Dec. 19, 1950 I. A. WILLIAMS 2,534,893

BAG HANDLE FEEDING MACHINE

Filed Jan. 8, 1949 4 Sheets-Sheet 1

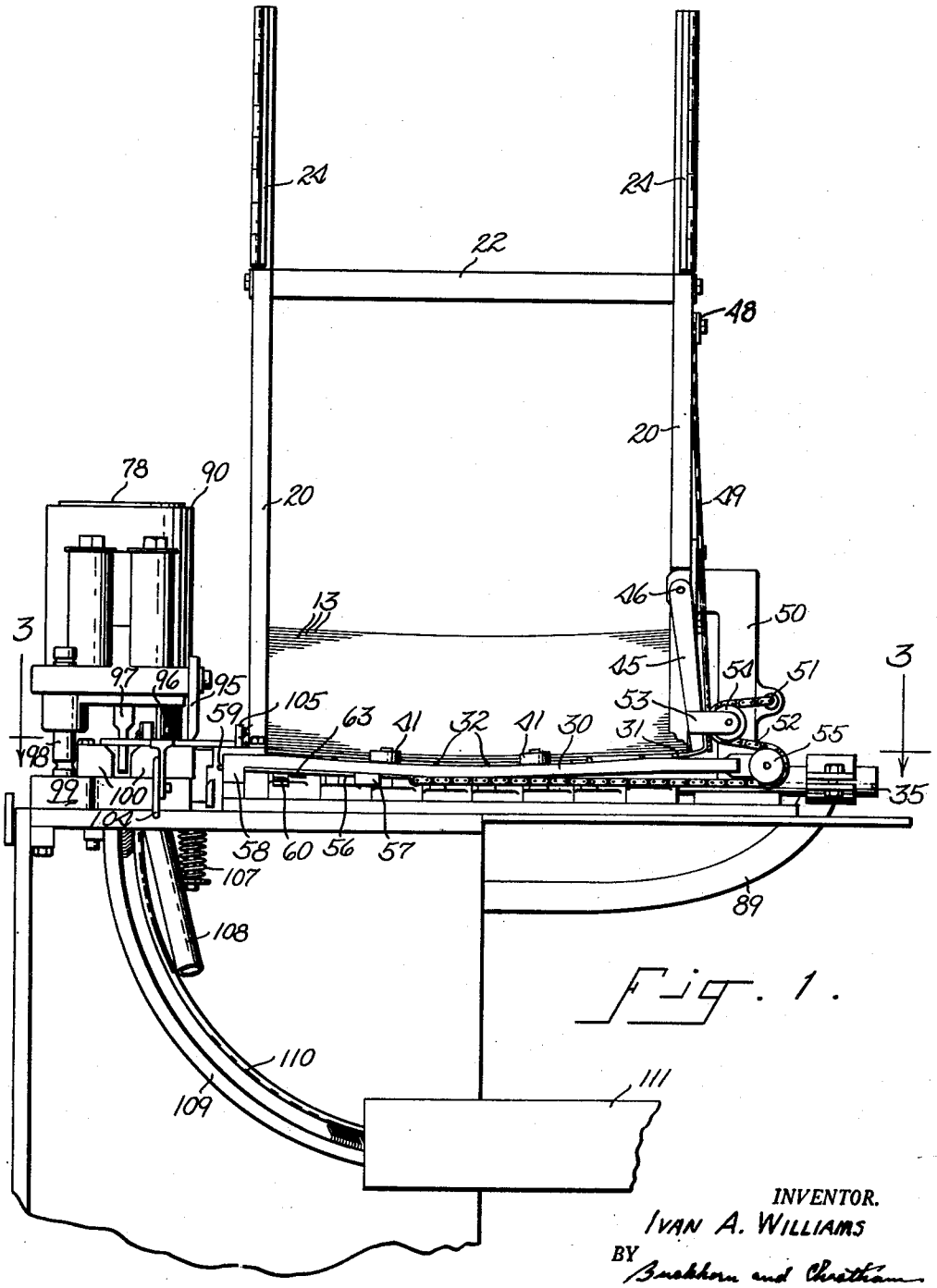


Fig. 1.

