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WASTE STRIPPING MECHANISM FOR CARTON
BLANK FORMING APPARATUS

2,647,446

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2 Sheets-Sheet 1

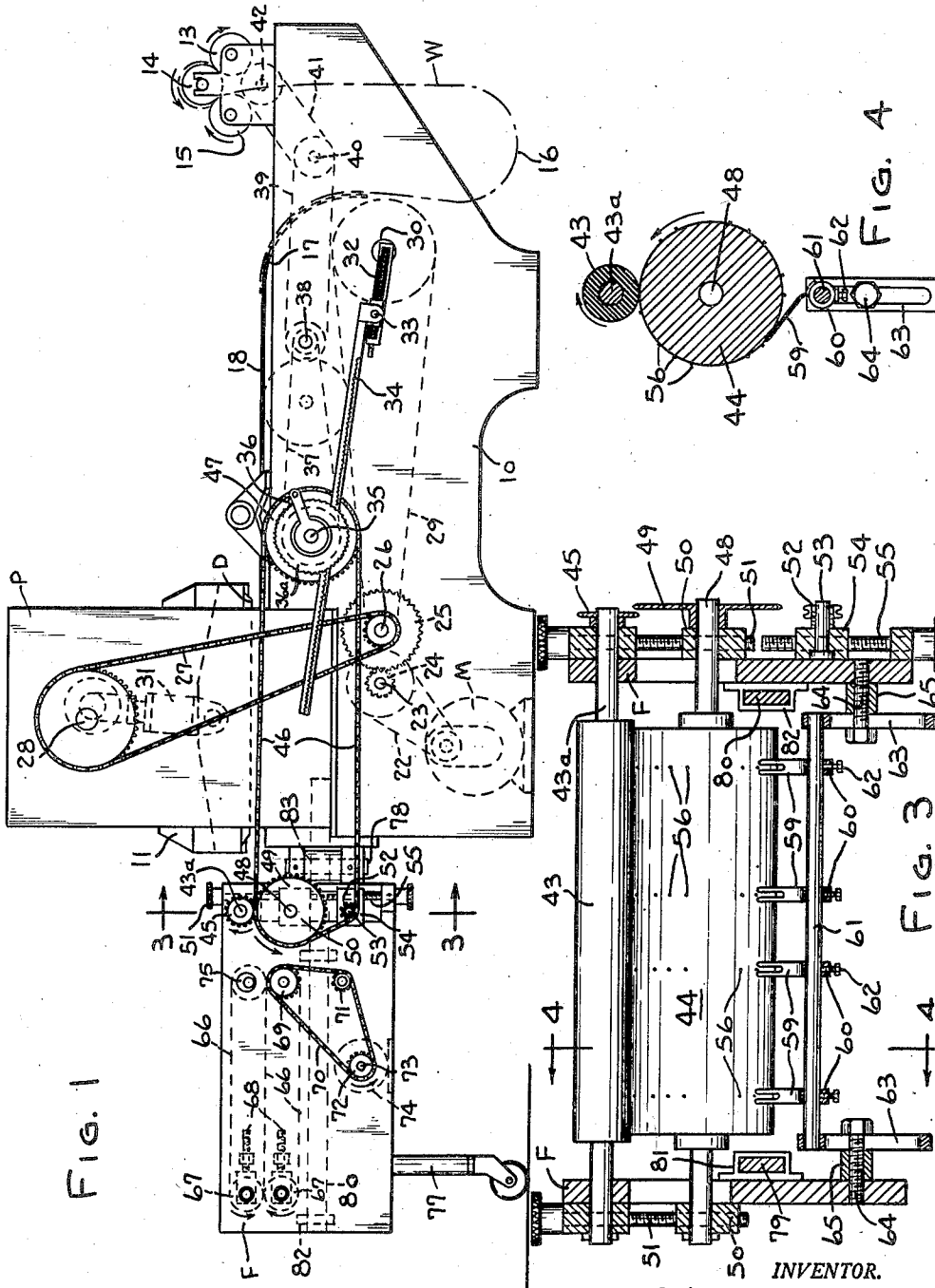


FIG. 1

FIG. 4

FIG. 3

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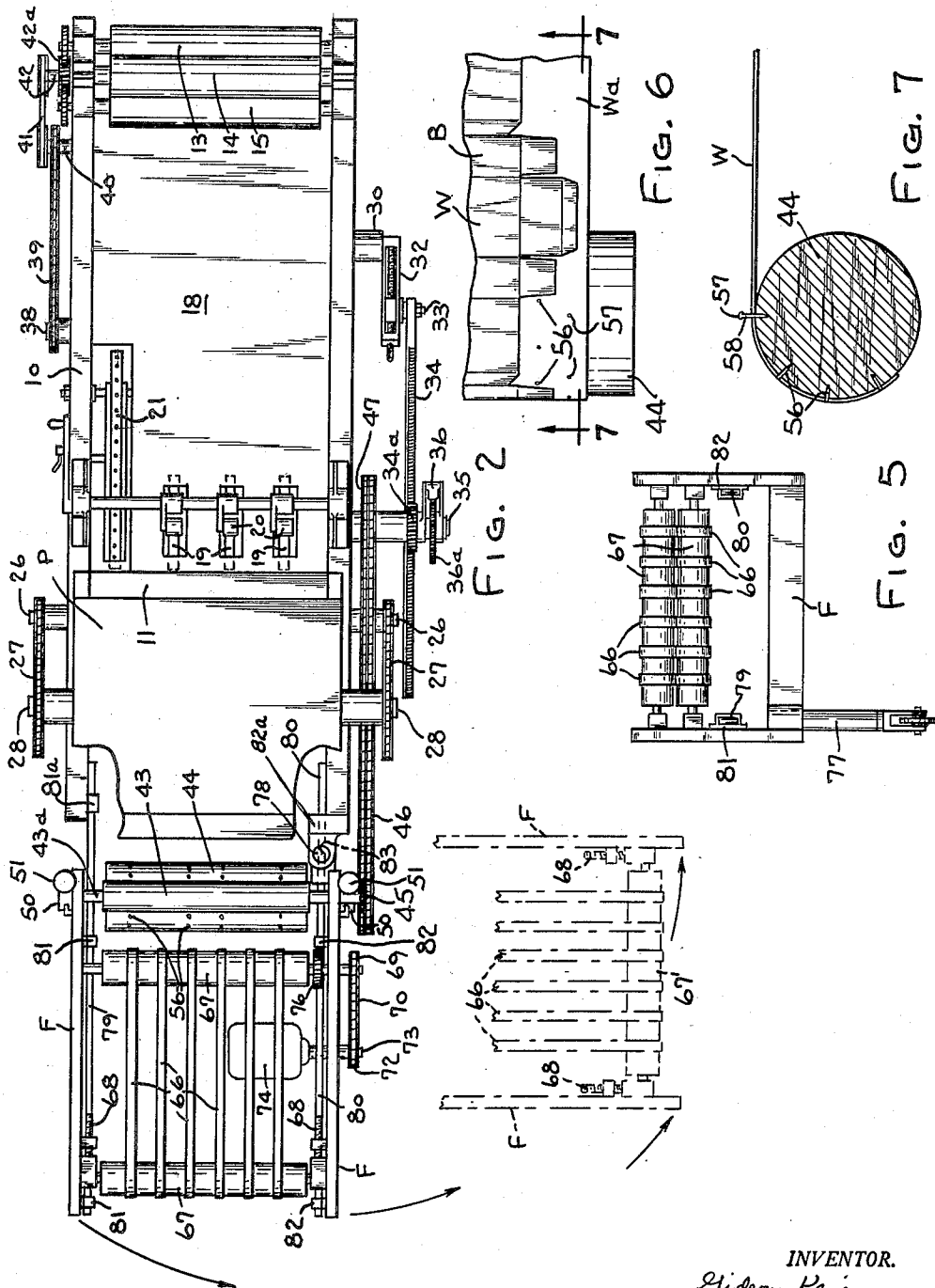
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WASTE STRIPPING MECHANISM FOR CARTON BLANK FORMING APPARATUS

Gideon Kane, Green Bay, Wis.

Application February 28, 1951, Serial No. 213,097

2 Claims. (Cl. 93—36)

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The invention relates to carton blank forming apparatus and more particularly to a method and apparatus for automatically removing the waste from the cut carton blank.

In carton making, the general practice has been to remove the waste from the cut blank manually. The object of this invention is to provide a method and apparatus by which the stripping of the waste from the blank is accomplished mechanically. More particularly, with the present apparatus, after the blank is cut by the blanking press, it is fed past a stripping mechanism which operates in synchronism with the feed of the web to the blanking press, and the waste from the blank is positively removed as the blank is carried to a mechanism for delivering the finished cut blank from the machine. The stripping mechanism includes a pair of rolls between which the cut blank is fed, one of these rolls provided with pins disposed to engage the waste portions of the blank and upon which said waste portions are impaled as the blank passes to the delivery mechanism, the impaled waste portions being subsequently removed from the pins on the above mentioned roll.

