

C. HOLLY.
MACHINE FOR FORMING PAPER-BLANKS.
APPLICATION FILED FEB. 25, 1911.

1,040,987.

Patented Oct. 8, 1912.

3 SHEETS—SHEET 1.

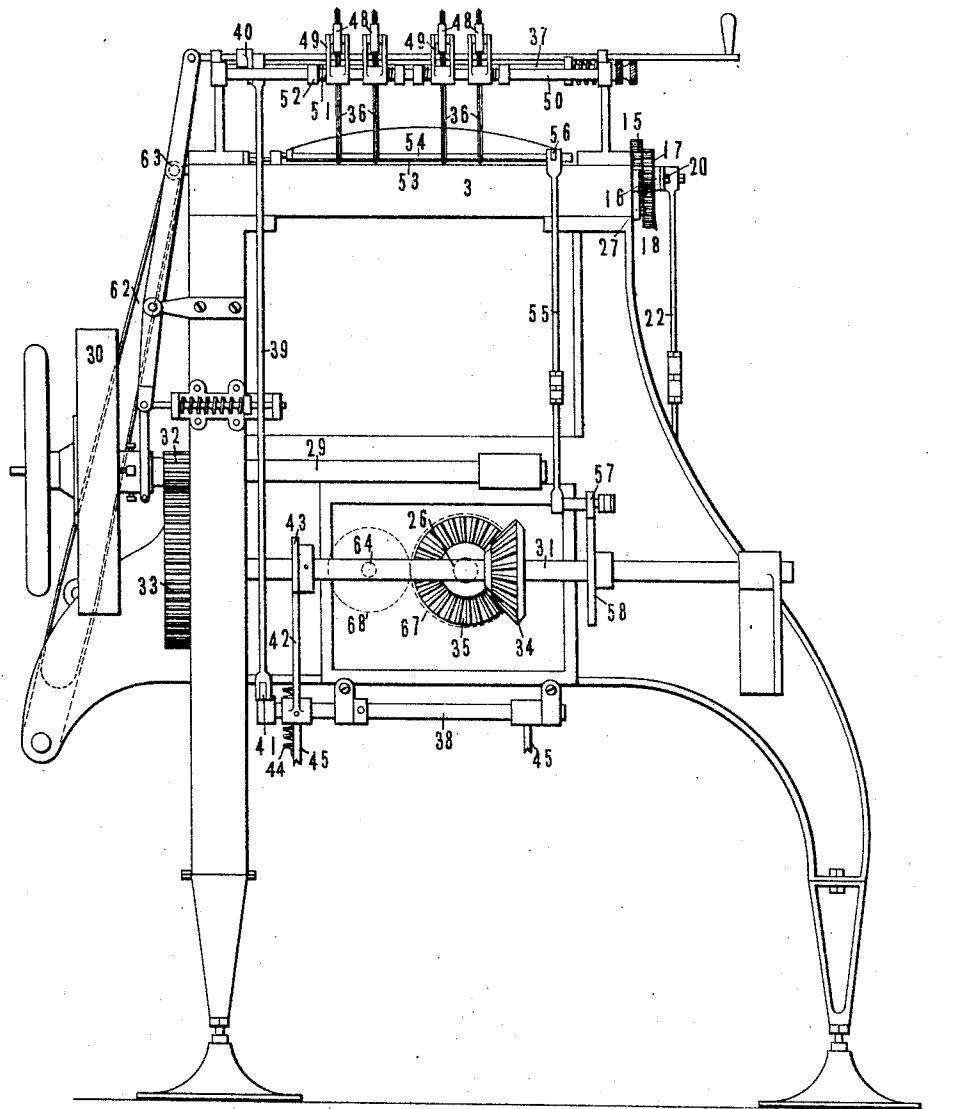


Fig. 1.

