Jan. 12, 1965 J. Y. PELAVIN ETAL 3,165,178

LIGHT-WEIGHT LUGGAGE CASE WITH REINFORCING X-FRAME

Filed May 29, 1963

FIG.1

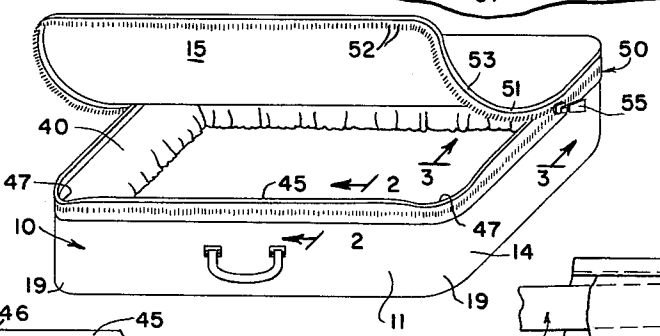


FIG.5

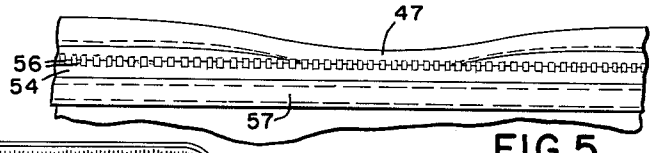


FIG.2

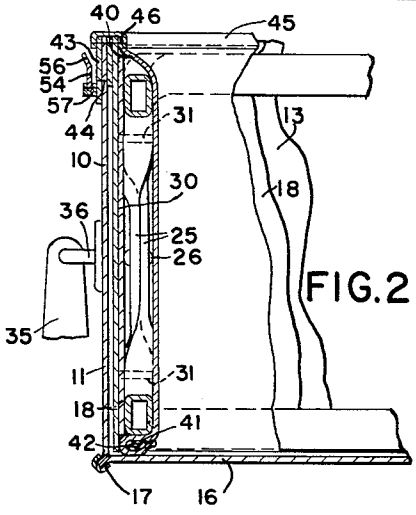


FIG.3

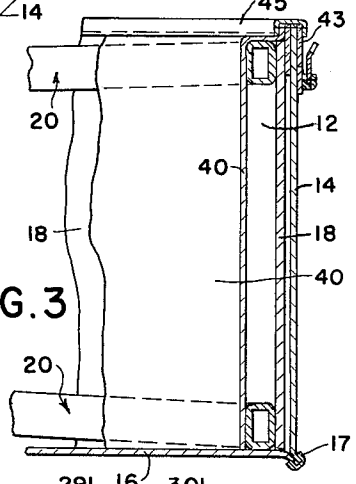
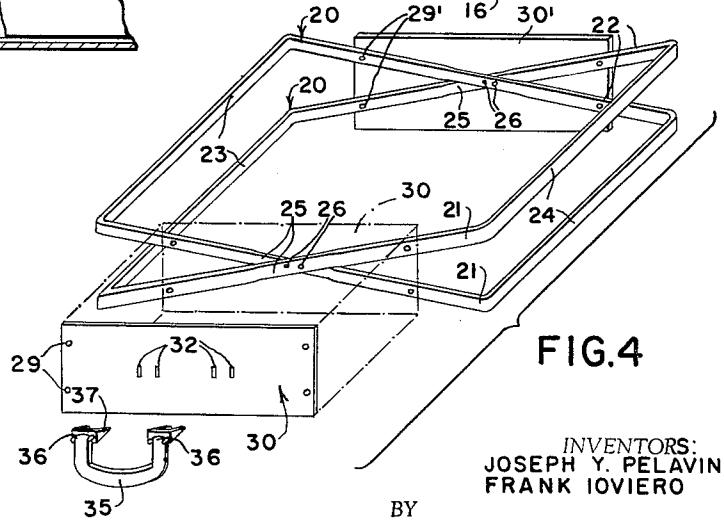


FIG.4



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LIGHT-WEIGHT LUGGAGE CASE WITH REINFORCING X-FRAME

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This invention relates to luggage cases and, more particularly, to a novel very light-weight luggage case of high strength, including a fabric casing interiorly reinforced by tubular frame means of light-weight metal, and further characterized by novel constructional features.

Reduction in the weight of luggage cases, particularly those used for air travel where weight is at a premium, has been achieved by using construction materials of very light weight. However, the reduction in the weight of the construction materials used has usually been effected by using materials which do not have the strength to resist stresses due to handling, or crushing stresses, as when one luggage case may be piled on top of another. Also, when known light-weight luggage cases are positioned upright, with the handle uppermost, and which is the position which they normally occupy at rest, any weight placed upon the then upper or handle wall will result in distortion and probable crushing of the case. This inability to resist applied stresses has mitigated against the known advantages of light-weight luggage cases.

