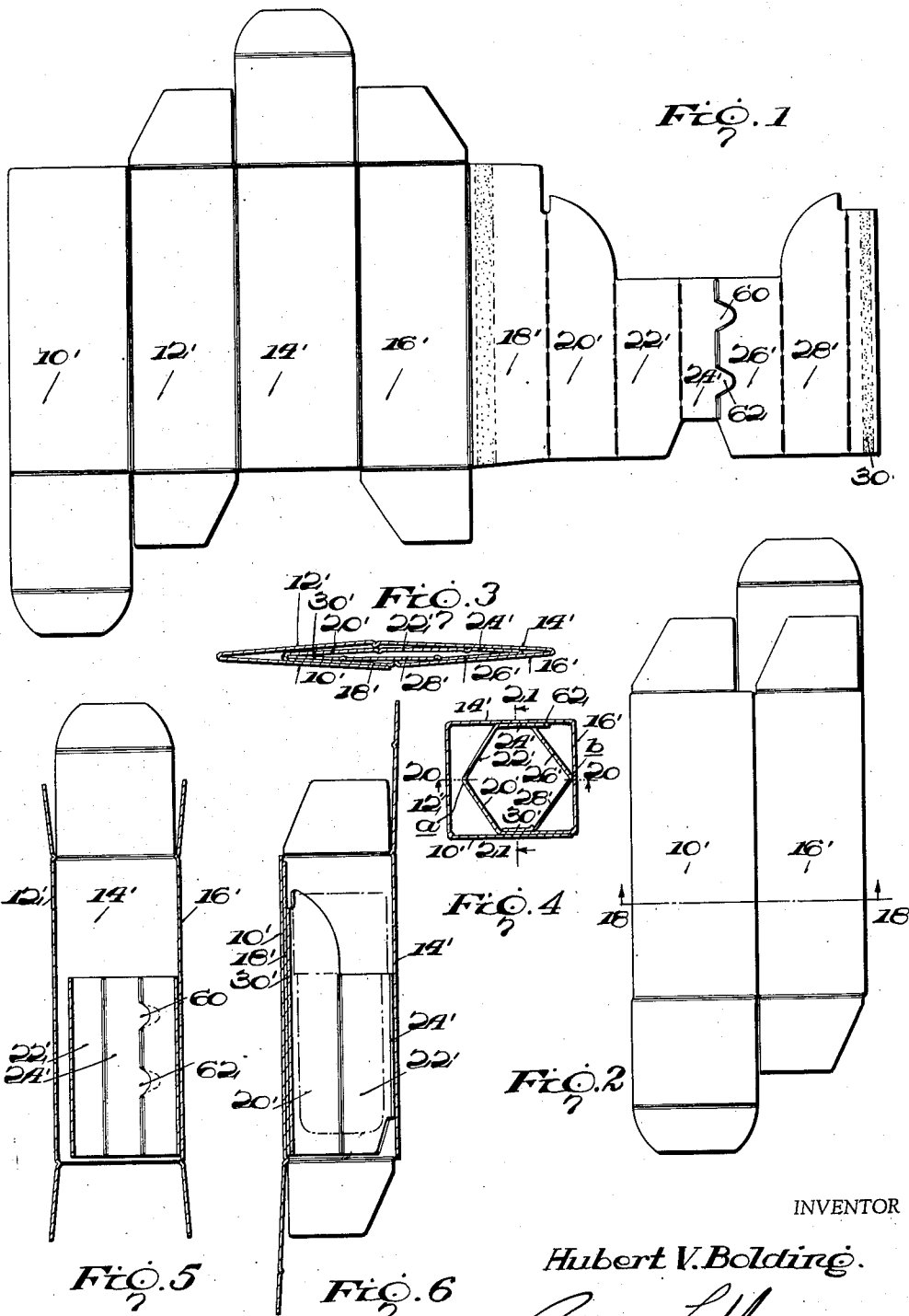


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H. V. BOLDING
PROTECTIVE CARTON
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PROTECTIVE CARTON

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This invention relates to cartons and has particular reference to a protective carton having an inner lining or sleeve which is spaced from the main outer walls of the carton and functions to absorb shock to which the carton exterior may be subjected.

An object of the invention is to establish a substantial quantum of resiliency in the walls of a carton for shockproof purposes. This is accomplished by providing an outer wall or sleeve within which is positioned a second sleeve the wall of which is spaced from the outer wall of the carton. This provides a buffering action which absorbs shocks and protects fragile contents of the carton such as radio tubes, etc.

