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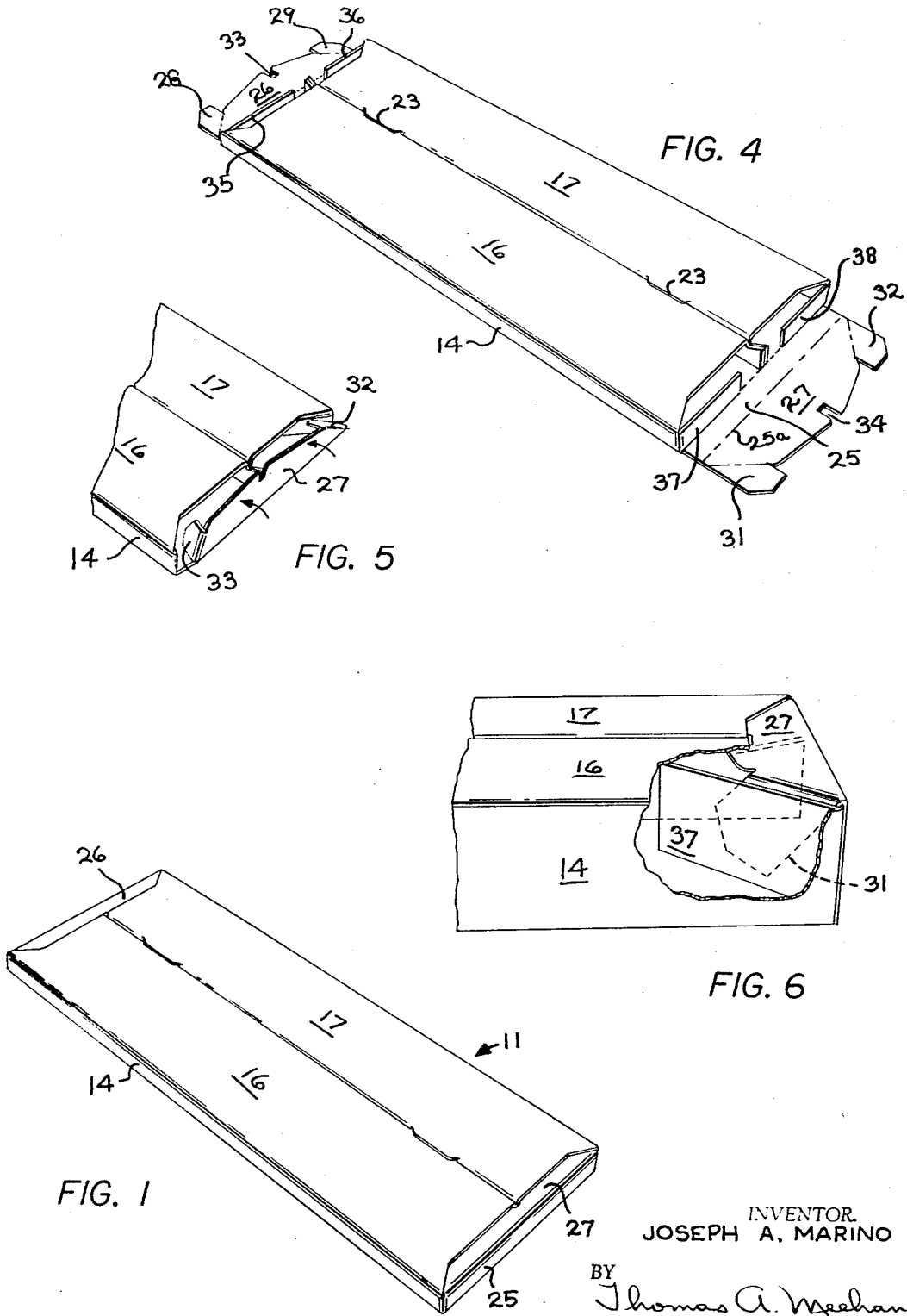
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3,343,665

