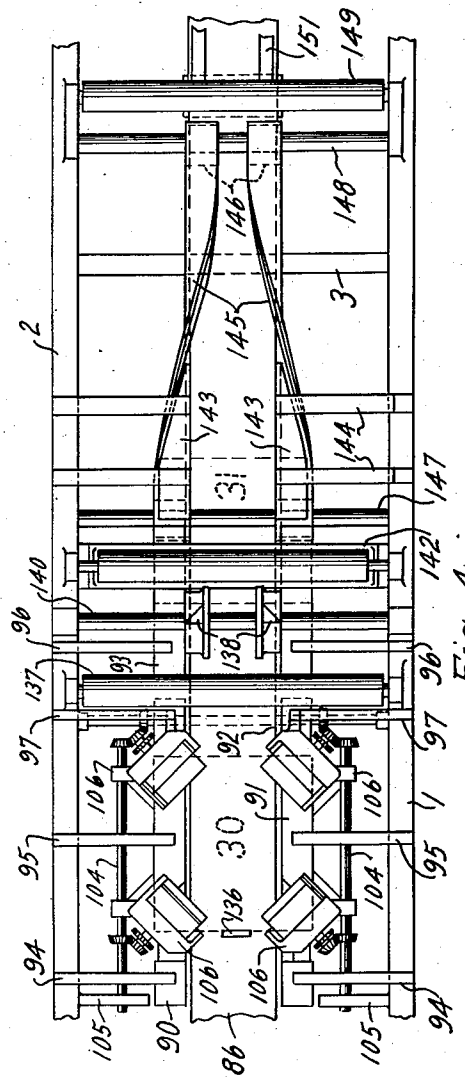


Fig. 4

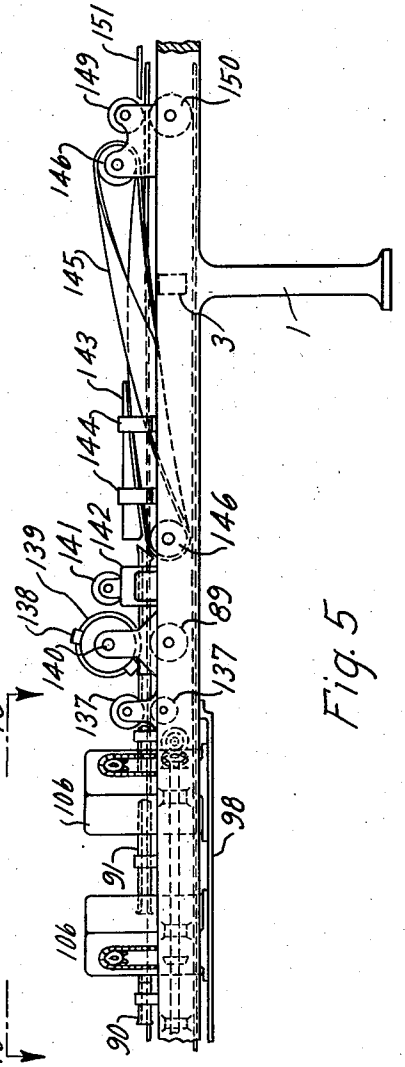


Fig. 5

Inventor

Melvin H. Sidebotham

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MANUFACTURE OF LOCKED CORNER BOXES

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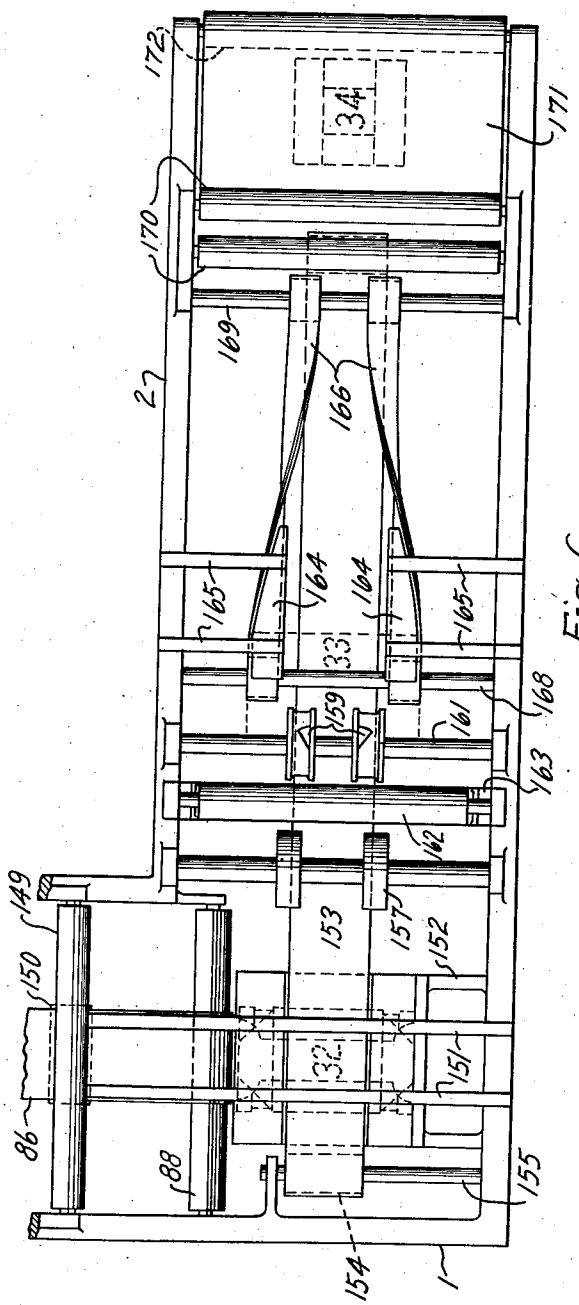


Fig. 6

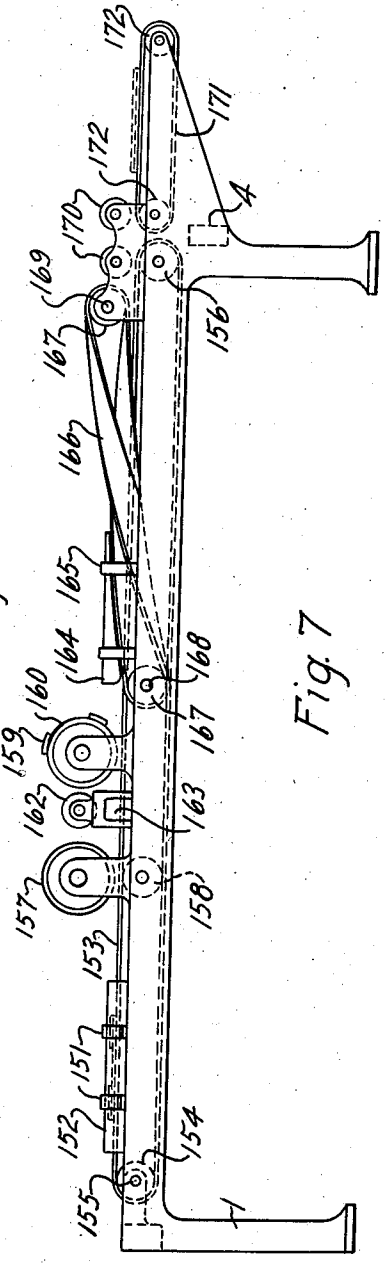


Fig. 7

Inventor

Melvin H. Sidebotham

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MANUFACTURE OF LOCKED CORNER BOXES