WITNESSES
Monroe
Henry Ryan

INVENTOR
C. Holly
BY
Dull, Warfield & Dull
ATTORNEYS

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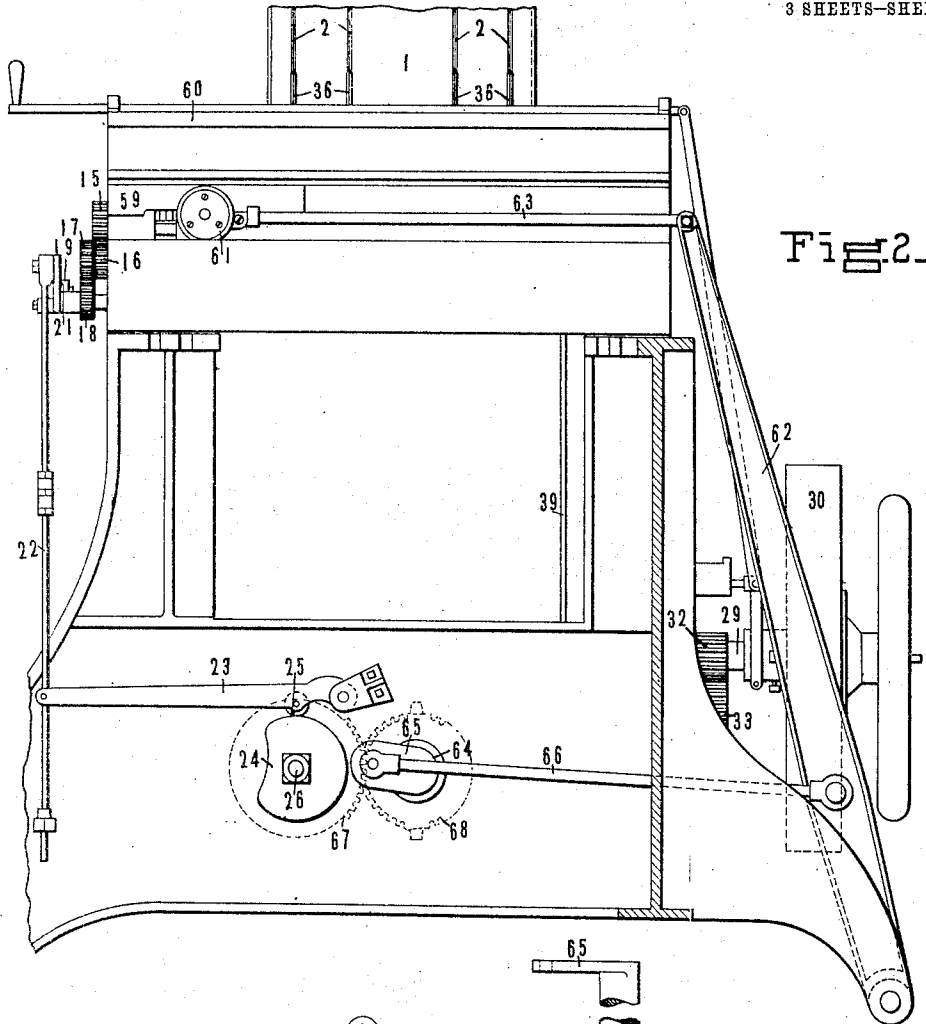


Fig. 2.

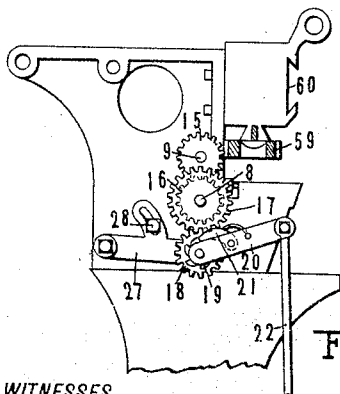


Fig. 7.

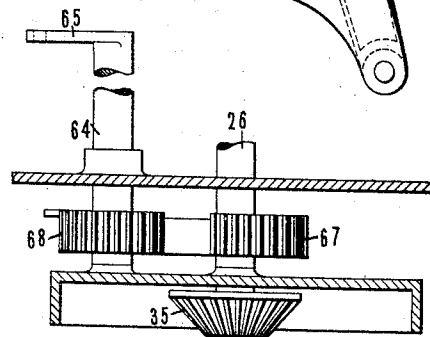


Fig. 8.

WITNESSES
Henry Ryan

INVENTOR
C. Holly
BY
Dull, Crawford & Dull
ATTORNEYS

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3 SHEETS-SHEET 3.

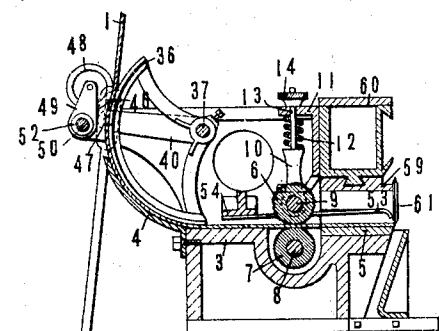


Fig. 3.

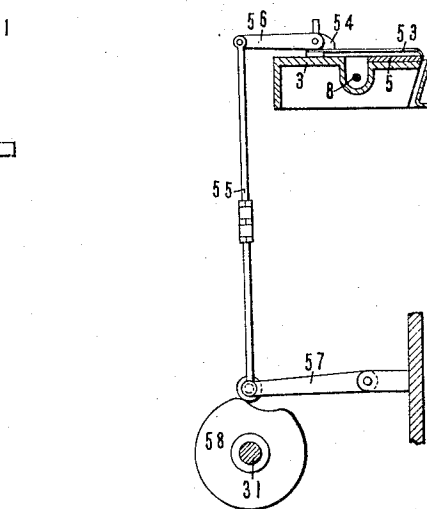
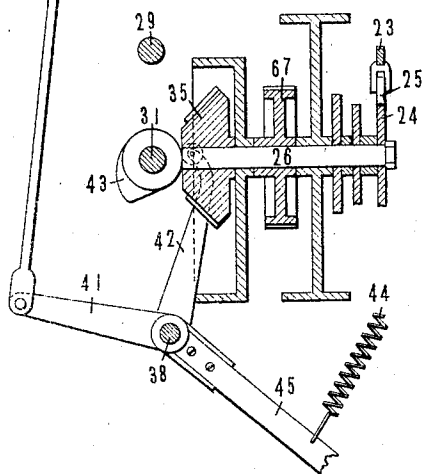


Fig. 5.

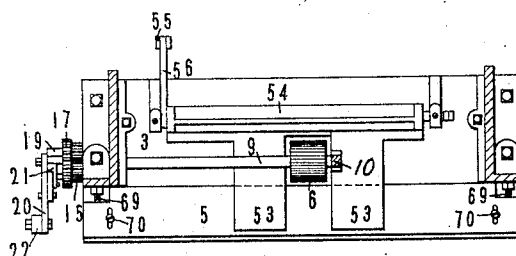


Fig. 6.