REEL FOR WEB-LIKE MATERIAL AND BLANK THEREFOR

Filed Dec. 11, 1964

2 Sheets-Sheet 1



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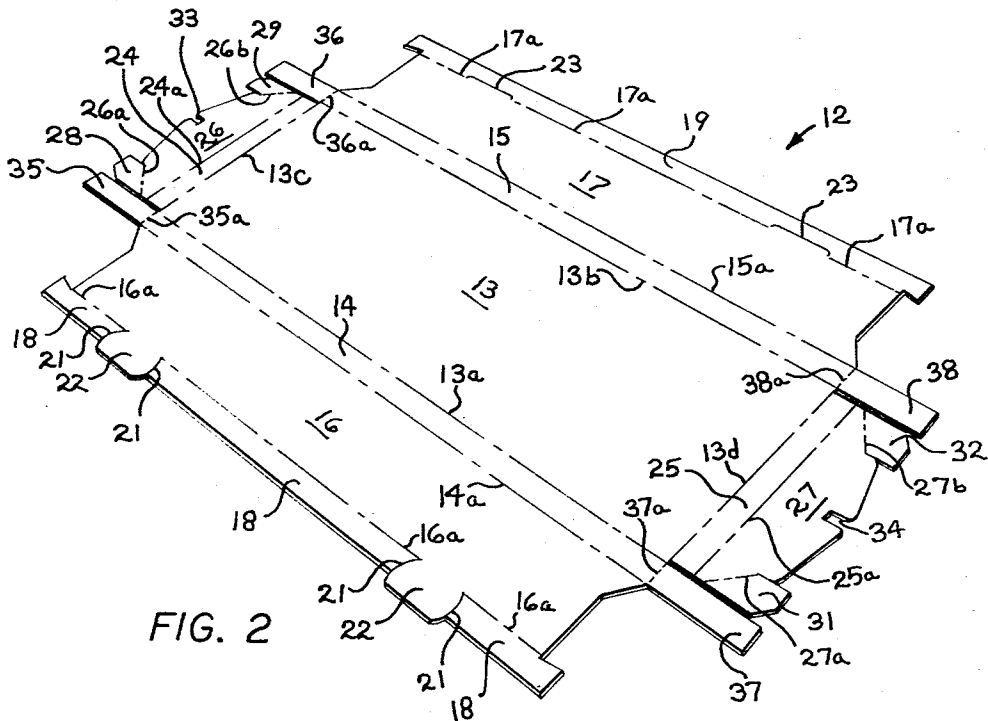


FIG. 2

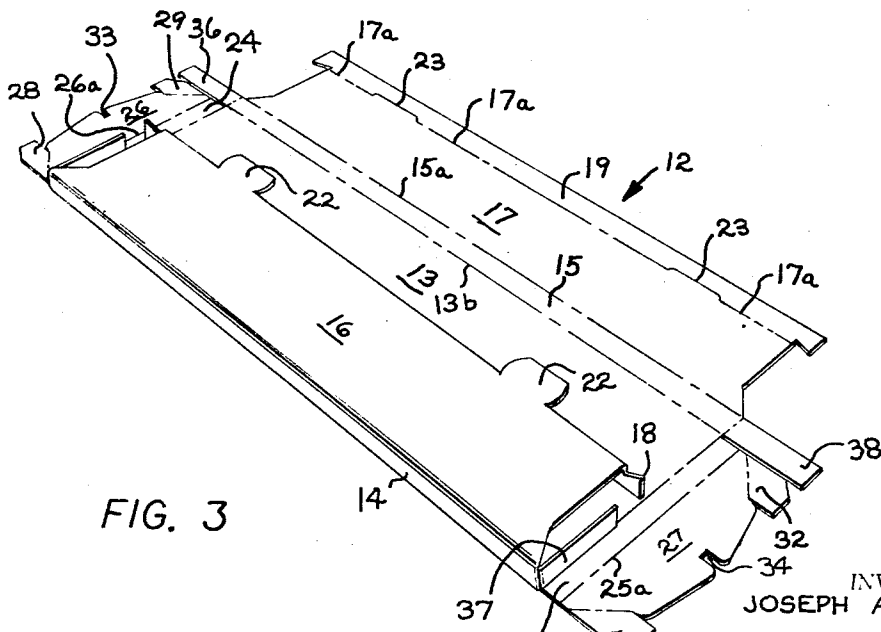


FIG. 3

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**REEL FOR WEB-LIKE MATERIAL
AND BLANK THEREFOR**

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7 Claims. (Cl. 206—50)

This invention relates to a reel of novel and advantageous construction for the winding thereon of a web-like material such as a length of textile fabric. More particularly, the invention relates to a reel shaped generally in the figuration of a thin parallelepiped and formed from a single sheet or blank of relatively stiff sheet-like material, such as corrugated paperboard, and to the blank from which such reel is formed.

