Aug. 28, 1945. P. A. HILLIARD 2,383,797

MACHINE FOR MAKING DECORATIVE PAPER STRIPS

Filed Sept. 28, 1943 3 Sheets-Sheet 1

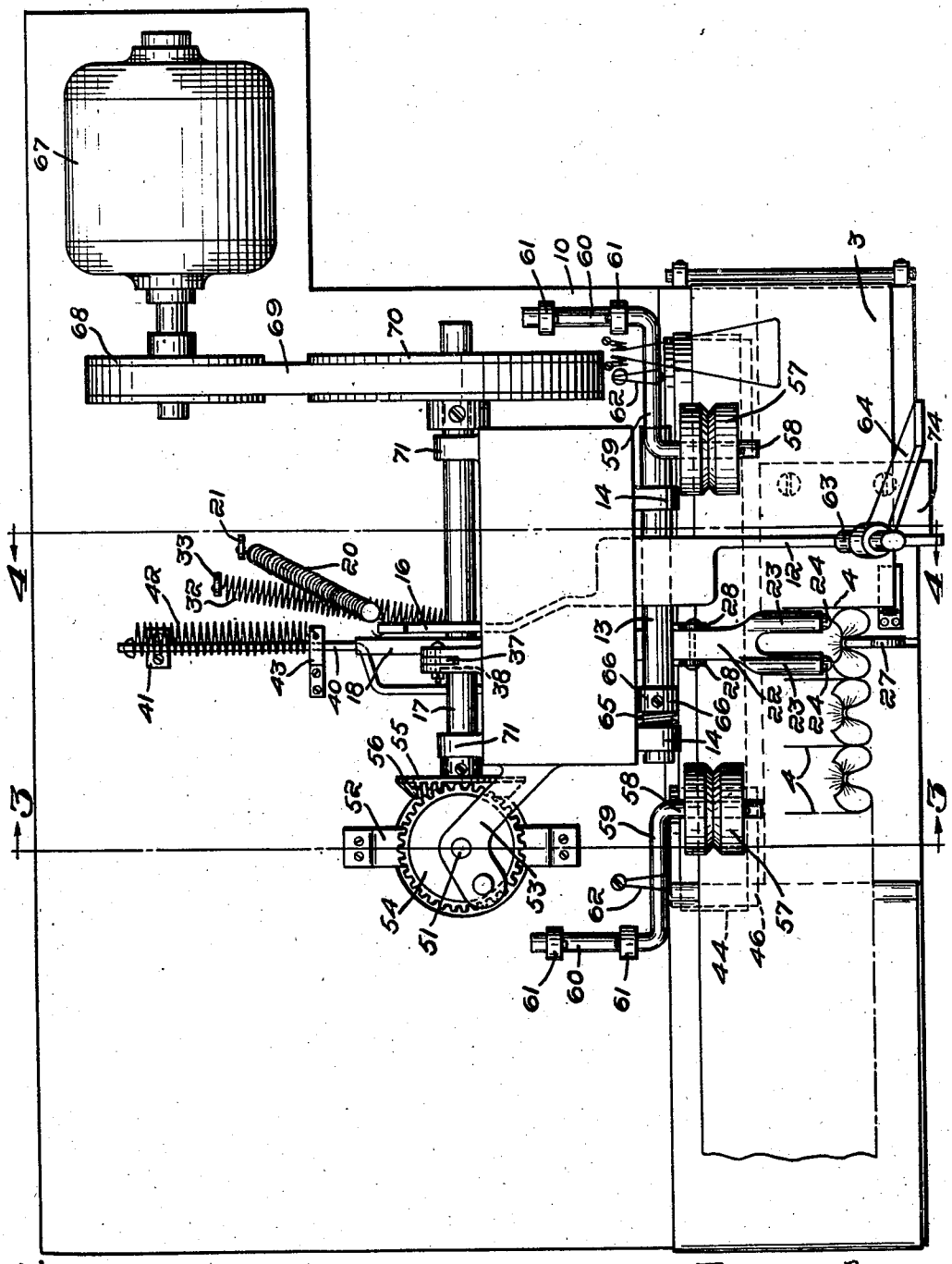


Fig. 1.

