Luggage or container with casters comprising a plurality of pivoting wheels and a braking device

The invention relates to luggage or a container with casters comprising a braking device and a plurality of pivoting wheels.

Suitcases provided with pivoting wheels, particularly with four pivoting wheels, pose the risk of spontaneous rolling and unwanted movement away from their owner, particularly when travelling on public transport or when parked on a slope.

Suitcases, luggage or containers with casters comprising a braking device and a plurality of pivoting wheels are known in the art.

Pivoting wheels can be braked by immobilization with the help of a foot-operated catch. The catch can be operated by a system integrated in the pivot axis of the wheel or by an external unit working with a gear wheel, for example.

Another braking system used particularly in supermarket trolleys comprises a friction pad with an external pushbutton to immobilize at least one wheel of the supermarket trolley or of the container through friction on the tread. Friction on the tread may likewise be replaced by an engagement with a coaxial gear wheel at the rolling axis of the pivoting wheel.

Finally, cable- or lever-operated systems are known in the art. The lever-operated braking system can be controlled by a rigid rod. The braking control may, in the particular case of a suitcase or container with a retractable handle, be integrated in the retractable handle. However, the disadvantage of this device is that the braking system can only be operated by retracting said retractable handle.

A first aim of the invention is to simplify and perfect the state of the art by proposing new luggage or a new container with ergonomic wheels of simple design offering greater reliability.

The object of the invention is luggage or a container with casters comprising a braking device acting on a plurality of pivoting wheels by means of at least one Bowden cable passing through at least one

corresponding flexible tensioning sheath, characterized in combination by the fact that the braking device comprises a means of manual control actuating at least one said Bowden cable and acting on a corresponding means of actuating braking of the pivoting wheel and by the fact that the manual control means exhibits a first button, the so-called "activation button", and a second button, the so-called "deactivation button".

According to other alternative characteristics of the invention:

- the activation button exhibits a first position corresponding to the free rotation of the pivoting wheels on the luggage or container and a second position corresponding to the braking of the plurality of pivoting wheels on the luggage or container;

- the deactivation button exhibits a conformation guaranteeing a detent function and preventing the activation button from returning towards the position corresponding to the free rotation of the pivoting wheels on the luggage or container;

- the deactivation button is mounted in a pivoting manner in relation to the body of the manual control means, so as to release the levers and stop the braking of the pivoting wheels by pressing on the deactivation button to release the activation button;

- each brake actuation means is a first class lever mounted in a housing attached to a pivoting axis of the pivoting wheel and acting directly or indirectly on a friction element, to ensure the braking of a pivoting wheel;

- each actuation means acts on a coaxial tappet at a pivoting axis of the pivoting wheel;

- the pivoting axis of the pivoting wheel is advantageously a hollow pin in which the coaxial tappet slides;

- the friction element is an element which can be deformed under the action of the tappet;

- the friction element is advantageously an elastic blade forming the return spring of the tappet in a position corresponding to the release of the pivoting wheel;

- the brake actuation housing advantageously has an open bottom applied against the bottom of the luggage or container with casters.

The invention will be understood more easily with the help of the description which follows and which is provided by way of a non-limiting example with reference to the attached drawings in which:

Figure 1 represents in schematic form an elevated view of luggage or a container with casters according to the invention.

Figure 2 represents in schematic form a perspective view of a brake actuation housing of luggage or a container with casters according to the invention.

Figure 3 represents in schematic form a sectional view according to the plane III-III in Figure 2 of a brake actuation housing in the free movement position of luggage or a container with casters according to the invention.

Figure 4 represents in schematic form a sectional view similar to Figure 3 of a brake actuation housing in the braking position of luggage or a container with casters according to the invention.

Figure 5 represents in schematic form a perspective view of a manual control means in the braking position of luggage or a container with casters according to the invention.

Figure 6 represents in schematic form a sectional view of a manual control means in the free movement position of luggage or a container with casters according to the invention.

Figure 7 represents in schematic form a sectional view according to the plane VII-VII in Figure 6 of a manual control means in a free movement position of luggage or a container with casters according to the invention.

Figure 8 represents in schematic form a sectional view according to the plane VIII-VIII in Figure 5 of a manual control means in the braking position on luggage or a container with casters according to the invention.

Figure 9 represents in schematic form a sectional view according to the plane IX-IX in Figure 8 similar to Figure 7 of a manual control means in the braking position of luggage or a container with casters according to the invention.

With regard to the Figures 1 to 9, identical or functionally equivalent parts are referred to using identical reference numbers.