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Filed Jan. 8, 1949 4 Sheets-Sheet 2

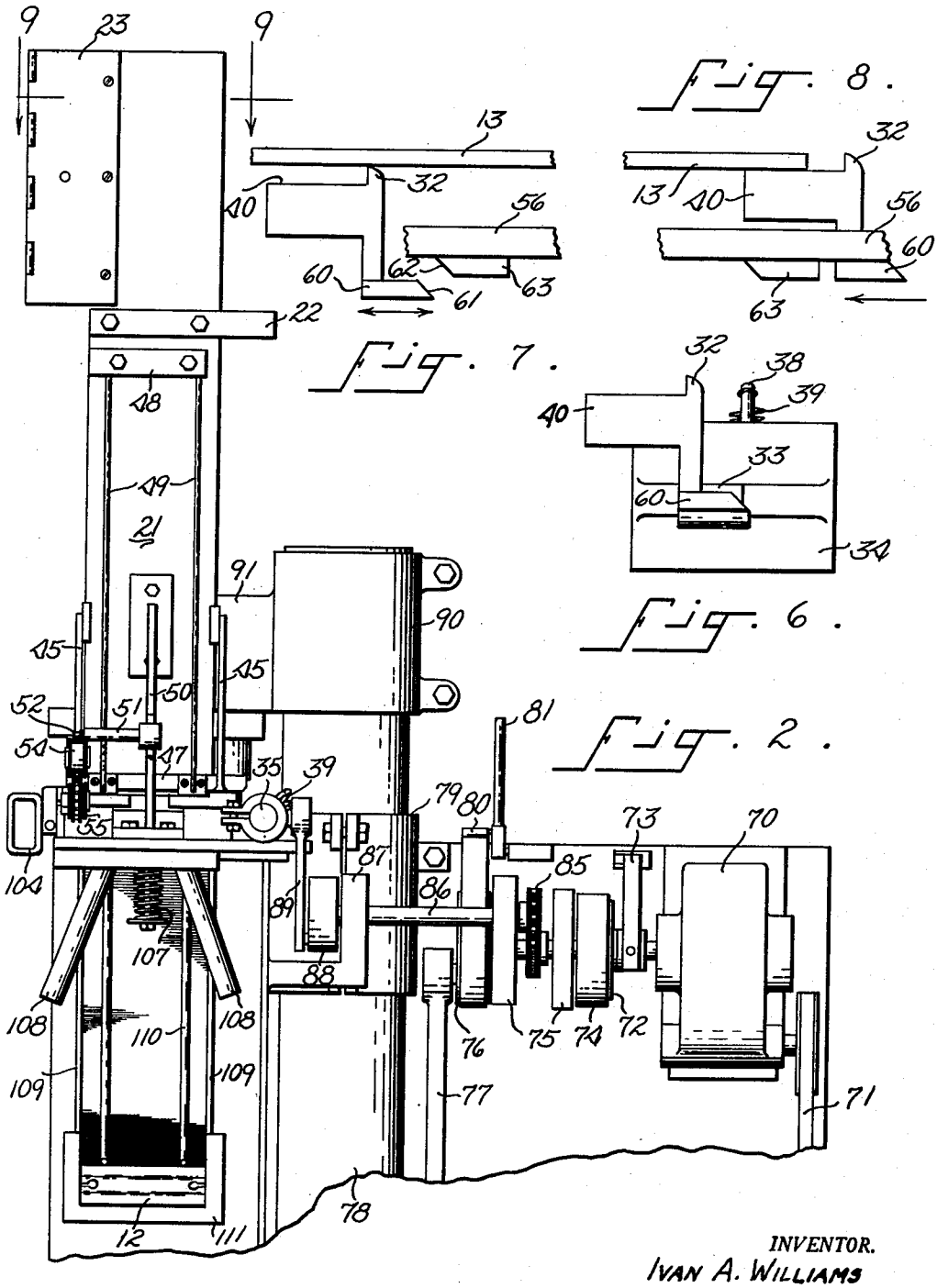


Fig. 7.

Fig. 8.

Fig. 6.

Fig. 2.