Inventor:
Perley A. Hilliard.
By Heard Smith & Lemmert
Attorneys

Aug. 28, 1945. P. A. HILLIARD 2,383,797

MACHINE FOR MAKING DECORATIVE PAPER STRIPS

Filed Sept. 28, 1943 3 Sheets-Sheet 2

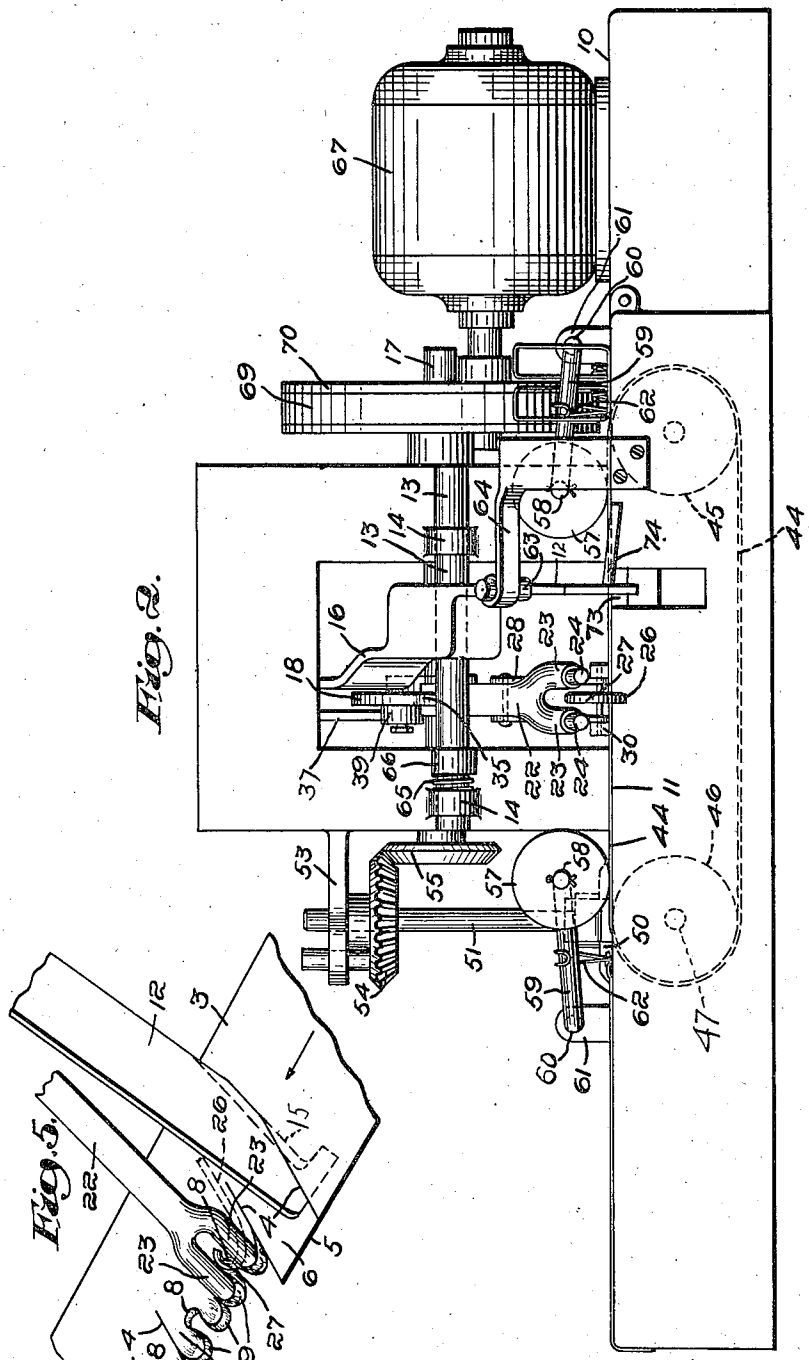


Fig. 2.

Fig. 5.

Inventor:
Perley A. Hilliard
By Heard Smith Holcomb
Attorneys

Aug. 28, 1945. P. A. HILLIARD 2,383,797

MACHINE FOR MAKING DECORATIVE PAPER STRIPS

Filed Sept. 28, 1943 3 Sheets-Sheet 3

Fig. 3.