The present invention is directed to a novel very light-weight luggage case of high strength which is free of the disadvantages of the prior art, and which includes various novel constructional features.

More particularly, the light-weight luggage case of the present invention comprises a flexible fabric casing having side walls, a front wall and a rear wall, with at least some of these walls being preferably stiffened by a strip of relatively stiff material, such as cardboard or fiber board, in contact with the inner surfaces of the walls. However, even with this stiffener, the walls do not have the inherent strength to resist crushing, bending and distorting stresses.

Accordingly, the principal feature of novelty of the present invention is the provision of high strength, light-weight reinforcing means in the form of a pair of substantially rectangular frames of light-weight metal which extend in generally laterally spaced relation around and in contact with the inner surfaces of the side walls to reinforce the latter. Each of these frames is in the form of a relatively narrow and elongated strip which is preferably a flat tube in cross section. Those portions of the respective frames extending along a pair of opposed side walls are arranged to intersect each other so as to provide X-frame constructions along this pair of opposed side walls.

The pair of opposed side walls thus reinforced by an X-frame construction is preferably the pair of longer side walls of the case, to one of which the handle is attached. These longer side walls are further reinforced by a pair of relatively elongated and relatively thin plates of light-weight and strong metal each of which is anchored to the intersecting frame portions along a respective side wall. One of these plates serves as an anchor for the handle.

The flexible fabric casing preferably includes a front wall which is connected to the forward edge of only one of the longer side walls, and is free from the other three side walls. To close this front wall, a separable fastener is provided having a runner on the front wall and another runner disposed somewhat below the forward edges of the other three side walls, these side walls being joined by curved corners.

In running a slide fastener around the three side walls to interconnect the two runners of the separable fastener, there has hitherto been considerable difficulty in drawing the slider around the rounded corners, particularly toward the handle carrying wall of the case. In the present invention, this difficulty is avoided by a particular configuration of the forward edges of the side walls at the rounded corners joining the two narrower side walls to the longer side wall having the handle and which is normally the upper wall.

Specifically, the reinforced forward edge of each side wall is dipped or lowered in a forwardly concave curve at the rounded corners, thus bringing the two runners of the separable slide fastener closer to each other in those portions which extend around the rounded corners. Consequently, pulling of the slider of the separable fastener is greatly facilitated as the slider passes around the rounded corners, and the force required to move the slider is thus substantially uniform along the entire length of the separable slide fastener, as distinguished from known constructions wherein a greatly increased force must be used to draw the slider around the rounded corners.

A further feature of the light-weight case of the invention is the provision of an inner liner for the side walls and which is secured along one edge to the forward edges of the side wall and has a free edge adjacent the rear wall. This free edge is hemmed and an elastic band is passed through the hem so that the inner periphery of the liner is substantially elastic. With this arrangement, the inner edge of the liner may be held in position by tucking the thus elasticized inner edge under the edges of the respective frame portions and under the edge of the reinforcing plate extending along the handle-carrying side wall. Thereby, stitching of the inner edge of the liner in position is obviated, substantially reducing the expense of constructing the luggage case.

For an understanding of the principles of the invention, reference is made to the following description of a typical embodiment thereof as illustrated in the accompanying drawings. In the drawings:

FIG. 1 is a perspective view of a partially open light-weight luggage case embodying the invention;

FIGS. 2 and 3 are sectional views taken on the correspondingly numbered lines of FIG. 1;

FIG. 4 is an exploded perspective view of the interrelated reinforcing frames, the reinforcing plates, and the handle; and

FIG. 5 is a developed view illustrating the configuration of the upper edges of the side walls in extending along a rounded corner.

In the following description, the components of the luggage case will be referred to as they would appear if the luggage case were standing upright. Thus, that surface which, in the upright position of the luggage case, is engaged with the support surface will be referred to as the bottom side wall, that wall to which the handle of the suitcase is attached will be referred to as the top side wall, and the side walls interconnecting the bottom side wall and the top side wall will be referred to as the end side walls. The openable wall or cover of the luggage case will be referred to as the front wall, and the wall opposite such front wall will be referred to as the rear wall.

Referring to the drawings, the novel luggage case of the invention comprises a generally rectangular fabric casing including a top side wall 11, a bottom side wall 12, end side walls 13 and 14, a front wall 15, and a rear wall 16. The fabric casing 10 may be made of any suitable fabric, either natural or synthetic, which has a high strength combined with a light-weight. Preferably, it is a woven or knitted fabric material. The side walls

11 through 14 are joined together by a suitable transverse seam or seams (not shown) to form a continuous band.