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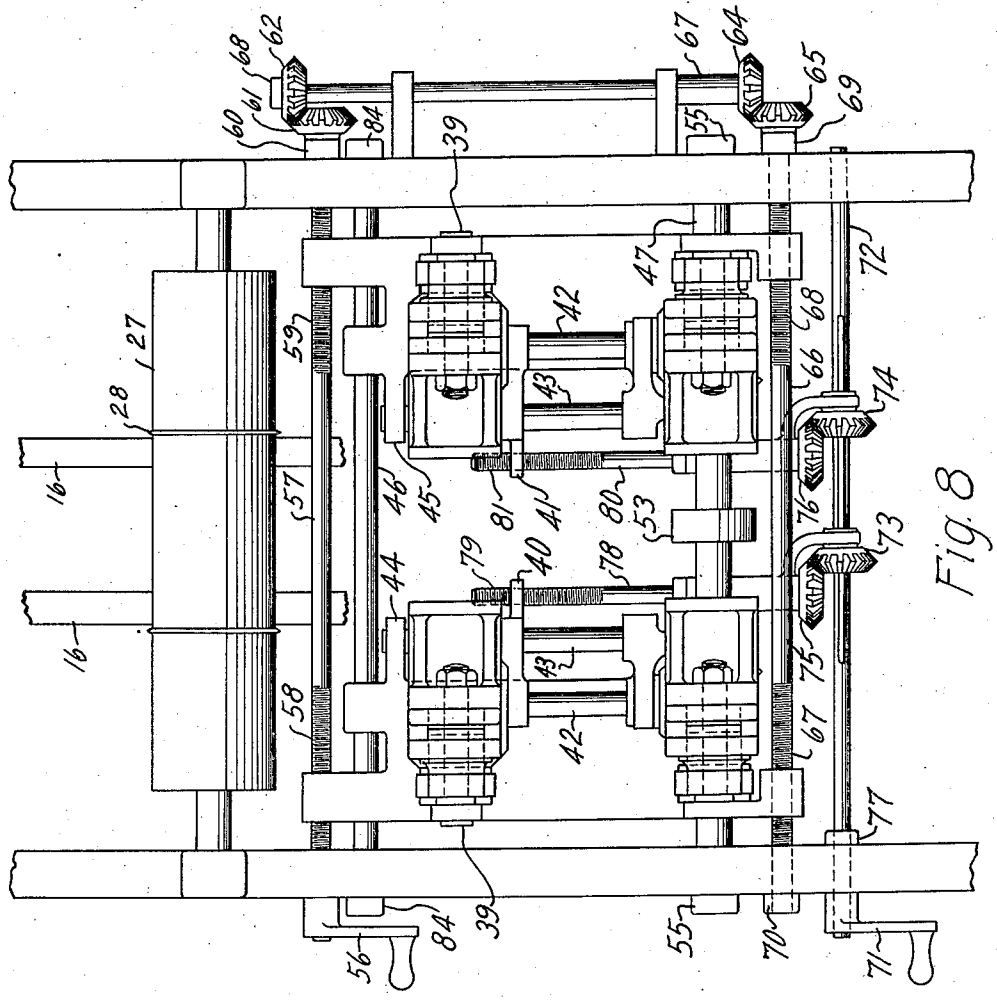


Fig. 8

Inventor

Melvin H. Sidebotham

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MANUFACTURE OF LOCKED CORNER BOXES

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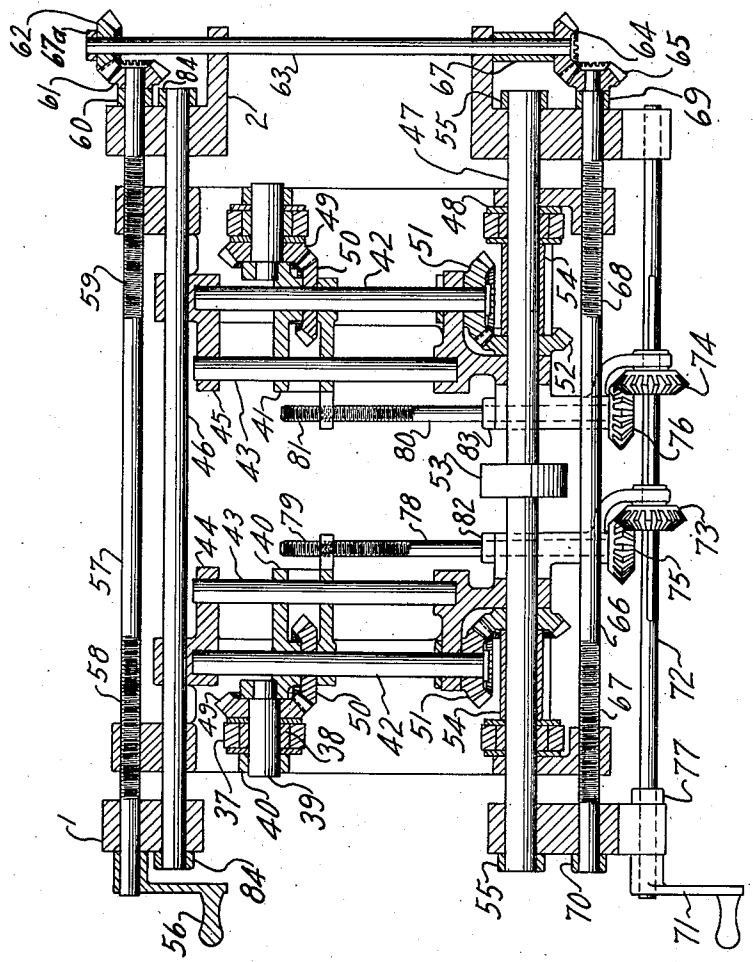


Fig. 9

Inventor

Melvin H. Sidebotham

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MANUFACTURE OF LOCKED CORNER BOXES