In Figure 1, luggage (1) or a container with pivoting casters (2) comprises a manual control means (3) disposed, for example, in the vicinity of a retractable handle.

The manual control means (3) acts on a single Bowden cable (4) comprising flexible tensioning sheaths (5, 6).

Each end of the cable (4) acts on a brake actuation lever (7) situated inside a housing (8) attached to the pivoting axis of a pivoting wheel (2).

The manual control means (3) is actuated with the help of a single operation.

The provision of a single control cable (4) enables adjustment and balancing differences between the two brake housings (8) of two pivoting wheels to be avoided.

The reduction in play and defects resulting from the presence of multiple cables is likewise eliminated, because adjustments are made on the length of the cable (4) during fitting, without changing the assembly of the braking device.

In Figure 2, a brake housing (8) comprises a physical structure (8a) allowing the assembly of an articulated lever (7) about an axis (7a).

The housing (8) is a bottomless housing provided with guide pins (8b).

The guide pins (8b) allow the housing (8) to be assembled inside and on the bottom of the suitcase by through bolts working with a pivoting wheel counter-housing disposed on the outside of the wall 1a of the luggage or container according to the invention.

Hence, the wall (1a) of the luggage or container according to the invention is sandwiched between the brake housing (8) and the pivoting wheel assembly counter-housing.

The housing (8) allows the assembly of a tappet (9) guided in a straight line substantially vertically.

In Figure 3 the housing (8) supports a lever (7) articulated about the axis (7a).

The first end of the lever (7) articulated about the axis (7a) may be actuated by a first end of the Bowden cable (4), possibly with the interposition of a return spring.

The lever (7) presses on the tappet (9) with its second end.

The tappet (9) is mounted coaxially at the pivoting axis (A) of the pivoting wheel (2).

A guide tube (10) of the tappet (9) is likewise mounted coaxially at the pivoting axis (A) of the pivoting wheel (2).

The fork (2a) of the pivoting wheel supports an elastic blade (11), of which the end opposite its end fixed to the fork (2a) is subject to the action of the tappet (9).

In Figure 3 the lever (7) is not drawn upwards by the Bowden cable (2), such that the elastic force of the blade (11) presses the tappet (9) upwards and allows the pivoting wheel (2) to roll freely.

The return spring mounted at a first end of the Bowden cable (4) presses the first end of the lever (7) articulated about the axis (7a) downwards and thereby prevents the lever (7) from pressing on the tappet (9) with its second end.

In Figure 4 the Bowden cable (2) applies traction to the first end of the lever (7), such that the second end of the lever (7) presses on the tappet (9).

The pressure applied the tappet (9) deforms the blade (11) elastically on contact with the wheel (2).

The elastically deformed blade (11) brakes the wheel (2) through friction on the tread of the wheel (2).

The invention is not limited to friction on the tread of the pivoting wheel (2), but on the contrary extends to any form of braking of the pivoting wheel (2) by an elastic blade acting on a joint element of the pivoting wheel (2), for example on a concentric disc with a smaller diameter.

The lever (7) is preferably a first class lever exhibiting an amplification ratio greater than 1.

This amplification ratio greater than 1 is defined by the ratio between the length of the lever arm situated between the articulation axis (7a) and the end of the Bowden cable (2) and the length of the lever arm situated between the articulation axis (7a) and the tappet (9).

In Figure 5 a manual braking control means (3) is represented in perspective.

The manual control (3) exhibits a first button, referred to as the "activation button" (3a) and a second button, referred to as the "deactivation button" (3b).

In Figure 6 the activation button (3a) is in the raised position corresponding to the free movement of the pivoting wheels on the luggage or container according to the invention.

A protuberance (3e) in the manual control means (3) is formed to guide the Bowden cable with the help of teeth, without pinching it.

The deactivation button (3b) is in a substantially vertical position, such that its lower end in the form of a hook or detent is not active and does not hold the upper edge of the activation button (3a).

In Figure 7, corresponding to the position in Figure 6, the activation button (3a) is in the raised position substantially corresponding to an outcrop on the lateral edges of the manual control means (3).

The manual control means (3) likewise comprises the guiding and assembly conformations (3c, 3d) of the Bowden cable (2) designed to use the Bowden cable's inherent elasticity and to guarantee an upwards elastic return of the activation button (3a) when it is not locked in a braking position.

The "policeman's hat-type" curve of the Bowden cable guided by the assembly ends (3c) of the flexible tensioning sheaths (5, 6) and by the protuberance (3e) actually enables the elastic effect of the cable forming part of the Bowden cable (2) to be exploited.