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BAG HANDLE FEEDING MACHINE

Filed Jan. 8, 1949 4 Sheets-Sheet 3

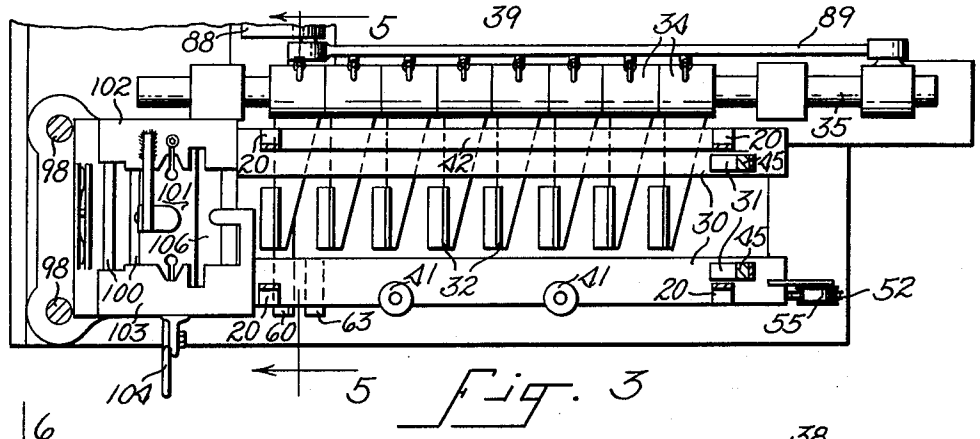


Fig. 3

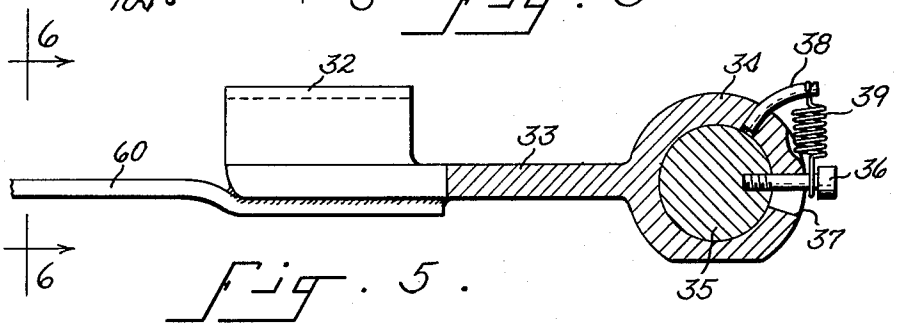


Fig. 5.

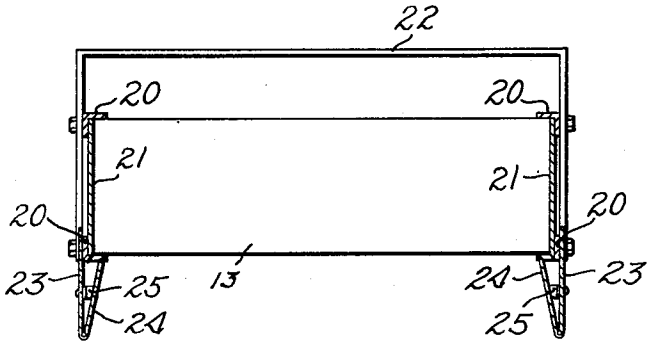


Fig. 9.

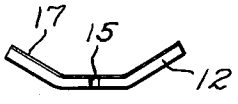


Fig. 11.

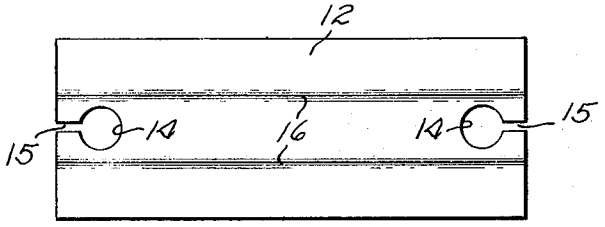


Fig. 10.

