

[54] **TWO-WHEEL CASTOR FOR A CHAIR OR THE LIKE**

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[51] **Int. Cl.²** **B60B 33/00**

[58] **Field of Search** 16/18, 18 A, 18 CG, 45, 16/47, 26

[56] **References Cited**

UNITED STATES PATENTS

636,757 11/1899 Carraway 16/24
2,981,969 5/1961 Fontana 16/18 CG

FOREIGN PATENTS OR APPLICATIONS

2,007,012 1/1970 France 16/45

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[57] **ABSTRACT**

A two-wheel castor, especially for a chair or a similar piece of furniture, consisting of a supporting member which is adapted to be mounted on the chair or the like and to support two wheels. The supporting member and the wheels are partly surrounded by a casing which is shaped like the periphery of a solid of revolution, e.g. a ball socket, which has an opening which is smaller than a diametrical cross-section, so that the wheels are well protected. The supporting member has a peripheral surface the shape of which corresponds to the shape of the inner surface of the casing. Thereby the supporting member can be mounted in the casing and kept in position without any latch means, and by a suitable dimensioning of the parts the wheels and the supporting member can be inserted in the casing through the opening in the casing.

5 Claims, 6 Drawing Figures

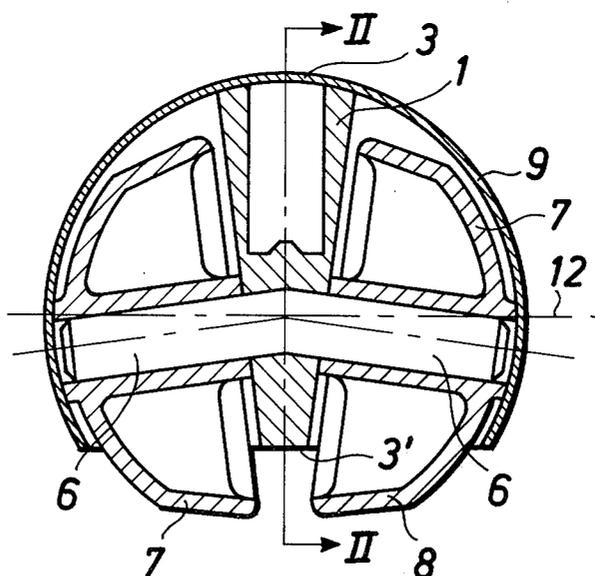


Fig. 1

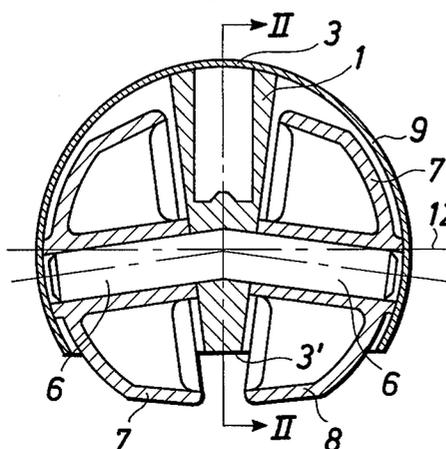


Fig. 2

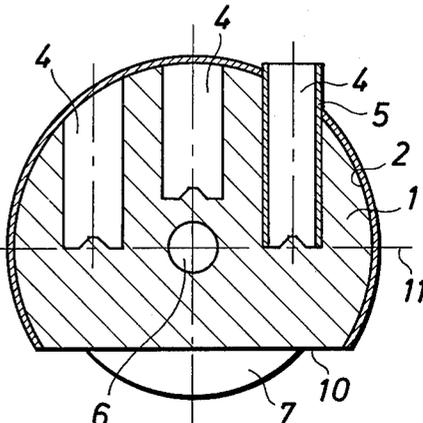


Fig. 3

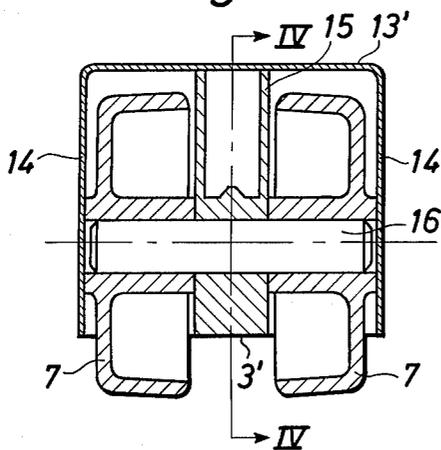


Fig. 4

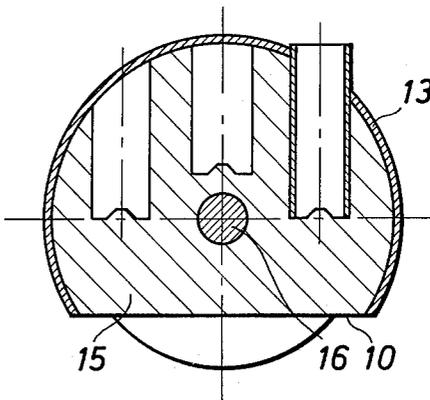


Fig. 5

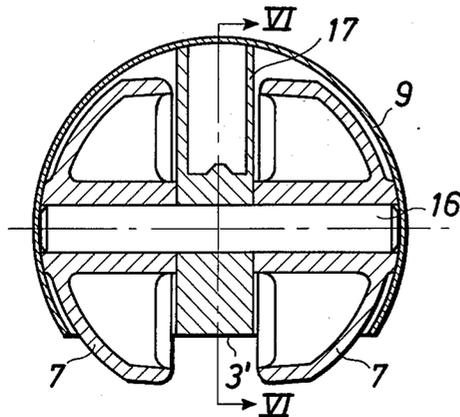
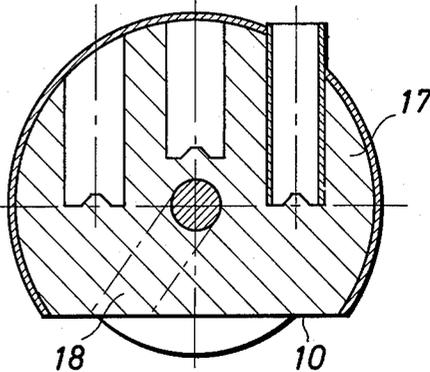


Fig. 6



TWO-WHEEL CASTOR FOR A CHAIR OR THE LIKE