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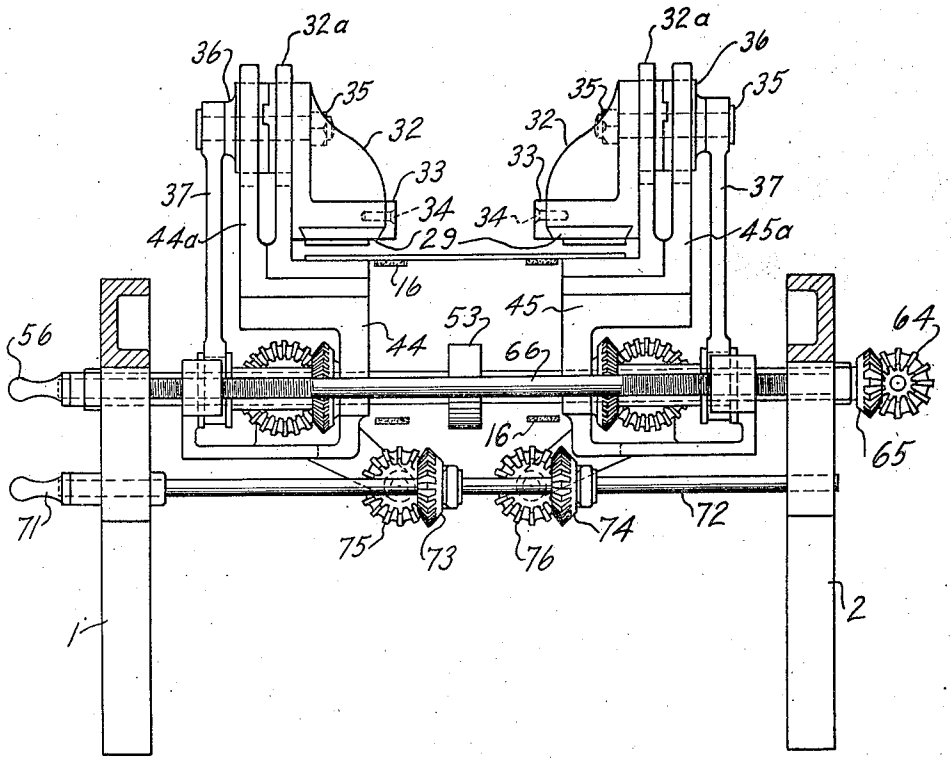


Fig. 10

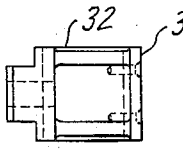


Fig. 11

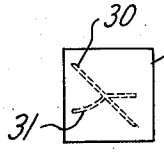


Fig. 14



Fig. 15

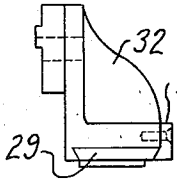


Fig. 12

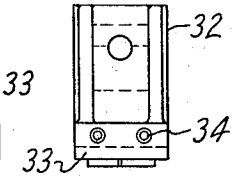


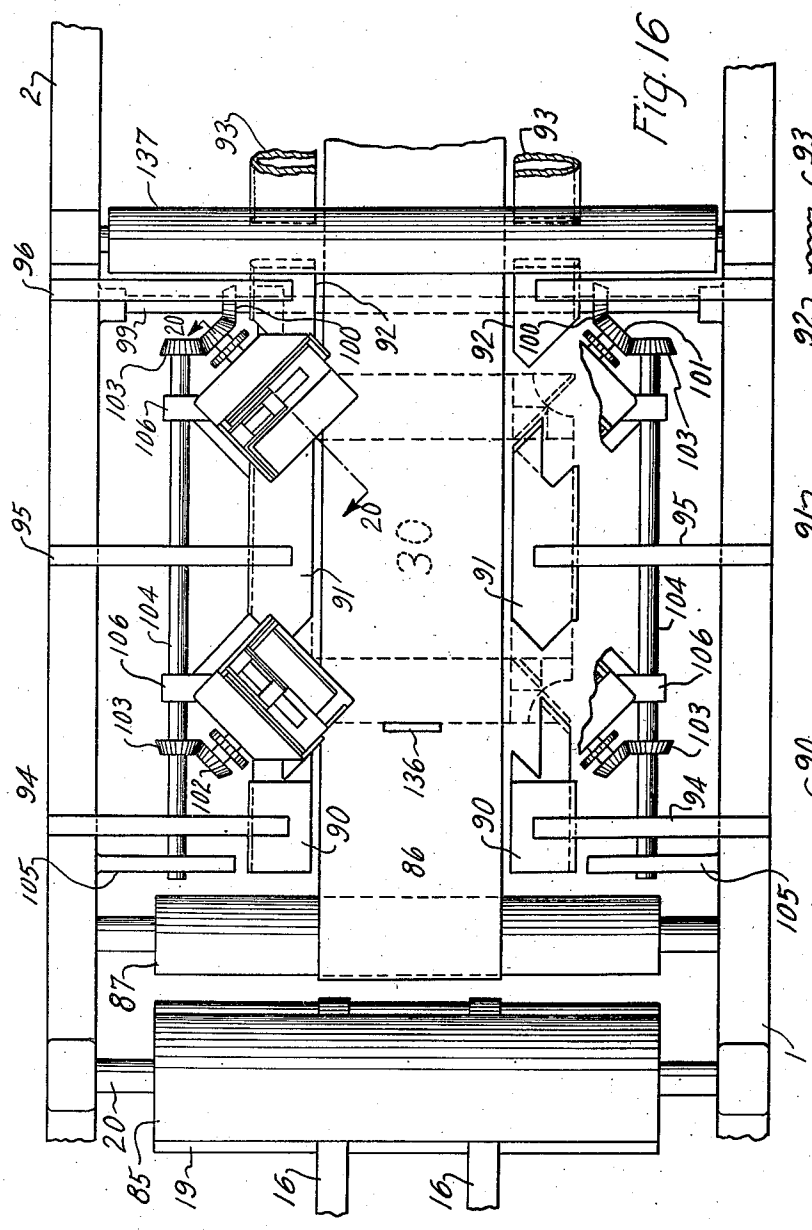
Fig. 13

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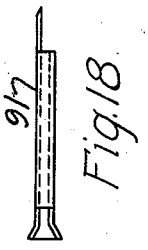
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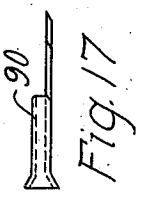
MANUFACTURE OF LOCKED CORNER BOXES

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Inventor
Melvin H. Sidebotham.

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MANUFACTURE OF LOCKED CORNER BOXES

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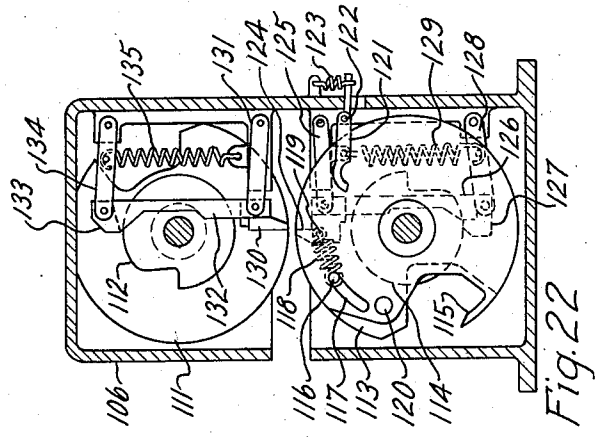