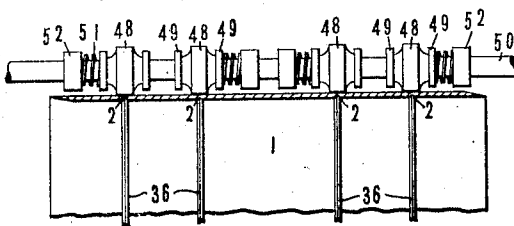


Fig. 7.

WITNESSES
Montgomery
Henry Ryan

INVENTOR
C. Holly
BY
Duell, Warfield & Duell
ATTORNEYS

UNITED STATES PATENT OFFICE.

CARLOS HOLLY, OF LOCKPORT, NEW YORK, ASSIGNOR TO THE F. N. BURT COMPANY, LIMITED, OF BUFFALO, NEW YORK, A CORPORATION OF ONTARIO, CANADA.

MACHINE FOR FORMING PAPER BLANKS.

1,040,987.

Specification of Letters Patent.

Patented Oct. 8, 1912.

Original application filed April 24, 1909, Serial No. 492,029. Divided and this application filed February 25, 1911. Serial No. 610,764.

To all whom it may concern:

Be it known that I, CARLOS HOLLY, a citizen of the United States, residing at Lockport, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Machines for Forming Paper Blanks, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for forming blanks or strips of material, and especially to mechanism for producing paper blanks such as are employed in the structure of boxes.

One object of the invention is the production of an efficient means for severing blanks from a length or web of paper.

Another object of the invention is the provision of practical means to move or feed the web of paper.

Another object of the invention is the production of efficient mechanism to produce blanks of accurate and predetermined width or depth.

Another object of the invention is the provision of efficient means whereby a web may be supported and guided while being fed, so that the blanks formed therefrom shall be smooth and free from disfigurement.

Another object of the invention is the provision of simple mechanism for feeding and guiding a scored web, and one which will not injure or destroy the scores.

Still another object of the invention is the provision of a practical device for feeding a web accurately and severing from the end thereof a blank or strip of predetermined width.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth; and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein similar reference characters refer to similar parts throughout the several views,—Figure 1 represents a rear elevation of the machine;

Fig. 2 represents a front elevation of the mechanism; Fig. 3 represents a vertical section through the mechanism; Fig. 4 is a plan view showing the guiding devices; Fig. 5 is a plan view showing the feed mechanism and the stationary knife blade; Fig. 6 is a side elevation, partly in section, of the holding device for the web; Fig. 7 is a side elevation of the feed roller driving devices; and Fig. 8 is a plan of the gearing for controlling the movable cutting disk.

In the manufacture of paper boxes, the paper blanks for forming the boxes, or parts of boxes, are bent or folded into the shape desired, the folding lines being determined by grooves or scores in the blanks, as, for instance, disclosed in applicant's application Serial No. 492,029, filed April 24, 1909. The mechanism herein disclosed is particularly designed to feed and cut from a continuous web blanks or flange strips which may be embodied with other elements into a box, as disclosed in the aforesaid application, and this application is a division of the application above identified.

When the blanks are cut from a continuous web of material and folded into an article by separate mechanism, it is important to feed the material accurately into cutting position and to cut the blanks therefrom at a definite point so as to produce a blank of predetermined shape and size, and one which will efficiently cooperate with such mechanism as may thereafter act thereupon.

The mechanism herein described is specially designed to produce paper blanks from continuous material, said blanks being adapted for further manipulation; but it is obvious that the herein described mechanism and the elements thereof are not limited to the particular application specified, but may be employed wherever useful.

In the present embodiment a continuous web of paper, cardboard or other material suitable to form the flange of a box is provided with scarfed edges and with longitudinal scores or lines which correspond with the folding lines of the blank. Said scarfs and scores are preferably provided by means of the devices disclosed in the prior application hereinbefore referred to. Preferably these scores are four in number, and extend parallel to each other along the up-

per surface of the web. The web is indicated at 1 and the scores at 2; the scores being formed preferably by removing the material of the web on one side, thus preserving the smooth surface of the opposite side, as set forth in the application above identified. Prepared as thus described, the web is delivered to the mechanism which feeds it into the position at which blanks are cut therefrom.

Referring now more particularly to the drawings, 3 represents a horizontal cross piece which is arranged transversely in the upper rear part of the machine and forms part of the stationary main frame and which serves as a feed table for the web feeding mechanism. The web 1 passes downwardly along the concave side of a curved guide plate 4 arranged at the rear end of the feed table and thence horizontally forward over this table and over a cutter blade or plate 5 which is arranged upon the front edge of said table.

