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H. LEBENSFELD
BALL-BEARING ASSEMBLY

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Fig. 1.

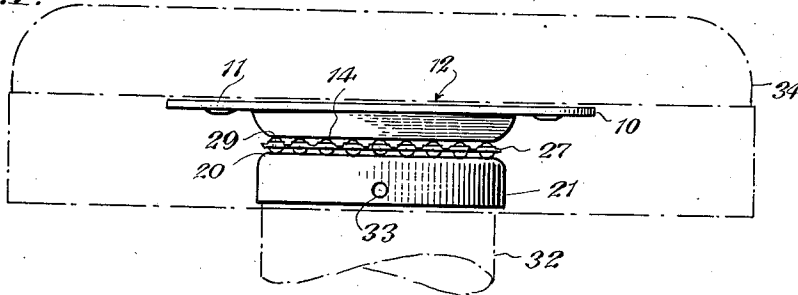


Fig. 2.

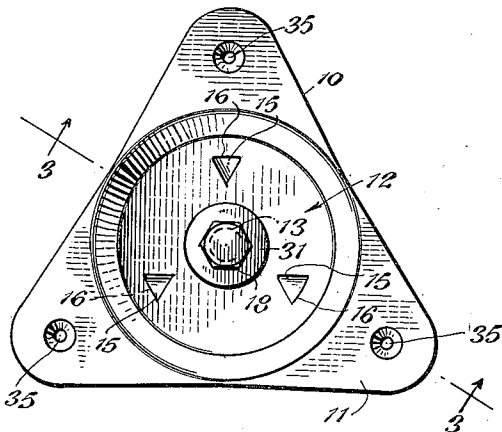


Fig. 3.

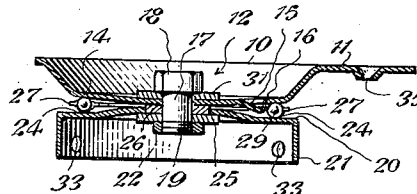
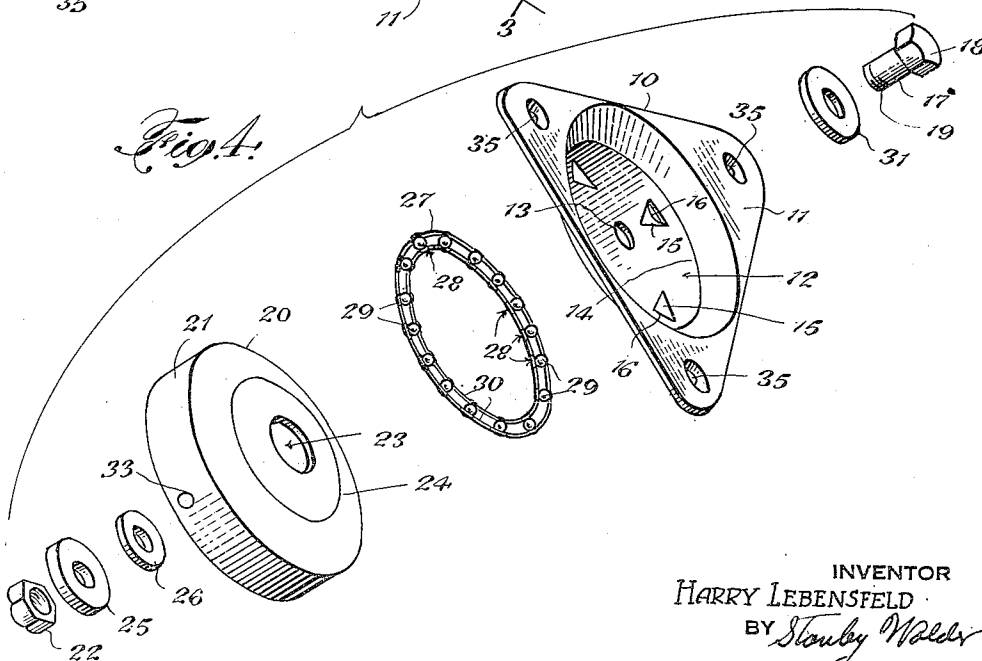


Fig. 4.