Another object of the invention is to simplify and expedite the production of such a carton, particularly from the standpoint of assembling. To this end a single integral blank is so fashioned that it may be readily and quickly formed into the hitherto described carton. The blank is such that only four folding operations and three gluing operations are required, a factor which is extremely important from the point of view of time and labor consumed in setting up the cartons from the blanks.

Still another object of the invention is to provide a carton of the type generally described above which may be shipped to and stored by the user in flat condition but set up instantaneously for packing and loading.

Yet another object of the invention is to so construct a buffer-lined and therefore shockproof carton that delicate and fragile objects such as radio tubes may be loaded into the carton speedily and without undue care on the part of the operator. The construction is such that when loading the non-glass base adjacent the glass of the radio tube is engaged by and supported interiorly of the carton upon a resilient shoulder formed by edges of certain of the buffer walls. The tube may be inserted into the carton without exerting any pressure whatsoever on the glass of the tube and no pressure or shock is imparted to the glass of the tube after it is loaded in the carton, regardless of whether the carton falls upon its top, bottom or side.

For purposes of illustration I have disclosed herein several embodiments of the invention each of which involves to a large extent the same basic concept of providing an inner sleeve or carton liner in the form of a hex, two sides of which lie in face-to-face contact with the inner surfaces of opposite side walls of the carton with the faces of the hex between these two sides extending diagonally across the corners of the carton.

It may be preferred in many instances to utilize a modified form of liner or sleeve wherein only one wall of the hex is secured to a wall of the carton, the other and opposite wall of the hex lying in abutting face-to-face relation with the opposite wall of the carton but being free to slide across the same. This permits a certain amount of free swinging of the hex within the carton and facilitates loading. Particularly is this true where electronic tubes are packaged. These are fed in rapid succession into succeeding cartons and alignment between the tube

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and the carton at the time of actual loading may not always be identical. Since the liner into which the tube passes when loading is free to swing within the carton, the spherical end portion of the tube functions to cam this inner liner into proper alignment for reception of the tube without necessitating any movement of the carton itself.

While the invention will be described with particular reference to a carton designed specifically for radio tube packing, it will be apparent that the invention is in no way limited to use in conjunction with such articles.

Various other objects and meritorious features of the invention will be apparent from the following description taken in conjunction with the drawings wherein like numerals refer to like parts throughout the several figures and wherein:

Fig. 1 illustrates a blank for forming a modified type of carton;

Fig. 2 is a side elevation of the modified structure completed and in collapsed form;

Fig. 3 is a section through 18—18 of Fig. 2;

Fig. 4 is a horizontal section through an open or erected carton;

Fig. 5 is a section through 20—20 of Fig. 4, and

Fig. 6 is a section through 21—21 of Fig. 4.

The blank includes wall panels 10', 12', 14' and 16' together with a lap panel 18', buffer panels 20' and 22', brace panel 24', buffer panels 26' and 28' and anchor panel 30'. These panels are delineated by parallel weakened lines. Each of the outer wall panels 10'—16' and the lap panel 18' are separated from one another by score lines, whereas the other weakened lines preferably consist of spaced die cuts through the flexible material to facilitate bending of the panels about their respective weakened lines of juncture.

Certain of the wall panels are provided with side and main closure flaps which need not be here designated inasmuch as they function in the conventional fashion and form no part of the invention.

While I have referred broadly to the use of "weakened lines" which connect the parallel panels heretofore described, it is of some importance to note that the connections between the panels 10', 12', 14', 16' and 18' are in the form of score lines whereas the connections between the other panels described consist of successive slots die cut in the material and separated from one another by score lines.

The inner face of the blank is illustrated in Fig. 1. A portion of the outer face of lap panel 18' is coated with adhesive from top to bottom, as indicated in the drawing, and a portion of anchor panel 30' is similarly coated adjacent its outer extremity.

In forming this modified carton the right-hand end of the blank is first folded about the weakened line connecting buffer panels 26' and 28', then folded about the weakened line connecting buffer panels 20' and 22'. This results in adhering the anchor panel 30' to the lap panel 18'.

Still operating on the right side of the blank, it is folded about the weakened line separating lap panel 18' from wall panel 16' and the left-hand side of the blank thus formed is folded about the weakened line separating wall panels 12' and 14'. This results in adhering the wall panel 10' to the adhesively surfaced portion of lap panel 18' and the carton is complete in flat form as illustrated in Figs. 2 and 3.

