A locking mechanism assembly for a jewellery strand comprising a male end pin with a rounded end and a groove, and a corresponding female end socket in the shape of a hollow cylinder that neatly fits the pin, and further may comprise a spring wrapped around the socket, at least two separate holes at the inner end of the socket, ball bearings each of which correspond to one of the holes, and a housing that encases the socket, the spring, the holes and the ball bearing. Insertion of the pin into the socket locks the pin in the socket. Release of the pin may be effected by extending the socket housing towards the pin before removing the pin from the socket.
STRAIGHT LOCKING MECHANISM ASSEMBLY

FIELD OF THE INVENTION

The present invention relates to locking mechanisms. In particular, the present invention relates to locking mechanisms for releasably attaching the ends of a jewellery strand.

BACKGROUND OF THE INVENTION

It is common for strands of jewellery to be worn for a variety of purposes, including as fashion accessories and to convey emergency medical information. The prior art devices generally used to join the ends of such strands may include hooks, clasps, spring locks, lobster claws, and other clasping means. These prior art devices have not been functionally compatible with beads that are to be strung on the same strand. In contrast, the present invention is designed to be aesthetically beautiful and functionally compatible with the beads strung next to it.

SUMMARY OF THE INVENTION

There is provided a locking mechanism assembly for a jewellery strand comprising female and male components, wherein the male component comprises a pin with a rounded end and a groove. The pin may be cylindrical. The groove may be proximal to the rounded end.

The female component may comprise a socket in the shape of a hollow cylinder that exactly fits the pin, and further may comprise a spring wrapped around the socket, at least two separate holes at the inner end of the socket, ball bearings each of which corresponds to one of the holes, and a housing that encases the socket, the spring, the holes and the ball bearing.

The groove may be adapted for receiving the ball bearings of the female end to move and lock into. The socket may consist of a collar surrounding one end of the socket and forming an external ledge against which one side of the spring can exert its force.

The housing may comprise an internal ledge around the inner circumference where one side of the spring can exert its force upon. The internal ledge may be adapted to press against each of the ball bearings such that they sit firmly in their corresponding holes. The housing may consist of an inner surface tapering from the internal ledge that allows the ball bearings to move freely at a wider end of the taper.

The tapered inner surface may be adapted such that it pushes against a retainer ring that sits in a groove along the socket’s outer circumference, preventing the spring from pushing the housing off of the socket.

BRIEF DESCRIPTION OF THE DRAWINGS OF THE INVENTION

The invention will be better understood when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

FIG. 1 is a side view of the male end pin of the present invention;
FIG. 2 is a side cross-sectional view of the female end receptacle of the present invention;
FIG. 3 is a component and construction view of the locking mechanism assembly of the invention;
FIG. 4 is a side cross-sectional view of the locking mechanism assembly of the invention in a locked position; and
FIG. 5 is a side cross-sectional view of the locking mechanism assembly of the invention wherein the housing has been dislocated to free the pin from the receptacle.

DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

The present invention provides a locking mechanism assembly for connecting the ends of a jewellery strand. In this specification, the word “strand” means an elongate structure and includes bracelet, anklet, necklace, strap, chain, cord, string, belt and rope. Such jewellery strands may include necklaces worn around the neck, bracelets or watches worn around the wrist, anklets worn around the ankles, and belts worn around the waist. The strands may be made of metals, polyvinyl chloride and other plastics, rubber, leather, fabric or other natural or artificial materials.

The locking mechanism assembly comprises two primary elements, a grooved male end pin connected to one end of the strand and a female end receptacle connected to the opposite end of the strand. The ends of the strand are connected by inserting the grooved pin into the receptacle. The pin and receptacle are designed to be of a size and shape to permit them to fit neatly together. Locking occurs when ball bearings in the receptacle enter into the recess of the groove in the pin, preventing removal of the pin from the receptacle without an initial release step.

As best seen in FIG. 1, the male end pin 2 consists of pin 4 attached to a strand 6. The pin is cylindrical with a rounded distal end 8 and a groove 10 circumscribing the pin in proximity to the distal end. The groove forms a recess in the pin into which ball bearings in the receptacle may be inserted in a locked position, as will be described below.

Referring to FIGS. 2 and 3, the female end receptacle 12 comprises a socket 14 of a length, width and shape selected to neatly receive the pin and located within a housing 16. The socket is connected at a first end to a strand 18. At an opposed second end, the socket includes a collar 20 having an exterior diameter greater than the exterior diameter of a body section 22 of the socket. The collar thereby forms an external ledge 24 around the socket. A spring 25 is mounted about the body of the socket and is prevented from sliding past the second end of the socket by the collar.