Fig. 22

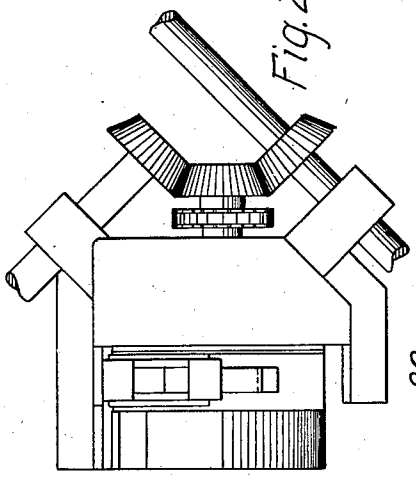


Fig. 21

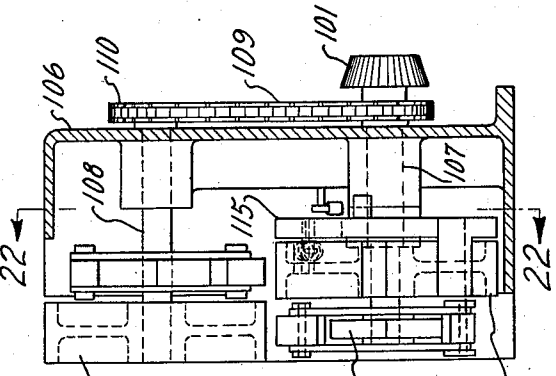


Fig. 20

Inventor
Melvin H. Sidebotham

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MANUFACTURE OF LOCKED CORNER BOXES

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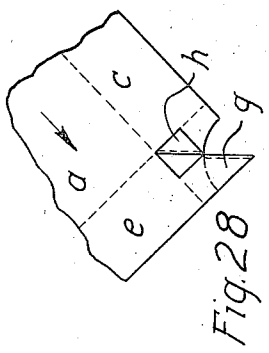


