Nov. 18, 1969 M. NOSENZO 3,478,382

SEALED BALL TRANSFER

Filed July 3, 1967

Fig. 3

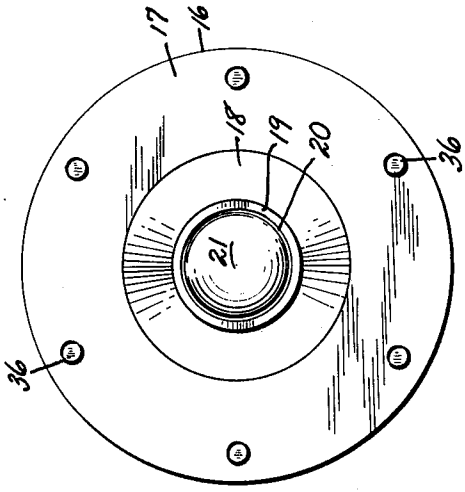


Fig. 2

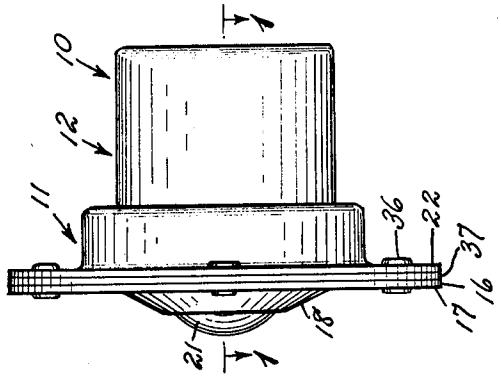
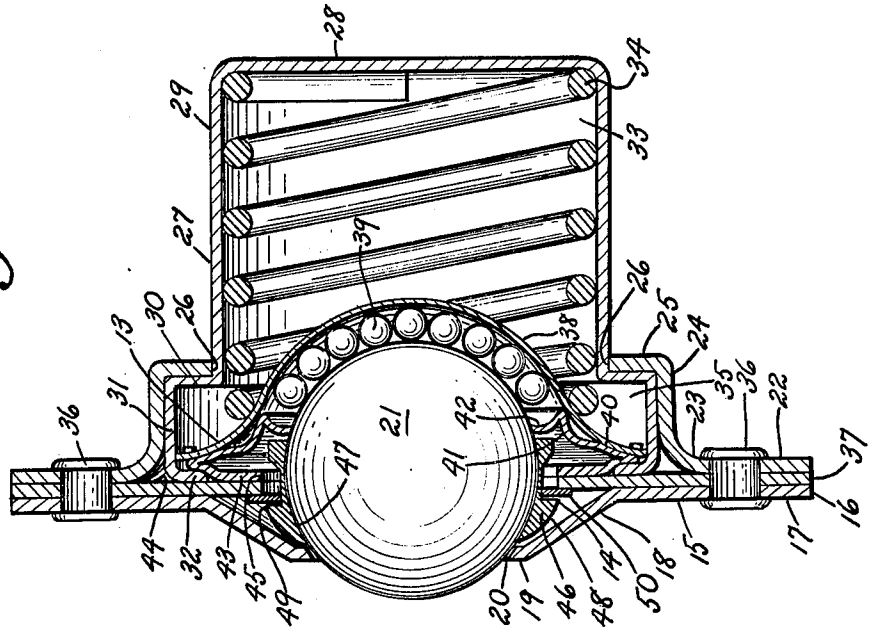


Fig. 1



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SEALED BALL TRANSFER

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U.S. Cl. 16—44 2 Claims

ABSTRACT OF THE DISCLOSURE

A sealed ball transfer in which the main ball is resiliently mounted with respect to a housing, and in which the sealing means is snapped directly upon the ball to move with the same under deflection.

This invention relates generally to the field of ball transfers, of a type in which a plurality of the same may be mounted upon a horizontal or other surface for the purpose of facilitating the sliding movement of containers or other articles thereover. Devices of the instant type are known in the art, and the invention lies in specific constructional details which permit the obtaining of a sealed main ball which will be relatively impervious to the deleterious effects of dirt, dust and other foreign material, while yet permitting the ball to resiliently flex within a housing within which it is mounted, this end being obtained by forming the ball sealing means in such manner that it is independent with respect to permissive movement of said housing.

It is among the principal objects of the present invention to provide a sealed ball transfer of the type described in which the sealing means directly engages the main ball surface as a sliding fit, while not being readily disengaged with resilient axial flexing of the ball with respect to the housing in which it is mounted.