In Figure 8 the activation button (3a) has been depressed in the braking position and the button (3b) ensures a detent function, preventing the upwards elastic return of the activation button (3a).

In this braking position, the locking of the activation button (3a) is maintained due to the transmission of the elastic force of the elastic blade (11) through the mechanical assembly thereby achieved.

In Figure 9 the activation button (3a) is in the braking position in Figure 8.

In this position, the lower guiding end (3e) with the help of Bowden cable (2) teeth guarantees downwards traction and raising of the ends of the single Bowden cable (2), such that the levers (7) are raised upwards into a position such as that shown in Figure 4.

The activation button (3a) is held in position by the button (3b) exhibiting one end in the form of a hook or detent. The button (3b) itself is articulated about an axis fixed to the body of the manual control means (3).

In order to release the levers (7) and stop the braking of the pivoting wheels (2), it is sufficient to press on the end of the button (3b), in order to deactivate the detent of the button (3a).

The upwards elastic return of the button (3a) by the elastic blades (11) acting on the tappets (9) and the levers (7) then ensures downward traction of the cable, which automatically raises the activation button (3a) and thereby enables the position in Figures 6 and 7 to be returned to.

The invention described with reference to a particular embodiment is in no way limited to this, but on the contrary covers any change in form and any realization variant within the framework of the attached claims.

The invention described with reference to a single cable applies likewise to a system of double cables controlled by a single manual control means (3). The invention described with reference to single wheels applies likewise to pairs of wheels in which the braking is controlled by a single manual control means (3).

The activation button (3a) can cooperate with a tensioning part to which two independent cables are fixed.

This tensioning part allowing the length of each cable to be adjusted independently preferably comprises a metal cable fixing section.

This metal cable fixing section avoids the risk of creep on the activation button (3a) made of a plastic material.

This tensioning part allows the system to be assembled by tensioning the cables during final assembly of the activation button (3a) from the outside.

Finally, the invention described with reference to a system for adjusting the tension and/or cable length at wheel level, extends to the variant according to which the tensioning part includes a system intended to adjust the tension and/or length of each cable following the final assembly of the activation button (3a) from the outside.

1. Luggage (1) or container with casters (2) comprising a plurality of pivoting wheels (2) comprising a means (3) of manual control comprising a first button, the so-called "activation button" (3a), and a second button, the so-called "deactivation button" (3b) characterized in that the control means actuates one cable so called Bowden cable (4) passing through two flexible tensioning sheaths (5, 6) and in that said cable acts on each of its ends on a means (7) of actuating braking of the pivoting wheel (2).

2. Luggage or container according to Claim 1, characterized in that the activation button (3a) exhibits a first position corresponding to the free rotation of the pivoting wheels on the luggage or container and a second position corresponding to the braking of the plurality of pivoting wheels on the luggage or container.

3. Luggage or container according to Claim 1, characterized in that the deactivation button (3b) exhibits a conformation guaranteeing a detent function and preventing the activation button (3a) from returning towards the position corresponding to the free rotation of the pivoting wheels on the luggage or container.

4. Luggage or container according to Claim 1, characterized in that the deactivation button (3b) is mounted in a pivoting manner in relation to the body of the manual control means (3), so as to release the levers (7) and stop the braking of the pivoting wheels (2) by pressing on the deactivation button (3b) to release the activation button (3a).

5. Luggage or container according to Claim 1, characterized in that each brake actuation means (7) is a first class lever mounted in a housing (8) attached to a pivoting axis (A) of the pivoting wheel (2) and acting directly or indirectly on a friction element (11), to ensure the braking of a pivoting wheel (2).

6. Luggage or container according to Claim 1 or Claim 5, characterized in that each actuation means (7) acts on a coaxial tappet (9) at a pivoting axis (A) of the pivoting wheel (2).

7. Luggage according to Claim 1 or Claim 6, characterized in that the pivoting axis (A) of the pivoting wheel (2) is a hollow pin (10) in which the coaxial tappet (9) slides.

8. Luggage according to Claim 5, characterized in that the friction element (11) is an element (11) which can be deformed under the action of a tappet (9).

9. Luggage or container according to Claim 8, characterized in that the friction element (11) is an elastic blade (11) forming the return spring of the tappet (9) in a position corresponding to the release of a pivoting wheel (2).

10. Luggage according to Claim 2, characterized in that the brake actuation housing (8) has an open bottom applied against the bottom of the luggage (1) or container with casters (2).