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CARTON CREASING AND CLOSING MACHINE

Filed Jan. 12, 1946

2 SHEETS—SHEET 1

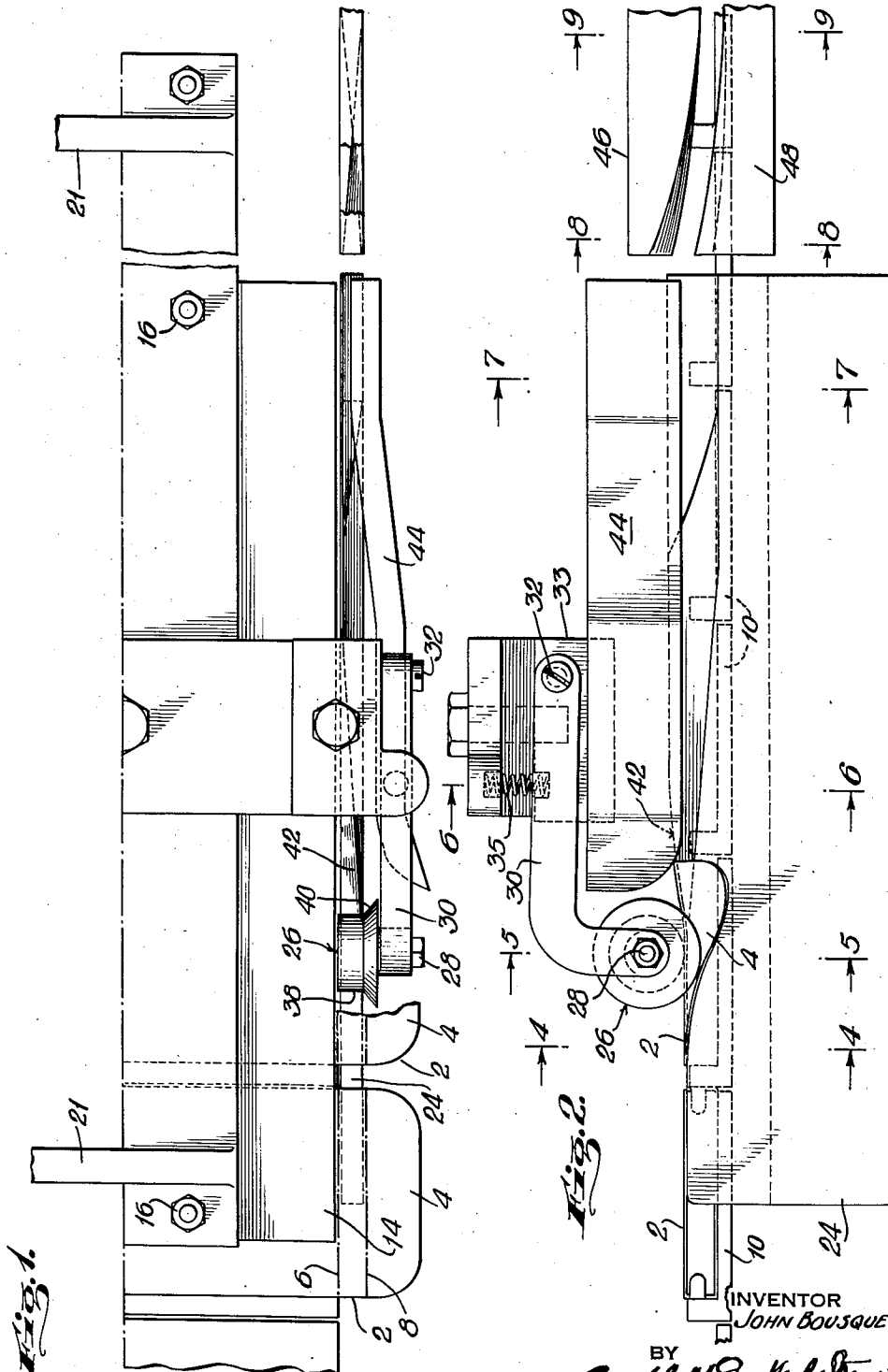


Fig. 2

Fig. 1

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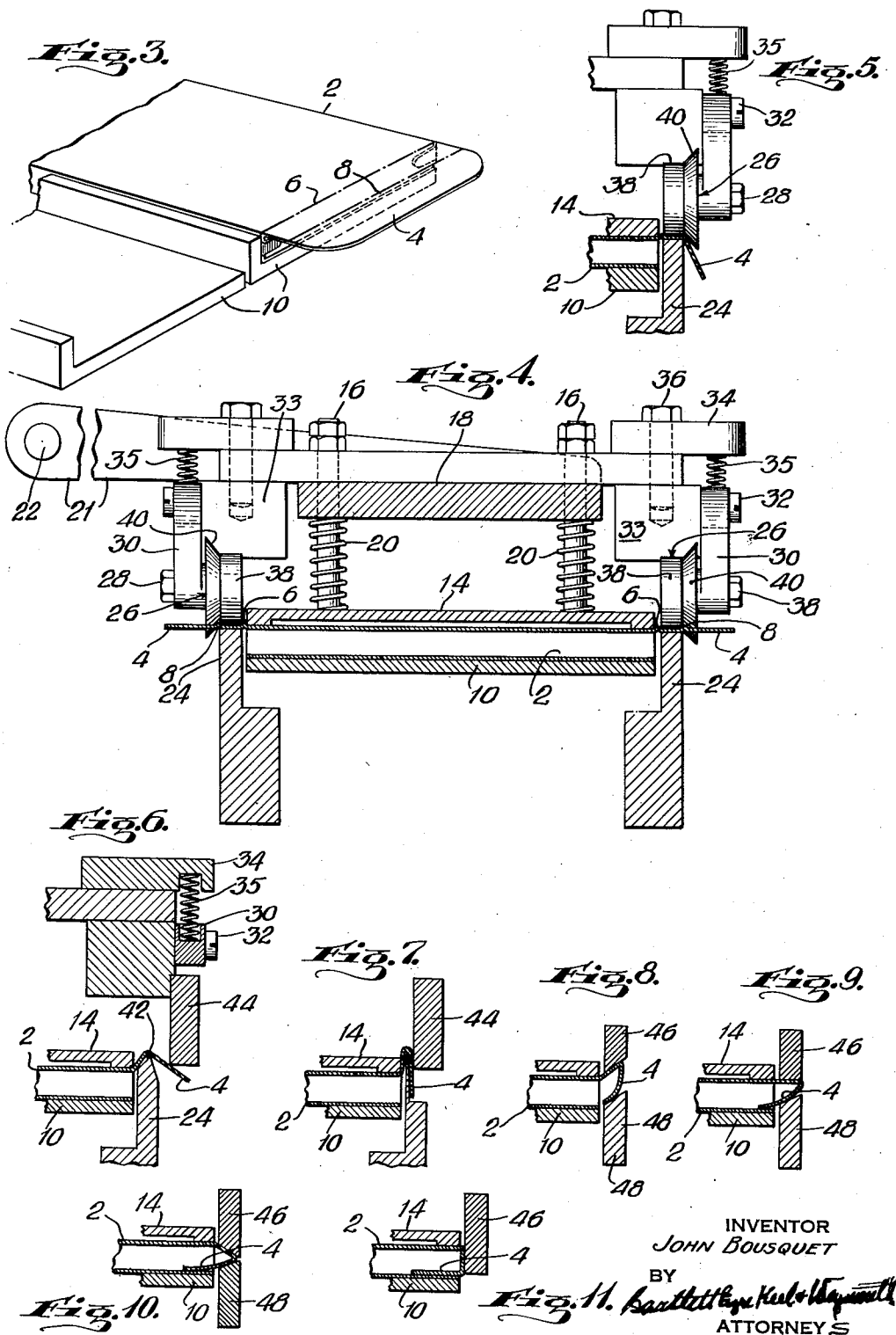
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2 SHEETS—SHEET 2



UNITED STATES PATENT OFFICE

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CARTON CREASING AND CLOSING MACHINE

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2 Claims. (Cl. 93—36)

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The present invention relates to machines for closing filled cartons or boxes, and particularly boxes for packaging candy-coated gum such as five cent boxes of "Beechies."

Boxes of this type are provided with closure flaps that are folded into the ends of the boxes after the boxes are filled. With the machines at present in general commercial use for closing such boxes, considerable difficulty has been experienced because of failure of the machines to properly fold in the closure flaps.

The principal object of the present invention is to provide novel and improved devices in a box-closing machine for folding in the end flaps of boxes of the character indicated.

The several features of the invention, whereby this and other objects may be attained, will be readily understood from the following description and accompanying drawings, in which:

Figure 1 is a plan view of a portion of a box-closing machine embodying the features of the invention in their preferred form;

Fig. 2 is a side view of the same;

Fig. 3 is a detail view in perspective of a portion of the box conveyor of the machine, a portion of a box with one of its closure flaps open being shown in position on the conveyor.

Fig. 4 is a vertical sectional view, taken substantially on the line 4—4 of Fig. 2;

Fig. 5 is a sescctional elevation, taken substantially on the line 5—5 of Fig. 2;

Figs. 6, 7, 8, and 9 are detail sectional views, respectively, taken substantially on the lines 6—6, 7—7, 8—8, and 9—9 of Fig. 2; and

Figs. 10 and 11 are views similar to Figs. 6, 7, 8 and 9 but illustrating the final steps of inserting the outer portions of the flaps into the box.

The machine illustrated in the drawings is particularly adapted for use in closing the ends of boxes 2 which are provided with closure flaps 4 projecting from the ends of one of the side walls of the boxes. As shown, the closure flaps 4 are provided with score lines 6 which are arranged adjacent the ends of the box, and score lines 8 which are spaced a distance therefrom corresponding substantially to the width of the box.