6, 7 represent upper and lower feed wheels or rollers which are arranged on opposite sides of the path of the web in a position about centrally between the front and rear edges of the feed table and have their peripheries knurled or roughened so that these surfaces of the feed wheels, which engage with the under and upper sides of the horizontally moving portion of the web midway of its width, obtain a firm grip upon the same and operate to feed it reliably forward when the feed wheels or rollers are turned forwardly. The lower feed roller 7 is arranged in a cavity formed in the upper side of the feed table 3 and is mounted on a transverse shaft 8 which is journaled in stationary bearings on the adjacent part of the frame. The upper feed roller 6 is mounted on a transverse shaft 9 which is journaled loosely at one end in a bearing on the frame, so as to be capable of a slight vertical oscillation to permit the upper feed roller to adapt itself to slight variations in the thickness of the paper or other stock of which the web is made. The upper feed roller is yieldingly held downwardly in engagement with the upper side of the web so as to firmly grip the latter between the feed rollers and insure reliable feeding of the same. The preferred means for this purpose comprise a vertically movable bearing 10 in which the free end of the upper feed roller shaft is journaled, a bracket 11 secured to the adjacent part of the main frame and provided on its lower part with a guide which controls the vertical movement of the bearing 10, and a spring 12 surrounding an upwardly projecting rod 13 on this bearing and engaging at its lower end against a shoulder on this rod and at its upper end against the bracket 11 in which the upper end of the rod 13 is guided. For the pur-

pose of raising the upper roller a sufficient distance above the lower roller to permit of easily pushing the web between the same when getting the machine ready, a lifting device is provided which preferably consists of a screw nut 14 applied to the upper threaded end of the rod and adapted to bear against the upper side of the bracket 11. Upon turning the screw nut 14 in one direction the upper roller 6 is raised to clear the space between the same and the lower roller and permit the web to be freely inserted between these rollers and after the web has been thus inserted the screw nut is loosened to permit the spring 12 to press the upper roller against the web and cause the latter to be gripped between the upper and lower feed rollers.

The two feed rollers are compelled to turn in unison by means of intermeshing like gear wheels 15, 16 secured respectively to their shafts, and an intermittent rotary forward movement is imparted to these wheels or rollers so that they feed the web forwardly step by step by a mechanism which consists of a gear wheel 17 secured to the shaft of the lower feed wheel 7, a pinion 18 meshing with the gear wheel 17 and provided with a ratchet wheel 19, a ratchet lever 20 pivoted concentrically with the pinion and ratchet wheel and provided with a spring pressed pawl 21 engaging with the ratchet wheel, an upright shifting rod 22 connected at its upper end with the ratchet lever 20, a transverse rock lever 23 pivoted on the lower front part of the frame and connected with the lower part of the shifting rod 22, a rotatable cam 24 engaging with its upper sides against a roller 25 on the rock lever 23 and operating to turn the ratchet lever 20 so as to turn the web feed rollers forwardly, and a horizontal longitudinal shaft 26 journaled in the lower part of the frame and carrying said cam 24. The idle return movement of the ratchet lever 20 is effected by gravity but may be aided by a spring, if desired.

To permit of varying the extent of the forward movement of the web at each step to suit the width of blank desired, the pinion 18 may be changed for one of larger or smaller size. For this purpose this pinion is mounted on an adjustable support 27 having preferably the form of an arm pivoted to swing vertically on the frame and held adjustably in place by a screw 28 on the frame passing through a segmental slot in the adjustable arm.

29 represents the main driving shaft of the machine which is journaled horizontally and transversely in bearings on the lower central part of the main frame and which may be driven by a driving belt passing around a pulley 30 at the outer end of this shaft or any other suitable means. Motion

is transmitted from this driving shaft to the longitudinal shaft 26 previously referred to by means of a counter-shaft 31 journaled horizontally and transversely in the lower part of the machine below the main driving shaft and operatively connected with the latter by means of a pinion 32 on the main shaft meshing with a gear wheel 33 on the counter-shaft and also operatively connected with the longitudinal shaft 26 by means of intermeshing beveled gear wheels 34, 35 secured respectively to the counter-shaft and the longitudinal shaft. While the web is being fed forward to the mechanism where blanks are cut off from the front end of the same, it is guided so as to be held in place against lateral movement and insure its proper presentation to the mechanism which subsequently operates upon the same. This guiding mechanism is constructed as follows: 36 represents a plurality of segmental guiding blades or fingers which are arranged in front of the curved guide-plate 1 and each of which engages with its convex face in a longitudinal score or groove of the web. The several guiding blades or fingers are mounted on a horizontal rock shaft 37 journaled transversely in bearings on the adjacent part of the main frame, which shaft is rocked by means of a horizontal rock shaft 38 journaled horizontally and transversely on the lower part of the frame, an upright connecting rod 39 connected at its upper end with a rock arm 40 projecting rearwardly from one end of the upper rock shaft 37 and at its lower end with a rock arm 41 projecting rearwardly from the lower rock shaft 38, an upright rock arm 42 secured to said lower rock shaft and engaging with a rotatable cam 43 on the counter-shaft, and a spring 44 which connects a forwardly-projecting arm 45 on the lower rock shaft with part of the stationary frame. A slack or loose joint is provided somewhere in the mechanism, whereby the movement of the cam 43 is transmitted to the guide blades 36, this being preferably effected by means of a slot 46 in the upper end of the rod 39 and receiving a pin 47 on the respective upper rock arm 40. During each rotation of the cam 43 the high part of the same upon engaging the upper right rock arm 42 causes the guiding blades or fingers to be turned backwardly by engagement of the lower end of the slot 46 with the pin 47. When the low part of this cam is presented to the rock arm 42, the spring 44 actuates the intermediate connecting mechanism, so as to move the rod 39 and disengage the lower end of its slot 46 from the pin 47 and leave the guide blades in their rearward position free to be moved forward by the pull of the web as the latter is subsequently fed forward by the rollers 6, 7. The means for actuating

these blades or fingers are so timed that the same are moved backwardly while the feed rollers 6, 7 are at rest and by their grip upon the web hold the same against backward movement, thereby permitting the guiding blades to slide backwardly in the scores or grooves of the web independently of the latter, but during the forward or feeding movement of the feed rollers, the guiding blades turn forwardly in unison with the same by the pull of the web, thereby eliminating the friction on the web and the undue strain on the latter, which otherwise would be the case if the blades were stationary and the feeding rollers were obliged to pull the web around the convex edges of the several blades.

