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[56]

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[54] **CASTER ASSEMBLY.**
10 Claims, 10 Drawing Figs.

[52] U.S. Cl. 206/56,
308/6; 16/18; 206/46

[51] Int. Cl. B60b 33/00

[50] **Field of Search**..... 16/18, 26,
25, 31, 30; 206/46, 56A3, (Adhesive digest);
308/6X

ABSTRACT: A caster for supporting a fixture comprises a block having a socket in which a ball is retained. The ball is adapted to roll in the socket while supporting the weight of the fixture. A common web joins a plurality of like casters in spaced relationship, whereby the plurality of casters may be utilized as a unit in a fixture or the casters may be separated from the web and used singly or in subunits.

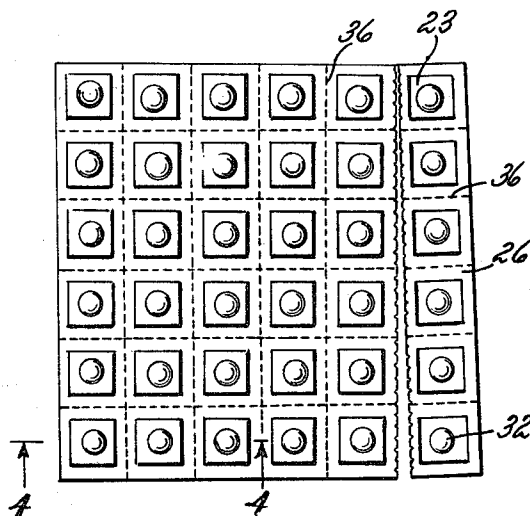


Fig. 1

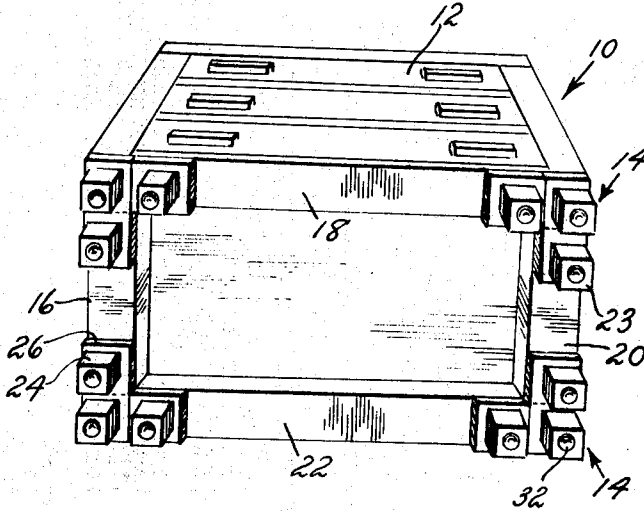


Fig. 2

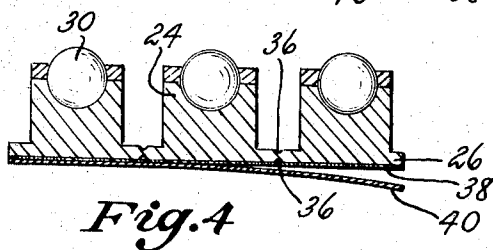
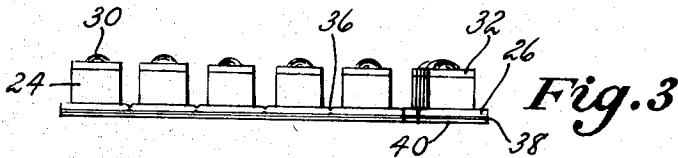
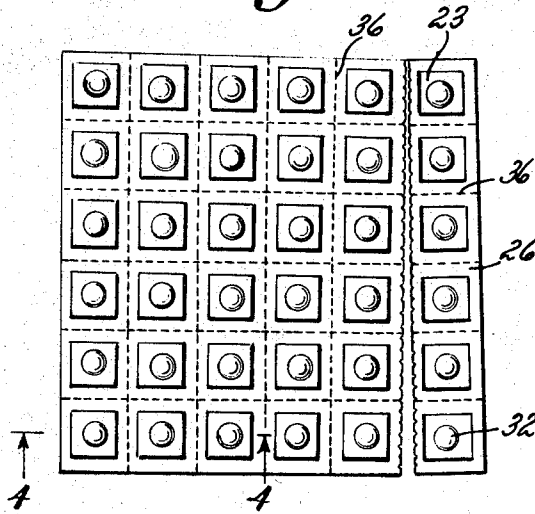