Front wall 15 provides a cover for the bag or luggage case, and for this purpose is hingedly connected to the forward edge of the bottom side wall 12 throughout the major portion of the length thereof, such hinging attachment being formed in any known manner in accordance with the teachings of those skilled in the art. Rear wall 16 is secured, around its entire periphery, to the inner edges of the side walls 11 through 14, preferably with the interposition of a suitable binder or binding strip 17 of natural or artificial leather or plastic composition material. The four side walls are stiffened and held to shape by a stiffener 18 which extends preferably completely around all four side walls and is flush with the inner surface of the portions of the fabric casing 10 defining the four side walls. This stiffener may be made of any suitable material such as heavy cardboard, fiber board, or the like. The stiffener tends to give form to the luggage case, by virtue of its stiffness, and it will be noted that the luggage case is provided with rounded corners as indicated at 19.

However, while stiffener 18 is effective to adequately stiffen and shape the side walls and thus, generally, to shape the luggage case, in accordance with the invention the luggage case is provided with rigid reinforcing means of light-weight construction which enables the luggage case to withstand a very substantial amount of stress such as occurs when a person may sit on an upright luggage case or when the luggage case is in a pile underneath other luggage. Such reinforcement of the luggage case is provided by a reinforcing structure including a pair of substantially rectangular frames 20 of light-weight metal extending around the inner surfaces of the side walls and reinforcing the latter. Each frame 20 is in the form of a relatively narrow and elongated strip of light-weight metal, such as a magnesium or aluminum alloy, and the relatively narrow and elongated strip is preferably tubular in cross section for increased strength and decreased weight. Each frame includes a front section 21 adjacent top wall 11, a bottom section 22 adjacent bottom wall 12, and side sections 23 and 24 adjacent side walls 13 and 14, respectively.

Preferably the tubular cross section of the frames 20 is a flattened rectangle or oval, although it may be any other shape. At the center of each section 21 and 22, the frames 20 are flattened by collapsing the tubular walls toward each other, as indicated at 25. The respective portions 21 and 22 of each of the frames 20 intersect or cross over each other at the flattened portions 25 and are riveted together as indicated at 26, preferably utilizing more than one rivet in order to prevent pivoting of the frame sections 20 about their interconnections. Thus, the portions 21 and 22 of the two frames within the top and bottom walls 11 and 12 form an X-frame reinforcing along these top and bottom walls, thus greatly enhancing the strength and rigidity of the luggage case.

The portions 23 and 24 of each frame extend along and in surface-to-surface contact with the inner surface, adjacent the forward end, of one end side wall 13 or 14 and in contact with the inner surface, adjacent the inner end, of the other wall 14 or 13. Thus, in effect, each frame 20 is skewed or extends diagonally of the luggage case with respect to the width of the top and bottom side walls 21 and 22.

A further feature of the invention is the provision of a pair of bracing or reinforcing plates of light-weight metal, such as aluminum or magnesium alloy. Such plates are indicated at 30 and 30'. Plate 30 overlies the intersecting frame portions 21, 21, and plate 30' overlies the intersecting frame portions 22, 22. As indicated in dotted lines at 31 in FIG. 2, and at 29, 29' in FIG. 4, plates 30, 30' are riveted to the respective intersecting frame portions adjacent each corner of a plate. Plates 30, 30' thus form rigid reinforcing plates for top wall 11

and bottom wall 12, further strengthening the frame structure including frames 20, 20.

Plate 30 is also formed with apertures 32 for attachment of a handle 35 to the luggage case. Handle 35 is pivoted to pivot brackets 36, 36. Each pivot bracket 36 is formed with a pair of bent tabs 37, which are preferably pointed, and the handle 35 is firmly anchored to the luggage case by extending the tabs 37 through the fabric covering 10 and the stiffener 18 and then through the apertures 32 in plate 30. The tabs 37 are then bent over behind the plate 30, or over its innermost surface.

Rear wall 16 may be provided with an inner liner (not shown) of suitable fabric which may be stitched in position by the same stitching securing the binder 17 to rear wall 16 and to the rear edges of the side walls 11 through 14. An inner lining 40 extends around the side walls 11 through 14 and covers the frames 20. Liner 40 is a relatively wide and elongated strip of suitable fabric having its outer edge secured to the outer edges of the side wall and its inner edge hemmed, as at 41, and with a continuous elastic band 42 stitched thereto. A narrow strip 43 of cardboard or fiber board extends around the outside of the fabric casing 10 adjacent its forward edge. Side wall liner 40 is secured in position by a U-shape binder strip 45 of suitable material such as natural or artificial leather or plastic composition material which overlies and is stitched to the strip 43, the forward edge of the fabric casing 10, and the forward edge or front edge of the side wall liner 40. An additional line of stitching is also used to secure the strip 43 in position, as indicated at 44.