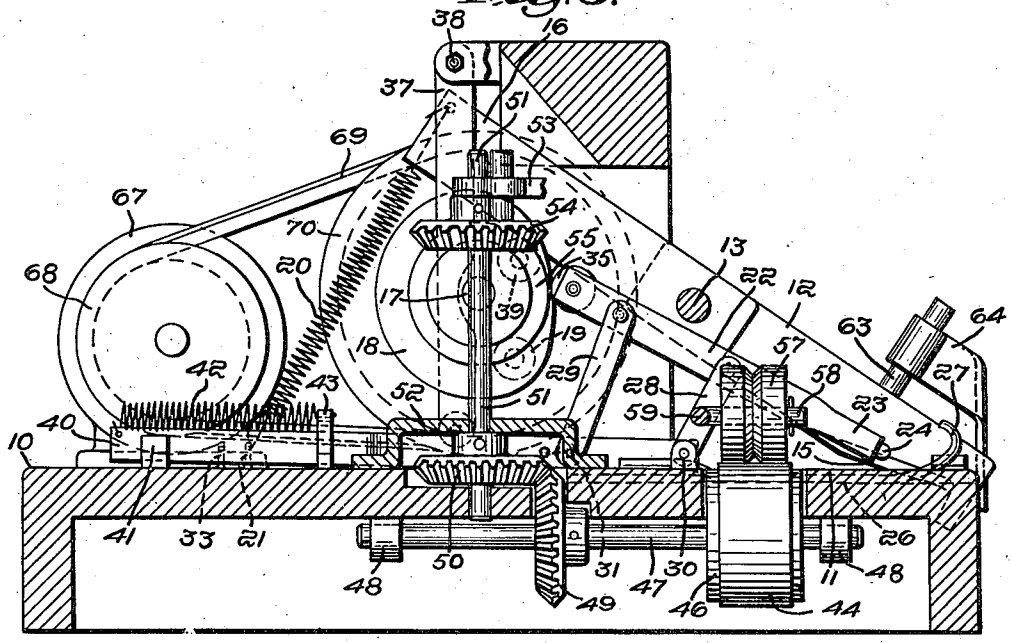
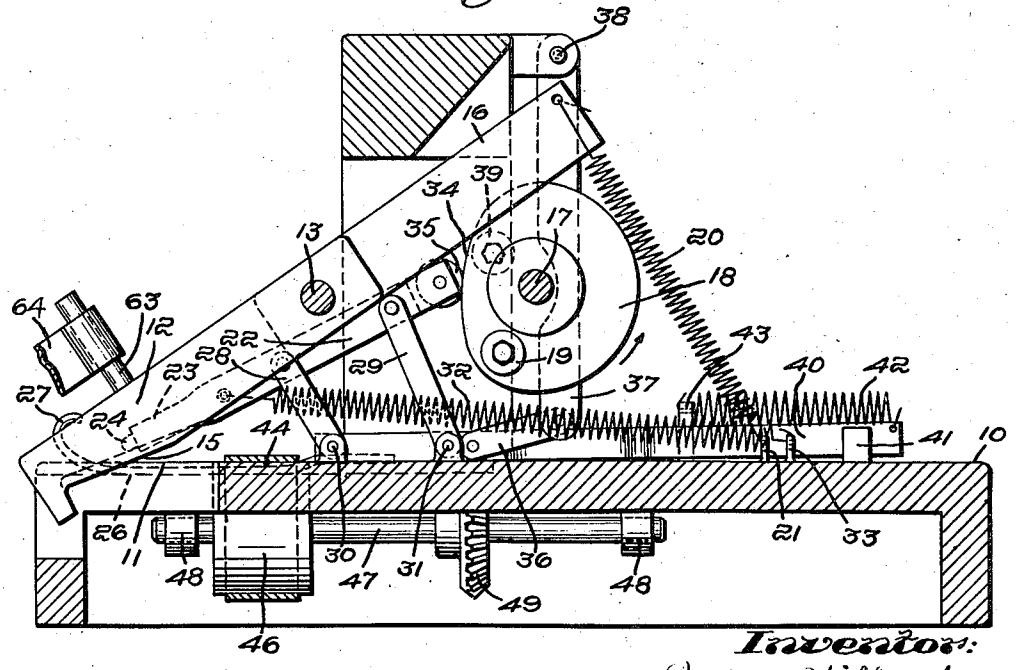


Fig. 4.



Inventor:
Perley A. Hilliard
By Heard Smith & Tennant
Attorneys

Patented Aug. 28, 1945 2,383,797

UNITED STATES PATENT OFFICE

2,383,797

MACHINE FOR MAKING DECORATIVE PAPER STRIPS

Perley A. Hilliard, Newton Center, Mass.