Fig. 5

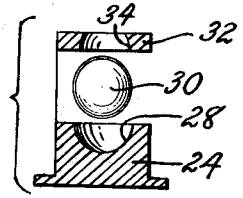


Fig. 6

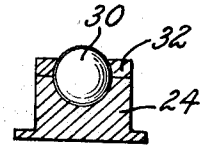


Fig. 7

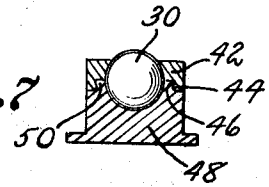


Fig. 8

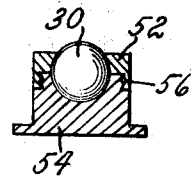


Fig. 9

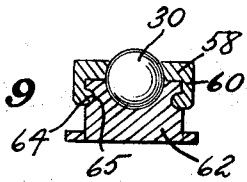
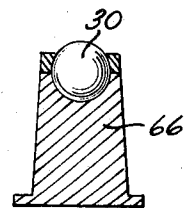


Fig. 10



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CASTER ASSEMBLY

BACKGROUND OF THE INVENTION

Casters as used on furniture, appliances and other fixtures to facilitate moving the fixture from place to place are usually located in the four corners of the fixture. Since the entire load of the fixture is concentrated on these four casters, the latter are frequently required to be made of strong or heavy material or are otherwise reinforced. Such casters are usually screwed, bolted, mounted in elongated sleeves or otherwise affixed to a reinforced or other heavy base member of the fixture. Accordingly, it is often necessary to make holes or otherwise permanently deface the fixture to provide means for affixing the casters thereto. Consequently, these known casters are not readily adaptable for use on fragile, thin, or finished areas of the fixture.

As a result of the aforesaid arrangement and construction, the costs of labor and material in connection with the use of such casters are increased, and the use to which they may be put is limited. Packaging problems also occur in that casters frequently are not shipped in their installed condition and when packed in a separate bag or container, they may become lost in transit or others to otherwise damaged. If a caster is lost damaged, it may become costly since an exact duplicate of the remaining casters must be located or an entire new set must be obtained. If an exact duplicate cannot be obtained, complete alteration of the fixture may be required to accommodate a whole new set of like casters. This may require discarding the existing holes and making additional holes for the screws, bolts, or other fastening device used to attach or affix the new casters.

Usually women, children or others are not equipped to install or replace the casters. In some cases, special tools or parts or skilled personnel are required to effect a replacement. In addition to the above, the usual four casters concentrate the weight on small areas in each corner of the fixture resulting in undesirable marring or marking of the floor or other damage thereto. Further, the floor must always be substantially flat or the fixture may topple over as might occur, for example, if one of the casters were damaged or fell off due to a loose fastening screw or the like.

The instant invention overcomes the aforesaid difficulties by providing an inexpensive caster which may be readily installed on the fixture, the construction and arrangement being such that a plurality of such casters, in excess of the usual four, may be economically and readily installed without any special skills or tools or without any permanent defacement to the fixture. Since it is practical to use more than the usual four casters, the weight of the fixture is distributed over a larger area, thereby eliminating the requirement for a costly heavy duty caster.

The casters of the instant invention do not require fastening devices such as screws or bolts or the like. They may be readily attached anywhere by an unskilled person, without requiring any special tools, and without requiring any holes or other damaging alterations or structural change in the fixture. Further, the instant casters may be utilized in a variety of readily selectable arrangements to fit any area on the base of the fixture to which they are to be applied.

