

May 16, 1950

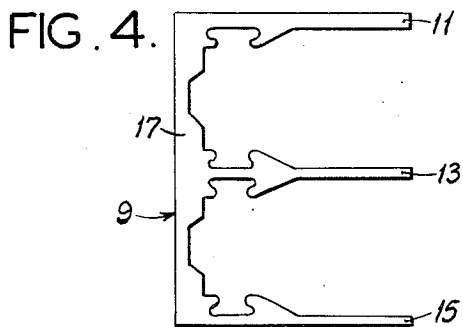
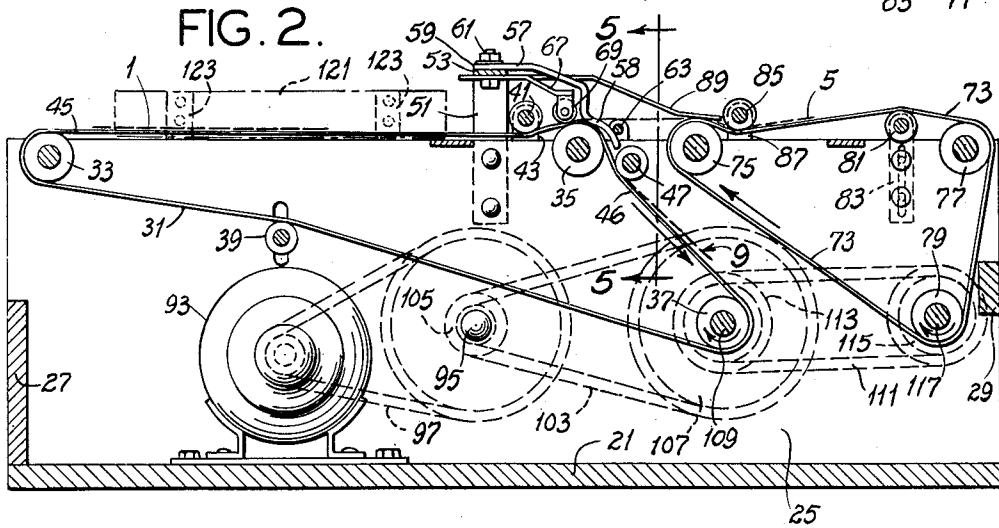
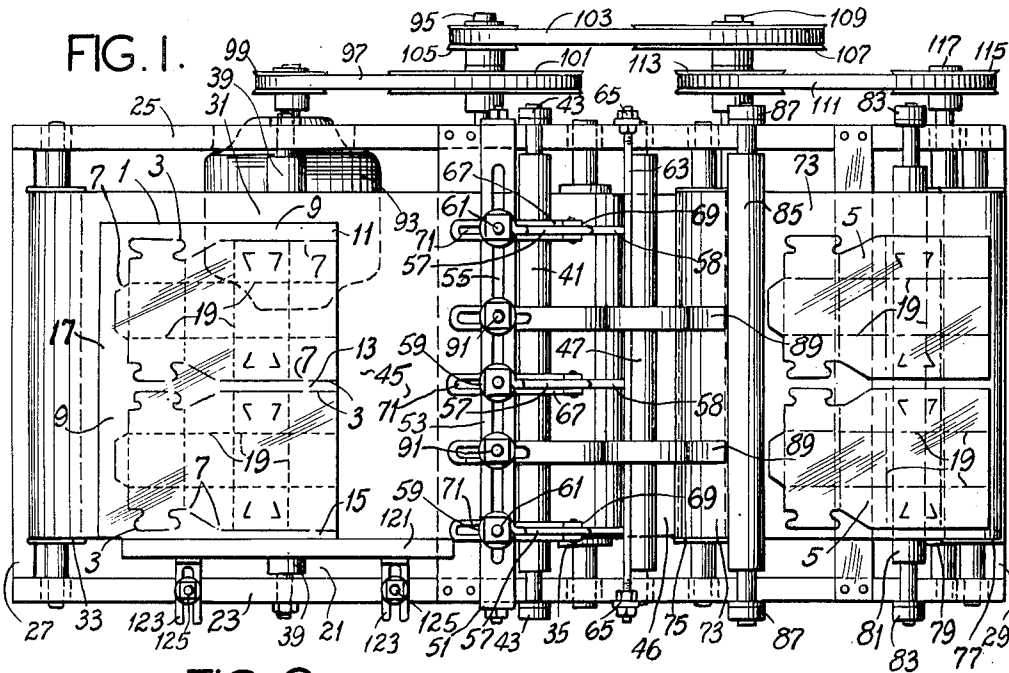
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2,508,083

STRIPPER

Filed June 3, 1946

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 3.