Application September 28, 1943, Serial No. 504,139

8 Claims. (Cl. 93—1)

This invention relates to a machine for crimping paper and especially to a machine adapted to crimp one edge of a strip of paper, thereby to provide a paper strip having a crimped or ruffled edge which is eminently suitable for use in decorating boxes and baskets such as are used as containers for confections, etc.

One of the objects of the invention is to provide a machine constructed to cut transversely extending slits in one edge of a strip of paper, thereby to form finger-like sections, and then to crimp the end portion of each finger-like section, thereby to give the edge of the strip a ruffled appearance.

Other objects of the invention are to provide certain novel features in paper crimping machines which will be more fully hereinafter set forth and then pointed out in the claims.

In the drawings wherein I have illustrated a selected embodiment of the invention:

Fig. 1 is a top plan view of a paper crimping machine embodying the invention.

Fig. 2 is a side elevation thereof.

Fig. 3 is a section on the line 3—3, Fig. 1.

Fig. 4 is a section on the line 4—4, Fig. 1.

Fig. 5 is a fragmentary perspective view showing the product of the machine and the manner in which the strip of paper is cut and crimped.

Referring first to Fig. 5, 3 indicates a strip of paper, and said figure illustrates the manner in which said strip is cut and crimped to produce the desired product.

A series of transversely extending cuts or slits 4 are made in the paper strip 3, said slits extending from the edge 5 toward the centre. These slits produce fingerlike sections 6. Means are provided for gripping each section 6 along each edge adjacent its free end, and then the central portion 8 of the free end of the strip is forced inwardly to a point beyond the places where the finger section is gripped, thereby to crimp the end as shown in Fig. 5. This produces two bulging portions 9 at the end of each finger section 6, and when the strip has been entirely cut and crimped in this way it presents a ruffled ornamental edge. If the paper which is used is ordinary crepe paper, the crimping or ruffling which is put into the edge of the strip as above described will be permanent.

The machine herein described for producing this product is provided with a frame 10 having a bed portion 11 over which the strip 3 of paper is fed, the feeding movement being from right to left in Figs. 1 and 2. The slits 4 are cut in the edge of the strip 3 by means of a knife 12 which operates in a slot 73 with which the bed is provided and which cooperates with a ledger blade 74 that forms one wall of said slot. This knife 12 is carried by a rock shaft 13 which is pivotally mounted in bearings 14 carried by the frame and said knife is formed on its under face with a cutting edge 15.

The strip 3 of paper is fed over the bed 11 with an intermittent or a step-by-step movement which carries any portion of the strip first to a slitting station where the knife 12 operates and then at a point farther on in the travel of the paper to a crimping station where the edge of the paper is crimped, the strip of paper remaining at rest for a short interval at each station. At each period of rest between forward steps the rock shaft 13 is turned counter-clockwise in Fig. 4, thereby to swing the left-hand end of the knife downwardly, during which movement the cutting edge 15 cooperates with the ledger blade 74 to cut a slit 4 in the edge of the strip 3. Any suitable means for giving the knife its operative movement may be employed without departing from the invention. In the construction shown, the shaft 13 has rigid therewith a rearwardly extending arm 16 which is acted on by a cam carried by a cam shaft 17, for the purpose of raising the said arm 16 and thereby rocking the shaft 13 to cause the knife 12 to make its cutting movement. The cam shaft 17 is shown as having a cam disk 18 mounted thereon. This disk carries on one side a roll 19 which, as the disk 18 rotates counter-clockwise in Fig. 4 engages the under side of the arm 16 and raises the latter thereby to give the knife 12 its cutting movement as above described.

20 indicates a pulling spring which is connected at one end to the arm 16 and at the other end to the frame as shown at 21, said spring operating to return the knife to its raised position after each actuation thereof.

As stated above, after each finger section 6 has been formed by the making of one of the slits 4, said finger section is advanced to the crimping station by the step-by-step forward feeding movement of the strip, and as each finger section arrives at the crimping station, it is gripped at each edge adjacent its free end, and while the finger section is so gripped, the center portion 8 of the free end thereof is forced backwardly beyond the points where the finger section is gripped, thereby to produce the desired crimping effect. The gripping of each finger section 6 is accomplished by a hold-down device 22 which is forked at its free end to present two arms 23, each of which is formed with a rubber tip

24. This hold-down device is normally in its raised position above the bed, so that the paper strip can be freely fed beneath it. At the proper time in the operation of the machine, the hold-down element 22 is moved downwardly into its lowered operative position in which the two tip ends 24 engage a finger section 6 at its two edges and adjacent its end, thereby clamping the finger section 6 against the bed. The points where the finger section 6 is engaged by the clamping device 24 is indicated in Fig. 5.