SUMMARY OF THE INVENTION

A caster for supporting a fixture on a floor comprises a block of material having a socket in one face thereof. The socket is in the form of a spherical, concave surface and is adapted to receive part of a spherical ball. Retaining means are provided on the caster block to prevent the ball from falling out of the socket. The block also incorporates thereon further means adapting the block to be affixed to the bottom or base of a fixture. The ball contacts the floor to support the fixture and provides a rolling support surface therefor as the ball rolls in the socket. A common web joins a plurality of like casters in spaced relationship whereby a plurality of like casters may be utilized as a unit on a fixture or the casters may be separated and used singly or as subunits.

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Additional objects and advantages of the invention will be come apparent during the course of the following specification when taken in connection with the accompanying drawing in which:

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a bottom perspective view of a dresser showing casters, constructed according to one embodiment of the present invention, mounted on the bottom thereof;

FIG. 2 is a top plan view of a plurality of casters joined to one another by a web and showing one row which has just been severed from the remaining web;

FIG. 3 is an elevational view of the plurality of casters shown in FIG. 2;

FIG. 4 is a sectional view taken along the line 4-4 of FIG. 2 but on a larger scale;

FIG. 5 is an exploded view, in section, of a single caster as it would appear before assembly;

FIG. 6 is sectional view of the caster shown in FIG. 5 after it has been assembled;

FIG. 7 is a sectional view of an alternate embodiment in which the retaining ring is held in place by a snapping element;

FIG. 8 is a sectional view showing another alternate embodiment in which the retaining ring is threaded to the caster block;

FIG. 9 is a sectional view showing another alternate embodiment in which the retaining ring is held in place by another type of snapping element; and

FIG. 10 is a sectional view showing a further alternate embodiment in which the caster block has an elongated and tapered configuration.

DETAILED DESCRIPTION

Referring to the drawing, FIG. 1 shows a conventional dresser 10 having a plurality of dresser drawers 12 and a solid base on which a plurality of caster assemblies 14, constructed according to the present invention, are mounted. The caster assemblies 14 are affixed to the bottom flat surface of the structural members 16, 18, 20, 22 which define the base of the dresser 10. Each caster assembly 14 consists of a plurality of casters 23. Each caster 23 comprises a block 24 having a base which is integrally joined to a like base mounting another caster block whereby the joined bases form a common web 26. Thus, as can be seen in FIG. 2, a plurality of casters 23 are formed on a web 26 in which the caster blocks 24 and the common web 26 are all integral. The web 26 may be much longer than that illustrated and rolled into cylindrical form for storage.

Each caster block 24 has a socket 28 FIG. 5 therein in the form of a concave, spherical surface. The socket 28 receives a ball 30 which defines the moving or rolling part of the caster. In order to retain the ball 30 within the socket 28, retaining means are provided. These retaining means may take various forms. In the embodiment of FIGS. 1 to 6, the retaining means is in the form of a retaining ring 32 having a central opening 34, the latter having a varying diameter whereby to form an annular, arcuate, inner surface adapted to conform to the spherical shape of the ball 30. The larger diameter of the opening 34 (i.e. the lower diameter in FIG. 5) in the retaining ring 32 is approximately equal to the diameter of the ball 30 whereas the smallest diameter is smaller than the diameter of the ball 30. With this construction it will be apparent that once the ball 30 has been placed in the socket 28, the retaining ring 32 may be affixed, by means to be described, to the caster block 24, for retaining the ball 30 in place. If desired, however, a separate retaining ring may be dispensed with, and the caster block may be provided with integral retaining means. For example, the retaining ring 32 shown in FIG. 6, may be made integral with the caster block and the ball 30 may be inserted into the socket 28 by forcing it past the smaller diameter of the retaining ring into its assembled position. The caster block 24 and integral retaining ring may be made of a material (e.g. plastic) permitting the portion thereof

defining the smallest diameter of the ball opening to flex slightly as the ball 30 is forced into the socket and to return to its unflexed position after the ball 30 is in place, thereby to retain the ball 30 within the socket.