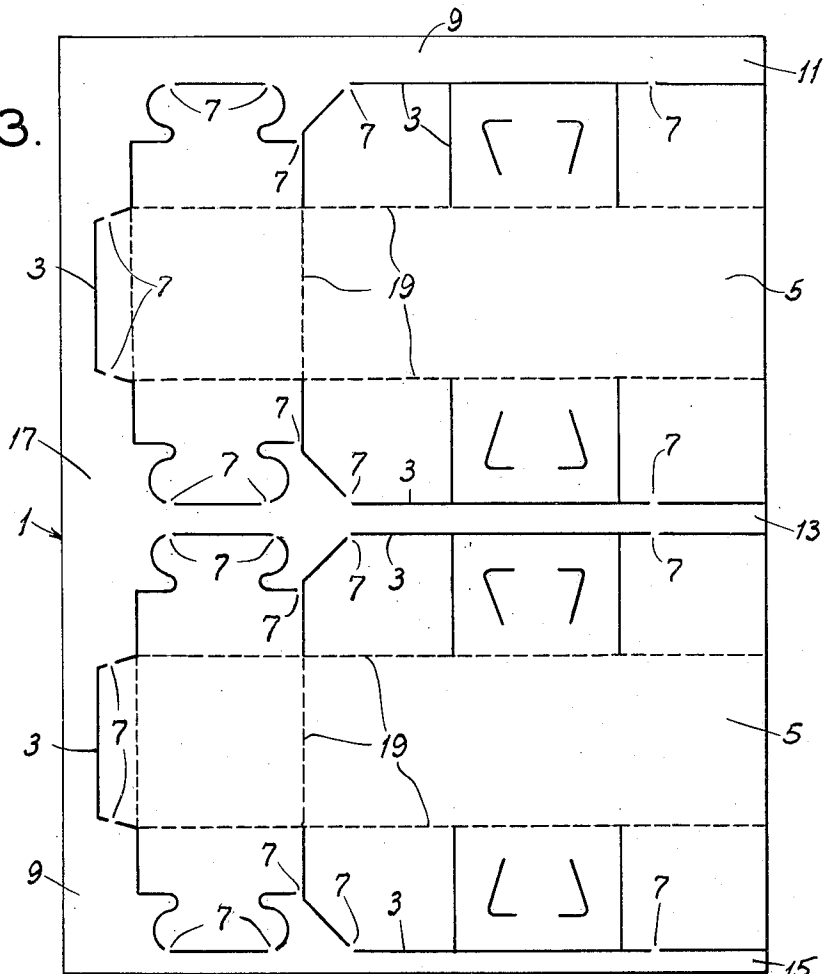
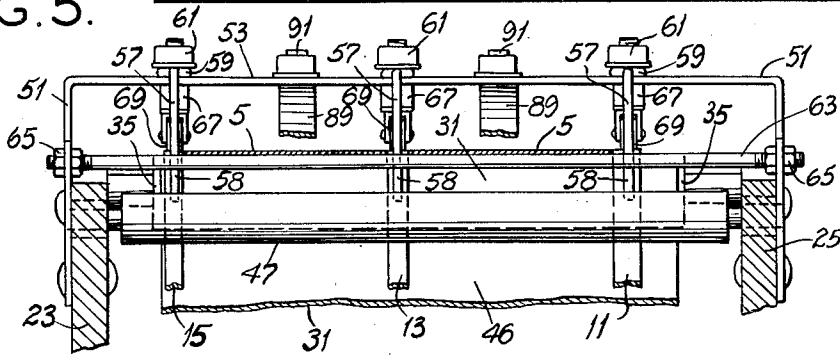


FIG. 5.



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UNITED STATES PATENT OFFICE

2,508,083

STRIPPER

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Application June 3, 1946, Serial No. 674,133

2 Claims. (Cl. 93—58)

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This invention relates to strippers and, more particularly, to apparatus for automatically stripping the waste portions from box-blank portions previously incompletely severed from cardboard blanks.

Among the several objects of the invention may be noted the provision of an automatic stripper for rapidly and efficiently separating the waste portions from incompletely severed box-blank portions of cardboard sheets; the provision of a stripper of this class which separates the waste portions from the box-blank portions by tearing the connections between said portions; the provision of such a stripper which is readily adjustable to strip various sizes of sheets having various box-blank outlines cut therein; and the provision of a stripper of this class adapted continuously to convey the sheets to the stripper and to feed the stripped box blanks in one direction and the waste in another direction to a point of disposal. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated,

Fig. 1 is a plan view of the waste stripper of this invention;

Fig. 2 is a longitudinal vertical section taken through the stripper of Fig. 1;

Fig. 3 is a plan view of a cardboard sheet adapted to be stripped by the stripper of Fig. 1;

Fig. 4 is a plan view on a reduced scale of the waste portion per se of the sheet of Fig. 3; and,

Fig. 5 is an enlarged transverse section through the stripper, taken on line 5—5 of Fig. 2.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Flat cardboard box blanks which are adapted ultimately to be folded into boxes are conventionally formed by die cutting cardboard sheets on the outlines of box blanks within the peripheries of the sheets. This cutting operation leaves peripheral waste portions of the sheets surrounding the box-blank outline therein. These waste portions are almost completely severed from the box-blank portions of the sheets in the cutting operation but remain connected to the box-blank portions by narrow connecting tongues or bridges.