INVENTOR
HARRY LEBENSFELD
BY *Stanley Walden*
ATTORNEY

UNITED STATES PATENT OFFICE

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BALL-BEARING ASSEMBLY

Harry Lebensfeld, New York, N. Y., assignor to
United Industrial Syndicate, Inc., New York
County, N. Y., a corporation of New York

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11 Claims. (Cl. 308—235)

1

The present invention relates to an improved ball-bearing assembly particularly applicable to bar stools having rotatable seats.

An object of my invention is to provide a ball-bearing assembly of simple construction, the elements of which are easily removable and simply replaced.

A further object of my invention is to provide an inexpensive but serviceable ball-bearing assembly for use with bar stools having rotatable seats.

These objects and others are achieved by a ball-bearing assembly including axially aligned movable and base members, secured to one another across a spacer washer, which members have opposed flat surfaces forming a raceway in which may rotate anti-friction balls, mounted at spaced intervals in an annular ball carrier, which carrier is secured against lateral displacement by a plurality of dimples in one of said members disposed along the inner margin of said carrier.

Other objects and a fuller understanding of my invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing which illustrates a preferred embodiment thereof, it being understood that the foregoing statement of the objects of my invention and the brief summary thereof are intended to generally explain the same without limiting it in any manner.

Fig. 1 is a side elevation of a ball-bearing assembly embodying my invention, there being shown in dashed outline cooperative portions of a bar-stool seat and column with which it may be employed.

Fig. 2 is a top plan view thereof.

Fig. 3 is a sectional view thereof in elevation taken along line 3—3 of Fig. 2.

Fig. 4 is an exploded view in perspective of said assembly showing the relation of parts.

Referring to the drawings, the embodiment of my invention therein illustrated includes a movable member 10 comprising substantially planar outer portions 11, a centrally disposed concavity 12 of substantially circular cross-section, and having a centrally located aperture 13; the underside of said concavity having an annular flat upper race 14 concentrically related to said aperture and downwardly extending dimples 15, in the form of indentations in said concavity which may be pierced therethrough, disposed about the inner margin of said upper race, the outer portions 16 of said dimples having preferably the same degree of arc as the inner margin of upper race 14.

2

A bolt 17, having a head 18 and a threaded shank portion 19, passes through a washer 31 and retains a base member 20 in association with movable member 10 by means of the coactive restraining influence of nut 22 and washer 25. Base member 20 is essentially a dish-shaped disc having a relatively broad centrally located aperture 23. The peripheral portions of base member 20 have been bent downward to form a collar 21. A plane annular surface extending inward of said collar along the top of said base member forms lower race 24 substantially in register with upper race 14 on the underside of movable member 10 when apertures 13 and 23 are axially aligned, thereby forming a raceway between said upper and lower races. Within aperture 23 is seated spacer washer 26 which consists of an annular flat ring having a diameter just slightly less than the diameter of aperture 23 and having an axially disposed aperture preferably of the same diameter as aperture 13 in movable member 10. Spacer washer 26 is just slightly thicker than the thickness of the material of which base member 20 is made and is designed in that fashion in order to prevent the binding of base member 20 and movable member 10.

An anti-friction element, comprising an annular ball carrier 27 of substantially the same diameter as upper and lower races 14 and 24 having apertured sockets 28 at spaced intervals in which are retained balls 29, is disposed between said base and movable members 10 and 20 and axially aligned with apertures 13 and 23 in said members. Sockets 28 are of slightly smaller diameter than balls 29 so that somewhat less than one-half of such balls extend therethrough. Balls 29 are loosely held in place in ball carrier 27 by means of the upturned and inwardly turned marginal portions 30 of said carrier, which extend inwardly over the equator or greatest horizontally extending portions of said balls. Said marginal portions are slightly rounded at the location of each ball in order to minimize wear between said balls and the upper walls of such marginal portions.