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BAG HANDLE FEEDING MACHINE

Filed Jan. 8, 1949 4 Sheets-Sheet 4

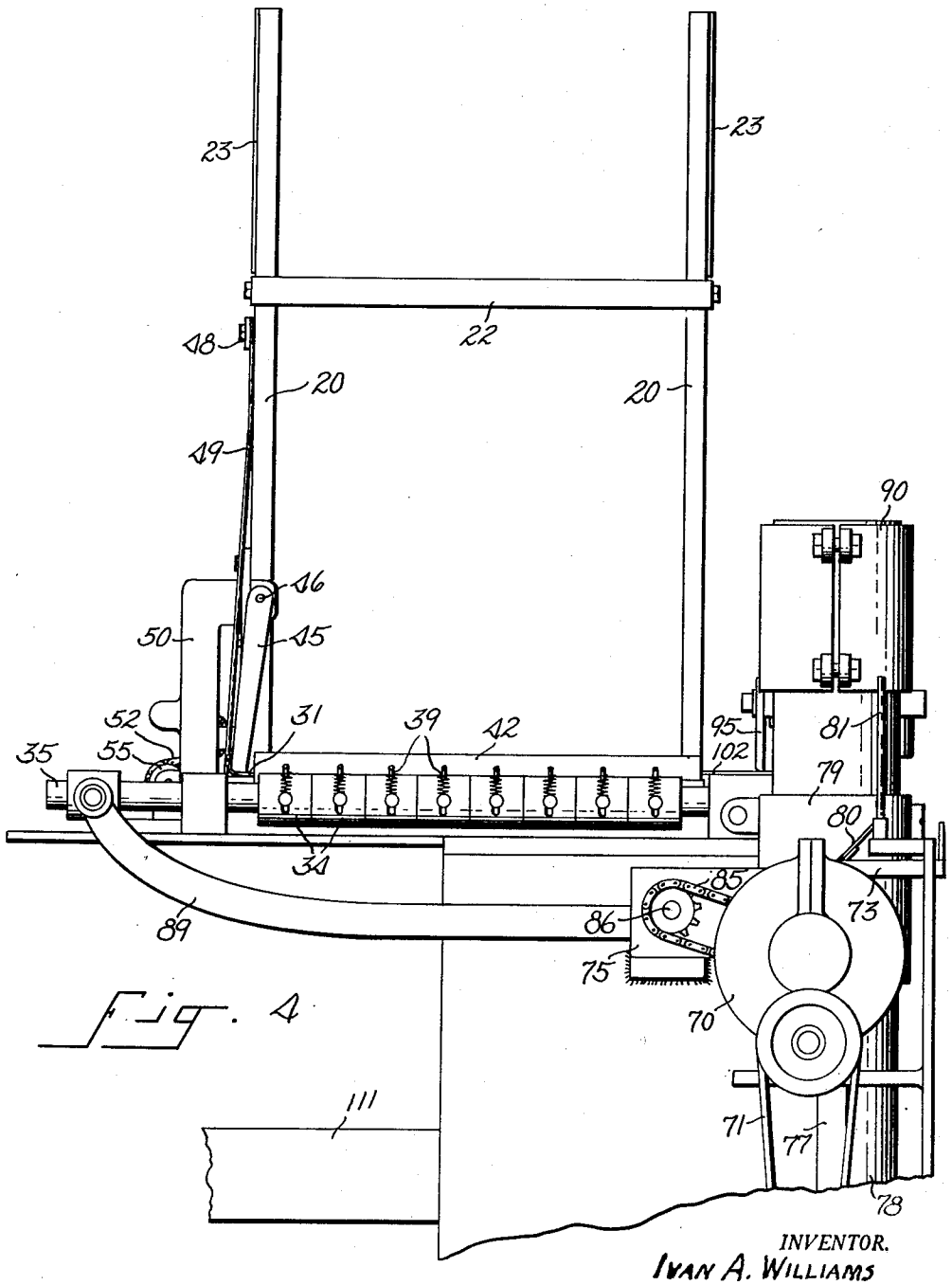


Fig. 4

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UNITED STATES PATENT OFFICE

2,534,893

BAG HANDLE FEEDING MACHINE

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Application January 8, 1949, Serial No. 69,886

7 Claims. (Cl. 271—44)

1

The present invention comprises a machine for performing repeated operations on strip material such as would be required to punch articles from strips of metal, cardboard, wood, or other materials which may be so formed. The particular embodiment of the invention herein illustrated is designed for the production of shopping bag handles from strips of cardboard, pasteboard, or similar materials, but it is not to be construed as being limited thereto. Handles formed in accordance with the present machine are illustrated and claimed in the patent to Crary, No. 2,215,116, dated September 17, 1940.

A principal object of the present invention is to provide means for feeding strips of material step by step from the bottom of a stack into punching or other forming apparatus.

A further object of the present invention is to provide a feeding means of the character previously described which will operate upon sheets of material which are so formed as to be permanently curved. Such strips in the particular application of the invention comprise short strips or sheets of pasteboard which are cut from a longer strip which has been rolled into a tight roll thus imparting a permanent set to the material. When a plurality of such sheets are stacked upon each other the center of the lowermost sheet of the stack is considerably below the ends thereof so that a conventional feeding mechanism cannot be employed. The principal object of the present invention is to provide means whereby the feeding mechanism may accommodate itself to the curvature of the strips within a range of curvatures.