Cooperating with the clamping device is means to give the desired crimped effect. Extending transversely of the bed 11 and situated beneath the strip 3 is a crimping member 26 in the form of a wire, having its free end bent upwardly and backwardly to form a hook portion 27. This crimping element is located directly beneath the hold-down member 22 and between the two arms 23 thereof.

While each finger section 6 is being clamped against the bed by the tip portions 24 as above described, the crimping element 26 is given a movement transversely of the strip from its inoperative position shown in Fig. 4 to its crimping position shown in Fig. 5, and during this movement of the crimping element 26, the hook 27 thereof engages the end of the finger section 6 at its central portion 8 and forces said central portion inwardly beyond the points where the device 24 engages the finger section, thereby crumpling the end of the finger section and producing the desired crimping effect in the edge of the paper. After the hold-down member 22 and the crimping member 26 have performed their duties, they are returned to their normal position and the paper strip is then moved forwardly another step.

The hold-down device 22 may be mounted in any suitable way and given its operative movement by any suitable means. As herein shown, said hold-down member 22 is pivotally connected to the upper end of two links 28, 29 which are in turn pivoted at their lower ends to the bed as shown at 30 and 31. The hold-down member has connected thereto a pulling spring 32, one end of which is anchored to the frame at 33. This spring normally holds the hold-down member in its raised position as shown in Fig. 4.

Said member is given its operative clamping movement by means of the cam disk 18, the face or edge of which has the cam portion 34 that engages a roll 35 on the end of the clamping member 22. As the disk 18 rotates, this cam edge 34 acts against the roll 35 and moves the clamping member forwardly, and since said hold-down or clamp member is mounted on the links 28, 29, and since the link 28 is shorter than the link 29, such forward movement causes the front end of the hold-down to move downwardly into gripping or clamping engagement with a finger section 6 of the paper.

The cam disk 18 is also utilized to give operative movement to the crimping element 26. Said element has a link 36 pivotally connected to its rear end, which link is pivotally connected to the lower end of a lever 37, the upper end of which is pivoted to the frame at 38. The cam disk 18 has a roller 39 mounted on its side face and as the disk is rotated this roller engages the lever 37 and swings the latter backwardly, thereby giving the operative crimping movement to the crimping member 26. This member 26 has a rearward extension 40 which operates in suitable guides 41, and said rear extension has connected thereto a return spring 42, one end of which is anchored to the frame at 43. This spring tends to move the crimping element 26 forwardly and thus yieldingly holds it in its forward inoperative position shown in Fig. 4.

I have stated above that the strip 3 is fed forward intermittently or with a step-by-step movement. For this purpose there is provided a feed belt 44 on which the strip 3 rests and which extends around two pulleys 45, 46. The pulley 46 is a driven pulley and is operated intermittently, the pulley 45 being merely a direction pulley. The pulley 46 is fast on a shaft 47 which is journaled in bearings 48 beneath the bed 11 and which has fast thereon a bevel gear 49 that meshes with a beveled gear 50 carried by a vertically extending shaft 51. This shaft 51 finds a bearing at its lower end in a bracket member 52 mounted on the bed and at its upper end it is journaled in a bracket arm 53. The upper end of the shaft 51 carries a beveled gear 54 which is adapted to mesh with a mutilated beveled gear 55, that is fast on the cam shaft 17. This gear 55 has a short section of gear teeth 56 so that at each rotation of the cam shaft 17 the gear 54 will be given a turning movement, the extent of which is determined by the length of the toothed section 56 of the mutilated gear 55. This is so designed as to give the gear 54 and thus the feed roll 46 the proper turning movement to feed the paper strip forward the desired amount at each forward step. It will be understood, of course, that when the toothed section 56 of the mutilated gear 55 passes out of mesh with the gear 54, said gear 54 will come to rest and will remain at rest until it is again picked up by the toothed section 56.

57 indicate presser rolls that rest on the upper face of the paper strip and yieldingly hold it in contact with the feed belt 44. Each presser roll 57 is rotatively mounted on the free end 58 of a shaft which is bent to form the portion 59 at right angles to the portion 58 and the portion 60, which extends parallel to the portion 58. This portion 60 of the shaft is rotatively mounted in bearings 61 carried by the frame. 62 indicates a spring element which presses downwardly on the portion 59 of the bent shaft, thereby yieldingly holding the presser roll 57 against the paper.