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These connecting tongues result from the provision of narrow recesses or notches in the die cutting blades so that the sheet is completely severed on the box-blank outline except in the zones of the notches, where it remains unsevered. The waste has heretofore been separated from the box blanks by stacking a plurality of the sheets and manually beating off the peripheral waste portions with a mallet or hammer. This inefficient manual process is superseded by the stripper of this invention, which provides for automatic and expeditious stripping of the waste from the box blanks.

Referring now to the drawings, and particularly to Fig. 3, there is shown at numeral 1 a typical blanked sheet adapted to be stripped by the apparatus of this invention. This sheet is rectangular in outline and has been processed by means of a system of cuts extending completely through the sheet on interrupted cut lines 3, each cut line 3 being in accordance with the outline requirements of a box blank 5. There are two such systems of cut lines and, consequently, two such box blanks 5. The interruptions in cut lines 3 connote narrow connecting tongues or bridges 7, which connect the box-blank portions 5 and waste portion 9. The waste portion 9 includes three longitudinally extending waste leader strips 11, 13 and 15 connected at one end by a transverse strip 17 (Fig. 4). The dotted lines 19 within the box-blank outlines connote score lines upon which the box blanks are ultimately folded into the form of a box.

Referring now more particularly to Figs. 1, 2 and 5, the elements of the waste stripper of this invention are mounted in a frame comprising a bottom member 21, side frame members 23 and 25, a rearward end member 27 and a forward end frame member 29. An endless conveyor belt 31 passes around belt rolls 33, 35 and 37 journaled in the side frame members. A belt tightening idler roll 39 is adjustably journaled in the side frame members to provide the proper tension on the belt 31. An idler nip roll 41 is journaled in bearings 43 mounted on the upper edges of side frame members 23 and 25. This roll cooperates with the upper surface of the belt 31 to form means for feeding the sheets forward. The upper reach 45 of belt 31 between rolls 33 and 35 is substantially horizontal, though the belt slopes slightly upward from nip roll 41 to roll 35. The reach 46 of belt 31 between rolls 25 and 37 slopes forward and downward from roll 35. Another idler nip roll 47, journaled in the side frame members, engages the upper surface of the slop-

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ing reach 46 of belt 31 for a purpose to be described.

An inverted U-shaped bracket 51 has its side legs suitably connected to the side frame members 23 and 25. The bar 53 of the bracket spans the frame between the side frame members and has an elongate slot 55 therein. Secured to the bar 53 are stripping fingers 57 which extend forward and downward from the bar. The forward ends 58 of these fingers are curved around the belt 31 over the belt roll 35. Each stripping finger 57 has an eye 59 at its rearward end. The eyes 59 are disposed on the bar 53 and secured thereto in adjusted position by nut and bolt fastenings 61. The bolts of these fastenings pass through the eyes and through the slot 55 in the bar 53. The stripping fingers 57, as indicated particularly in Fig. 5, are narrower than the waste leader strips 11, 13 and 15 and are positioned on the bar 53 so as to engage and deflect these strips around roll 35 and into the nip of nip roll 47 and belt 31, but to permit the passage of box blanks 5 between the fingers. A rod 63, suitably secured at its ends to the side frame members, as indicated at 65, is positioned over the ends 58 of fingers 57 to retain them in position against belt 31.

Also adjustably secured to the bar 53 by the nut and bolt fastenings 61 are fingers 67 having rollers 69 journaled in the forward ends thereof. These rollers are adapted to engage the waste leader strips 11, 13 and 15 intermediate the nip roll 41 and the stripping fingers 57 to prevent buckling of the strips when they engage the fingers 57. Fingers 67 are provided with slots 71 in their rearward ends, which are disposed against the bottom of bar 53. The bolts of the fastenings 61 extend through the slots 71 in fingers 67. The fingers 67 are thus coadjustable with stripping fingers 57.

An endless conveyor belt 73 for conveying stripped box blanks from the stripper passes around belt rolls 75, 77 and 79 journaled in the forward ends of the side frame members 23 and 25. A belt tightening roll 81 journaled in adjustable bearings 83 mounted on the side frame members provides for proper tension in the belt. An idler nip roll 85 is journaled in bearings 87 mounted on the side frame members in position to engage the upper surface of belt 73 between belt rolls 75 and 77. Secured to bar 53 are resilient guide fingers 89 which extend forward and downward therefrom into engagement with the belt 73 over roller 75. The forward ends of these guide fingers guide the stripped box blanks into the nip of nip roll 85 and belt 73. The guide fingers are slotted at their rearward ends and are adjustably secured on bar 53 by nut and bolt fastenings 91. The bolts of these fastenings extend through the slots in the guide fingers and the slot 55 in the bar 53.