A further object of the present invention is to provide feeding mechanism of the character described which will positively insure the feeding of successive strips in abutting relationship to each other. In accordance with the present invention, a plurality of dogs each successively engage one strip to perform the step feeding operations, and a finger is brought into action to initiate movement of a succeeding strip when the last of the series of dogs is operating upon the first strip.

The foregoing and other objects and advantages of the present invention will be more readily apparent from inspection of the following specification taken in connection with the accompanying drawings wherein like numerals refer to like parts throughout, while the features of novelty will be more distinctly pointed out in the appended claims.

In the drawings:

Fig. 1 is a front elevation of a machine embodying the present invention;

Fig. 2 is an end elevation thereof;

Fig. 3 is a horizontal section taken substantially along line 3—3 of Fig. 1;

Fig. 4 is a rear elevation of the machine;

2

Fig. 5 is a vertical section, on an enlarged scale, through one of the feeding dogs and the arm upon which it is mounted, taken substantially along line 5—5 of Fig. 3;

Fig. 6 is a front end view of the feeding dog illustrated in Fig. 5;

Fig. 7 is a schematic front end view of a portion of the feeding apparatus including the feeding dog illustrated in Fig. 6, showing the action thereof when an intermediate portion of a strip is above the last feeding dog;

Fig. 8 is a view similar to Fig. 7 showing the action of the mechanism when the last feeding dog is in engagement with the trailing end of a strip;

Fig. 9 is a vertical section taken substantially along line 9—9 of Fig. 2;

Fig. 10 is a plan view of a handle formed by the present machine; and

Fig. 11 is an end view of the handle.

The present machine is designed to form handles 12 from strips of pasteboard or similar material 13. The strips 13 are of sufficient width so that handles 12 of the proper length may be provided when the strip is successively cut transversely. The portions which are cut from the strips are provided with a pair of holes 14 and connected slots 15 extending to the ends of the handles by means of which the cords of conventional paper shopping bags may be engaged in the holes 14. The strips are shaped by scoring the strips lengthwise along score lines 16 and bending the side edges upward to form a trough-like, rigid handle which will support the shopping bag cords in the central portion and which will be prevented from bending in the middle when held in the hand by the bracing effect of the upwardly bent side edges. The upper surface of each handle is preferably provided with a covering 17 of finished paper upon which printed matter may be placed so that the handles may act as advertising means. Either because of the usual practice of cutting the strips 13 from a lengthy, rolled-up strip of material, or because of the drawing effect of the adhered covering member 17, or for other reasons, the strips when supplied to the manufacturer of the handles are curved as illustrated in Fig. 1. Therefore, the central portion of a stack of strips which may be approximately twenty-four inches long is as much as three-fourths of an inch below the ends of the stack.

The machine of the present invention comprises vertical stack-guiding means including four vertical angle irons 20 adapted to embrace the corners of the stack. The front and rear spaces between the angle bars are preferably left open so that a stack may be manipulated between the angle bars, but the spaces at the ends are preferably closed by vertical sheets 21 so that the

ends of a stack will be maintained in vertical alignment. The sheets 21 preferably are slightly closer together toward the top of the guiding means than they are toward the bottom thereof so as to insure free downward movement of the stack once it has been positioned in the upper end of the guiding means. The angle irons 20 are mounted upon the standard of the machine and at an intermediate point thereof are braced by a C-shaped bar 22 which passes about the rear of the guiding means and is bolted to each of the four angle irons, the rear portion thereof preferably being spaced away from the rear angle irons so as to permit a hand to be inserted downwardly alongside of the stack. In order that a bundle of strips may be inserted in the guiding means, the upper ends of the front angle irons are cut away along the front faces thereof from the tops to a point adjacent the brace 22. Plates 23 are fixed to the corner angle irons and extend forwardly therefrom, terminating in hinge portions hingedly supporting hinged plates 24 which extend toward the stacking means. The plates 24 are beveled at their inner ends and the vertical sheets 21 are correspondingly beveled so that when the plates 24 are pressed toward the plates 23 the beveled ends are forced together so that the plates 24 form a continuation of the sheets 21. Leaf springs 25 are fixed to the plates 23 and thrust the plates 24 outwardly to the position shown in Fig. 9. However, the springs permit the plates to swing into alignment with the vertical sheets 21 when a stack of strips 13 is slid laterally between the plates 24. When the strips are arrested against the rear angle irons 20 the plates 24 swing outwardly to prevent the stack from toppling out of the guiding means and to hold the strips in vertical alignment until they pass below the cut-away portions of the front angle irons 20.

