United States Patent [19]

Royet

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[45] **Oct. 22, 1974**

[54] **WHEEL-MOUNTED LUGGAGE**

[76] Inventor: **Paul Ferdinand Royet,** Chanteloire, Aurec, France

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[21] Appl. No.: **330,258**

[52] **U.S. Cl.** ..... **190/18 A**

[51] **Int. Cl.** **A45c 5/14**

[58] **Field of Search**..... 190/18 A; 280/43.1, 47.3 R, 280/47.17; 16/18

[56] **References Cited**

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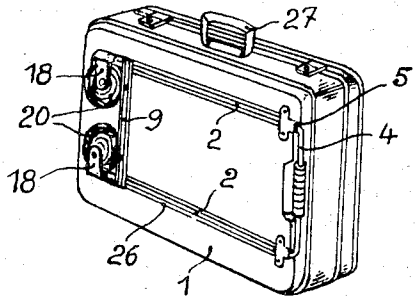
Primary Examiner—Herbert F. Ross
Attorney, Agent, or Firm—Karl F. Ross; Herbert Dubno

[57] **ABSTRACT**

This device permits of readily converting an article of hand luggage or a trunk into a wheel-carried structure. It comprises a retractable handlebar adapted, when pulled out, to cause a pair of sleeves to rotate and set the wheels to their operative or carrier position. Means are provided between these sleeves and fixed bearings for locking said sleeves in their operative positions, to prevent the wheels from yielding or wobbling when they carry the weight of luggage.

1 Claim, 13 Drawing Figures



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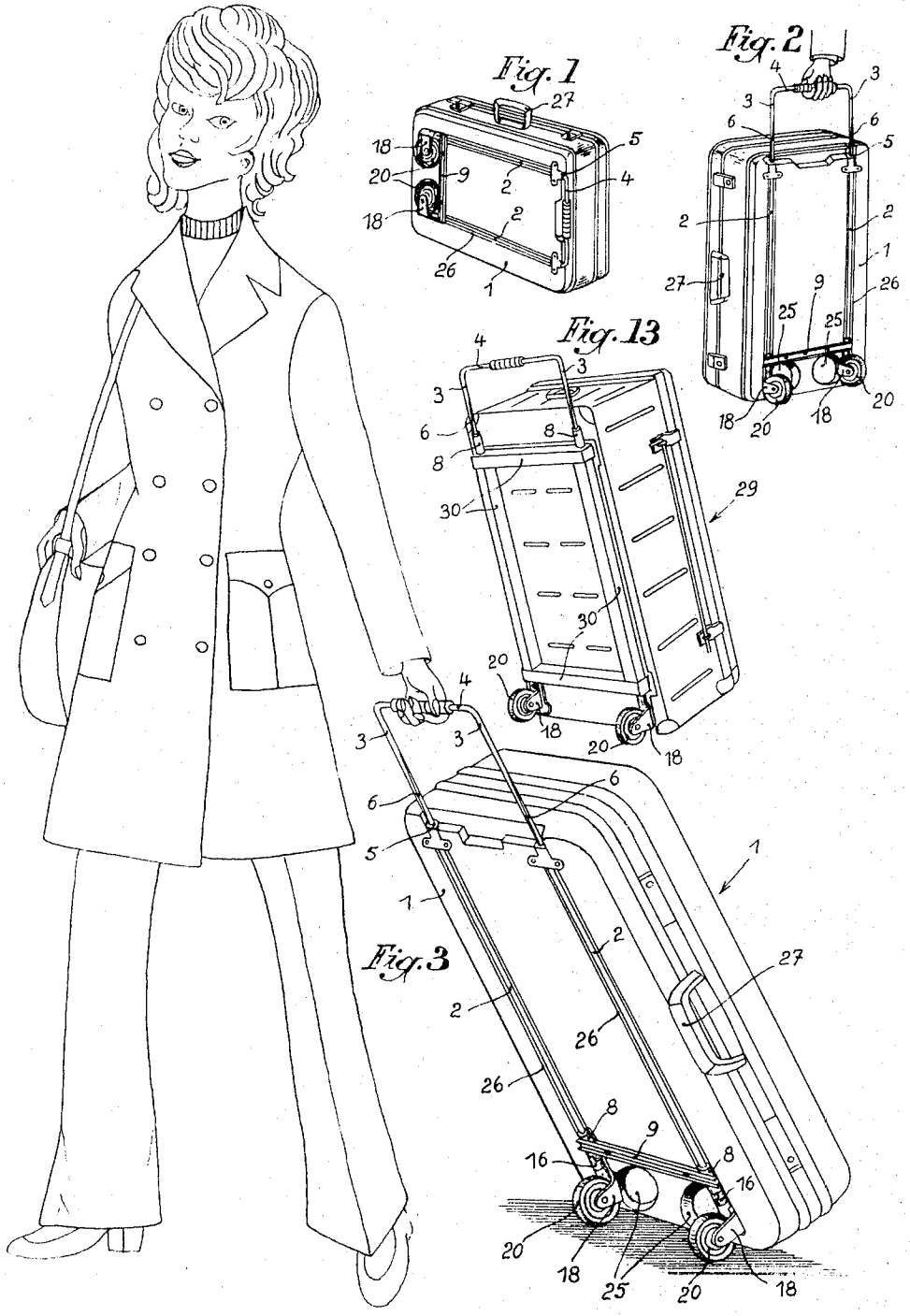