63 indicates a stop element to limit the raising movement of the knife 12. This stop element is shown as mounted in a bracket 64 secured to the bed of the machine and it is situated to be engaged by the back side of the knife as the latter is moved into its raised inoperative position by the spring 20.

Shaft 13 on which the knife is mounted is capable of slight movement in the direction of its length and it is acted upon by a spring 65 which encircles it and is located between one of the bearings 14 and a collar 66 that is fast to said shaft 13. The purpose of this spring is to maintain the cutting edge 15 of the knife 12 in yielding engagement with the edge of the ledger blade 74 so as to insure that the knife will make a clean cut in the paper.

The cam shaft 17 may be operated from any suitable source of power. As herein shown, a motor 67 is provided which has a pulley 68 on its shaft that is connected by a transmission belt 69, with a pulley 70 fast on the cam shaft 17.

The operation of the machine will be readily understood from the above description. At each rotation of the cam shaft 17, the paper strip is fed forwardly one step and while the strip is at rest after each forward step, the knife 12 is ac-

tuated to cut a slit 4 in the edge of the strip 3, thereby to form a finger section 6, and the hold-down 22 and crimping element 26 cooperate as above described to crimp the end portion of one of the previously formed finger sections 6.

The strip of paper will be delivered from the machine with its edge slit and crimped and with the desired ruffled appearance.

As stated above, a strip ornamented in this way is admirably suited for making May baskets, or for decorating boxes, and for other purposes.

I claim:

1. An apparatus for making decorative paper strips comprising means to feed a strip of paper in the direction of its length, means to cut transversely extending slits in one edge of the strip, thereby to form finger-like sections, and means to crimp the end edge portion of each finger-like section in the direction of the length thereof.

2. An apparatus for making decorative paper strips comprising means to feed a strip of paper with a step-by-step motion, means operative during each period of rest to cut in one edge of the strip a slit which extends transversely of the strip and part way only across the width thereof, thereby to form a finger-ilke section, and means to crumple the end edge portion of each finger-like strip.

3. An apparatus of the class described, comprising means to feed a strip of paper in the direction of its length with a step-by-step motion, means to cut in one edge of the strip and during each period of rest a transversely-extending slit which extends part way only across the width of the strip thereby to form a finger-like section, a hold-down to engage each finger-like section during a period of rest, and means cooperating with the hold-down to crumple the end portion of such section while it is engaged by the hold-down.

4. An apparatus of the class described comprising a supporting bed, means to feed a strip of paper in the direction of its length over said bed, means to cut in one edge of the strip a plurality of transversely extending slits which extend part way only across the width of the strip thereby to form finger-like sections, a hold-down to engage each finger-like section and clamp it against the bed, and means cooperating with said hold-down to crumple the end edge portion of each such section while it is so held.

5. A device of the class described comprising a supporting bed, means to feed a strip of paper in the direction of its length over said bed with a step-by-step motion, a knife cooperating with the bed to cut in one edge of the strip a plurality of transversely extending slits which extend part way only across the width of the strip, thereby to form finger-like sections, and means to crumple the end edge portion of each finger-like section.

6. A device of the class described comprising a supporting bed, means to feed a strip of paper in the direction of its length over said bed with a step-by-step motion, a knife cooperating with the bed to cut in one edge of the strip a plurality of transversely extending slits which extend part way only across the width of the strip thereby to form finger-like sections, a hold-down to engage each finger-like section and clamp it against the bed, and means cooperating with the hold-down to crumple the end edge portion of each such section while it is so held.

7. An apparatus of the class described comprising a supporting bed, means to feed a strip of paper in the direction of its length over said bed with a step-by-step motion, means to cut a transversely extending slit in one edge of the strip during each period of rest thereby to form a finger-like section, a hold-down having two arms to engage each finger-like section adjacent its edges and clamp such section to the bed, a means to force the centre part of the end portion of said section inwardly to a position beyond said hold-downs while the latter are active.

8. A device of the class described comprising a supporting bed, means to feed a strip of paper in the direction of its length over said bed with a step-by-step motion, thereby to move any section of the paper to a slitting station and subsequently to a crimping station and to bring the paper to rest at each station, a knife at the slitting station co-operating with the bed to cut in one edge of the strip a transversely extending slit while the paper is at rest, thereby to form finger-like sections, and means at the crimping station to crumple the end edge portion of each finger-like section.

PERLEY A. HILLIARD.