The lowermost strip of the stack rests upon a pair of bed rails 30 which extend substantially horizontally but are curved to conform to the average curvature of the strips being employed so that the rails 30 lie generally parallel to the strips 13 in the stack. The angle irons 20 are mounted upon the rails 30 and, as is seen in Fig. 3, the lowermost portions of the legs thereof which retain the stack against endwise movement are cut away so that the lowermost strip may be fed longitudinally from the stack toward the left end of Fig. 3 and in order that a pair of pusher fingers 31 may reciprocate alongside of the pair of angle irons at the right end of the stack in Fig. 3 to engage the rear end of the lowermost strip of the stack when it is desired that it be started on its step-by-step movement from beneath the stack. A plurality of feeding dogs 32 extend transversely of the space between the rails 30 in position to engage the rear edge of the lowermost strip when presented thereto in succession. Each of the dogs 32 projects upwardly from an arm 33 which underlies the rear rail 30 and extends laterally from a hub 34 pivotally embracing a longitudinally extending support 35 preferably in the shape of a large, round member. Each hub 34 is of the same length so that the dogs 32 are equidistantly spaced. The hubs are retained on the support 35 by bolts 36 screwed into threaded holes in the support and extending outwardly through vertical slots 37 in the hubs. An anchoring pin 38 projects rearwardly from an upper part of each hub to anchor one end of a spring 39 tensioned between the anchoring pin and the bolt 36 so that the arm is normally caused to extend horizontally, as seen in Fig. 5, with the bolt 36 engaging the upper end of the slot 37. However, each dog may independently move vertically to accommodate the curvature of the stack and also to compensate for the difference in elevation of various portions of the bottom of the stack as the lowermost strip is being fed step by step therefrom. The dogs 32 therefore may be depressed below the lowermost portion of the rails 30 and may, when the stack is entirely removed, all lie in horizontal alignment projecting above the ends of the rails 30. Each dog preferably is associated with a forwardly projecting support portion 40 on which the trailing end of a strip may rest while the dog 32 engages the rear edge of the strip. The support portions 40 are of considerable length so that the support 35 may be reciprocated a length greater than the distance between dogs so as to insure engagement of each dog successively with the trailing edge of the strip. The rear surfaces of the dogs are rounded, as seen in Fig. 6, so as to reduce the tendency of the dogs to retract a strip being fed forward, particularly when there are few strips in the stack. In order to maintain the strip in alignment a pair of guide wheels 41 are mounted on the front rail 30 and a side rail 42 is mounted on the rear rail 30.

The rearmost dog adjacent the fingers 31 will not pass to the rear of the stack when it is fully retracted, hence if it were not for other means for initiating movement of a bottom strip the dogs would reciprocate endlessly beneath the bottom of a stack without producing feeding movement. The initial movement of the bottom strip to bring it forward to a position such that the rearmost dog may engage its rear edge is accomplished by the fingers 31. These fingers are mounted upon the lower ends of arms 45 which extend upwardly and are pivoted to the rear angle irons 20 on pivot members 46, the arms being connected together for movement in unison by a rigid cross brace 47. A clamp 48 adjacent the C-brace 22 supports the upper ends of downwardly extending rod springs 49, the ends of which are prevented from slipping laterally by the heads of screws which retain the fingers 31 on the rocking frame provided by the arms 45 and cross brace 47. The rod springs 49 preferably comprise the arms of a U-shaped rod, but other types of spring return means may be substituted therefor. A vertical brace 50 extends from the frame of the machine upwardly to a point adjacent the pivots 46 and is connected to the plate 21 forming the rear end of the stacking mechanism, the brace being spaced from the rear of the stacking mechanism a sufficient distance to permit rocking of the cross brace 47. A chain attaching member 51 is mounted on the brace 50 and one end of a chain 52 is attached to the forward end thereof. A pulley support 53 extends rearwardly from one of the arms 45 and pivotally supports a first pulley 54 which is located between the chain attaching member 51 and the rear of the stack. A second pulley 55 is mounted adjacent and below the chain attaching member 51 on a fixed portion of the frame of the machine such as the forward rail 30. The chain 52 extends from the attaching member 51 forwardly and about pulley 54, then rearwardly and about pulley 55, then forwardly beneath the rail 30, and is attached to a slide 56 slidably mounted beneath the forward end of rail 30 and retained by guides 57 and 58 against lateral displacement. The forward tip 59 of the slide extends through the guide 58 and is so shaped as to prevent retraction of

the slide beyond a desired limit even though the spring rods 49 tend to retract the slide to a greater extent.