Ball carrier 27 is prevented from shifting laterally by detent means in the form of dimples 15, the outer curved portions 16 of said dimples coming into contact with the inner margin of said carrier. Although two such dimples are sufficient and although more than three may also be employed, I prefer to use three such dimples as the most efficient detent means commensurable with economic construction.

The elements of the assembly are made in self-

3

evident fashion and hence need no comment. It may be observed, however, that the principal members may be formed in relatively simple stamping operations.

The assembly of the elements calls for neither particular mechanical skill nor special tools. Bolt 17 is passed through the various elements in the order shown in Fig. 4, nut 22 being tightened home against washer 25.

The ball-bearing assembly is easily incorporated into a bar stool, such as the one indicated in dashed outline in Fig. 1 by slipping collar 21 of base member 20 over column 32 of a pedestal such as the pedestal illustrated in my application for a patent filed December 1, 1949, for a Pedestal, bearing Serial No. 130,568 (series of 1948). Bores 33 may be aligned with similar bores on such column and said base member may be bolted to said column or otherwise affixed thereto by fastening means passing through said bores. The movable member 10 may be secured to the underside of a seat 34 by means of wood screws or other fastening devices passing through bores 35 in said movable member.

For best operation, the anti-friction element may be covered with heavy grease. It will be found that a seat mounted upon the ball-bearing assembly will rotate easily either with or without a heavy load.

Although I have described my invention with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous additional changes in the details of construction, combination and arrangement of parts may be resorted to without transcending the scope of the invention as hereinafter claimed.

I claim as my invention:

1. A ball-bearing assembly comprising a base member, a movable member mounted for rotation relative to said base member, said members having opposed surfaces forming a raceway therebetween, anti-friction means disposed between said members, said means including an annular ball carrier and balls rotatably mounted at spaced intervals along said ball carrier, said balls being operable in said raceway, and detent means, formed on one of said members, disposed along a margin of said anti-friction means to prevent lateral displacement thereof.

2. A ball-bearing assembly comprising a base member, a movable member mounted for rotation relative to said base member, said members having opposed surfaces forming a raceway therebetween, anti-friction means disposed between said members, said means including an annular ball carrier and balls rotatably mounted at spaced intervals along said ball carrier, said balls being operable in said raceway, and detent means, comprising a plurality of dimples in one of said members extending toward the other of said members, disposed along a margin of said anti-friction means to prevent lateral displacement thereof.

3. A ball-bearing assembly comprising a base member, a movable member mounted for rotation relative to said base member, said members having opposed surfaces forming a raceway therebetween, anti-friction means disposed between said members, said means including an annular ball carrier and balls rotatably mounted at spaced intervals along said ball carrier, said balls being operable in said raceway, and detent means, comprising a plurality of dimples in one of said members extending toward the other of

4

said members, disposed along a margin of said anti-friction means to prevent lateral displacement thereof, said dimples having curved edges confronting a margin of said anti-friction means and substantially in register therewith.

4. A ball-bearing assembly comprising a base member, a movable member oppositely and rotatably mounted in association with said base member, said members having opposed annular surfaces forming a raceway therebetween, an annular ball carrier disposed between said members, balls rotatably mounted at spaced intervals along said ball carrier, said balls being operable in said raceway, and detent means, formed on one of said members, disposed along a margin of said ball carrier to prevent lateral displacement thereof.

5. A ball-bearing assembly comprising a base member, a movable member oppositely and rotatably mounted in association with said base member, said members having opposed annular surfaces forming a raceway therebetween, an annular ball carrier disposed between said members, balls rotatably mounted at spaced intervals along said ball carrier, said balls being operable in said raceway, and detent means, comprising a plurality of dimples in one of said members extending toward the other of said members, disposed along a margin of said ball carrier to prevent lateral displacement thereof.

