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R. J. HENNESSEY
CARTON PACKING CONSTRUCTION

2,570,946

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2 Sheets-Sheet 1

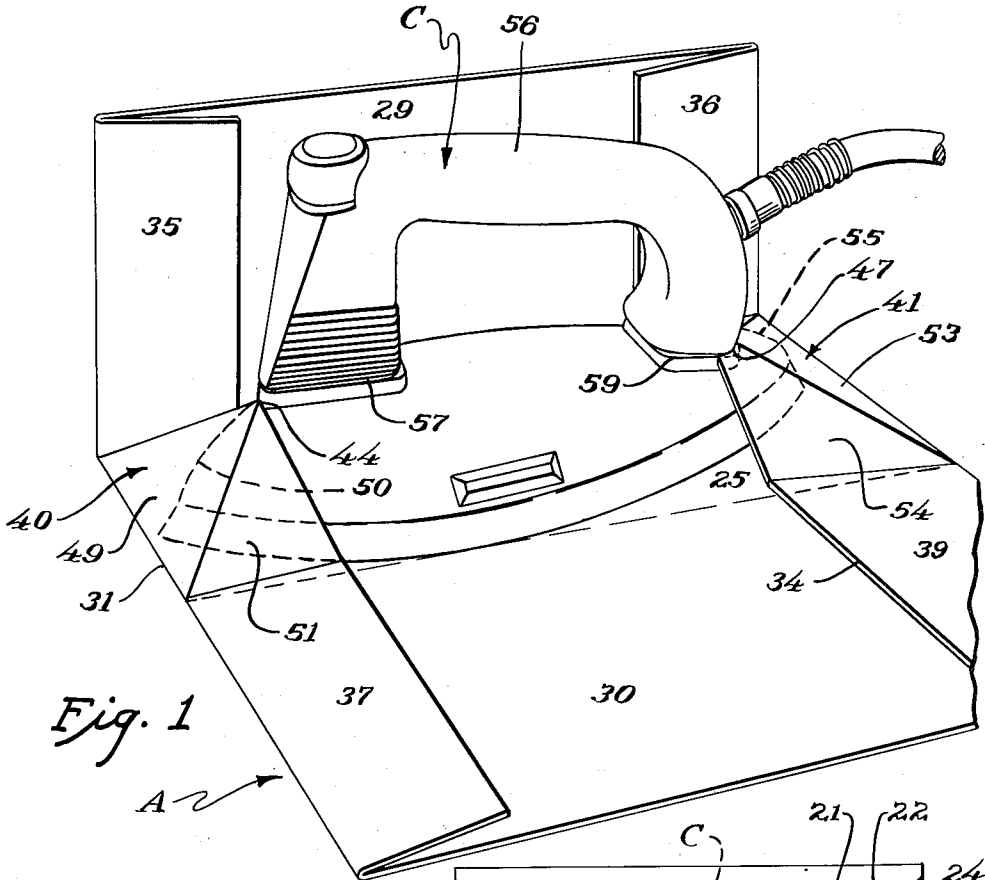


Fig. 1

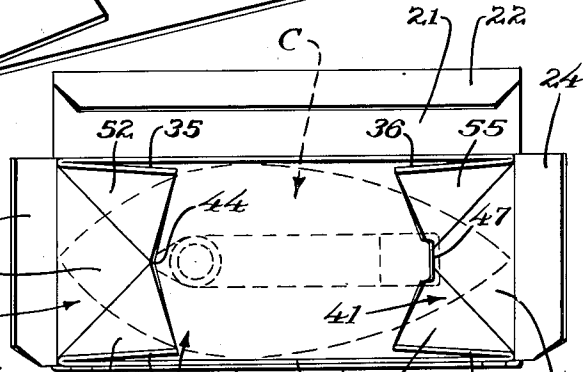


Fig. 3

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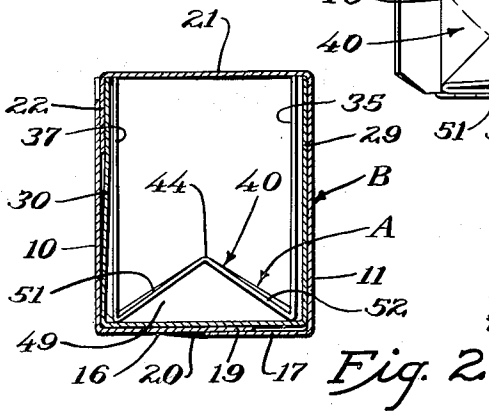