In order to hold the web with its scores or grooves reliably in engagement with the convex edges of the blades or fingers 36, pressing means are provided which preferably consist of a plurality of vertical rollers 48 which are arranged above the upper edge of the curved guide-plate 4 and each of which engages with the rear or unscored side of the web in line with one of the scores therein and an opposing guiding and feeding blade and is yieldingly held in its operative position by means of a vertically-swinging upright arm 49 carrying the presser roller at its upper end and turning loosely at its lower end on a horizontal transverse rod 50 secured to the main frame, and a coiled spring 51 surrounding said rod and connected at its opposite ends with said supporting arm and a supporting collar 52 adjustably secured to the rod.

After the web issues from the front side of the feed rollers 6, 7 the same is presented to the mechanism whereby successive blanks are cut off from the front end of the same, which blanks or flange strips may be subsequently assembled with other elements of a box by suitable mechanism, as hereinbefore referred to. In order to reliably hold the front portion of the web against displacement while the front edge thereof is being cut off, a clamping device is provided which holds the web in place immediately in rear of the cutting line and in front of the feeding rollers 6, 7. This clamping or holding device is preferably constructed as follows: 53 represents a pair of clamping jaws which are arranged lengthwise above the feed table and lower cutter blade on opposite sides of the web feeding rollers 6, 7 and which are preferably constructed from a single piece of spring steel or other metal and have their front operative ends turned downwardly to form gripping edges or flanges. At their rear ends these jaws are connected with a vertically-rocking bar 54 which is journaled transversely on the adjacent stationary part of the machine and oscillated by means of an upright connecting

rod 55 connected at its upper end with an upper rock arm 56 projecting rearwardly from the rocking bar 54 and at its lower end with a lower rock arm 57 projecting rearwardly from the lower part of the frame, and a rotatable cam 58 mounted on the counter-shaft and engaging with the lower rock-arm 57. As the high part of the cam 58 engages the lower rock-arm 57, the clamping jaws 53 are depressed and caused to bear downwardly upon the web, thereby gripping the latter between said jaws and the lower cutter blade 5, so that the same is positively held against displacement while that portion of the web in front of the clamping jaws is being operated upon. When the low part of the cam 58 is presented to the lower rock lever 57, the clamping jaws are raised into their inoperative position owing to the preponderating weight of the rock arms and connecting rod which effect this raising of the clamping jaws by gravity although the same may be aided, if desired, by a spring. This operation of the clamping jaws is so timed that the web is gripped while the feeding mechanism is at rest and released when the feeding mechanism is in operation, thereby insuring control of the web at all times. By making the clamping jaws of spring metal the throw of the high part of the cam may be slightly in excess of that required for bringing the clamping jaws into engagement with the web and thereby cause these jaws to be strained or flexed slightly after such engagement, thereby enabling this clamping device to adapt itself to slight variations in the thickness of the web and reliably hold the same in place without requiring any fine adjustment of the parts and without liability of breaking or straining the same.

At the end of each forward movement of the web a blank or strip is cut off transversely from the front end or edge of the same, and the preferred form of mechanism for accomplishing this is constructed as follows: 59 represents a transversely and horizontally movable carriage or slide which is arranged above the lower cutter plate or blade 5 and is guided on the under side of a cross piece 60 on the adjacent stationary part of the frame. 61 represents a circular cutter, blade or disk which is pivoted on the front side of the carriage so as to be capable of rotating in a vertical plane transversely of the machine and which coöperates with the front edge of the lower cutter blade 5 for severing a blank from the front edge or end of the web which is projected by the feed mechanism in front of the cutting line. The carriage upon which this rotary cutter is pivoted is reciprocated intermittently preferably by means of a vertically swinging upright rock lever 62 pivoted at its lower end on the main frame and connected at