This invention relates to a castor, especially for a chair, of the type which has a disc-shaped supporting member which is substantially vertical in the operative position and which is rotatably mounted on a substantially vertical shaft member which is mounted on the chair or the like, from each side surface of which supporting member a shaft pin extends, on each shaft pin a wheel being journalled, said supporting member and a portion of the wheels being surrounded by a casing which is open at the bottom, the shaft which connects the supporting member with the chair or the like extending through an opening in said casing.

A castor construction is known in which the casing consists of a portion of a cylinder surface without end walls, so that the wheels can be mounted on the shaft pins by insertion from the side. Each wheel has a boss with a groove in which a latch member engages, which latch member is mounted on the supporting member by means of a screw.

The castor according to this invention is characterised in that the casing is shaped as the periphery of a solid of revolution which at the bottom has an opening which is smaller than the largest cross-section area of the casing, and that the supporting member has a peripheral surface the shape of which corresponds to the shape of the inner surface of the casing.

With this construction of the castor a casing may be used which surrounds a rather large portion of the wheels, so that the wheels are well protected, and in spite of this fact the castor can be assembled without using any latch means, as the supporting member, when it is positioned in such a way that its peripheral surface corresponding to the shape of the casing abuts the inner side of the casing, is kept in this position only by means of the shaft pin which connects the castor to the chair or the like, and the castor according to this construction only consists of parts which are important for the function, viz. the supporting member, the casing, the shaft pins, the wheels, and the shaft pin which connects the castor to the chair or the like. Special latch means which make the castor expensive and make the assembly of the castor complicated and further provide a risk of unintentional taking apart of the castor are eliminated.