Fig. 2

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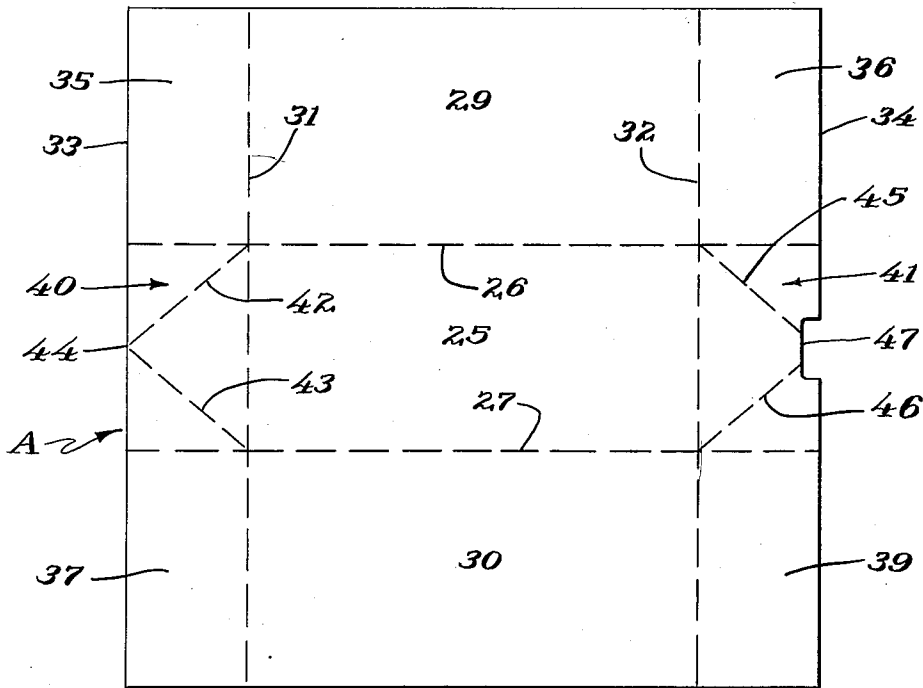


Fig. 4

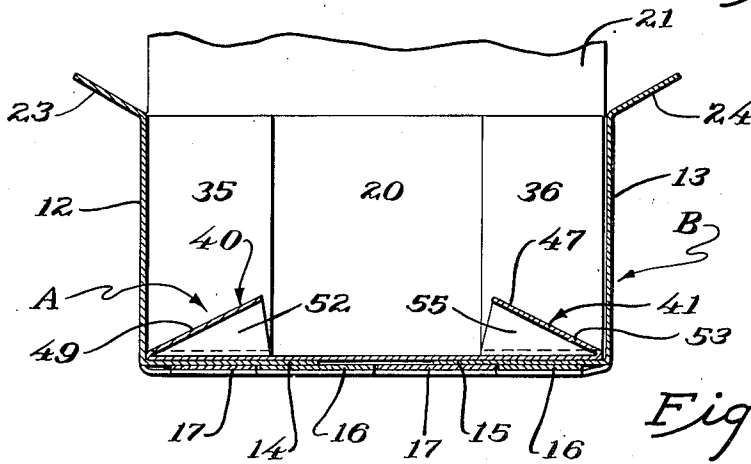


Fig. 5

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UNITED STATES PATENT OFFICE

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CARTON PACKING CONSTRUCTION

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9 Claims. (Cl. 229—14)

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My invention relates to an improvement in carton packing construction and deals particularly with a simple type of packing which has proven extremely effective in holding heavy articles such as electric flat irons or the like in position during handling and shipment.

Considerable difficulty is experienced in packing heavy articles such as electric irons and the like in preventing the articles from being broken during shipment. The bases of the irons are usually heavy and solid and do not require much protection. However, the handles of the irons are often made of plastic and other material which may be easily broken if a sharp blow or force is exerted thereagainst. For example if the iron is dropped while in inverted position the weight of the iron will often cause damage or breakage to the handle. Furthermore the iron handles often support the electrical controls for the iron and these controls are also relatively fragile and break if subjected to a sharp blow.