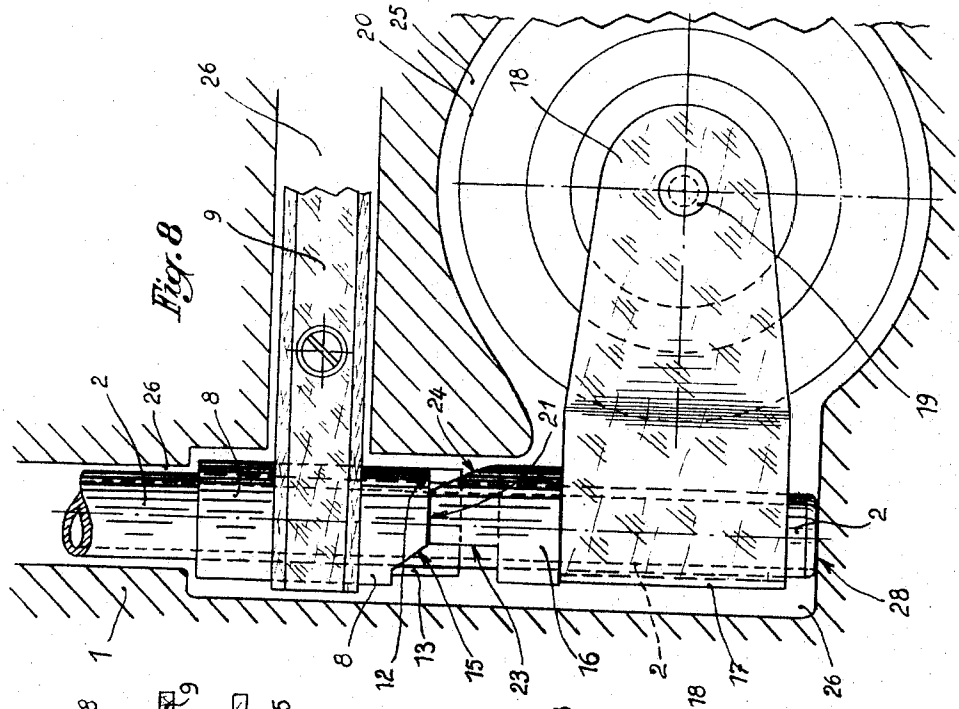


Fig. 8

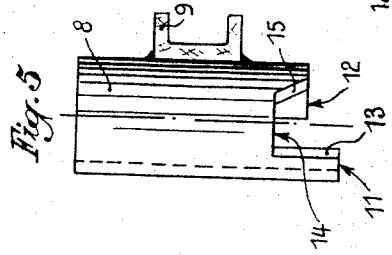


Fig. 5

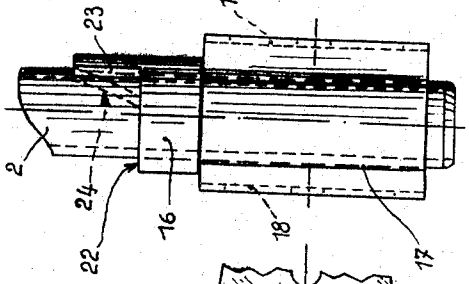


Fig. 7

