Oct. 9, 1962 W. G. LEVIN ETAL 3,057,002

COMBINATION BALL BEARING ROLLER AND HINGE FOR LUGGAGE AND THE LIKE

Filed Aug. 12, 1959

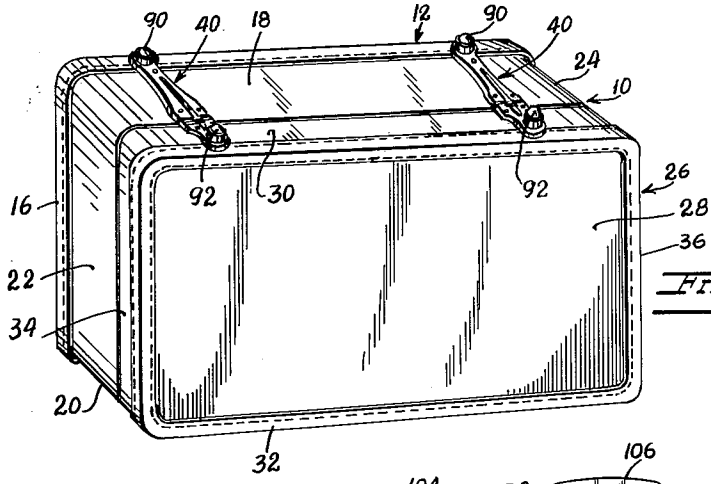


Fig. 2.

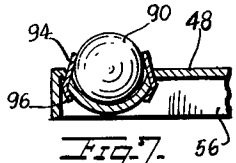


Fig. 7.

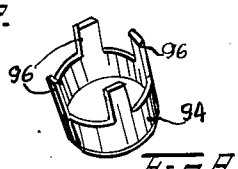


Fig. 8.

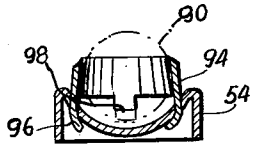


Fig. 6.

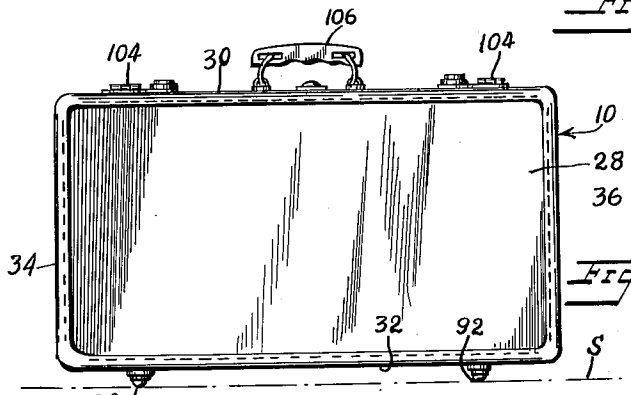


Fig. 1.

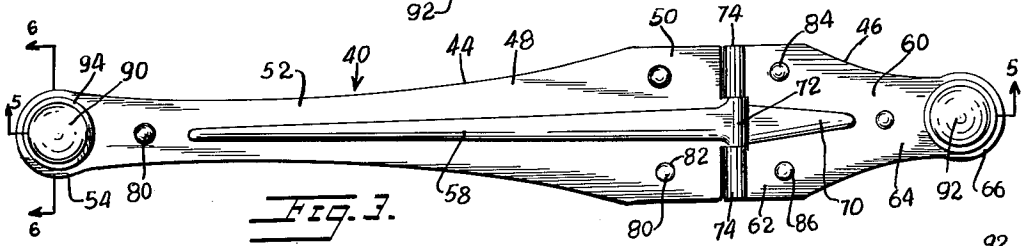


Fig. 3.