its upper end with the cutter carriage by means of a link 63, a crank shaft 64 journaled lengthwise on the frame of the machine parallel with the longitudinal shaft 26 and having the crank 65 at its front end connected by a connecting rod 66 with the upright rock lever 62 between its upper and lower ends and a mutilated master gear wheel 67 secured to the longitudinal shaft 26 and meshing with a corresponding pinion 68 secured to the adjacent part of the crank shaft, said pinion being one-half the size of the master gear wheel and provided on diametrically opposite sides with dwells or locking faces which are adapted to be engaged successively by the concentric dwell face of the master wheel and on opposite sides of said dwells with toothed segments which are adapted to be engaged successively by the toothed segment portion of the master wheel. By this means an intermittent rotary movement is imparted to the crank shaft from the longitudinal shaft 26 which rotates continuously in the same direction, each step of this movement causing the crank shaft 64 to make half a turn and to move the cutter disk 61 alternately from one side to the other of the path of the web and causing the same to rest momentarily upon reaching the end of the stroke in either direction and before commencing the stroke in the opposite direction. While the cutter disk is at rest at one end of its stroke on one side of the path of the web, the latter is fed forwardly one step or space and projected beyond the severing line of the cutter disk and blade a distance equal to the width of the blank or flange strip which is desired on the box. After the web has been fed forward to this extent by its feeding mechanism and has come to rest, the cutter disk sweeps transversely across the web and severs a strip from the front end thereof and then comes to rest momentarily on the opposite side of the web. The latter is now fed forward another step equal to the width of blank desired, and after coming to rest the cutter disk returns again to the opposite side of the web and during this movement severs another blank therefrom. It will be noted that by this operation of the cutter disk a blank is cut from the web during each stroke of the cutter disk in either direction. For the purpose of permitting of adjusting the relation of the two cutters 5, 61 for adapting the same to the particular thickness of the web and also for taking up wear upon these cutters, the lower cutter blade or plate 5 is mounted on the feed table 3, so that the same is capable of moving horizontally relatively to the upper rotary cutter. This adjustment of the lower cutter 5 is effected preferably by means of horizontal adjusting screws 69 interposed between opposite ends of its rear edge and the adjacent

stationary parts of the frame, and after adjustment this blade is held in position by means of clamping screws 70 passing through longitudinal slots in this cutter blade and into the adjacent part of the feed table.

In this disclosure the feeding and cutting mechanism is shown mounted in position on a frame which is similar to the frame of the box making machine disclosed in the prior application above referred to, but it will be understood that though this is the preferred mounting and arrangement, any other efficient supporting device may be employed.

By the construction thus described, it will be perceived that a mechanism is provided which, among other results, accomplishes the objects hereinbefore referred to.

It will be noted that the foregoing description sets forth a mechanism which is well adapted to feed and guide a thin or flexible web and especially a web having thin edges such as would be provided by the scarfs hereinbefore referred to. Thus the blanks which are cut from the web have their edges non-distorted so that in the subsequent manipulation of the web these edges will be in proper position.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In an apparatus of the character described, in combination, means adapted to grip and feed a web, and a guide disposed intermediate the edges of the web and adapted to restrain lateral movement thereof as it is fed.

2. In an apparatus of the character described, in combination, mechanism adapted to feed a web by frictionally cooperating therewith at a point spaced from an edge thereof, and means adapted to guide said web as it is fed.

3. In an apparatus of the character described, in combination, mechanism adapted to feed a web by cooperating therewith at a point spaced from an edge thereof, and means adapted to contact the web intermediate its edges to guide the same.

4. In an apparatus of the character de-

scribed, in combination, a web supply, cutting mechanism, means adapted to feed the web from the supply to the cutting mechanism by cooperating with the web at a point intermediate its edges, and web guides disposed to engage intermediate portions of the web transverse to the line of feed.

5. In an apparatus of the character described, in combination, web feeding rollers disposed to grip a web at a point spaced from an edge of the web and leave a portion of web ungripped, and pivoted guide fingers adapted to engage the web and restrain lateral movement thereof.

6. In an apparatus of the character described, in combination, means adapted to feed a flexible web and a guide finger adapted to engage and move with the web as it is fed.

7. In an apparatus of the character described, in combination, means adapted to feed a flexible web and a curved guide blade adapted to engage and move with the web as it is fed.

8. In an apparatus of the character described, in combination, means adapted to intermittently feed a web, oscillatory guide fingers adapted to contact the web intermediate its edges, and means adapted to preserve the relative position of the web and the guide fingers as the web is fed.

9. In an apparatus of the character described, in combination, means adapted to intermittently feed a web, a guide adapted to be pressed against the web intermediate its edges, and means whereby the guide moves in unison with the web as the latter is fed.

10. In an apparatus of the character described, in combination, means adapted to grip a grooved web between its edges and feed the same, a cutter to which the web is fed, and means adapted to engage a groove of the web and guide the same to the cutter.

11. In an apparatus of the character described, in combination, means adapted to grip a grooved web between its edges and feed the same, a cutter to which the web is fed, and means adapted to engage a groove of the web and restrain lateral movement thereof as the web is fed.

12. In an apparatus of the character described, in combination, means for feeding a web which is scored or grooved in a direction lengthwise of its movement, and a guide for said web comprising a blade adapted to engage a groove of the web.

13. In an apparatus of the character described, in combination, means for feeding a web which is scored or grooved in a direction lengthwise of its movement, and a guide for said web comprising a pivoted blade adapted to engage a groove of the web.

14. In an apparatus of the character described, in combination, means for feeding

a web which is scored or grooved in a direction lengthwise of its movement, and a guide for said web comprising a pivoted curved blade adapted to engage a groove of the web.

15. In an apparatus of the character described, in combination, means for feeding a web which is scored or grooved in a direction lengthwise of its movement, and a guide for said web comprising a reciprocatory blade adapted to engage a groove of the web.

16. In an apparatus of the character described, in combination, means for feeding a web which is scored or grooved in a direction lengthwise of its movement, a cutter adapted to sever the web transversely of said grooves, and a web guide adapted to engage said grooves or scores.