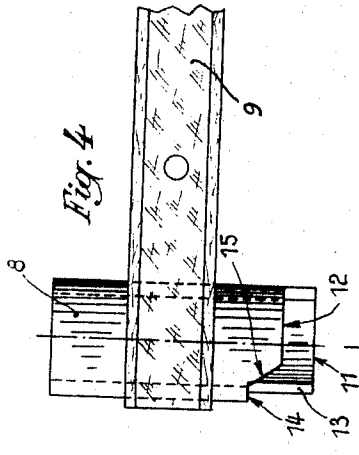


Fig. 4

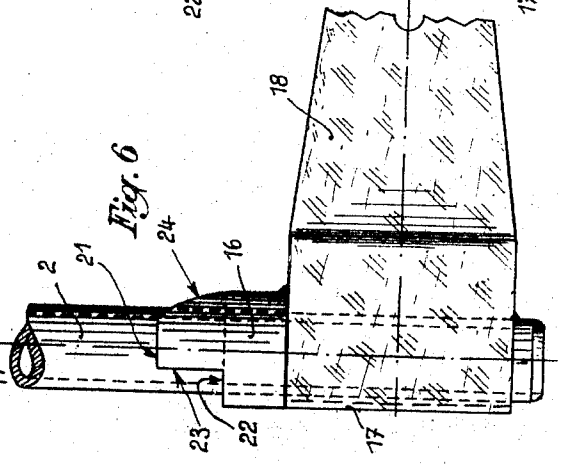


Fig. 6

Fig. 10

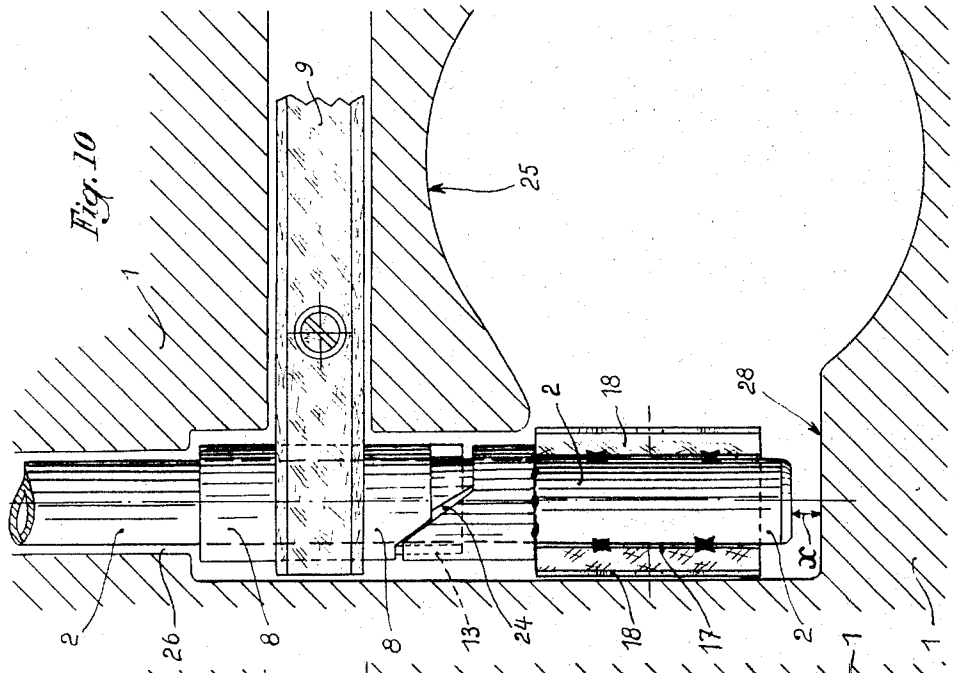
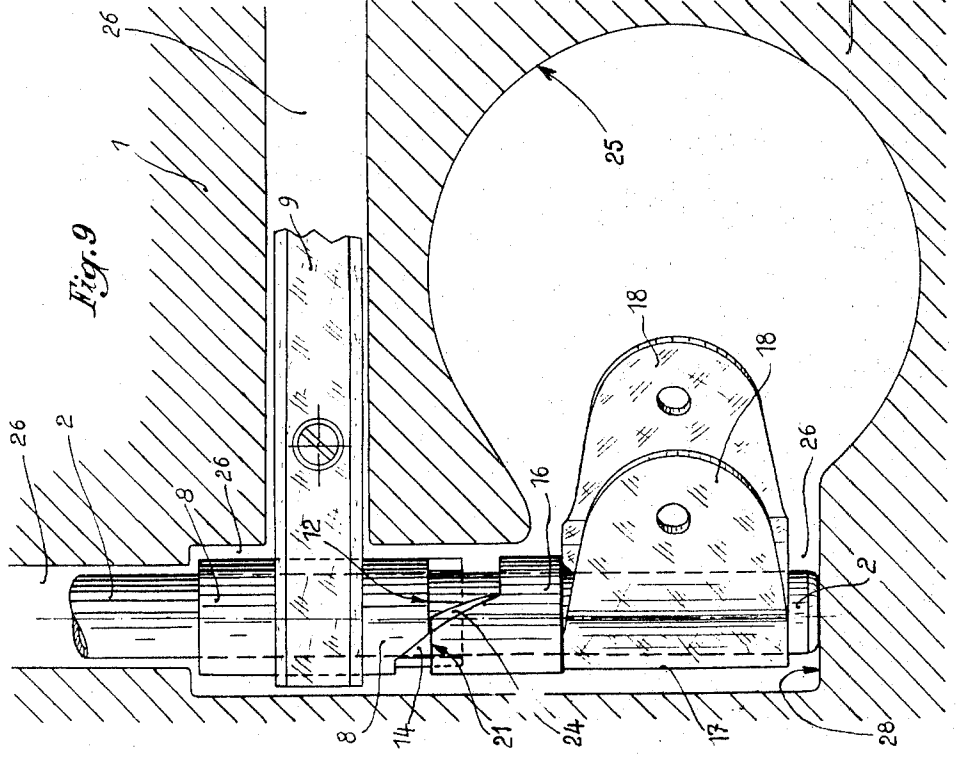