In order that the slide may be moved forward when desired to thus cause pulley 54 and the attached fingers 31 to move rearwardly, cooperating means are provided on the slide 56 and on the last dog in the series of dogs. The cooperating means comprises a projection 60 extending forwardly from the arm 33 of the last dog, as seen in Figs. 3 and 5. The rear edge of the projection 60 is provided with a cam face 61 (Fig. 7) which engages an oppositely disposed cam face 62 on an abutment 63 extending downwardly from the lower surface of the slide 56 so that on the rearward movement of the dog assembly the projection 60 will be caused to pass beneath the abutment 63 even though the last dog is elevated. As long as the strip 13 being fed forward is depressing the last dog 32 the vertical edges of the members 60 and 63 will clear each other when the dog assembly is moving forward as seen in Fig. 7. However, if the trailing edge of the strip 13 is located beyond the point to which the last dog 32 is retracted, then the spring 39 associated with the last dog will cause upward movement thereof to an extent sufficient to permit engagement of the vertical faces of the members 60 and 63 when the dog assembly moves forward. The extent of movement is such that the fingers 31 are retracted from beneath the rear edge of the stack, thus causing the rear of the stack to drop onto the end portions of the rails 30. At this position the rear edge of the lowermost strip may be engaged by the fingers 31 which push the lowermost strip forwardly a distance sufficient that the rearmost dog may engage the rear edge thereof. The proportioning of parts is such that the forward movement of the fingers 31 is accomplished while the dog assembly is moving toward the rear; therefore, an unbroken succession of strips will be fed in end-to-end relation to the operating mechanism.

In order to have a complete understanding of the instant machine, sufficient thereof is illustrated and described to explain the general characteristics thereof. The operating machine preferably comprises a frame upon which is mounted a reduction gear assembly 70. The gears thereof are driven by belt means 71 extending to a source of power (not shown). A shaft leading from the reduction gear assembly supports one element 72 of a clutch, the element 72 being under control of a shifting fork 73 from which a rod leads to a clutch lever conveniently located (not shown). The clutch element 72 may be shifted into engagement with a driven clutch member 74 mounted upon a driven shaft supported in a pair of brackets 75. The driven shaft supports a brakedrum 76 upon which is located an eccentric pin driving a main crank rod 77. The main crank rod 77 is pivotally connected to the lower end of a vertically reciprocating post 78 which is slidably guided in a bearing 79 mounted upon the frame. A brake band 80 extends about drum 76 and is connected to a brake lever 81 by means of which reciprocation of the post 78 may be quickly arrested when the clutch is disengaged. Other means well known in the art may be provided for controlling the clutch and brake, and automatic safety mechanism may be incorporated if desired. A sprocket chain 85 driven from the shaft which supports the brake drum drives an auxiliary shaft 86 suitably mounted in one of the supports 75 and in an auxiliary support 87. The free end of shaft 86 supports a crank 88 from which a connecting rod 89 extends to the rear end of the dog supporting rod 35. The dog assembly is therefore reciprocated in unison with the vertical reciprocations of the post 78.

A collar 90 on the upper end of the post 78 supports a forwardly extending bracket 91 upon which a knife and die assembly is mounted. The assembly comprises a knife 95 adapted to sever successive handle blanks from the strip. Forwardly thereof are punches 96 for forming the holes 14 and slots 15 in the blank, and forwardly therefrom is a forming die 97 adapted to bend the blank downwardly along the crease lines 16. The knife and die assembly is vertically guided by guide pins 98 extending through guide openings in a die bed block 99. The bed block supports the fixed bending members 100 and a die member 101 for cooperation with the punches 96. A fixed hold-down 102 is mounted upon the rear of the bed block and a removable hold-down 103 is mounted at the front thereof, the same being provided with a handle 104 by means of which it may be withdrawn, and the machine being provided with a latch 105 by means of which it is retained in operating position. The knife 95 cooperates with a knife block 106 which is vertically movable against the upward thrust of a spring 107, thus permitting the ends of the strip to move downwardly as the knife cuts a blank therefrom, and then forcing the end of the strip back against the lower surfaces of the hold-downs. Punching eliminator tubes 108 extend laterally and downwardly from beneath the holes in the dies where the openings 14 are formed so as to prevent the small discs punched from the blanks from blocking the delivery chute. The chute comprises spaced angle bars 109 and curved spring retainer rods 110 which lead the stack of nested blanks into a trough 111 from which they may be removed for packaging. It is to be appreciated that the details of the forming and delivery mechanism may be varied according to the teaching of the art in order that the same or other articles may be formed from the same or other types of material.