17. In an apparatus of the character described, in combination, means for feeding a web which is scored or grooved in a direction lengthwise of its movement, a cutter adapted to sever the web transversely of said grooves, and a pivoted blade adapted to engage said grooves or scores.

18. In an apparatus of the character described, in combination, a pair of cooperating feed rollers adapted to engage with opposite sides of a web, and means for separating these rollers relatively to each other and holding them yielding in feeding position comprising a shaft carrying one of said rollers and journaled at one end so as to be capable of moving at its opposite end toward and from the other roller, a movable bearing supporting the free end of said shaft, a spring for yieldingly moving said shaft and its rollers toward the other roller, and a lifting device for raising said shaft and its roller from the other roller.

19. In an apparatus of the character described, in combination, means adapted to feed a grooved web, a guide engaging the groove of the web, means adapted to press the web against the guide, and means whereby the guide moves in unison with the web as the latter is fed.

20. In an apparatus of the character described, in combination, a support on which a web is adapted to be fed, and segmental guides on the support to engage the web.

21. In an apparatus of the character described, in combination, a support on which a web is adapted to be fed, pivoted segmental guides to engage the web, and means to operate the guides.

22. In an apparatus of the character described, in combination, a support for a web, oscillatory segmental guides to engage the web, and means for positively moving the guides in one direction.

23. In an apparatus of the character described, in combination, a support for a web, oscillatory segmental guides cooperating

ing with the web, and movable therewith in one direction, and means to positively move the guides in the opposite direction.

24. In an apparatus of the character described, in combination, a segmental guiding blade, and means to yieldingly hold the web against the blade.

25. In an apparatus of the character described, in combination, an oscillatory segmental blade adapted to guide a web, and a spring pressed roller cooperating with said blade.

26. In an apparatus of the character described, in combination, a guide finger mounted to oscillate, means to positively move the guide finger in one direction, and means permitting independent movement of the finger and the moving means.

27. In an apparatus of the character described, in combination, means to feed a web, and guiding means adapted to engage and move with the web.

28. In an apparatus of the character described, in combination, means to feed a web, and arcuate guides engaging the web.

29. In an apparatus of the character described, in combination, means for feeding a web which is scored or grooved in a direction lengthwise of its movement, and a guide for said web having members engaging with said scores or grooves.

30. In an apparatus of the character described, in combination, means for feeding a web which is scored or grooved in a direction lengthwise of its movement on one of its sides, and a guide device for said web comprising a curved plate which is adapted to engage with the unscored side of said web, and curved blades or fingers engaging with the grooves of the web.

31. In an apparatus of the character described, in combination, means for feeding a web which is scored or grooved in a direction lengthwise of its movement, and a guide for said web having members engaging with said scores or grooves and presser rollers engaging with the unscored side of the web in line with said groove engaging members.

32. In an apparatus of the character described, in combination, means for feeding a web which is scored or grooved in a direction lengthwise of its movement on one of its sides, and a guide device for said web comprising a curved plate which is adapted to engage with the unscored side of said web, curved blades or fingers engaging with the grooves of the web, and spring pressed rollers engaging with the unscored side of the web in line with said blades or fingers.

33. In an apparatus of the character described, in combination, means for feeding a web which is scored or grooved in a direction lengthwise of its movement, and web guiding means comprising a support engaging with the unscored side of the web, and guid-

ing blades or fingers engaging with said scores or grooves in the web and having a forward and backward movement.

34. In an apparatus of the character described, in combination, means for feeding forward intermittently a web which is scored or grooved lengthwise, vibrating guides adapted to engage with said grooves, and means which move said guides backward while the web feeding means are at rest and which have a slack connection with said guides whereby the latter are free to be moved forwardly by the pull of the web.

35. In an apparatus of the character described, in combination, feeding mechanism for feeding a web which is provided with longitudinal scores or grooves, and web guiding means comprising a curved guide plate adapted to engage with its concave side against the unscored side of the web, oscillating blades or fingers having convex curved edges engaging with the groove or scores of the web, and a rock shaft carrying said blades or fingers.

36. In an apparatus of the character described, in combination, feeding mechanism for feeding a web which is provided with longitudinal scores or grooves, and web guiding means comprising a curved guide plate adapted to engage with its concave side against the unscored side of the web, oscillating blades or fingers having convex curved edges engaging with the grooves or scores of the web, a rock shaft carrying said blades or fingers, and spring pressed arms carrying rollers bearing against the unscored side of the web in line with said blades.

37. In an apparatus of the character described, in combination, feeding rollers whereby a web is fed which is scored or grooved lengthwise on one side, means for turning said feeding rollers forward intermittently, guide fingers engaging with said web, and means for moving said fingers backwardly while said rollers are at rest and permitting said fingers to be moved forwardly by said web.

38. In an apparatus of the character described, in combination, a table, mechanism adapted to feed a web relative thereto comprising feed rollers disposed within the area of the table, shafts carrying said rollers, and means adapted to adjust one end of one of said shafts toward and from the other.

39. In an apparatus of the character described, in combination, a stationary support, means for holding a web thereagainst comprising a vibratory bifurcated spring jaw, and means for vibrating the same.

40. In an apparatus of the character described, in combination, means for intermittently feeding a web, and means for holding said web while the same is at rest comprising a relatively stationary support over

which said web passes, a clamping jaw movable toward and from said support, and a rocking support carrying said clamping jaw.