9
25
1
2
18
28
x
2
26
8
8
13
24
18
17
2
1
1

Fig. 9


26
25
1
9
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18
26
26
2
8
26
12
16
2
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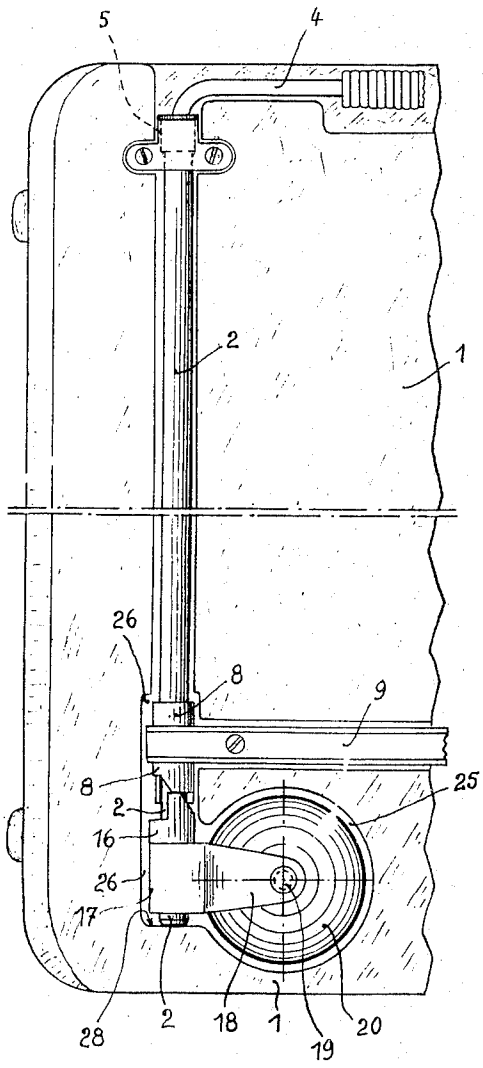
21
24
17
28