Fig. 28

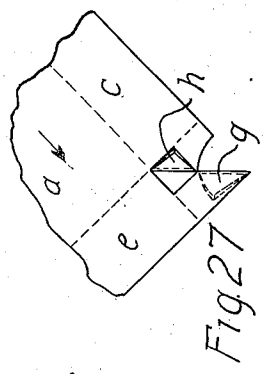


Fig. 27

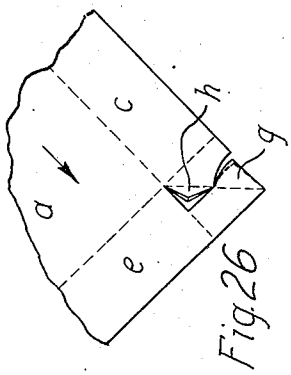


Fig. 26

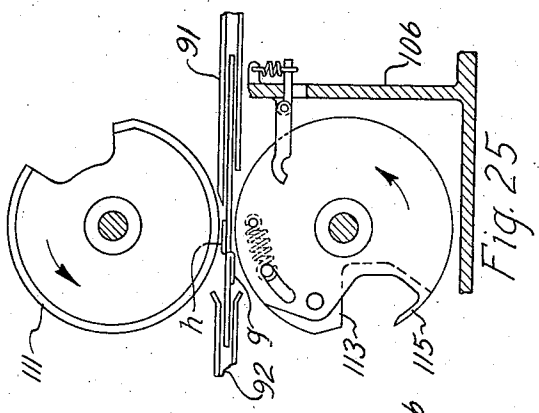


Fig. 25

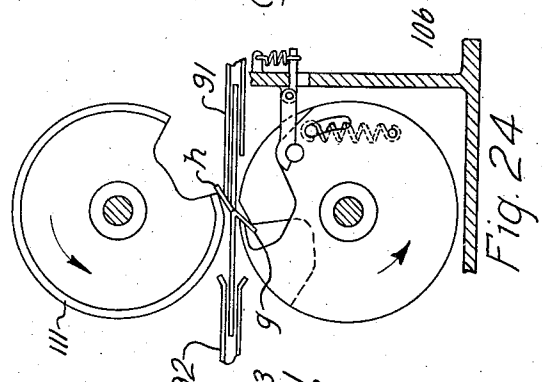


Fig. 24

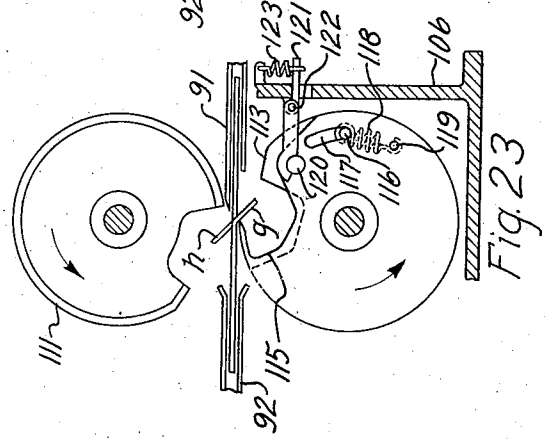


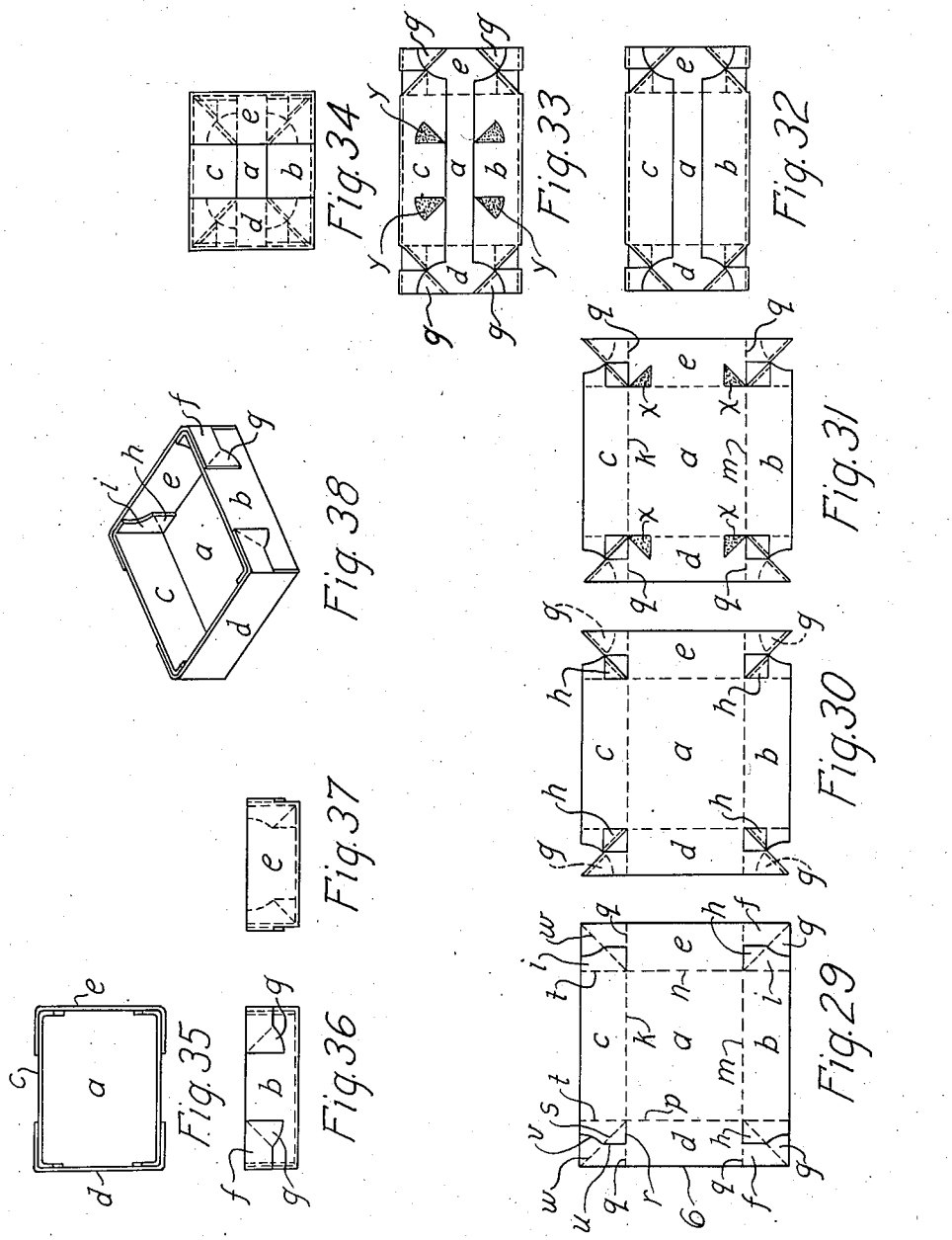
Fig. 23

Inventor
Melvin H. Sidebotham

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MANUFACTURE OF LOCKED CORNER BOXES

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Inventor
Melvin H. Sidebotham

Patented Nov. 21, 1939 2,180,748

UNITED STATES PATENT OFFICE

2,180,748

MANUFACTURE OF LOCKED CORNER BOXES

Melvin H. Sidebotham, West Newton, Mass.

Application August 13, 1937, Serial No. 158,978

10 Claims. (Cl. 93—49)

The present application discloses an improvement on my invention described in my application filed June 3, 1936, Serial No. 83,263, which became Letters Patent No. 2,112,121 March 22, 1938, in which is explained a method and machine for making boxes from cut and creased blanks.

My invention relates to the manufacture of boxes of the class commonly known as "knock-down" or wall boxes which are furnished to the trade in flat or collapsed condition for purposes of saving space in stock rooms and in stores where they are to be used, and also for saving transportation costs. Such boxes are opened or "set-up" as they are needed for use, and when set up have upright walls.

The present invention includes a novel method of producing "knock-down" boxes by a sequence of operations which makes it possible to produce printed boxes at high speed from a sheet or web of paper or from a roll of paper board.

One of the objects of my invention is to effect rapid production of knock-down wall boxes by a sequence of operations, comprising the feeding of a web of paper, creasing and cutting the web to produce a succession of blanks, printing the blanks, progressively advancing the blanks to folding and adhesive applying devices and discharging the box in knock-down condition ready to be set up for use.

Another object of my invention is to provide blank creasing and cutting mechanisms which are adaptable to quick change and adjustment to make boxes of different sizes.

Box blanks which are cut to provide cut-out portions and flaps are very difficult to feed and handle from a stack or pile by automatic machinery. This difficulty is due in part to the irregular shape of the blanks, the openings and flaps providing means for catching onto other blanks in passing from the stack. The present invention eliminates this trouble by uniting the blank making and blank fabricating operations to produce the box herein described.

Other more specific objects and advantages of the invention will be apparent to persons skilled in the art as the same becomes better understood by reference to the following description, taken in connection with the accompanying drawings, in which I have illustrated one practical embodiment of the invention, and wherein:

Figure 1 is a plan view of the feeding, blank forming and printing section of the machine.

Figure 2 is a side elevation at 2—2 of Figure 1.

Figure 3 is a front elevation of Figure 1.

Figure 4 is a plan view of the flap folding section of the machine.

Figure 5 is a front elevation of Figure 4.

Figure 6 represents a plan view of the delivery end of the machine.

Figure 7 represents a front elevation of Figure 6.

Figure 8 represents a plan view at 8—8 of Figure 3 on a larger scale.

Figure 9 represents a partial section on line 9—9 of Figure 3 on a larger scale.

Figure 10 represents an enlarged section at 10—10 of Figure 3.

Figure 11 represents a plan view of die block assembly.

Figure 12 is a front elevation of the die block assembly shown in Figure 11.

Figure 13 is a side elevation of the die block assembly shown in Figure 12.

Figure 14 represents a plan view of one of the dies used for cutting and creasing the corner portions of the blanks.

Figure 15 is an elevation of the cutting and creasing die shown in Figure 14.

Figure 16 represents a plan view on line 16—16 of Figure 5 on a larger scale.

Figure 17 represents a side view of blank guide 90 shown in Figures 4 and 16.

Figure 18 represents a side view of blank guide 91 shown in Figures 4 and 16.

Figure 19 represents a side view of blank guide 92, and a side view of a portion of blank guide 93 shown in Figures 4 and 16.

Figure 20 represents a partial section on line 20—20 of Figure 16.

Figure 21 represents an enlarged plan view of one of the forward flap folding mechanisms.

Figure 22 represents a section on line 22—22 of Figure 20.

Figures 23, 24, and 25 are diagrammatic illustrations of the flap folding devices shown in Figure 22.

Figures 26, 27, and 28 are plan views of a corner of the blank and illustrate the effect of the flap folding devices on the blank.

Figure 29 represents a plan view of the blank after it has been cut and creased.

Figure 30 represents a plan view of the blank after it has been acted upon by folding devices which fold certain flap sections downward and then up against the under-side of the blank and fold other flap sections upward and then down against the top surface of the blank.

Figure 31 represents a plan view of the blank

after adhesive has been applied to areas of the end walls of the blank.

Figure 32 illustrates a plan view of the blank after the front and rear margins have been folded.

Figure 33 represents the blank after adhesive has been applied to areas of the front and rear walls.

Figure 34 is a plan view of the completed box in flat folded condition.

Figure 35 is a plan view of the box in set-up condition.

Figure 36 is a side elevation of the box after it has been set-up.

Figure 37 is an end view of the box in set-up condition.

Figure 38 is a perspective view of the box shown in Figures 35, 36, and 37 tilted so as to show a portion of the interior thereof.

It will aid toward an understanding of the operation of the machine and of the method of fabricating the box, to first explain the action of the machine which effects the production of the completed printed box in "knock-down" condition from a sheet, roll or web of paper board. Figure 1 shows a plan view of the feeding, blank forming and printing section of the machine. The material from which the box is made is supplied from a roll **5** (Figures 1 and 2). The paper web drawn from roll **5** is advanced through creasing rolls **8** and **9**; thence the web passes to cut-off rolls **11** and **12** where the web is cut to provide blanks of the required sized. The individual blanks then pass successively to the transfer table **14** from which the blanks are conveyed between printing rolls **21** and **22** where the printing operation is performed. From the printing rolls the blanks are carried through an ink setting oven **23** (Figures 1 and 3). The blanks then pass between creasing rolls **26** and **27**. The blanks are then conveyed to the corner creasing and corner cutting mechanisms, shown in Figure 8, which completes the blank forming operation. The individual blanks are then in the condition illustrated by Figure 29.