When the carton is erected or opened the wall panels and liner or sleeve panels of the hex assume the position illustrated most clearly in Fig. 4 of the drawings. Since lap panel 18' is secured to the inner face of its adjacent outer wall panel and anchor panel 30' is secured to the inner face of said lap panel, as by means of the ad-

hesive heretofore suggested, it will be seen that the remainder of the hex liner or sleeve delineated by the buffer walls and brace wall 24' is free to flex and move about within the carton itself. The fixed hinge lines about which such movement is permitted are the weakened lines separating anchor panel 30' and buffer panel 28' and the weakened line separating lap panel 18' from buffer panel 20'.

As noted most clearly from the blank illustrated in Fig. 1, the weakened line separating brace panel 24' and buffer panel 26' consists of spaced weakened lines separated by tongues 60 and 62 which are integral with brace panel 24' but are die cut from the body of buffer panel 26'.

When the carton is erected it will be noted that brace panel 24' abuts the inner surface of wall panel 14' and lies in face-to-face engagement therewith, as do also the tongues 60 and 62. During swinging or pivotal movement of the hex liner within the carton the free play of the various sides of the hex about their lines of juncture permits the brace panel 24' to slide freely across the inner face of wall 14' of the carton while remaining in surface-to-surface contact therewith. Thus a constant brace is provided for the sleeve or liner against opposite walls of the carton regardless of the exact position of the liner within the carton walls. This area of brace engagement with the inner face of carton wall 14' is substantially increased by virtue of tongues 60 and 62 which constitute in effect a portion of brace wall 24'.

The corners *a* and *b* of the hex liner are a distance apart less than the width of the carton between walls 12' and 16'. This is likewise one of the structural relationships between elements which permits swinging or flexing movement of the liner within the carton. When the carton has been opened from the flatted or collapsed condition illustrated in Figs. 2 and 3 the major portion of the width of brace panel 24', including as a portion of such width tongues 60 and 62, lies on the same side of line 21-21 of the carton as corner *b*. Thus the tongues 60 and 62 tend to resist collapsing movement of the carton and provide additional bracing surface engaging wall 14'.

As will be readily apparent, the rounded nose of a tube moved into the carton will engage the walls of the hex liner and, if the two are not in absolute alignment, continued movement of the tube into the carton will cam the liner within the carton so that the tube slides easily into the liner, the carton itself remaining immobile.

While not specifically described in connection with this modification, it will of course be noted that the length of certain of the buffer panels (here buffer panels 22' and 26') is less than the height of the carton. As described in detail earlier, the margins of these shorter buffer panels provide a stop and seat upon which the rigid base portion of the tube rests when fully inserted within the carton. Since the hex liner within which the glass portion of the tube is retained is free to swing, and the corners of the liner abut the side walls of the carton at each end of such swinging movement, the tube is free to float within certain limits inside the carton. The corners of the liner, which are not in contact with the tube, absorb any shock which would otherwise be transmitted to the tube.

In view of the foregoing, various modifications of the invention described herein will be apparent to those skilled in the art and for that reason I wish to limit myself only within the scope of the appended claims.

What I claim is:

1. A collapsible carton including outer walls and inner buffer walls spaced therefrom, said carton being formed from a single blank comprising adjacent panels delineated by parallel weakened lines and including successively four outer wall panels, a lap panel secured to the inner face of the fourth wall panel, two adjacent inside buffer panels, a brace panel abutting the inside face of the wall panel opposite that to which the lap panel is secured and free to slide thereacross, two additional adjacent buffer panels, and a terminal anchor panel secured to the inner face of said lap panel.

2. A collapsible carton including outer walls and inner buffer walls spaced therefrom, said carton being formed from a single blank comprising adjacent panels delineated by parallel weakened lines and including successively four outer wall panels, a lap panel secured to the inner face of the fourth wall panel, two adjacent inside buffer panels, a brace panel abutting the inside face of the wall panel opposite that to which the lap panel is secured and free to slide thereacross, two additional adjacent buffer panels, and a terminal anchor panel secured to the inner face of said lap panel, said brace panel including longitudinally spaced tongues struck from an adjacent buffer panel.

3. A collapsible carton including outer walls and inner buffer walls spaced therefrom, said carton being formed from a single blank comprising adjacent panels delineated by parallel weakened lines and including successively four outer wall panels, a lap panel secured to the inner face of the fourth wall panel, two adjacent inside buffer panels, a brace panel abutting the inside face of the wall panel opposite that to which the lap panel is secured and free to slide thereacross, two additional adjacent buffer panels, and a terminal anchor panel secured to the inner face of the lap panel, said anchor and brace panels being of less width than the outer wall panels with which they are associated and being engaged therewith intermediate the sides of the respective wall panels whereby the adjoining buffer panels extend diagonally across the corners of the outer wall panels.

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