The object of the present invention lies in providing a simple packing for use within a carton or container and protecting the portion of the iron above the heavy base thereof. The packing is so arranged as to hold the base of the iron against the bottom wall of the carton and thus to support the handle of the iron in spaced relation to the carton walls. Thus if the carton is dropped or subjected to hard handling the relatively fragile upper structure of the iron is protected from damage.

A feature of the present invention lies in the provision of a generally U-shaped packing member having a base and substantially parallel side walls. Means are provided for holding the base of the iron against the base of the packing pad and means are also provided for urging the parallel sides of the packing against opposite walls of the carton. The vertical side walls of the packing therefore act not only to reinforce the sides of the carton or container against which they rest, but also act to withstand the force of a weight dropping upon the carton or to withstand the weight of the iron in the event the carton is dropped while the iron is in an inverted position.

An added feature of the present invention lies in the provision of a simple pad which holds the iron from longitudinal movement within the carton. The pad is formed of fiber, heavy paper board or the like. The pad includes end folds which are folded to overlie portions of the ends of the various pad panels. Diagonal crease

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lines are provided extending from the corners of the folds at the juncture between the ends of the bottom panel and the side wall panels, these diagonal fold lines extending toward the center of the folds overlying the bottom panel. When the side wall panels are folded into parallel relationship, the thickness of the pad and the resistance to folding of the pad cause the center part of the fold overlying the bottom panel to fold upwardly along the diagonal fold lines thus producing a tapered recess between the fold and the bottom panel into which the ends of the iron may engage.

An added feature of the present invention lies in folding a pad of fiber board or heavy cardboard so that the portion of the fold overlying the bottom panel buckles upwardly to accommodate the iron ends and to provide continuations of the fold which extend vertically on opposite sides of the iron to hold the ends of the iron against the bottom panel. The vertically extending portions of the fold securely hold the center part of the fold in proper relation to the bottom panel and the iron is firmly locked against the bottom panel of the pad.

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of my specification:

Figure 1 is a perspective view of the pad with an iron in position thereupon, one side of the pad being folded upwardly as it would appear while in the carton and with the other side of the pad folded downwardly into the plane of the pad bottom panel.

Figure 2 is a sectional view centrally through a carton and through the pad showing the position of the pad in the carton with the iron removed.

Figure 3 is a top plan view of the carton and the pad therein, the view indicating the location of the iron in dotted outline.

Figure 4 is a plan view of the pad in unfolded form.

Figure 5 is a longitudinal section through the carton with the iron removed.

The pad A is designed for accommodation into a carton B and is specifically shown in use in holding an iron C in proper position within the carton.

The carton B may be of any desired form of construction capable of containing the iron and the packing pad A. As shown in the drawings

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the carton B includes a front wall 10, a rear wall 11, and end walls 12 and 13. Flaps are provided on the lower edges of the carton walls, these flaps being folded inwardly as indicated in Figures 2 and 5 of the drawings to form a bottom wall of suitable design. In the particular form of construction illustrated the end walls 12 and 13 are provided with integral bottom flaps 14 and 15 respectively, which fold into substantially coplanar relationship. The front and rear walls 10 and 11 are provided with bottom flaps 16 and 17 respectively which are provided with overlapping locking tongues 19 and 20 which form a lock bottom. If preferred the bottom closure could be glued or otherwise sealed.

A cover panel 21 is foldably connected to the rear wall panel 11 and a tuck flap 22 is hingedly secured to the free edge of the cover panel 21. This tuck flap 22 normally tucks between the front wall 10 of the carton and the adjacent wall of the pad A so as to form a normally closed carton. Short flaps 23 and 24 are foldably connected to the upper extremities of the ends walls 12 and 13. These short flaps 23 and 24 are usually hinged down over the upper extremity of the pad A and are held in place by the cover panel 21.