The boxes may be fed through the machine by means of a conveyor which comprises open ended trays 10, each tray being adapted to receive a box with the closure flaps 4 thereof projecting laterally. As the boxes are thus fed through the machine, they pass beneath a downwardly spring-pressed plate 14 which serves to hold each

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of the boxes down on the bottom wall of its tray. The plate 14 is secured on the lower ends of bolts 16 which are mounted to slide in apertures in a head or block 18, the plate 14 being pressed downwardly by means of springs 20 coiled about the bolts 16 and interposed between the block 18 and the plate. The block 18 together with the plate 14 may be swung upwardly out of the way to permit access to the cartons in the trays, and for this purpose it is provided with projecting arms 21 which are pivotally mounted on a rod 22.

In accordance with the present invention, as the boxes are fed beneath the spring-pressed plate 14, the end closure flaps thereof ride on rails or folding members 24, and then beneath downwardly spring-pressed rollers 26. These rollers are mounted to turn on a pin or bolt 28 on the ends of arms 30 which are pivoted on cap screws 32 secured to a bracket member 33 on the block 18. The arms 30 are individually yieldingly pressed downward by means of coiled springs 35 which are interposed between the arms and bracket members 34, the two bracket members 33 and 34 being secured to the block 18 by means of bolts 36.

Each of the rollers 26 is provided with a cylindrical surface portion 38 which is adapted to engage the portion of the end flap of the box between the score lines 6 and 8 so as to firmly press this portion of the flap upon the associated rail or folding member 24. The roller 26 is further provided with an outwardly beveled surface portion 40 which as the box flap passes beneath the roller serves to sharply bend the outer portion of the flap on the score line 8 over the outer edge of the folding member 24 (Fig. 5).

As the flaps of each box pass from beneath the rollers 26, they ride up over inclines 42 on the folding members 24 and beneath a folding member 44 which serves to bend the flaps upwardly on the score line 6 and to bend the outer portions of the flaps downwardly on the score line 8 (Fig. 6). During the continued movement of the boxes, the folding members 24 and 44 further act on the flaps to bend them upwardly into the folded positions shown in Fig. 7, in which position the outer ends of the flaps are positioned slightly above the inner surface of the lower side wall of the box. As the flaps leave the folding members 24 and 44, they pass between folding members 46 and 48 which fold the inner portions of the flaps downwardly and the outer portions of the flaps inwardly to the position shown in Fig. 8. Such folding of the flaps

is continued until the inner portions of the flaps reach a substantially horizontal position and the outer portions of the flaps have entered the box as shown in Fig. 9. During the further continued movement of the box these folding members complete the insertion of the outer portion of the flaps into the box as illustrated in Figs. 10 and 11, thus completing the closing of the ends of the box.

It has been found that by thus accurately starting the fold by means of the rollers 26 and the associated folding members, that the subsequent folding and tucking-in operations may be uniformly and accurately performed so as to properly close the boxes.

As will be evident to those skilled in the art, my invention permits various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. In a machine for closing boxes having closure flaps projecting from the ends of one of the side walls thereof, each of the flaps being scored on parallel lines with one of the score lines arranged adjacent the associated end of the box, and the other score line spaced outwardly therefrom a distance corresponding to the width of the interior of the box, the combination of means for feeding the boxes edgewise with said side wall uppermost, folding members over which the portions of the flaps between said score lines pass as the boxes are being fed with said flaps extending substantially in the plane of said side wall of the box, said folding members being in the form of rails having their top surfaces flat and having abrupt outer edges which register with said outer score lines of the box flaps as the boxes are fed over said folding members, rollers having cylindrical surfaces for pressing said portions of the side flaps downwardly upon said folding members, and having outwardly beveled surfaces for folding the outer portions of said flaps downwardly at an angle over the outer edges of the top surfaces of said folding members, and devices for thereafter tucking the end flaps into closing position in the ends of the boxes.

2. In a machine for closing boxes having closure flaps projecting from the ends of one of the side walls thereof, each of the flaps being scored on parallel lines with one of the score lines arranged adjacent the associated end of the box and the other score line spaced outwardly therefrom a distance corresponding to the width of the interior of the box, the combination of means for feeding the boxes edgewise with said side wall uppermost, folding members over which the portions of the flaps between said score lines slide as the boxes are being fed with said flaps extending substantially in the plane of said side wall of the box, said folding members being in the form of rails having their top surfaces flat and having abrupt outer edges which register with said outer score lines of the box flaps as the boxes are fed over said folding members, rollers having cylindrical surfaces for pressing said portions of the side flaps downwardly upon said folding members, and having outwardly beveled surfaces for folding the outer portions of said flaps downwardly at an angle over the outer edges of the top surfaces of said folding members, and means for then bending the inner portions of said side flaps upwardly on their inner score lines and their outer portions downwardly on their outer score lines to arrange said portions substantially in vertical position with the outer edges of the flaps above the other side wall of the box, and for then bending the flaps downwardly on their inner score lines while folding the outer portions of the flaps into the ends of the box.

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