Having illustrated and described a preferred embodiment of the invention, it will be apparent to those skilled in the art that the invention permits of modification in detail and arrangement. I claim as my invention all such modifications as come within the true spirit and scope of the appended claims.

I claim:

1. Means to feed individual strips of material step by step in one direction from the bottom of a stack of strips, comprising a plurality of dogs engageable with the bottom of said stack, means reciprocating all of said dogs in said direction a distance slightly greater than the spacing between individual dogs, resilient means urging each of said dogs upwardly against the bottom of said stack, a movable member adapted in one position to retain the rearward edge of the lowermost strip in an elevated position, means associated with the foremost dog for withdrawing said member when the trailing edge of a strip is engaged by said foremost dog, and means for returning said movable member to its retaining position when said foremost dog is being retracted whereby the trailing edge of a succeeding strip is moved forwardly in position to be engaged by the rearmost dog.

2. A feeding mechanism for feeding a sheet of material step by step from the bottom of a stack of sheets, comprising a plurality of reciprocating dogs underlying the stack and equidistantly spaced in line in the direction of feeding, means to reciprocate said dogs in unison, resilient means urging each dog upwardly independently of the other dogs so that each dog may engage the trailing edge of a sheet in turn, a finger normally extending beneath the rear edge of the stack, and finger retracting mechanism operated by the one of said dogs adjacent the forward edge of the stack when it is elevated to engage the trailing edge of a sheet being fed from beneath the stack.

3. A feeding mechanism for feeding a sheet of material step by step from the bottom of a stack of sheets, comprising a plurality of reciprocating dogs underlying the stack and equidistantly spaced in line in the direction of feeding, means to reciprocate said dogs in unison, resilient means urging each dog upwardly independently of the other dogs so that each dog may engage the trailing edge of a sheet in turn, a finger normally extending beneath the rear edge of the stack, finger retracting mechanism operated by the one of said dogs adjacent the forward edge of the stack when it is elevated to engage the trailing edge of a sheet being fed from beneath the stack, and spring means to return said finger to its normal position while said one dog is being retracted whereby a succeeding sheet is moved forward in position to be engaged by the first in line of said dogs.

4. The combination set forth in claim 3 wherein said finger retracting mechanism comprises a slide arranged adjacent said one dog, a projection on said one dog, a chain attaching member located in a fixed position spaced from the rear of said stack, a first pulley fixed to said finger, a second pulley adjacent said chain attaching member, a chain extending from said chain attaching member forwardly about said first pulley, then rearwardly about said second pulley, and then forwardly to said slide, and means on said slide engageable by said projection when said one dog is elevated.

5. In a machine of the character described, a plurality of substantially aligned, horizontally reciprocating dogs, resilient means urging each of said dogs upwardly independently of the rest of said dogs, a finger movably mounted adjacent the first in line of said dogs, and means connecting the last in line of said dogs to said finger when said last in line dog is elevated for causing simultaneous movement of said finger and said dogs.

6. In a machine of the character described, a plurality of substantially aligned, horizontally reciprocating dogs, resilient means urging each of said dogs upwardly independently of the rest of said dogs, a finger movably mounted adjacent the first in line of said dogs, and means connecting the last in line of said dogs to said finger when said last in line dog is elevated for causing simultaneous movement of said finger and said dogs, said means comprising a movement reversing device whereby said finger and said dogs move in opposite directions.

7. In a machine of the character described, a plurality of substantially aligned, horizontally reciprocating dogs, resilient means urging each of said dogs upwardly independently of the rest of said dogs, a finger movably mounted adjacent the first in line of said dogs, means connecting the last in line of said dogs to said finger when said last in line dog is elevated for causing simultaneous movement of said finger and said dogs, said means comprising a movement reversing device whereby said finger and said dogs move in opposite directions, and a spring for returning said finger while said dogs are being retracted.

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