As indicated in Figure 4 of the drawings the pad A includes a bottom panel 25 which is hingedly connected along parallel fold lines 26 and 27 to pad side walls 29 and 30. The ends of the bottom panel 25 and the side wall panels 29 and 30 are defined by parallel fold lines 31 and 32 spaced from the edges 33 and 34 of the pad. This arrangement provides integral side wall flaps 35 and 36 connected to opposite ends of the side wall panel 29. Similar side wall flaps 37 and 39 are connected to opposite ends of the side wall panel 30. Flap structures indicated in general by the numerals 40 and 41 are hingedly connected to opposite ends of the bottom panel 25. The side wall flaps are connected to the bottom flap structure along extensions of the fold lines 26 and 27. A diagonally extending fold line 42 extends from the juncture of the fold lines 26 and 31 to a mid-point on the free edge 33 of the flap structure 40. A similar diagonal fold line 43 extends between the juncture of the fold lines 27 and 31 to the same mid-point 44 of the flap structure 40. A similar diagonal fold line 45 extends from the juncture of the fold lines 26 and 32 toward an intermediate point on the free edge 34 of the flange structure 41. A diagonal fold line 46 likewise extends from the juncture of the fold lines 27 and 32 toward a mid-point of the free edge 34 of the flange structure 41. A notch 47 is provided in the free edge 34 of the carton extending on either side of the mid-point of the flange structure 41. This notch is arranged to extend on opposite sides of the handle of the iron as will be later described in detail to assist in holding the iron from twisting or from side movement. A similar notch could be provided in the free edge 33 if desired, but such a notch has been found unnecessary in the particular arrangement disclosed.

The pad A is preferably formed of fiberboard or heavy card board which is at least $\frac{30}{1000}$ of an inch thick and preferably somewhat thicker. This board tends to resist folding and has a natural springiness which tends to cause the stock to return to flat form. The first step of forming the pad into bracing relation is to fold the pad upon the fold lines 31 and 32. While

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the panels 29 and 30 are in the same plane as the bottom panel 25, the folded ends of the pad outwardly of the fold lines 31 and 32 may rest substantially flat upon the center portion of the pad. However, because of the thickness of the stock the flap structure 40 and 41 overlying the bottom panel 25 could not remain flat after the panels 29 and 30 were folded upwardly into parallel relationship as the distance between the panels 29 and 30 is less than the width of the flap structures 40 and 41. Thus if the diagonal fold lines described herein were not employed the flap portions 40 and 41 would buckle upwardly as the walls 29 and 30 were bent into parallel relation in order to compensate for the thickness of the stock of which the pad is made. By providing the diagonal fold lines described the applicant simplifies the folding process and permits the intermediate flap structure 40 and 41 overlying the bottom panel 25 to fold upwardly into end pockets which may accommodate the pointed ends of the iron C.

As illustrated in the various figures of the drawings, the flap structure 40 includes a triangular area 49 which extends at an upwardly inclined angle from the fold line 31 to the flap structure mid point 44 overlying the pointed forward end 50 of the iron C. The flap structure 40 also includes an opposite pair of triangular panels 51 and 52 which incline upwardly and inwardly from the fold lines 26 and 27 to the flap structure mid point 44. Thus in effect the flap structure 40 forms one-half of a pyramidal structure which forms a secure pocket for enclosing the forward end 50 of the iron.

The flap structure 41 also includes a triangular area 53 which extends upwardly and inwardly from the fold line 32 at the end of the bottom panel 25 toward the mid point of the free edge 34 of the flap structure. The flap structure 41 also includes a pair of upwardly and inwardly inclined triangular areas 54 and 55 which incline upwardly and inwardly from the fold lines 26 and 27 to the mid point of the free edge 34 of the flap structure 41. Thus the flap structure 41 also forms substantially one-half of a pyramid for accommodating the sloping rear end 55 of the iron C.

The handle 56 of the iron C comprises a substantially inverted U-shaped body connected at its forward end 57 to the body of the iron and also connected at its rear end 59 to the body of the iron. The notch 47 extends on opposite sides of the handle 56 at its connected end 59, thus preventing lateral movement of this end of the iron. The shape of the forward part of the iron is such that the triangular areas 51 and 52 engage the iron body and hold it from lateral movement. However, if desired a notch similar to the notch 47 could be provided to engage the handle end 57.

It will be noted that as the side wall flaps 35, 36, 37, and 39 are connected to the side wall panels 29 and 30 along parallel lines of fold, the upper edge of these flaps in folded condition will be on the same plane as the upper edges of the side wall panels 29 and 30. Similarly the lower ends of these flaps connected by the fold lines 26 and 27 to the flap structures 40 and 41 rest upon the upper surface of the bottom panel 25. Because of the upward bulging of the center portion of the flap structures 40 and 41, the flaps 35, 36, 37, and 39 may be slightly spaced from the wall panels when the pad A is in place. These flaps engage against the top panel 21 of the car-

ton and against the top flaps 23 and 24 of the carton and hold the fold lines between the flaps and the flap structures 40 and 41 against the upper surface of the bottom panel 25. Thus when the carton B is closed the pockets at opposite ends of the bottom panel can not increase or decrease in size or shape. As a result the ends of the iron C are firmly held against the bottom panel 25 and the iron is held from longitudinal or lateral movement with respect thereto.