Returning to the illustrated embodiment, the common web 26 joining the plurality of caster blocks 24 is provided with means defining weakened lines 36 extending between the caster blocks 24 to facilitate separation of one or more blocks 24 from the remainder thereof. These weakened lines 36 may be in the form of score lines indented partly into the surface of the web, either in the top or the bottom surface or both. In FIG. 4, weakened lines 36 in the form of indented score lines are provided in the upper and lower surfaces of the web 26. Alternatively, the weakened lines may comprise rows of spaced holes or elongated slots (not shown) passing completely through the web 26. As can best be seen in FIG. 2, the lines of weakness 36 are provided between each row and column of blocks 24 so that any number of blocks may be severed from the remaining blocks as desired. In FIG. 2 the vertical row of blocks at the right is shown just after it has been severed from the remaining blocks along a weakened line.

The back or undersurface of the web 26 is provided with means for affixing the casters to the surface of the fixture which it is to support. The means may be in the form of a layer of pressure-sensitive adhesive 38 having a backing sheet 40 (e.g. paper) thereon which can be readily peeled off just prior to installation to expose the layer of adhesive 38 and adapt the block to be adhesively retained on the surface of the fixture. FIG. 4 shows the backing sheet 40 in the process of being peeled off of the bottom surface of the web 26 to expose the adhesive layer 38.

It will be apparent that any combination of caster blocks 24 may be severed from the web 26 shown in FIG. 2. For example, three blocks arranged at right angles to one another may be severed and arranged in each corner of the dresser 10, as shown in FIG. 1. Of course, it will be understood that the blocks may be applied singly or singly and in pairs to form the illustrated 3-block combination. After the three blocks are removed from the web 26 and the backing sheet 40 removed therefrom, it is only necessary to place the web 26 of the casters against the bottom flat surface of the dresser structural members 16, 18, 20, 22 and the layer of adhesive 38 will adhere the web 26 thereto without requiring the use of a fastening device or other means which would put holes in or otherwise mar or deface the furniture or fixture. Although in the illustrated embodiment, 12 casters 23 are shown on the bottom of the dresser 10, additional co casters may be provided all along the dresser structural members 16, 18, 20, 22.

In cases where the bottom of the fixture defines a complete flat surface, the total bottom area may have casters affixed thereto. For example, if the base of a fixture has a generally flat surface corresponding in area to the size of the web 26 shown in FIG. 2, such web may be affixed in its entirety to the base of the fixture. Accordingly, the fixture would be provided with 42 casters and the weight would be distributed over 42 locations. It will be apparent that any number of combinations or overall configurations of caster arrangements may be applied to the furniture or fixture as may be desired and that as more casters are used, the less concentrated is the weight of a fixture on any one particular caster. Thus, a large number of miniature casters may be applied to the entire bottom surface of a large and heavy fixture and will be effective in distributing the weight thereof.

In the embodiment of FIGS. 5 and 6, the retaining ring 32 is affixed to the caster body 24 by an adhesive. In the embodiment of FIG. 7, a retaining ring 42 is provided with a downward depending collar 44 having a bead 46 on the inner surface thereof. The caster block 48 has a reduced diameter portion 50 with an annular groove adapted to accommodate the bead 46 of the retaining ring 42. Accordingly, it will be apparent that when the retaining ring 42 is made of a material (e.g. plastic) having some inherent resiliency, the retaining ring 42 may be snapped into place into the position shown in

FIG. 7 wherein the bead 46 fits into the groove of the caster block 48 to hold the two together and thereby retain the ball 30 in position in the socket. In this embodiment the caster block 48 and retaining ring 42 may have a cylindrical configuration.

The embodiment of FIG. 8 is somewhat similar to that of FIG. 7. However, instead of being secured by a snapping construction, the retaining ring is threaded to the caster block 54. Thus, the retaining ring 52 is provided with a downwardly depending collar having an internal thread 56 which threadedly engages an external thread on the upper part of the caster block 54.

The embodiment of FIG. 9 uses a snapping construction as in the case of the FIG. 7 embodiment but in this case, the retaining ring 58 is provided with a downward depending collar 60 having an inner diameter approximately equal to the outer diameter of the caster block 62. The lower extremity of the collar 60 is provided with an annular bead 64 which is adapted to engage and to fit into an annular groove 65 in the caster block 62. The retaining ring 58 is made of a material having an inherent resiliency adapting the collar 60 and bead 64 to flex slightly as it is forced or snapped into the position shown in FIG. 9.