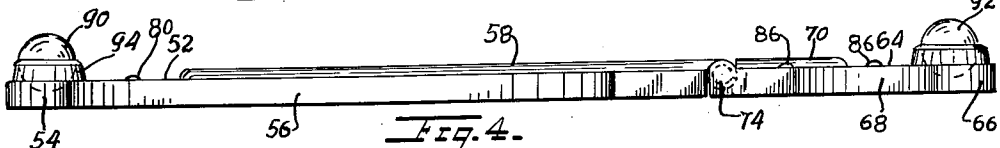


Fig. 4.

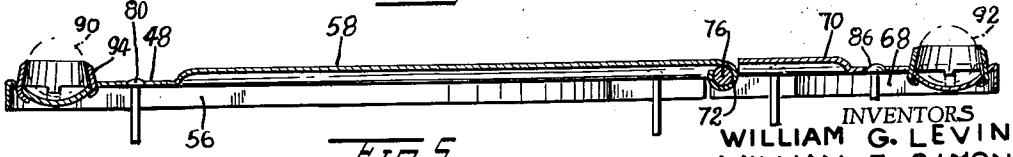


Fig. 5.

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United States Patent Office 3,057,002 Patented Oct. 9, 1962

3,057,002

COMBINATION BALL BEARING ROLLER AND HINGE FOR LUGGAGE AND THE LIKE

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Filed Aug. 12, 1959, Ser. No. 841,915
1 Claim. (Cl. 16—24)

This invention relates generally to luggage and the like and, more particularly, to heavy articles of luggage, baggage carriers, trunks, boxes, salesmen's sample cases and the like having hinged covers, which devices are usually transported by the user pushing same over the supporting surface.

The principal object of the present invention is to provide a hinge construction for the covers of such devices that is also adapted to serve as a mounting for ball bearings upon which the device may be rolled over a floor, platform or other supporting surface.

A further object of the invention is to provide a combined hinge construction and mounting for ball bearings.

A specific object of the invention is to provide a hinge construction wherein the hinge leaves mount ball bearings.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claim in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

FIG. 1 is a side elevational view of a suitcase with a combined hinge construction and ball bearing mounting embodying our invention applied thereto.

FIG. 2 is a perspective view of the suitcase of FIG. 1 shown upside down to more clearly disclose the invention.

FIG. 3 is an enlarged top plan view of a combined hinge construction and ball bearing mounting embodying our invention.

FIG. 4 is a side view thereof.

FIG. 5 is a longitudinal sectional view taken on the plane of the line 5—5 of FIG. 3.

FIG. 6 is a cross-sectional view taken on the plane of the line 6—6 of FIG. 3.

FIG. 7 is a view similar to FIG. 6 but showing the ball in full lines.

FIG. 8 is a perspective view of the ball retaining device.

Referring in detail to the drawings, in FIG. 1, for the purpose of illustration only, the invention is shown applied to a suitcase 10. It will be understood, of course, that the invention might be applied to any similar type of closure structure, such as a trunk, box, salesman's sample case and similar structures. The suitcase 10 may be made of any suitable material such as wood, plastic, metal, leather, fibre and the like, and comprises a hollow box-like body 12 rectangular in configuration and cross section. The box-like body includes a base or bottom wall 16, side walls 18 and 20, and end walls 22 and 24 and is open opposite the base 16 as viewed in FIG. 2.

A cover 26 closes the opening in the box-like body 12. The cover is of a shallow box-like shape including a top wall 28, side flanges 30 and 32 and end flanges 34 and 36, said flanges registering with the side and end walls of the box-like body 12.

The cover 26 along one of its side flanges, for example, flange 30, is hingedly connected to one side wall of the box-like body 12, for example, side wall 18. In accordance with the present invention, the hinge connection between the box-like body and cover comprises two end hinge structures 40 and 40.