The side wall panels 29 and 30 are slightly higher than the handle 56 of the iron so that the handle is spaced from the top panel 21 when the carton B is closed. The iron is firmly held by the pad A from twisting or from movement away from the pad 25 and therefore the handle 56 is effectively protected from injury during the handling or shipment.

I have found that my pad structure has been extremely effective in protecting irons during handling and shipment and that very little breakage has resulted from these operations. Weight placed upon the top of the carton is resisted not only by the carton walls, but by the side walls of the pad and by the side flaps thereof. The side panels 29 and 30 engage against the opposite side walls of the carton and reinforce the same. The handle is substantially spaced from the end walls of the carton and therefore can not readily be damaged from these directions. As the top of the iron handle is spaced from the top of the carton it is necessary to flex the top of the carton inwardly a considerable distance before damage to the handle may occur. Such inward flexing requires the distortion of others of the carton walls as well as the pad and as a result the iron is effectively protected.

In accordance with the patent statutes, I have described the principles of construction and operation of my carton packing construction and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A pad for use in a rectangular carton, the pad comprising a body of thick sheet material including a bottom panel and a pair of substantially parallel side wall panels, foldably connected flaps on an end of the side walls and bottom panel, said flaps being connected with each other along lines of fold, the flap overlying the bottom panel being bulged upwardly at its center in spaced relation to the bottom panel to form a pocket, the lines of fold between the flaps resting on said bottom panel.

2. The structure described in claim 1 and including diagonally extending fold lines in the flap foldably connected to the bottom panel, the diagonal fold lines extending inwardly from the juncture between the bottom panel and the side wall panels toward the center of this flap.

3. A pad for use in a rectangular carton, the pad including a sheet of relatively heavy paper board or the like folded along a line spaced from one end of the pad to form a connected flap structure, the pad including fold lines at substantially right angles to the first mentioned line of fold dividing the pad into a bottom panel and a pair of side wall panels foldable into substantially parallel relationship, the portion of the flap structure overlying the bottom panel bulging upwardly at its center point away from the

bottom panel to form a pocket, the lines of fold in the flap structure lying in a substantially common plane.

4. The structure described in claim 3 and including a pair of diagonal fold lines converging from the juncture between the bottom panel and the side wall panels, toward the center point of the free edge of the flap structure portion overlying the bottom panel.

5. A pad for use in a substantially rectangular carton, the pad including a generally rectangular body of paper board or the like having a fold line spaced from one edge thereof and parallel thereto, and a pair of fold lines at right angles to the first mentioned fold line for dividing the portion of the body on one side of the first mentioned fold line into a bottom panel and side wall panels, the portion of the pad between the spaced fold lines and on the other side of the first mentioned fold line being divided into three generally triangular areas by diagonal fold lines extending from the juncture between the first mentioned fold line and the spaced fold lines, and a mid point on the free edge of the pad, said triangular areas being foldable into semi-pyramidal form above the bottom panel.

6. A packing pad for use in conjunction with a rectangular carton, the pad including a generally rectangular body including a pair of substantially parallel fold lines spaced from and parallel to, opposite side edges of the body, a second pair of fold lines extending in right angular relation to the first mentioned fold lines and dividing the body into a center portion and two substantially similar outer portions, the portions of said center portion of the body outwardly of the first mentioned fold lines being divided into three triangular areas, foldable into semi-pyramidal form above said center portion.

7. A pad for use in a generally rectangular carton including a body of paper board folded to provide a bottom panel and a pair of generally parallel side wall panels, integral end flap structure at each end of said panels, each end flap structure including a pair of wall flaps hingedly connected to the wall panels and the bottom flap structure foldably connected to the bottom panel, said wall flaps being foldably connected to the bottom flap structure, said bottom flap structure being bulged upwardly into semi-pyramidal form from said bottom panel to form pockets.

8. The structure described in claim 7 and including diagonally extending fold lines in the bottom flap structure dividing the bottom flap structure into three connected triangular areas folded to produce a semi-pyramidal form.

9. The structure described in claim 7 and including a notch in one of said upwardly bulged portions at the uppermost portion of the bulge.

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