Due to the elastic band 42 extending around the hem 41 at the inner edge of the side wall liner 40, the latter need not have its inner end stitched in position. This inner edge of the side wall liner 40 is held in position by tucking the stretched elastic band hem 41 underneath the inner edge of the stiffener 18 where, due to the elasticity of the band 42, the inner edge of the side wall liner 40 is maintained in position overlying the inner surfaces of the several side walls of the luggage case.

The front wall or cover 15 is releasably held in closed position by a separable slide fastener generally indicated at 50 and extending around three edges of the cover and the side walls and partly around the bottom side wall of the luggage case. Separable slide fastener 50 includes a first runner 51, having teeth 52, extending around three sides and part of the fourth side of the cover and front wall 15, and held in position by a binder strip 53 of natural or artificial leather, or plastic composition material, which preferably matches the binder strip 45 and the binder 17. Slide fastener 50 further includes a second runner 54 having teeth 56 and extending around the forward edges of three of the side walls and partly along the bottom side wall 11, this runner 54 being secured in position by a binder 57 and extending substantially parallel to the rear edges of the side walls 11 through 14.

It is known to provide a luggage case with a separable slide fastener extending around three sides thereof so that the luggage case may be open to its full area. However, in known luggage cases involving constructions of this type, there has been difficulty in pulling the slider, such as 55, around the corners, such as 19. In accordance with the present invention, the movement of the slider of the separable fastener around the corners, such as 19, is facilitated and eased in a novel manner.

Referring more particularly to FIGS. 1 and 5, the binder strip 45, as well as the forward edge of the stiffener 18, has "dips" 47 extending around the corners 19. Referring particularly to FIG. 5, it will be noted that the dipped portion of the binder strip 47 is sufficiently deep so that the inner seamed edge thereof is disposed substantially below the outer edges of the teeth 56 of runner 54. Thus, as the sliders 55, which are preferably two in number, are pulled forwardly along the end side

walls 13 and 14, the front wall or cover 15 is pulled down tightly against the binder 45. This naturally imposes some stress, resisting movement of the sliders 55, and this stress is greatly increased when it is attempted to pull a slider 55 around a corner 19. Due to the provision of the dips 47, the cover 15 can move inwardly relative to the main body of the case at the corners and thus the stress on the sliders 15 at the corners 19 is greatly reduced so as to compensate for the increased stress normally resulting from pulling the slider 55 around a corner 19. However, inasmuch as the runner 51 extends parallel to the outer plane of the cover 15 and the runner 52 extends parallel to the plane of the wall 16, the closed case will still present the same appearance as if there were no dips 47 in binder 45.

Due to the novel X-bracing of the top and bottom walls 11 and 12 provided by the crossing sections of the metal frames 20, these walls are greatly strengthened, and the top and bottom walls are further greatly strengthened by virtue of the provision of the light-weight metal plates 30, 30' anchored to both of the frames 20. Thus, when the luggage case is in an upright position, a person may apply his weight to the top wall 11 without doing any damage to the luggage case. Also, when the luggage is stacked with other luggage, the framing provided by the frames 20 and the plates 30, 30' maintains the luggage case against crushing due to other luggage piled on top thereof. The result is a very light-weight but nevertheless very strong luggage case having novel constructional advantages and ease of operation, such as provided by the particular arrangement for the cover or front wall 15.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. In combination with a substantially rectangular light-weight, flexible fabric luggage case of unitary construction having a first side wall, a second side wall spaced from and parallel to said first side wall, a third side wall, a fourth side wall spaced from and parallel to said third side wall, a front wall and a rear wall, a self-supporting reinforcing frame for placement within said luggage case comprising first and second rectangular frame members secured together substantially centrally of one pair of opposite sides of each of said frame members to define an X-framing, and means for securing together said frame members to prevent relative pivotal movement therebetween, said secured together opposite sides respectively overlying said third and fourth walls along the diagonals thereof, said unsecured sides of said frame members respectively extending along the joints defined by said first and second side walls and said front and rear walls.

2. In combination with a substantially rectangular light-weight, flexible fabric luggage case of unitary construction having a first side wall, a second side wall spaced from and parallel to said first side wall, a third side wall, a fourth side wall spaced from and parallel to said third side wall, a front wall and a rear wall, a self-supporting reinforcing frame for placement within said luggage case comprising first and second rectangular frame members secured together substantially centrally of one pair of opposite sides of each of said frame members to define an X-framing, and elongated flat plates of relatively rigid material, secured to each of said frame members at each of said X-joints, and means for securing said frame members to one another and to said flat plates to prevent relative pivotal movement therebetween, said secured together opposite sides of said frame members and said flat plates respectively overlying said third and fourth walls along the diagonals thereof with said flat plates in contact with said third and fourth walls, said unsecured sides of said frame members respectively extending along the joints defined by said first and second side walls and said front and rear walls.

3. The structure defined in claim 2 and further including a handle and anchor means for said handle extending through the luggage case and secured to one of said flat plates.

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