6. A ball-bearing assembly comprising a base member, a movable member oppositely and rotatably mounted in association with said base member, said members having opposed annular surfaces forming a raceway therebetween, an annular ball carrier disposed between said members, balls rotatably mounted at spaced intervals along said ball carrier, said balls being operable in said raceway, and detent means, comprising a plurality of dimples in one of said members extending toward the other of said members, disposed along a margin of said ball carrier to prevent lateral displacement thereof, said dimples having curved edges confronting a margin of said ball carrier and substantially in register therewith.

7. A ball-bearing assembly comprising a base member having a relatively broad centrally located circular aperture therein, a spacer washer seated in said aperture, said washer being slightly thicker than said base member and of a diameter slightly less than that of said aperture, a movable member having an axial opening, said movable member being oppositely and rotatably mounted in association with said base member by means passing through said washer and said opening, said members having opposed annular surfaces forming a raceway therebetween, an annular ball carrier disposed between said members, anti-friction balls rotatably mounted at spaced intervals along said ball carrier, said balls being in contact with said annular surfaces and operable in said raceway, and detent means, formed on one of said members, disposed along a margin of said ball carrier to prevent lateral displacement thereof.

8. A ball-bearing assembly comprising a base member having a relatively broad centrally located circular aperture therein, a spacer washer seated in said aperture, said washer being slightly thicker than said base member and of a diameter slightly less than that of said aperture, a movable member having an axial opening, said movable member being oppositely and rotatably mounted in association with said base member by

5

means passing through said washer and said opening, said members having opposed annular surfaces forming a raceway therebetween, an annular ball carrier disposed between said members, anti-friction balls rotatably mounted at spaced intervals along said ball carrier, said balls being in contact with said annular surfaces and operable in said raceway, and detent means, comprising a plurality of dimples in one of said members extending toward the other of said members, disposed along a margin of said ball carrier to prevent lateral displacement thereof.

9. A ball-bearing assembly comprising a base member having a relatively broad centrally located circular aperture therein, a spacer washer seated in said aperture, said washer being slightly thicker than said base member and of a diameter slightly less than that of said aperture, a movable member having an axial opening, said movable member being oppositely and rotatably mounted in association with said base member by means passing through said washer and said opening, said members having opposed annular surfaces forming a raceway therebetween, an annular ball carrier disposed between said members, anti-friction balls rotatably mounted at spaced intervals along said ball carrier, said balls being in contact with said annular surfaces and operable in said raceway, and detent means, comprising a plurality of dimples in one of said members extending toward the other of said members, disposed along a margin of said ball carrier to prevent lateral displacement thereof, said dimples having curved edges confronting a margin of said ball carrier and substantially in register therewith.

10. A ball bearing assembly comprising a base member having a relatively broad centrally located circular aperture therein, a spacer washer seated within said aperture, said washer being slightly thicker than said base member and slightly smaller in diameter than said aperture, a

6

movable member having an axial opening and adapted to carry a load oppositely and rotatably mounted in association with said base member by means passing through said washer and said opening, said members having opposed flat annular surfaces forming a raceway therebetween, an annular ball carrier disposed between said members, anti-friction balls rotatably mounted at spaced intervals along said ball carrier, said balls being in contact with said opposed annular surfaces and operable in said raceway, said movable member having a plurality of dimples therein extending toward said base member and spaced along the inner edge of the annular surface on said movable member, said dimples having curved edges confronting the inner margin of said ball carrier and substantially in register therewith, thereby preventing the lateral displacement thereof.

11. A ball-bearing assembly comprising a base member, a movable member mounted for rotation relative to said base member, said members having opposed surfaces forming a raceway therebetween, anti-friction means disposed between said members, said means including an annular ball carrier and balls rotatably mounted at spaced intervals along said ball carrier, said balls being operable in said raceway, and detent means formed in at least one of said members, disposed in contacting relationship to said anti-friction means to prevent lateral displacement thereof.

HARRY LEBENSFELD.

REFERENCES CITED

The following references are of record in the file of this patent:

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