Figure 29 illustrates the cut and scored blank wherein scored lines are indicated by dash lines marked *k*, *m*, *n*, *p*, *q*, *s*, *t* and *w*, cut lines are shown as full lines marked *r*, *u* and *v*. The said cut lines and scored lines effect a division of the blank to form a bottom section *a*, a front wall section *b*, a rear wall section *c*, end wall sections *d* and *e*, end wall extensions *f*, end wall extension flaps *g*, front and rear wall extensions *i*, front and rear wall extension flaps *h*.

Figure 30 illustrates the condition of the blank after it has been acted upon by flap folding devices which fold flaps *h* upward and then down against the top of the front and rear wall extensions. Flap folding devices also fold flaps *g* downward and then up against the bottom of the end wall extensions. The blank is then acted upon by devices which deposit adhesive to areas marked *x* (Fig. 31). Devices then fold the blank along lines *k*, *m* and *q* with the result that folded flaps *h* will contact the adhesively treated areas *x* as shown in Figure 32. Adhesive is then applied to areas *y* of the front and rear wall sections (Fig. 33). The blank is then folded on lines *n*, *p* and *t* with the result that folded flap sections *g* will contact the adhesively treated areas *y*, thus completing the box in flat folded condition (Figure 34) ready to be set up for use.

The boxes are set-up for use by simply raising the front and rear walls *b* and *c* (Fig. 34), with the result that the front and rear wall extensions *i* will snap outward against the inside surface of the end walls and the end wall extensions *f* will unfold against the outside surface of the front and rear walls.

Referring to Figures 1, 4 and 6, these three figures, taken together, indicate a plan view of the entire machine. The right hand portion of Figure 1 duplicates parts shown at the left hand end of Figure 4 to render clear the relation of the parts of the machine shown in these two figures; and the right hand portion of Figure 4 duplicates parts shown in the upper left hand portion of Figure 6 to render it clear that these two parts of the machine operate at an angle to each other. In said Figures 1, 4 and 6 some of the positions of the blanks are indicated by dotted lines where the dotted numerals **29**, **30**, **31**, **32**, **33** and **34** appear. Those dotted numerals are employed because at those points of the machine the blanks are in substantially the condition shown by Figures 29 to 34 inclusive. In other words, each blank at position **29** (Fig. 1) is as shown in Figure 29; when it reaches position **30** it is substantially as shown by Figure 30; and so on until when it reaches position **34** (Fig. 6) it is substantially as shown by Figure 34. The timing is such that when the machine is in operation different parts of the machine are operating simultaneously on blanks which are spaced about as indicated by the dotted line indications of the blank in Figures 1, 4 and 6. In other words, while one part of the machine is performing an operation on one blank other parts of the machine are at the same time performing other operations on other blanks, all of said blanks following one another progressively through the machine and are delivered therefrom as complete boxes in collapsed condition as shown in Figure 34.

It will be readily understood, without need of illustration, that any suitable motor may be employed for operating the machine, and that suitable gearing is employed in practice to cause the various rolls and shafts to rotate at uniform peripheral speed to feed the web and cut the blanks therefrom, and to effect travel of the blanks through the machine and to operate the various devices which act on the blanks in the sequence described.

The frame of the machine consists of side frames **1** and **2** and crossbars **3**, and **4** (Figs. 1, 2, 3, 4, 5, 6 and 7), suitable bearings are provided in said sideframes for attaching the different mechanisms to the frame.

Referring to Figures 1 and 2, the material from which the boxes are made is supplied from a roll **5** mounted on shaft **6** journaled in sideframes **1** and **2**. The paper web drawn from supply roll **5** is advanced over guide roll **7** journaled in sideframes **1** and **2**. The web then passes between creasing rolls **8** and **9** journaled in sideframes **1** and **2**. Creasing knives **10**, adjustably mounted on creasing roll **9**, operate to provide crease lines on the web as it is drawn between said rolls **8** and **9**. The web is then advanced to pass between rolls **11** and **12**, journaled in sideframes **1** and **2**, where the web is severed by knife **13**, secured to roll **12**, to provide a succession of individual blanks of the required dimensions. The individual blanks then pass singly and successively to transfer table **14**. Guide bars **15** secured to sideframes **1** serve to hold the blanks in position against conveyor belts **16** driven by roll **17** mounted on shaft **18** journaled in sideframe **1**. The other ends of the conveyor belts **16** are supported by roll **19** se-

cured to shaft 20 journaled in sideframes 1 and 2.

The blanks are then advanced, by means of conveyor belts 16, to pass between printing rolls 21 and 22 journaled in sideframes 1 and 2. The printing mechanism may be of any desired type and need not be here described. From the printing operation the blanks are advanced to the ink setting oven 23 where the printing matter is quickly set or dried by the application of heat. The blanks are then carried, by conveyor belts 16, between guide rolls 24 and 25 journaled in sideframes 1 and 2. The blanks then pass between creasing rolls 26 and 27 journaled in sideframes 1 and 2. Creasing knives 28, adjustably mounted on creasing roll 27, operate to provide creased lines on the individual blanks as they pass between said creasing rolls 26 and 27.

The blanks are then advanced singly and successively to corner cutting and corner creasing devices which operate to complete the box blank to the condition illustrated by Figure 29. Referring to Figures 1, 3 and 8 through 15 inclusive, the corner cutting and corner creasing unit is composed of four assemblies, one assembly for each corner of the box blank. Each corner of the blank is cut and creased by reciprocally operated dies 29, provided with creasing edges 30 and cutting edges 31. The said dies 29 are clamped to die heads 32 by means of clamps 33 and screws 34. Secured to said die heads 32 by means of bolts 35 are guide blocks 36. Removable platens 32*a* and removable brackets 44*a* and 45*a* serve to operatively secure the die heads 32 to the corresponding yoke (44 or 45) or carriage (40 or 41). The die heads 32 are operated up and down by means of operating links 37 the upper ends of which are mounted on bolts 35 and the lower ends mounted on eccentric rolls 38. The two eccentric rolls which operate at the rear corners of the blank are secured to stub shafts 39 journaled in carriages 40 and 41 slidably mounted on shafts 42 and 43 supported by yokes 44 and 45 slidably mounted on shafts 46 and 47 secured to sideframes 1 and 2. Collars 84 are provided to retain shaft 46 in position. Said stub shafts 39 are provided with washers 48 to retain the operating links 37 in position. Stub shafts 39 are caused to rotate by means of gears 49 meshing with gears 50 slidably but not rotatably mounted on shafts 42. Secured to said shafts 42 are gears 51 which mesh with gears 52 slidably but not rotatably mounted on shaft 47. Said shaft 47 is caused to rotate by means of pulley 53 secured thereto, power being supplied to said pulley by any desired means not necessary to describe. Spacer sleeves 54 and washers 48 and collars 55 are provided on shaft 47 to retain the gears 52 and operating links 37 in proper relation to each other.