Fig. 11


5
4
2
1
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26
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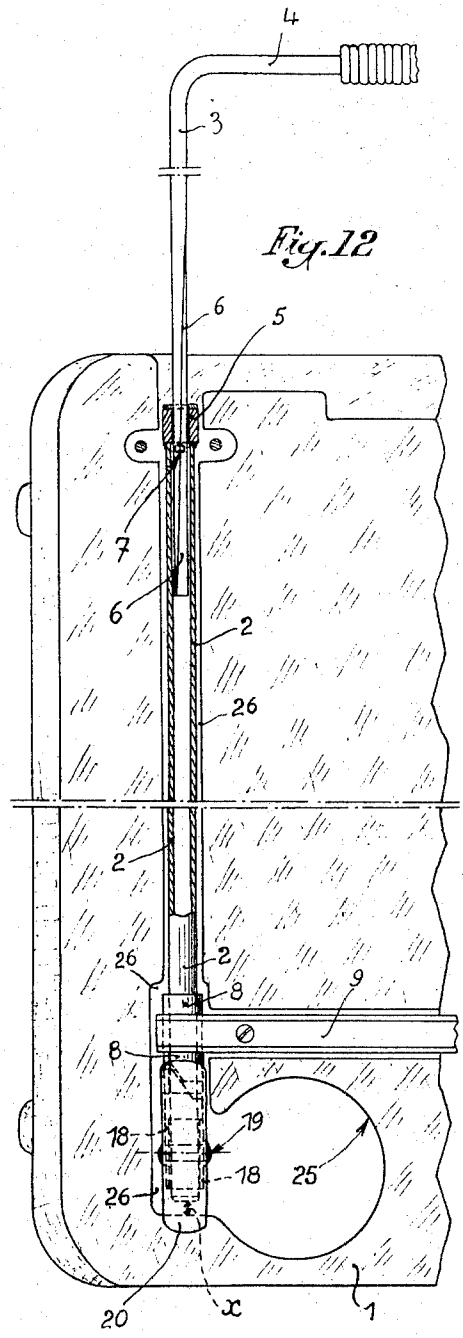
1
19
20

Fig. 12


4
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1

WHEEL-MOUNTED LUGGAGE

BACKGROUND OF THE INVENTION

The present invention relates to hand-carried luggage, this term designating in general all hand luggage including cases and crates, suitcases and small trunks, whether rigid or not, as well as large trunks, canteens, officers' chests, or the like, and also related to separate luggage caddies or racks adapted to roll on wheels on the ground.

SUMMARY OF THE INVENTION

This invention is concerned more particularly with luggage of the type wherein the wheels permitting the easy rolling of the luggage on the ground or floor are adapted, when the luggage is to be carried by hand, to be folded and collapsed against the bottom-forming major surface of the luggage by causing the side or longitudinal members of a handbar to slide in rotatably mounted sleeves. This sliding movement causes the sleeves to pivot through substantially 90°; in this structure, each rotary sleeve carries at one end a pair of flanges acting as a shoulder for supporting the shaft of the relevant wheel.

Thus, in the hand-carried position, the wheels lie against the aforesaid bottom-forming major surface of the luggage without projecting appreciably from this surface, with their wheel shafts perpendicular to the surface; on the other hand, in the rolling position the wheels swung to their operative positions, i.e., with their axes parallel or substantially parallel to the major surface.

In luggage thus equipped the pivoting movement of each wheel supporting socket is limited, in the operative or rolling position, by a simple stop member so that when a transverse force is applied to the wheels or to one of the wheels in the direction opposite to said stop member, for example when clearing a pavement or sidewalk step, this force is transmitted to the mechanism which caused the wheels to move to their operative position, thus tending to fold the wheels and producing a certain wheel wobble and undesired strain in the mechanism controlling the wheel position.

The invention avoids this inconvenience by providing means for affording a certain freedom of movement of each wheel-supporting sleeve in the axial direction and by on the other forming in each sleeve a notch adapted, at the end of the movement of the wheels towards their operative positions to act as a limit stop and as a positive means for coupling the sleeves to fixed bearings guiding said sleeves, this coupling taking place automatically by snap action due to the weight of the luggage and causing the wheels to be positively held in the proper orientation.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of a luggage in the hand-carried position;

FIG. 2 is a perspective view showing the same article of luggage after the displacement of the wheels to their rolling position;

FIG. 3 is another perspective view showing on a larger scale the same article of luggage being used on the floor;