41. In an apparatus of the character described, in combination, means for intermittently feeding a web, and means for holding said web while the same is at rest comprising a relatively stationary support over which said web passes, a clamping jaw movable toward and from said support, a rocking support carrying said clamping jaw, and means for pressing said jaws against the web when the feeding mechanism is at rest and releasing said jaw from the web when the feeding mechanism is in operation.

42. In an apparatus of the character described, in combination, means for intermittently feeding a web, and means for holding said web when at rest comprising a relatively stationary support over which said web passes, a rocking clamping jaw movable toward and from said support, a rod connected to said jaw, a link pivoted to the rod and to a stationary member, and a cam to operate the rod.

43. In an apparatus of the character described, in combination, a relatively stationary support over which a web passes, a bifurcated clamping jaw cooperating with said support, and intermittently operating feed rollers located in the bifurcation of the clamping jaw.

44. In an apparatus of the character described, in combination, a web feeding mechanism, and a cutter mechanism adapted to cut strips successively from the front end of said web and comprising a relatively stationary blade, a circular cutter movable transversely of the web, a carriage supporting said circular blade, and means for reciprocating said carriage comprising a rock lever connected with the carriage, a crank shaft having its crank connected with the rock lever, and means for intermittently rotating said crank shaft.

45. In an apparatus of the character described, in combination, a web feeding mechanism, and a cutter mechanism adapted to cut strips successively from the front end of said web and comprising a relatively stationary blade, a circular cutter movable transversely of the web, a carriage supporting said circular blade, and means for reciprocating said carriage comprising a rock lever connected with the carriage, a crank shaft having its crank connected with the rock lever, and means for intermittently rotating said crank shaft, comprising a shaft having a mutilated gear, means adapted to continuously drive said shaft, and a mutilated gear on the crank shaft cooperating with that of the former shaft to cause the cutter to dwell at each end of its path.

46. In an apparatus of the character described, in combination, a frame, rollers

mounted thereon adapted to grip a web, a guide against which the web is pressed, a driving shaft, cams driven thereby, levers operated by said cams, respectively, and connections between said levers and the rollers and guide whereby the rollers are intermittently rotated to feed the web and the guide moved in unison with the web.

47. In an apparatus of the character described, in combination, a frame, rollers mounted thereon adapted to grip a web, a plurality of curved guides against which the web is yieldingly pressed, a driving shaft, cams driven thereby, levers operated by said cams, respectively, intermeshing gear wheels on said rollers, means adapted to intermittently rotate said gear wheels from one of said levers, and means adapted to oscillate said guides comprising an arm on said guides, a rod extending from the other lever, and a pin and slot connection between said rod and said arm.

48. In an apparatus of the character described, in combination, a frame, rollers, mounted thereon adapted to grip a web, a plurality of curved guides against which the web is yieldingly pressed, a driving shaft, cams driven thereby, levers operated by said cams respectively, intermeshing gear wheels on said rollers, means adapted to intermittently rotate said gear wheels from one of said levers, and means adapted to positively move the guides in a direction opposed to the direction of feed of the web between the intervals of feed, comprising a pin secured to the guides, a rod connected to the other lever and having a slot engaged by the pin, and spring means adapted to move the guides in unison with the web as it is fed.

49. In an apparatus of the character described, in combination, means adapted to intermittently feed a grooved web, comprising gripping rollers disposed within an edge of the web, oscillatory guides against which the web is pressed adapted to engage the grooves, means whereby the guides move in one direction in unison with the web as it is fed, means adapted to positively move the

guides in the opposite direction while the web is at rest, and a reciprocatory cutter adapted to sever a blank from the web in each direction of movement of the cutter.

50. In an apparatus of the character described, in combination, rollers between which a web is adapted to be engaged, means adapted to yieldingly press the rollers toward each other, intermeshing gear wheels carried by said rollers, a pinion engaging one of said gears and provided with a ratchet wheel, a rock shaft, a plurality of segmental blades carried by said rock shaft, a roller opposite each blade, spring means disposed to press each roller against its blade, a carriage, a rotary cutting disk mounted on the carriage, a cutter blade adapted to cooperate therewith, a clamp jaw adjacent the edge of the cutter blade, a driving shaft, a countershaft, a longitudinal shaft, a crank shaft, connections from the driving shaft adapted to continuously rotate the countershaft and the longitudinal shaft, connections between the longitudinal shaft and the crank shaft adapted to intermittently rotate the latter, cams on the countershaft and connections therefrom whereby the clamp jaw is moved toward and from the cutter blade and the segmental blades positively moved in one direction, a cam on the longitudinal shaft and connections whereby the ratchet wheel is oscillated, and connections between the crank shaft and the carriage whereby the latter is reciprocated.

51. In an apparatus of the character described, in combination, means adapted to intermittently feed a web having longitudinal parallel grooves, a rock shaft, curved guiding blades carried by the rock shaft adapted to engage the grooves, respectively, a rod, arms pivoted thereon, rollers on the arms, and springs adapted to press the rollers toward said blades.

In testimony whereof I affix my signature, in the presence of two witnesses.

CARLOS HOLLY.

Witnesses:

GEORGE W. RILEY,
L. C. PALMER.