In its preferred embodiment, this invention relates to a reel for web-like material formed from a self-locking blank of suitably cut and scored corrugated paperboard in which the flutes or convolutions thereof are unexposed in order to safeguard against the transfer of paper dust and the like which may be collected therein to the web-like material wound about the reel; additionally, the invention relates to a blank of corrugated paperboard from which such a reel can be constructed. In a refined embodiment, the invention relates to such a reel, and to the blank from which it is formed, in which the ends of the reel are provided with means comprising a portion of the blank from which the reel is formed and which serve to reinforce such ends to increase their resistance to crushing.

For further understanding of the invention, attention is directed to the following portion of the specification, the drawing, and the appended claims.

In the drawing:

FIG. 1 is a perspective view of a reel constructed in accordance with the present invention;

FIG. 2 is a perspective view of a suitably cut and scored blank of relatively stiff sheet-like material from which the reel of FIG. 1 may be constructed;

FIGS. 3-5 are perspective views illustrating successive steps in the construction of the reel of FIG. 1 from the blank of FIG. 2;

FIG. 6 is a fragmentary view of an end portion of the reel of FIG. 1, with portions thereof broken away, illustrating novel and advantageous reinforcing means that are provided when a reel is constructed from the blank of FIG. 2.

In accordance with the present invention, a reel of the type indicated generally by reference numeral 11 of FIGURE 1 may be formed from a blank, illustrated generally by reference numeral 12 of FIGURE 2, of relatively stiff sheet-like material such as, preferably, corrugated paperboard, or, for example, a type of material generally referred to as "foam board" which is formed by a pair of plies of kraft paper or the like with a foamed plastic material sandwiched therebetween. Blank 12 is suitably cut and scored, or otherwise provided with fold lines, to define a plurality of elements including a rectangular central panel 13 having an opposed pair of side edges 13a and 13b and an opposed pair of end edges 13c and 13d. Blank 12 further comprises first and second side wall panels 14 and 15 foldably attached to panel 13 along side edges 13a and 13b, respectively and second and third panels 16 and 17 foldably attached, respectively, to side wall panels 14 and 15 along lines 14a and 15a which are spaced from, and extend parallel to, edges 13a and 13b, respectively, of panel 13.

At least one of panels 16 and 17, and preferably both of them, are provided with additional panel means 18 and 19, respectively, which are foldably attached to panels 16 and 17 along fold lines 16a and 17a which extend generally parallel to fold lines 14a and 15a. It is to be pointed

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out the the extent of panel means 18 and 19 in the direction transversely of lines 16a and 17a, respectively, and parallel to blank 12, is substantially equal to the spacing between lines 13a and 14a (less an allowance for the thickness of the sheet of material from which blank 12 is formed).

As is shown clearly in FIG. 2 of the drawing, each of lines 16a and 17a is discontinuous. In the case of panel means 18, fold line 16a is interrupted by at least one, and preferably a pair, of pairs of cut lines 21 which extend outwardly from line 16a to the edge of blank 12 and which, thereby, define a pair of outwardly projecting tab portions 22 which are integral with panel 16. The discontinuities of line 17a, on the other hand, are provided by a number of lines of cut 23 which extend between adjacent termini of portions of line 17a and which correspond in number, location, and extent to the pairs of lines 21.

In the assembly of a reel from the blank of FIG. 12, as thus far described, and as is shown in FIGS. 3 and 4, side wall panels 14 and 15 are folded with respect to panel 13 along lines 13a and 13b, respectively, so that they extend from the same side of panel 13 and generally perpendicularly thereto. Second and third panels 16 and 17, in turn, are folded about lines 14a and 15a, respectively, so that they extend toward one another and generally parallel to panel 13. It is herein pointed out that the spacing between lines 14a and 16a, i.e. the lateral extent of panel 16, and the spacing between lines 15a and 17a, i.e. the lateral extent of panel 17, are preferably equal to one another and the sum thereof is preferably equal to the spacing between lines 13a and 13b, i.e. the lateral extent of panel 13 (again, less an allowance based on the thickness of the sheet from which blank 12 is formed). Accordingly, the terminating edges of panels 16 and 17, i.e. those defined by lines 16a and 17a, will be disposed closely adjacent one another. Prior to bringing the terminating edges of panels 16 and 17 into such closely disposed relationship, each of panel means 18 and 19 is so folded with respect to panel 16 and 17, respectively, that when the edges 16a and 17a thereof are brought into closely disposed relationship such panels means 18 and 19 will extend inwardly toward panel 13 and will abut there against and will thereby serve to maintain panels 16 and 17 spaced from panel 13 even under loading directed normally thereto.