FIG. 4 is a front-elevational view of one of the fixed notched members acting as a bearing for the respective rotary tubular sleeve;

FIG. 5 illustrates the same fixed notched member in side-elevational view;

FIG. 6 illustrates in a front elevational view the rotary sleeve with its wheel-supporting arm;

FIG. 7 shows the same sleeve in a side-elevational view;

FIG. 8 is a fragmentary detail view showing the front surface of the luggage with the wheels retracted therein;

FIGS. 9 and 10 are views similar to FIG. 8 but showing the mechanism in an intermediate position and in the fully operative position, respectively;

FIGS. 11 and 12 are elevational views showing the device in the positions of FIGS. 8 and 10, respectively; and

FIG. 13 illustrates the use of the device of this invention in the case of a canteen or officer's chest or trunk.

SPECIFIC DESCRIPTION

The article of luggage 1 is of rectangular parallelipipedal shape and comprises, on its major surface constituting the bottom thereof (opposite to the cover), a pair of spaced parallel tubular rotary sleeves 2 in which the side members or arms 3 of a handlebar 4 are telescoped.

As shown more particularly in FIGS. 11 and 12, a socket 5 is secured for example by welding or brazing to the end of each sleeve 2. The throughgoing axial hole of this socket 5 is of polygonal section, for example square section, and the side members 3 have the same cross-sectional contour with a play sufficient to permit their sliding movement therein. Moreover, the aforesaid arms 3 have a helical configuration as shown at 6, whereby the axial sliding movement of the members 3 in the sockets 5 causes the sleeves 2 to rotate. Stop members 7 prevent the side members 3 from being totally withdrawn from the sockets 5 in which they are slidably mounted.

At its opposite end, each sleeve 2 extends through a fixed bearing 8 acting as guide means and these bearings 8 are secured to the front surface of the luggage 1 by means of a cross member 9 of suitable cross-sectional contour.

The lower end of each bearing 8 is notched and comprises a pair of semi-circular faces 11, 12 disposed at different levels, as seen in the drawing (FIGS. 4 and 5). Face 11 lies at to a lower level than face 12 and terminates with a vertical face 13 extending to the bottom of a notch 14 connected through a cam face or ramp 15 to the other semi-circular face 12.

This contour of the fixed bearing 8 registers with a matching contour formed on a portion 16 of greater diameter of the sleeve 2 which is rigid with a clamp-like collar portion 17 formed with integral radial flanges 18 receiving in their outer ends the shaft 19 of a wheel or roller 20.

The thicker portion 16 of sleeve 2 has an upper contour constituting the counter-part of the notched contour of the respective bearing 8 in that it comprises a pair of semi-circular faces 21, 22 interconnected by a vertical face 23 and an inclined face 24, as shown.

The bottom surface of the luggage further comprises across each wheel 20 a hollow or dished depression 25

adapted to accomodate the corresponding wheel in the retracted or collapsed position thereof, to avoid any undesired profection of the wheels from this surface.

The sleeves **2** are also sunk for the same reason in grooves **26** formed in said bottom surface of the luggage.

Finally, it will be noted that the sleeves **2** and the means **16, 17, 18, 19** and **20** carried thereby can move freely in their axial direction through a distance *x* (FIG. **10**) in their fixed bearings **8.**

Thus, in operation, when the side members **3** are pushed inwards or telescopically into the sleeves **2,** the former are so rotated about their common axis with the latter that the radial flanges **18** and the wheels **20** carried thereby are pivoted against the bottom surface of luggage **1** and therefore received in the hollows **25.** This is the position obtained when it is desired to carry the luggage by hand, that is, by means of its conventional handle **27,** as shown in FIGS. **1, 8** and **11.**

In this position (FIG. **8**) the front face **21** of each thicker portion **16** of sleeves **2** engages or bears against the registering end face **12** of the corresponding fixed bearing **8,** and the lower ends of said sleeves **2** bear against the lower ends of the corresponding grooves **26.**

When it is desired to transport this luggage by converting same into a cart and causing same to roll on the ground or floor as shown in FIG. **3,** it is only necessary to pull the handlebar **4** from its inoperative position (FIGS. **1** and **11**) to its operative position (FIGS. **2, 3** and **12**). During this movement, the helical configuration of the side arms **3** cause (via the sockets **5**) the rotation of sleeves **2** and therefore the pivotal movement of the flanges **18** carrying the wheels **20** through an angle of about **90°** and in opposite senses so that the wheels **20** are swung from their hollows **25** and eventually extend at right angles to the bottom surface of the luggage.