A study of Figure 9 will show that the corner cutting and creasing heads are adjustable to operate on blanks of different size. The yokes 44 and 45 are designed to be moved toward each other or away from each other as required to suit the size of blank to be operated on. Carriages 40 and 41 which move with yokes 44 and 45 are adjustable for longitudinal movement as required.

The adjustment of yokes 44 and 45, which control the lateral positions of the corner creasing and cutting devices, is regulated by crank 56 secured to shaft 57. Right hand threads 58 are provided on one end of said shaft 57 and left hand threads 59 are provided on the opposite end of said shaft. It will be apparent that with corresponding female threads provided in the portions of the yokes 44 and 45, adjacent to said shaft 57, proper transverse adjustment may be made. A spacer 60 is provided on shaft 57 to retain said shaft in proper position. Secured to shaft 57 is a gear 61 which meshes with gear 62 secured to shaft 63 supported by sideframe 2. Secured to the opposite end of said shaft 63 is a gear 64 which meshes with gear 65 secured to shaft 66. Spacer 67 and collar 67*a* are provided on shaft 63 to maintain gears 62 and 64 in position. Said shaft 66 is provided at one end with right hand threads 67 and at the other end with left hand threads 68. Corresponding female threads are provided in the adjacent portions of yokes 44 and 45. A spacer 69 and a collar 70 are provided on said shaft 66 to retain the shaft in position.

The adjustment of carriages 40 and 41, which control the longitudinal positions of the rear corner creasing and cutting devices, is regulated by crank 71 secured to shaft 72. Slidably but not rotatably mounted on said shaft 72 are gears 73 and 74 which mesh with corresponding gears 75 and 76. A collar 77 is provided on shaft 72 to retain said shaft in position. Said gear 75 is secured to one end of shaft 78 which is rotatably mounted in yoke 44. Said shaft 78 is provided at its outer end with a screw thread 79. It is apparent that with a corresponding female thread in the adjacent portion of carriage 40 the shaft 78 in rotating will cause the carriage to move along the axis of said shaft according to the direction of rotation of shaft 78. Gear 76 is secured to one end of shaft 80 which is rotatably mounted in yoke 45. Said shaft 80 is provided at its outer end with a screw thread 81. With a corresponding female thread in the adjacent portion of carriage 41 the shaft 80 in rotating will cause the said carriage 41 to move along the axis of said shaft according to the direction of rotation of shaft 80. Collars 82 and 83 are provided to retain shafts 78 and 80 respectively in position.

Thus the operation of crank 56 controls the transverse positioning of the corner creasing and cutting dies, and crank 71 operates to control the longitudinal positioning of said dies.

The completed blanks then pass under guide roll 85 journaled in sideframes 1 and 2 to a conveyor belt 86 carried by rolls 87, 88 and 89 journaled in sideframes 1 and 2 (Figs. 1, 4, 5 and 6). The blanks are advanced by conveyor belt 86 to guide bars 90, 91, 92 and 93 (Figs. 16, 17, 18 and 19) supported by arms 94, 95, 96 and 97. When the blank reaches the position indicated by the dotted outline of the blank and marked by dotted numeral 30 in Figures 4 and 16 the blank is operated on by devices which fold the extension flaps *g* and *h* to the condition illustrated by Figure 30. The flap folding mechanism includes four units adjustably mounted on bed plate 98 supported by sideframes 1 and 2. The said flap folding units are driven from power shaft 99 by gears 100 fixed thereon which drive gears 101 thus operating the forward folding units. Gears 102 which operate the rear folding units are driven from gears 101 of the forward folding units by means of gears 103 carried by shafts 104 supported by bearings 105 and castings 106. The operating shaft 107 on each flap folding unit (Figs. 20 and 22) is driven by gear 101 fixed thereon. Sprocket 110 fixed on said shaft 107 drives shaft 108 by means of chain 109 and sprocket 110. Fixed on said shaft 108

of each forward folding unit, is a flap folding segment 111 and a cam 112. Operating shaft 107 has fixed thereon a flap folding segment 113 and a cam 114. The flap folding guide segment 115 is supported by, but not fixed to, said shaft 107. Said guide segment 115 is driven from flap folding segment 113 by means of pin 116 in segment 113. Said pin 116 extends into slot 117 of segment 115. The relation of said segments 113 and 115 is governed by the said slot 117 and spring 118 suspended between said pin 116 and pin 119 which is fixed in guide segment 115. Pin 120 on guide segment 115 is placed to engage lever 121 pivoted on pin 122 supported by casing 106. Spring 123 serves to resist pivoting of lever 121. The lower flap bending finger 124 (Figs. 20 and 21), guided by links 125, is caused to operate up and down at predetermined intervals by connecting links 126 to which is attached cam follower 127 and links 128. Spring 129 has one end connected to links 128 and the other to casing 106. The upper flap bending finger 130, guided by links 131, is caused to operate up and down at predetermined intervals by connecting links 132 to which is attached cam follower 133 and links 134. Spring 135 has one end connected to links 134 and the other end to casing 106.

Figures 23, 24 and 25 illustrate the operation of the flap folding segments 111 and 113 and also the action of flap guide segment 115. The arrows indicate the direction of rotation.

Figures 26, 27 and 28 are plan views of a corner of the blank shown in Figures 23, 24 and 25. respectively. The arrows indicate the direction of travel of the blanks.

The four flap folding units are similar to each other except that the two units which act on the rear corners of the blank are assembled so that the folding mechanisms (Figs. 20 and 22) on shafts 107 and 108 are reversed, with the result that the mechanism on shaft 107 of Figures 20 and 22 will operate on the top of the blank to fold flap sections *h* at the rear corners of the blank, and the folding mechanism shown on shaft 108 will operate on the under side of the blank to fold flap sections *g* at the rear corners of the blank.

The blank is advanced from the flap folding devices by conveyor belt 86 which is provided with lugs 136 (Fig. 1) which at timed intervals arrive at the rear edge of the blanks to propel them forward. In the progress of the blank forward it passes between pressing rolls 137 journaled in sideframes 1 and 2. While the blank is being conveyed forward adhesive is applied thereon to predetermined areas (marked *x* in Fig. 31) by pads 138 fastened to wheels 139 fixed to shaft 140 journaled in sideframes 1 and 2. Adhesive is applied to said pads 138 by contacting adhesively coated roll 141 journaled in sideframes 1 and 2. Said roll 141 is coated with adhesive by causing it to rotate in liquid adhesive contained in reservoir 142 supported by sideframes 1 and 2. The blank is then carried forward to folding devices which fold the blank on lines *k*, *m* and *q* (Fig. 29) which results in the blank taking the form illustrated by Figure 32. Said folding devices consist of guides 143 supported by arms 144 fastened to sideframes 1 and 2; and folding belts 145 carried by pulleys 146 mounted on shafts 147 and 148 journaled in sideframes 1 and 2. The blank is then carried to pressing rolls 149 and 150, thence under guards 151 supported by sideframe 1 to transfer table 152 supported by sideframe 1. From said transfer table 152 the blank is carried forward by conveyor belt 153 propelled by roll 154 mounted on shaft 155 journaled in sideframe 1. The forward end of said conveyor belt 153 is supported by roll 156 journaled in sideframes 1 and 2. The blank then passes between rolls 157 and 158 journaled in sideframes 1 and 2, and thence to adhesive applying devices. Adhesive is applied to predetermined areas (marked *y* in Fig. 33) by pads 159 fastened to wheels 160 fixed to shaft 161 journaled in sideframes 1 and 2. Adhesive is applied to said pads 159 by contacting adhesively coated roll 162 journaled in sideframes 1 and 2. Said roll 162 is coated with adhesive by causing it to rotate in liquid adhesive contained in reservoir 163 supported by sideframes 1 and 2. The blank is then advanced to folding devices which fold the blank on lines *n*, *t* and *p* (Fig. 33) which results in the completion of the box in flat condition shown by Fig. 34. Said folding devices consist of guides 164 supported by arms 165 fastened to sideframes 1 and 2 and folding belts 166 carried by pulleys 167 mounted on shafts 168 and 169 journaled in sideframes 1 and 2. The blank is then carried under pressing rolls 170 journaled in sideframes 1 and 2, thence to the delivery belt 171 carried by rolls 172 journaled in sideframes 1 and 2.