Some embodiments of the invention are described in the following with reference to the drawing, where

FIG. 1 is a sectional view of a castor according to the invention,

FIG. 2 a section along the line II—II in FIG. 1,

FIG. 3 the same as FIG. 1 for a modified embodiment,

FIG. 4 a section along the line IV—IV in FIG. 3,

FIG. 5 the same as FIG. 1 for a further modification, and

FIG. 6 a cross-section along the line VI—VI in FIG. 5.

The castor which is shown in FIGS. 1 and 2 consists of a disc-shaped supporting member 1 the periphery of which is constituted by a circular portion 2 and a cord 3' in the circle. The arched surface 3 corresponding to the circular portion is shaped as a part of a ball zone. As shown in FIG. 1, the supporting member 1 has a larger width at the top than at the bottom, so that the shape of the member is like an extended ball sector. In

the supporting member there are three vertical bores 4 of which the middle bore is positioned in the vertical middle axis of the supporting member, as shown in FIG.

2. The three bores 4 are adapted to receive a shaft pin (not shown) connecting the castor with a chair or the like. In the bore to the right in FIG. 2 a sleeve 5 is mounted, and in this sleeve the said shaft pin is rotatably mounted, so that the castor as a unit can swing about the said shaft pin. The three bores can be used optionally, and if two shaft pins are used, the castor will be fixed to the chair or the like.

In the supporting member 1 two shaft pins 6 are mounted under an obtuse angle to each other, as shown in FIG. 1. On the shafts two wheels 7 are rotatably mounted. Each wheel has such a shape that its peripheral portion 8 can run on the floor on which the chair or the like is positioned.

The supporting member and the wheels are surrounded by a casing 9 which is shaped as a ball socket having the same radius as the peripheral surface 3 of the supporting member 1. The casing has an opening 10 which is constituted by a substantially horizontal plane cutting removing a ball segment, so that the edge of the opening 10 is circular. As shown in FIG. 2, the sleeve 5 passes through the casing, and thereby the casing is fixed in relation to the supporting member 1.

The castor according to FIGS. 1 and 2 is taken apart thereby that the sleeve 5 and the shaft pin (not shown) are removed from the supporting member 1, whereafter the supporting member 1 is rotated about the axis 11 in FIG. 2, so that one of the wheels 7 is positioned at the opening 10. Now, this wheel can be removed together with the shaft pin 6 through the opening 10 in the casing. Thereafter the supporting member 1 is rotated in opposite direction about the axis 11 until the second wheel 7 is positioned at the opening 10, and now, this wheel and its shaft pin 6 can be removed from the supporting member 1. At last the supporting member is rotated about the axis 11 to the position shown in FIG. 1, and thereafter it is rotated about the axis 12 until the cord 3' is substantially vertical, whereafter the supporting member 1 can be removed through the opening 10. The assembly of the parts takes place in the same manner as described, but in opposite order, and no special latch means are used. The supporting member 1 is fixed in relation to the casing 9 by means of the shaft pin which connects the castor with the chair or the like and which is not shown in the drawing. As will appear from FIG. 1, the wheels 7 and the shaft pins 6 cannot change position or fall out from the casing.

In the embodiment according to FIGS. 3 and 4 the casing 13 is shaped as a part of a cylinder surface 13' and has two plane end walls 14. The opening 10 is limited by two cords in the circular end walls 14 and two generatrices in the cylinder surface. The supporting member 15 is shaped as a disc having equal thickness and a periphery which is constituted by an arched surface corresponding to the inner surface of the casing and a cord 3'. The shaft pins for the wheels 7 consist of a common shaft 16 which is coaxial with the axis of the casing and has substantially the same length as the distance between the end walls 14.