In this position, it is only required to impart a slight inclination to the luggage **1** to enable the wheels **20** to engage the ground, so that the luggage can be carried very easily like an ordinary cart by pulling the handlebar **4** (FIG. **3**).

In a first fraction of the pivotal movement of sleeves **2,** the end face **21** of their thicker portion **16** slides along the end face **12** of bearing or bushing **8** to the intermediate position shown in FIG. **9.** Beyond this intermediate position, the inclined ramp **24** of portion **16** registers with the notch **14** of fixed bearing **8,** and due to the weight of the luggage supported by the wheels **20,** the inclined ramps or flanks **24** engage the notches **14** as shown in FIG. **10** while the vertical faces **13** and **23** engage each other, thus limiting the permissible pivotal movements of sleeves **2** and therefore of the wheels **20** to a predetermined value.

On the other hand, the inclined ramps **15** and **24** engaging each other hold the aforesaid abutment and counteract any contrary action tending to collapse the wheels **25** (FIG. **10**).

To convert the luggage again from the cart condition, to the hand-carry condition, it is only necessary to push the handlebar **4** back while the luggage is in the position shown in FIG. **2,** so that the wheels **25** do not contact the ground, i.e., to prevent the luggage weight from bearing on these wheels.

Thus, the sleeves **2** can move freely downward and take up the play *x*, so that the inclined ramps **24** are released from their notches **14** and the helical configuration of arms **3** causes these sleeves to be rotated in the opposite direction to re-insert the wheels into their hollows **25** and cause them to engage the bottom surface of the luggage.

FIG. **13** illustrates the application of the present invention to a trunk or canteen **29,** wherein the sleeves **2** are mounted under a frame structure **30** so that the hollows **25** can be dispensed with, the wheels **20** being retracted inside this frame structure, as shown.

Of course, and as already pointed out in the foregoing, this invention should not be construed as being strictly limited to the specific forms of embodiments described, illustrated and suggested herein, since various modifications and applications may be contemplated without departing from the basic principles of the invention as set forth in the appended claims, as will readily occur to those conversant with the art.

What I claim as new is:

1. A wheel-supported carrier comprising:

a casing of generally rectangular parallelipedal configuration with a broad base defined by a pair of longitudinal edges and a pair of transverse edges;

a pair of bushings mounted on said base parallel to and adjacent to each said longitudinal edge

a pair of wheels each connected to a cylindrical rotatable sleeves and mounted on said base about respective pivotal axes generally parallel to said longitudinal edges whereby the axes of said wheels can assume a retracted position perpendicular to said base and an operative position generally parallel thereto upon pivotal movement of said sleeves about their relative axes;

said sleeves fixed to said casing along said base in said bushings, each sleeve having an end portion of larger diameter than the remainder of said sleeve each bushing and the respective end portion of said sleeve having camming engagement confronting faces, one of the confronting faces being formed with a recess defined between a steep flank and an inclined flank and the other confronting face being formed with a projection generally complementary to said recess and formed between a steep flank and an inclined flank whereby the steep flanks of the confronting faces abut one another in said operative position to limit further rotation of each sleeve in the sense tending to swing the respective wheels of its retracted position while the inclined flanks of the confronting faces mutually engage to prevent opposite rotation of the respective sleeve in the absence of relative axial displacement of each bushing and the respective sleeve; and

a cross member fixing said bushings to said casing and extending parallel to one of said pairs of edges;

a respective handlebar member received in each sleeve and axially displaceable therein;

cooperating formations on each handlebar member and sleeve for operatively coupling same to rotate said sleeves and the larger end portion connected thereto to swing the respective wheels out of their retracted positions and into their operative positions upon axial telescoping withdrawal of the handlebar members from the respective sleeves; and

means for mounting said bushing on said casing for axial movement relative to the respective sleeves to permit reverse rotation of said larger end portions of said sleeves to the retracted position upon telescoping of said handlebar members into said sleeves upon unloading of said wheel and the camming engagement of the inclined flanks of the confronting faces.

* * * * *