A further object of the invention is to provide a stripping apparatus including a wooden or wooden faced roll of the same diameter as that of the printing cylinder, used to repeat print on the web which is fed through the blanking press, which roll is driven at the same speed as the feed mechanism for the blanking press, so that substantially absolute registry is obtained to bring the waste portions of the cut blanks into contact with the same areas of said wooden faced roll, said wooden roll having pin projections disposed in said waste portion areas upon which these waste portions are impaled as the blank is carried out of the press. In connection with this mechanism a simple method of locating the waste removing pins has been developed comprising successively nailing down the waste portions of a cut blank onto the wooden roll as the blank is carried out of the press and successively cutting off those portions of the nails that project above the nailed down waste portions to form a stripping roll for removing the waste from the particular form of carton blank then being cut by the blanking press. While a different wooden roll is used for each different form of carton blank, these rolls are relatively inexpensive, and the method above described insures positive removal of the waste portions of the blank in an expeditious manner.

The invention further consists in the several

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features hereinafter described and more particularly defined by claims at the conclusion hereof.

In the drawings:

Fig. 1 is a side elevation view of blank forming apparatus including the stripping mechanism embodying the invention;

Fig. 2 is a plan view of the apparatus, parts being broken away;

Fig. 3 is a detailed vertical sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a detailed vertical sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is an end elevation view of the delivery conveyor and its supporting frame;

Fig. 6 is a detailed elevation view of a portion of the stripping mechanism and a carton blank;

Fig. 7 is a detailed vertical sectional view taken on the line 7—7 of Fig. 6.

Referring to Figs. 1 and 2, I have shown a blank forming apparatus corresponding to that of my copending application Serial No. 165,015, filed May 29, 1950, for "Method and Apparatus for Making Box Blanks," to which reference may be had for details not specifically shown and described herein, such parts of this apparatus being shown herein as are directly associated with the stripper mechanism embodying this invention. The apparatus includes a frame 10 having a blanking press P mounted thereon including a reciprocatory platen 11 on which the cutting dies D are mounted, which dies cooperate with a stationary platen (not shown) on said frame to cut the carton blank from the web W as it is intermittently advanced through the apparatus. For advancing the web W to the press a set of feed rolls 13, 14, and 15 draw the web from a supply roll or from a printing press and advance it to form a loop 16 which passes upwardly over a curved apron 17 forming part of a flat bed 18 over which the web passes and along which it is drawn by sets of draw rolls 19 and 20 cooperating with a pin belt 21, to advance the web to the blanking press P.

As in the aforementioned application, a geared head electric motor M is operatively connected by a belt and pulley drive 22, to a shaft 23 connected by gears 24 and 25 with a lay shaft 26, which shaft is connected by a chain and sprocket drive 27 to the platen operating crank shaft 28 and by a belt and pulley drive 29 to a shaft 30. The crank shaft 28 is operatively connected to the reciprocatory platen 11 by connecting rods 31. The shaft 30 carries variable length crank mechanism 32 whose adjustable crank pin 33 is pivotally connected to a rack bar 34 which meshes

with a pinion 34a, loose on a shaft 35 and connected with an oscillatory feed pawl 36 engageable with a ratchet wheel 36a fixed to the shaft 35, which shaft carries the draw rolls. The pawl and ratchet drive mechanism above described functions to intermittently advance the web W into the blanking press in amounts equal to the carton blank lengths with the printed matter in proper registry with the finished blank. The shaft 35 is also operatively connected to the feed rolls 13, 14, and 15 through a belt and pulley drive 37 to a shaft 38 connected by a chain and sprocket drive 39 to a shaft 40 connected by a belt and pulley drive 41 to a shaft 42 which, as shown in said application, has a gear connection indicated here by 42a with gears on the shafts for the rolls 13, 14, and 15, so that the feed of the web to the loop is the same as the feed of said web through the draw rolls 19 and 20.

The stripper mechanism embodying the invention includes a pair of feed rolls 43 and 44, driven from the shaft 35 to advance the blanked web from the blanking press the same amount it is fed into said press, that is, the length of a carton blank and at the same rate.

The feed roll 43 is a soft faced rubber roll whose shaft 43a is journaled in an auxiliary frame F and is positively driven by a sprocket 45 meshing with one of the runs of a double chain 46 running over a double width sprocket 47 on the shaft 35, so that said roll is positively driven.