A motor 93 is mounted within the frame with its shaft extending beyond the side frame member 25. The motor drives a countershaft 95 by means of a belt 97 passing around a small pulley 99 on the motor shaft and a large pulley 101 on the countershaft. The countershaft 95 is coupled to belt roll 37 by a belt 103 passing around a small pulley 105 on the countershaft and a large pulley 107 on the shaft 109 of the belt roll 37. Shaft 109 is coupled to drive belt roll 79 by a belt 111, passing around a pulley 113 on shaft 109 and pulley 115 on the shaft 117 of belt roll 79. Belts 31 and 73 are driven clockwise, as viewed in Fig. 2.

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A side guide 121 for guiding the side edge of a cardboard sheet 1 is adjustably mounted upon the upper edge of the side frame member 23. This side guide is supported by slotted brackets 123 and may be locked in adjusted transverse position by nut and bolt fasteners 125, the bolts passing through the slots in the brackets.

Operation of the stripper is as follows:

For stripping cardboard sheets such as shown at 1, the stripping fingers 57 are transversely adjusted upon the bar 53 to positions wherein the forward ends 58 are adapted to engage the waste leader strips 11, 13 and 15. This also adjusts fingers 67 so that rollers 69 are adapted to engage the strips to prevent buckling. The side guide 121 is adjusted so that when the edge of the leader strip 15 engages it, the cardboard sheet is in such a position that the leader strips 11, 13 and 15 will be engaged and deflected by fingers 57. The operator places a cardboard sheet 1 upon the reach 45 of conveyor belt 31, with the edge of leader strip 15 against the side guide 121, and preferably with the ends of the leader strips forward. The cardboard sheet is then conveyed by the conveyor belt 31 into the nip of nip roll 41 and the belt 31, which feed the sheet forward. As the cardboard sheet emerges from between the roll 41 and the belt 31 the waste leader strips 11, 13 and 15 are gripped between the forward ends 58 of fingers 57 and the belt 31 and thereby constrained to travel on the sloping reach 46 of belt 31. The box blanks, being unconstrained, travel forward in the direction of the plane path between rollers 69 and the belt 31. The divergence of the paths of travel of the box blanks and the waste portion 9 results in the tearing of the narrow tongue or bridge connections 7 to separate the box blanks from the waste portion. The ends 58 of fingers 57 direct the waste portion 9 into the nip of nip roll 47 and the belt 31 and the waste is thereby conveyed downward onto the bottom member 21 of the frame for disposal. The box blanks are moved forward until their forward ends are guided by the ends of guide fingers 89 into the nip of nip roll 85 and belt 73, whereupon the box blanks are conveyed away by the belt 73.

The operator may rapidly place the cardboard sheets 1 upon the reach 45 of the belt 31 and thereby effect rapid, automatic stripping of the sheets. The forward ends 58 of the stripping fingers 57 function effectively to separate the waste portion 9 from the box blanks 5 by a tearing apart of the connecting tongues 7 between these portions. A wide variety of sizes and configurations of box blanks may be stripped by suitable adjustment of stripping fingers 57.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above constructions without departing from the scope of the invention, 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.

I claim:

1. Apparatus of the character described, comprising a conveyor belt having a substantially horizontal upper reach and a reach sloping forward and downward therefrom, a nip roll engaging said upper reach and cooperating therewith to feed a sheet forward along a substantially horizontal path, said sheet comprising a plurality of portions separable upon substantially longi-

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tudinal lines, a second nip roll engaging the sloping reach of the belt, and a deflecting finger adapted to guide one of said portions of said sheet onto the sloping reach of said belt and into the nip of said second nip roll and belt, thereby to separate said one portion from the remainder of said sheet and to feed it to a point of disposal.

2. Apparatus of the character described, comprising a conveyor belt having a substantially horizontal upper reach and a reach sloping forward and downward therefrom, a nip roll engaging said upper reach and cooperating therewith to feed a sheet forward along a substantially horizontal path, said sheet including a waste portion separable from the remainder of said sheet along substantially longitudinal lines, said waste portion including a plurality of transversely spaced strips, a second nip roll engaging said sloping reach of the belt, and a plurality of transversely spaced deflecting fingers adapted to guide said strips onto the sloping reach of

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said belt and into the nip of said second nip roll and belt while permitting the remainder of said sheet to move forward along a substantially horizontal path, thereby to separate said strips from the remainder of said sheets and feed them to a point of disposal.

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