It is desirable, of course, to provide means to maintain the assembled relationship between panel 13 and panels 16 and 17 thus far described, and while the use of means such as tape, staples, or glue is contemplated, it is preferable from an assembly standpoint if the means to maintain such assembled relationship comprise a part of the blank itself; that is, it is desirable that the panels 13, 16, and 17 of reel 11 be self-locking with respect to one another. Such a self-locking feature is readily obtained when reel 11 is constructed from the blank of FIG. 12 by means of the slots defined at the juncture of third panel means 17 and panel means 19 by cut line 23 and by the insertion therewith of tabs 22 of panel 16. Thus, in the embodiment of the invention illustrated in the drawing, the necessity of providing additional means to maintain the assembled relationship between panel 13 and panels 16 and 17 is obviated.

Additionally, a reel in accordance with the present invention comprises means foldably attached to opposed end edges 13c and 13d of panel 13 for closing the spaces at the ends of the reel defined by panel 13 and panels 16 and 17 when they are brought into assembled relationship with respect to one another. Such end-closing means comprise first and second end wall panels 24 and 25 attached to panel 13 at fold lines along edges 13c and 13d, respectively. End wall panels 24 and 25 extend

from edges 13c and 13d of panel 13 for a distance defined, respectively, by fold lines 24a and 25a, which distances are equal to one another and to the distances between fold lines 13a and 14a and 13b and 15a (less an allowance for the thickness of blank 12). Thus, the space at the ends of reel 11 defined by panel 13 and panels 16 and 17 is closed by folding each of end wall panels 24 and 25 to a position extending generally perpendicularly to panel 13 and from the same side thereof as side wall panels 14 and 15. End wall panels 24 and 25 may be maintained in such position with respect to panel 13 by providing them, respectively, with tuck-in flaps 26 and 27 which are foldably attached to panels 24 and 25 along fold lines 24a and 25a. Tuck-in flaps 26 and 27 diminish in lateral extent as they proceed from lines 24a and 25a, respectively, by limiting their lateral extent by means of converging lines 26a, 26b and 27a, 27b, respectively. Lines 26a, 26b, 27a and 27b may be lines of cut which, thereby, limit the overall extent of blank 12. Preferably, however, they comprise fold line portions which, thereby, define tabs 28 and 29 which are foldably attached to tuck-in flap 26 along lines 26a and 26b, respectively, and tabs 31 and 32 similarly attached to tuck-in flap 27 along lines 27a and 27b, respectively. Tuck-in flaps 26 and 27 are, additionally, provided with notches 33 and 34, respectively, of a width, and at a location, in their extremities which correspond to the placement of panels means 18 and 19 in the assembled reel. Thus, end wall panels 24 and 25 are maintained in their upright position by inwardly folding tuck-in flaps 26 and 27, respectively, so that they are tucked-in underneath the lateral extremities of panels 16 and 17 with notches 33 and 34 receiving and engaging lateral end portions of each of panels means 18 and 19. Such a relationship of panel means 18 and 19 to notches 33 and 34 serves to maintain panel means 18 and 19 in an upright position.

Before tuck-in flaps means 26 and 27 are tucked-in under panels 16 and 17, each of tabs 28, 29 and 31, 32 is folded to extend at a substantial angle with respect to tuck-in flaps 26 and 27, respectively, as is indicated generally in FIG. 5. Thus, when tuck-in flaps 26 and 27 are being folded to be brought into tucked-in relationship, tabs 28, 29 and 31, 32 will be disposed inwardly of side wall panels 14 and 15 with adequate clearance to enable flaps 26 and 27 to be tucked-in and, once flaps 26 and 27 are in such tucked-in relationship, tabs 28, 29, and 31, 32 will bottom against panel 13 and will serve to provide for resistance of the ends of reel 11 against crushing forces applied normally to panel 13 and panels 16 and 17.