The end hinge structures 40 and 40 are of similar construction and each includes a pair of hinge leaves 44 and 46. Hinge leaf 44 is constituted by an elongated flat metal plate 48 having a wide square portion 50 at one end and an elongated intermediate portion 52 tapering from said wide end portion toward the other end, said other end being slightly enlarged and semicircular as indicated at 54. Flanges 56 extend inwardly along the long edges of the plate to provide rigidity to the hinge leaf, and the center of the body of the plate is punched out as indicated at 58 to provide a reinforcing ridge and to enhance the appearance of the leaf.

The hinge leaf 46 is of substantially the same construction as hinge leaf 44 but is much shorter. The hinge leaf 46 is formed of a flat metal plate 60 having a square wide end 62 merging with a short intermediate portion 64 tapering toward the other end which is slightly enlarged and semicircular, as indicated at 66. Flanges 68 extend along the long edges of the plate 60 to rigidify the plate, and a short punched out portion 70 extending along the center of the plate serves to rigidify and beautify the plate.

The material of the plate 48 of the hinge leaf 44 is extended at its wide end and centrally thereof and is looped upon itself to form a hinge knuckle 72. The wide end of the hinge leaf 46 is similarly extended at its sides and looped to form spaced hinge knuckles 74, 74 adapted to receive the knuckle 72 of leaf 44 therebetween in alignment, the aligned knuckles being connected by a hinge pin 76.

The hinge leaf 44 is fastened to the outer surface of the side wall 18 of the box-like body 12 by means of rivets 80 passing through holes 82 in the ends of the plate 48 and passing through the material of the box-like body 12. Hinge leaf 46 is similarly fastened to the flange 30 of the cover 26 by rivets 84 passing through holes 86 in the plate 60 and through the material of the flange 30.

According to the invention, each of the end hinge structures 40, 40 also serves as a mounting for steel castors or ball bearings 90 and 92 at the ends thereof. For this purpose, the narrow semicircular end 54 of plate 48 of each hinge leaf 44 is formed with an indented portion providing a curved seat 92 for the ball bearings 90. The ball bearing is retained on its seat but permitted to rotate thereon by an annular cap 94 secured in any suitable manner to the plate 48 around the seat 92 such as by prongs 96 extending through spaced slots 98 in the plate and bent inwardly thereunder, as shown in FIG. 6. The diameter of the outer opening in the cap 94 is slightly less than the diameter of the ball bearing.

Locking mechanism 104 is fastened to adjacent edges of the side wall 20 of the box-like body 12 and of the flange 32 of the cover 26 at each end of the suitcase for locking the cover in closed position. This locking mechanism is of ordinary construction and forms no part of the present invention.

A handle 106 is fastened to side wall 20 for transporting the suitcase when desired.

In use, the suitcase 10 may be placed on a level supporting surface such as indicated at S in FIG. 1 resting upon the ball bearings 90 and 92. In order to transport the suitcase on such a level supporting surface, it is merely necessary to grasp the handle 106 and push the suitcase forwardly, the suitcase moving forwardly upon the rotating ball bearings.

It will be understood that the hinge construction may be made in various shapes and forms with leaves of similar lengths or of varied lengths, the present invention comprehending broadly a hinge construction with ball bearings. It will also be understood that instead of two end hinge constructions with ball bearings as shown, a third intermediate hinge construction with ball bearings might be mounted between the end hinge constructions.

While we have illustrated and described the preferred embodiment of our invention, it is to be understood that we do not limit ourselves to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claim.

Having thus described our invention, what we claim as new, and desire to secure by United States Letters Patent is:

In a suitcase, an elongated hinge leaf plate, a mounting for a ball bearing at one end of said plate comprising an indented curved semicircular portion forming a seat for supporting a ball bearing, said seat having spaced slots therein, near the edge thereof; and an annular cap connected to the end of the plate and extending above the seat and plate, said connection including spaced prongs above the slots and extending from the edge of the cap through the slots in said seat and interlocked therewith, the diameter of the outer opening in the cap being slightly less than the diameter of the ball bearing thereby serving to retain the ball bearing loosely on its seat, on the plate.

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