The housing comprises a hollow cylinder. The internal opening of the housing extending from a first end corresponding to the second end of the socket is of a fixed diameter sufficient to permit movement therein of the socket and encircling spring. At a medial position, the internal diameter of the housing narrows to form an internal ledge 26. The spring is prevented from sliding toward the strand by the internal ledge of the housing. The internal diameter of the ledge is selected to maintain inward pressure on the plurality of ball bearings to bias them into the socket groove during locking.

Beyond the internal ledge, the internal opening of the housing tapers outwardly towards the strand. The opening of the housing toward the strand is round and widens in a taper toward the strand so that when the locking mechanism is disengaged by forcing the housing away from the strand, the ball bearings that were pressed by the housing during engagement of the holes of the socket into the groove of the pin will have room to be retracted from the pin, allowing the lock to release the pin.
At the first end of the socket there are disposed a plurality of at least two openings 28 disposed around the circumference of the pin and in which a corresponding plurality of ball bearings 30 are seated. Between the first end of the socket and the plurality of openings, a groove 32 encircles the socket. A retaining ring 34 may be positioned in the groove 32 to prevent the housing from sliding off the socket towards the strand.

As shown in Fig. 4, in operation, the locking mechanism assembly is engaged by moving the housing away from the strand to allow movement of the ball bearings, pushing the male end pin into the female end receptacle until the ball bearings are aligned with the groove of the pin, and releasing the housing to force the ball bearings into the plurality of holes in the socket and into the groove of the pin by the internal ledge of the housing pressing upon them. In a locked position, the pin may not be extracted from the receptacle. In the locked position, the spring holds the housing in place.

During unlocking, as shown in Fig. 5, the housing is forced against the spring towards the pin, away from the strand. Compression of the spring allows the housing to be displaced, thereby dislocating the internal ledge from its position adjacent the ball bearings. As sufficient room around the ball bearings is made available by the widening taper of the housing, the ball bearings are able to be extracted from the groove of the pin and the pin may be extracted from the receptacle.

When the pin and receptacle are locked together, the spring 25, which is wrapped around the socket 14 and covered by the housing 16, sits inside its space nearly and compressed with one side pushing against the ledge of the socket and the other against the ledge of the housing. In this position, the retaining ring 34 that sits in its groove 32 is squeezed and pressed against by the tapered inner surface of the housing, making the spring unable to push the housing any further towards the strand. While the housing pushes against the retainer ring, the ledge pushes against the ball bearings 30 so that they sit firmly in their holes 28, which allows one-third of their height to lock into the groove of the pin 4, making the pin and receptacle unable to come apart. The ball bearing lock is designed for the purpose of being able to join and free two ends of a strand with components that are aesthetically compatible with beads that are strung on the same strand. The lock is designed for ease of use, with a pin securely attached to one end of the strand and a receptacle securely attached to the other. The ends of the strand lock together when the pin is inside the socket of the receptacle, the housing of the lock pushing ball bearings firmly into their holes in the socket, and the spring holding the housing in place. To lock or unlock the two ends, simply push the housing in the direction of the pin, and the pin will be able to move freely in and out of the socket.

It will be appreciated by those skilled in the art that other variations of the preferred embodiment may also be practiced without departing from the scope of the invention.

We claim:

1. A locking mechanism assembly for a jewellery strand comprising female and male components, wherein the male component comprises a pin with a rounded end and a groove.

2. The locking mechanism assembly of claim 1, wherein the pin is cylindrical.

3. The locking mechanism assembly of claim 1, wherein the groove is proximal to the rounded end.

4. The locking mechanism assembly of claim 1, wherein the female component comprises a socket in the shape of a hollow cylinder that neatly fits the pin.

5. The locking mechanism assembly of claim 4, wherein the female end further comprises a spring wrapped around the socket, at least two separate holes at the inner end of the socket, ball bearings each of which correspond to one of the holes, and a housing that encases the socket, the spring, the holes and the ball bearing.

6. The locking mechanism assembly of claim 5, wherein the groove is adapted for receiving the ball bearings of the female end to move and lock into.

7. The locking mechanism assembly of claim 5, wherein the socket consists of a collar surrounding one end of the socket and forming an external ledge against which one side of the spring can exert its force.

8. The locking mechanism assembly of claim 4, wherein the housing comprises an internal ledge around the inner circumference where one side of the spring can exert its force upon.

9. The locking mechanism assembly of claim 8 wherein the internal ledge is adapted to press against each of the ball bearings such that they sit firmly in their corresponding holes.

10. The locking mechanism assembly of claim 9 wherein the housing consists of a inner surface tapering from the internal ledge that allows the ball bearings to move freely at a wider end of the taper.

11. The locking mechanism assembly of claim 10 wherein the tapered inner surface is adapted such that it pushes against a retainer ring that sits in a groove along the socket's outer circumference, preventing the spring from pushing the housing off of the socket.

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