The roll 44 is a wooden or wooden faced roll whose metal shaft 48 carries a sprocket 49 over which the other run of the double chain 46 runs so that this roll is positively driven. The outer diameter of the roll 44 is such that its circumference is equal to the length of the cut blank and is of the same diameter as that of the plate cylinder used in printing the web in the spaces thereof forming portions of the finished cut blanks and the pitch diameter of the sprocket 49 is the same as the diameter of the roll 44 and the pitch diameter of the sprocket 47 is the same as that of the rolls 43, so that the same length of web fed into the blanking press will be fed out of the press by the rolls 43 and 44 and the same portions of the cut blanks and waste carried out of the press will always contact the same spots on the roll 44. Thus the roll 44 is a repeat roll for each particular design of blank blanked out by the cutting and creasing press, and since these designs may vary so that the diameters of the rolls 44 may vary, the shaft 48 for the roll 44 is journaled in vertically adjustable bearing boxes 50 carried by feed screw shafts 51 mounted in the frame F to accommodate the different sizes of rolls 44 that may be used.

For tensioning the double chain 46, a double tooth sprocket 52 is rotatably mounted on a stud shaft 53 carried by a vertically adjustable block 54 carried by a feed screw shaft 55 mounted in the frame F.

For stripping the waste from the cut blank the roller 44 is provided with waste impaling pins 56, one or more of which are located in the peripheral surface of said roll at those points where the waste passing between the rolls 43 and 44 occurs.

Referring to Figs. 6 and 7, as a simple method of locating the pins 56 on the repeat roll 44, the first cut blank B with its waste Wa on being led out of the press has its waste portions Wa tacked or nailed onto the roll 44 by small wire nails or brads 57 whose heads or those portions 58

projecting above the blanks are then cut off to provide the pins 56.

With the location of the pins 56 established, as the cut web is fed out of the press between the rolls 43 and 44, the pins 56 press up through those portions of the web between the rolls which are waste and positively carry said waste downwardly in the direction of the lower arrow indicated in Fig. 1, and as this impaled waste moves down, a series of slotted spring metal fingers 59 bearing upon the roll 44 and straddling the pins 56 pry the impaled waste from the roll 44. As previously noted, the diameter of each roll 44 is the same as that of the plate cylinder used in printing the carton blank and the sprocket 49 used to drive this roll has the same pitch diameter as the diameter of said plate cylinder.

Each finger 59 is connected to or united with a metal collar 60 slidably mounted on a supporting shaft 61 and securable in adjusted position thereon by a set screw 62, said shaft extending parallel to and below the axis of the shaft 48 and connected at its ends to slotted supporting arms 63 which in turn are vertically adjustably secured to the frame F by clamping bolts 64 threaded into said frame and carrying spacing collars 65.

After the waste is removed from the cut blank, it is fed by the rolls 43 and 44 into the bight of a pair of delivery aprons formed by sets of spaced endless belts 66 running over spaced rollers 67. The journals for the outer rollers 67 of each set are adjustably mounted on the frame F through jack screws 68 to vary the tensions of the belts 66. The shaft for the lower inner roller 67 carries a sprocket 69 connected by a chain 70, tensioning sprocket 71, and sprocket 72 to the drive shaft 73 of an electric drive motor 74. The shaft for the upper inner roll 67 is eccentrically mounted in its adjustable bearings 75 in the frame F and at one end carries a gear 76 meshing with a gear (not shown) on the shaft for the lower roll.

To provide ready access to the dies of the blanking press, the frame F is mounted to swing out to one side of the press and is provided with a castor wheel leg 77, said frame being mounted to swing about a hinge pin 78 mounted at one corner of the press P. For holding the frame F in proper aligned position when the press is operating, guide rods 79 and 80 slidably mounted in brackets 81 and 82 on the frame F are slidable into slotted brackets 81a and 82a on the frame of the press P, and the guide rod 80 also slides through a slot 83 in the hinge pin 78 to lock the frame F against swinging movement. The circumference of the roll 44 is the same as the length of the web from which any one of the carton blanks are cut and the term "length of the carton blank" refers to this length which, of course, may be slightly longer than the actual length of the carton blank itself.

I desire it to be understood that this invention is not to be limited to any particular form or arrangement of parts except in so far as such limitations are included in the claims.

What I claim as my invention is:

1. In the carton blank art, the method of locating waste impaling pins in a stripper roll which comprises taking a roll having a facing capable of anchoring nails and driving nails into said facing and through waste portions of a web containing the carton blank while said web is contacting said roll and then cutting off the projecting ends of said nails to form the impaling pins for the removal of waste from other blanks carried over said roll.

2. In the carton blank art, the method of preparing a stripper roll for stripping waste from a cut blank which comprises making a roll having a facing capable of anchoring nails and having a circumference equal to the length of the blank to be stripped, moving a cut web in contact with said roll as the roll is rotated through one revolution, and driving nails into said facing and through waste portions of the web as it is carried over said roll, and then cutting off the projecting ends of said nails to form the impaling pins for the removal of waste from other blanks carried over said roll.

GIDEON KANE.

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