Cooperating with tabs 28, 29 and 31, 32 in providing the crush-resistance above noted by maintaining them in place so that they will bottom against panel 13 and also in providing additional resistance to crushing, in and of themselves, are a plurality of ribs 35, 36 and 37, 38 which are foldably attached to an end edge of one of side wall panels 14 and 15 along lines 35a, 36a and 37a, 38a, respectively. Before end wall panels 24 and 25 are folded into their upright assembled position, ribs 35, 36 and 37, 38 are folded to extend inwardly of the reel and at an angle substantially less than 180° with respect to the respective side wall panels 14 and 15, as is shown in FIGS. 3 and 4. As each of flaps 26 and 27 with tabs 28, 29 and 31, 32 folded at an angle with respect thereto, respectively, folded into tuck-in position, ribs 35-38 will be further inwardly deflected to some acute angle with respect to the respective side wall panel 14 and 15 by virtue of abutment with one of the tabs. This relationship is shown clearly in FIGURE 6 with reference to rib 37 and tab 31. The advantage of such a construction is that the presence of the rib will tend to keep the adjacent tab from flattening into a plain parallel to that of the tuck-in flap to which it is attached and will, thereby, maintain the tab in crush resisting position. Additionally, each of the ribs will contribute additional resistance to crushing by virtue of its own presence.

It is to be noted that the advantages of crush resistance imparted to the reel illustrated in the drawing by virtue of the presence of tabs 28, 29 and 31, 32 and ribs 35, 36 and 37, 38 can be obtained without the consumption of any additional or extra sheet-like material since they are located in areas of a rectangular sheet from which blank 12 is formed that would otherwise be wasted.

An additional feature of a reel constructed in accordance with the present invention is that the closed ends thereof defined by the exterior surfaces of end wall panels 24 and 25 are convenient for the affixing to such a reel of labels, stamps, or the like, visible from the exterior of a wound reel, and bearing such information as trademarks, quality designations, and the like.

It will, of course, be obvious to one skilled in the art that various modifications and changes can be made to the preferred embodiment of the invention described herein without departing from the principles of the invention, and it is not, therefore, the purpose of the foregoing description to limit patent granted hereon other than as is necessary by the scope of the appended claims.

I claim:

1. A reel for web-like material comprising, in combination: a rectangular panel having an opposed pair of side edges and an opposed pair of end edges; first and second side wall means foldably attached to said panel along said opposed pair of side edges, respectively, and extending from the same side of said panel generally perpendicularly thereto; second and third panels foldably attached to said first and second side wall means, respectively, along lines spaced from, and parallel to, said opposed pair of side edges, respectively, said second and third panels extending generally parallel to said panel toward one another and having terminating edges disposed closely adjacent one another; support wall means foldably attached to one of said second and third panels along said terminating edge and extending toward said rectangular panel and generally perpendicularly thereto; means for attaching said second panel and said third panel to one another; first and second end wall means foldably attached to said rectangular panel along said opposed pair of end edges and extending therefrom for a distance substantially equal to the distance which said first and second side wall panels extend from said rectangular panel; first and second tuck-in flaps foldably attached to said first and second end wall means, respectively, along lines spaced from, and parallel to, said opposed pair of end edges, the extent of each of said tuck-in flaps in the direction parallel to its line of attachment being defined by a pair of spaced apart lines which converge with respect to one another as they proceed from said line of attachment, said tuck-in flaps being folded to lie in the space between said rectangular panel and said second and third panels; and a pair of tabs foldably attached to each of said tuck-in flaps along said spaced apart lines and being folded along said lines to extend toward said rectangular panel when said tuck-in flaps lie in the space between said rectangular panel and said first and second panels.

2. A reel in accordance with claim 1 wherein each of said tuck-in flaps is provided with a peripheral notch for snugly engaging, and so-engaging, portions of said support wall means to retain said support wall means in an upright position.

3. A reel in accordance with claim 1 and further comprising a rib foldably attached to each end of each of said first and second side wall means along a line extending normally to the opposed pair of side edges, each of said ribs being folded to lie in the space between the rectangular panel and the second and third panels and interiorly of said first and second end wall means.

4. A reel in accordance with claim 3 wherein each of the ribs lies in abutting relationship with one of said tabs and serves to maintain said tab in folded position with respect to the tuck-in flap to which it is attached, said ribs further serving to reinforce said reel against crushing

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forces applied perpendicularly to said rectangular panel.