The diameter of the wheels is less than the distance between the two said generatrices, so that the wheels can pass the opening 10. The castor is taken apart thereby that the supporting member 15 after removal

of the shaft pin which connects the castor with the chair or the like is rotated about the axis of the shaft 16, whereafter the complete unit consisting of the supporting member 15, the shaft 16, and the wheels 7 can be drawn through the opening 10.

The castor according to FIGS. 5 and 6 has in the same way as the castor according to FIGS. 1 and 2 a casing 3 which is a ball socket, and the supporting member 17 has the same shape as the supporting member 1 with the only difference that it has an equal thickness. The wheels 7 are mounted on a common shaft 16 the axis of which coincides with a diameter in the ball socket. This castor is assembled and taken apart in the same manner as the castor according to FIGS. 1 and 2.

As the shaft 16 has the same length as a diameter in the ball socket the inner surface of the ball socket can constitute stop means for the ends of the shaft, and as shown in FIG. 5, it can also constitute stop means for the wheels 7.

The supporting member 17 may be provided with a slot 18 connecting the bore for the shaft 16 with the straight edge 3', which is shown by the stippled line in FIG. 6. Thereby it will be possible to mount the wheels 7 and the shaft 16 in the casing and thereafter to insert the supporting member in the casing.

Known castors have a supporting member which is integral with the casing, and this unit is manufactured by a moulding process. According to this invention the casing can be manufactured separately, e.g. by deformation of a plate material, such as steel plate, and it is not necessary that the supporting member is of the same material as the casing.

I claim:

1. An improved two-wheel castor for a chair or the like having shaft means extending downwardly therefrom, comprising casing means having a hole therein through which said shaft means can be downwardly inserted, and wheel supporting means within said casing means, said wheel supporting means having a hole therein for receiving said downwardly inserted shaft means and having a central bore, pin means inserted into said bore and two opposed wheels mounted on said pin means, at opposite sides of the wheel supporting means,

wherein the improvement comprises the combination of the following further features:

i. the casing means is a hollow casing adapted to enclose the major portion of said two wheels, the interior of which is shaped to correspond with the curved surface of a segment of a solid of revolution

about an axis extending parallel to the chordal plane of said segment, said casing having an opening at the bottom thereof corresponding to said chordal plane;

ii. the wheel supporting means is a separate member in the form of a segment of a disc, the radius of the curved portion of the periphery of the disc corresponding to the maximum radius of said solid of revolution and the perpendicular height from the center of the chord of the disc segment to said curved portion of the periphery of the disc being greater than the radius of said curved portion but smaller than the maximum dimension of said opening at the bottom of the casing;

whereby to assemble the castor said separate wheel supporting member having the two wheels mounted thereon are inserted through the opening at the bottom of the casing and then turned until the holes in the casing and the wheel supporting means are in registration to permit downward insertion of said shaft means extending from the chair or the like, the castor being disassembled by retracting said shaft means and turning the wheel supporting member until it is removable through said opening.

2. A castor according to claim 1 in which sleeves are provided extending into said bores in the supporting member through corresponding holes in the upper portion of the casing, for receiving said pin means.

3. A castor according to claim 1 in which the inner surface of the casing is spherical and the shaft pin means comprises two pins mounted at an obtuse angle to each other, each having an end extending into said central hole in the supporting means, and each having a wheel mounted thereon and shaped to conform with said spherical surface.

4. A castor according to claim 1 in which the inner surface of the casing is spherical and the shaft pin means comprises a single pin extending through said central hole in the supporting means, and having a wheel mounted at each end thereof and shaped to conform with said spherical surface.

5. A castor according to claim 1 in which the inner surface of the casing is a circular cylinder with two plane end walls and the shaft pin means comprises a single pin extending through said central hole in the supporting means, and having a wheel mounted at each end thereof and shaped to conform with said plane end walls.

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