Another object of the invention lies in the provision of an improved sealed ball transfer, possessed of the above advantage, in which the cost of fabrication may be of a reasonably low order, with consequent wide sale, distribution and use.

Another object of the invention lies in the provision of an improved sealed ball transfer which may be conveniently fabricated using existing production techniques, and without resort to special skills.

Yet another object of the invention lies in the provision of an improved sealed ball transfer of the type described which, owing to its improved constructional features, may have a relatively long, trouble-free, useful life.

Yet another object of the invention lies in the provision of an improved sealed ball transfer in which the main ball is resiliently mounted with respect to the housing in which it is installed, thereby permitting the device to offer shock cushioning properties not available in the prior art.

A feature of the disclosed embodiment lies in the relative ease of assembly of the same during manufacture.

These objects and features, as well as other incidental ends and advantages, will more fully appear in the progress of the following disclosure, and be pointed out in the appended claims.

In the drawing, to which reference will be made in the specification, similar reference characters have been employed to designate corresponding parts throughout the several views.

FIGURE 1 is a longitudinal central view of an embodiment of the invention, as seen from the plane 1—1 in FIGURE 2.

FIGURE 2 is a side elevational view thereof.

FIGURE 3 is an end elevational view, as seen from the left hand portion of FIGURE 2.

In accordance with the invention, the device, generally indicated by reference character **10**, comprises broadly: a casing element **11**, a resilient element **12**, a ball unit element **13**, and ball unit sealing means **14**.

The casing element **11** is preferably formed from sheet metal drawings or stampings, and includes a lower orificed member **15**, bounded by an outer periphery **16**, and including a planar member **17**, a conical member **18** interconnected thereto, and a planar inner member **19** having an orifice **20** therein for accommodation of a main ball **21** of conventional type, preferably formed from carbon steel.

Interconnected with the member **15** is an upper orifice member **22**, including a planar outer member **23**, a cylindrically shaped member **24**, and an orificed planar inner member **25** defining a circular opening **26** which accommodates a spring housing **27**.

The housing **27** includes an end wall **28**, an upper cylindrical wall **29**, a radially outwardly disposed flange **30**, a lower cylindrical wall **31**, and a radially inwardly directed flange **32**. An upper recess **33** accommodates a compression spring **34**, while a lower recess **35** accommodates the above mentioned ball unit element **13**.

Rivet means **36** interconnects the members **15** and **22**, sandwiching therebetween a flexible orifice member **37** of neoprene or similar material which forms part of the sealing means **14**.

The ball unit element **13** includes an upper housing **38** enclosing a plurality of smaller ball bearings **39** maintained thereagainst, and against the inwardly disposed surface of the main ball **21** by a retaining member **40**. As best seen in FIGURE 3, the member **40** includes an upper portion **41** forming a ball-retaining trough **42**, and a lower member **43** which engages the upper surface **44** of the member **37**, and defines an opening **45** co-extensive therewith.

The ball unit sealing means **14** also includes a molded nylon shield **46** adapted to be snapped directly upon the ball **21** (FIGURE 3). It is bounded by a spheroidal inner peripheral surface **47**, a lower outer surface **48**, and a notched portion **49** which accommodates, in addition to the members **37** and **43**, a spring steel ring **50** which, in effect, closes the openings in the members **37** and **43**.

It will be observed that under deflection, the entire ball unit element **13** can flex between an outermost limit in which the retaining member **40** contacts the flange **32**, and an innermost limit in which the upper housing **38** contacts the flange **30**. During the entire range of this deflection, the shield **46** will move with the ball **21**, irrespective of the presence of simultaneous rotation of said ball. Owing to the knife edge formed by the meeting of the surface **48** and the surface **47**, the ball is constantly scraped clean of foreign material.

I wish it to be understood that I do not consider the invention limited to the precise details of structure shown and set forth in this specification, for obvious modifications will occur to those skilled in the art to which the invention pertains.

I claim:

1. In a sealed ball transfer, a housing element, a ball unit element mounted within said housing element for limited movement with respect thereto, along a principal

axis thereof, resilient means urging said ball element to a limit of travel within said housing in which said ball unit projects outwardly of said housing through an orifice therein; said ball unit including a main ball, a plurality of spherical bearings supporting said ball, and a cup-shaped member retaining said spherical bearings in position; and means for preventing the entry of foreign material from the surface of said main ball, said means including a shield of distortable material bounded by a semi-spheroidal inner surface corresponding to the outer surface of said main ball, and resiliently engaged therewith.

2. Structure in accordance with claim 1, including a flexible planar sealing member interconnecting said shield and said housing.

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16—24