5. A planar blank of relatively stiff sheet-like material useful in the construction of a reel therefrom and comprising, in combination:

- (a) a first rectangularly-shaped panel portion generally centrally disposed within the outline of said blank and defined by first and second opposed pairs of score lines;
- (b) a second rectangularly-shaped panel portion contiguous to the first panel along one of the first of the opposed pairs of score lines, and extending therefrom a distance limited by a fifth score line extending parallel to and spaced relatively closely to, said one of the first of the opposed pair of score lines;
- (c) a third rectangularly-shaped panel portion contiguous to the first panel along the other of the first opposed pair of score lines and extending therefrom a distance limited by a sixth score line extending parallel to said other of the first pair of score lines and spaced therefrom a distance substantially equal to the spacing between the fifth score line and the one of the first opposed pair of score lines;
- (d) fourth and fifth panels contiguous, respectively, to the second and third panels along the fifth and sixth score lines, respectively, and extending therefrom distances defined, respectively by seventh and eighth lines, at least one of which comprises a score line portion, the sum of the spacings between the fifth and seventh lines and the sixth and eighth lines being substantially equal to the spacing between the score lines of the first opposed pair;
- (e) sixth panel means contiguous to the one of the fourth and fifth panels along the one of the seventh and eighth lines comprising a score line portion and extending therefrom a distance substantially equal to the distance which said second and third panels extend from the first panel;
- (f) first and second side panel portion means disposed contiguous to the first rectangular panel along first and second of the second opposed pair of score lines, respectively, and each of which is provided with a score line extending parallel to the respective one of the opposed second pair of score lines, spaced therefrom a distance substantially equal to the distance between the fifth score line and said one of the first opposed pair of score lines, and serving to divide the respective side panel means into first and second portions;
- (g) first and second converging line means extending across the second portion and serving to decrease the dimension of the second portion in a direction parallel to the second opposed pair of score lines as said second portion extends from said portion; and
- (h) first and second tab portions contiguous to the second portion of each of the first and second side panel means along said first and second converging line means, respectively.

6. A blank in accordance with claim 5 and further comprising: first and second rib panel portions disposed contiguous to each of the second and third panel portions and separated therefrom by additional score lines extending generally parallel to the second opposed pair of score lines.

7. A planar blank of relatively stiff sheet-like material useful in the construction of a reel therefrom and comprising, in combination:

- (a) a first rectangularly-shaped panel portion generally centrally disposed within the outline of said

blank and defined by first and second opposed pairs of score lines;

- (b) a second rectangularly-shaped panel portion contiguous to the first panel along one of the first of the opposed pairs of score lines, and extending therefrom a distance limited by a fifth score line extending parallel to and spaced relatively closely to said one of the first of the opposed pair of score lines;
- (c) a third rectangularly-shaped panel portion contiguous to the first panel along the other of the first opposed pair of score lines and extending therefrom a distance limited by a sixth score line extending parallel to said other of the first pair of score lines and spaced therefrom a distance substantially equal to the spacing between the fifth score line and the one of the first opposed pair of score lines;
- (d) fourth and fifth panels contiguous, respectively, to the second and third panels along the fifth and sixth score lines, respectively, and extending therefrom distances defined, respectively by seventh and eighth lines, at least one of which comprises a score line portion, the sum of the spacings between the fifth and seventh lines and the sixth and eighth lines being substantially equal to the spacing between the score lines of the first opposed pair;
- (e) sixth panel means contiguous to the one of the fourth and fifth panels along the one of the seventh and eighth lines comprising a score line portion and extending therefrom a distance substantially equal to the distance which said second and third panels extend from the first panel;
- (f) first and second side panel portion means disposed contiguous to the first rectangular panel along first and second of the second opposed pair of score lines, respectively, and each of which is provided with a score line extending parallel to the respective one of the opposed second pair of score lines, spaced therefrom a distance substantially equal to the distance between the fifth score line and said one of the first opposed pair of score lines, and serving to divide the respective side panel means into first and second portions;
- (g) first and second converging line means extending across the second portion and serving to decrease the dimension of the second portion in a direction parallel to the second opposed pair of score lines as said second portion extends from said portion; and
- (h) first and second rib panel portions disposed contiguous to each of the second and third panel portions and separated therefrom by additional score lines extending generally parallel to the second opposed pair of score lines.

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