The roll 5 which supplies the blank material is arranged so that the axis of said roll is parallel with the direction of travel of the blanks through the printing, corner cutting and creasing, and flap folding units. The reason for so arranging said roll is that the grain of paper or paper board almost invariably runs lengthwise of the material as it is drawn from the roll. It is usually desirable to have the grain of the paper board run crosswise of the box, therefore to get this result the said roll 5 is arranged as shown.

It will not depart from the spirit of my invention to feed uncut, unscored rectangular shaped blanks of the required size to the machine, for blank formation and box fabrication, instead supplying the blank material from a roll.

While the invention includes the combined instrumentalities above mentioned, I wish it to be understood that I consider the aforesaid means not only combinatively novel, but insofar as I am aware, certain of the devices going to make up such means are new in less combinations than the whole and some capable of individual use, as will more clearly appear hereinafter.

Having now described my invention, what I claim is:

1. The method of making folding paper boxes from a web, comprising, causing the web to travel, creasing the web, cutting the web to produce a box blank of predetermined size, printing the blank, heat setting the printing ink, creasing the blank at right angles to the previously applied creases, creasing and cutting the corner areas of the blank to complete a box blank provided with a bottom section, front and rear wall sections and end wall sections extending from said bottom section, extension sections projecting from each end of the said front and rear wall sections and extension sections projecting from each end of the said end wall sections each of said extension sections being intersected by a creased line radiating substantially from the apex of the corner of the bottom section to form a flap at the outer end of each extension section; folding the flaps at the ends of the front and rear wall extension sections upward and then down against

the top of said extension sections, folding the flaps at the ends of the end wall extension sections downward and then up against the under side of said extension sections, applying adhesive to predetermined areas of the end wall sections, folding the front and rear wall sections and their extension sections and the extension sections at the ends of the end wall sections upward and then down upon the bottom section and the end wall sections, applying adhesive to predetermined areas on the upward facing surface of front and rear wall sections, folding the end wall sections and the extension sections thereon and the extension sections at the ends of the front and rear wall sections upward and then down upon the ends of the front and rear wall sections.

2. The method of making collapsed paper boxes from a web by a sequence of operations consisting of causing the web to travel; cutting and creasing the web to provide complete paper box blanks having a bottom section, front and rear wall sections and end wall sections extending from said bottom sections, extension sections projecting from each end of the said front and rear wall sections and extension sections projecting from each end of the said end wall sections, each of said extension sections being intersected by a creased line radiating substantially from the apex of the corner of the bottom section to form a flap at the outer end of each extension section; folding the flaps at the ends of the front and rear wall extension sections upward and then down against the top of said extension sections, folding the flaps at the ends of the end wall extension sections downward and then up against the under side of said extension sections, applying adhesive to predetermined areas of the end wall sections, folding the front and rear wall sections and their extension sections and the extension sections at the ends of the end wall sections upward and then down upon the bottom section and the end wall sections, applying adhesive to predetermined areas on the upward facing surface of front and rear wall sections, folding the end wall sections and the extension sections thereon and the extension sections at the ends of the front and rear wall sections upward and then down upon the ends of the front and rear wall sections.

3. The method of making collapsed paper boxes from a web by a sequence of operations consisting of causing the web to travel; creasing and cutting the web to provide individual cut and creased blanks; folding some corner flaps of the blank against the upper surface of the blank and folding other corner flaps of the blank against the under surface of the blank, applying adhesive to predetermined areas of the blank, and folding marginal portions of the blank so that the folded flaps will coincide with the adhesively treated areas.

4. The method of making collapsed paper boxes from a web by a sequence of operations comprising; creasing and cutting the web to provide individual cut and creased box blanks; folding some corner flaps of the blank against the upper surface of the blank and folding other corner flaps against the under surface of the blank; folding the marginal portions and securing the folded flaps to the proximate surfaces of the wall portions of the blank, substantially as described.

5. The method of making collapsed paper boxes by a sequence of operations comprising; creasing and cutting a section of paper to provide box blanks having the required box elements; folding some corner flaps of the blank against the upper surface of the blank and folding other corner flaps against the under surface of the blank; folding the marginal portions and securing the folded flaps to the proximate surfaces of the wall portions of the blank, substantially as described.

6. The method of making collapsed paper boxes by a sequence of operations consisting of causing paper blanks to travel; creasing and cutting each blank to provide the necessary box elements; folding some corner flaps of the blank against the upper surface of the blank and folding other corner flaps of the blank against the under surface of the blank, applying adhesive to predetermined areas of the blank, and folding marginal portions of the blank so that the folded flaps will coincide with the adhesively treated areas.

7. In a machine for making folded wall boxes, means for advancing a paper web; creasing and cutting devices, including a plurality of horizontally adjustable corner creasing and cutting dies secured to a reciprocatory die head, to provide individual box blanks; means for doubling portions of the corner sections of the blank consisting of mechanism for folding some of said portions upward and other portions downward, devices for folding front and rear wall margins of the blank toward each other, and means for folding the ends of the partly formed box toward each other, substantially as described.

8. In a machine for making folded wall boxes the combination of web creasing rolls, a web severing device, blank printing means, horizontally adjustable, reciprocatory mounted, blank corner creasing and cutting mechanism, and folding devices for folding flap portions and wall portions of the blank.

9. The combination in a box making machine comprising, a plurality of horizontally adjustable, reciprocatory mounted, cutting and creasing die mechanisms adapted to operate in sequence with blank carrying means, an adhesive applying mechanism, adjustable flap folding devices, and wall folding devices, all substantially as described.

10. In a machine for making folded wall boxes by a sequence of operations comprising; means for causing a paper blank to travel; horizontally adjustable cutting and creasing dies secured to vertically operating die heads; means for doubling certain sections of the blank, and folders for folding opposite margins toward each other.

MELVIN H. SIDEBOTHAM.