It will be understood that the retaining ring, the caster block, and the ball may be made of different materials. For example, the retaining ring serves only to retain the ball in place in the socket and does not carry the weight of the fixture as does the caster block and the ball. Accordingly, the retaining ring may readily be made of a material adapting it to flex as previously described.

The caster block may take various forms and shapes. In the alternate embodiment of FIG. 10 for example, the caster block 66 is elongated and tapered and resembles a leg of a piece of furniture. The choice of configuration may be governed in part by the desire to enhance the appearance of the fixture to which it is to be affixed.

From the foregoing description it will be seen that the casters are connected to a web having weakened lines and arranged not too unlike a sheet of stamps so that any desired length, width, or shape or other configuration may be detached or severed from the web. The web has a self-adhering adhesive from which the protective backing may be readily removed when the casters are ready for use. By using a plurality of casters, less weight is concentrated on each one thereby tending to avoid depressions or marring of the floor floors. Also, since there is less weight concentrated on each caster, there is less likelihood of wear or damage thereto. By using a larger number of casters, if one is damaged or falls off, the fixture will not topple over as in the case of the conventional 4-caster arrangement.

The casters may be installed by women, children, or unskilled personnel without requiring special tools or parts. It is not necessary to make any holes in the fixture or to affix screws, bolts, nails or the like. The floor need not be absolutely flat or smooth and the casters will still function.

It will be apparent that the casters of the present invention can be made relatively inexpensively and can be made widely available as an every day household item. When ready for use, one or more casters may be separated by a knife or scissors or manually severed by bending and tearing along the weakened lines. The casters may take on a wide variation of sizes and may be made in decorative colors and shaped to enhance the appearance of the fixture to which they are attached.

While preferred embodiments of the invention have been shown and described herein, it will be obvious that numerous omissions, changes and additions may be made in such embodiments without departing from the spirit and scope of the invention.

I claim:

1. A caster assembly for supporting a fixture on a floor comprising a plurality of blocks of material joined by a flexible web, each of said blocks having a socket on one face thereof and a base portion at the opposite face thereof, a spherical ball

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partly in said socket and partly protruding therefrom, and adhesive means on said base portion for affixing the latter to a surface of said fixture to be supported, whereby the protruding ball contacts the floor to support the fixture and provides a rolling support surface therefor as said ball rolls in said socket, said flexible web having weakened lines of separation bordering each of said blocks whereby selected combinations of blocks can be separated from said web along said weakened lines.

2. A caster assembly according to claim 1 in which said socket has a spherical concave surface sized to receive said spherical ball snugly, and in which a retaining ring on said one face of said block maintains said ball in said socket.

3. A caster assembly according to claim 1 in which said flexible web has a thickness substantially less than the height of said blocks, and in which the base portions of said blocks are integral with and coextensive with said web.

4. A caster assembly according to claim 1 wherein said weakened lines comprise indented score lines on opposite surfaces of said web.

5. A caster assembly according to claim 2 wherein said

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retaining ring has a central opening, the smallest diameter of which is less than the diameter of said ball, thereby retaining the ball within the socket.

6. A caster assembly according to claim 2 wherein said retaining ring is integral with said block.

7. A caster assembly according to claim 2 wherein said retaining ring is a separate member, and means are provided for affixing said retaining ring to said block.

8. A caster assembly according to claim 7 wherein said retaining ring has a collar having an internal thread, said block having a threaded portion to threadedly receive said collar.

9. A caster assembly according to claim 7 wherein said retaining ring has a collar with an annular bead thereon, and means on said block having an annular groove to receive said bead to thereby secure said retaining ring to said block.

10. A caster assembly according to claim 1 wherein said adhesive means for affixing said blocks to the fixture comprises a pressure-sensitive adhesive and a backing sheet covering said adhesive and readily removable to expose said adhesive prior to affixing the block to said fixture.

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